Green Growth Industrial Strategy Public Consultation Submissions

August 2026

Introduction

The Department of Enterprise, Tourism and Employment sought the views of interested stakeholders to inform the development of a new Green Growth Strategy, which is linked to commitments in the Programme for Government 2025 – Securing Ireland's Future.

The aim of the new strategy is to ensure that Ireland develops a strong domestic supply chain in the renewable energy sector and that government adopts a coherent and ambitious approach to future opportunities. Interested stakeholders were invited to take part in this public consultation process, which was published on the Department's website.

Background

In March 2024, Powering Prosperity – Ireland's Offshore Wind Industrial Strategy marked a significant milestone as the first strategy of its kind for Ireland. Powering Prosperity set out 40 actions to be delivered across 2024 and 2025, to ensure we are well placed to capture the full economic potential of Ireland's offshore wind sector and the government's plan-led approach to offshore wind.

The delivery of Powering Prosperity is widely regarded as successful. However, from conversations with stakeholders (government departments, agencies and industry), we are keenly aware that offshore wind cannot sit on its own and needs to be viewed in the wider energy system. Therefore, a more holistic approach looking at the wider energy ecosystem – energy generation, the systems required to support the generation and distribution, and then the demand side including uses of the generated energy beyond large energy users – should be undertaken as part of a wider 'green growth' industrial strategy. As such, the Action Plan on Competitiveness and Productivity published in September 2025, contained an action to *"Publish a green industrial growth strategy focused on the development and industrial deployment of green technologies to support sectoral growth and unlock economic opportunities across all regions"*.

This proposed new green growth strategy will not replace Powering Prosperity. Rather, it will be a successor to it, building on the momentum and progress as well as the most effective elements of Powering Prosperity.

The need for renewable energy becomes increasingly urgent with each passing year. Ireland has recognised the potential of offshore wind not only to decarbonise our energy system, but to generate significant economic opportunities and ensure our energy security. This national commitment has been reinforced by the establishment of the Offshore Wind Delivery Taskforce, commitments in the Programme for Government to fast-track offshore wind energy development and support Irish companies to integrate into the offshore wind supply chain, and more recently by the establishment of the Offshore Wind Energy Clearing House.

To truly harness the potential of our abundant renewable energy resources, we must expand our focus beyond offshore wind alone. To increase the potential gains from an industrial strategy, we must examine the potential of offshore renewable energy technologies beyond wind. Our closest neighbours are already diversifying into marine energy, including floating and fixed offshore wind, wave energy and tidal stream technologies, and there may be opportunities here for Ireland also.

It is envisaged that the proposed green growth strategy will focus primarily on supporting companies developing certain green technologies, including innovation and in-company research and development, and the required supply chain for deployment rather than developing any policy for these technologies. The growth of the renewable energy sector should be the focus for this strategy.

Similar to Powering Prosperity, it is proposed that the new strategy focus on the economic opportunities presented by the green transition, specifically focussing on those green technologies which would benefit from a strategic level intervention as described above.

The next phase of Ireland's green industrial strategy should also:

- Enable integration: Ireland's strengths — a highly educated workforce, a thriving innovation ecosystem, and advanced digital capabilities — are transferable across green technologies. Building on insights gained and lessons learned in developing and implementing Powering Prosperity, a coordinated approach will ensure these sectors do not operate in silos, and instead benefit from shared knowledge, skills, and infrastructure.
- Strengthen international partnerships: To remain competitive and accelerate net-zero technologies, Ireland must continue to cultivate strategic international partnerships. Collaborating with global leaders in green innovation, research institutions, and multilateral organisations will enhance knowledge exchange, attract investment, and position Ireland as a hub for green industrial development.

Scope

It is worth noting that the range of green technologies is vast and it will be impossible to focus on everything. Therefore**,** the public consultation sought views in relation to the following areas:

- **offshore renewable energy,**
- **onshore renewable energy,**
- **storage,**
- **grid technologies,**
- **green hydrogen and its derivatives;**
- **and carbon capture technologies.**

Objectives

The Department of Enterprise, Tourism and Employment launched the public consultation to gather insights from industry, academia, communities and individuals on the following:

- Which technologies should Ireland prioritise as part of such a strategy?
- What challenges and opportunities exist across different technologies?
- How can government best support innovation, investment and workforce development within the renewable energy and green technology sphere?
- How can we build on the success of Powering Prosperity and develop a stronger industrial strategy with even greater impact?

Stakeholder feedback will help shape an important, future-focused strategy – one that not only powers Ireland's green transition but also unlocks long-term economic resilience, global leadership in clean innovation and prosperity for generations to come.

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AIRCRAFT LEASING IRELAND, IBEC

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

N/A

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Sustainable Aviation Fuel (SAF) should be a top national priority. It is the most impactful near-term technology for reducing emissions for existing aircrafts.

Green hydrogen is another strategic technology. It underpins the production of synthetic efuels for aviation and supports the long term shift toward hydrogen powered aircraft. Ireland's exceptional offshore wind potential makes it well placed to produce low-cost green hydrogen, strengthening both the energy system and future aviation fuel pathways.

By prioritising SAF, green hydrogen, and related renewable energy technologies, Ireland can strengthen its energy system and support aviation secure compliance with ReFuelEU Aviation mandates.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

SAF requires the most urgent and targeted supply chain support in the EU, particularly in Ireland. SAF deployment is essential for the aviation sector to achieve net zero carbon emissions by 2050.

Ireland's Sustainable Aviation Fuel Policy Roadmap identifies SAF as a critical technology where supply chain intervention is needed and recommends the following:

Uptake Supports for Aircraft Operators: provides fiscal incentives to reduce the price gap between CAF and SAF to accelerate the deployment of SAF in Ireland.

Production Subsidies: involves providing financial assistance to SAF producers through mechanisms such as grants, tax incentives or other forms of direct support.
Feedstock Supports: provides financial incentives for the production and supply of bio feedstocks.

Import Tariff Reductions: lowering or removing tariffs on imported feedstocks and intermediate products used in SAF production to decrease the overall production costs.
Capital Expenditure Support: provide grants or low interest loans for the initial set up of SAF production facilities and tax relief for capital investment in SAF projects.
Tax incentives: provide tax incentives for Irish developers, distributors and manufacturers of SAF.

Operational Expenditure: support to ensure ongoing production is financially viable particularly during the scaling-up phase.

Renewable Energy Price Guarantees: Implement price guarantees for renewable energy used in SAF production to ensure stable and competitive energy costs.

Develop a Revenue Certainty Mechanisms: This can play a central role in supporting SAF investment, for example through a Contract for Difference (CfD) scheme to drive price stability and long-term certainty on return on investment to improve investor confidence in SAF projects.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

SAF requires significant additional support in terms of broad/system research, development and innovation (RD&I) as well as in-company R&D. Although SAF is essential for aviation decarbonisation, progress remains constrained by several barriers including:

High capital expenditure: There is a global shortage of materials and labour (including specialist engineering, procurement, and construction contractors) leading to soaring initial investment costs for SAF producers.

Operating expenses: This remains high due to competition for feedstock, such as used cooking oil, and limited private sector appetite to address risks associated with advanced technology and feedstock developments.

Limited infrastructure: There is inadequate SAF production, supply chains, and distribution networks which hinders new technology-driven SMEs from entering the market.

The lengthy certification process: This is largely controlled by the American Society for Testing and Materials (ASTM), it takes a minimum of 2-3 years, making it prohibitive for new entrants to develop advanced technology and feedstock. Additionally, regulatory hurdles and the need for harmonised policies across EU member states further slows down SAF's adoption and scaling.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

While SAF is technically viable and certified for use in existing aircraft, largescale deployment is constrained by several barriers as outlined in Ireland's Sustainable Aviation Fuel Policy Roadmap:

The gap between SAF supply and demand: Current global and EU SAF production is too small to meet the rapid rising demand for SAF. Ireland along with the rest of the EU will require increasingly significant amounts of SAF to be deployed, particularly from 2035. Ireland's Sustainable Aviation Fuel Policy Roadmap, launched in August 2025 by the Department of Transport, highlights a severe supply demand gap that will require major industrial scaling.
The production and operational costs in Ireland: High energy prices and labour costs make Ireland a relatively expensive location for SAF production, with European industry already reporting that energy costs are a major barrier to investment and EU fuel producers facing a competitiveness disadvantage compared to other global regions.

Irelands planning system: Ireland's Sustainable Aviation Fuel Policy Roadmap shows that planning and permitting is a major obstacle, as SAF production will require large, strategically zoned industrial sites with transport infrastructure, although the Government has begun reforms through the Planning and Development Act 2024, the planning system still needs significant strengthening to support SAF projects at scale.

Available and affordability of SAF on the market: SAF is currently more expensive than conventional jet fuel, with HEFA SAF costing almost three times more than CAF and eSAF costing up to €9,450 per tonne, meaning that in the short term airlines will rely mainly on limited HEFA supplies while high prices and uncertain progress in scaling advanced biofuels and eSAF create a significant affordability barrier and a risk that costs will not fall as quickly as expected.

The availability of skilled workers in Ireland to produce SAF: SAF production will require a highly specialised workforce across engineering, operations, logistics, safety, and regulatory roles, Ireland may face skills shortages unless initiatives like Green Skills 2030 successfully develop the talent needed for this emerging industry.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

A major barrier to scaling renewable energy and green technologies is not having sufficient national and EU funding to support the introduction of meaningful grant schemes for R&D into new SAF technologies and feasibility studies into SAF supply chains. This includes accessing mechanisms such as the Innovation Fund, the Industrial Decarbonisation Bank, Horizon Europe and Invest EU. SAF opportunities extend beyond physical production and into Ireland’s digital economy, where platforms and marketplaces will be required to support adoption. SAF specific research topics should be included in existing funding streams such as SEAI RD&D and

the Disruptive Technologies Innovation Fund. Blended finance solutions are needed to encourage early industry participation and investment.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

The department should consider changes to current measures and look at how it can access the billions of euro now available under the EU's Sustainable Transport Investment Plan to accelerate SAF.

8.Are there existing supports that should be expanded or improved?

SAF opportunities extend beyond physical production and into Ireland's digital economy, where funding could also support the development of SAF marketplaces and digital platforms. Existing funding such as SEAI RD&D and the Disruptive Technologies Innovation Fund, should be expanded. Blended finance solutions would help attract early industry participation and investment.

Introducing a tax relief similar to the tax relief that was previously in place to support investment into renewable energy generation companies (Section 486B TCA 1997), for investment in companies/universities developing new technologies which contribute to the development of SAF enabling technologies. This tax incentive could be linked to greenhouse gas emissions reduction providing more tax relief for higher impact projects.

Extending the accelerated capital allowances (ACA) regime under Section 285A TCA 1997 to apply to plant and machinery used to enable the development, manufacture, and supply of SAF.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Given the complexity of aviation, ecosystem approaches that bring together producers, off takers, infrastructure providers, local communities and financiers are critical.

The strategy should support the ESB H2Fuels pilot and similar hydrogen innovation projects, which are essential for unlocking Ireland's renewable energy potential, advancing the decarbonisation of transport and industry, and securing long-term competitive advantages for the economy.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Tools and funding outlined in the EU's Sustainable Transport Investment Plan should be used to guarantee price stability and commercial opportunities for other sectors to support green technologies. Predictable, long-term regulatory frameworks are also needed to enhance the business case and underpin investment decisions.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Successful countries adopt whole of government- strategies that align energy, transport, finance, and industrial policy. These frameworks help reduce fragmentation and support global investment in sustainable technologies. Moving from policy ambition to green technologies that will support aviation meet its net zero ambition will require coordinated action, stronger incentives, targeted de-risking and long-term regulatory clarity.

12.If so, how might similar approaches be adapted to the Irish context?

N/A

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

N/A

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

N/A

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

DETE should consider supporting the development of a domestic SAF ecosystem as a key pillar of Ireland's new Green Growth Strategy. Building SAF production capacity would help the aviation sector achieve Net Zero by 2050 while creating new green industrial opportunities.

ASL SAFETY & TRAINING LTD

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be

applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Overall this interim document increased awareness in the Public Sector and across Departments, it has fostered the idea of public/private collaboration- we have been trying to do this for year to no avail, there is still huge distrust of Public /Private relationships largely due to the state procurement system as it is and the "MEAT" requirement- cheapest isn't always the answer. Private sector is as always leading, people in renewables need to be listened to and encouraged- guaranteed low-cost finance form an bod y that understands the market would be a huge step. Europe is giving out the money- for some reason Ireland isn't.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Battery, Solar, Offshore

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

1. Offshore
2. Solar
3. Battery

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support

Biggest barrier to us as the only fully accredited training provider for wind and solar in Ireland is access to reasonable cost funding- existing LEO and EI grants and funding schemes don recognise the what we do- no box available on applications to tick.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Offshore Wind
Utility Solar

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Skills Transfer, creating funding bottlenecks, for ourselves accessing affordable financing- lack of grants and red tape associated with them.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

A dedicated funding/grant scheme vehicle for businesses pivoting to renewables, with red tape kept to a minimum

8. Are there existing supports that should be expanded or improved?

1. Add in a renewables layer for renewables businesses in LEO's, we applied for a 50 k business expansion grant and were told our business is outside of the criteria- we are providing the training and skills for everybody who will work in this area.

2. A finance vehicle to provide longer term funding/finance options that relates to the delivery times that are being imposed by the states other arms- considering its taking 10 years to get a project through planning. We have self funded so far but do with more funding to bridge the planning gap.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Yes, there are various areas of the country that are very expert in certain things- these should be clustered nationall and supported to co-develop and work together. Also, the areas where there are significant developments expected like east coast or south east should be provided wit ha central point person/cluster to manage this- this could be done through a local authority or a cluster/area manager. First job is fully map aligned sectors,

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

By funding a national cluster supported by a funded regional model, map what's there and build just like UK and beyond.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Scotland and UK.

12. If so, how might similar approaches be adapted to the Irish context?
We are already working on clusters at East Ore Network (5 years in existence)

SMEs
13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.
By having dedicated renewables funding option for grants/finance that support the needs of SME, clustering, green parks, free green zones.

Monitoring
14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?
By developing green parks- linking business /public sector academia in a way that none feel threatened.

Other considerations
15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?
SMES will be the lifeblood of these renewable developments and in turn this will encourage regional development through promoting, funding, financing relevant regional strengths. Provided renewable funding/financing to business to encourage them to pivot.

AUSTRALIAN INSTITUTE OF SUSTAINABLE FINANCE PROFESSIONALS (ISFP)

Powering Prosperity
1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.
The skills-focused actions were particularly impactful. Action 8, which committed to progressing recommendations from the Greentech Skillnet/WEI Skills Assessment and agreeing actions to address offshore wind skills priorities, led to the publication of the Offshore Wind Skills Action Plan in October 2024. It was also supported by dedicated funding in Budget 2025 and the launch of the Skillnet Offshore Wind Academy in November 2024. This sequence — evidence-based skills assessment, published action plan, and funded implementation — provides a practical model that could be replicated for other priority green technologies.

Cross-agency coordination mechanisms also appear effective. Action 10 resulted in a Memorandum of Understanding between EirGrid, Enterprise Ireland and IDA Ireland in March 2025 to support offshore wind sector development and supply chain growth. Establishing formal coordination structures between system operators and enterprise agencies provides clarity of roles and improves alignment. A similar model could be applied to grid technologies, storage or hydrogen development where delivery requires multi-agency cooperation.

Finance and supply chain support measures are also noteworthy. Action 7 highlighted the availability of the Growth and Sustainability Loan Scheme to companies in the offshore wind sector. Ensuring that existing finance instruments are clearly linked to strategic priorities helps SMEs access capital for participation in emerging supply chains. This approach could support other green technology sectors seeking to scale.

Finally, procurement readiness initiatives under Action 9, including the circulation of tender information and plans for procurement workshops, recognise that domestic firms need visibility and capability to compete effectively in large-scale renewable projects. While still progressing, this emphasis on practical engagement with procurement pathways is transferable to other green industrial segments.

Overall, the most effective aspects of Powering Prosperity were not limited to offshore wind itself, but rather the structured governance, coordinated agency action, and linkage between skills, finance and supply chain development. These design features provide a replicable template for supporting other priority green technologies under the proposed Green Growth Strategy.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

No answer provided.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Ireland should focus on a defined set of energy system technologies where there's both a clear contribution to climate targets and a realistic pathway to creating domestic economic value.

1. Offshore Wind (including floating) as the anchor technology

Offshore wind should remain central to Ireland's green growth strategy. It's the most scalable renewable resource we have and already underpins national decarbonisation plans. Floating offshore wind, in particular, suits our maritime profile and offers longer-term industrial and supply chain opportunities if supported properly.

2. Grid infrastructure and system modernisation as a core enabler
Renewable generation can't scale without grid readiness. Investment in grid reinforcement, digital management systems and transmission infrastructure should be treated as equally important to generation capacity. Grid capability will ultimately determine the pace and credibility of renewable deployment.

3. Energy storage and flexibility solutions
As renewable penetration increases, system flexibility becomes essential. Battery storage and longer-duration storage solutions will be critical for maintaining reliability and balancing supply and demand. These technologies also create opportunities in engineering, integration and digital optimisation services.

4. Onshore renewables and solar deployment
Onshore wind and solar remain important where they can be delivered efficiently and at scale. These mature technologies support energy security and can often be deployed more quickly, complementing offshore wind expansion.

5. Green hydrogen: targeted and use-case driven
Green hydrogen should be prioritised selectively and aligned with credible industrial demand or export opportunities. It should complement, rather than distract from, near-term deployment priorities and infrastructure readiness.

Taken together, this combination (scalable generation, enabling infrastructure, system flexibility and carefully targeted emerging technologies) provides the most coherent pathway to meeting climate targets while maximising domestic supply chain participation and long-term economic resilience.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

1) Offshore wind (especially floating): system R&D + in-company R&D
This is the anchor technology, but Ireland needs targeted R&D to build domestic capability and supply chain depth. Powering Prosperity itself calls for offshore wind-specific R&D funding and the ambition to establish an offshore wind centre of excellence (OWCE).
Barriers Government can address: access to test and demonstration environments, coordinated research infrastructure, and clearer pathways from research to commercial deployment (to encourage firms to invest in their own R&D).

2) Grid technologies and power system innovation: primarily broad/system R&D
Grid readiness will determine delivery pace. EirGrid's innovation reporting makes clear that innovation and research are essential to transforming the power system for security and

affordability as the system changes.

Barriers Government can address: enabling real-world pilots and sandboxes, data access and interoperability (so innovation can be tested safely), and faster pathways for trialling new approaches within regulated grid operations.

3) Energy storage (including flexibility solutions): system R&D + enabling in-company R&D
Ireland needs materially more storage, but barriers persist. Industry-focused research highlights financial, regulatory and policy barriers as key constraints to storage development here.

Barriers Government can address: clearer market signals and revenue mechanisms (so pilots can become investable), streamlined consenting and grid connection for storage, and targeted supports for Irish firms to develop and trial integration, control and optimisation solutions.

4) Green hydrogen (targeted to credible use-cases): system R&D + in-company R&D
Hydrogen needs policy and market architecture before private R&D scales. Irish policy analysis notes the need for regulatory adjustments, certification and market/financing design to move to the next stage.

Barriers Government can address: certainty on standards and certification, demand-side market design and offtake development (so firms can justify their own R&D), and coordinated demonstration projects linked to real industrial use.

5) Marine renewables (wave/tidal): primarily early-stage system R&D
Marine energy should be supported on an evidence-led basis, with R&D targeted at proving technical and commercial viability and building a credible deployment pathway (as reflected in SEAI's offshore renewable energy technology roadmap work).

Barriers Government can address: access to test sites, predictable permitting for trials, and staged demonstration support tied to performance milestones.

Cross-cutting barrier (applies to all of the above): from R&D to bankable deployment. A recurring constraint is the gap between research outcomes and investable projects. Aligning R&D funding, demonstration programmes, grid access and market rules, and skills/execution capability will increase Ireland's ability to convert innovation into deployment at scale.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Grid Infrastructure and System Modernisation
Grid capacity is the single most critical constraint on renewable deployment. Without faster reinforcement, digitalisation and connection reform, generation targets can't translate into operational capacity. Industrial deployment support should prioritise transmission upgrades,

grid technologies and system management capability, as these underpin the viability of all other renewable technologies.

Energy Storage and System Flexibility
While storage is widely recognised as essential to managing high renewable penetration, large-scale deployment remains commercially constrained. Additional support is needed to provide long-term market clarity and revenue certainty so projects can move from development to financial close. Storage isn't a future technology; it's a present system requirement.

Industrial Electrification and Demand-Side Technologies
Electrifying industrial processes and integration technologies represent one of the most immediate opportunities for emissions reduction. However, many firms face capital cost barriers and integration complexity. Targeted support to accelerate deployment here would deliver near-term emissions impact while strengthening domestic engineering capability.

Green Hydrogen: tightly focused demonstration and scaling Hydrogen requires disciplined deployment. Support should concentrate on specific, credible industrial use cases where renewable supply, infrastructure and demand can be aligned. Broad deployment without these conditions risks inefficiency.

In summary, industrial deployment support should focus on removing system bottlenecks and accelerating technologies that enable scale across the energy ecosystem. Prioritising infrastructure and flexibility technologies will have the greatest multiplier effect across the wider renewable transition.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
The main barriers to scaling renewable energy and green technologies in Ireland are increasingly systemic rather than technological. The core constraints relate to infrastructure sequencing, regulatory clarity, skills depth and capital mobilisation.

Grid and Infrastructure Readiness
The pace of renewable generation ambition is now outstripping the speed of grid reinforcement, connection reform and enabling infrastructure development. Without faster transmission upgrades, digital grid modernisation and clearer connection pathways, renewable projects face delays regardless of investor appetite. Infrastructure sequencing is the primary constraint.

Regulatory and Planning Timelines
While policy direction is clear, project timelines remain vulnerable to uncertainty in consenting, grid connection and environmental processes. Predictability and coordination across agencies are as important as speed. Investors and developers need confidence that timelines are realistic and consistently applied.

Capital Mobilisation and Project Bankability

Renewable deployment at scale requires substantial private capital. The constraint is less about availability of global sustainable capital and more about project bankability, risk allocation and revenue visibility. Cost volatility, regulatory complexity and long development horizons increase perceived risk. Building capability in sustainable project finance, infrastructure structuring and risk modelling will reduce friction and improve Ireland's competitiveness for investment.

Skills Depth and Execution Capability
Ireland faces not only engineering shortages but gaps in specialist project management, grid systems expertise and financial execution capability. Renewable deployment requires integrated teams spanning engineering, digital systems and finance. Without coordinated workforce development aligned to priority technologies, projects risk delay and over-reliance on constrained international talent markets.

SME Readiness and Supply Chain Integration
Domestic value capture is limited where Irish firms aren't prepared to meet procurement, compliance and scale requirements of large infrastructure projects. Improving SME readiness and early visibility of project pipelines would strengthen local participation and long-term industrial resilience.

In summary, the primary barriers to scaling renewable energy in Ireland aren't about technological feasibility but delivery discipline. Addressing infrastructure sequencing, regulatory predictability, capital structuring capability and workforce alignment in an integrated manner will determine whether renewable ambition translates into sustained industrial growth.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

1. Strengthen Project Bankability and Capital Structuring Capability
A core constraint in scaling renewable technologies isn't global capital availability but local project bankability. Government could support the development of stronger domestic capability in sustainable infrastructure finance, risk modelling and project structuring. This includes supporting professional development in areas like renewable project finance, sustainability-linked financing structures and integrating climate risk into credit assessment. Improving financial execution capability will reduce perceived investment risk and boost Ireland's competitiveness for long-term capital.

2. Align Public Finance Instruments with Priority Technologies
Existing supports (including growth and sustainability loan schemes and enterprise funding instruments) could be more explicitly aligned with clearly prioritised green technologies. Clear signalling that public finance is coordinated with industrial priorities can crowd in private investment and provide early-stage confidence for developers and SMEs.

3. Develop Investment Readiness Programmes for SMEs
Many Irish firms face barriers not only in technology development but in financial readiness. Targeted programmes that support SMEs in becoming investment-ready (including understanding capital requirements, risk allocation and procurement finance) would strengthen domestic supply chain participation and increase our ability to capture economic value.

4. Expand Specialist Workforce Development in Renewable Finance and Risk
Scaling green technologies requires integrated teams combining engineering and financial expertise. Government should support role-specific skills development in sustainable project finance, infrastructure investment analysis, climate risk modelling and sustainability data integration. These capabilities are essential for structuring bankable projects and managing long-term asset performance.

5. Improve Policy Predictability to Attract Long-Term Capital
Stable and transparent policy frameworks are a form of capital support in themselves. Multi-year clarity on technology priorities, grid development and support mechanisms reduces uncertainty and lowers the cost of capital. Coordinated signalling across agencies strengthens investor confidence.

8. Are there existing supports that should be expanded or improved?

1. Growth and Sustainability Finance Instruments
Existing loan and enterprise finance schemes provide an important foundation, but their strategic alignment with clearly prioritised green technologies could be enhanced. More explicit signalling that these instruments are designed to support renewable infrastructure, storage, grid technologies and associated supply chains would improve investor and SME confidence. Where appropriate, scaling the size or duration of these facilities could further crowd in private capital.

2. Demonstration and Commercialisation Supports
Ireland has strong research funding mechanisms, but greater emphasis could be placed on bridging the gap between demonstration and bankable deployment. Expanding supports that link innovation funding directly to commercial readiness and investment structuring would help projects progress beyond pilot phase.

3. Workforce Development Programmes Linked to Financial Execution
Existing workforce and enterprise-led training programmes could be expanded to include more specialist pathways in renewable project finance, infrastructure investment analysis, sustainability-linked financing structures and climate risk modelling. Strengthening these capabilities will improve Ireland's ability to structure and finance large-scale projects domestically.

4. SME Investment Readiness and Procurement Preparedness
Enterprise supports aimed at helping SMEs access supply chains could be further developed to

include financial readiness components — such as understanding capital requirements, compliance standards and risk allocation within large renewable projects. This would increase domestic participation and reduce reliance on imported capability.

5. Cross-Agency Coordination of Capital and Skills Supports
Finally, improved coordination between enterprise agencies, skills bodies and system operators would enhance the effectiveness of existing programmes. Aligning finance instruments, workforce development and industrial priorities within a coherent framework would strengthen investor confidence and reduce fragmentation.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

1. Financial and Professional Services (Renewable Infrastructure Finance)
Ireland's financial services ecosystem represents a strategic asset. Developing deeper expertise in renewable project finance, sustainable infrastructure structuring, climate risk modelling and sustainability-linked financing can strengthen Ireland's role in mobilising capital for green technologies. Aligning this sector with renewable deployment priorities would improve project bankability and enhance Ireland's attractiveness as an EU-aligned investment platform.

2. Engineering and Technical Services
Engineering consultancies, marine services, grid systems specialists and digital systems integrators are essential to project delivery. Supporting the growth of high-value engineering capability will reduce reliance on imported expertise and increase domestic participation across renewable projects.

3. Digital and Data Services
Energy system digitalisation, grid optimisation, predictive maintenance and sustainability data management are increasingly central to renewable deployment. Ireland's established digital services base provides an opportunity to develop exportable expertise in energy tech and system integration.

4. Advanced Manufacturing and Fabrication
Where commercially viable, supporting manufacturing and fabrication capacity linked to renewable supply chains (particularly in components, balance-of-plant systems and specialist equipment) can strengthen domestic value capture.

5. Skills and Training Ecosystems
Training providers and professional development bodies play a critical enabling role. Aligning technical, digital and financial skills pathways with renewable deployment needs will ensure that workforce capability evolves in parallel with industrial ambition.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

1. Use Procurement and Project Pipelines as a Signalling Tool
The most effective way to identify capable firms is through analysis of existing supply chains in engineering, digital services, manufacturing and professional services. Mapping firms already supplying infrastructure, marine, construction, grid or energy-intensive industries can reveal those with adjacent capability. Publishing forward project pipelines and procurement forecasts then provides the commercial signal firms need to invest in capability expansion.

2. Structured Supply Chain Mapping and Capability Audits
Government and enterprise agencies could undertake targeted supply chain mapping exercises for priority technologies. This would identify firms with transferable skills (for example, digital companies with grid optimisation expertise, engineering firms with offshore or infrastructure experience, or financial services firms with infrastructure finance capability). Structured capability audits can then highlight where upskilling or capital support is needed.

3. Targeted Investment Readiness and Transition Programmes
Many firms hesitate to diversify due to uncertainty around capital requirements, standards compliance and procurement processes. Programmes that combine financial readiness support, regulatory guidance and sector-specific training can reduce perceived risk. This is particularly important for SMEs.

4. Align Skills Development with Clear Market Demand
Role-specific training pathways should be directly linked to identifiable project opportunities. When companies see a visible skills roadmap aligned to credible market demand, they're more likely to invest in workforce development.

5. Facilitate Cross-Sector Collaboration Platforms
Structured forums that bring renewable developers together with engineering firms, digital companies, financial services providers and manufacturers can speed up knowledge transfer and partnership formation. These platforms should focus on commercial collaboration rather than general networking.

6. Provide Stable, Long-Term Policy Signalling
Above all, firms diversify when they believe demand will persist. Clear multi-year prioritisation of technologies, coupled with transparent policy consistency, reduces strategic hesitation and encourages private investment in capability expansion.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

1. Blended Finance and Public Capital Catalysation (Australia and Singapore)
In Australia, recent policy efforts have increasingly focused on using public capital strategically to crowd in private investment through blended finance structures. These models combine concessional public funding, guarantees or first-loss capital with institutional investment to improve project bankability and reduce early-stage risk. This approach recognises that the primary barrier to scaling clean infrastructure is often risk allocation rather than capital availability.

In my current role in Australia, I'm working on blended finance models designed to mobilise private capital alongside government participation. The key lesson is that disciplined structuring, clear governance and risk transparency are as important as the funding itself. Ireland could explore similar catalytic models, particularly for grid infrastructure, storage and targeted hydrogen deployment.

2. Coordinated Industrial and Capital Strategy (European Union – Net Zero Industry Act)
The EU's Net Zero Industry Act demonstrates the value of aligning industrial priorities with capital and supply chain strategy. By identifying key net-zero technologies and integrating state aid flexibility, regulatory clarity and strategic investment support, the EU has created a more coherent framework for attracting industrial deployment. The lesson for Ireland is the importance of clear prioritisation and alignment between industrial policy and financial instruments.

3. Skills and Industry Alignment (Singapore)
Singapore's approach to green growth combines strong industrial targeting with structured workforce development and financial sector capability building. By deliberately developing expertise in sustainable finance alongside clean technology deployment, Singapore has strengthened its position as both a technology and capital hub. The lesson is that financial execution capability can be treated as an industrial asset in its own right.

4. Infrastructure-Led Deployment Models (Denmark)
Denmark's offshore wind success illustrates the power of long-term policy consistency, coordinated infrastructure planning and early supply chain integration. Predictability over decades allowed firms to invest in capability with confidence. The central lesson is that stable signalling reduces cost of capital and strengthens domestic participation.

12.If so, how might similar approaches be adapted to the Irish context?

1. Use catalytic public capital to crowd in private finance (Irish “blended finance” approach)
Ireland could apply blended finance principles by using targeted public instruments (e.g., guarantees, concessional co-investment, first-loss tranches, or outcome-based supports) to reduce early-stage risk and improve project bankability for priority areas such as grid infrastructure, storage and targeted hydrogen use cases. The Irish adaptation should be to keep structures simple, transparent and tightly linked to pipeline-ready projects, with clear governance and eligibility criteria to avoid complexity and slow execution.

2. Align enterprise supports with a small set of priority technologies
Rather than creating new schemes, Ireland could more explicitly align existing enterprise supports and loan/finance instruments to clearly prioritised technologies. This improves market signalling, reduces investor uncertainty and gives SMEs confidence to invest in capability and bid for supply chain opportunities.

3. Establish sector-specific delivery coordination for bottleneck areas
International examples work best where coordination is institutionalised. In Ireland, this could mean structured, time-bound coordination mechanisms for specific constraints (e.g., grid + storage delivery, ports + offshore wind supply chain). The focus should be on delivery outcomes, clear accountability and regular progress reporting.

4. Treat "financial execution capability" as part of industrial capability
A key adaptation would be to develop specialist skills in sustainable project finance, infrastructure structuring, climate risk modelling and sustainability data integration alongside engineering and technical training. This reduces execution risk, strengthens bankability, and improves Ireland's attractiveness to long-term capital.

5. Build demonstration-to-deployment pathways with clear progression gates
Where innovation support is needed (e.g., storage integration, hydrogen), Ireland should fund demonstration in a way that connects to commercial deployment—using milestone-based progression and clear routes to procurement or investment, so pilots do not stall.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

1. Publish credible project pipelines and procurement roadmaps
SMEs invest when they can see demand. Forward visibility on grid, storage, offshore wind, ports and hydrogen-related work (including likely contract types, timelines and standards) allows SMEs to decide where to specialise and invest in skills, equipment and certifications.

2. Create "procurement readiness" pathways for energy projects
Many SMEs are capable but blocked by procurement complexity. Practical supports should focus on pre-qualification requirements, quality and safety standards, insurance, contract terms, and bid writing. This works best when delivered alongside real upcoming tenders rather than generic training.

3. Provide working capital and contract finance support
Even when SMEs win work, they can struggle with cashflow, bonds and long payment cycles. Targeted finance (like invoice finance support, performance bond facilitation, contract mobilisation loans) helps SMEs participate in large infrastructure supply chains without excessive balance sheet strain.

4. Build role-specific skills for delivery, not "green literacy"
SMEs need applied capability tied to energy system deployment: grid engineering interfaces, storage integration, marine and offshore standards, project controls, systems commissioning, and sustainability data requirements where relevant for contracts. Training should be modular and aligned to the priority technology pipelines.

5. Establish cluster-based supplier development (regional + sectoral)
SME participation improves when firms can collaborate (consortia bidding, shared compliance resources, shared training). Regional clusters around ports, grid hubs and industrial zones can support specialisation and reduce duplication of effort.

6. Improve access to testing, demonstration and standards support
For SMEs developing new products or services, access to testbeds, demonstration sites and guidance on applicable standards and certification lowers cost and risk. This is particularly relevant for storage integration, digital grid tools, marine services and hydrogen-adjacent components.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Establish a "Green Growth Technology Observatory" function
A light, dedicated capability (within an existing agency structure) that continuously scans, synthesises and reports on priority technologies. Its role should be to translate signals into decisions: what to prioritise, pilot or deprioritise.

2) Track deployment-leading indicators, not just research activity
Monitor indicators that show technologies are moving toward scale, such as

- Planning, permitting and grid connection queues.
- Project pipeline maturity (concept to FEED to FID to construction).
- Cost and performance trends (LCOE, capacity factors, storage duration economics).
- Supply chain localisation and SME participation rates.
- Availability and cost of capital (financing terms, insurance, risk premiums).

3) Use capital markets as an early warning system
Create a structured way to engage investors, lenders, insurers and developers quarterly. Changes in what capital is willing to fund (and on what terms) is one of the fastest indicators of which technologies are becoming bankable, and where policy or risk barriers are emerging.

4) Formalise industry and research horizon scanning
Run an annual process that combines:

- Enterprise agencies (what firms are building and exporting)
- Universities and research centres (what's coming next)
- System operators (what the grid can accommodate)
- Developers (what will actually be deployed)

This should result in a short annual "priority refresh" rather than a long report.

5) Create structured pilot and scale pathways for emerging tech
To identify emerging technologies early, Ireland should support small, milestone-based pilots and require clear progression gates (technical performance, cost trajectory, permitting feasibility and a route to procurement). This prevents "pilot purgatory" and makes it clear which technologies deserve scaling support.

6) Benchmark against EU and peer markets
Ireland should routinely benchmark against EU Net Zero Industry Act priority technologies and monitor where peer countries are already deploying at scale (like grid flexibility, storage, floating

wind, hydrogen corridors). This helps identify technologies that are transitioning from "emerging" to "deployable" and where Ireland can realistically compete.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Elevate delivery and financial execution capability alongside technology prioritisation. Scaling green technologies depends not only on selecting the right sectors but on improving project bankability, capital structuring expertise and coordinated execution across agencies. Strengthening these capabilities will materially improve deployment outcomes and investor confidence.

Ensure policy coherence and sequencing across infrastructure, capital and skills. Renewable ambition must be matched by aligned grid development, workforce planning and enterprise supports. Clear sequencing and coordination will reduce bottlenecks, lower perceived investment risk and improve cost efficiency.

Embed measurable domestic value creation within the strategy. Alongside emissions targets, the strategy should track supply-chain participation, SME engagement, workforce capability development and capital mobilisation. This will ensure green growth translates into sustained industrial competitiveness and regional economic impact.

BnM

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

BnM commend Powering Prosperity's commitment to delivering an assessment of the role, benefits and barriers to energy parks in Ireland. GDG's report on the Economic Assessment of Green Energy Park Concepts as commissioned by DECC, was an extremely worthwhile publication for illuminating the significant gains in economic output, job creation, regional development and renewable energy growth associated with developing Green Energy Parks in Ireland. This has provided developers and policy makers with indisputable confidence in the value of placing strategic focus on the acceleration of Green Energy Parks.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

In BnM's view, it is paramount that onshore storage technologies are prioritised. Widescale uptake of storage units will allow the significant amount of renewable energy which is currently lost due to grid limitations, to be stored and utilised when needed. At present, our electricity grid is insufficient to carry all of energy produced by renewable technologies. This raises consumers bills as expensive fossil fuels are used to meet the demand when cheap renewable energy is not available. Furthermore, generators suffer loss of revenue when their generated energy is curtailed, which discourages investment in renewable energy development and stifles progress on cutting emissions.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
No answer provided.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
No answer provided.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
Supports for Long Duration Energy Storage (LDES) are urgently needed. Specifically, industry stress the necessity for government to support higher procurement volumes. At present, EirGrid is procuring for 201 MW of capacity in the upcoming storage auction, which is below the 500 MW estimated by Energy Storage Ireland of capacity needed by 2030 to meet climate and grid stability targets.

BnM also stress the importance of a government-backed stable route to market and regulatory framework for storage units. Due to energy markets no longer aligning with the transition to a renewables-based system, storage technologies do not have a viable route to market and present a weak financial case for investors.

BnM would also support for the uptake of Grid Forming Inverters. Specifically, we would welcome mandatory deployment of these technologies, supported by a predictable regulatory environment. These technologies are already mandatory in Italy and Germany. They serve to stabilise the grid and offer a cleaner alternative to using fossil fuels at times of grid instability. This also allows for a higher penetration of renewable energy generation. As mentioned, the electricity grid is insufficient to sustain the level of renewable energy required to meet our climate targets. While a concerted effort must be made to expand the size of the grid, the grid

can also benefit from implementing modern technologies, which are not yet present in Ireland but do exist in our counterpart EU countries.

Finally, as discussed in Question 9, heat intensive industries currently rely on gas for combustion activities, since it is cheaper than electricity. Capital grants would be welcome to incentivise and facilitate businesses to retrofit boilers from gas to electric.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Grid availability is a leading barrier to scaling up renewables and green technologies, limiting both the development of new generation and significantly curtailing the amount of energy produced from renewable sources.

Grid development is cautious by design and entails meticulous assessments, yet given the urgency to rapidly develop the grid, BnM would welcome a bolder approach to taken by EirGrid. At present, the System Operator has taken a conservative approach to facilitating Long Duration Energy Storage, setting the upcoming auction volume at 201 MW, while 500 MW was quoted in the government's 2024 Electricity Storage Policy Framework.
The current policy and regulatory framework for hybrids is underdeveloped. While work is progressing in this area to integrate hybrid sites into network and market systems the pace is slow. The workstream on the dynamic sharing of MEC and the issue of multiple legal entities sharing a connection point need to be progressed. Similarly, the most recent consultation on MEC sharing suggested that energy sharing behind the meter, to facilitate charging of storage from otherwise wasted electricity would not be allowed. These are all key issues that undermine the commercial development of hybrid sites and limit the benefits they can bring to the system.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

BnM would strongly welcome government intervention to enable a viable investment context for onshore storage technology. Specifically, we would welcome a replicate of the regulatory structures for storage as seen in Great Brittian, whereby battery storage is paired with renewable generation under a Contracts for Difference framework. While the inclusion of storage technologies in the upcoming Renewable Energy Support Scheme auction is a welcome development, under the current framework, storage units co-located with renewable energy generation units cannot freely engage in the electricity market: severely restricting operational and commercial potential.

In our view, tariff reform is an extremely important mechanism that the Regulator can implement to support storage units and modern renewable energy technologies. We believe Locational tariffs should be implemented at pace to incentivise renewable energy projects to

develop in areas away from grid congestion. Such projects protect grid stability, regional development and grid development outside of Dublin.

It is also essential that network tariffs are reformed to provide incentives for large energy consumers to shift their usage to times of low demand, to minimise curtailed energy. EirGrid have predicted that electricity demand will increase by 45% by 2034.

8.Are there existing supports that should be expanded or improved?
Storage assets have enormous value to harnessing lost energy, reducing consumer bills and decarbonising the electricity system. Their presence on the system is paramount, and Ireland's Renewable Energy Support Scheme (RESS) must transition to support their procurement. This will require a high level of engagement between government and industry, to ensure the design of RESS sufficiently accommodates the changing energy system over the next decade.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?
Across industry, there is consensus that alignment should exist between the electrification of heat-intensive industry and the need to decrease dispatch down. Heat-intensive industries demonstrate a high degree of flexibility, and signals from the TSO could be employed to utilise dispatch down energy from the grid to replace gas and thereby electrify the heat demand.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?
No answer provided.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?
No answer provided.

12.If so, how might similar approaches be adapted to the Irish context?.
No answer provided.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.
No answer provided.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

No answer provided.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

No answer provided.

CEMENT MANUFACTURERS IRELAND

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

One existing indigenous supply chain in Ireland that could support the Offshore Wind Industrial Strategy is the cement and concrete industry. The sector not only has the capacity to enable the redevelopment and expansion of Ireland's Port infrastructure but elsewhere in the world concrete is used extensively for floating wind turbine platforms in deep water and also as anchor points or seabed foundations. Local R&D will be required in Ireland to develop suitable concrete mixes and manufacturing process and technologies to enable fabrication of turbine components, but much experience and work is being done in other countries seeking to deploy deepwater floating offshore wind turbines.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Carbon Capture. The forthcoming CCS Vision Document from DCEE will help to accelerate development of this important technology to enable 'hard-to-abate' sectors in Ireland to decarbonise. Sectors include cement, waste to energy, refining and power generation itself.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Carbon Capture, Utilisation and Storage. The full supply chain will need to be developed in Ireland as the discussion about carbon capture is only now starting in Ireland. The

Government's vision for CCS and the appropriate policy supports will be required to establish a credible pathway forward.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Carbon Capture. Given the early stage we are at in Ireland, the next vital steps will only happen if there is real recognition and strategic support from the Irish Government for this technology.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Carbon Capture.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The regulatory picture for carbon capture is currently uncertain in Ireland that needs to be addressed before the other challenges can be tackled.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

No answer provided**.**

8.Are there existing supports that should be expanded or improved?

No answer provided.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

The cement and concrete sectors are key local enablers of the Port development that is required to support both offshore and carbon capture. The Offshore Wind Industrial Strategy includes a fact finding mission to Esbjerg Port in Denmark but there was no reference to the Greensands CO2 Transit Terminal that is being developed in Esbjerg. A strategic plan for Ports in Ireland is that as they expand their offshore capabilities they should also seek to co-locate temporary carbon storage capabilities to facilitate the development of CO2 export

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?
No answer provided.

International examples
11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?
The UK has been progressing and supporting carbon capture projects following almost a decade of discussion and development. Real progress is happening and final investment decisions are now being made so there are many opportunities for learning from the UK to accelerate carbon capture in Ireland**.**

12.If so, how might similar approaches be adapted to the Irish context?
No answer provided.

SMEs
13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.
No answer provided.

Monitoring
14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?
No answer provided.

Other considerations
15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?
While the Offshore Wind Industrial Strategy rightly talks about co-locating new industry to align with renewable generation, co-location close to existing large industrial site like the four cement factories should also feature in the proposed Green Growth Industrial Strategy. The strategic location of suitable industry could support industrial symbiosis and unlock resource efficiencies.

Separately, recognition and expansion of the circular economy opportunities that exist in the strong partnership between the members of Cement Manufacturers Ireland at Ireland's waste sector should be included in the proposed Green Growth Industrial Strategy. in 2025 Ireland four cement kilns used 370,000 tonnes of solid recovered fuel (SRF), which equates to 22% of Ireland's residual municipal solid waste arisings. The figure is set to grow as our members

continue to replace fossil fuels with local SRF. Not only does this partnership provide a reliable local wate recovery option but it is also a solid supply chain upon which to build additional capacity to solve other problematic waste challenges for Ireland in the future.

CHAMBERS IRELAND

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Powering Prosperity was a very welcome initiative that has been a positive force in the development of Ireland's Offshore Wind industry. While the strategy had a short-term lifespan of two years, it provided a clear and coherent framework for linking our decarbonisation and energy security ambitions with economic growth. The progress report from April 2025 showed 38 out of the 40 key actions were complete or in progress. A final implementation report would be a welcome follow-up to help guide decisions for the new green growth industrial strategy, however, this is progress we can build upon with the next iteration.

One of the biggest successes of Powering Prosperity was the surety it gave industry by indicating what the priority areas for development were and reaffirming a commitment to offshore wind development. This is needed at a time when green energy projects are subject to significant risks, including planning and permitting issues, grid connection delays, policy uncertainty, supply chain constraints, financing pressures, skills gaps and supporting-infrastructure deficits. The publication of the strategy and the robust monitoring helped to alleviate the risk of policy and regulatory uncertainty, as all stakeholders had a clear roadmap and signal of intent from government for the years ahead. In this way, it also strengthened supply-chains by allocating funding and stimulating demand signals to reinforce the market. The strategy provided industry with clear and coherent direction, which has been an important driver in de-risking green energy projects. The reduction in risk is also an important catalyst for capital investment.

The strategy also successfully fostered strong connections and collaboration across government departments, regulatory bodies, state agencies and grid operators. It recognised that success cannot be achieved in silos. By co-ordinating entities including the Department of the Environment, Climate and Communications, SEAI, EirGrid and An Bord Pleanála, the strategy created clearer decision-making pathways and more predictable regulatory processes. This collaborative architecture strengthened investor confidence, accelerated project delivery and helped ensure that offshore wind deployment is integrated with grid development, spatial planning and climate policy objectives. From a developer-led side, the fostering of collaborative clusters was a successful intervention that could be developed further and applied successfully to other green technologies.

It would be positive to see the actions contained within Powering Prosperity being developed and incorporated into a new iteration of Ireland's green growth industrial strategy that is seeking to incorporate all the different stakeholders in our domestic energy mix. The momentum that was created should now be built upon and the lessons learned from that strategy should inform the next phase of policy development, including embedding regulatory clarity, coordinating delivery and stakeholder engagement as standard practice to translate ambition into sustained investment, timely project delivery and long-term energy security. Developing a whole-of-energy system will require this coordinated action and planning if we are to realise Ireland's national decarbonisation and competitiveness goals.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

It is positive to see sustained engagement on the green technologies that can be deployed in Ireland in the years ahead, and Chambers Ireland welcomes the Department's commitment to strengthening domestic energy supply while supporting economic development. The transition to a low-carbon economy is both an environmental imperative and a strategic opportunity to enhance security of supply. While Ireland must keep pace with technological advancements and global competition, the core objective of a new Green Growth Industrial Strategy should be accelerating delivery. That means rapidly scaling proven, cost-effective technologies, underpinned by stable regulatory frameworks, streamlined planning and policy certainty that gives investors confidence to act.

Although the successor to Powering Prosperity proposes a broader technology mix, offshore and onshore wind must remain central pillars of the strategy. Security of supply and climate targets should continue to anchor Ireland's energy transition, and our exceptional wind resource provides a strong foundation for industrial development. Diluting this focus risks undermining investor confidence and forfeiting Ireland's early-mover advantage in offshore and floating wind. Instead, wind should be consolidated as the backbone of the clean energy system and leveraged to stimulate innovation, export growth, supply-chain development and regional economic opportunity.

At the same time, a credible green industrial strategy cannot rely on wind alone. Meeting Ireland's decarbonisation and energy security ambitions will require coordinated investment in enabling and complementary technologies. Grid reinforcement and expansion, medium and long-duration storage, hydrogen production and storage, demand-side response and increased interconnection are all essential to building a resilient, reliable energy system. These areas are not simply technical add-ons but they represent significant industrial opportunities in their own right, with potential to support domestic enterprise, attract inward investment and create exportable expertise in emerging clean-tech sectors.

Chambers Ireland has consistently advocated for green hydrogen and its derivatives to be treated as a strategic pillar of the energy transition, leveraging surplus offshore wind to produce export-capable fuels and to decarbonise hard-to-electrify sectors. While meeting domestic demand must remain the immediate priority, the infrastructure required to enable renewable hydrogen production should be advanced without delay. The National Hydrogen Strategy provides a clear roadmap for developing an indigenous hydrogen sector and should be fully embedded within the Green Growth Industrial Strategy. Analysis by Arup indicates that Ireland's production potential could significantly exceed projected domestic demand, positioning the country as a future exporter. Renewable gases, including green hydrogen, offer viable pathways to decarbonise sectors such as heavy industry, high-temperature heat, freight transport, and potentially sustainable aviation fuels.
Investment in energy storage will be equally critical to maximising the economic and system benefits of the transition. Short and medium-duration battery storage can help stabilise the grid and manage renewable intermittency, while long-duration solutions, including green hydrogen and flow batteries, will be essential during prolonged periods of low renewable output. Embedding storage within Ireland's broader energy and industrial policy will strengthen resilience, reduce curtailment and enhance competitiveness.

Continued growth in solar PV, which now exceeds 1.7GW of installed capacity, will also remain important. Solar's flexibility, scalability and complementary generation profile make it a valuable partner to wind, supporting a more balanced and secure renewable energy system.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
All of the above technologies require intensive supports and significant investment. Without robust enabling frameworks in place, we risk eroding investor confidence, halting progress and losing ground to global competitors. Energy infrastructure needs to be treated as a critical national priority, therefore, without a resilient supply chain, broad RD&I and industry deployment opportunities, the potential of our green energy sector will fail to be realised. We cannot afford to be selective when energy security and decarbonising our energy systems are critical national imperatives.

The robustness of Ireland's supply-chains that serve our green energy infrastructure projects needs to be prioritised as a matter of urgency. As we refer to wind energy above as a strategic pillar in our energy transition, we need to ensure that as deployment accelerates, potential structural bottlenecks are being managed appropriately. Global competition for specific components is intensifying and resulting in longer lead-times and rising price volatility. There is currently inadequate enabling infrastructure across port developments, grid upgrades, security and cybersecurity frameworks and specialist offshore installation vessels. Without proactive and coordinated investment across these enabling elements, offshore wind ambitions risk being constrained not by resource potential, but by supply chain readiness.

Similar issues exist across the other green technologies.

In battery storage, we included the need to investigate sodium-ion batteries, as well as the more prolific lithium-ion batteries and this is because of the abundance of sodium as a key raw material when compared with the scarcity of lithium as a mineral resource. Similarly, flow batteries can offer longer storage durations and cycle lives, as well as lower degradation compared with Li-ion batteries. However, both alternatives currently do not offer cost competitiveness compared with lithium but this balance may shift over time and we should be ready to realise any potential opportunities.

In the recent report by Arup into the export potential of green hydrogen, it was recommended that repurposing existing pipelines would be the most cost-effective option for transporting to Europe. Investigating these opportunities and what may be required to retrofit such infrastructure or, if needed, develop new pipelines or shipping options will be a key driver of growth and development in this sector.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

In terms of research, development and innovation, we should take a technology neutral approach that focuses on system value and integration. The green growth industrial strategy should recognise that in a complex, interconnected energy system the greatest economic and decarbonisation gains arise from how technologies work together rather than from any single breakthrough. A system-value approach instead assesses how investments contribute to overall reliability, flexibility, affordability, security of supply and emissions reduction. This should ensure that renewable generation is developed alongside grid capacity, storage, demand response and interconnection, instead of developed in independent silos.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

No answer provided.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Planning and permitting are some of the biggest obstacles facing the growth of the renewable energy and green technology sectors in Ireland. Although reform of the system has been prioritised in recent years, planning approvals are still too slow. The risk of judicial review and the lengthy waiting times for approvals give rise to great uncertainty and risk for developers. If the state cannot negate these obstacles when it comes to infrastructure of strategic national importance, then developers of new green technologies are even more at risk. Additionally, the institutional capacity within government departments, planning bodies and regulatory agencies

needs to be strengthened and there should be greater alignment across all decision-making bodies to avoid fragmentation and inconsistent decisions. The establishment of MARA as Ireland's maritime regulator has represented an important step towards greater cohesion, however, it is yet to result in the real-world acceleration of renewable energy projects.

The traditional prioritisation of mature technologies across Ireland's regulatory framework is another barrier to scaling new and emerging renewable energy and green technologies in Ireland. While the proposed focus on innovation in this new green growth strategy is commendable, the reality is that the system naturally benefits technologies with established risk profiles, stable business models and predictable deployment pathways. Anything the disrupts the status quo or requires broader regulatory overhauls, for example in planning, licensing or grid connections, will increase project risk and potential costs, and can leave projects susceptible to failure.

Finally, skills gaps continue to be one of the biggest constraints facing businesses of all sizes and across all sectors in Ireland, and the renewable energy sector is perhaps even more vulnerable to the consequences of this. When we talk about new and cutting-edge technologies, we significantly reduce the potential talent-pool with the necessary skills and experience to design, execute and oversee these new energy projects safely and competently. Recruitment will therefore become a significant constraint unless national skills strategies can effectively adapt in line with market developments to ensure our further and higher education systems are responding with the programmes and course material that is needed for this next generation of our energy system.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

In recent years, a number of EU interventions and forthcoming national initiatives have the potential to expedite development. This creates opportunities to fast-track or streamline certain issues. At an EU level, Renewable Energy Directive (RED) III introduces specific planning and permitting reforms aimed at speeding up renewable energy installations such as solar, wind and storage. It directs Members States to designate renewable acceleration areas, it mandates the simplification of permitting processes and it proposes that grid connection planning and storage installations must be aligned with renewables permitting. Similarly, the Net Zero Industry Act sets strict maximum timelines for environmental and construction permits for strategic net-zero projects. It also embeds monitoring and coordination mechanisms to track progress on manufacturing capacity to help identify supply-chain bottlenecks that will support coordination across the EU that can benefit Ireland. At a national level, Ireland should be utilising these measures to fast-track energy projects of strategic national importance.

8.Are there existing supports that should be expanded or improved?

No answer provided.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

No answer provided.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

No answer provided.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

No answer provided.

12.If so, how might similar approaches be adapted to the Irish context?

No answer provided.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

No answer provided.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

No answer provided.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Ireland's next phase of a green industrial strategy that aims to capitalise on the economic opportunities of the green energy transition must move beyond the ambition that was initiated in Powering Prosperity and set out a clear delivery framework for deploying net zero technologies. Green growth will only be realised if underpinned by a cohesive national vision that aligns energy policy, industrial strategy, infrastructure investment, spatial planning and skills development within a single, coordinated framework. Domestically, Ireland must focus on realistic and targeted policies to combine the extensive rollout of mature renewable

technologies including wind and solar with focused support for emerging technologies that can diversify our energy mix and strengthen competitiveness. By embedding coordination and delivery at its core, the Green Growth Industrial Strategy can convert climate ambition into durable economic growth, regional development and enhanced energy security.

CORK CHAMBER

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Cork Chamber represents 1,200 members together employing 130,000 people throughout the city, metropolitan area and county. Our vision is to lead a transforming and ambitious Cork city and county, and our purpose is to unite, represent and support our members and community. At Cork Chamber, our direction is guided by our formal pledge to uphold the UN SDGs, five of which have been identified as priority areas by the Chambers Ireland network. Cork Chamber has also recently been appointed an SDG Ambassador by the Department of Climate, Energy and the Environment.

Our advocacy is shaped by the views and priorities of our partners, and is informed by our continuous engagement with members, our Board and key stakeholders in Cork city and county. The energy system is a key priority area for Cork Chamber members, critical to enabling future economic and population growth, as well as leading the transition to climate neutrality.

Cork Chamber also coordinates the work of the Cork Offshore Renewable Industry Forum (CORIF), which brings together representatives of the offshore renewable energy industry in the Cork region to advocate for the critical policy and infrastructural enablers needed to facilitate the sector's growth and realise the associated social and economic benefits for Cork and Ireland as a whole.

Since the introduction of Powering Prosperity, there has been some welcome progress towards the development of offshore wind and the achievement of the strategy's 2030 targets. While certain Phase One projects have progressed, alongside recent progress towards the development of the first site, Tonn Nua, as part of the South Coast Designated Maritime Area Plan (DMAP), national progress has been slower, with the new National DMAP not likely to be finalised until late 2027 at the earliest.

Progress has also been made on actions to support the realisation of the many economic benefits associated with the development of offshore wind. Recent government initiatives such as the Large Energy User Action Plan (LEAP), containing aims to co-locate renewables supply with industry in new Green Energy Parks, are particularly welcome in this regard, helping to translate these economic ambitions into concrete steps towards a more sustainable economic future.

While some progress has been made towards Powering Prosperity's aims of leveraging relevant funding and support opportunities to support the offshore wind sector and related supply chain, further work should be done to ensure that sufficient funding and advisory supports are readily available to support firms of all sizes in their involvement in the offshore renewable energy sector and the scaling up of their activities.

In addition, there has been some welcome progress in the area of green skills, with a number of new courses and micro-credentials in the area of offshore wind being made available in recent years via Skillnet Ireland's Offshore Wind Academy, for example, and Springboard-funded courses such as UCC's certificate in Offshore Renewable Energy. These represent a welcome step towards bridging the skills gap that exists in the green energy sector, however continued investment and resourcing for green skills courses, both at undergraduate and postgraduate level, as well as opportunities for upskilling and reskilling, will be vital to ensure the sector continues to be supported as it expands.

Powering Prosperity's aim to develop an Offshore Wind Centre of Excellence has not yet been achieved, and it is vital that this is progressed swiftly to support the sector's growth. Consideration should be given to Cork as a location for the proposed Centre of Excellence, given the region's existing energy ecosystem and heritage, as well as the presence of complementary educational offerings through the National Maritime College of Ireland (NMCI) and UCC's MaREI Centre**.**

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ensuring that the growth of green technology and innovations is supported insofar as possible is critical to realising both the climate and economic goals a thriving green sector can bring. Supporting green enterprises to access existing incentives in the first instance is critical to support the integration of green technologies into the broader economy. Initiatives like the R&D Tax Credit are important in this regard and should be recognised by the Strategy, building on Powering Prosperity's aim to promote R&D opportunities and ensure appropriate support mechanisms for the sector are in place.

Furthermore, ensuring an appropriate mix of renewable energy, including wind, solar, hydrogen and biomethane, is critical to the development of a stable and competitive green economy. Ireland's broader economic competitiveness increasingly depends on the country's ability to guarantee security of supply and reduce our dependence on imported fossil fuels. In the current climate of rising geopolitical tensions and uncertainties in global trade, supporting the growth of an appropriate mix of renewables at a domestic level is critically important.

Although the aim of the new Strategy to expand focus beyond offshore wind is welcome, it is

critical that offshore wind continues to receive the support it requires as a burgeoning sector of the economy. A holistic approach that integrates broader renewable energy development within the context of Ireland's economic and sustainability goals would be welcome.

The proposed inclusion of green hydrogen is also welcome and should be considered in relation to the parallel development of offshore wind and other technologies. The strategy should include recognition of the various roles that can be played by green hydrogen to fully harnessing renewable production in Ireland, including: reducing the level of dispatch down of renewable generation; providing a direct or indirect route to market for renewable generation; meeting the energy requirements of hard to abate sectors; and storing energy at scale for use when needed.

In the short to medium term, government must prioritise supports for the green hydrogen sector to facilitate the development of the necessary technology required to unlock the full potential of green hydrogen in the years to come. With Ireland's only oil refinery located in Whitegate, Co. Cork, there is an opportunity to pilot the utilisation of green hydrogen and associated technologies in the region, supporting broader decarbonisation goals.

Finally, striking the right balance between reusing and redeploying existing infrastructure to serve more sustainable purposes, as well as developing new infrastructure at pace where necessary is important. Existing critical infrastructure, such as the gas network for example, can often be redeployed to support more renewable energy sources, such as biomethane and hydrogen. Such repurposing has the additional benefit of supporting Ireland's broader sustainability and circular economy goals.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
With regard to supply chain development, emerging sectors such as green hydrogen and biomethane will likely require most support over the coming years. To ensure that Ireland can deliver on its renewable energy targets in a timely manner, government must ensure that the growth of the required supply chain is fully supported in the initial phase of growth to facilitate the acceleration of renewable energy generation. Continued supports for the offshore wind supply chain will be important too as the sector continues to grow, particularly if we are to meet the ambitious climate targets set out at both national and EU level.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
Similarly, these key emerging sectors should also be prioritised for additional support in term of broad/system research, development and innovation and in-company RD&I. Supporting these sectors to grow and innovate through targeted research and innovation supports and broader

system supports should also be prioritised, ensuring these sectors receive sufficient, ongoing support as they continue to grow. Offering advisory supports to help interested stakeholders access broader enterprise and economic supports, such as the R&D Tax Credit and Enterprise Ireland supports, should also be prioritised in this regard.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

In terms of industrial development, the new Strategy's aims should be aligned to existing policy frameworks, including recent initiatives like LEAP in particular, as well as broader economic and demographic growth projections, such as those contained in the National Development Plan and National Planning Framework. With LEAP setting out aims to develop Green Energy Parks, co-locating renewable supply with industrial development, it is critical that supports for the development of renewable energy are considered within the broader lens of economic growth and development. Consideration should also be given to the strategic plans of other state agencies under the remit of the Department of Enterprise, Tourism and Employment in this regard, such as Enterprise Ireland and IDA Ireland.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The current regulatory and compliance burden associated with the execution of renewable energy projects often necessitates the procurement of external service providers to assist with compliance, incurring considerable additional costs and time expenditure for developers. This can have an adverse impact on investor confidence and potentially dissuade future investors and FDI. Consideration should be given to aligning the new Strategy with government initiatives such as the Accelerating Infrastructure Action Plan, with aims to reduce compliance burdens to support the acceleration of infrastructural developments in the green energy sector.

Uncertainty regarding government planning and development timelines also has a detrimental impact on developers' ability to plan strategically and future-proof their operations. In the area of offshore wind for example, uncertainty remains around the proposed development and route to market for the remaining South Coast DMAP sites following the conclusion of the Tonn Nua auction in late 2025.

Infrastructure remains a key challenge too, and continued investment in supporting infrastructure in a timely manner that enables the future growth of renewable energy is of critical importance. Alongside large-scale infrastructure projects such as the Celtic Interconnector and investments in grid upgrades to support capacity as renewables come onstream, investment must also continue in ports and other transport infrastructure to support related logistics requirements.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Supporting the development of green technologies in Ireland must be considered through the broader lens of economic growth and competitiveness, as well as FDI retention and attraction and supports for indigenous enterprises. With this in mind, existing government supports for innovation, such as the R&D Tax Credit, have an important role to play, alongside existing Enterprise Ireland supports, for example. Ensuring that there is a clear pathway for those involved in green technologies to find out about and access these supports is critical. Consideration should be given to dedicating specific channels for grant applications to green technologies, for example, in order to expedite such processes to support the achievement of key climate targets on time.

Government should also consider building on these supports to further enhance innovation, through collaborations with education and research institutions for example, or additional opportunities for regulatory sandboxes to explore particular ideas or innovations in the green technology sector. Support for pilot projects to explore new industries, for example floating offshore wind projects, should also be prioritised.

8.Are there existing supports that should be expanded or improved?

As above.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Ensuring alignment with broader developments across education, research and innovation in the first instance is critical to future-proof the sector's growth and provide certainty for prospective investors and developers that Ireland can provide a talent pool of work-ready, skilled graduates in the sector.

In addition, the new industrial strategy should prioritise alignment with economic projections, particularly those related to sectors with a high concentration of Large Energy Users (LEUs). LEUs already play an important role in the domestic economy and ensuring security of supply for existing and future connections is critical to the continued attraction and retention of FDI across key sectors, including technology.

With this in mind, the new Strategy should seek to build on CRU's recently published LEU Connection Policy, as well as LEAP, while also giving consideration to potential upcoming developments such as the Private Wires Bill. Integrating policy aims and developments across government and state agencies will be essential to facilitate timely industrial engagement and necessary infrastructure delivery to safeguard existing economic activity and chart a course for

future growth and investment. Alongside close cooperation with Enterprise Ireland and IDA Ireland, the Department could also consider expanding collaboration with local business representative organisations, including Chambers of Commerce, to ensure that national policy aims reflect the economic reality on the ground, particularly in regional locations.

Collaboration with key energy sector stakeholders, including EirGrid and ESB Networks, is also critical to ensure that economic growth is aligned to current and future energy network capacity projections, and that areas where there is sufficient capacity to support new connections are well-identified and considered in government planning for future investment.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Ireland is home to a thriving innovation and start-up ecosystem across a wide variety of sectors. Ensuring continued support for and engagement with early-stage start-ups, incubator hubs and key educational institutions is an important first step to identifying emerging firms who may have a role to play in the renewable energy or green technology space.

Furthermore, continued collaboration and engagement across government departments, state agencies is critical to ensure effective and timely identification of opportunities for cross-collaboration. Support for collaboration, through cluster networks or local stakeholder groups, should also be prioritised to encourage the development of an innovative, collaborative ecosystem for companies operating in related industries.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

N/A

12.If so, how might similar approaches be adapted to the Irish context?

N/A

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Many firms, particularly SMEs and start-ups, are limited in their resources and financing. Ensuring that effective government programmes are in place to help firms identify opportunities to participate in the development and deployment of green technologies in the first instance is vital; advisory services that are easily accessible to firms at a local level should be prioritised.

In addition, while many companies may be ready and willing to play their part in the green

transition by dedicating resources to the development and deployment of green technologies, financial constraints are often a barrier to what can be achieved in the sector by such firms. Ensuring that grant opportunities are accessible, with streamlined and coordinated application processes and timelines where possible, is absolutely critical. Consideration should also be given to the expansion of current support structures to ensure green technologies are prioritised for R&D and innovation supports, while also ensuring that sufficient resources remain available for other key areas of R&D.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

With Ireland preparing to assume the Presidency of the Council of the European Union in the second half of 2026, there is an opportunity to prioritise the progression of green technologies at European level. Many other EU Member States have much more advanced green energy and technology sectors, presenting an opportunity for Ireland to learn from their experiences, avoid their mistakes where possible, and accelerate green technology development.

Alongside the monitoring of developments in other countries, collaboration with neighbouring countries should also be prioritised to leverage opportunities for collaboration on projects of shared interest as they arise. Engagement with UK counterparts is particularly important in this regard.

Prioritising ongoing engagement at ministerial and civil service level will be crucial as the sector develops, however opportunities for industrial engagement across borders should be identified and supported insofar as possible. Such an approach would enable those working in the sector in Ireland to exchange ideas and share learnings with those working at a more advanced stage of development and sectoral growth in other jurisdictions, supporting further innovation.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

With many sectors of the green economy still in their infancy in Ireland, there is a clear opportunity at present to integrate the green transition with sustainable economic growth and the digital innovation that is central to a more competitive economy. Ensuring that the new Strategy is closely aligned with economic growth aims, particularly in the area of competitiveness as set out in government's Action Plan on Competitiveness and Productivity, is crucial to realising the vision of a sustainable, green and prosperous future economy.

Consideration should also be given to the distinct opportunities that exist at local and regional level across Ireland. In Cork, for example, considerable work has been done by local stakeholders to achieve the EU Climate-Neutral and Smart Cities Mission Label. Exploring opportunities to integrate national green growth aims with developments at local level, encouraging regional investment and economic development, should be a key focus.

In addition, local initiatives such as the Local Green Deals in Cork, a collaboration between Cork City Council and Cork Chamber, support businesses in developing tailored climate action plans aligned with national and EU climate aims. Government should consider engaging with existing initiatives like this, with a view to supporting the continued deployment of green technologies at local level and identifying opportunities to scale up projects to national level and support interested businesses across the country in engaging with the green transition.

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Coordination across agencies

One of the most impactful elements of *Powering Prosperity – Ireland's Offshore Wind Industrial Strategy* is the coordination of state agencies around shared delivery objectives. Aligning agencies behind coherent strategies enables each organisation to invest in its respective area with confidence that investment will not be stranded. For example, the Port of Cork is able to invest in offshore wind facilities because the ORESS auctions and grid development strategies provide confidence that sustained demand will materialise.

A similar coordinated approach could support other Grid Enhancing Technologies (GETs). One example would be the development of GET test facilities, similar to the National Grid UK Deeside Centre for Innovation[1], located on state lands with existing grid access (e.g. Bord na Móna lands). Encouraging EirGrid and ESB Networks to identify priority technologies for future grid deployment, and working with industry, academia, and Bord na Móna to test and qualify these technologies at such sites, would enable technologies required by the Irish power system to be validated rapidly and deployed at scale.

This approach could be linked with enterprise and employment strategies to establish a European Centre of Excellence for Grid Innovation, potentially eligible for EU Innovation Fund

[1] https://www.nationalgrid.com/electricity-transmission/engineering-and-consultancy-solutions-ecs/deeside-centre-for-innovation

support. Bringing multiple agencies together in this way would drive economic growth through job creation, skills development, and accelerated delivery of technology-enabled grid capacity.

Building domestic supply chains
A second impactful element of *Powering Prosperity* is the focus on developing domestic supply chains. The Progress Report notes measurable success, including the growth of the Gael Offshore Network and increasing international expansion by Irish companies through overseas offices, joint ventures, and contracts.

Global supply-chain constraints represent a major barrier to grid development. For example HVDC cables and converter stations face lead times exceeding 5-10 years. Ireland's offshore renewable potential can only be realised through development of a timely and cost-effective offshore transmission grid. Therefore, tackling the supply chain constraints is an appropriate action for ensuring Green Growth.

One opportunity would be support for the development, testing, and manufacturing of High Temperature Superconductors (HTS). Superconducting cables offer extremely high capacity with low losses and reduced infrastructure footprint, making them particularly suited to offshore applications. An Irish company, SuperNode, is leading development of this technology to make it suitable for larges sub-sea cable deployments. The Irish Government could support development of an HTS offshore HVDC cable manufacturing facility in a manner similar to UK and Scottish Government support for Sumitomo Electric Industries' £350 million subsea cable manufacturing facility at the Port of Nigg in Scotland, supported by up to £24.5 million in public funding[2]. That project combined long-term deployment certainty with industrial policy support, anchoring strategic manufacturing capability while addressing a critical supply-chain bottleneck.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

At the centre of the energy transition is a safe, secure and reliable electricity network that can both enable and keep pace with the rapid development of all sectors where the green transition will occur. Ireland should prioritise technologies that can increase the capacity and flexibility of the grid, in a safe, secure, and reliable manner.

[2] https://www.hie.co.uk/news-and-blogs/news/2024/february/23/245m-to-secure-350m-inward-investment/

Key Irish industry stakeholders (including CRU, EirGrid, ESB, and IDA) have recognised Ireland's inability to maintain network development with conventional technologies in increasingly challenging conditions e.g. the raw materials required, the already overloaded equipment supply chains, public acceptance, protected approval processes, capital funding, etc.

Grid Enhanced Technologies like Advanced Power Flow Control, Dynamic Line Rating, Voltage Regulation, and Advanced Conductors need to be adopted on masse to make the systemic changes required. Many GETs have exceptionally low environmental impacts and are fast to build. They have been shown to be procured and delivered from concept to energisation in as little as a year. Each technology on its own could offer as much as double the existing available grid capacity, and when two or more technologies are used together this benefit can increase even further.

Other Grid Enhancing Technologies like superconducting cables allow new pathways or links in the grid to be created with as much a ten times the same capacity as new conventional line or cables within the same footprint as a conventional underground cable, with a fraction of the raw materials.
Supporting GET deployment reduces uncertainty across the broader energy transition by providing confidence that grid capacity can be delivered on time and at lower cost. This aligns directly with CRU's PR6 "Network Needs Assessment," which identifies deliverability and uncertainty as key risks to achieving Ireland's energy ambitions.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
In the recent CRU Price Review 6 process ESB and EirGrid identified 29 priority transmission projects. One notable feature pf these projects is the increasing trend of deploying underground cables to deliver additional capacity in favour of overhead line networks. The move towards undergrounding is happening globally. When combined with the extensive development of offshore subsea networks it is creating a global shortage of both raw materials and manufacturing capacity for cables. There is a pressing need for new production facilities and the profitability both financially and economically of such a facility is a huge opportunity for Ireland. Perhaps this is best evidenced by the development of a cable manufacturing facility by SUMITOMO in Scotland.

The investment totalled, building a £350 million state-of-the-art high-voltage cable manufacturing facility at the Port of Nigg in the Highlands, which was supported by £24.5 million in Scottish Government funding. This is expected to generate approximately 150–190 jobs directly and indirectly 330–500 jobs, primarily locally in the Highlands. It will support the 45GW of offshore wind projects and was recently named as the preferred bidder for the Shetland 2 HVDC subsea link.

Supports for cable production in Ireland, especially for newer cable types for which large scale facilities do not exist globally e.g. Superconductors would be a low risk, high return move. In

both Ireland and globally there is a growing dependency on cables to develop networks. Ireland's unique geographical position with extensive deep-water ports, the EU with the largest global market and unique indigenous knowledge in emerging new cable technologies like superconductors (e.g. Dublin based SuperNode) makes it a natural choice for investment.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

All Grid Enhancing technologies could benefit from access to a test facility specifically designed to test the capability of these devices to operate on HV networks from 10kV - 400kV. This would be similar to Action 25 of the 'Powering Prosperity Ireland's Offshore Wind Industrial Strategy' offering the opportunity to extend this action to incorporate all technologies for offshore wind development strategy, as the onshore network strengthening will be a key necessity to realise this strategy).

Similar test facilities have been a major support for other countries policy objectives and proven to be economically advantageous to their electrical sector industries. Well published examples of these include, NGET, Deeside Centre for Innovation test facility in the UK, KEMA laboratory in Arnhem in the Netherlands, or the HVDC Innovation Laboratory (HIL) at RTE France.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Many Grid Enhancing Technologies (GETs) are technically mature but face barriers to industrial scale deployment due to market dynamics.

Utilities typically require evidence of manufacturing capacity before adopting new technologies, while technology developers require confirmed demand before investing in manufacturing facilities. This creates a "chicken-and-egg" barrier to industrialisation.

Hardware-based technologies requiring high upfront capital investment particularly face this challenge, including:

- High and Medium Voltage Cables
- High Temperature Superconductors (cables, cryostats, and cooling systems)

Targeted public or EU institutional support is required to break this deployment deadlock.

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

A primary barrier to renewable energy deployment in Ireland is insufficient grid capacity and the time required to deliver new connections. Network congestion, constraints, and infrastructure delays reduce investor confidence.

A related barrier is the slow pace of adoption of proven Grid Enhancing Technologies. Several technologies trialled in Ireland have taken significantly longer to scale than in comparable jurisdictions, including Dynamic Line Rating, Power Flow Control technologies, superconducting fault current limiters, and composite core conductors.

These examples suggest institutional barriers affecting technology adoption. Proven solutions include regulatory benefit-sharing incentives, risk-reduction mechanisms for trials, performance-linked adoption metrics, independent advisory oversight, and publicly funded test facilities.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Develop a strategy for trialling new technologies, which involves all industry key stakeholders chaired by the Govt, including ESB, EirGrid, CRU, SEAI, IDA, large scale developers and Irish based equipment suppliers (similar to the past marine SEA working group).

This strategy should focus on not only the immediate commercially ready technologies and fast track their deployment (refer to problem outlined in response to question 4 on difficulty in wide-spread adoption), but also the entire suite of issues out to a fully decarbonised green energy network. The strategy should identify technologies that will be key in the longer term and should plan a proofing and entrance strategy across all barriers to introduction.

Past experience has shown that committed team is required throughout the process to avoid failure to deliver solutions. Some examples of past examinations of commercial mature technologies that have failed to deliver are:

- Advanced Power Flow Control had the first deployment in Europe in Ireland for a one-year pilot in 2016. Since then, deployments have been installed in UK (in multiple locations), Greece, Bulgaria, Austria and is being installed in Slovenia, Switzerland and Netherlands, but Ireland has no deployment
- Fault limiting superconductors, a full evaluation and an offer of free equipment for use in 2016 did not proceed. They are now installed in Germany, France and the UK in Europe, and many other countries globally.
- Dynamic Line Rating has been considered to over 10 years and has only been installed on 3 110kV lines the first in late 2024.

- Composite core overhead line conductor able to provide 200% of the existing default conductor capacity, was untested (until 2025) and is not yet considered a standard overhead line technology despite being used extensively in Europe and globally and supplied by numerous global companies for more than 20 years

Other support measures proven to be highly beneficial to the uptake and of new innovative technologies include:
Proven ways of addressing these include:

- Introducing regulatory incentive schemes for utilities such as benefit sharing. For example, the European association of regulators (ACER) proposed 'benefit sharing' as a way to accelerate adoption of new technologies and the Italian regulator, ARERA, has implemented such a scheme providing significant network capacity increases and savings to Italian consumers (over €100m to date).
- Risk reduction support for utilities who trial technologies – this could be in the form of regulatory allowances to recover project costs or government underwriting of project risks.
- Balance Scorecard rewards linked to fast adoption of technology
- Industry oversight / advisory committees who can assess progress of technology adoption and challenge projects that are not taking advantage of available technologies.
- Government funded R&D and test facilities that allow technology companies provide their technology is fit for purpose on the Irish grid and meets technical requirements.

8. Are there existing supports that should be expanded or improved?

Regulatory price controls for ESB and EirGrid can be improved by providing benefit sharing incentives that allow these companies keep a percentage of the consumer cost savings if they use new technologies (proven to work e.g. in the UK).

Government R&D Funding could be expanded to provide high and medium voltage test facilities to allow technology companies provide their technology is fit for purpose on the Irish grid and meets technical requirements.

Existing power network contestability rules could be expanded opening up more network development projects to competition (proven to work in other jurisdictions e.g. Australia, South America).

Leverage changes proposed by the European Union Grids Package to relax state aid rules allowing direct provision of financial support to innovative technologies looking to develop or scale up manufacturing facilities in Ireland

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Most modern technologies in the power network are electronics based and use onboard software and controls. Therefore, one aligned sector would be the software industry.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Research grants for denoted topics using the existing structures under the SEAI would be one quick to deliver option. Establishing a partnering platform to allow interested Irish based SMEs developing electrical network equipment to make connections for joint grant applications, in conjunction with dedicated resource time with semi-state utilities innovation teams would ensure a meaningful and productive outcome to research that will already be fit for purpose and assessed for use.

International Experience

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Several international approaches have proven effective:

- UK regulatory benefit-sharing incentives accelerating deployment
- US ARPA-E and GRIP programmes supporting trials and manufacturing scale-up
- Competitive transmission development models in South America
- UK/Scottish Government support for strategic cable manufacturing (Sumitomo facility).

12. If so, how might similar approaches be adapted to the Irish context?

Ireland can easily replicate some or all of these policies.

- Complete a strategic analysis of the supply chain required to deliver the onshore and offshore infrastructure needed for 2030-50 Using this information to develop a strategy to attract and support OEMs to locate manufacturing facilities in Ireland.
- Ireland can provide additional state support by designating these facilities as IPCEI (Investment projects of common interest) which would give access to more funding and possibly other supports
- CRU can copy the benefit sharing regulations have been used in other jurisdictions
- Expand contestability rules to allow third parties build out deep reinforcements.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

One of the key obstacles to SMEs in their participation and growth in the electricity sector (which is highly dominated by Government and Semi state bodies) is the existing procurement law requirements. For example, providers of innovative technologies and services find meeting the economic and financial standing checks difficult.

Requirements on the size of annual turnover, historical financial history, debt/funding ratios, etc for a newly formed and/or rapidly growing company are often not possible. Also risk mitigation in the form of bonding or retention for payments received can also be a serious problem for early-stage companies, and financial cost of providing such instruments cost more than any payment received impacting cashflow. A government back scheme to underwrite high risk new innovations identified by utility operator/owner companies would dispense with these securities and encourage native SME growth.

The high voltage test facility in response mentioned earlier would be another major advantage to SMEs in Ireland in the sector. Government support schemes to offer free (or reduced cost) testing for Irish SME developers would be another measure that would be invaluable in promoting Irish SMEs.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Ireland should establish an industry-led advisory committee to guide technology deployment. Ireland should also adopt Smart Grid Indicator metrics under the EU Grids Action Plan to assess deployment performance.

Other Considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

There are several measures that would be impactful that DETE might consider as part of the industrial strategy.

In line with the EU Grids package proposals, early adoption of the compulsory evaluation of the defined ‘non-wires’ solutions for existing network needs, could identify solutions with immediate network capacity benefits. Those that are positive after a cost benefit analysis could be implemented and provide new capacity within a year.

Examine the United States Department of Energy, Grid Resilience and Innovation Partnerships (GRIP) Program. The program has $3 billion ($600m/yr) of Smart Grid Grants are designed to

increase the flexibility, efficiency, and reliability of the electric power system, with particular focus on:

- Increasing capacity of the transmission system
- Preventing faults that may lead to wildfires or other system disturbances
- Integrating renewable energy at the transmission and distribution levels
- Facilitating the integration of increasing electrified vehicles, buildings, and other grid-edge devices

This program will accelerate the deployment of transformative projects that will help to ensure the reliability of the power sector's infrastructure.

Government administrated investor schemes to fund the development of projects, technologies, research and test centres. An alternative to a purely investor model would be to make a provision on the network tariffs of consumers that could be diverted into a fund for innovation. Offering of equity investments into Irish based SMEs in the industry could be offered with returns on investments being used to fund other innovators or reduce future network tariff's

DAJIN HEAVY INDUSTRY

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

In 'Powering Prosperity – Ireland's Offshore Wind Industrial Strategy', the Department of Enterprise, Tourism and Employment outlined several actions and initiatives which are impactful in establishing the foundations of a competitive offshore wind industry ecosystem in Ireland. One of these areas is the focus on international strategic partnerships and foreign direct investment (FDI) as critical enablers for achieving Ireland's offshore wind capacity targets.

Delivering offshore wind targets at the pace and scale required will depend on continued access to reliable international supply chains, particularly for the most advanced components where domestic capacity is insufficient or developing.
Continuing the roll out of green technologies in Ireland in tandem with strategic international partnerships and FDI is essential to maintain access to efficient global supply chains, alongside streamlined frameworks that enable investment and innovation. These partnerships can help reduce costs, enable timely project delivery, support progress toward the 2040 and 2050 targets, and strengthen energy security for Ireland and Europe.

Link to relevant article -

https://cms.implementconsultinggroup.com/media/uploads/articles/2025/No-wind-shield-required/No-wind-shield-required.pdf

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ireland should prioritise offshore wind as the primary green technology for meeting its climate targets and maximising economic opportunities from the green transition.

Offshore wind offers the most viable route to scale given Ireland's prime wind resources, available seabed capacity, and the proven efficacy of the technology. Compared to land-based renewable energy sources, offshore wind delivers more consistent and reliable electricity generation. This stability makes it particularly well-suited to power energy-intensive industries that require dependable, large-scale electricity supply, as noted in the Government's recently launched Large Energy User Action Plan. Likewise, emerging technologies such as floating offshore wind should be prioritised as fixed-bottom sites become constrained.

While offshore wind should be the primary focus, other options should also be considered. Onshore wind should continue to play a role; however, development opportunities are increasingly constrained by opposition from stakeholders. Rooftop solar offers value for distributed generation and demand-side participation, though Ireland's weather limits its contribution

Other offshore technologies such as tidal and wave energy are too technologically immature and commercially unproven to justify significant investment at present in comparison to offshore wind.

Links to relevant articles:

https://www.irishtimes.com/business/economy/2025/05/08/ireland-has-strong-potential-to-develop-globally-competitive-offshore-wind-supply-chain-says-report/https://static.energy-transitions.org/uploads/resources/Capturing-the-offshore-wind-opportunity.pdf

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Ireland's offshore wind industry requires scaling that exceeds current European manufacturing capacity for certain critical components. Given some of the EU legislation already in place such as Carbon Border Adjustment Mechanism (CBAM) or the Net Zero Industry Act (NZIA), further restricting supply chains through other EU policies such as the local content requirements under the Industry Accelerator Act or anti-dumping tariffs, risks higher costs, delayed deployment, and ultimately slower progress toward climate objectives and security of supply.

According to recent research commissioned by BCG, the European offshore wind sector currently faces significant capacity shortfalls in key technologies including:

- A 63% gap in wind turbine generators;
- A 71% gap in power converters;
- A 32% gap in foundations;
- A 71% gap in cables;
- A 48% average gap between supply chain and demand.

These results are consistent with other studies conducted by other reputed firms such as Implement Consulting or AFRY.

An approach that combines European manufacturing strength with strategic access to reliable international suppliers offers the most viable path to meeting Ireland's renewable energy goals and delivering security of supply.

Links to relevant article:
https://web-assets.bcg.com/f8/2b/195b4e54467089ff2360f54c77ff/measuring-the-wind-of-change-a-call-to-action.pdf

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
N/A

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
While Ireland maintains favourable conditions as an open economy, offshore wind deployment at scale faces challenges that require additional support.

Clear visibility on credible execution plans for offshore wind development are essential to secure the long-term commitments required from developers, investors, and supply chain partners.

Industrial deployment depends on open access to global supply chains which are capable of delivering projects cost-effectively and on schedule. Artificial constraints, including trade barriers and protectionist measures, create bottlenecks that increase costs and cause delays.

To enable industrial deployment, Irish Government support should focus on maintaining regulatory clarity, ensuring supply chain openness, and avoiding protectionist policies.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

In our view, Ireland faces a number of barriers to scaling renewable energy.

Planning delays and lengthy approval processes hinder and significantly slow down progress; streamlining these procedures would accelerate renewable energy development.

Variability results in lower average output and creates reliability challenges. Addressing this requires enhanced interconnection capacity to balance supply across the grid, along with expanded battery storage infrastructure to manage intermittent generation. Infrastructure and access to state-of-the art wind power equipment is also having a negative impact on delivery. Delivering offshore wind targets at the pace and scale required will depend on a combination of European manufacturing strength and access to reliable international supply chains, particularly for the most advanced components.

Ireland should also consider the impact of EU trade-related policies such as the Carbon Border Adjustment Mechanism (CBAM) and the Net Zero Industry Act (NZIA) and proposed legislation like the Industry Accelerator Act, along with anti-dumping tariffs risk slowing renewable deployment timelines, increasing costs, and undermining competition.

Numerous examples from other markets show that any relevant local content requirement in offshore wind tenders (and other renewables), even if attractive on paper for the general public, systematically conduct to slower development, higher prices and unsustainable industries that cannot survive when competing in the global market

Policy measures should carefully balance the objective of strengthening European manufacturing with the need to maintain competitive costs and timely renewable deployment.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

To support the development of green technology deployment in Ireland, the Government and State agencies should consider the following actions:

Prioritise policy certainty and strategic planning by publishing clear, long-term policy frameworks and deployment roadmaps, such as Powering Ireland, that provide industry with the confidence necessary for long-term and sustained investment. Predictable regulatory environments enable companies to commit capital and resources.

Facilitate access to global supply chains through open trade policies and streamlined import frameworks. This approach ensures cost-effective project delivery while maintaining Ireland's competitive position in attracting international investment and expertise.

Create favourable conditions for foreign investment by pursuing reduced regulatory barriers and approval timelines at national and EU level.

Defend free trade at EU level by advocating for a level playing field rather than supporting “Made in Europe” mandates.

8. Are there existing supports that should be expanded or improved?

Current support mechanisms would benefit from regulatory simplification and better procurement support between domestic manufacturers and global manufacturers to deepen supply chain participation.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

The technology sector, particularly large energy users such as data centres, is a strategically aligned sector that should be closely integrated into Ireland’s green industrial growth strategy.

Ireland has developed into a globally significant technology and digital infrastructure hub. Data centres represent a major and growing source of electricity demand and are central to Ireland’s export economy. Ensuring that this demand growth is aligned with renewable energy ambitions, particularly offshore wind, presents both a challenge and an opportunity. A coordinated approach and improved regulation could enable long-term Corporate Power Purchase Agreements (CPPAs) between offshore wind developers and tech companies, improve stability through co-location or grid-aligned connection strategies, and enhance Ireland’s attractiveness for both renewable and technology FDI.

The Large Energy User Action Plan (LEAP) provides an important framework for managing demand growth however there is scope to strengthen the alignment between renewable deployment and large energy user planning to ensure mutually reinforcing development.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

N/A

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Industrial development policy interventions in Poland are particularly effective. Poland has set out clear policies that embrace the global supply chain allowing collaboration between global suppliers and local companies. Dajin Heavy Industry has recently signed a contract with the Polish state-owned company Wulkan Shipyard in Szczecin for the fabrication of at least 40 internal platforms for foundations to be delivered to Nordseecluster B in the North Sea. These policies are effective in both creating vital local jobs and facilitating a timely execution of offshore wind projects.

Link to relevant article:
https://renewablesnow.com/news/polish-shipyard-to-supply-parts-for-900-mw-wind-project-in-german-waters-1290515/

12.If so, how might similar approaches be adapted to the Irish context?
N/A

SMEs
13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.
N/A

Monitoring
14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?
Engagement with international industry leaders such as Dajin Heavy Industry provides an effective mechanism for monitoring emerging green technologies, including floating offshore wind. This enables policymakers to maintain current awareness of technological advancements and international best practice. In addition, recent research by BCG introduced a KPI-based monitoring framework for offshore wind expansion which could be utilised to monitor the development of these green technologies and identify emerging technologies and sectors in the future.

Link to relevant article:
https://web-assets.bcg.com/f8/2b/195b4e54467089ff2360f54c77ff/measuring-the-wind-of-change-a-call-to-action.pdf

Other considerations
15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?
N/A

EDFps Response to the DETE Consultation on proposed Green Growth Strategy

Dear Green Growth Strategy Team,

I write on behalf of EDF power solutions Ireland, part of one of the world's largest electricity companies. Our investment and innovation in renewable energy are reducing costs for consumers and delivering long term benefits for communities. The EDFps Ireland team has extensive experience delivering complex onshore and offshore wind, solar PV and battery storage projects.

In 2020 we acquired 50% of Codling Wind Park (CWP), Ireland's largest Phase 1 offshore windfarm located off the coast of Co. Wicklow, and 100% of Wexford Solar, which includes eight solar projects across Ireland. In 2023 we also acquired 50% of both Emerald and Western Star, two potential floating offshore wind (FLOW) developments off the south and south-west Irish coast. In total, we have an Irish onshore development pipeline of almost 1 GW. We have constructed and energised three of the first utility-scale solar farms in Ireland in Wexford and Kilkenny and have announced five new onshore wind projects in the past two years. We have taken the final investment decision to commence construction on Taduff 110MWp Solar. We continue to assess M&A and JV opportunities and are actively looking at battery co-location options for our renewable projects.

We welcome the opportunity to respond to the Department's consultation on the Green Growth Strategy. As a developer of large-scale onshore wind, solar, battery energy storage systems (BESS) and hybrid projects across Ireland, our submission reflects EDFps' development priorities: offshore fixed wind, the onshore pipeline (onshore wind, solar, battery), and offshore floating wind. We support a technology-neutral national strategy that nonetheless signals clear, multi-year demand and targeted industrial supports to accelerate renewable energy deployment, scale domestic supply chains, and deliver regional jobs and economic benefits.

Prioritisation table - Ordering, rationale and immediate actions

EDF's believes the following technologies should be prioritised by Ireland as part of the strategy:

Technology	Rationale	Key challenges to deployment	Recommendations for immediate government action
Offshore wind (fixed)	Largest near-term scale and export potential; anchors port and manufacturing investment.	Consenting timelines; port readiness; grid export corridors; skills.	Publish multi-year leasing and procurement windows; accelerate port upgrades and grid export planning.
Onshore pipeline (wind, solar, battery & hybrids)	Rapid deployment for emissions reduction and regional economic benefit; flexible project delivery; technology diversity.	Local planning certainty; transmission connections and distribution network constraints; revenue stacking for storage.	Streamline consenting; reform grid access and curtailment rules; enable hybrid procurement.
Offshore wind (floating)	Strategic long-term opportunity for deeper water sites and advanced manufacturing.	Unclear whether there is policy support; perceived higher technology and financing risk; need for demonstration scale to progress.	Provide policy clarity & commitment; fund targeted demonstration projects; provide staged procurement and port test infrastructure.

Challenges and opportunities

In our view, the following technologies face both opportunities and challenges:

- Offshore fixed wind - Opportunity: anchor largescale manufacturing, high value services and exports. Challenge: synchronising maritime planning, ports and grid build; scaling workforce.
- Onshore pipeline - Opportunity: fastest route to near-term emissions reductions and local jobs. Challenge: consenting certainty, community acceptance, transmission connections and distribution network capacity.
- Battery storage & hybrids - Opportunity: enable higher renewable penetration and firming (i.e. making intermittent renewable output more reliable by guaranteeing a dispatchable power profile e.g. delivering energy at times of system need), which helps meet capacity

or reliability obligations); unlock revenue stacking. Challenge: market design for long duration services and clear revenue streams.

- Offshore floating wind - Opportunity: access to deeper resources and exportable technology expertise. Challenge: demonstration funding, port adaptation and supply chain development. Unclear whether there is policy support.

How government can best support innovation, investment and workforce development
EDFps believes that innovation, investment and workforce development can best be supported through the implementation of the following actions:

- Predictable, multi-year demand signals - Publish a clear procurement calendar (auctions/CFDs) for offshore fixed wind, onshore renewables and storage, and staged windows for floating wind so industry can plan investment, scale supply chains and align workforce development to a predictable pipeline. This would provide a publicly available schedule that specifies indicative or firm dates for auction launches and award notifications, expected capacity by technology and target delivery years, high-level auction design parameters (contract length, eligibility and any conditionality), and key dependencies such as grid and port readiness.
- Market and grid reforms - Reform grid access, curtailment and connection queuing; and define ancillary service products that reward flexibility and long-duration storage. Specifically, reform grid access by standardising and shortening connection timelines, replacing first-come, first-served queues with clear allocation mechanisms, issuing firm, technology-sensitive connection offers aligned to network reinforcement plans, improving public data on network capacity and constraints, and introducing contractual protections to reduce curtailment risk for co-located renewables and storage so projects and supply chains can be financed and delivered.
- Targeted industrial policy and procurement - Use anchor projects (large, staged procurements such as major offshore fixed wind farms) to catalyse domestic supply chains by combining multi-year procurement windows with conditional procurement clauses (local content and skills commitments), supplier development grants and coordinated port and training investments so that manufacturers, ports and training providers can scale capacity with confidence.
- Demonstration and de-risking support - Fund first-of-a-kind floating wind and long-duration storage pilots using blended finance to absorb early technology and construction risk, lower the cost of capital, and attract private investors while attaching clear milestones for local content, skills and performance.
- Ports and logistics investment - Prioritise port upgrades, quayside test facilities and logistics corridors aligned to the offshore fixed pipeline and future floating needs.
- National skills roadmap - Align apprenticeships, modular upskilling and regional training hubs to the published pipeline; fund retraining for transferable trades.

- Community and regional frameworks - Standardise community benefit mechanisms and local procurement targets to build social licence and maximise regional value capture.

Building on Powering Prosperity - suggested next steps and recommendations (12-24 months)

EDFps would recommend the following measures to support Building on Powering Prosperity:

- Coordinated delivery - establish a cross-departmental delivery unit to align DETE, DECC, Transport and local authorities on consenting, infrastructure and industrial supports.
- Measure impact - set KPIs for jobs, exports and emissions avoided and publish progress against the pipeline timetable.
- Priority pipeline and procurement calendar - Publish a calendar for offshore fixed projects, onshore projects and floating demonstration windows.
- Supply Chain - Launch a Green Supply Chain Accelerator Programme to match anchor projects with domestic suppliers and provide capability grants.
- Ports and Grid - Commit to a ports and grid investment plan with clear timelines and funding envelopes.
- Hybrids, LDES and FLOW - Fund demonstration pilots for floating wind and long duration storage; support hybrid onshore tenders.
- Skills - Deliver a National Skills Roadmap with apprenticeship and retraining targets tied to regional clusters.

Prioritising offshore fixed wind, the onshore pipeline, and FLOW aligns public policy with Ireland's opportunity to capture industrial value and regional jobs. We believe that predictable demand, coordinated infrastructure investment, targeted industrial supports and a national skills programme are essential levers to convert that opportunity into sustained beneficial economic and climate outcomes.

Finally, in response to Question 9, "***Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?"*** we align with the industry view, as set out in the WEI response and below:

In the context of the broader green energy transition, support for aligned sectors should be focused on those which are the **key drivers of electricity demand** in Ireland. We recommend that DETE considers adjacent sectors that depend on clean energy and can help make it viable at scale, such as:

- Construction & built environment (broad electrification)
- Manufacturing & industrial demand decarbonisation
- Transport

- Digital/Data Services
- Agriculture

We also acknowledge that the Large Energy User Action Plan (LEAP) published by DETE in January 2026, is focused primarily on new concepts and new FDI, but we must not forget about existing industrial and commercial sectors and ensuring that there are appropriate incentives and supports in place to enable the transition, particularly those harder to decarbonise sectors.

In conclusion, we would like to thank The Department of Enterprise, Tourism and Employment for the opportunity to engage on this matter. Should you wish to discuss any of the issues raised in our response or have any queries, please contact [redacted] on [redacted]. I confirm that this letter may be published on the DETE website.

Yours sincerely,

[redacted]

EIREDYNE LIMITED

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

One of the most impactful aspects of Powering Prosperity has been the clear emphasis on building domestic industrial capability alongside renewable deployment. In particular, actions focused on:

- Strengthening innovation and in-company R&D supports
- Developing supply chain readiness
- Supporting export positioning of Irish offshore wind capability
- Enabling industry-academic collaboration

These actions are directly transferable to other offshore renewable technologies, including tidal stream and wave energy.

Marine energy technologies such as tidal stream are at an earlier stage of commercial maturity than offshore wind but share significant overlap in:

- Marine operations
- Subsea structures

- Grid integration
- Hydrogen coupling potential
- Fabrication and assembly infrastructure

Strategic support for marine energy innovation, particularly through targeted R&D funding, test infrastructure access, and supply chain capability development, could enable Ireland to establish early leadership in emerging offshore technologies beyond wind.

Ireland possesses strong tidal resources and relevant offshore engineering expertise. With structured industrial support similar to that provided for offshore wind, indigenous marine renewable technologies could contribute not only to energy decarbonisation but also to regional economic development and export growth.

Importantly, marine renewables can complement offshore wind by providing predictable generation profiles that support hydrogen production and grid stability.
Extending the industrial strategy framework to tidal and other marine technologies would diversify Ireland's offshore renewable portfolio while strengthening domestic clean technology innovation capacity.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ireland should prioritise green technologies that combine strong domestic resource potential, industrial capability overlap, and export opportunity. In the energy system context, particular focus should be given to:

1. Offshore Renewable Energy (beyond fixed-bottom wind)
While offshore wind remains central, Ireland should actively support the development of tidal stream and wave energy technologies. Ireland has significant tidal resource in coastal regions, and marine renewables share substantial supply chain overlap with offshore wind (marine fabrication, subsea engineering, grid connection, O&M). Early strategic support could position Ireland as a technology developer and exporter, not solely an energy importer.

2. Green Hydrogen and Integrated Offshore-to-Hydrogen Systems
Hydrogen production coupled with renewable generation offers long-term energy storage, grid balancing, and export potential. Technologies that integrate offshore generation directly with electrolysis and existing gas infrastructure should be supported.

3. Grid and Storage Technologies

Enhanced grid flexibility, battery storage, and long-duration storage solutions are essential to unlock renewable penetration and improve system resilience.

4. Industrial Decarbonisation Technologies
Solutions that enable electrification of industry, low-carbon fuels, and carbon capture where appropriate should also be part of the strategy**.**
A diversified offshore renewable portfolio — including tidal stream — would complement wind by providing predictable generation profiles that support hydrogen production and system stability. Strategic intervention at this stage could enable Ireland to capture greater economic value through indigenous technology development and export growth.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Several green technologies would benefit from additional strategic support in supply chain development, particularly those that are technically promising but at earlier stages of commercial maturity.

1. Tidal Stream and Marine Renewable Energy Technologies
Tidal stream technologies require additional support across multiple elements of the supply chain, including:

- Marine fabrication and assembly capacity for large subsea structures and nacelle systems
- Specialised drivetrain and low-speed generator manufacturing capability
- Subsea installation and retrieval systems suitable for tidal environments
- Testing and validation infrastructure, including hydrodynamic modelling, structural analysis, and scaled physical testing
- Operations and maintenance capability development for harsh marine environments

While offshore wind has successfully stimulated growth in fabrication yards, marine contractors, and installation services, these capabilities are largely geared toward wind-specific components. Marine energy technologies share overlap but often require different structural forms, retrieval strategies, and drivetrain architectures.
Ireland has significant offshore engineering expertise, but without targeted early-stage support, there is a risk that marine renewable developers will rely heavily on imported subsystems, limiting domestic value capture.

2. Green Hydrogen and Offshore-to-Hydrogen Integration
Hydrogen production integrated with renewable generation requires:

- Electrolyser integration expertise in offshore or nearshore environments
- Compression, storage, and transport infrastructure adaptation

- Balance-of-plant engineering capability

Support is needed not only in electrolyser manufacturing but in systems integration engineering.

3. Grid and Long-Duration Storage Technologies
Increased renewable penetration will require:

- Grid reinforcement technologies
- Power electronics manufacturing and integration capability
- Long-duration storage solutions (including hydrogen-based storage)

Evidence from neighbouring markets indicates that early industrial strategy intervention (e.g., UK tidal stream CfD ringfencing, Scottish marine test infrastructure) has helped stimulate domestic supply chain capability and inward investment.

If Ireland wishes to capture economic value from emerging marine renewable technologies, supply chain support must extend beyond deployment targets to include innovation funding, fabrication capability development, and test infrastructure access.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

The technologies most in need of additional support for broad/system RD&I and in-company RD&I are tidal stream and wave energy, alongside offshore-to-hydrogen integration and enabling grid/storage technologies.

1) Tidal stream and wave (ocean energy)
These technologies require additional RD&I support because they must operate in harsh, highly variable marine conditions and still need cost reduction, reliability improvement, and validated design methods before scaled commercial roll-out. The EU recognises ocean energy as predictable and valuable for the energy system and supports RD&I for that reason.
Key RD&I barriers Government can help address
Access to test infrastructure and validation pathways (tank + sea) with clear stage-gates; testing is costly and high-risk (devices must prove survivability/reliability). EMEC is an example of how dedicated test infrastructure reduces time/cost/risk for developers.
Revenue-to-innovation bridge (“first arrays”): without a predictable route to early deployments, private capital won’t fund iteration. The UK’s CfD “ringfence” for tidal stream is a practical example of targeted market support to pull innovation through.

Engineering tooling and standards alignment: support for CFD/FEA/V&V capability, reliability engineering, and certification-ready design practices (DNV etc.) so Irish companies can progress from concept to bankable design.
In-company RD&I funding tuned to hardware: larger, milestone-based supports (beyond small feasibility grants) for prototype manufacture, instrumentation, and iterative design improvements.

2) Green hydrogen and derivatives (system integration)
Hydrogen RD&I should focus on integration engineering: coupling variable offshore renewables to electrolysers, balance-of-plant, compression/storage, and grid/network interfaces. (The emerging push for hydrogen hubs and infrastructure reuse underlines the need for this systems work.)

Barriers to address

- High capex and long lead times for demonstration
- Lack of "plug-and-play" integration standards for offshore contexts
- Need for testbeds and reference architectures

3) Grid technologies and long-duration storage
RD&I support is needed for power electronics, grid-forming inverters, dynamic constraints management, and long-duration storage to unlock higher renewable penetration and reduce curtailment.

What Government can do (practical interventions)

- Expand access to marine test and validation programmes and reduce cost of sea trials (permitting, logistics, metocean data, grid connection).
- Create stage-gated RD&I supports for ocean energy hardware (design → prototype → sea demo → pre-commercial arrays).
- Support targeted "pull" mechanisms for early marine energy deployment (akin to the UK tidal CfD ringfence) to de-risk private investment.
- Fund industry–research capability in CFD/FEA, reliability, materials/corrosion, and certification/V&V to build Irish competence and reduce dependence on imported engineering services.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

The technologies most in need of additional support in terms of industrial deployment are tidal stream and wave energy, alongside early-stage offshore-to-hydrogen integration systems.

1. Tidal Stream and Wave Energy

While offshore wind is now commercially mature and supported by well-established market mechanisms**,** tidal stream and wave technologies remain at the pre-commercial or early commercial stage. These technologies face a well-documented deployment barrier: capital costs remain high until devices are deployed in small arrays, yet investors are reluctant to fund arrays without revenue certainty.

International experience demonstrates that targeted deployment support can unlock industrial growth. For example, the UK's Contracts for Difference (CfD) scheme introduced a ringfenced allocation for tidal stream, which has enabled multiple projects to proceed to array-scale deployment. This targeted intervention has stimulated private investment, supply chain development, and inward technology growth.
Without similar early deployment pathways, there is a risk that Ireland's marine renewable resource will remain underdeveloped while industrial capability is captured elsewhere.

2. Offshore-to-Hydrogen Integration
Industrial deployment support is also needed for projects integrating renewable generation with hydrogen production. While electrolyser technology exists, large-scale integration with offshore renewables remains at an early stage and requires demonstration projects to validate technical and commercial models.

Deployment support mechanisms could include:

- Pilot project funding
- Market incentives for green hydrogen production
- Support for infrastructure adaptation and grid integration

Why Deployment Support Matters
Innovation funding alone is insufficient for hardware-intensive technologies. Marine renewable systems require:

- Fabrication
- Offshore installation
- Operational validation in real conditions

These cannot be proven in laboratory environments. Industrial deployment support enables:

- Learning-by-doing cost reduction
- Reliability improvement
- Supply chain activation
- Investor confidence

If Ireland aims to maximise economic opportunity from the green transition, it must not only support research and development but also provide structured pathways to early commercial deployment for emerging marine technologies.

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The main barriers to scaling renewable energy and green technologies in Ireland fall into four interrelated categories: regulatory certainty, grid and infrastructure readiness, skills capacity, and access to risk-tolerant capital.

1. Regulatory and Permitting Certainty

While progress has been made in offshore wind, emerging technologies such as tidal stream and wave face uncertainty in consenting pathways, maritime spatial planning alignment, and grid access. Long and uncertain permitting timelines increase development risk and discourage early-stage investment. Clear, technology-inclusive consenting pathways and predictable timelines are essential.

2. Grid Capacity and Infrastructure Constraints

Grid availability and connection timelines are a significant bottleneck for renewable deployment. Without proactive grid reinforcement and flexible connection models, renewable projects are delayed or curtailed. Greater integration planning between generation, storage, and hydrogen infrastructure is required to enable system-wide optimisation.

3. Skills and Engineering Capability

Scaling offshore renewables and associated green technologies requires specialised skills in:

- Subsea engineering
- Power electronics
- Systems integration
- Marine operations
- CFD, FEA and verification & validation

Ireland has strong engineering capability, but targeted development of marine and energy systems expertise will be necessary to avoid reliance on imported services and to maximise domestic value capture.

4. Access to Patient and Risk-Tolerant Capital

Hardware-intensive technologies such as marine energy and hydrogen integration face a “valley of death” between prototype validation and early commercial deployment. Traditional venture capital is often unsuitable for long development timelines and capital-heavy demonstrations. Blended finance, co-investment mechanisms, and early deployment supports are critical to unlocking private investment.

5. Supply Chain Activation
Ireland risks becoming primarily an energy importer of technology if supply chain capability is not proactively developed. Strategic coordination between industry, research institutions, and government is required to ensure fabrication, installation, and systems integration capability can scale alongside deployment**.**

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

To support the development of green technologies in Ireland, Government and State agencies should focus on coordinated, stage-gated interventions that bridge innovation, demonstration, and early deployment.

1. Expand and Scale Hardware-Focused RD&I Supports
Ireland has strong early-stage innovation supports (e.g., Innovation Vouchers, feasibility funding). However, hardware-intensive green technologies such as marine energy, grid hardware, and hydrogen systems require larger, milestone-based funding instruments that support:

- Prototype fabrication
- Offshore or real-world demonstration
- Reliability testing and validation

Expanding in-company RD&I grants for capital-intensive technology development would help bridge the gap between concept validation and commercial readiness.

2. Create a Clear Early Deployment Pathway for Emerging Marine Technologies
Similar to targeted deployment mechanisms used in neighbouring markets, Ireland should consider:

- Ringfenced procurement or market mechanisms for early-stage marine renewables
- Support for first-array deployments
- Revenue certainty instruments for demonstration-scale projects

Without structured deployment pathways, innovation funding alone will not translate into industrial scaling.

3. Strengthen Industry–Research Capability Platforms
Technology Gateways, university research centres, and applied research groups play a critical role in enabling SMEs to access advanced engineering capability.
Supports that could be expanded include:
Increased funding for CFD, FEA, power electronics, and marine systems modelling capability

Expanded access to test infrastructure (tank testing, subsea trials, grid simulation)
Structured collaboration programmes linking SMEs with research institutions
This reduces reliance on imported technical services and strengthens domestic capability.

4. Improve Access to Patient Capital
Green technologies often require longer development timelines and higher upfront capital than software or service-based sectors.
Potential interventions include:

- Co-investment funds targeted at hardware-intensive green technologies
- Blended finance structures
- Strategic public-private investment vehicles

This would help overcome the "valley of death" between pilot and commercial scale.

5. Integrate Hydrogen, Grid and Renewable Strategy
Policy support should ensure alignment between renewable generation, hydrogen production, and grid infrastructure. Demonstration projects that integrate generation and hydrogen production could be supported as part of a broader system approach.

6. Expand Existing Supports Rather Than Create Fragmentation
Existing supports that could be expanded include:

- Enterprise Ireland RD&I funding mechanisms
- Technology Gateway programme
- SEAI innovation supports
- Marine Institute test and research programmes

Scaling and coordinating these supports would likely be more effective than creating entirely new schemes.

8. Are there existing supports that should be expanded or improved?
Yes — Ireland already has a strong foundation of supports for green technology development. However, several existing mechanisms could be expanded or refined to better support industrial scaling and hardware-intensive innovation.

1. Enterprise Ireland RD&I Supports
Enterprise Ireland provides valuable early-stage innovation supports (e.g., Innovation Vouchers, feasibility grants, and R&D funding). These are particularly effective for concept validation and collaboration with research institutions.
However, for hardware-intensive green technologies (marine energy, hydrogen systems, grid hardware), development cycles are longer and capital requirements are higher. Expanding:
The scale and duration of in-company R&D supports

Milestone-based prototype and demonstration funding
Support for pilot-scale manufacturing and validation would help bridge the gap between laboratory validation and early commercial deployment.

2. Technology Gateway Programme
The Technology Gateway network plays an important role in giving SMEs access to applied research capability (e.g., CFD, structural analysis, materials engineering).
This programme could be strengthened by:

- Increased funding for advanced modelling and verification capability
- Dedicated marine and energy systems engineering capacity
- Faster access pathways for SMEs working on strategic green technologies

Enhancing this capability domestically reduces reliance on overseas engineering services and strengthens Ireland's technical ecosystem.

3. Marine and Test Infrastructure Supports
Access to test infrastructure remains a key bottleneck for emerging marine renewable technologies.

Existing supports through agencies such as the Marine Institute and SEAI could be expanded to:

- Reduce cost barriers to sea trials
- Improve access to metocean data
- Provide structured progression from tank testing to offshore validation

This would accelerate development timelines and de-risk private investment.

4. SEAI Innovation Supports
SEAI plays a strong role in research and demonstration funding. Expanding support for:

- Integrated renewable-to-hydrogen pilot projects
- System-level demonstrations
- Long-duration storage validation would help bridge innovation and deployment.

5. Coordinated Scaling Rather Than Fragmentation
Ireland's support ecosystem is strong but sometimes fragmented. Improved coordination and clearer progression pathways between agencies (Enterprise Ireland, SEAI, Marine Institute, IDA, and others) would help companies move more smoothly from early innovation to industrial scaling.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Yes — to maximise economic opportunity and ensure long-term resilience, the industrial strategy should support aligned sectors that enable, supply, and scale renewable energy and green technologies.

1. Marine and Offshore Engineering
Offshore wind, tidal stream, wave energy, and offshore-to-hydrogen systems all depend on:

- Marine fabrication and assembly
- Subsea engineering
- Offshore installation and retrieval systems
- Operations and maintenance capability

Strengthening Ireland's marine engineering sector would support renewable deployment while building exportable expertise applicable across multiple offshore technologies.

2. Advanced Manufacturing and Fabrication
Green technologies require:

- Heavy fabrication capability
- Precision machining
- Composite manufacturing
- Large-scale structural assembly

Investment in advanced manufacturing facilities and supply chain readiness would increase domestic value capture and reduce reliance on imports.

3. Power Electronics and Electrical Engineering
Scaling renewables requires:

- Grid-forming inverters
- High-voltage equipment
- Power conversion systems
- Control systems integration

Ireland should support development of expertise and companies in power electronics and grid technologies to underpin renewable penetration and electrification.

4. Hydrogen and Process Engineering
Hydrogen production and derivatives (ammonia, synthetic fuels) require:

- Electrolyser integration
- Compression and storage systems
- Process engineering capability
- Balance-of-plant design

Developing these competencies supports both domestic decarbonisation and export opportunity.

5. Digital Engineering and Systems Integration
The energy transition is increasingly data-driven and system-integrated. Aligned sectors include:

- Digital modelling and simulation (CFD, FEA, grid modelling)
- Control systems engineering
- Condition monitoring and predictive maintenance
- Energy system optimisation

Supporting these capabilities enhances both renewable reliability and export potential.

6. Maritime Logistics and Port Infrastructure
Port infrastructure upgrades, heavy lift capacity, and offshore logistics are critical enablers of renewable deployment and long-term industrial competitiveness.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?
Companies in complementary sectors can be identified and encouraged to broaden into renewable and green technologies through targeted mapping, capability translation, and structured engagement programmes.

1. National Capability Mapping
Government and State agencies should conduct structured capability mapping exercises across sectors such as:

- Marine engineering
- Heavy fabrication
- Precision machining
- Power electronics
- Process engineering

- Automation and controls

Many firms in these areas may already possess transferable competencies but are not actively engaged in renewable markets. A clear database or sectoral map identifying capabilities aligned with renewable supply chains would enable more effective engagement.

2. Sector Translation Initiatives
Many companies do not enter renewable markets due to perceived regulatory complexity or uncertainty around standards and procurement pathways.
Targeted programmes could:

- Host industry briefings explaining renewable market entry pathways
- Provide guidance on certification standards (e.g., offshore, grid, hydrogen compliance)
- Offer technical "gap analysis" support to help companies assess readiness

This reduces perceived risk and lowers entry barriers.

3. Innovation and Demonstration Partnerships
Structured collaboration programmes linking established industrial firms with renewable technology developers or research institutions could accelerate cross-sector integration.
Examples include:

- Joint R&D calls
- Co-funded pilot projects
- Innovation cluster initiatives
- Technology Gateway collaborations

These mechanisms allow companies to enter renewable markets incrementally through partnership rather than wholesale transition.

4. Public Procurement Signalling
Clear long-term policy signals and deployment targets give industrial firms confidence to invest in retooling and capability expansion. Where possible, procurement frameworks should highlight opportunities for domestic supply chain participation.

5. Skills and Upskilling Supports
Upskilling programmes targeted at transferable engineering disciplines (e.g., offshore safety standards, hydrogen systems engineering, grid compliance) can help firms adapt existing competencies to renewable markets.

6. Regional Cluster Development

Regional cluster initiatives focused on offshore energy, hydrogen, or grid technologies could connect SMEs, large industry players, research institutions, and State agencies. Clusters reduce fragmentation and encourage knowledge spillover.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Several international policy interventions offer useful lessons for Ireland in supporting green technology industrial development.

1. UK – Contracts for Difference (CfD) with Targeted Ringfencing
The UK's Contracts for Difference scheme has been highly effective in scaling offshore wind by providing long-term revenue certainty. More recently, the introduction of a ringfenced allocation for tidal stream projects has enabled early array-scale deployments and stimulated private investment. This approach demonstrates how targeted, time-limited deployment support for emerging technologies can accelerate cost reduction and supply chain formation without distorting mature markets.

2. Scotland – Marine Energy Test Infrastructure (EMEC)
Scotland's investment in the European Marine Energy Centre (EMEC) has provided structured sea-test facilities with grid connection, permitting support, and environmental monitoring frameworks.
This infrastructure has reduced development risk for marine energy companies and positioned Scotland as a global centre for ocean energy innovation. The key lesson is that accessible, world-class test infrastructure can anchor domestic industrial capability.

3. Denmark – Long-Term Offshore Wind Industrial Strategy
Denmark's offshore wind success was not driven solely by resource potential, but by long-term industrial coordination between government, utilities, manufacturers, and research institutions.
Key features included:

- Stable policy frameworks
- Early demonstration projects
- Domestic supply chain development
- Close collaboration between academia and industry

This integrated approach allowed Denmark to build globally competitive companies rather than simply deploy renewable capacity.

4. Germany – Energy Transition with Industrial Manufacturing Focus

Germany's Energiewende combined renewable deployment targets with strong domestic manufacturing and engineering capability development. Support for grid technology, power electronics, and advanced manufacturing enabled export strength in renewable-related industries.

5. Netherlands – Hydrogen and Industrial Clustering
The Netherlands has focused on hydrogen hubs linked to existing industrial and port infrastructure, combining infrastructure repurposing with targeted innovation funding and cluster development.
This demonstrates the value of integrating renewable generation, industrial decarbonisation, and infrastructure reuse.

Key Lessons for Ireland
Across these examples, several common themes emerge:

- Long-term policy certainty reduces investment risk
- Targeted deployment support accelerates early-stage technologies
- Investment in test infrastructure anchors innovation ecosystems
- Industrial clustering strengthens domestic value capture
- Coordination between agencies is critical

Ireland can draw on these models to design targeted interventions that support not only renewable deployment but also indigenous technology development and export growth.

12.If so, how might similar approaches be adapted to the Irish context?

Yes. Several proven approaches could be adapted to Ireland by building on existing Irish institutions (Enterprise Ireland, SEAI, the Technology Gateway network, ports, and test facilities) and tailoring interventions to Ireland's scale and resource profile.

1) Revenue certainty for early-stage technologies (UK CfD ringfencing → Irish "emerging tech" allocation)

Ireland could introduce a limited, time-bound support mechanism for early commercial deployment of emerging offshore renewables (e.g., tidal stream and wave), similar in principle to the UK tidal ringfence. In an Irish context this could be:
A dedicated "emerging offshore renewables" tranche within auction/contract mechanisms, or
A small number of competitively selected demonstration/first-array contracts that provide bankable revenue certainty.
This would help overcome the "valley of death" between prototype and early array scale, allowing learning-by-doing cost reduction and supply chain activation.

2) Test infrastructure as an industrial anchor (EMEC model → expanded Irish test and validation pathway)

Ireland could strengthen and better integrate test infrastructure into a clear stage-gated pathway:
tank → nearshore → offshore grid-connected demonstration,
with predictable timelines, environmental monitoring frameworks, and reduced administrative overhead for trials. This reduces cost and risk for technology developers and makes Ireland a more attractive location for RD&I and inward investment.

3) Whole-of-supply-chain industrial coordination (Denmark model → Irish cross-agency delivery framework)
Rather than fragmented supports, Ireland could implement a cross-agency delivery structure aligned to offshore renewables and hydrogen (Enterprise Ireland, SEAI, IDA, ports, education/training bodies). This should:

- Map supply chain capability and gaps,
- Set clear targets for domestic value capture,
- Coordinate skills programmes and certification readiness,
- Align RD&I supports with deployment milestones.

4) Cluster and hub development linked to infrastructure (Netherlands hydrogen hubs → Irish regional hubs)

- Ireland can build regional "clean energy hubs" around existing assets:
- ports and fabrication capacity,
- gas and electricity infrastructure,
- coastal regions with strong renewable resources.

These hubs should combine: renewable generation + grid solutions + hydrogen production/handling + industrial off-take development, enabling regional growth and lowering system costs.

5) Finance instruments suited to hardware and demonstration
Ireland could expand patient capital and blended finance tools for hardware-intensive green technologies, including:

- milestone-based co-investment,
- demonstration guarantees or risk-sharing instruments,
- support for pilot manufacturing and verification/validation.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can ensure SMEs are well placed to participate in the development and deployment of green energy-system technologies by focusing on market access, capability building, and predictable pathways from RD&I to deployment.

1) Create clear "routes to market" for SMEs
SMEs will invest in capability only when there is visibility of future demand. Ireland should provide clear pipelines of upcoming opportunities (offshore renewables, grid upgrades, hydrogen pilots, storage) and design procurement frameworks that enable SME participation, including packaging work into lots that are accessible to SMEs.

2) Strengthen applied engineering supports for SMEs
Many SMEs need access to high-end capability (CFD/FEA, power electronics, testing, certification readiness) to participate in green technology supply chains. Expanding the Technology Gateway network and targeted programmes that provide rapid access to applied research, prototyping and verification/validation would help SMEs compete and reduce reliance on overseas engineering services.

3) Support stage-gated development and demonstration
Hardware-focused green technologies require prototype build, test, iteration and demonstration in real environments. SMEs need milestone-based supports that bridge the gap between feasibility funding and early deployment (prototype manufacture, instrumentation, test campaigns, field trials).

4) Build clusters and regional ecosystems
Regional clusters linking SMEs with large contractors, ports, research institutions and utilities can accelerate capability transfer and reduce fragmentation. Cluster programmes should focus on offshore renewables, hydrogen integration and grid technologies, aligned with regional strengths and infrastructure.

5) Improve access to finance suited to hardware innovation
SMEs developing or supplying into green technologies often face long timelines and high capex. Blended finance, co-investment mechanisms and risk-sharing instruments targeted at hardware RD&I and demonstration would enable SMEs to scale.

6) Enable skills, standards and certification readiness
Support SMEs with training and advisory programmes focused on energy-system standards and qualification pathways (offshore/marine standards, grid compliance, hydrogen safety, QA systems). This reduces barriers to entry and increases supplier credibility.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Ireland should adopt a structured, data-informed approach to monitoring green technology development and identifying emerging sectors, combining horizon scanning, industry engagement, and performance metrics.

1. Establish a Formal Horizon Scanning Function

A cross-agency working group (Enterprise Ireland, SEAI, Marine Institute, IDA, academia and industry representatives) could be tasked with:

- Monitoring international policy and technology trends
- Tracking deployment data and cost curves
- Assessing emerging technologies with relevance to Ireland's resource base and industrial capability

This function should publish periodic outlook reports identifying technologies approaching commercial viability.

2. Track Key Industrial and Innovation Indicators

Monitoring should go beyond installed capacity and include:

- Number of Irish SMEs participating in renewable supply chains
- RD&I investment levels in targeted technologies
- Demonstration and pilot project activity
- Export activity linked to green technologies
- Patenting and intellectual property trends

This ensures the strategy measures industrial development, not only energy output.

3. Engage Industry Through Structured Consultation Cycles

Regular structured consultation with SMEs, large industry, research institutions and investors can identify:

- Emerging bottlenecks
- Capital constraints
- Technology readiness inflection points
- New industrial opportunities

A predictable 2–3 year review cycle would allow the strategy to evolve without constant policy shifts.

4. Link Monitoring to Test and Demonstration Activity
Test infrastructure and pilot projects provide early signals of technological progress. Monitoring:

- Device reliability data
- Cost reduction trajectories
- Performance benchmarks can inform when technologies are ready for scaled deployment support.

5. Benchmark Internationally
Ireland should benchmark progress against peer countries (e.g., UK, Denmark, Netherlands, Norway) to identify where competitive advantages are emerging and where intervention may be required.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

In developing the new green growth industrial strategy, DETE may wish to consider three overarching principles: long-term certainty, coordination, and value capture.

1. Provide Long-Term Policy Certainty
Green technology investment decisions — particularly in offshore renewables, hydrogen, grid infrastructure, and storage — are capital-intensive and long-term. A stable, clearly signalled policy environment with multi-year visibility is essential to attract both domestic and international investment.
Short policy cycles or frequent structural changes can deter investment in emerging sectors.

2. Prioritise Industrial Value Capture, Not Just Deployment
Renewable deployment alone does not guarantee economic benefit. The strategy should explicitly focus on:

- Domestic supply chain participation
- Technology development and export potential
- Skills and capability building
- SME integration into major projects

Ireland should aim not only to meet climate targets, but to build globally competitive clean technology capability.

3. Align Infrastructure, Innovation and Finance
The energy transition cuts across multiple agencies and policy domains. Coordinated alignment between:

- Renewable deployment planning
- Grid development
- Hydrogen strategy
- RD&I supports

Industrial development funding will be critical. A clear progression pathway from innovation to pilot to deployment would strengthen Ireland's competitiveness.

4. Move Early in Emerging Technologies
Ireland's natural renewable resource extends beyond offshore wind. Emerging technologies such as tidal stream, wave energy, and renewable-to-hydrogen integration offer potential industrial advantages if supported at the right time.
Early, targeted intervention in promising sectors can allow Ireland to develop indigenous expertise rather than relying solely on imported technologies.

5. Ensure Strategy is Adaptive
Given the pace of global clean technology development, the strategy should include a mechanism for periodic review and adjustment, allowing Ireland to respond to emerging opportunities and technological breakthroughs.

EIRGRID

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

No answer provided.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

- Subsea cables. This is relevant to future HVDC offshore grid applications, and interconnection.
- Greater integration of industrial electrification (heat and transport), and enabling regulations to ensure optimal utilisation of this resource to reduce redispatch of renewable energy
- Grid forming technologies

- Virtual inertia. This is an emerging technology that allows variable-speed wind turbines to provide instantaneous responses to grid frequency changes, similar to the physical inertia provided by conventional rotating generators

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
No answer provided.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
EirGrid identifies Grid-Forming (GFM) technology as an essential enabler for operating the power system at progressively higher levels of renewable penetration because it can assume key stability roles traditionally performed by synchronous generators, such as providing inertia, system strength, and voltage and frequency formation. As the power system advances toward much higher System Non-Synchronous Penetration (SNSP), with targets of 95% by 2030, fewer conventional thermal units remain online, reducing the availability of these inherent stabilising services and increasing the need for more capable inverter-based controls. GFM inverters meet this need by acting as autonomous voltage sources that can supply the stabilising functions required to maintain reliable system behaviour as synchronous generation declines. By deploying these capabilities within Power Park Modules—such as wind, solar and battery plants—and within HVDC systems, EirGrid aims to ensure that the power system can operate securely and resiliently with a very high share of inverter-based renewable generation.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
No answer provided.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
The transmission electricity grid is critical for the scaling of renewable energy and green technologies. EirGrid has engaged with the Department of Public Expenditure, Infrastructure, Public Service Reform and Digitalisation on the development of the Accelerating Infrastructure Report and Action Plan. This plan has identified key barriers to delivery of electricity infrastructure and sets out action to resolve those barriers, we would encourage support for delivery of these actions.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Referring to Regulatory Sandboxes in section 6.1.1 of Powering Prosperity – Ireland's Offshore Wind Industrial Strategy: Such arrangements would be very useful for the trialling of new Innovative technologies, and align with the key enabler from EirGrid's Innovation and Research Strategy. In existing Sandbox arrangements as used in other countries the regulator is usually the driving force. As such, having regulatory support for a grid sandbox is vital to its successful operation.

Example of an existing sandbox style framework: The Qualification Trial Process (QTP) is a key activity under the Operations pillar of EirGrid and SONI's Shaping Our Electricity Future Roadmap. The purpose of the QTP is to enable new technologies to prove their system service capabilities prior to their participation in the central procurement process.

For more information, a response to the 2025 Call for Information on Qualification Trial Process can be found here:
https://cms.eirgrid.ie/sites/default/files/publications/Qualification_Trial_Process_Call_for_Information_2025_Industry_Responses_v2.0.pdf

8.Are there existing supports that should be expanded or improved?

Continued support for the development of education and skills in green growth sectors is vital.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

The new industrial strategy should ensure the greater integration of industrial electrification (heat and transport) and enabling regulations to ensure optimal utilisation of this resource to reduce redispatch of renewable energy.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

No answer provided.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

No answer provided.

12.If so, how might similar approaches be adapted to the Irish context?
No answer provided.

SMEs
13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.
No answer provided
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Monitoring
14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?
No answer provided.

Other considerations
15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?
No answer provided.

ESB GROUP

Powering Prosperity
1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.
Powering Prosperity was particularly effective in enabling institutional and collaborative development opportunities, launching supply chain and other funding schemes, progressing and infirming strategic considerations such as demand (i.e. Large Energy Users Action Plan) and the international promotion of Ireland's offshore wind ambition.
While the ambition of the challenge was considerable, Powering Prosperity demonstrated commendable progress by rapidly implementing a series of enabling actions. These initiatives laid a strong foundation for future strategic and tangible outputs, setting Ireland on a promising path towards achieving its offshore wind goals.

In entering the next phase, and the Green Growth Strategy, a holistic energy system wide approach is welcome. We support the strategy's focus on growing the renewable energy sector and incorporating energy generation, supporting systems, and diverse demand uses beyond large consumers. It should focus on the delivery strategic and tangible outputs. It must be developed in tandem with measures to accelerate infrastructure development (e.g., as outlined in the Accelerating Infrastructure Taskforce Report & Action Plan) and a policy and funding

framework for ports. At the same time, it is critical that this broader framing does not dilute focus on offshore wind, which remains the cornerstone of Ireland's decarbonised energy system and the area where Ireland has the strongest natural advantage and scale potential.

It should home in on areas where we have a natural advantage, the mechanisms and infrastructure to support it and developing a supportive environment for industry to develop.

We would recommend that the next iteration focusses on effective actions which will provide outputs such as independent reports and analysis; supply chain mapping and gap analysis; and proposals for credible delivery pathways. We would also recommend that a budget to allow the delivery of the plan is clearly signalled and scoped.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

The role of net zero or green technologies in meeting climate targets and maximising economic opportunities arising from the green transition are arguably distinct objectives. Modelling undertaken for ESB's 2050 pathway report shows that by 2050, Ireland's annual electricity needs will be 2.5 times greater than today. To meet that demand, a massive buildout of renewable power will be required – as much as eight times the capacity we have today. Growth will be driven in the next few years by mature and well-developed technologies such as onshore wind and solar, with offshore wind playing a more significant role into the 2030s.

ESB recently conducted analysis to inform our response to the SEAI Decarbonised Energy System Study. From the outset, it is important to point that ESB's analysis incudes technologies beyond the short list provided with the consultation, some of which are included in the Net Zero Industry Act (NZIA) list of technologies (for example batteries, sustainable alternative fuel technologies) and beyond.

The analysis shows that most of Ireland's decarbonisation pathway is already defined and should focus on scaling proven technologies, while developing a small number of enabling and firm capacity technologies to complete the system.

Priority technologies include:

- Onshore and offshore wind (fixed and floating) as the backbone of renewable electricity generation. Offshore wind has very high scalability potential relative to other options.
- Solar PV (utility scale and rooftop) as the second most important renewable technology in Ireland, with rooftop solar offering particularly strong spatial efficiency.
- Battery storage (Li-ion and emerging chemistries) to support short and medium duration flexibility (up to at least 12 hours).

- Long duration energy storage (LDES) including hydrogen storage in depleted gas reservoirs, iron-air batteries, CO_2 batteries, liquid air and thermal storage, to manage periods of low renewable output ("Dunkelflaute").
- Clean dispatchable generation using hydrogen, ammonia, HVO or other renewable efuels in OCGT/CCGT plant to provide firm capacity and system services without carbon emissions.
- Sector coupling technologies (power to heat, power to molecules) to decarbonise transport, industry and heat while improving overall system efficiency.

To unlock the full potential of clean electricity, we need to accelerate electrification across the heating, transport and industry sectors. ESB's 2050 report shows it will be possible to meet all residential and commercial energy and heating requirements with electricity. As for transportation, all but the heaviest and more niche vehicles can be electrified. Even in industry where very high-temperature processes make the picture more challenging, advances in heat-pump and electric boiler technologies will allow a sizeable percentage of demand to be met with electricity.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
Supply chain resilience and localisation are now critical constraints for green growth. Technologies requiring targeted supply chain development include:

- Offshore wind, particularly ports, vessels, foundations, grid components and O&M capability.
- Battery technologies beyond Li-ion, such as sodium-ion, iron-air and flow batteries, to diversify materials and reduce critical mineral risk.
- Hydrogen and its derivatives, such as ammonia: production systems (including electrolysers), storage infrastructure, transport infrastructure (including pipelines), and turbine technology (including retrofits).
- System services equipment (synchronous condensers, STATCOMs, flywheels) which are proven but under recognised and need domestic delivery capability.

As Ireland is a relatively small player in global supply chains, it is imperative that there is a clear framework for investment in Ireland. Having a long-term investment roadmap in green technologies will help develop future pipelines and align suppliers and partners. The most effective intervention may not be to replicate full manufacturing ecosystems, but to consider where we can successfully operate within the supply chain and then provide clarity, coordination and long-term investment signals for relevant companies to come here.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

No answer provided.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Innovation support should focus on system value, not individual "winners", and be grounded in Irish operational conditions. Ireland's relatively small Net-Zero manufacturing industry in comparison to other Member States (Reference: The net-zero manufacturing industry landscape across the Member States. Annex 2, Country fiches - Publications Office of the EU, Country Fiche for Ireland, Page 109) underpins the importance of collaboration with other Member States.

Priority RD&I energy areas include:

- Whole system modelling and integration, addressing security of supply, deliverability and grid constraints rather than isolated technology scoring.
- Floating offshore wind platform demonstrators that can perform reliably in the aggressive Atlantic conditions off the west coast of Ireland.
- Supply side and demand side flexibility to match the output of variable renewables with electricity demand in the most efficient way.
- Long-duration storage technologies, hydrogen storage, iron air batteries, and thermal energy storage, which are technically feasible but require Irish-specific demonstration.
- Hydrogen and e-fuel value chains, including production, storage and conversion back to electricity or use in industry.

Key barriers Government can address include:

- Lack of high-quality Irish cost data and reliance on generic international assumptions. The NZIA requires Member States to collect data, every 3 years, across several indicators including obstacles to intra-EU trade in net-zero technologies, often driven by global supply chain disruptions, and ongoing developments in market trends and prices, including auction data relevant to regulatory requirements. (Article 42)
- Regulatory immaturity bias against emerging technologies that will only deploy at scale post 2040. The existing regimes for renewable energy supports are designed to deploy mature technologies. The funding and policy landscape is not set up to support net zero technologies.

- Insufficient focus on ability to scale and deliver, rather than academic scoring frameworks. There is limited opportunity to allow for pre-commercial innovative technologies to be trialled.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

To enable the deployment of green technologies into the 2030's beyond those already being delivered, Government should clearly provide an evidence-base of the system requirement for such technologies, as well as routes to market. Deployment support should prioritise technologies that provide firm capacity and system resilience in a renewables led system.

Offshore wind: An enduring and future-focussed offshore wind framework is critical to deployment of a large-scale offshore wind industry. Offshore wind has long been understood to be the driver of a low carbon energy system in Ireland. To continue to develop the pipeline and bring projects to reality, clarity on the volumes, timelines and market mechanisms is required into the future.

Storage: Deployment of energy storage technologies requires consistent market signals and policy. It is important that the 2024 Energy Storage Policy Framework are implemented. Action 6 (Distribution and Transmission procurement) is progressing. Discreet milestones should be agreed with industry for the delivery of the remaining actions between now and 2028.

Electrification of industrial heat: Electrification will feature prominently as temperatures achievable with heat pumps exceed 200°C and technologies such as electric boilers are further deployed. The recent EU wide pilot auction for industrial process heat decarbonisation demonstrates how electrified industrial heat is now a priority at EU level and presents a model Ireland should align with.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

From a technology perspective, regulatory and planning constraints are a barrier particularly when today's frameworks are applied to 2040–2050 technologies. In addition, there are enabling infrastructure limitations, including transmission, ports, hydrogen transportation and storage infrastructure. There are skills and delivery risk, especially for complex, 'first of a kind' project requiring long development timelines.

Planning and consenting: There are several barriers to delivering onshore generation projects, including planning and consenting. This has been recognised by government and several actions contained within the Accelerating Infrastructure Report and Action Plan should alleviate some of this friction. Connection policy, particularly in relation to hybrid connections remains a barrier to efficient use of existing grid capacity. Retaining renewable generation at

existing viable sites is critical. Securing a route to market for repowering projects remains challenging. Delivering a workable solution for repowering as part of RESS 6 would be a very useful step forward.

Offshore wind: Offshore wind faces barriers to deployment while we welcome the development of a National DMAP which will signpost offshore locations for this pipeline, we are concerned that the policy required to enable critical supporting infrastructure (ports, grid) and route to markets (auctions, energy parks, private wires) is still lagging.

Route to Market: CPPAs have been called out as an enabler to couple renewables with industrial growth. Government policy to develop this CPPA market could accelerate green renewables deployment. A clear and enduring route to market for storage technology is required, noting how batteries can provide solutions across several markets.

Skills: From a skills perspective, whilst many disciplines will be required to propel Ireland's green growth, having sufficient electronic and electrical engineering graduates remains a point of concern. Despite strong and growing labour market demand, enrolments in electronic and electrical engineering in Ireland have not increased proportionately and have lost share to software and computing programmes. Addressing this mismatch is critical to sustaining growth in key sectors to support the green economy. To deliver Ireland's industrial policy objectives in areas such as semiconductors, electrification, advanced manufacturing and digital infrastructure, electrical and electronic engineering must be treated as a strategic enabling capability. Aggregate engineering measures are insufficient to address discipline specific shortages in these high substitution barrier fields. Targeted interventions spanning higher education capacity, student incentives, curriculum alignment and industry partnership are therefore required to ensure that skills supply keeps pace with industrial ambition.

The Net Zero Industry Academies, created under the NZIA, are designed specifically to tackle skill shortages that limit industrial growth in net zero technologies. They offer targeted solutions in fields like electrical and electronic engineering and help align Ireland's skills training with its goals for energy, electrification, and advanced manufacturing. Through industry driven, specialised training, these academies address severe bottlenecks that broad STEM approaches can't fix. Using this framework would speed up industrial expansion, lessen Ireland's reliance on international recruitment, and bolster progress toward net-zero targets and greater competitiveness.

8.Are there existing supports that should be expanded or improved?

In the first instance it should be noted that successful renewable support schemes have helped Ireland to grow a substantial base of renewable generation. One reason for this success is the investment clarity that these schemes deliver.

While alignment with NZIA requirements is important and a legal requirement, the incorporation of non price criteria should be carefully designed and consulted on to avoid undermining deliverability or increasing the cost of renewable projects.

Government should explore new avenues of incentivising investment in green industry in green technologies, for example innovative tax incentives as used in the United States. While Ireland supports net zero technologies primarily through grants, accelerated capital allowances, and R&D tax credits, it does not yet offer a dedicated clean technology investment tax credit. The EU's Clean Industrial State Aid Framework (CISAF) explicitly enables Member States to deploy tax incentives to accelerate clean tech manufacturing, deployment, and industrial decarbonisation. Ireland should examine the associated benefits of introducing such a measure.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

The decarbonisation of the demand sector is a naturally aligned with the deployment of renewable energy sources and sector coupling should be encouraged and promoted. The ongoing decarbonisation of heat and transport through electrification relies on expanding Ireland's renewable generation. As these sectors continue to electrify, so too does the need for additional renewables.

Large Energy Users, including data centres have driven growth in electricity demand in recent years and this is expected to continue in the 2030's. The CRU's large energy user connection decision explicitly links the Data Centre Sector with provision of renewables generation. The recent Large Energy User Action Plan (LEAP) signals a move towards a plan-led co-location of demand and supply clusters.

The ports sector is a critical enabler for offshore wind. Government should ensure that the forthcoming National Ports Policy update includes commitments to fund port infrastructure and prioritises a framework for timely planning and consenting of necessary ports enhancements.

To identify aligned sectors, there needs to be clarity on which economic sectors the strategy is seeking to target and grow. This should be informed by an integrated energy masterplan that considers factors such as Large Energy User (LEU) growth, location and timing. In doing so, initial focus should be placed on sectors where Ireland has a clear competitive advantage, supported by an established skills base and mature supply chains.

In looking at aligned sectors, we should focus initially in areas where we have a competitive advantage and where we have well-established mature skills base and supply chains.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Companies that have high heat requirements (e.g. food processing, cement, chemicals, agriculture) are all complementary sectors as are other heat demands such as district heating, swimming pools. Coupling renewable energy sector with the transport sector is another area of opportunity so companies involved with commercial fleet management and heavy haulage are also potential candidates.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

The practice of clearly setting out an industrial strategy, by establishing a vision and choosing important policy actions to support it, has proved effective, for countries with heavy industries as well as those who are less industrialised.

France is utilising decarbonisation as a tool for reindustrialisation and jobs, not just emissions reduction.

- Strategy: Large, targeted public investment to build green industrial champions and creating an explicit link between decarbonisation, jobs and sovereignty
- Mechanisms: dedicated funding of up to 50% for decarbonisation projects as well as emerging green industries (batteries, hydrogen, heat pumps, low carbon aviation), and green taxation schemes for priority sectors. Fast tracked permitting and "ready to use" industrial sites.

Germany is preserving the industrial base while shifting it onto a net zero pathway.

- Strategy: Protect and transform energy intensive industry (steel, chemicals, mobility) and use hydrogen where electrification is not viable
- Mechanisms: They have deployed multi- billion-euro support to transform the energy system (hydrogen infrastructure, electrolysers) and funding for industrial pilots. Explicit electricity price subsidies for energy intensive industries, having moved away from the model of the EEG surcharge for domestic electricity consumers in 2022.

Denmark's approach is abundant clean power will lower costs and increase competitiveness, and ultimately exports.

- Strategy: Develop huge volumes of renewables and harness electrification to unlock growth.
- Mechanisms: Massive offshore wind build-out (with state support where needed), long-standing carbon taxes, with strong electrification, district heating and biomethane policies.

Sweden uses price signals to drive behaviour, and public capital to de-risk transition.

- Strategy: High, predictable carbon prices and government shares risk in first-of-a-kind project.
- Mechanisms: Long standing carbon taxes, public co-investment in green steel, batteries, clean fuels and strong skills and innovation ecosystems.

12. If so, how might similar approaches be adapted to the Irish context?

Having a clearly defined industrial strategy, coupled with dedicated mechanisms to execute this vision, in line with Ireland's natural advantages (i.e. offshore wind) and EU mandated obligations is essential. The international examples above demonstrate that regardless of the concentration of heavy industry, or net zero technologies, a clear purpose and dedicated instruments to deliver this vision is essential.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can ensure that SMEs are well placed to participate in the development and deployment of green technologies by undertaking a structured supply chain mapping and gap analysis that clearly identifies where SMEs can add value across the energy system. This should focus on areas where Ireland already has demonstrated strengths, including data and digital services, power system analytics, financial and commercial services, high tech engineering, systems integration, project development and operations.

There are already strong examples of Irish SMEs operating in these areas, such as companies providing grid modelling, digital asset management, offshore survey services, engineering design, project finance, and operations support for renewables and energy infrastructure. Clustering these capabilities—through regional hubs linked to ports, energy parks, data centres and/or research institutions—can help SMEs scale and integrate into the energy sectors such as offshore wind, energy storage, hydrogen and system services value chains. Data clusters in Dublin and engineering and manufacturing clusters in Cork and Shannon Estuary provide a foundation that can be built upon.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

The Net Zero Industry Act (NZIA) has introduced measures at the EU level to monitoring at how net-zero technologies are developing across Member States, with a strong focus on manufacturing and supply chains, not just deployment. (Article 42, Regulation - EU - 2024/1735 - EN - EUR-Lex). To support this reporting, the NZIA places explicit reporting obligations on Member States, requiring data on net zero technology reporting within the territory, planned and

operational strategic projects, permitting timelines and other measures.

As reporting in the country fiche for Ireland, this provides an important basis for demonstrating credible manufacturing, services or value-chain capability. From a national perspective, this must underpin and inform the vision for Ireland's industrial policy.

(Reference: The net-zero manufacturing industry landscape across the Member States. Annex 2, Country fiches - Publications Office of the EU, Country Fiche for Ireland, Page 109)

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Net Zero Energy System Master Plan: A comprehensive Net Zero Energy System Master Plan is crucial for achieving Ireland's climate objectives, ensuring energy security, and supporting competitiveness. The National Economic & Social Council's recent report advocates for an integrated energy policy that encompasses electricity, heating, and transport. This approach emphasises robust spatial planning, prioritised grid connections, and enhanced resilience for households and SMEs, demonstrating the necessity of adopting a whole-system perspective rather than limiting efforts to the power sector alone. Current studies, such as the DESS study, have the potential to serve as foundational analyses for a master plan covering all sectors. This will be a key enabler of a Green Growth Strategy and should work in lockstep with Action 2 of the Large Energy Users Action Plan.

Site and location suitability: Location of projects, and the capability of the grid to support the location of certain strategic projects, must be considered. The spatial planning of generation and demand will constitute a key component of this Strategy. From inception, and in line with the LEAP and its outputs, it should be firmly anchored in the technological, social, economic, and infrastructural attributes of existing and prospective locations.

Clarity on roles and responsibilities across departments and agencies: As demonstrated in LEAP

It is crucial for Government to clearly define the responsibilities of various industry players, including Departments, Agencies, RAs, and System Operators. Government policy should establish a clear hierarchy for national objectives and interacting policies to clarify investment signals.

FLOTATION ENERGY LTD.

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Flotation Energy is a global offshore wind developer, specialising in pioneering floating projects in deeper waters. We are an Edinburgh-based and are part of the Japanese TEPCO Group. We focus on large-scale, deep-water renewable energy projects, notably our founders having developed the Kincardine project, one of the world's largest floating wind farms.

The targets outlined in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were beneficial in keeping the Government and industry on track. There will always be unexpected challenges, as well as recognised ones, and clear targets provide a roadmap and reassurance for developers.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Floating offshore wind:

Ireland aims to become a global leader in offshore wind, with targets of 5GW by 2030, 20GW by 2040, and 37GW by 2050, heavily relying on floating offshore wind to reach targets. While early targets focus on fixed-bottom which has access to circa 18,000km^2 developable sea around the Irish coast, floating wind is essential for long-term goals and has the potential to deliver projects across 65,000km^2 of Ireland's EEZ. The requirement for floating wind is also stated in the Powering Prosperity and SEAI Technology Roadmap. Ireland needs to progress floating offshore wind alongside fixed projects.

The global reach of expertise in floating offshore wind will be advantageous for Ireland. Approximately 80% of the world's offshore wind resource potential lies in waters deeper than 60 metres. This will mean many gigawatts of new floating offshore wind projects in the years ahead, most notably in regions where fixed foundation windfarms are not compatible.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Floating offshore wind:

Floating offshore wind has a lower degree of commercial readiness than fixed offshore wind, but efforts to deploy the technology at scale are gathering pace globally. With existing experience in developing floating wind in UK waters recognise the contribution to industry evolution from demonstration projects. A deliverable floating demonstrator of sufficient size

will allow Irish supply chain companies gain experience and provide a real-life gap analysis of supply chain in Ireland.

It is important to have clear objectives for these projects and to determine the relevant parameters such as technology, innovation drivers or supply chain enabling.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

n/a

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Floating offshore wind has passed the 'test and demonstrator' stage, however it is not yet at industrial scale. This allows an opportunity for Ireland but it also highlights the need for additional support.

Ireland needs floating wind demonstrators of sufficient scale to progress the industry. As mentioned to achieve government policy targets, Ireland needs FLOW.

Additional support to deliver a floating wind demonstrators includes;

1. Deliver a competitive MAC auction for two scalable FLOW demonstrators (initially, 200MW each, expandable to commercial scale project) in Q1 2028. To achieve this, work must commence on designing the auction process in 2026, to ensure Ireland is auction-ready when the N-DMAP process concludes in Q4 2027.

2. Commission a technical study to deliver recommendations on the optimum support systems for floating Demonstrators, facilitating a dedicated pot for FLOW.

3. The SEAI working group on FLOW to report to the Taoiseach's Clearing House.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?.

1. Route to market. The route to market for floating offshore wind will transition from demonstration projects to structured commercial frameworks involving government-backed auctions, corporate agreements, and alternative offtakes.

2. Joined up thinking with large scale energy users. The industry and renewable ambitions need to have synergy in terms of large-scale end users (i.e. close collaboration with EirGrid, CRU,

DETE, DCEE for further development of Green Energy Parks and regional generation to support regional demand).

3. Road map needed for certainty for direct investment. The roadmap for floating offshore wind from demonstration projects to a fully commercialized industry. The Government and industry bodies need an established phased approach to de-risk supply chains and integrate these projects into national energy grids.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Regular auctions and government investment:
Looking towards the success of Ireland's neighbours, we can see that Scotland is a global leader in delivering floating offshore wind. Scotland has this success because of the support provided by the government to deliver the next generation of offshore renewables. Small projects like Hywind Scotland and Kincardine have been in operation since 2021, and we can see that the Scottish and UK governments are still supporting this industry to grow by awarding Contracts for Difference (CfD) in January 2026 of a 100MW project in Scotland (known as Pentland Floating Offshore Windfarm) and the 100MW project in the Celtic Sea known as Erebus. Further to this, GB Energy invested in the Pentland project, which demonstrates the government's continued support of the industry.

With projects existing, and projects approved for consent and subsidy, the UK and Scottish governments are also supporting the supply chain to deliver these projects, they are encouraging new technologies, bespoke to floating offshore wind to continue to develop, obtain investment and demonstrate their capabilities on these smaller scale projects that will then grow to commercial scale opportunities.

8. Are there existing supports that should be expanded or improved?

n/a

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

n/a

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

n/a

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Scottish experience:

Flotation Energy is based in Scotland and has seen at first hand the benefits from policy in attracting FDI and generating jobs. Scotland has established itself as a global leader in floating offshore wind through ambitious, policy-driven initiatives, aiming for up to 40GW of offshore wind capacity by 2040. Key support mechanisms include the ScotWind leasing round, which specifically enabled large scale floating projects, targeted port infrastructure investment and a comprehensive Offshore Wind Policy Statement that streamlines planning and regulatory processes. Further to this, Scotland also introduced the INTOG (Innovation – Targeted Oil & Gas) round, which identified demonstration sites to showcase innovative technology but also be the enabling projects for commercial scale projects to follow.

12. If so, how might similar approaches be adapted to the Irish context?

Key policy support actions from Scotland that could be applied to Ireland include;

1. Marine planning: The Sectoral Marine Plan for Offshore Wind plan identified specific, deep-water locations for commercial-scale floating wind deployment

2. Leasing rounds: A landmark leasing round, ScotWind, primarily driven by the Scottish government, specifically attracted developers for floating technologies, contributing to a sustainable pipeline of projects

3. Financial & Strategic Backing: The Scottish National Investment Bank, alongside UK partners, has backed key floating projects like the Pentland Floating Offshore Wind Farm

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Supply chain demonstration for floating wind:

Ireland is currently producing world class technology SME's (LRD's, Micropiles etc) that can support the next generation of offshore renewables. However, these Irish based companies will have to go abroad to prove their technologies as there are currently no sites or projects identified for them to design around or engage with developers on. If Ireland starts the process, like Scotland has with UK T&D Leasing Opportunity, Scotwind and INTOG, then the SME's would have an opportunity to deliver their technologies on Irish projects.

We recommend that Ireland supports the concept of FLOW Demonstrators, specifically Supply Chain FLOW Demonstrators. Projects that deliverable in the near term, have the ability to move faster through the consenting process and can work with technology SME's to prove their

technology on a pre-commercial scale project will ensure SME's are well placed to participate in the development and deployment of green technologies around Ireland and into foreign markets worldwide.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Clear targets and roadmap are essential. There will always be unexpected challenges as well as recognised ones and clear targets provide a roadmap and reassurance for developers progressing large scale infrastructure through consenting systems.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

To achieve synergy between floating offshore wind (FLOW) and large-scale end users, policy in renewable energy and industry growth need to continue to align in its approach. Strategy alignments are needed regarding renewable generation with specific industrial demands to solve the dual challenges of grid and financial certainty.

FuturEnergy Ireland

FuturEnergy Ireland is a renewable energy developer, that is a joint venture company owned on a 50:50 basis by Coillte and ESB. Our mission is to maximise the potential of our national resources and accelerate Ireland's transformation to a low carbon energy economy. Our ambition is to develop 1GW of renewable energy capacity by 2030 and make a significant contribution to Ireland's commitment of achieving 80% of electricity from renewable sources by the end of the decade. In addition to our renewable generation projects, we are actively developing long duration energy storage solutions to further enhance grid flexibility and support the integration of renewables across Ireland.

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

We have provided input to the Wind Energy Ireland response and we endorse their response.

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Onshore wind

Ireland has established green technology priorities aligned with both national and EU climate targets, aiming to foster economic growth. The new strategy should emphasise technologies that offer robust policy certainty and immediate benefits in decarbonising Ireland's energy production, storage, distribution and consumption.

Onshore wind must feature prominently among these priorities, given its clear near-term potential for Ireland. Onshore wind offers an immediate and substantial opportunity to increase renewable energy output to meet decarbonisation targets and support sustainable economic growth. Its implementation yields significant economic benefits, including local job creation in construction, operations and maintenance and supports rural development. Utilising domestic wind resources enhances Ireland's energy security by reducing reliance on imported fossil fuels and contributing to a stable power supply. Ongoing investment in onshore wind also drives supply chain expansion and innovation, generating positive spill-over effects for other green technologies and associated sectors across the economy.

Consideration of Large Energy Users (LEUs) is essential, not only regarding offshore wind but particularly in regions of Ireland experiencing major network constraints. Ireland can distinguish itself as an attractive option for co-location with onshore renewables with demand, appealing to energy intensive users. Without such measures, some wind farms may remain unconstructed, or their generated energy might not be exported due to grid constraints. Strategically located demand can help increase penetration of renewable energy and provide regional opportunities outside the greater Dublin area for investment and job creation.

Storage Technologies

Long Duration Energy Storage (LDES) technologies, particularly those capable of multiday storage, can play a pivotal role in supporting Ireland's transition to a zerocarbon energy system. Multi-day storage is ideal technology for Ireland as it can absorb renewable surpluses and reduce the volume of dispatch down, supply multi-day deficits, cut fossil use by displacing fossil fuel peaking generation, enhance grid security and deliver economic and emissions benefits that short-duration batteries simply cannot.

Economically, investment in advanced LDES solutions unlocks substantial opportunities including driving job creation across development, construction, and operation, while also stimulating innovation and growth within Ireland's energy supply chain. Multiday storage can also play a role for Large Energy Users (LEUs) to meet their demand with green electricity. Enabling the use of Guarantees of Origin (GoO) with multiday storage enables capture of otherwise lost renewable energy to be time shifted to meet a demand profile of an LEU. These storage GoOs can be used to increase the percentage of demand met on the Irish grid met with renewable electricity. This would require appropriate GoO accounting using time-stamped

certificates through the use of hourly matching. Further details and the benefits of hourly matching can be found at Homepage - EnergyTag (https://energytag.org/).

Grid Technologies
The development of new grid infrastructure is critical for accommodating the rapid expansion of renewable energy sources, ensuring the stability and reliability of Ireland's electricity supply. Building out the grid must go together with the integration of advanced smart grid technologies, including real-time monitoring, demand response systems, dynamic line rating (DLR) and power flow controllers. These innovations enable more efficient and flexible management of distributed energy resources, supporting the seamless connection of new renewable projects, especially in rural and remote regions, while maximising local economic gains.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support?
Long Duration Energy Storage (LDES) stands out as needing additional support in terms of supply chain development. While Ireland has made progress in planning and permissions for novel storage technologies, there is a gap in the downstream commercialisation of the supply chain when these projects come to realisation. This includes the processes and infrastructure required to bring these innovative storage solutions to market including construction, integration into the grid and scaling up operations. This also includes skilled individuals to support LDES projects across stages from inception through to operation. Addressing these downstream challenges is essential to unlock the full potential of LDES.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and incompany RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
Establishing a dedicated framework or forum that actively involves industry stakeholders is crucial for accelerating research and development (R&D) within Ireland's energy sector. By fostering close collaboration between industry leaders, innovators and policymakers, such a platform could enable the sharing of best practices, technical expertise and market insights, ultimately driving the deployment of cutting-edge solutions. Industry-led initiatives can help identify practical challenges and emerging opportunities ensuring that R&D efforts are closely aligned with real-world needs. This approach also encourages investment in innovation, supports skills development and helps bridge the gap between research and commercialisation.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
Long Duration Energy Storage (LDES) technologies currently face significant challenges due to the lack of a clear and reliable route to market. This uncertainty hampers the commercialisation

and large-scale deployment of these novel solutions, despite their critical role in supporting Ireland's transition to a zero-carbon energy system. There is an urgent need for the implementation of the actions outlined in the Electricity Storage Policy Framework, which would provide the regulatory clarity and support mechanisms required to unlock investment and accelerate deployment.

Advancing the opportunity for hourly matching and leveraging LDES for time-shifting renewable energy will be essential in enabling pathways towards 24/7 carbon-free electricity and supporting decarbonisation pathways for LEUs. By capturing and storing surplus renewable generation for use during periods of low supply, LDES can facilitate continuous decarbonised power, thereby maximising the value of renewable assets and supporting Ireland's climate ambitions. Without targeted support to address these deployment barriers, the full potential of LDES to deliver economic, energy security and environmental benefits will remain unrealised. We have also provided input to the Wind Energy Ireland response and we endorse their response.

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The Departments Accelerating Infrastructure Report and Action plan outlines the key barriers and plan to tackle these barriers. While the report focused on water, energy and transport infrastructure, there are parallels with renewable energy and green technologies.

Planning and consenting processes in Ireland can cause significant delays for renewable and green infrastructure projects. Delays can result from lengthy decision-making timelines from local authorities and An Coimisiún Pleanála, as well as potential judicial reviews after approvals. Evolving policy frameworks such as transposition of European policy and directives into national policy also contribute to uncertainties, particularly during the transitional period to a new process. These factors lead to unpredictable timelines, increasing financial risk and discouraging investment. While rigorous planning is essential, unpredictability in timelines increases financing risk and can deter investment.

Grid constraints are a the primary structural obstacle to expanding renewables and green technologies. There is a need to reinforce and deliver new grid infrastructure to increase capacity for renewable generation and demand. In particular, grid in the North and Northwest needs grid reinforcement to realise renewable generation and support economic growth in the region. The network here suffers significant levels of lost energy (dispatch down) relative to the national value. In 2025 the overall lost energy in Ireland was 10.4% while in the northwest the figure is almost double the national at 19.6% driven mainly by grid constraints i.e. lack of grid capacity.

Broadly, to meet Ireland's climate targets and energy independence goals, the State and its agencies must have adequate capacity and resources, ensuring a coordinated approach among all relevant departments.

Focusing on LDES, there are additional barriers that prevent these technologies from scaling in Ireland, which are network charges, route to market and scheduling and dispatch.

Today storage assets pay Demand Transmission Use of System (DTUoS) charges, this creates a significant barrier to investment particularly as durations increase. Analysis carried out for Energy Storage Ireland by ECA estimates that changes to the network charges approach can increase the utilisation of storage by 30% on average[3].

We believe that in an efficient market the system value provided by LDES should be remunerated to send appropriate investment signals. Currently the DTUoS charges levied on storage blocks investment in LDES technologies, particularly multi day storage technologies. This is preventing investment in technologies that would serve to reduce Use of System (UoS) costs for all other customers on the system and enable better utilisation of the network. FuturEnergy Ireland acknowledges that determining an appropriate level of UoS remuneration for storage is complex and developing an efficient network charging system would take time. As such it is prudent to consider interim measures that could address this issue in a simple way in the very near term. Two potential options are that storage should be exempt from UoS charges or that storage should pay Generator TUoS charges rather than DTUoS.

The Electricity Storage Policy Framework outlines several actions to support the role of storage in the Irish system. It is essential that these actions are fully implemented and delivered in the timelines provided in the framework. In particular, Action 10 which seeks to ensure a route to market for LDES requirement for 2030-2040. A roadmap for how this procurement will be implemented would increase investor confidence for the scaling of LDES in Ireland.
Finally, there is a need for improved scheduling and dispatch of storage in the Irish electricity market. While recent updates to the scheduling and dispatch of storage including negative physical notifications and improved access to the energy markets by EirGrid are welcome, storage is still not being dispatched optimally. With longer durations, particularly multi-day storage, ongoing improvements to EirGrid's tools and systems are crucial to maximise the benefits that storage offers.

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland?
Timely, targeted Government supports and incentives are essential to de-risk commercial projects and encourage investment in renewable energy and green technologies. Financial incentives that increase revenue certainty, such as indexation in auctions and reforms to network charges, can help unlock private finance. In addition, prioritising investment in critical enablers like grid expansion and demand growth opportunities is vital to accelerate deployment and create local jobs. Implementation of actions in the LEAP strategy and the inclusion of the renewable energy industry as part the 'Sectors of the Future' council can ensure that government are aware of any specific interventions that can support development and

[3] Network charges for energy storage

deployment of green technologies. For storage, as outlined in the response to question 6, full and timely implementation of the Electricity Storage Policy Framework is essential to provide certainty for the route to for storage technologies. The implementation of Policy Action 2 to create a sandbox project to advance both System Operators' technological knowledge of emerging electricity storage technologies is a key would greatly support the development and deployment of LDES. The 100-hour Iron Air Ballynahone Storage project in Donegal is an example project that could be used as a sandbox project.

8.Are there existing supports that should be expanded or improved?

To effectively support the development of green technologies, a phased funding model could be used. Initially, capital grants could be provided for pilot projects to minimise administrative overheads and facilitate project initiation. Subsequently, a competitive process such as an auction may be introduced. Insights gained from the implementation of Phase 1 can be used to inform the design of a suitable auction for Phase 2, ensuring the funding mechanism is appropriately tailored to the technology's requirements.

While there is European funding avenues available, such as the EU Innovation Fund, to support green technologies, Ireland has had limited success to date with only a single project funded through the Innovation Fund. A national approach as described above could be used if a project has been unsuccessful at European level with specific criteria needed to meet the national funding requirements.

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

We have provided input to the Wind Energy Ireland response and we endorse their response.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

We have provided input to the Wind Energy Ireland response and we endorse their response.

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

The Danish Government have identified 11 industrial parks in Denmark where the area already has, or will build, the required infrastructure for the park [4]. The necessary infrastructure includes water, electricity, generation and transport. The parks are targeted at different manufacturing industries based on the regions the park is to be established. The designated municipality supports the development of the industrial park.

[4] Industrial Parks | Ministry of Industry, Business and Financial Affairs

The Danish industrial park policy is exemplified by the Kasso Industrial Park in the Aabenraa Municipality. It hosts the world's first large-scale commercial e-methanol facility[5]. It is adjacent to a 304 MW solar farm and substantial grid infrastructure. This was realised through a strong strategy that had unanimous council support and political prioritisation, a fast permitting process, active citizen engagement and using green growth as a business strategy for the region. All of which is underpinned by clear national policy and implementation plans.

12. If so, how might similar approaches be adapted to the Irish context?

The key elements that can be seen in the Danish example given in question 11 that can be adapted for the Irish context are listed below: Strategic national policy that has green growth as a business strategy

- Clear translation of this national policy into regional policy and roadmap
- Unilateral political support at national and local level Predictable, transparent and efficient consenting processes

It should be acknowledged that Offaly County Council has demonstrated that industrial development policy can be aligned with climate policy. They took a proactive approach based on national climate policy to support green transition in the county.

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

We have provided input to the Wind Energy Ireland response and we endorse their response.

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

A detailed plan should accompany this Strategy, explaining how it will align with wider energy and climate policies, particularly the LEAP Action Plan, the CRUs LEU connection policy decision, the upcoming DETE Enterprise 2035 Plan, and legislation of the Private Wires Bill. There is also a need for clear political messaging about the role of LEUs and technology in shaping tax revenue, creating budget surpluses and affecting public services. Unified political

[5] Kassø e-methanol facility officially inaugurated - European Energy

support for green technologies is essential to promote sustainable economic growth, energy security and decarbonisation.

We would like to thank the Department for the opportunity to response to this consultation on the proposed Green Growth Strategy and we would be happy to engage with you on any elements of our response.

GAS NETWORKS IRELAND

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The proposed strategy rightly emphasises the critical role of offshore wind generation. The scale of deployment envisioned in the Climate Action Plan presents a transformative opportunity for Ireland. Realising this potential depends on the development of complementary infrastructure, robust policy and market frameworks, and mechanisms to efficiently utilise renewable electricity during varying system demand. Coordinated planning will be vital to integrating offshore wind resources into Ireland's energy system, supporting both domestic needs and future export opportunities.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Achieving Ireland's climate targets requires an integrated, whole of energy system approach, encompassing generation, networks, storage, and end use demand. This approach is essential to maintain security of supply, system resilience, and affordability for consumers. Strategic planning across all energy vectors will ensure that infrastructure investments are efficient, future proofed, and deliver maximum value to the economy.

GNI welcomes the inclusion of green hydrogen and its derivatives within the Green Growth Strategy. Green hydrogen, as highlighted in the Climate Action Plan and National Hydrogen Strategy, will play a pivotal role in enabling system integration, supporting enterprise development, and advancing decarbonisation.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

See response to Question 2.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

A technology neutral, system wide perspective is essential to foster innovation and ensure Ireland is well placed to capture industrial, economic, and employment opportunities associated with a low carbon energy system. The Green Growth Strategy should encourage diverse solutions and facilitate the integration of emerging technologies.

Clear, consistent, and adaptive regulatory frameworks are needed to facilitate infrastructure development, accelerate project timelines, and provide certainty for investors.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Green hydrogen will play a pivotal role in enabling system integration, including reducing renewable electricity curtailment by providing flexible, non-power demand and enabling long duration, large scale energy storage to enhance system flexibility, resilience, and supply security.

Ireland's existing gas infrastructure represents a valuable asset within an integrated energy system. Repurposing and adapting this infrastructure, where feasible, offers a cost-efficient solution for the transport and storage of renewable and low carbon gases, including green hydrogen. Leveraging existing assets reduces capital and operational expenditure, accelerates deployment timelines, and enhances investment certainty.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The transition to a green economy will require investment in workforce skills and training to support new technologies and industries. Collaboration between government, industry, and educational institutions will be essential to build a skilled workforce capable of delivering on Ireland's climate ambitions.

Clear, consistent, and adaptive regulatory frameworks are needed to facilitate infrastructure development, accelerate project timelines, and provide certainty for investors. Streamlining permitting and approval processes can help unlock investment and support timely delivery of strategic projects.

Active engagement with communities and stakeholders is vital to ensure public support for renewable energy projects and infrastructure adaptation.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Effective coordination across sectors, including electricity, gas, transport, industry, and agriculture, will maximise synergies, optimise resource use, and enable holistic solutions to decarbonisation challenges.

8. Are there existing supports that should be expanded or improved?

See response to Question 6.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Effective coordination across sectors, including electricity, gas, transport, industry, and agriculture, will maximise synergies, optimise resource use, and enable holistic solutions to decarbonisation challenges.

Aviation is integral to Ireland's economy and international connectivity. The development of sustainable aviation fuels, including electro fuels produced from green hydrogen and captured CO_2, presents a significant opportunity to reduce emissions while maintaining competitiveness.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Strategic inclusion of aviation decarbonisation pathways in the Green Growth Strategy can anchor demand for renewable electricity and hydrogen, foster new industrial value chains, and ensure Ireland is positioned to capture economic and employment benefits from the transition.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

See response to Question 1.

12.If so, how might similar approaches be adapted to the Irish context?

Applying coordinated planning, complementary infrastructure development, and robust policy and market frameworks across emerging green technologies will support both domestic needs and future export opportunities.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

A technology neutral, system wide perspective is essential to foster innovation and ensure Ireland is well placed to capture industrial, economic, and employment opportunities associated with a low carbon energy system.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Strategic planning across all energy vectors will ensure that infrastructure investments are efficient, future proofed, and deliver maximum value to the economy, while maintaining system resilience and security of supply.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Gas Networks Ireland is committed to ongoing engagement with the Department of Enterprise, Trade and Employment and all stakeholders as the Green Growth Strategy is developed and implemented. GNI stands ready to support the delivery of Ireland's climate objectives through collaborative action, innovation, and strategic investment in integrated energy solutions.

IADT

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The Dublin Array project offers the best long term energy generation for Ireland. This could be replicated in multiple locations around the coast. Coupled with its off shore marine rejuvenations areas and investment in local communities, Ireland could become a world leader in offshore energy production.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Wind energy, solar, nuclear

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
Address the over onerous planning process, where small SIGs have disproportionate influence over the public good. We require this today.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
Offshore wind energy coupled with fish farming and marine rejuvenation schemes require massive government support.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
Environmental impact of offshore windfarms on marine eco systems

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
Main barriers are planning permission process and government investment

Government Supports
7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?
Green Growth must be coupled with Degrowth focusing investment in specific areas of public reeds - Public Transport, Housing and Health. This will require tax increases on both corporate and private citizens.

8.Are there existing supports that should be expanded or improved?
No answer provided.

Aligned Sectors
9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?
High speed rail infrastructure, Public Transport, Housing, Health,

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

No answer provided.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Public Transport - Brussels, Luxemburg, Valencia - Spain
Regenerative agriculture and rewilding to encourage biodiversity implementing the recommendations from the Irish Citizens Assembly,

12.If so, how might similar approaches be adapted to the Irish context?

Expand programmes like the "Living Streets" in Dun Laoghaire

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

This is looking at the problem from the wrong end of the telescope, the focus should not be Growth, but in focusing on investing in companies that would help us reduce the size of our economy by reducing our consumption rates. The right to repair and shift to granting agency on what we produce is key.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Degrowth policies where government have agency on what and how much is produced, minimising investment in energy intensive industries

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Following the recommendations of the UN, we need to report on the wellbeing of society, not through Green Growth linked to GDP, but to a fundamentally different metric

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11 March 2026

Re: Green Growth Public Consultation - March 2026
Dear Sir/Madam,
Ibec welcomes the opportunity to present its views on the proposals for a new Green Growth Strategy. Ibec is Ireland's largest business group and represents firms in nearly every sector of the Irish economy. Ibec and our members are committed to playing an active and constructive role in Ireland's transition to a competitive netzero economy.

Overview
Ireland's transition to a net zero energy system presents an immense opportunity to build a more resilient and competitive economy. But it is also an opportunity to build a thriving and dynamic green economy. Offshore renewable energy and electrification will be at the heart of Ireland's transition and this economic opportunity. However, Ireland' climate targets cannot be met through offshore wind and electrification alone. Ireland will require a mix of energy technologies and climate solutions, and this creates an opportunity to develop a diverse green economy that can cater for Ireland's unique transition needs, and scale internationally to support the global transition. Ibec therefore welcomes the decision to extend the scope of Powering Prosperity to include a wider array of technologies and climate solutions while continuing to recognise the vital role of offshore wind.
This is also an opportunity to build on the progress and success of Powering prosperity and for Ireland to be more ambitious in its support for the sector and industry more broadly. Ibec would like the actions in the new strategy to be more substantive and defined - moving beyond policy consideration and research, to action and implementation. Budget 2027 should be targeted as an early opportunity for the new strategy to begin showing real impact.
Ibec notes that "the proposed green growth industrial strategy will focus primarily on supporting companies developing certain green technologies, including innovation and in-company research and development, and the required supply chain for deployment rather than developing any policy for these technologies." Ibec recognises the distinction here. However better policies and supports are needed to drive demand for the products and services of Irelands green economy. Policies that can derisk investment in premium renewable technologies and climate solutions are needed now more than ever given global economic uncertainty. Strong collaboration between the Department of Enterprise and the Department of Climate, Energy and the Environment is needed to ensure Ireland's Green Growth Strategy is

accompanied by impactful incentives and supports to help build a dynamic market locally for green technology and services. Ibec also sees a role for a new industrial strategy or masterplan that would allow for a more holistic and aligned approach to industrial growth and decarbonisation. The UK's Modern Industrial Strategy from 2025 is a good model that demands consideration. It allows for a complete holistic approach and comprises eight sectoral plans one of which covers Clean Energy Industries.

Final remarks

Ibec would like an opportunity to engage with the Department directly on these proposals and support the work and implementation of the strategy once finalised.

Yours sincerely,

[redacted]

[redacted]

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Ibec believes Powering Prosperity was most impactful where it set clear ambition, coordination mechanisms and delivered early enabling actions. The strategy improved information and knowledge sharing between stakeholders, supported the development of domestic and international supply chains, clarified future demand, strengthened infrastructure planning and promoted Ireland internationally as a future offshore wind hub.

Several actions were particularly effective in enabling knowledge exchange and coordinated planning. Actions such as Action 10 - Establish and implement MoU between EirGrid and relevant enterprise agencies -, Action 19 - Seek opportunities to develop strategic partnership with other countries or organisations, including in the form of MoUs or DoIs, to enable knowledge sharing and growth of the supply chain in Ireland – and Action 38 - Lead fact-finding mission with key stakeholders to international locations where green energy industrial parks have been successfully established – strengthened information flows and reduced fragmentation. These actions helped direct long term investment strategies, identify areas of focus more effectively and ensure that infrastructure requirements such as grid capacity or port development were understood early, by drawing on international best practice and aligning domestic actors.

Actions on supply chain development, whether domestic or international, greatly contributed to making Powering Prosperity impactful, aiming to create structural, long term capability rather

than short-term project support. Action 4 - Deliver long-term strategic funding options to support scaling Irish offshore wind supply chain companies and Action 17 - Utilise Ireland's membership of Cooperation Alliances such as NSEC, and existing bilateral agreements with European partners to advance the development of international OWE supply chain opportunities – laid the groundwork for a resilient domestic industry. These actions helped address market access and integration into global supply chains essential for scaling.

The strategy also strengthened Ireland's international profile. Actions 12–14 (targeting FDI and promoting Ireland as a high-potential offshore wind market) and Action 20 - Promote Ireland as a high potential OWE market through ministerial trade missions and active participation in international conferences, trade shows and other major OWE sectoral events, including though engagement with industry representative bodies positioned Ireland as a credible and attractive location for investment, partnership, and innovation. This visibility remains critical in a competitive global market to attract investment and contribute to long term projects.
Ibec believes that a key learning from the last strategy is that fast, coordinated action with clear delivery focus can be replicated across other green technologies, provided it remains outcome-driven and aligned with infrastructure delivery. Knowledge sharing, early actions to develop supply chains, attracting foreign and domestic investment and ensuring that enabling infrastructure is planned and delivered in parallel were central to Powering Prosperity's impact and can serve as a model for accelerating progress to support other green technologies.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ibec supports the prioritisation of scaling proven renewable technologies, while developing and funding research on a small number of enabling technologies to complete the system. Offshore wind is central, as well as solar and onshore wind. Consideration needs to be given to grid and storage technologies to maintain grid stability and matching demand and generation profiles.

Technologies such as green hydrogen can play an important role alongside large-scale renewable deployment. A 2024 Compass Lexecon report, commissioned by Business Europe modelled different pathways for Europe to achieve its net zero ambitions by 2050. In both scenarios modelled hydrogen becomes a major feedstock and energy carrier, with demand ramping up to between 850 TWh and 1,100 TWh by 2050. As Ireland increases offshore wind capacity, green hydrogen offers a flexible means of absorbing surplus generation that would otherwise be curtailed, providing an additional route to market for renewable electricity. It also offers a viable decarbonisation pathway for hard-to-electrify sectors such as industrial heat, heavy transport, etc. where direct electrification is not technically or economically feasible. And critically, hydrogen enables long-duration and seasonal energy storage needed to achieve system resilience and security of supply in a net zero power system.

Ibec welcomes the inclusion of carbon capture in the new strategy. Ibec foresees carbon capture as being of vital strategic importance for Ireland's energy future. In our assessment, industrial and energy system gas use equipped with carbon capture and storage technology presents a viable solution in some hard to abate high energy use sectors. This involves the capture of CO2 from a plant's flue gases and its transportation to a geologically stable underground or undersea storage facility in Ireland or abroad. While the form CCS takes in Ireland remains to be decided and further work on this is required. It may involve the development of CCS clusters in areas with high concentrations of heavy industry and conventional natural gas power generation.

Ibec also welcomes the specific inclusion of grid-technologies. Subsea cable technology and Grid-Forming (GFM) technologies will be particularly important in enabling an efficient transition in Ireland. GFM technologies are an essential enabler for operating the power system at progressively higher levels of renewable penetration because it can assume key stability roles traditionally performed by synchronous generators, such as providing inertia, system strength, and voltage and frequency formation. As the power system advances toward much higher System Non-Synchronous Penetration (SNSP), with targets of 95% by 2030, fewer conventional thermal units remain online, reducing the availability of these inherent stabilising services and increasing the need for more capable inverter-based controls. GFM inverters meet this need by acting as autonomous voltage sources that can supply the stabilising functions required to maintain reliable system behaviour as synchronous generation declines.

Ibec notes the absence of bioenergy and biomethane from the list. This is hard to understand given there is a national ambition to deliver 5.7 Terawatt hours (TWh) of indigenously produced biomethane by 2030 and a national biomethane strategy which underlines its economic and decarbonisation potential. Ireland is recognised as having one of the largest potentials for biomethane production in Europe per capita. For many Ibec members, especially those in hard-to-abate sectors, Biomethane offers a clear near term climate solution for their heat and processing needs. And given the availability of viable sustainable feedstocks, the biomethane sector and associated supply chain, could become a major driver of employment and economic growth in Ireland. A commercial scale biomethane plant is estimated to deliver c. 150 direct and indirect jobs and, on average, €200m of rural economic benefit over its lifespan. Biomethane can also play a significant role in enhancing Ireland's energy security— an issue that is increasingly coming into focus as geopolitical tensions continue to disrupt global energy markets and Ireland's only domestic gas supply at Corrib continues to decline. Ibec recommends the addition of biomethane and bioenergy more broadly.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Ibec believes supply-chain resilience remains a major constraint for many key technologies. While *Powering Prosperity* was an important first-step that set the course for offshore wind development, additional support must be given to offshore wind infrastructure (ports, vessels,

grid and operations), as well as to the development of domestic companies to carry out the infrastructural projects required for effective offshore project delivery.

Ireland's emerging hydrogen sector faces several critical supply-chain gaps that required targeted support, particularly in production infrastructure, storage and transport. Although the National Hydrogen Strategy emphasises the importance of scaling renewable green hydrogen through electrolysis powered by renewables, Ireland currently has minimal production capacity, and the supply chain for key components such as electrolysers, compressors and associated equipment remains underdeveloped. Significant investment is also needed in large-scale hydrogen storage, as Ireland lacks the dedicated facilities. Transport infrastructure presents additional challenges. Future ambitions will require infrastructure readiness, particularly for ports. Support will be needed to develop country-wide availability. Demand-side readiness is similarly still limited, with few hydrogen-ready projects in place. Regulatory guidance and robust certification systems are also clear member priorities. These measures are essential to unlock early adoption, provide certainty for investors, and support the development of a fully functioning hydrogen ecosystem.
On the topic of Carbon Capture, Utilisation and Storage, given that the discussion is only now starting in Ireland, the full supply chain will need to be developed. Many of the supply chain development actions in Powering Prosperity could easily be extended to CCS/CCU, especially those examining international best practice and knowledge transfer.

In all new green technologies developed, Ibec believes that Ireland should focus on where it can add value withing global supply chains rather than trying to build full manufacturing ecosystems unless Ireland has a clear advantage and unique offering.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
While many of the technology areas listed are mature or maturing fast , there is a need for a additional R&D support for some critical technologies to ensure full market readiness and a commercial application in an Irish context e.g. hydrogen, carbon capture, deeper offshore projects, and modern grid technologies.

Government can help by improving Irish-specific data, addressing regulatory bias against emerging technologies, and creating more opportunities to trial innovations at scale, for example through innovation sandboxes to allow regulatory flexibility, as some innovations are accelerating faster than regulatory frameworks allow their implementation.

There is also an opportunity for Ireland to better support Irish project applications to the EU Innovation Fund. Ibec understand that Irish projects have not been as successful in the process as expected. There is also an opportunity for the State to step in and support failed bids by

providing an elevated level of state aid. This should be considered for technology projects of strategic importance.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Clear routes to market, consistent policy frameworks and long-term visibility are critical to unlocking private investment.

The new Offshore Wind Clearing House (together with the Offshore Wind Taskforce) is already beginning to show results and has mobilised all key stakeholders in a collective effort to resolving the many barriers to ORE delivery. The involvement of the Department of Taoiseach has been critical. This may prove to be an effective model for other critical technology areas in time where a comparable effort is needed. As onshore wind and solar are expected to deliver most of the emissions reduction in the power sector this decade and the early part of the 2030s, these areas could benefit from such an approach. Biomethane, grid development, and industrial decarbonisation are also critical areas that demands special attention.

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Ireland's longstanding issues with energy infrastructure delivery remains the main barrier to a scaling up of renewable energy and green technologies in Ireland. The ambitious programme of work stemming from the Accelerating Infrastructure Taskforce offers an opportunity to address this problem head on. The AIT workstreams on civil/judicial reform, judicial review, critical fracture, and public acceptance are key to unlocking some of these barriers. Because of planning and project delay bottlenecks there is an opportunity to grow Irish green technology businesses by supporting their capacity to work in project outside Ireland. This could ensure Irish firm remain viable and are building the necessary scale, expertise, skills, and experience to support Irish based projects when the time comes.

Grid capacity limitations as well as grid connection delays and curtailment are also major bottlenecks. Ireland's grid infrastructure has not kept pace with rising electricity demand for housing, transport electrification and data centres. Ibec fully support the grid ambition in PR6 to enable new generation and storage projects and grow industrial demand, however, more needs to be done to keep Irish grid costs in line with European counterparties. The new Large Energy User Action plan is an opportunity to develop more flexible, efficient and concentrated areas of demand.

Costs are also cited as an important barrier to scale. Ireland's renewable energy options are often significantly more expensive than their non-renewable counterparts. For example, in the absence of any grants or subsidies for biomethane, the price of this product can in some cases be multiples of natural gas. Replacement or repurposing of infrastructure remains costly.

High capital costs and financial uncertainty reduce investor appetite. The projected costs of hydrogen in Ireland remains prohibitive. Ibec has previously called on government to carry out a

thorough assessment of the renewable energy cost drivers compared with other jurisdictions and identify potential mitigation options.

Ibec has also recommended the introduction of greater industrial decarbonisation supports to allow for projects of real scale to be delivered. Ibec has proposed the introduction of competitive Climate Action Contracts regime which would involve the use of two ways CFDs bridging the cost of fossil fuels and the renewable energy alternatives. Such a regime in already in place in Germany[6]

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Ireland should aim to improve innovation, investment certainty, and delivery speed.

Many of our members believe that regulatory sandboxes, such as the one introduced in section 6.1.1 of *Powering Prosperity* would be useful for the trialling of new innovative technologies and allow for greater flexibility in innovative technologies.

Ireland could also explore new incentives, such as tax-based supports for clean technologies, in-line with EU state-aid rules, or support and funding for projects that are of vital interest. (See comments above on EU innovation fund)

Most medium-large organisations in Ireland have ambitious targets to reduce their carbon emissions. However, meeting these targets- especially in hard to abate sectors will be very challenging in the current economic environment. Ibec sees a clear role for an enhanced business decarbonisation support framework – one that enable the deployment of major energy decarbonisation projects. (See comments above regarding Ibec's Climate Action Contracts proposals.)

For biomethane, one such policy consideration would be the removal of carbon tax for end users who procure biomethane. Currently, gas suppliers are required to apply carbon tax to all gas supplies regardless of whether the gas is fossil-based or renewable. This approach does not reflect the zero-carbon nature of biomethane and creates a disincentive for businesses seeking to decarbonise their energy use. As biomethane is considered carbon neutral, the

[6] Ibec Climate Action Contracts Proposal 2024 - https://www.ibec.ie/connect-andlearn/insights/insights/2024/08/23/contracts-for-difference

carbon tax should not apply to the renewable portion of gas consumed. A comparable precedent exists under the EU Emissions Trading System (EU-ETS), where companies are not required to surrender carbon allowances for the share of energy derived from biomethane; end users of biomethane should be afforded a similar treatment under Ireland's carbon tax regime.

8. Are there existing supports that should be expanded or improved?

Continued support for the development of education and skills in green growth sectors remains vital, as many Ibec members continue to highlight the lack of skilled workforce in this area. Some members also believe that while DSU schemes have been fruitful in incentivising large energy consumers to temporarily reduce their electricity demand on the grid, improving DSU schemes to incentivise further participation from industry through incentives other than financial might be beneficial.

Schemes like the Energy Efficiency Obligation, the Renewable Transport Fuel Obligation Scheme, the forthcoming Renewable heat Obligation, and the various environmental aid programmes offered by state agencies can all help build demand for green, renewable, and zero carbon products and services. However, these programmes are not all perfect and there are gaps, especially for large organisations, and Ibec would welcome an opportunity to meet with the Department on how these could be best resolved.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Several sectors of the economy are strongly aligned with Ireland's renewable energy ambitions and should be strategically supported within the new industrial strategy. These sectors are central not only to decarbonisation, but also to energy security, economic resilience, and Ireland's ability to attract and retain investment.

Upgrading Ireland's grid is one of the most critical enablers of the green transition. Grid development has been identified by many of our members as a major bottleneck for integrating renewable electricity and meeting national targets. An industrial strategy that supports grid modernisation and energy storage technologies will reduce curtailment, improve stability and unlock an efficient use of clean energy.

Transport is among Ireland's most challenging sectors for decarbonisation, with slow progress to data and substantial reliance on fossil fuels. As such, hard-to-abate transport modes such as aviation, critical to Ireland's connectivity given its geographic position and reliance on international travel for trade and economic activity must be supported within a Green Growth Strategy. Including aviation within the Green Growth Strategy can anchor demand for renewable energy, support new industrial value chains, and deliver economic and employment benefits.

Ireland's industrial heat demand still depends heavily on fossil fuels, which leaves the system both carbon-intensive and vulnerable to geopolitical volatility and price shocks. Supporting industrial electrification, the development of a dynamic biomethane sector, and other

renewable fuels like HVO and BIO LPG will reduce reliance on imported fossil fuels and align industrial development with net-zero compatible technologies.

Energy intensive sectors including data centres and considerations about the development of energy parks are crucial to include in this strategy. Supporting these sectors and initiatives can drive investment while ensuring they stay in line with nezero strategy and contribute to accelerating renewable energy development.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

To encourage diversification, companies should be supported through awareness raising, capacity-building programmes. These initiatives would help firms understand where their existing competencies align with emerging needs in green energy. As per Action 20 in *Powering Prosperity* ("Promote Ireland as a high potential market for innovative renewable integration systems through ministerial trade missions and active participation in international conferences, trade shows and other major sectoral events, including though engagement with industry representative bodies."), highlighting government backing for pilot projects and the recent successes of *Powering Prosperity* can also serve to give clarity to companies on how to broaden their work to include renewable energy and green technologies.

Fostering collaboration between industry and the public sector ensures a two-way exchange: industry gains clarity on key technologies and future opportunities, while policymakers receive grounded insights on practical barriers to diversification.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Not answered

12. If so, how might similar approaches be adapted to the Irish context?

Industrial policy interventions from other countries show the value of clear and holistic industrial strategies, strong public investment, faster permitting and strong support for key technology deployments.

Several countries have invested massively in future facing technologies, offering long term clarity through planning and allowing derisking for early adopters. Denmark launched in 2025 a $4.2 billion carbon capture and storage fund, offering 15-year contracts covering CO2 capture, transport, and storage. The UK has been supporting carbon capture projects based on almost a decade of discussion and development and aims to build two CCUS clusters by the mid-2020s plus two more by 2030.

Countries such as Germany conducted large plans with legally binding targets up to 2045. This allows for predictability as investor certainty is guaranteed by law. Germany's Innovation Tenders consistently award projects that pair Solar PV with battery storage because these hybrid systems deliver lower-cost, most flexible, grid supportive renewable energy, resulting in every winning bid combining PV and storage across multiple tender rounds. Germany has managed to make innovation predictable, by releasing multiple Innovation Tenders every year with predictable, pre-announced volumes.

Contracts for Difference (CfDs) are quickly becoming the instrument of choice for countries looking to drive private investment in industrial decarbonisation and high cost technologies essential to the net-zero transition like hydrogen and carbon capture.
In 2020 the Netherlands secured European Commission state aid approval to introduce a €30 billion muti-technology competitive CfD scheme for industrial decarbonisation. The Stimulering Duurzame Energieproductie ('SDE++') went live in 2022 and supports a wide range of different technological approaches, including projects based on renewable electricity and heat, low carbon and renewable gas, including hydrogen, and transport fuels. Awarded projects receive a variable premium for 12-15 years.

In March 2024, Germany launched a €50 billion competitive multi-technology CfD scheme. The Climate Protection Contracts scheme targets large scale decarbonisation in Germany's ETS installations. The winning bidders will receive a guaranteed strike price for using a lower or zero carbon option reflecting the prevailing cost of the higher-carbon option. This effectively makes the low/zero carbon option the same price as the high-carbon option. Importantly, the German scheme functions as a two-way CfD and if the greener option becomes cheaper, the situation is reversed.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can position SMEs to effectively contribute to the advancement and implementation of green technologies by conducting a comprehensive supply chain mapping and gap analysis. This process will clearly determine where SMEs can deliver value to progress the green technology sector.

High potential firms should also be identified and supported through Enterprise Ireland with a view to building market share outside Europe.

In the domestic market there is a need to boost demand for their products and services, and this can best be achieved by enhancing the decarbonisation supports for businesses.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Monitoring should be embedded across the full value chain. This includes tracking engineering innovation, manufacturing capacity, component availability, bottlenecks, skill requirements, and domestic demand. Building visibility into these areas allows to anticipate and respond early to constraints that may arise.

Ibec supports continued collaboration between government, industry, and research. Through partnerships and knowledge sharing, Ireland can develop real-time insight into technological maturity, energy efficiency, and commercial readiness of new innovations. Engagement could include exchanges, workshops, working groups, Etc.

International engagement should also remain at the foreground of monitoring of green technology developments. Participation in international conferences, EU-level working groups, state visits, and missions to foreign implementations would give Ireland early access to signals into new and future trends in green technologies.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Three technologies/policy areas not mentioned in the list but critical to Ireland meeting its climate ambitions are bioenergy (biomass, biomethane, bio-LPG), waste to energy, and resource circularity. In fact, Government's own National Biomethane Strategy states that Ireland cannot meet its Climate Action Targets without biomethane.

While the focus of this consultation appears to be on the electricity sector, transport and heat also need to be decarbonised as part of Ireland's ambitious, legally binding climate action targets. These three technology areas, particularly bioenergy, have historically been neglected in favour of technologies which decarbonise electricity (e.g. solar/wind), however they are critical if Government wants to decarbonise the full energy complex (electricity, heat, transport).

Biomethane represents a major opportunity for Ireland given the availability of high-quality feedstocks and the presence of heat intensive heavy manufacturing which require a gas to decarbonise.

INDIVIDUAL RESPONSE

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The establishment of the Offshore Wind Delivery Taskforce was particularly effective. It created a clear cross-departmental governance structure and reduced policy fragmentation. The model of defined ownership, timelines and inter-agency coordination should be replicated for other priority technologies such as green hydrogen, long-duration storage and marine energy. A standing cross-sector "Green Industry Delivery Group" could serve a similar role.

The development of a structured offshore wind supply chain roadmap and targeted enterprise supports (including capability mapping, cluster development and SME engagement initiatives) was also impactful. It provided clarity to domestic firms on entry points into the value chain and helped identify capability gaps. A similar supply-chain mapping and capability development exercise should be undertaken for floating offshore wind, grid technologies and hydrogen infrastructure to ensure early domestic participation rather than late-stage import dependency.

Investment in test and demonstration infrastructure and early project pipelines was another effective element. Certainty around project sequencing provided visibility to investors and suppliers. For emerging sectors such as wave, tidal stream and hydrogen, early support for pilot and demonstration zones will be essential to crowd in private capital and reduce first-mover risk.
The emphasis on workforce planning and skills alignment was also important. Targeted engagement with higher education institutions and training bodies helped anticipate offshore wind demand. This approach should be broadened to include electrolysis engineering, marine operations for floating wind, power electronics for grid modernisation, and hydrogen safety and storage systems. Applying measurable industrial performance indicators across other green technologies would strengthen accountability and ensure the strategy remains economically focused. These mechanisms are transferable and should form the backbone of the broader Green Growth Strategy.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ireland should focus on offshore wind (fixed and floating) as the anchor technology because it is central to meeting electricity decarbonisation and energy security goals, and because national policy targets scale-out to 20GW by 2040 and at least 37GW by 2050. The next priorities should be grid technologies (including digital grid management and power electronics), long-duration electricity storage (to firm variable renewables), and enabling infrastructure for green hydrogen where there is credible industrial demand. These priorities align with Ireland's target to meet 80% of electricity demand from renewable sources by 2030 and with the Climate Action Plan emphasis on grid upgrades and long-duration storage. Marine energy (tidal stream and wave) should be included as a smaller, targeted "optionality" pillar focused on R&D, testbeds and early demonstrations rather than near-term scale targets.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Offshore wind (especially floating) needs additional supply-chain support in ports, marshalling and assembly space, heavy-lift capability, installation and O&M vessels, subsea cables, and high-voltage electrical equipment. Ireland's ability to deliver near-term offshore wind targets is constrained by current port readiness, which impacts the whole project pipeline and local value capture. Grid technologies need supply-chain support in transformers, switchgear, protection systems, converters, and specialist services for grid connection and commissioning, because grid reinforcement is a stated national priority and a prerequisite for renewables integration. Storage needs supply-chain development in EPC capacity, grid integration services, safety and compliance systems, and (for longer duration) enabling components and balance-of-plant, because deployment depends on rapid, repeatable delivery models. Hydrogen needs supply-chain support in electrolysers and integration services, compression/storage, safety systems, and offtake-linked infrastructure, because without domestic integrators and service capability Ireland will import most system value even where generation is domestic.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Floating offshore wind, marine energy, long-duration storage, hydrogen and CCUS need additional R&D and in-company RD&I support. The main barriers are first-of-a-kind risk, limited Irish test and demonstration infrastructure at scale, difficulty bridging from research to bankable pilot projects, and uncertainty of long-term demand signals (particularly for hydrogen and CCUS). For offshore renewable energy more broadly, national roadmaps note the scale ambition and the likely need for significant R&D investment to realise potential. Government can help by funding shared testbeds and validation facilities, expanding competitive demonstration funding that requires industry participation, reducing administrative friction for pilots (consenting/grid access for demonstrators), and supporting standards, measurement and certification capability so Irish firms can sell into EU supply chains.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Offshore wind enabling infrastructure requires the strongest industrial deployment support: port upgrades, grid connections, and coordinated project sequencing so suppliers can invest with confidence. The 5GW-by-2030 ambition remains challenging without urgent enabling infrastructure and delivery alignment, and stakeholders have flagged the risk of missing early-decade delivery windows. Grid reinforcement and long-duration storage also need deployment support because the Climate Action Plan explicitly links them to maximising renewables and system security.

Hydrogen deployment support should be conditional on credible offtake (industrial clusters, heavy transport, maritime, certain exports) so public funds are tied to demand-backed projects rather than speculative buildout. Marine energy deployment support should focus on staged demonstrations and pre-commercial arrays to build capability and IP, not immediate scale targets.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The main barriers are grid capacity and connection timelines, port and marine infrastructure gaps, planning/consenting complexity and duration, shortages of specialised skills (marine engineering, HV electrical, power systems, hydrogen safety), and project finance risk for first-of-a-kind technologies. A further barrier is policy and market uncertainty on who pays for enabling infrastructure and how benefits (system, climate and industrial) are valued, which slows investment decisions. Ireland's wider 2030 delivery challenge is reflected in official projections indicating the scale of the implementation gap across sectors, reinforcing the need to remove delivery bottlenecks quickly.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Yes. Government and State agencies should prioritise interventions that reduce delivery risk and accelerate domestic value capture. The most important supports are (a) a coordinated "one-stop" delivery model for major green industry projects so firms can navigate consents, grid connection, maritime/port permissions and State supports without serial delays, (b) targeted capital investment for enabling infrastructure that unlocks multiple technologies, especially port capacity for offshore wind and grid reinforcement and digitalisation, and (c) scaled supports for demonstration and first-of-a-kind deployment where private finance is constrained by risk, particularly for floating offshore wind, long-duration storage, hydrogen applications with credible offtake, and early marine energy pilots. This should be backed by supply-chain capability mapping and firm-level upgrading supports, building on the action-led model used in Powering Prosperity and its implementation programme.

8.Are there existing supports that should be expanded or improved?

Yes. Expand the scale and speed of supports that directly enable deployment and supply-chain participation. Increase multi-annual funding certainty for port readiness and offshore wind enabling infrastructure; expand SEAI and enterprise supports so more firms can move from assessment to capital investment quickly; and strengthen support for testbeds, standards/certification capability, and demonstrator funding that requires industry participation so R&D translates into bankable projects. These improvements align with the consultation's stated intent to focus on industrial deployment and supply-chain development as a successor approach building on Powering Prosperity rather than creating another standalone policy layer.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Key aligned sectors include advanced manufacturing and precision engineering (components, fabrication, balance-of-plant systems), maritime and port services (marine operations, logistics, vessel services, subsea activities), construction and civil engineering (foundations, grid infrastructure, large-scale project delivery), electrical and power systems engineering (grid connection, substations, power electronics), ICT and digital services (grid management, energy optimisation, data analytics, cybersecurity), professional services (project finance, legal, environmental assessment), and agri-food and bioeconomy sectors where renewable energy integration and green fuels may create new demand.

Heavy industry and large energy users should also be considered aligned sectors, particularly where electrification, hydrogen or carbon management solutions create anchor demand for domestic supply chains.

Higher education should be embedded as a strategic pillar of industrial capability, skills development and applied innovation within the Green Growth Strategy. Higher education institutions should be supported to expand capacity in priority disciplines directly linked to offshore wind, grid systems, power electronics, hydrogen engineering, marine operations, energy systems modelling and advanced manufacturing. This includes funded expansion of places in engineering and technical programmes, accelerated conversion courses for professionals moving from adjacent sectors, and flexible lifelong learning provision aligned with emerging industry demand.

The strategy should strengthen structured industry–university collaboration through applied research centres, industry PhDs, and co-funded demonstration projects where firms and higher education institutions jointly develop and test technologies. This is particularly important for floating offshore wind, marine energy, long-duration storage and hydrogen systems, where domestic innovation capability can support supply-chain positioning.

Higher education can also support industrial deployment by providing independent testing, validation, certification support and performance monitoring for new technologies, helping Irish firms compete in EU and global markets.

The strategy should include coordinated skills forecasting (i.e. the new National Skills Observatory) linked to renewable energy targets, with funding mechanisms that allow higher education institutions to respond quickly to industry demand. Without parallel expansion in engineering, technical and digital capability, infrastructure investment alone will not deliver domestic value capture.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Companies in complementary sectors should be identified through structured supply-chain mapping and regional cluster analysis linked to specific technology roadmaps. Enterprise agencies can proactively map firm capabilities (e.g. fabrication, electrical systems, marine services, digital solutions) against renewable energy value chains to identify realistic diversification pathways.

To encourage diversification, government should provide targeted supports for capability upgrading, certification and standards compliance, demonstration partnerships with technology developers, and risk-sharing instruments for firms entering new markets. Public procurement and State-backed projects should include clear visibility of future project pipelines so firms can invest with confidence. Cluster-based initiatives, supplier development programmes and industry–higher education collaboration can further reduce entry barriers.

The objective should be practical integration: enabling firms already active in adjacent sectors to transition part of their portfolio into renewable energy and green technology markets, thereby strengthening domestic value capture and regional economic development.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

The UK's Contracts for Difference reforms are a useful example of using auction design to drive supply-chain outcomes, including the Clean Industry Bonus aimed at fixed and floating offshore wind. The UK has also set out an Offshore Wind Industrial Growth Plan that links value-chain "make or buy" analysis to targeted actions and investment priorities. Denmark is a strong example of clustering and port-led industrial development, with Port Esbjerg and the surrounding cluster demonstrating how co-location of offshore capabilities (including transition from oil and gas) supports scale, skills and supplier depth. The Netherlands provides an example of using tender design and non-price criteria to steer outcomes beyond lowest cost, including innovation and ecological requirements. Outside Europe, the US Inflation Reduction Act approach demonstrates the effect of long-term, rules-based manufacturing incentives such as the Section 45X production credit to attract domestic clean tech manufacturing investment.

12.If so, how might similar approaches be adapted to the Irish context?

Ireland could adapt these approaches by embedding supply-chain and sustainability incentives into its renewable electricity support mechanisms (e.g., offshore auction design), modelled on the UK's CfD approach, while keeping requirements simple and enforceable. A Danish-style cluster model can be applied by concentrating investment around a small number of "anchor" ports and regions, pairing port upgrades with supplier parks, training pipelines, and services for installation and O&M to build durable local capability. A Dutch-style use of non-price criteria can be applied selectively to reward credible commitments on innovation, nature-inclusive design and supply-chain readiness where it reduces project risk and increases domestic value

capture. Ireland can replicate the intent of US-style manufacturing incentives through EU-compliant, multi-annual supports (grants/tax measures) targeted at specific bottleneck components and enabling equipment (e.g., high-voltage electrical equipment, power electronics, grid hardware), with clear eligibility rules and predictable duration so firms invest with confidence.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

SMEs need clear line-of-sight to upcoming projects, realistic entry points into value chains, and practical supports to meet the commercial and compliance requirements of large developers and Tier 1 contractors. This starts with publishing multi-year project pipelines and procurement forecasts (ports, grid, offshore wind, storage, hydrogen infrastructure) in a format SMEs can use, backed by structured "meet-the-buyer" engagement and a national supplier matchmaking function led by the enterprise agencies.

SMEs also need targeted capability-upgrading supports that are specific to energy-system value chains: standards and certification (e.g., quality, marine, health and safety, grid compliance), tendering and contracting capability, digital requirements (data, traceability, cybersecurity), and investment in the equipment and facilities needed to deliver at scale. A dedicated supplier development programme should help SMEs move from "potential supplier" to "qualified supplier" through mentoring, paid readiness assessments, and co-funded upgrading plans tied to real procurements.

Access to finance is a major barrier when SMEs are asked to invest ahead of contracts. Ireland should expand risk-sharing instruments such as guarantees, working-capital facilities, and milestone-based supports that allow SMEs to tool up, hire, and certify without taking unsustainable balance-sheet risk. For emerging technologies (floating wind, long-duration storage, hydrogen applications, marine energy), SME participation will depend on testbeds and demonstrators where SMEs can validate products and services with credible reference projects; public funding should require meaningful SME roles, not just subcontracting at the margins. SMEs will participate more if there is local clustering around enabling infrastructure. Port-led and regional cluster approaches, linked to higher education and training provision, can concentrate demand, skills pipelines and shared facilities (testing, fabrication space, training rigs), making it easier for SMEs to specialise and collaborate. The overall aim should be to reduce information gaps, lower qualification barriers, and de-risk early investment so SMEs can compete for recurring work across the build-out, operations and maintenance phases.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Ireland should monitor green technology development through a structured, data-driven framework with clear industrial and system indicators, combined with horizon scanning for emerging sectors.

First, the strategy should establish a small set of measurable KPIs linked to both energy delivery and industrial outcomes. These should include domestic value capture (percentage of project spend retained in Ireland), SME participation rates, export growth in green technology goods and services, jobs created in priority value chains, port and grid readiness milestones, and R&D-to-deployment conversion rates. Monitoring should not focus solely on installed capacity; it should track industrial capability and competitiveness.

Second, a cross-departmental monitoring unit should publish an annual Green Industry Scorecard aligned with energy targets and enterprise indicators. This should draw on enterprise agency data, grid connection statistics, port utilisation metrics, skills pipeline data, and project pipeline visibility. Transparent reporting will allow early identification of bottlenecks in infrastructure, supply chain depth or workforce capacity.

Third, Ireland should establish a formal technology horizon-scanning function, linking enterprise agencies, research funding bodies, higher education institutions and industry. This function should monitor EU initiatives (e.g., Net Zero Industry Act developments), global deployment trends, patent activity, venture capital flows and cost trajectories to identify technologies approaching commercial inflection points. A biennial review mechanism should allow the strategy to adjust priority technologies based on evidence rather than political cycles.

Fourth, structured engagement with industry clusters and research centres should be used to identify emerging niches where Ireland could develop comparative advantage, particularly in digital energy systems, marine technologies, advanced materials and grid innovation. Monitoring should be continuous, data-led and tied to clear decision points, ensuring that Ireland can reallocate support towards technologies showing scalable industrial potential while avoiding long-term lock-in to underperforming areas.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Policy coherence is critical. Enterprise supports, energy market design, planning and consenting reform, grid investment, skills funding and regional development policy must be aligned. Industrial ambition will not materialise if permitting, grid connection timelines or infrastructure delivery lag behind.

Infrastructure sequencing should be treated as an industrial policy lever. Port upgrades, grid reinforcement and storage deployment are not just energy measures; they determine whether Ireland captures domestic value or imports most components and services.

Long-term visibility and stability are essential. Multi-annual funding commitments, predictable auction schedules and transparent project pipelines will enable firms to invest in people, facilities and certification with confidence.

Skills planning must be embedded from the outset. Workforce forecasting should be linked to capacity targets, with funded expansion in engineering, marine operations, grid systems and hydrogen technologies, alongside flexible reskilling pathways.

Regional balance should be considered strategically. Clustering activity around key ports and grid nodes can stimulate regional growth, but this requires coordinated spatial planning and enterprise supports. The strategy should incorporate a formal review mechanism every two to three years, allowing adjustment based on market evolution, EU policy developments and technology cost trajectories. A clear governance structure, measurable KPIs and public reporting will be essential to maintain credibility and delivery discipline.

IRELAND SOUTH EAST DEVELOPMENT OFFICE

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

N/A

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

The strategic opportunity for the country lies in building offshore wind capacity, and in pairing it with local dispatchable and flexible energy systems that enable renewable power to drive industrial growth and regional economic development.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

To maximise the economic benefits of offshore renewable energy, Ireland should focus on strengthening three key parts of the value chain:

1. Assembly and installation infrastructure, particularly port facilities capable of staging offshore wind projects
2. Domestic manufacturing and engineering supply chains, enabling Irish firms to participate in project delivery
3. Operations and maintenance capability, which represents the largest long-term employment opportunity. Strategic investment and policy support in these areas would enable Ireland not only to deliver its renewable energy targets but also to build a sustainable offshore renewable energy industry with strong regional economic benefits.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

N/A

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

N/A

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Ireland currently lacks sufficient specialised port infrastructure capable of supporting offshore wind deployment at scale.
Offshore wind turbines and foundations require: Deep-water ports; Heavy-lift quays; Large component storage areas; and Assembly and staging facilities
Many Irish ports were not designed for these activities and require major upgrades.

As a result:
1. Construction staging may occur in foreign ports
2. Ireland risks losing large portions of the offshore wind economic value chain.
3. Financial support mechanisms for port development are therefore essential.

Potential supports include Government capital investment, EU funding programmes (e.g., Connecting Europe Facility) Public-private partnerships, Targeted infrastructure funds for offshore renewable energy ports. Without this investment, Ireland may struggle to capture the economic benefits of offshore wind development.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Strategic Infrastructure Investment
One of the most important interventions is direct public investment in enabling infrastructure, particularly where private investment alone is unlikely to deliver the required scale.

Priority areas include:
Port infrastructure upgrades to support offshore renewable energy assembly, installation and operations.

Electricity grid expansion and offshore transmission infrastructure to connect large volumes of renewable energy.
Energy storage and flexibility infrastructure to manage variable renewable generation.
Given the strategic importance of offshore wind to Ireland's energy transition, State-backed capital funding for port development should be considered. This could be delivered through a dedicated Offshore Renewable Infrastructure Fund, potentially supported by EU programmes such as the Connecting Europe Facility.

8. Are there existing supports that should be expanded or improved?
N/A

Aligned Sectors
9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?
1. Engineering and Advanced Manufacturing
The engineering sector will play a central role in delivering renewable energy infrastructure and supporting the wider green transition.

This includes capabilities in:
1. Mechanical and precision engineering
2. Electrical engineering and power systems
3. Marine engineering and offshore construction
4. Advanced materials and manufacturing

These capabilities are critical across the renewable energy value chain, including offshore wind development, energy storage systems, grid infrastructure, and hydrogen technologies.

Ireland already has strong engineering clusters across sectors such as manufacturing, pharmaceuticals, and construction. With targeted support, many of these firms could diversify into renewable energy supply chains, supporting activities such as fabrication, installation services, equipment maintenance, and infrastructure development.
Developing this sector would also create opportunities for high-value jobs and exportable expertise in renewable energy technologies.

2. Digital Technology and Smart Energy Systems
The transition to a renewable energy system will increasingly rely on digital technologies to manage complex, decentralised energy networks.

Areas where digital technology will play a key role include:
1. Smart grid management
2. Energy forecasting and system optimisation
3. Digital twins for energy infrastructure
4. Predictive maintenance for offshore wind and energy assets
5. Energy trading platforms and demand response systems

Ireland already has a strong international reputation in digital technologies, with significant expertise in software development, cloud computing, and data analytics. These capabilities can be leveraged to develop solutions that support renewable energy systems and grid management.

The integration of renewable generation with digital platforms represents a major opportunity for Ireland to develop high-value intellectual property and exportable services in the global clean energy market.

3. Data and Research Capabilities
The energy transition will generate enormous volumes of data related to generation, consumption, weather forecasting, grid performance, and infrastructure monitoring.
This creates significant opportunities in data research and analytics, particularly in areas such as:

Artificial intelligence and machine learning for energy forecasting
Climate and environmental data modelling
Energy system optimisation
Predictive analytics for infrastructure maintenance

Ireland's universities and research institutions already have strong capabilities in data science, digital technologies, and environmental research. Supporting these research areas would strengthen Ireland's position in emerging fields such as energy informatics and climate technology innovation.

Collaboration between research institutions, industry and government agencies will be critical in translating research capabilities into commercial technologies and services.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Ireland has a strong base of companies in engineering, digital technology and data research that could play a significant role in supporting the renewable energy transition. By proactively identifying these firms, increasing awareness of market opportunities, investing in skills development through ETBs and higher education institutions, and providing targeted enterprise supports, Ireland can enable companies to broaden their activities into renewable energy and green technologies while strengthening the domestic supply chain for the energy transition.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

The Basque Country appear to have successfully developed a globally competitive renewable energy industry through a long-term cluster-based industrial policy. Policies focused on helping existing manufacturing and engineering firms diversify into renewable energy supply chains. Companies that previously worked in sectors such as shipbuilding, heavy engineering and industrial manufacturing were supported in transitioning into offshore wind component manufacturing and services.

The United Kingdom provides a strong example of effective policy interventions designed to develop domestic offshore wind supply chains. A key element of the UK approach was public investment in port infrastructure to support offshore wind deployment. Through mechanisms involving The Crown Estate and government-backed funding programmes, significant investment was directed towards developing specialised offshore wind ports capable of supporting turbine assembly, installation and maintenance. The UK Government also implemented programmes aimed at increasing domestic content in offshore wind projects. These programmes encouraged developers to work with local suppliers and helped SMEs gain access to offshore wind supply chains.

12. If so, how might similar approaches be adapted to the Irish context?

Adopt the Basque approach to cluster-led capability building and the UK approach of direct investing in enabling infrastructure — but implement them through Ireland's institutions via a multi-annual offshore enabling infrastructure fund, delivery-led regional clusters anchored in ports and TUs, and a national O&M-first workforce pathway delivered through ETBs and colleges.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can get SMEs into the green tech value chain by doing three things well: creating early visibility of opportunity by making companies aware; then assisting with capability + skills upgrading so that the business is equipped to take part in the sector; and finally a procurement pathway that turns interest into contracts.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

To ensure Ireland can monitor the development of green tech and identify new opportunities by: Continued investment in research and innovation programmes; Establishment of centres of excellence focused on green technologies and energy systems; Implementation of technology foresight and monitoring frameworks; and Strong collaboration between industry, academia and government

By adopting this coordinated approach, Ireland can not only track emerging technologies but also position itself to develop new capabilities and capture economic opportunities from the global green transition.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

In developing the new industrial strategy for green technologies, it will be important for the Department of Enterprise, Trade and Employment to consider the importance of scale, certainty and coordinated delivery. For industries to invest in new capabilities, supply chains and workforce development, they must see a sufficient and predictable pipeline of projects.

In this context, achieving critical mass is essential. The development of renewable energy projects, particularly offshore wind, should be structured in a way that creates a meaningful and sustained market opportunity for industry. A piecemeal or fragmented approach to project auctioning risks undermining the ability of companies to invest in facilities, equipment and workforce training, as the scale of opportunity may not justify long-term investment. Delivering projects at sufficient scale enables the development of economies of scale, which are critical for attracting international investment, developing domestic supply chains and reducing costs over time. It also provides the long-term certainty required for companies to establish operations, invest in manufacturing capacity and develop specialised services.

From an industrial development perspective, the priority should therefore be to deliver the full pipeline of renewable energy projects identified in national policy frameworks, rather than progressing projects incrementally in a way that limits industry confidence. Clear visibility on future project timelines, capacity targets and infrastructure development will allow both Irish and international firms to plan investment decisions with greater certainty.

Ultimately, the success of Ireland's green industrial strategy will depend not only on policy ambition, but on consistent and timely delivery of projects at a scale that allows industry to respond and invest accordingly.

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Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Wave Energy

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Wave Energy

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
Wave Energy. It is well documented and understood that our Oceans have an abundance of renewable energy. This needs to be supported at a national level. Not European. Funding needs to be made available to individuals with ideas on how to harness this energy! Individuals with ideas should be supported with 100% funding for proof of concept. The initial cost to proof of concept is relatively small relative to potential. With Ireland facing worrying carbon fines, it's makes sense to look at all options!

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
Wave energy

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
Wave Energy. A test site needs to be provided. At present no foreshore licence in place.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
All of what is mentioned plus lack of support for individuals with ideas.

Government Supports
7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?
A one stop shop for Renewables. A body be put in place to champion Wave Energy.

8.Are there existing supports that should be expanded or improved?
European funding is out of reach for individuals and individuals who form a company in the hope of getting support. The cost of registering and keeping it compliant is financially demanding.
Something needs to be done. Wave energy can make a considerable contribution to the energy requirements. I am aware of individuals who have creditable ideas but as individuals they have no support. Founding is aimed at research institutions! This should be extended to include individuals.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Offshore wind and wave energy can complement each other. With such a demand for energy by the data centre fraternity it would be great if there was a way of making contact with this sector. You might say one can email them. This does not work ! This has been tried without success. There needs to be a way for individuals to contact Data Centres.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Data centre's

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

The US attitude is more supportive of ideas. Europe needs to look at it's attitude to risk.

12.If so, how might similar approaches be adapted to the Irish context?

Early support and be prepared to take risks!

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

A support structure needs to be put in place to help SMEs with grant applications. 100 per cent grant funding for green technologies keeping in mind the fines coming down the line!

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Talk to all with ideas. Put a body in charge to monitor and champion renewables**.**

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Face to face consultation. Decisions on support for ideas need to be made in Ireland not Europe.

Funding should be at national level not European. Have Europe provide funding that is managed at national level.

MID WEST REGIONAL ENTERPRISE PLAN

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

Impactful actions under Powering Prosperity – Ireland's Offshore Wind Industrial Strategy included: establishing a long-term, plan-led framework for Offshore Renewable Energy (ORE) through the Future Framework; accelerating assessment of a West Coast Designated Maritime Area Plan (DMAP); developing domestic supply chain capacity; scaling skills programmes; and early work on green energy industrial parks. These actions align directly with what the Shannon Estuary Economic Taskforce and the Mid-West Regional Enterprise Plan already progressed locally. Powering Prosperity's 40 actions, the Future Framework's plan-led ORE system, and national commitment to Green Energy Industrial Parks and the Shannon Estuary Region reinforce these priorities. The Regional Enterprise Plans are crucial and new plans should be now prepared and published.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ireland should prioritise offshore wind, onshore renewable energy (wind and solar), grid and interconnection technologies, long- and short-duration energy storage, green hydrogen and hydrogen-derived fuels, and biomethane as a dispatchable renewable gas to decarbonise heat and transport. The Mid-West Regional Enterprise Plan should be used as a vehicle to progress a Green Technology Working / Advisory Group in the Mid-West Region.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Technologies requiring supply-chain development include Floating Offshore Wind (FLOW)—particularly port infrastructure, substructure fabrication, installation, and operations and maintenance; hydrogen technology manufacturing; grid and interconnection components including high-voltage cabling; biomethane anaerobic digestion (AD) components; and long-duration storage technologies. The Shannon Estuary's port and land assets provide a natural hub for these activities. Government supply-chain actions include port readiness, skills pipelines, FLOW component fabrication, and hydrogen system manufacturing.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Research, Development and Innovation (RD&I) needs include FLOW engineering and digitalisation; hybrid offshore–onshore grid architecture; hydrogen production and storage; decarbonisation of industrial heat; and large-scale retrofit in the built environment. Key barriers include permitting complexity, funding availability for demonstrators, and access to testbeds for small and medium enterprises (SMEs). National RD&I policy emphasises the Offshore Wind Centre of Excellence, increased funding, and collaborative university–industry research. The Regional Enterprise Plans are an excellent vehicle for this collaboration and new plans should be now prepared and published.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Industrial deployment supports are needed for Floating Offshore Wind (FLOW), biomethane production, district heating networks, hydrogen mobility and industrial pilot projects, long-duration energy storage, and renewable-energy-powered data centres. Deployment should focus on co-located renewable supply and industrial demand. Ireland's ORE targets require deployment at regional scale, especially in the Shannon Estuary Region.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Main barriers include long consenting timelines, infrastructure bottlenecks (ports, grid, roads), investment risk for first-of-a-kind technologies, uncertainty regarding green fuel off-take, and the need for community benefit structures.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Government should prioritise a plan-led West Coast DMAP, invest in port and grid infrastructure, establish green energy parks (in locations such as in the Shannon Estuary Region), scale skills programmes, accelerate biomethane development through a dedicated delivery unit, and support early hydrogen and storage demonstrators. The Future Framework prioritises West Coast DMAP development and supports Green Energy Industrial Parks linked to renewable supply chains.

8.Are there existing supports that should be expanded or improved?

Existing supports to expand include the Green Transition Fund, Local Enterprise Office Green for Business programme, Technology Gateway supports (such as those linked to advanced

manufacturing and digitalisation), district heating support frameworks, and funds for regional renewable energy infrastructure.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Aligned sectors include advanced manufacturing, digital and data services, bioeconomy activities, aviation and logistics, sustainable construction and retrofit, creative industries, and low-carbon tourism. These sectors, particularly in the Mid-West, can benefit from and contribute to renewable energy deployment.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Companies can be identified and encouraged through cluster mapping, supplier engagement days, publication of project pipelines, regional innovation challenges, and the use of enterprise hubs to spread opportunities across towns and rural areas. The Regional Enterprise Plan is an essential tool to map and action these.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

International examples include structured offshore spatial planning, port-led industrial clustering, strong supply-chain development policies, and one-stop-shop permitting and investment models used in countries such as Denmark, the Netherlands, and Scotland. Ireland–Scotland ORE cooperation deepens supply-chain and RD&I alignment.

12.If so, how might similar approaches be adapted to the Irish context?

Similar approaches could be adapted by establishing West Coast DMAP, strengthening Shannon Estuary port investment, and creating a formally recognised green energy industrial park in the Shannon Estuary Region integrating offshore wind, hydrogen, storage, and advanced manufacturing. The plan-led Future Framework enables adaptation of international clustering, permitting, and co-location models. The Regional Enterprise Plans have a key role here.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can enable SME participation by using the Regional Enterprise plan to expand cluster supports, provide procurement-readiness training, improve SME access to testbeds and

demonstrators, link SME green programmes to offshore wind and hydrogen projects, and use funding instruments to de-risk innovation.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Monitoring should involve a national dashboard tracking deployment progress, supply-chain readiness, skills development, RD&I outputs, and regional impacts. Regionally, the Shannon Estuary Economic Taskforce Report should continue to be used as a road map for the future, and the Mid-West Regional Enterprise Plan can monitor and measure effectiveness of actions.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Additional considerations include formalising a Shannon Estuary Green Energy Park designation, embedding community benefit mechanisms early, facilitating private wire connections, and bringing forward interconnection planning to enable energy export. National export ambitions position the Shannon Estuary Region as an EU-facing industrial hub. A timely launch of the new Regional Enterprise Plans is crucial.

Natural Power Submission to DETE Green Growth Strategy Consultation

Natural Power is a renewable energy and energy transition consultancy with extensive experience supporting the development of onshore and offshore wind, solar, energy storage and emerging low carbon technologies across Ireland, the UK and international markets. In Ireland, Natural Power has been actively engaged in the development of the offshore wind sector, working with developers, supply chain companies and public bodies across site development, environmental assessment, consenting, grid and project delivery.

This response reflects our practical experience of what enables, and constrains, green growth in the Irish context, with a particular focus on offshore wind as a cornerstone of Ireland's future energy system and industrial opportunity.

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

From Natural Power's perspective, the most impactful elements of Powering Prosperity to date have been:

- Clear recognition of offshore wind as a strategic industrial opportunity, not solely an energy policy objective
- Early focus on port infrastructure and maritime services as critical enablers
- Commitment to coordinated action across departments and agencies, particularly energy, planning, enterprise and transport

These actions have helped create early momentum, increase investor confidence and signal that Ireland intends to compete internationally in offshore wind.
Similar approaches could be applied to other green technologies by:

- Identifying anchor technologies (e.g. offshore wind, grid-scale storage, hydrogen) where Ireland has a comparative advantage
- Publishing clear development roadmaps that integrate policy, infrastructure, skills and enterprise supports
- Treating enabling infrastructure (ports, grid, digital systems) as integral to industrial strategy

Offshore wind demonstrates that green technologies scale fastest when treated as system-wide industrial opportunities rather than standalone projects.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Offshore wind should remain the primary strategic focus for Ireland's green growth agenda, given its scale, long-term decarbonisation potential and ability to underpin new industrial development. Offshore wind will be central to delivering Ireland's climate targets while supporting the development of ports, maritime services, grid infrastructure and export-oriented supply chains, in line with the ambitions of the Green Growth Strategy.

However, maximising the value of offshore wind deployment requires a system-wide approach that also recognises the continued importance of onshore wind as a near-term, cost-effective and system-ready technology. Ireland has an established and growing onshore wind pipeline,

and onshore generation already makes a substantial contribution to national electricity supply. From a delivery and economic perspective, onshore wind represents the most immediate opportunity to grow renewable output while offshore capacity is developed at scale. The emergence of Offshore Hybrid Assets as an opportunity to integrate offshore wind and at the same time strengthen interconnection to other electricity systems provides new opportunities. In particular the integration of High Voltage Direct Current (HVDC) technology will increase in importance over time.
In this context, Large Energy Users (LEUs) and other sources of flexible electricity demand should be viewed as a critical enabler of both offshore and onshore wind. While LEUs are often discussed in relation to future offshore wind volumes, Natural Power considers it equally important that they are strategically encouraged to locate in regions with strong onshore or offshore wind resources and existing network constraints. This approach can reduce system inefficiencies, support regional development and improve the investment case for renewable projects.

Under the 2026 LEAP framework, Large Energy Users (LEUs) are mandated contributors to system security. The CRU's Large Energy User Connection Policy requires Tier B data centres to provide 100% de rated dispatchable generation or storage and to participate directly in the Single Electricity Market. This obligation creates a substantial pool of privately financed grid connected assets with clear value.

The Green Growth Strategy provides a mechanism to convert these private investments into shared public benefit by directing LEUs toward designated Green Energy Parks that relieve nodal constraints. Building on the precedent set by Microsoft in Dublin, where Grid Interactive UPS systems deliver real time frequency response, these facilities can operate as Virtual Power Plants, effectively functioning as a nationally distributed, privately funded battery.
This model also delivers additionality. Because LEUs are required to match 80% of demand with new Irish renewable generation, they become anchor investors for the next phase of onshore and offshore wind deployment. For consumers, the benefits are twofold: reduced exposure to high carbon peaker price volatility and lower Dispatch Down costs, as excess wind generation is absorbed locally rather than curtailed. Within a plan led framework, data centres shift to a core instrument of curtailment reduction, grid stability, and national energy security.

From Natural Power's experience, a coordinated strategy that prioritises offshore wind for long-term scale, while actively leveraging onshore wind, LEUs and system integration measures, best supports the Green Growth Strategy's objectives of optimising renewable energy assets, attracting investment, strengthening regional economies and delivering long-term economic value from Ireland's energy transition.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

We believe that offshore wind requires the most urgent and coordinated supply-chain development support in Ireland. While Ireland has a strong offshore wind resource and a growing project pipeline, there is a clear risk that a significant proportion of economic value will be captured outside the State unless domestic supply-chain capability is developed at pace. Priority offshore wind supply-chain gaps include ports and harbour infrastructure, marine and maritime services, environmental and geotechnical services, and offshore electrical engineering, commissioning and operations and maintenance. Limited capacity in these areas is already driving reliance on overseas suppliers and increasing delivery risk.

In parallel, energy storage and advanced grid technologies must be treated as core enabling supply chains, rather than ancillary technologies. Additional support is required for grid-scale and long-duration energy storage, power electronics and control systems, digital grid management tools, and high-voltage grid delivery capability. Without accelerated development of these supply chains, increasing volumes of offshore wind will lead to higher curtailment, system inefficiencies and reduced economic value.

Floating offshore wind represents a significant emerging opportunity for Ireland, particularly on the Atlantic coast. However, kick-starting this industry will require early targeted support and a simplified Maritime Area Consent (MAC) and consenting pathway for demonstrator and pre-commercial projects. Enabling smaller-scale demonstrators to progress quickly will be paramount to building technical expertise, de-risking future commercial projects and allowing Irish supply-chain companies to develop capability at an early stage. Natural Power has recently opened a west of Ireland office in Co. Mayo and stands ready to support this nascent industry. While offshore wind is the strategic priority, continued support for onshore wind-related supply chains is also important to safeguard near-term delivery. Supporting supply chains linked to grid reinforcement, energy storage and Large Energy User (LEU) integration will be essential to minimising curtailment and protecting existing indigenous capability.

Overall, Natural Power considers targeted supply-chain development across offshore wind, energy storage and advanced grid technologies to be central to delivering the Green Growth Strategy's objectives of value creation, regional development and long-term economic resilience.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Ireland already has a strong base of research activity across many green technologies, including offshore wind. We don't believe that the principal RD&I gaps are in fundamental research, but rather in applied, system-level innovation focused on technologies that are pre-commercial or require adaptation to Ireland's specific offshore conditions, grid constraints and energy system characteristics.

Floating offshore wind represents the most significant RD&I priority. While international research is well advanced, additional support is required for demonstrator and pre-commercial projects addressing the likes of floating foundations, mooring and anchoring systems, dynamic cables, installation methodologies and environmental monitoring. The absence of streamlined pathways for demonstrators, including simplified consenting, remains a key barrier to translating research into delivery capability and early supply-chain development.
Further RD&I support is also required for energy storage and advanced grid technologies, including long-duration storage, hybrid wind-storage configurations, power electronics and digital grid management tools. These technologies are critical to integrating large volumes of offshore and onshore wind and reducing curtailment.
Key barriers to innovation and RD&I include:

- Limited funding for innovation based on applying existing technologies in new ways, rather than novel invention
- Insufficient opportunities for real-world testing, demonstration and early deployment
- Fragmentation across RD&I programmes and agencies
- Weak alignment between research activity and near-term delivery challenges

Government can help address these barriers by prioritising industry-led, applied RD&I, ensuring R&D tax credits support system integration and first-of-a-kind deployment, enabling demonstrator projects through proportionate consenting processes, and aligning funding and supports with the SEAI Offshore Renewable Energy Innovation Roadmap.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

We feel that offshore wind, energy storage, green hydrogen, and smart grids / flexibility technologies all require additional, targeted support at the industrial deployment stage to deliver Ireland's climate targets and the ambitions of the Green Growth Strategy.
Offshore wind (fixed and floating) should be the primary focus. It is an emerging industry for Ireland and remains at an early stage of commercial rollout. In the short term, deployment support is required to enable timely delivery of fixed offshore wind through predictable

consenting and auction frameworks, accelerated grid and port infrastructure delivery, and strong cross-agency coordination. In the medium to long term, floating offshore wind will require dedicated deployment support, including proportionate consenting routes, early demonstrator projects and clear pathways from pre-commercial to commercial scale, to avoid delays and loss of first-mover advantage.

Energy storage, particularly long-duration energy storage (LDES), requires more deployment support to move beyond demonstration and reduce costs through scale. Clear revenue frameworks and system signals are needed to enable storage to support offshore wind integration, reduce curtailment and improve overall system efficiency.
Green hydrogen also requires targeted deployment support to progress from pilot projects to early industrial applications. In the near term, deployment should focus on system flexibility, co-location with offshore wind and constrained network areas, and applications where direct electrification is not feasible.

Finally, smart grids and flexibility technologies require greater emphasis at deployment stage, including grid digitalisation, demand response, flexible connections and advanced system operation tools. These technologies are essential enablers of large-scale offshore wind deployment and minimising system costs.

In summary, Natural Power considers offshore wind (fixed and floating) to require the most urgent industrial deployment support, underpinned by accelerated deployment of energy storage, green hydrogen and smart grid solutions, with clear short-term and long-term objectives aligned to system needs and delivery timelines.

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
We know that many renewable and green technologies are technically mature but are not deploying at scale in Ireland because projects remain high-risk, capital-intensive and slow to progress through consenting and delivery processes.

The most significant barrier is the capacity of the State and State bodies to deliver at pace, including planning, consenting, grid, ports and enterprise supports. Insufficient resourcing, limited coordination across departments and inconsistent implementation materially increase delivery risk, particularly for offshore wind and enabling infrastructure.
Grid constraints represent a further major blocker. Capacity limitations, high curtailment levels and delayed grid reinforcement are already constraining onshore wind and pose a significant risk to offshore wind, storage and flexibility deployment.

Slow and uncertain planning and consenting processes continue to extend project timelines and deter investment, especially for emerging technologies such as floating offshore wind and long-duration energy storage.

High upfront capital costs, combined with route-to-market and offtake uncertainty, increase financing risk for offshore wind, storage and hydrogen projects, while the lack of port-ready infrastructure remains a critical bottleneck for offshore wind delivery.
Natural Power also considers it essential that Ireland's green growth ambitions are underpinned by strong, efficient and well-resourced environmental governance. Early, high quality environmental assessment, clear guidance for emerging technologies and proportionate but robust consenting processes will help accelerate delivery while maintaining biodiversity protection and high environmental standards. Ensuring that State bodies have the capacity to manage environmental assessment at pace will reduce project risk, support responsible development and strengthen Ireland's long term sustainability outcomes.

In summary, the primary barriers to scale relate to delivery capacity, grid and infrastructure constraints, consenting timelines and investment risk, rather than technology maturity. Addressing these issues is essential to achieving Ireland's green growth and climate ambitions.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland?

Government interventions should focus on reducing delivery risk, improving revenue certainty and accelerating project development, particularly for offshore wind and its enabling technologies.
Priority actions include stronger coordination and resourcing across DETE, DCEE, EirGrid, MARA, ports and local authorities, with clear accountability for delivery. Improved coordination is essential to address delays in consenting, grid delivery and port infrastructure.

Enhanced financial incentives and stable market frameworks would provide long-term revenue certainty for investors in offshore wind, energy storage, hydrogen and flexibility technologies, thereby reducing the cost of capital and enabling projects to reach final investment decision.

Greater emphasis should be placed on project enablers, including grid connections, port-ready infrastructure, planning capacity and system integration measures. Government should also actively support clustering and green energy park models, enabling the co-location of renewable generation, Large Energy Users, storage and hydrogen production to reduce curtailment and drive regional economic development.

Finally, market rules should be reviewed and adapted to better reward flexibility, storage and demand-side participation, ensuring the electricity market supports the efficient integration of high volumes of offshore and onshore renewables. Existing supports, including Enterprise Ireland and IDA supply-chain programmes, skills and training initiatives, and regional funding linked to ports and coastal infrastructure, should be expanded and more closely aligned with offshore wind and grid delivery timelines.

8. Are there existing supports that should be expanded or improved?

Existing supports are broadly well-designed but require greater scale, clearer targeting and stronger alignment with delivery timelines, particularly to maximise the opportunity presented by EU funding programmes.

Enterprise Ireland and IDA supports should be expanded and more explicitly targeted at offshore wind, grid, storage and system integration supply chains, including professional and advisory services, not just manufacturing. These supports should be better aligned with relevant EU funding mechanisms to help Irish companies leverage programmes such as the Innovation Fund, Connecting Europe Facility and Horizon Europe.

Skills and training programmes should be scaled up and aligned with offshore wind, grid and marine delivery needs, with a strong regional focus around ports and coastal locations, and greater use of EU co-funding where available.

Regional and infrastructure funding should be more closely linked to port-ready infrastructure, grid reinforcement and offshore wind clustering, with coordinated use of national and EU funding streams to reduce delivery risk and accelerate project timelines.

Finally, RD&I and innovation supports, including grants and tax incentives, should better support applied, industry-led innovation and first of a kind deployment, while ensuring strong alignment with EU-level research, demonstration and deployment programmes.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

We consider that the industrial strategy should support sectors that can drive clean electricity demand at scale and provide flexibility, ensuring that large-scale renewable deployment, particularly offshore wind, is economically viable and delivers wider economic value for society.

Manufacturing and industrial demand should be a primary focus. Energy-intensive and industrial users are critical both as large electricity consumers and as sources of demand-side flexibility. Supporting industrial electrification, process heat conversion and flexible demand will be essential, particularly given that a significant share of future demand flexibility is expected to come from industrial and commercial sectors. Appropriate incentives, market rules and advisory supports will be required to enable participation, especially for harder to decarbonise activities. Digital and data services represent another key aligned sector. When supported by clear market signals and co-location incentives, energy intensive digital infrastructure can help underpin investment in offshore wind, storage and grid infrastructure, while also contributing to system flexibility.

Transport and mobility, including private vehicles, public transport, freight and ports will be a major driver of long-term electricity demand growth. Coordinated deployment of charging infrastructure, smart charging and grid integration will be important to maximising system value.

Construction and the built environment will play a central role in the electrification of heat and the rollout of low-carbon buildings. Supporting skills, supply chains and standards in this sector will drive sustained electricity demand and emissions reductions across the economy.
While new investment and concepts are important, Natural Power considers it critical that the strategy also supports the transition of existing industrial and commercial sectors, ensuring they are enabled through incentives, market design and advisory supports to electrify, decarbonise and actively participate in the energy system. This balanced approach will be essential to making the renewable energy transition viable at scale and delivering the objectives of the Green Growth Strategy.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Identifying and enabling companies in complementary sectors to broaden their activities into renewable energy and green technologies will require active leadership from Government and State agencies, combined with practical, low-risk mechanisms that allow companies to engage and innovate. Government and semi-State bodies particularly Enterprise Ireland, IDA Ireland and SEAI should play a central role in proactively identifying companies with transferable skills and capabilities across sectors such as construction, manufacturing, marine services, digital and engineering. This should include structured mapping exercises, targeted outreach and sector-specific engagement focused on renewable energy and energy system opportunities.
Companies are more likely to diversify where there is clear visibility of the inherent opportunity. Providing early visibility of project pipelines, supply-chain needs and emerging demand linked to offshore wind, grid development, storage and flexibility would give businesses the confidence to invest in new capabilities. A dedicated innovation and transition funding pot should be available to allow companies and their customers to test, pilot and adapt different approaches to renewable energy and green technologies. Given the diversity of sectors and use cases, this funding should support experimentation rather than assume a one size fits all solution, and should enable collaboration between energy developers, technology providers and end users.
Beyond financial supports, companies will benefit from technical, regulatory and commercial advisory support to navigate energy markets, grid processes and consenting requirements. This is particularly important for firms new to the energy sector.
Finally, stronger coordination between enterprise supports, energy policy, market design and infrastructure delivery will be essential to ensure companies are not discouraged by complexity or conflicting signals.

In summary, Natural Power considers that a combination of active State-led identification, flexible innovation funding and clear market signals is required to encourage companies in complementary sectors to broaden their activities into renewable energy and green technologies and to participate meaningfully in Ireland's green transition.

International Examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

The most effective international industrial development interventions are those where Governments have actively shaped markets, delivered enabling infrastructure and supported early deployment until private investment could scale.

The UK offshore wind sector demonstrates the importance of long-term revenue certainty through stable market mechanisms, combined with Government-led seabed leasing, coordinated consenting and early investment in ports and grid infrastructure. This approach significantly reduced risk and enabled rapid scale-up and supply-chain development. There are other policies in the UK, specifically within Great Britian, that are looking to enable Large Energy Users to reduce cost to the consumer. Firstly, a revised Demand Flexibility Service will be launched soon by the System Operator, NESO. This looks to introduce lower thresholds of participation for users and supplements similar schemes at the distribution level. Secondly the UK Government is consulting on schemes to encourage Large Energy Users, specifically data centres, to locate in Scotland and the North of England to alleviate curtailment.

Denmark and Holland provide strong examples of State-led risk reduction, with centralised planning and Government delivery of offshore grid infrastructure. By removing key development risks and providing clarity on roles and timelines, these models accelerated deployment and improved investor confidence.

A relevant example is the Industrial Symbiosis model, adopted in the Danish clusters Kalundborg and Aalborg. In Kalundborg, firms like Novo Nordisk and Ørsted physically trade over 25 resource streams, using one plant's waste steam or cooling water as another's raw material. GreenLab Skive takes this further by treating real-time energy data as a shared infrastructure asset. This allows companies to sync their heavy power loads with onsite renewables, effectively creating a "transparent grid" that lowers the risk exposure for SMEs by letting them plug in to a neighbour’s surplus.

Germany has effectively supported emerging technologies through capital support and pilot to commercial pathways, allowing technologies to mature and reduce costs before full market exposure. Across these examples, common success factors include stable market frameworks, early investment in shared infrastructure, and targeted support for first of a kind deployment. Natural Power considers these approaches directly applicable to Ireland, particularly for offshore wind, floating wind and enabling technologies, and highly relevant to achieving the objectives of the Green Growth Strategy.

12. If so, how might similar approaches be adapted to the Irish context?

International best practice can be most effectively adapted to Ireland through stronger State leadership in delivering enabling infrastructure, particularly ports.
Ports should be treated as strategic national infrastructure, with early designation of roles, coordinated planning, and upfront public investment to de-risk development, similar to

approaches used in the UK, Denmark and Holland. Clear long-term policy signals would allow ports and the private sector to invest with confidence and avoid delays that risk exporting offshore wind activity and value overseas.

More broadly, Ireland can adapt international models by reducing project risk through State-led delivery of shared infrastructure, providing stable market frameworks, and supporting early deployment / pioneering projects until private investment can scale.
In this context, the establishment of State supported symbiosis centres at strategic hubs could enable structured coordination between Tier 1 energy users and local SMEs. By mapping resource flows, including electricity demand profiles, waste heat and by products, and by enabling the secure sharing of industrial telemetry through a national knowledge exchange framework, private system assets can be leveraged to deliver wider public value.
Focusing investment on a small number of strategically located ports and clusters, aligned with offshore wind rollout phases, would accelerate delivery, build capability quickly and maximise economic return in line with the Green Growth Strategy.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

SMEs will be best placed to participate in the development and deployment of green energy technologies where Government provides clear market visibility, targeted supports, reduced delivery risk and simplified access to funding.

Key priorities include early visibility of project pipelines for offshore wind, grid, energy storage and flexibility, enabling SMEs to invest in skills and capability with confidence. Enterprise supports should be explicitly designed to help SMEs enter and scale within energy-system supply chains, recognising transferable capabilities across engineering, construction, marine, digital and professional services.

Access to flexible funding mechanisms is essential to allow SMEs to test, pilot and adapt services or technologies for energy projects, supported by collaboration with developers and system operators. However, these supports must be simpler and faster to access, with reduced application complexity, clearer guidance and proportionate reporting requirements, recognising the limited administrative capacity of many SMEs.

Clustering and consortium models, particularly around ports, grid nodes and green energy parks, can further lower barriers to entry and enable SMEs to participate in larger projects.
In addition, SMEs require practical advisory support to navigate planning, grid, market and procurement processes, alongside SME-friendly procurement and contracting structures that support meaningful participation in large-scale energy projects.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Ireland should adopt a coordinated, industry-led and delivery-focused approach, informed by how leading renewable energy markets monitor technology development.

Internationally, countries with successful offshore wind and clean energy programmes combine regular market intelligence, active industry engagement and transparent data sharing to track technology maturity and identify emerging sectors. Ireland should adopt a similar model, drawing on input from developers, consultancies, SMEs, utilities and investors active across multiple markets, who are well placed to identify technologies approaching commercial readiness.

Monitoring should include structured, recurring assessments of key technologies such as offshore wind (including floating), energy storage, grid technologies and hydrogen, tracking project pipelines, supply-chain readiness, skills availability, costs and deployment risks. Progression from demonstrator to early commercial deployment should be a primary indicator of maturity, rather than research activity alone.

To support this, Ireland should consider establishing a centralised national database or observatory for green technologies, coordinated across DETE, DCEE, SEAI, Enterprise Ireland, IDA, EirGrid and MARA. This resource could consolidate data on projects, supply chains, infrastructure readiness and RD&I activity, providing a shared evidence base to inform policy, enterprise supports, skills planning and infrastructure investment.

In summary, Natural Power considers that combining international benchmarking, industry-led insight and a central national monitoring framework would enable Ireland to more effectively track green technology development and respond early to emerging opportunities in line with the Green Growth Strategy.

Other Considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

The success of the industrial strategy will depend on a strong focus on delivery, coordination and execution.

DETE should recognise the role of experienced project developers and consultants as enablers of green growth and prioritise State delivery capacity, ensuring that planning, grid, ports, skills and enterprise supports are adequately resourced, well-coordinated and sequenced. Ambition must be aligned with infrastructure and system readiness to avoid increasing project risk, costs and curtailment.

Grid, ports, market rules and planning capacity should be treated as strategic enablers of green growth, with early and proactive investment. Finally, policy stability and ongoing industry

engagement will be essential to maintaining investor confidence and ensuring the strategy remains grounded in delivery realities.

A strong industrial strategy must ultimately be judged on delivery, pace and economic impact. Natural Power would like to thank DETE for the opportunity to participate in this consultation and we stand ready to support Government, industry and the wider public in realising the full economic, environmental and societal benefits of an ambitious Green Growth Strategy for Ireland.

Yours sincerely

[redacted]

[redacted]

[redacted]

NEG8 CARBON

1.Which technologies should Ireland prioritise as part of such a strategy?

To date, work towards the green transition in Ireland has primarily involved the development of wind and solar renewable energy resources as well as biogas to replace the role of fossil fuels in electricity generation, energy networks and specific transport systems. This work should clearly continue. However approximately 20% of CO2 emissions (7 to 8 million tonnes per annum) result from hard-to-abate sources. We at NEG8 Carbon believe that Ireland should have as one of its green transition priorities the establishment of DAC as an instrument to achieve net zero/negative CO2 emissions in hard-to-abate areas including:

(a) E-fuels for aviation (e-kerosene) and shipping (e-methanol) (circular, net-zero decarbonisation). Note that the average Irish CO2 emissions from aviation = 2.55 Mtonnes CO2 /yr during the period 2013-2023 (3.44 Mtonne/yr in 2023) and Navigation emissions = 0.27 Mtonnes/yr during 2013-2023 (0.29 Mtonnes/yr in 2023). Coupled with hydrogen production systems the high purity CO2 captured from the atmosphere using DAC could readily replace the importation of the fossil fuels currently needed for aviation and shipping;

(b) Building materials manufacturing (CO2 storage in the cement/concrete industry with net negative decarbonisation). The potential capacity in Ireland is to store up to 0.5 Mtonnes of CO2 annually in cement and concrete products depending on the nature of downstream utilisation;

(c) Inefficiencies in energy management (specifically waste heat from Data Centres (as much as 7 TWh in 2024) and dispatch-down power generation (averaging ~1.1
TWh/yr since 2020) and emissions from waste-to-energy/fuel systems.

In addition to the utilisation technologies mentioned in (a) and (b), permanent cradle-to-grave end uses of the CO2 captured via DAC (particularly with reference, in part, to (b) and (c) above)

should be considered including storage either physically in disused gas (and/or oil) wells, or chemically through subterranean mineralisation or surface storage involving enhanced rock weathering (ERW).

2.and 3 What challenges and opportunities exist across different technologies? How can government best support innovation, investment and workforce development within the renewable energy and green technology sphere?

These two questions complement one another and are answered together. Focussing on those challenges and opportunities relating to Carbon Capture and the government supports needed to pursue technologies in this area we can summarize as follows:

(a) Carbon Capture opportunities in an Irish setting

For optimal deployment of the DAC systems under development at NEG8 Carbon, access to waste heat is a very important consideration. Based on waste heat figures noted in (1.c) above there is clearly a significant opportunity for NEG8 Carbon to avail of the waste heat from Data Centres and other sources. For example, in full production if NEG8 Carbon's advanced DAC systems utilised up to 7 TWh of waste heat from the Data Centres currently established in Ireland, this would enable capture of 15 Mtonnes/yr of CO2 from the atmosphere, i.e. approximately half of Ireland's total CO2 emissions. This however raises a significant challenge at this time vis-a-vis CO2 transport and storage which we turn to in (b) below.

(b) Carbon Capture Issues Requiring Legislative Solutions

Ireland currently lacks the regulatory framework to enable a functioning carbon capture ecosystem. We would welcome discussion on legislation covering:

The temporary storage of CO2

The permanent subterranean storage of CO2 either onshore or offshore

The transport of CO2 via pipelines, road/rail, and ship

The establishment of CO2 terminals on the east coast including possible sites in Dublin, Cork port and Waterford port

The establishment of storage sites at Kinsale and Corrib gas fields and their feeder network

The Government needs to transpose EU legislation for the utilisation of waste heat from industry, including data centres. The EU Energy Efficiency Directive (2023/1791) Article 12 establishes reporting obligations for data centres above 500kW, with Member State transposition due by 11 October 2025. Germany's implementation through the EnEfG goes further, requiring 10% waste heat reuse from July 2026, rising to 15% by July 2027 and 20% by July 2028. Ireland should consider similar mandatory requirements for new developments, consistent with the Government's preference for facilities decarbonised by design.

(c) Incentives for Hard-to-Abate Industries to Adopt Carbon Capture

There is a reluctance by large emitters to adopt Carbon Capture technologies due to cost and competitiveness issues. We propose two solutions:

First-of-a-Kind (FOAK) Demonstration Projects: Government should fund FOAK demonstration projects in each hard-to-abate industry sector to rapidly showcase what is possible. This de-risks adoption for subsequent commercial deployment.

Contracts for Difference: Ongoing support for rollout should include CfD mechanisms similar to those used in the UK. The UK Government committed £21.7 billion over 25 years to its CCUS cluster programme on 4 October 2024, precisely because such mechanisms provide the long-term certainty that enables private investment.

EU State aid rules provide substantial flexibility for such support. The amended GBER allows aid of up to €30 million per project for environmental protection without prior Commission notification. The new Clean Industrial Simplification Aid Framework (CISAF), effective from 25 June 2025, further streamlines support for carbon capture technologies and will remain in force until 31 December 2030.

4.How can we build on the success of Powering Prosperity and develop a stronger industrial strategy with even greater impact

Our response to this question is in two parts:

(a) Support for Irish Climate Deeptech Companies
It takes many years of research and development to build a DeepTech company. Ireland does not have the support systems in place to encourage the development of such companies and so we have very few. The road to the development and eventual deployment of wind power, a major component of Powering Prosperity, is a testament to this with solar power deployment also experiencing similar issues in recent years.

NEG8 Carbon is an Irish Deeptech company that started in TCD in 2014. All direct investment to date has come from climate-concerned Irish family offices who provide patient capital which is not available in the VC world. However, their resources are limited. The company has received no state support to date, yet we have developed a technology which is key to Ireland's decarbonisation efforts.

The company now requires additional funding to complete the scale-up of our technology and build our first commercial systems.

We would like to see the Irish Government proactively support key Irish DeepTech companies through grants and equity participation without the matched funding requirement. ISIF's double bottom line mandate and €2 billion climate commitment provide a ready vehicle for such investment, and the EU State aid frameworks outlined above provide the legal basis.

(b) Role of NEG8 Carbon in Creating an International Network to Support Irish Decarbonisation
NEG8 Carbon has established relationships with leading international partners across the carbon capture value chain:

- Aker Solutions (CCUS infrastructure – Sleipner, Northern Lights, Net Zero Teesside)
- Northern Lights (CO2 transport and storage)
- Equilibrion (project development)
- Rolls-Royce (SMR nuclear)
- Kent
- Johnson Matthey
- CRH
- Mott MacDonald
- Sumitomo
- Skellefteå Kraft
- SkyNRG
- ThyssenKrupp

We note Gas Networks Ireland's recent eTenders publication for the development of a CCUS transport network and have brought this opportunity to the attention of Aker Solutions. NEG8 Carbon has introduced Aker Solutions to the Government.

We hope the above comments and responses to your questions provide you with a good overall view of NEG8 Carbon's ambitions and our possible role in the new Green Growth Strategy and we look forward to our participation in the SAF Task Force in the coming months.

Kind Regards

NERGY CLOUD IRELAND

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

One of the most impactful elements of Powering Prosperity has been its focus on enabling infrastructure and supply chain readiness to ensure offshore wind deployment is not constrained by system bottlenecks. A similar strategic approach should now be applied to addressing renewable curtailment across the wider energy system. Ireland is already experiencing significant levels of curtailed renewable electricity due to grid and system limitations. Rather than treating this as an unavoidable loss, the Green Growth Industrial Strategy should prioritise investment in flexible storage solutions — including medium-duration battery systems (such as emerging 4-hour battery deployments), long-duration storage, and

community-scale storage models — to capture and repurpose this otherwise wasted clean energy. Critically, this captured energy could be directed toward tackling energy poverty through structured demand-side programmes, social housing retrofits, and partnerships with community organisations. Aligning storage deployment with social impact objectives would simultaneously improve grid efficiency, reduce system costs, strengthen energy security, and deliver measurable social benefit. Curtailment should be reframed not as a technical constraint, but as an untapped resource that can drive inclusive green growth.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ireland should prioritise storage, grid flexibility and demand-side technologies that reduce renewable curtailment. We are already wasting clean electricity because the system cannot absorb it at certain times. Capturing that energy through medium and long-duration storage, smarter grids, community-scale batteries and flexible demand (including social housing retrofits and smart heating) would both cut emissions and lower costs. The transition should be designed so that curtailed renewable energy can directly support households in energy poverty, making climate action tangible and inclusive.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Storage and grid technologies need the most supply chain support. Ireland lacks sufficient domestic capability in battery integration, grid-forming inverters, control systems, and local engineering services to deploy flexibility at scale. If curtailment is going to be reduced, we need a stronger ecosystem around storage development, installation, safety standards and long-term maintenance. There is also a gap in community-level delivery partners who could link storage projects to social housing and vulnerable households.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

More support is needed for research and in-company innovation in grid flexibility, storage optimisation and demand-side management. One barrier is limited access to real system data for innovators trying to design solutions that reduce curtailment. Another is uncertainty around market signals for flexibility and storage revenue streams. Government can help by funding real-world pilots that connect curtailed energy to social housing or community projects, and by providing clearer long-term policy signals for storage and flexibility markets.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Storage technologies, particularly medium-duration batteries and other flexible solutions, need stronger industrial deployment support. Curtailment is increasing, yet storage rollout is not keeping pace. Deployment should be linked to measurable social outcomes, such as reducing energy bills for low-income households. Supporting projects that combine grid services with energy poverty programmes would ensure the green transition delivers both system efficiency and social impact

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The main barriers are grid constraints, slow planning and connection processes, uncertain revenue models for storage, and limited coordination between energy policy and social policy. There is also a risk that the transition benefits those who can invest in rooftop solar or EVs, while vulnerable households see little direct gain. If curtailment is reframed as a resource and deliberately channelled toward reducing energy poverty, Ireland can scale renewables in a way that is both economically smart and socially fair.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Government should introduce targeted supports that link storage and flexibility directly to reducing renewable curtailment and tackling energy poverty. This could include dedicated grant or auction schemes for medium and long-duration storage, especially where projects commit to measurable social impact outcomes (for example, lowering bills in social housing). State-backed pilot programmes that connect curtailed renewable electricity to community heating, retrofitted homes or local energy schemes would also accelerate learning and deployment. In addition, clearer long-term market signals for storage and demand-side flexibility are needed so private capital can invest with confidence.

8.Are there existing supports that should be expanded or improved?

Existing supports for renewables should be expanded to better integrate storage and social impact criteria. For example, renewable support schemes could reward projects that minimise curtailment through co-located storage or demand management. Energy poverty schemes could also be broadened to include smart energy technologies, thermal storage and community batteries, not only fabric upgrades. There is also scope to improve coordination between energy, housing and social protection policies so that clean energy infrastructure is deliberately used to reduce inequality as well as emissions.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Yes. The strategy should actively support sectors that sit around the energy system, not only generation itself. This includes construction and retrofit companies, social housing providers, digital and software firms working on energy data and optimisation, community development organisations, engineering services, and advanced manufacturing. These sectors are critical if we want to reduce curtailment and ensure renewable energy delivers real benefits to households in energy poverty. The transition will only work if grid, storage, housing and social infrastructure are developed together rather than in silos.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Companies can be identified through existing enterprise agency networks, local authorities and housing bodies, and then encouraged through targeted funding calls that link green technology deployment with social outcomes. Clear, long-term policy signals around storage, flexibility and electrification will also encourage firms to diversify. Demonstration projects that show how curtailed renewable energy can reduce energy bills in communities would give businesses practical examples and a reason to expand into this space. Public procurement can also play a role by prioritising projects that combine renewable deployment, storage and measurable reductions in energy poverty**.**

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Several countries have taken strong system-level approaches that Ireland can learn from. The UK has used long-term contracts and capacity market signals to support offshore wind and storage deployment at scale. Germany has invested heavily in grid modernisation and flexibility markets to better integrate renewables. In parts of the US, targeted federal incentives have accelerated battery manufacturing and clean energy deployment. What stands out in these examples is long-term policy certainty, clear revenue frameworks for storage and flexibility, and deliberate efforts to build domestic supply chains rather than relying fully on imports.

12.If so, how might similar approaches be adapted to the Irish context?

In Ireland, similar approaches could be adapted by providing stable, multi-year support frameworks for storage and grid flexibility, alongside offshore wind. Policy should explicitly address renewable curtailment by creating strong market incentives to capture and use surplus clean energy. Ireland could also link industrial supports to social impact goals, for example prioritising projects that reduce energy poverty or support social housing electrification. A clear pipeline of projects, streamlined planning and grid processes, and coordinated action across

energy and housing policy would help translate international best practice into practical Irish outcomes.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can support SMEs by making the green transition practical, accessible and commercially viable for them. Many SMEs could play roles in storage installation, grid services, retrofit delivery, digital optimisation, and community energy projects, but they need clearer pipelines and simpler entry points. Government should provide targeted funding calls designed specifically for SMEs, not only large developers, and reduce administrative complexity in grant and procurement processes.

Clear, long-term signals around storage, flexibility and electrification would allow SMEs to invest in skills and equipment with confidence. Training and accreditation programmes focused on battery systems, smart energy controls and grid integration would also help. Finally, public procurement and demonstration projects should deliberately include SME participation, particularly where projects aim to reduce renewable curtailment and support households experiencing energy poverty. This ensures SMEs are not observers of the transition, but active delivery partners in building a more inclusive energy system.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Ireland should monitor green technology development using clear, practical indicators that go beyond installed capacity. This should include tracking renewable curtailment levels, storage deployment (by duration and location), grid flexibility performance, and the social impact of projects, including reductions in energy poverty and household energy costs. Monitoring should link technical system performance with economic and social outcomes, not treat them separately.

Government could establish a cross-agency monitoring group bringing together energy, enterprise and housing bodies to review progress annually and publish transparent data dashboards. Ireland should also support structured pilot and demonstration programmes, using them as learning platforms to identify emerging technologies early, particularly in storage, demand response and digital grid solutions. Regular engagement with SMEs, communities and research institutions would help surface innovation trends before they are visible at large scale, ensuring policy stays adaptive rather than reactive.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Yes: one critical point is that the strategy should explicitly connect industrial policy with social outcomes. If Ireland continues to build renewable generation without addressing curtailment, flexibility and affordability, we risk creating a system that is technically green but socially unbalanced. Curtailment should be treated as a strategic opportunity: surplus renewable energy can be redirected through storage, smart demand and community energy models to lower bills for households experiencing energy poverty. That would make the transition visible and meaningful to people, not abstract.

The strategy should also avoid siloed thinking. Energy, housing, enterprise and social protection policy need to be aligned so that grid upgrades, storage deployment and retrofit programmes reinforce one another. Clear long-term signals for storage and flexibility are as important as generation targets. Finally, Ireland should prioritise building domestic capability in integration, optimisation and system services, not only generation assets, so that we develop lasting expertise and jobs in managing a high-renewables system. A green industrial strategy should strengthen the whole system and ensure the benefits of the transition are widely shared.

We have just the following brief addendum (to the WEI Submission).

The challenge of our time is energy security of supply and energy independence for Ireland. Our modelling of the electricity system shows that staying on the current path towards 80% RES-E balanced by gas is more expensive (and of course less secure) than building a 100% gas free system with just wind, solar, short duration storage, long duration energy storage, interconnection and liquid fuel backup. With industrial strategy, we need to look beyond just the electricity sector. Aviation is a particular challenge. Our fairly bold claim is as follows. If Ireland picks a sensible mix of electricity system technologies, then we can generate enough energy to at least meet ReFuelEU mandated targets, and in fact fully satisfy our own needs in terms of aviation fuel.

But we can only do this if we pick the right technologies in the rest of the energy system. Specifically we should choose hydrogen based LDES so that we can cheaply generate green hydrogen using the headroom on the electrolysers, compressors and geological hydrogen storage. We can make green hydrogen which is cheap and easy to transport by road to refineries in Cork and Dublin to blend with aviation fuel.

This can be upgrade to e-SAF using the proven methanol to jet pathway. This fuel also need biogenic carbon dioxide. Again, if we ensure there is some level of CCS applied to biomass from Edenderry, CCS on cement factories with bio fuels such as biomethane or biomass, and CCS capturing at biogas upgrading, then our calculations show there is sufficient

to meet our needs, without having to resort to expensive Direct Air Capture. Conventional thinking suggests that building standalone dedicated infrastructure and carbon sources for e-SAF leads to fuel at 7-10x the cost of aviation fuel today. The better approach is to share the LDES infrastructure required for the electricity system. We believe this pathway means e-SAF can be produced at 2-3x today's aviation fuel (or under 2x if carbon price was included in the comparison).

There are lots of heavy industries that Ireland will never be competitive in attracting to our shores. But the Irish are the largest per capita consumers of jet fuel, and we are home to a very large and important leasing business. We've never had a supply disruption, but we suspect if there ever was one, as an island nation, there would suddenly be a lot of political focus on trying to secure an indigenous jet fuel supply. As we embark on the next phase of building our electricity sector, we believe it would be a missed opportunity not to kill two birds with one stone by preferring technologies that can solve aviation, traditionally one of the hardest to abate sectors.

Best regards,
[redacted]

RENEWABLE GAS FORUM IRELAND

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

From our perspective as the Renewable Gas Forum Ireland (RGFI), the principal lesson from Powering Prosperity is that offshore wind was treated not solely as climate policy, but as industrial strategy with clear delivery architecture. The most impactful elements were structured skills planning, cross-agency coordination, visible implementation tracking, and investable capital frameworks. The progress achieved under Powering Prosperity demonstrates the value of coordinated Government and Enterprise action in building an industrial supply chain around offshore wind.

Ireland's biomethane and renewable gas sector remains at an earlier stage of development and behind many European peers in deployment. However, it offers significant advantages in terms of indigenous energy security, industrial heat decarbonisation, long-term circular bioeconomy integration as well as economic and social sustainability.

Applying similar enterprise-focused mechanisms — particularly in skills development, cross-agency coordination and supply-chain implementation — could materially accelerate this sector.

In 2021 the Project Clover collaboration, led by Danone, along with Wyeth Nutrition, Tirlan, Dairygold, Carbery, Lakeland Dairies and Tipperary Co-op, commissioned KPMG, with RGFI co-

ordination, to examine the commercial and environmental sustainability of agri-based biomethane and biofertiliser production.

The Project Clover Feasibility Study, produced in October 2021, demonstrated how a farmer based, renewable gas industry, underpinned by a Charter to ensure environmental sustainability would:

- assist in decarbonising the full supply chain – specifically the significant gas energy input to dairy processing, but also addressing on-farm scope 3 emissions
- solve issues of slurry management, while producing organic fertilisers to displace artificial fertilisers, which will improve water and air quality and soil structure
- generate additional revenue streams to support on-farm sustainability, without reducing the national herd or disrupting food production
- support commercial sustainability and competitiveness of the Irish food and drinks industry
  create and sustain 3,000 jobs across rural Ireland

This study provided a practical template for scaling biomethane in Ireland and was referenced widely in the National Biomethane Strategy, published in 2024. Unfortunately, the reality today is that indigenous dairy and food processors have struggled to contract biomethane competitively where volumes are scarce and price volatility is high. Without long-term revenue certainty and meaningful capital de-risking, the dairy processors have been reluctant to underwrite early plant development. This underscores the need for enterprise-aligned demand frameworks and bankable investment conditions.

How the most impactful elements of Powering Prosperity could support Renewable Gas.
a The funded Offshore Wind Skills Action Pla addressed a key constraint — workforce capability — and signalled seriousness of intent. A structured Renewable Gas / Anaerobic Digestion Skills Programme could: Build AD plant operation and maintenance expertise; Develop gas upgrading and grid injection competence; Support digestate management standards; Enable mid-career transitions into renewable gas while strengthen indigenous engineering design and plant build capacity
b) Formal Cross-Agency Coordination. A structured coordination mechanism between: Gas Networks Ireland; Enterprise Ireland; IDA Ireland and RGFI as a co-ordination partner would: align gas network planning with enterprise development; support domestic engineering and technology providers, facilitate industrial heat decarbonisation and anchor renewable gas within Ireland’s competitiveness strategy.
c) Capital Funding - support for indigenous high energy users (ie food industry) is essential if it is to compete effectively. Ensuring long-term market visibility and de-risked infrastructure investment would allow

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Biomethane and renewable gas should be prioritised within Ireland's green growth strategy because they address a critical gap in the energy transition: high-temperature industrial heat, where electrification is not always technically or economically viable. In addition Heavy Transport may in time also find compelling uses for compressed (or liquid) biomethane in the green transition.

These renewable gasses strengthen indigenous energy security by producing dispatchable renewable energy from domestic resources, and they anchor circular bioeconomy value chains through nutrient recycling and farm-based diversification.
They are also directly relevant to Ireland's globally exposed agri-food processing base. Irish dairy and food manufacturers must decarbonise thermal energy while remaining internationally competitive. Biomethane offers a realistic pathway to do so — provided commercial conditions are workable. (The Project Clover dairy industry collaboration (2021) demonstrated industry alignment and intent. What is missing is enterprise-aligned commercial architecture.)

Ireland remains significantly behind many European peers in biomethane deployment. This lag now presents both a climate risk and an industrial competitiveness risk. If Ireland does not accelerate delivery, it risks importing both technology and renewable gas value chains rather than developing indigenous capability.
Acceleration requires more than targets. It requires enabling conditions:

- A structured Renewable Gas Skills Programme to build operator, engineering and grid injection competence
- Clear and bankable commercial frameworks to unlock investment
  Coordinated cross-agency delivery
- And structured approaches to social acceptance — ensuring that farm-based AD development is underpinned by transparent standards, environmental safeguards, and community engagement.
- Biomethane should therefore be treated not simply as an energy option, but as an industrial capability and enterprise development priority.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Ireland has a stated ambition to build an indigenous AD industry, (the national strategy set a target of 5.7 TWh by 2030). Current grid-connected capacity remains minimal relative to the 5.7 TWh ambition, underscoring the scale of supply-chain activation required. Without enterprise support, the majority of capital equipment and integration expertise will continue to be

imported, limiting domestic value capture.

The following technology elements require targeted supply-chain support:

Anaerobic Digestion (AD) Plant Technology

- Modular AD systems suitable for Irish farm-scale and cluster-scale deployment
- Feedstock handling and pre-treatment system
- Process control and optimisation technologies[GK4.1]

Gas Upgrading Technologies

- Membrane separation systems
- Water scrubbing and PSA (Pressure Swing Adsorption) systems
- Gas purification and drying systems

Upgrading to grid-specification biomethane is a specialised technical step requiring high compliance and operational reliability. Building domestic integration and servicing capability is essential to avoid long-term reliance on imported technical services.

Grid Injection and Metering Systems

- Gas quality monitoring
- Metering and odorisation systems
- Pressure regulation and injection interface equipment

Gas Networks Ireland has established technical standards and a renewable gas registry infrastructure. This provides a strong institutional foundation. However, supplier capacity to design, integrate and commission injection systems at scale remains limited and requires structured enterprise support.

Digestate Processing and Nutrient Recovery Technologies

- Solid–liquid separation systems
- Nutrient concentration and valorisation technologies
- Quality assurance and product standardisation systems

Project Clover identified digestate as a core circular bioeconomy output. Technology pathways that convert digestate into market-ready biofertiliser products are essential to strengthen plant economics and environmental performance.

Commercial and Digital Infrastructure Technologies

- Certification and traceability systems
- Digital monitoring and MRV (measurement, reporting and verification)
- Aggregation and trading platforms

Ireland is comparatively advanced in renewable gas registry infrastructure, which provides a platform for scaling. However, digital tools that support contracting, tracking and compliance at scale require further market development.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Despite the national ambition for biomethane, Ireland remains at an early deployment stage and needs additional support in terms of broad/system research, development and innovation and in-company RD&I . Priority RD&I areas include feedstock optimisation, methane-loss reduction, upgrading efficiency, digestate valorisation, and measurement and verification systems.

Barriers include fragmented demonstration funding, limited pathways from pilot to scale, and uncertainty in long-term market structures.

Specific needs

1. Whole-system performance and replicable plant models (Irish feedstocks, Irish operating conditions)

RD&I is needed to develop replicable, bankable “reference designs” for farm and cluster-scale plants—covering feedstock logistics, pre-treatment, digester stability, process control and operational reliability. This is crucial in an Irish context where the sector is early-stage and still developing the practical delivery model at scale.

2. Methane emissions measurement and mitigation (LDAR and “low-leak” operational standards)

Methane loss can materially affect carbon intensity and public confidence. RD&I is required to establish Irish best practice on measurement, continuous monitoring, and leak detection and repair (LDAR), and to embed “low methane slip” performance into procurement/specifications. The importance of robust methane emissions measurement/mitigation is well documented in European and international technical literature.

3. Upgrading optimisation and injection compliance (technology integration, not just equipment)

Ireland has clear technical requirements for biomethane injection (gas quality parameters, monitoring, commissioning and operational compliance). RD&I should focus on improving upgrading efficiency, reducing downtime, and developing standardised injection interface solutions that can be rolled out repeatedly (lower cost, lower risk).

4. Digestate processing, nutrient recovery and “market-ready” biofertiliser products

Digestate is central to the circular bioeconomy case, but it needs credible, scalable pathways:

solid–liquid separation, nutrient concentration/recovery technologies, emissions management during storage, and product quality assurance. This is an active RD&I field internationally, with established and emerging techniques documented by IEA Bioenergy and recent practical reviews focused on digestate use/valorisation and emission risk reduction.
5. MRV, certification and integration with industrial decarbonisation compliance
RD&I is also needed on "digital and compliance infrastructure": measurement, reporting and verification (MRV) that supports credible sustainability claims and enables industrial users to procure biomethane in a way that integrates with regulated reporting requirements (e.g., updating monitoring plans under EU ETS contexts).

Barriers Government could help address

- Fragmented pilot-to-scale pathways – Pilot and demonstration activity exists, but there remains a funding and support gap between pilot validation and commercial deployment
- Limited shared demonstration environments: Ireland would benefit from testbeds/demonstrators that allow multiple SMEs/technology providers to validate performance, emissions control and digestate solutions under Irish conditions.
- Standards and rules not fully mature for digestate products: without clear quality pathways and accepted use/valorisation models, digestate can become a bottleneck to deployment – and a circular economy / nitrates management opportunity missed
- Data and benchmarking gaps: early Irish plants need a structured approach to performance benchmarking, emissions measurement protocols and open learning (appropriately anonymised) to improve the next wave of projects.
- Uncertainty in long-term market structures: where revenue/offtake conditions are unclear, companies underinvest in in-house RD&I and capability because they cannot see a stable market.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Anaerobic digestion–based biomethane requires significant additional support in terms of industrial deployment if Ireland is to meet the target set out in the National Biomethane Strategy — namely the ambition to deliver up to 5.7 TWh of biomethane per annum by 2030. While policy intent is clear, deployment remains at an early stage relative to this ambition. Ireland currently has only a very small number of grid-connected biomethane facilities, meaning that the gap between installed capacity and the 2030 target is substantial. The constraint is no longer strategy design; it is industrial execution.

Industrial deployment is therefore the current bottleneck
To close this gap within the remaining timeframe to 2030, Ireland must accelerate:

- Final Investment Decisions on new AD plants
- Planning Permission process and timely decision making

- Grid injection readiness and connection timelines
- Capital deployment at scale
- Bankable long-term offtake arrangements
- Without scaled and coordinated deployment support, the 5.7 TWh target will not be met within the required timeframe.

Industrial deployment support is required in three specific areas:

1. Early-Plant Capital De-Risking
Biomethane plants are capital-intensive, particularly at first-of-a-kind scale.
Without scaled and predictable capital frameworks, projects will not reach Final Investment Decision.

2. Bankable Revenue Structures
The RHO will act as a demand-pull mechanism. However:

- Timing and ramp-up is critical
- Price certainty and tradability matter
- Design must avoid crowding out indigenous industrial heat users
  Until the RHO is fully effective, interim enterprise supports may be required

3. Industrial Offtake Enablement
Project Clover demonstrated industry willingness to engage.
But indigenous processors require predictable, competitively priced supply.
Without deployment support, supply chain development (Q3) and RD&I (Q4) will stall.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
In the context of biomethane deployment to meet the 5.7 TWh target by 2030, the principal barriers are structural and commercial rather than technological.

1. Capital intensity and investment risk
Early AD biomethane plants require substantial upfront capital. Without scaled and predictable de-risking frameworks, projects struggle to reach Final Investment Decision.

2. Revenue certainty and price volatility
Industrial offtakers require long-term price visibility. In the absence of bankable revenue frameworks, indigenous processors are reluctant to commit to long-term contracts or co-investment.

3. Demand-side competitiveness constraints

Where supply is limited, biomethane can be priced at levels that are difficult for globally exposed Irish manufacturers to absorb, particularly in dairy and food processing.

4. Planning, permitting and grid injection timelines
Multi-stage regulatory processes increase development timelines and financing costs. Planning and consenting timelines may also warrant further consideration in the context of national deployment targets. Recognition of anaerobic digestion (AD) biomethane facilities as Strategic Infrastructure Development (SID), where projects contribute to national decarbonisation and energy security objectives, could help streamline the planning process by enabling direct application to An Bord Pleanála. Given the compressed timeframe to achieve the 5.7 TWh biomethane target by 2030, even modest reductions in permitting timelines could materially improve the ability of projects to reach Final Investment Decision and proceed to construction.

5. Skills and delivery capability
Ireland must scale its indigenous operator, engineering and upgrading competence rapidly to meet deployment timelines. Indeed, many of the plants under construction are doing so using experience or technologies developed abroad. Having our own indigenous technical capabilities would build capacity for the long term and likely improve competitiveness

6. Social acceptance and local confidence
Farm-based AD deployment requires transparent standards, environmental safeguards and structured community engagement.
Importantly, Ireland is not constrained by registry infrastructure — it is relatively advanced in this area. The binding constraints are commercial and delivery-focused.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

To close the deployment gap, the following interventions are required:

1. A Renewable Gas Delivery Programme
A cross-agency implementation structure with named actions, milestones and annual reporting aligned to the 2030 target.

2. Scaled capital de-risking mechanisms
Support commensurate with the level of deployment required to reach 5.7 TWh.

3. Effective design and ramp-up of the Renewable Heat Obligation (RHO)
The RHO should function as a genuine demand-pull mechanism that supports bankable long-term contracting.

4. Demand-side enablement for indigenous industry

Frameworks that allow Irish industrial heat users to contract biomethane competitively and predictably.

5. A Renewable Gas Skills Action Plan
Structured training aligned to projected plant deployment.
The key lesson from Powering Prosperity is delivery architecture, not policy aspiration.

8.Are there existing supports that should be expanded or improved?
Yes — particularly in relation to deployment scale

- Capital support quantum must align with the ambition set out in the National Biomethane Strategy.
- RHO design must ensure liquidity, tradability and long-term certainty. It should incorporate competitiveness considerations for indigenous industry.
- Enterprise supports should explicitly include renewable gas supply-chain capability building.
- Skills programmes should reflect projected plant numbers required to meet 2030 targets.
- Ireland's registry platform is strong — that foundation should now be leveraged to build commercial depth.

Aligned Sectors
9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?
Biomethane deployment intersects directly with:

- Agri-food processing
- Co-operative dairy structures
- Farming and rural enterprise
- Engineering and fabrication services
- Circular bioeconomy industries (digestate valorisation , Biogenic CO2, etc)
- Project Clover illustrates that biomethane is an industrial platform that links these sectors. Deployment success would have multiplier effects across rural and manufacturing economies.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?
To enable complementary sectors (engineering, fabrication, agri-services, waste management, digital systems, etc.) to broaden into renewable gas supply chains, Government should focus

on enterprise capability supports.

Key measures could include:

1. Supply Chain Mapping and Visibility
Publish a biomethane deployment pipeline aligned to the 2030 target, clearly signalling expected plant numbers, timelines and technical components required.

2. Supplier Development and Diversification Grants
Enterprise Ireland programmes should explicitly support firms seeking to adapt products and services for anaerobic digestion, upgrading and grid injection systems.

3. Skills and Technical Training Supports
Develop targeted upskilling programmes for mechanical, electrical and process engineers, instrumentation specialists and plant operators.

4. Innovation and Tooling Grants for SMEs
Provide small-scale capital and innovation supports that allow SMEs to invest in certification, tooling, safety compliance and technical qualification required to enter the renewable gas supply chain.

5. Regional Cluster Development
Support regional biomethane clusters in agri-food areas to reduce coordination costs and accelerate capability building.

6. Facilitate buyer–supplier engagement through Enterprise Ireland and RGFI . (RGFI is running "meet-the-buyer" stakeholder programmes in 2026 and 2027)

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

International experience demonstrates that biomethane scales where:

- There is statutory demand pull (quota/obligation mechanisms).
  Revenue certainty mechanisms provide bankability.
- Certification and registry systems support credible trading and claims.
- Ireland already has strong registry infrastructure and is progressing the Renewable Heat Obligation - albeit it will not be effective until 2028. The priority is ensuring these instruments operate at sufficient scale and predictability to unlock industrial deployment.
- Relevant international lessons include:
- Quota-based renewable gas obligations (e.g. Austria proposals)

- Long-term tariff/revenue certainty mechanisms (Germany's historical EEG support for biogas)
- Strong registry and certificate trading systems (Germany's dena Biogas Register)
- These demonstrate that biomethane scales where demand pull, certification, and revenue certainty align.

12.If so, how might similar approaches be adapted to the Irish context?

Ireland has a late mover advantage in that we can learn from cases where the biomethane development worked best
We already have:

- A registry platform
- Policy direction via RHO

Strong agri-food integration potential - albeit the processing industry is challenged
Ireland should:

- Leverage its registry leadership.
- Ensure the RHO provides a predictable and bankable demand signal.
- Align capital support to the scale required to reach 5.7 TWh
- .Protect indigenous industrial competitiveness within demand-pull design.
- Maintain delivery discipline via cross-agency coordination

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

SME participation depends on:

- Clear visibility of deployment pipeline.
- Defined technical standards.
- Qualification and certification supports.
- Access to working capital and capability grants.
- Integration into procurement frameworks for AD plant delivery.
  Biomethane deployment should be positioned as a domestic supply-chain opportunity.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Monitoring of biomethane should be aligned to the 2030 target and track:

- Installed biomethane capacity (TWh equivalent)
- Projects at planning, financing and construction stages
- Capital committed
- Grid injection timelines
- Indigenous supply-chain participation
- Industrial offtake volumes
- Certificated volumes produced/injected to grid and sales to 3rd parties
- Skills training throughput
- Transparent tracking reinforces investor confidence and policy credibility.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Two strategic considerations:

1. The credibility of the 5.7 TWh target depends on accelerated industrial deployment within a compressed timeframe.

2. Without enterprise-aligned commercial frameworks, biomethane risks becoming a niche premium product rather than a strategic enabler of indigenous industrial decarbonisation. Biomethane should be treated as industrial policy, energy security strategy, and circular bioeconomy enabler. Project Clover demonstrates industry willingness; the industrial strategy must now ensure investable conditions and enterprise-aligned demand frameworks.

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Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The successful delivery of the actions outlined below is already contributing to the offshore wind sector's growth in Ireland and will continue to do so. These actions can also be adapted and applied across other industries and emerging technologies. It is important to recognise that each action requires ongoing effort and attention to ensure its effective implementation.

We would suggest the most impactful and / or effective were the following actions:

- **Action 4**: Deliver long-term strategic funding options to support scaling Irish offshore wind supply chain companies
- **Action 6**: Engage with other relevant agencies, such as SEAI, SFI, Marine Institute (MI), Irish Maritime Development Office (IMDO), to leverage support programmes and funding opportunities to maximise local supply chain content levels in the domestic Irish market.
- **Action 11**: Through engagement with industry partners, raise awareness of and encourage participation in national competitive call for clusters under the National Clustering Programme once announced.
- **Action 15**: Collaborate closely to ensure partnership opportunities with international companies in the offshore wind sector can be maximised.
- **Action 20**: Promote Ireland as a high potential OWE market through ministerial trade missions and active participation in international conferences, trade shows and other major OWE sectoral events, including though engagement with industry representative bodies

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

At present, Ireland is not on track to meet its domestic or European climate emissions reduction targets, as noted most recently in the Oireachtas Committee's report 34/CEE/06 - "Barriers to Achieving Climate Targets 2026-30".

Delivery of these targets requires that both onshore wind, solar PV and offshore wind projects are able to proceed at pace. This will require a concerted, cross-governmental approach to ensuring grid is developed at a similar scale and pace to ensure the generation can be transmitted (and not curtailed) and that the significant increase in renewable generation (and its associated lower costs) can flow through to businesses and domestic customers.

Such actions, including ensuring the timely delivery of already permitting and planned grid projects do not further slip (this is particularly important in the case of the North-South Interconnector and the Celtic interconnector).

We do not believe that now (in early 2026), the focus should shift from delivering the basics, to supporting other technologies at present (these would include green hydrogen and derivatives and carbon capture technologies) as these are longer-term potential opportunities; (that are themselves dependent on building offshore wind at scale).

More direct support, such as enabling greater use of flexible demand connections and ensuring overdue changes to the associated demand use of system tariffs that will encourage increased flexible demand are also a key area for support, noting that these decisions are the responsibility of the regulator (CRU).

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
Cross border collaboration and alignment on the Clustering Policy between developers, DETE, as well as with WEI and other regional cluster initiatives, is a key action. It requires a coordinated support while promoting an all-island approach to developing the offshore wind supply chain.

Ireland faces several critical systemwide challenges that must be addressed to unlock offshore wind deployment at scale, including.

- Grid availability, interconnection, and export capability
- Planning and consenting regimes
- Port and infrastructure development
- Regulatory evolution and routes to market
- Skills availability and supply-chain capability

These challenges mirror those faced by many emerging offshore wind markets globally.
A priority early action is to complete a comprehensive stocktake of current supply-chain capabilities. This should assess the existing depth of expertise across key component and service areas essential to offshore wind development in Ireland. Being decisive and strategic is vital. Key questions include:

- Which areas offer realistic, scalable potential based on existing strengths and future opportunity?
- Which areas are better left to other, more established markets?
- Where does Ireland have a niche opportunity to differentiate, innovate, and lead?

A useful reference point is the UK's Supply Chain Capability Assessment (SCCA), which was used to inform its Industrial Growth Plan published in April 2024. Ireland can draw from this approach while tailoring it to the unique needs and opportunities of an all-island strategy.

Examples of Irelands strengths in the sector include:

- Environmental & Technical consultancies and Marine designers
- Ports with Marshalling/Construction base and O&M capability (navigation and logistics)
- IT, AI and Data Analytics
- Survey Companies (Marine, Data acquisition)
- Engineering Support Services

In terms of supply chain development for hydrogen and CCS we do not believe that this is required now, and the need to ensure targeted to support to drive the domestic supply chain will be better focused on ensuring there is both certainty on future offshore auctions, which will provide investor certainty to developers, who will drive take up of supply chain services.

The recent report published by ARUP on behalf of DCEE, clearly recognises that whilst there is export potential for green hydrogen in future, rather than domestic consumption; and that " The priority should be the deployment of OWE at scale to provide the renewable electricity needed for green hydrogen production ".

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

As per our earlier responses, we do not believe that current technologies available which will be needed to drive the green transition require additional research or R&D support. What is needed is the whole of government approach to delivery of the Accelerating Infrastructure Action Plan and ensuring a holistic approach to the development of new demand load, delivery of the urgently required grid development and reinforcement.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

We do not believe that the technologies listed previously require additional support in terms of industrial deployment at this time.

However, there is a clear need to ensure sufficient regulatory focus to ensure planned grid developments can proceed at pace.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

As previously noted, the main barriers identified remain lack of infrastructure (including grid capacity – for all renewables), timely development of ports for offshore wind and the ongoing delays regulatory delays with permitting and financing (due to a lack of certainty) on route to market for these projects outside of the current RESS scheme and the ongoing uncertainty regarding the approach to the inclusion of NZIA criteria within the next onshore (RESS6) auction and planned offshore auctions.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Urgent clarity on the status of state aid approval required to extend the current RESS scheme is required in order for the planned upcoming RESS6 onshore auction to take place and future offshore auctions.

Government must also deliver on the actions in the Accelerating Infrastructure AP that will deliver the necessary civil reforms, regulatory realignment to deliver urgently required infrastructure in the short and medium term – this includes increasing and improving the public communication on the benefits of the green transition and supporting the development of renewables to increase public acceptance of the need for the green technologies (and its enabling infrastructure).

Furthermore, Government and Regional Assemblies must ensure the timely delivery of the Regional Renewable Electricity Strategies, to ensure the broader climate targets at a national level can be delivered.

Ensuring the clear and timely communication of proposals for the National DMAP.- noting that the N-DMAP should prioritise sites with both grid and Government support (CfD) for the first auction rounds, to ensure that the auctions lead to the development and delivery of offshore wind that can generate and be exported onto the Irish grid, in support of domestic and European targets.

Encouragement and support of grid technologies that can reduce the need or reliance on existing thermal plant (such as allowing the procurement of synthetic inertia from invertor-based devices) would send a positive signal in Ireland, given the delays to date to facilitate these technologies which have already been deployed in the UK and Netherlands.

8.Are there existing supports that should be expanded or improved?

As noted previously, ensuring the swift completion of the state aid for RESS, is a critical requirement and ensuring future alignment with both the Net Zero Industry Act and the Industrial Accelerator Act (once finalised) is critical to provide confidence to investors (both to the supply chain and developers).

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Given the intended level of new renewable energy planned and green transition it is fundamental to ensure that the anticipated increase in electricity demand from large Energy Users, whether these are data centres, life sciences, pharmaceuticals or AI continues to be supported to invest in new and drives additional new load.

We see there is a clear, mutually beneficial virtuous circle of ensuring new plan led renewables (both on and offshore) are aligned with the plan led approach for large energy users, as set out in DETE's recent LEAP strategy to support and roll out Green Energy parks for connection to

offshore wind.

Any new proposed industrial strategy should support delivery of actions already set out in the LEAP – noting in particular the importance of actions 5 (ensuring System Operators are empowered to facilitate a plan led approach , 8 (embed LEAP strategy within National spatial Planning Policy) and 15 (ensuring the development of next generation strategic IDA sites).

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

We note the recent decision by CRU on connections for large data centres now requires the clear commitment to new, additional renewable energy and this could be a helpful precedent for all new large users over time. However, we would continue to stress the need to ensure the renewable generation is able to connect, access a route to market remains the driver to provide and meet the increasing power demands of the future.

We would also expect the outcome of Actions 3 (Design flexible or 'nonfirm' contracts and hybrid connections for LEUs that maximise utilisation of available grid and renewable electricity use), Action 4 (Energy Network Tariffs, market operation and grid code redesign to deliver LEU demand flexibility) and Action 16 (Support innovation in the areas of energy management and storage for LEUs, and consider use of regulatory sandbox), will further support identified LEUs to consider renewable energy and complementary, green technologies.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

We would suggest AI Growth Zones example from UK as a clear example of effective interventions, identifying areas with existing infrastructure that are suitable and also potentially a "sandbox" approach to reduced timelines for planning consent and considering the broader issue of connections and costs for power

12.If so, how might similar approaches be adapted to the Irish context?

We would suggest that the LEAP would be best placed to ensure similar opportunities and deliver effective interventions to support industrial development, in particular action 15 to ensure a strategic approach for future Green Energy Parks

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

It is critical to ensure that SMEs can fully participate and support the development of green technologies in Ireland. There are already many agencies that can help support this, including

Local Enterprise Offices, Enterprise Ireland and Chambers Ireland.

Ensuring clear communication and encouraging collaboration within and across the different support groups. Minimising the complexity and administrative burdens associated with the energy system in ireland (including planning, and grid access) will help everyone, and in particular SMEs given their [relatively speaking] limited development budget and wider resources.

It is essential that SMEs understand their position within the offshore wind supply chain. Their capabilities and offerings must clearly align with the specific work packages required for an offshore wind farm. Proactive engagement with Tier 1 contractors is highly beneficial, as is developing a strong understanding of how developers operate across the various phases of a project's lifecycle.

An offshore wind developer typically contracts directly for 6–12 major service and component packages. Importantly, 70–85% of all subcontracting is undertaken by Tier 1 and Tier 2 suppliers, meaning that SMEs must know where their skills and services best fit within this structure.

A clear grasp of both supply chain positioning and the broader policy landscape is crucial for SMEs aiming to enter or grow within the sector. Alignment, coordination, and collaboration across all levels of the supply chain are vital to securing the investment and development needed to build a strong, resilient, and innovative offshore wind ecosystem.

RWE fully supports the creation of an all-Ireland supply chain cluster to enable this collaboration and unlock the full potential of regional SMEs.

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

There may be a role for a new research unit within DETE or DCEE to monitor development of green technologies and keeping a watching brief on emerging technologies / sectors. Close collaboration with universities, should continue and the Irish government should ensure full participation with and engagement with EU funding and innovation opportunities.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Any new industrial strategy must be consistent with and support existing Government objectives rather than seeking to be an industrial strategy that drives other Governmental objectives.

There is also a need for a pragmatic approach, which takes into account the existing, known knowns: these include – slowing down (at European level) of focus on carbon emissions to

greater affordability and cost competitiveness, increasing need / focus for made in Europe for renewable supply chain and impacts for IT /associated infrastructure.

We note the parallel workstreams underway with regulator, which include the review into demand tariffs to support flexibility, the recent decision on LEU connections (and the need for the TSO to issue guidance by the end of March on how these will be facilitated). In summary there is a lot already underway and it is critical that these workstreams and associated actions are delivered in a timely fashion.

SIMPLY BLUE

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's O□shore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies?
Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The single most impactful policy coming out of DETE in relation to o□shore wind is the Large Energy User Action Plan. Further consideration of alignment of demand and supply in this manner improves market conditions and create an enabling environment for industrial development. It is important to facilitate strategic alignment with this policy.
In general terms, the industrial policy focused, high value actions from Powering Prosperity, which sought to attract and establish manufacturing capacity within Ireland, would be a welcome focus area. Big ticket, ambitious items are welcome. RD&I, communication activities etc. should be covered elsewhere adequately already.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Offshore renewable energy has the most significant potential in terms of economic opportunity and decarbonisation. In Ireland, the majority of this will need to come from floating o□shore wind in the future, as fixed wind areas will become saturated.

As Powering Prosperity expands, it is important to maintain a focus on these technologies and ensure alignment with existing government strategy, deployment targets, and ultimately climate law.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Significant support is required for the development of ports for o□shore wind in Ireland, and there are significant concerns that the development model for ports in Ireland is not currently suitable for o□shore wind.
Floating wind requires specific port infrastructure. This is well understood and discussed in many studies and projects.

https://blog.windenergyireland.com/where-in-ireland-can-port-infrastructure-be-developed-to-support-the-delivery-of-floating-offshore-wind

Floating wind on the west coast of Ireland should be derisked via demonstration projects also. There are demonstration projects underway in the North Sea and Celtic Sea. Demonstration projects specific to the Atlantic are required also.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address?
Please note the relevant technology/technologies and provide evidence to support this.
When considering impactful industrial policy, additional support should focus on scaling innovation and capacity, rather than on R&D efforts.

A good example of this is floating wind, where there is existing technology now in need of deployment and scaling. The specific barriers to developing floating wind in Ireland are regulatory – there is currently no consent pathway to acquire a site for floating wind development in Ireland.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.
See previous response on ports for floating wind.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?
Regulation is the main barrier to o□shore wind development in Ireland. There are currently no sites available for development, outside of those already allocated to developers. Offshore sites are subject to considerable grid risk. Planning timelines are considerably longer than other jurisdictions. Unknown timelines for development under Ireland's plan-led system make investment into projects and supply chain higher risk.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Targeted Government interventions supports & incentives are needed at the right time which will ultimately help to de-risk commercial projects:

- Financial incentives to provide greater revenue certainty and unlock private finance options (e.g., via route-to-market mechanisms
- indexation in auctions, changes in network charges for battery storage etc)
- Focus on the enablers required to support development of projects – i.e., grid, demand, port infrastructure (as outlined in WEI Offshore Wind Action Plan, 2025)
- Incentivise investment into manufacturing capacity for green technologies in Ireland. Securing o□shore wind manufacturing capabilities should be a priority for this strategy

8. Are there existing supports that should be expanded or improved?

The EU Innovation Fund could be used to support green tech projects in Ireland. However, the long lead times involved in developing projects in Ireland due to regulatory barriers mean that that fund is not applicable. This should be looked at in partnership with the European Commission.

Furthermore, the EU Innovation Fund is very challenging to access as an SME. As Ireland does not have many large industrial companies, this can make it a challenging fund to access.

CISAF allows for additional state aid support in terms of accelerated depreciation and tax credits. This is something which should be explored by Irish policy makers to support the development of the green technologies.

The forthcoming Industrial Accelerator Act supports ambitious thinking in this regard.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Not answered

10 . How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Not answered

International Examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

There are examples from the UK and France of industrial policy interventions which support the development of ports that have proven highly effective in creating industrial hubs and capturing GVA, while at the same time derisking the delivery of green technologies.

12. If so, how might similar approaches be adapted to the Irish context?

Ireland should review its position on investment into ports to derisk offshore wind delivery.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

SMEs make up the vast majority of enterprises in Ireland and therefore it is essential to integrate these companies into the development and deployment of o□shore wind, storage, hydrogen and smart grid services. While there will be a requirement to work collaboratively with the international supply chain, integrating domestic companies into the process will ensure capacity and capability building for SMEs and that many of the economic benefits of the green transition remain in Ireland, rather than predominantly flowing out to large foreign developers/multinationals and equipment suppliers.

Ireland has several renewable energy developers, SMEs or otherwise, many of which are competing internationally. Simply Blue, for example, has UK offshore wind projects which are succeeding and moving forward e.g. the Erebus project was recently successful in the UK's Allocation Round 7. It is important that Ireland supports national champions which can compete internationally, while also ensuring a diverse, resilient and competitive market of developers domestically.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

This strategy should focus on industrial policy and supporting existing green technologies to deploy at scale over the coming decade, rather lower TRL technologies still in the R&D phase.

Other Considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

It is important that policy across government is reinforcing and coherent to deliver high impact. The increased coordination of action by government in recent years has been very welcome and we hope to see this continue.

The industrial strategy must align with existing government strategies (Future Framework, Powering Prosperity, LEAP etc) which are aimed at delivering deployment targets and ultimately fulfilling our legal obligations under EU and National Climate Law. We would encourage government not to narrow its focus on to that space.

We would also encourage DETE to think big in terms of tangible success for this strategy in terms of identifying and attracting significant investment into manufacturing capacity into Ireland for the delivery of green tech projects, so that we can create high skilled jobs and economic growth on the island of Ireland based on sustainable, clean energy.

Green Growth Public Consultation

Department of Enterprise, Tourism and Employment

Skillnet Ireland Submission

Introduction

Skillnet Ireland welcomes the opportunity to contribute to the Department of Enterprise, Tourism and Employment's consultation on a new *Green Growth Strategy*. We commend the Department's leadership and ambition in driving a strategic vision for the development of a strong domestic supply chain in Ireland's renewable energy sector.

Ireland has made substantial progress in advancing its offshore wind sector, laying a strong foundation for future growth. A 2026 statement from the Department of Climate, Energy and the Environment notes that Ireland now has nearly 8 GW of renewable electricity capacity installed (approximately 5 GW onshore wind and over 2.2 GW solar PV) and that wind power supplied roughly one third of national electricity demand in 2024, with renewables providing around 40–

41% of total electricity generation.[7] Building on this progress and recognising the need for a more holistic approach to the energy transition, we support broadening this momentum by exploring the full spectrum of renewable energy technologies. Diversifying our energy sources will not only enhance system resilience and strengthen long-term energy security but also enable Ireland to unlock wider economic and employment opportunities by fostering a competitive home-grown renewable energy supply chain.

As Ireland's national agency dedicated to workforce development, Skillnet Ireland strongly supports the Department's emphasis on our highly educated workforce and thriving innovation ecosystem as a key strategic enabler, and as such our observations in response to the consultation questions are framed through a skills and talent development lens.

Skillnet Ireland's new strategy - *Empowering Enterprise 2026–2028: Building Next Generation Capability*[8] - places a strong emphasis on future skills and cutting-edge innovation to keep pace with digital transformation, environmental change, and market disruption, while reinforcing that enterprise-led workforce development is now a strategic economic priority. Embedding talent development at the heart of the *Green Growth Strategy*, with coordinated action across industry and the education and training sector, will ensure Ireland secures a resilient, future-ready workforce capable of driving innovation, enhancing competitiveness, and delivering sustainable growth and global leadership in the renewable energy sector.

Consultation Questions

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The emphasis on skills and workforce development is one of the most impactful elements of *Powering Prosperity*. Collaboration between government, industry, and the education and training sector has been highly effective in delivering on skills priorities for offshore wind, helping to build a strong, sustainable talent pipeline to meet the sector's growing workforce demands.

The completion of a detailed skills assessment report - *Building our Potential: Ireland's*

[7] Minister O'Brien highlights Ireland's significant renewable electricity progress

[8] Skillnet Ireland. (2026). *Empowering Enterprise 2026–2028: A strategy for next-generation capability*. Skillnet Ireland. Accessible at Empowering Enterprise 2026-2028 | Skillnet Ireland

Offshore Wind Skills and Talent Needs[9] - which was conducted in collaboration with Wind Energy Ireland and Green Tech Skillnet, has been instrumental in shaping a clear, evidence-based workforce strategy for the sector. By identifying current gaps and forecasting future talent requirements, the report set a strategic direction for developing a robust pipeline of engineers, technicians, project managers, and maritime specialists capable of supporting large-scale offshore wind deployment. This targeted focus on skills strengthens project readiness and enhances investor confidence, while also maximising long-term economic benefits by embedding high-value employment within Ireland's growing offshore wind sector.

The delivery of Phase 1 and Phase 2 of the Offshore Renewable Electricity Support Scheme (ORESS), encompassing projects off the East Coast and within the South Coast Designated Maritime Area Plan (DMAP), is currently at the planning stage. As such, there is an immediate and pressing demand for critical roles associated with the early development phase of the offshore wind project lifecycle. Skills shortages are particularly acute within development and project management functions. These job roles include Project Managers, Engineers, GIS Technicians, Geophysicists, Offshore EIA Managers, Marine Ecologists, and Ornithologists. As highlighted in the *Building Our Potential* report, a key theme across the anticipated skills gaps in these areas is the need to adapt and transfer existing capabilities to meet the specific requirements of offshore wind deployment.

The Skillnet Offshore Wind Academy (SOWA) - Ireland's dedicated national training initiative for offshore wind - is a key output of the *Building our Potential* report and is specifically designed to support mid-career professionals in transitioning into the sector. It delivers high-impact, industry-led training, designed to upskill workers across the offshore wind value chain. Through a suite of targeted micro-credentials, SOWA is closing critical skills gaps by providing accessible, accredited pathways that enable experienced professionals from adjacent sectors to successfully transition into offshore wind, strengthening workforce capacity at pace and scale.

The ongoing monitoring of workforce requirements by the Expert Advisory Group on Offshore Wind Skills which comprises representatives from further and higher education, Government Departments, state agencies, and industry, ensures the timely identification of emerging and evolving skills needs. This structured, cross-sector oversight enables a proactive and agile response to workforce challenges, supports evidence-based interventions, and ensures that Ireland's skills system remains aligned with the rapidly developing offshore wind sector.

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[9] BVG Associates. (2024, January). *Building our potential: Ireland's offshore wind skills and talent needs* (report prepared for Green Tech Skillnet & Wind Energy Ireland). Skillnet Ireland. Accessible at *Building our Potential: Ireland's Offshore Wind Skills and Talent Needs*

Applying a similar cross-sector, data-informed model to other priority green technologies would significantly strengthen the *Green Growth Strategy*. Establishing dedicated skills advisory structures for areas such as hydrogen, energy storage, and electrification would enable coordinated workforce planning, faster identification of skills gaps, and more targeted training responses, building the capacity required to accelerate innovation, deployment, and long-term sustainability across Ireland's clean energy transition.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Electrification of Transport and Heat

Growing clean electricity demand in the heat, transport, and industrial sectors, including residential and commercial building retrofit, is one of the most effective pathways to end our dependency on imported fossil fuels and reduce Ireland's industry related carbon emissions. In addition to environmental benefits, electrification can strengthen the electricity grid and support renewable energy by making demand more flexible. Electrified technologies such as EV chargers, heat pumps, electric boilers, and thermal storage are more responsive to variable electricity generation and can help the grid operate more efficiently.

As set out in the SEAI *Energy in Ireland 2024 Report*[10], the transport sector remains the single largest source of energy demand in the Irish economy and one of the most significant contributors to national greenhouse gas (GHG) emissions. In 2023, transport accounted for just over 43% of total energy demand and more than 21% of Ireland's total GHG emissions. Electricity made up just 0.5% of total transport energy use that year, while fossil fuels accounted for 94%. The net increase in transport energy use was driven primarily by rising fuel consumption in international aviation and private car travel.

The heat sector presents a similarly pressing challenge. In 2023, 90.2% of Ireland's heat demand was satisfied by fossil fuels, a marginal reduction of just 3.8 percentage points over the past decade. Although the share of renewable energy in heat increased from 5.2% in 2013 to 8.0% in 2023, progress remains far below what is required to align with national and EU climate objectives. Residential heating, in particular, continues to be highly carbon intensive.

These trends underscore the urgency of accelerating electrification and the rapid deployment of renewable energy across the transport and heating systems. As emphasised by the Climate

[10] Sustainable Energy Authority of Ireland. (2024). *Energy in Ireland 2024* (SEAI annual energy statistics report). Sustainable Energy Authority of Ireland. Retrieved from https://www.seai.ie/sites/default/files/publications/energy-in-ireland-2024.pdf

Change Advisory Council in its *2024 Annual Review*[11], Ireland's reliance on the electricity network will increase substantially as the country moves towards increased electrification of transport and heating and further digitalisation of its economy and services, which are under increasing pressure from a growing population. The large-scale rollout of district heating networks in urban centres, the accelerated deployment of renewable-powered heat pumps, and a comprehensive programme of deep retrofits to improve the energy performance of existing homes will need to be significantly intensified and embedded at the core of Ireland's decarbonisation strategy.

Delivering this transformation will require parallel investment in skills development, training, and workforce capacity to design, install, operate and maintain new electrified technologies and infrastructure. The Expert Group on Future Skills Needs *Statement of Activity 2021* predicted the demand for skilled workforce in renewable energy and retrofit to increase from around 3,000 to 9,000 in wind and solar sectors, and from under 4,000 to 17,400 in retrofit over the next decade.[12]
Green Tech Skillnet, an enterprise-led business network supporting the workforce development needs of Ireland's renewable energy sector, recognises this significant opportunity and is actively prioritising the skills required to deliver it. The network provides targeted, industry-informed training and high-impact networking events focused on electrification-enabling technologies, including heat pumps, energy storage solutions, and thermal and electrical engineering, helping to build the expertise needed to electrify Ireland's economy.

Programmes include:

- Heat Pump Installer
- Retrofitting Domestic Buildings for Energy Efficiency
- QQI Level 6 Industrial Electrical Safety and Systems • Certificate in High Voltage Electrical Systems
- Certificate in Industrial Instrumentation Calibration
- Electricity Grid Operation
- Power Systems Dynamics and Control
- Grid Connection Process in Ireland

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[11] Climate Change Advisory Council. (2024). *Electricity sectoral review: Annual Review 2024* (Submitted to the Minister for the Environment, Climate and Communications, 9 May 2024). Climate Change Advisory Council. Retrieved from https://www.climatecouncil.ie/councilpublications/annualreviewandreport/AR2024-Electricity-final.pdf

[12] Expert Group on Future Skills Needs. (2022, July). *Statement of Activity 2021* (Annual activity statement 2021). Department of Enterprise, Trade and Employment / Future Skills Ireland. Retrieved from https://skillsireland.ie/media/vg5dbb1e/egfsn-annual-activity-statement-2021_.pdf

- Grid Analysis and Modelling
- Battery Technician Lab Programme
- Innoenergy - Energy Storage Training Licences
- Fundamentals of Modern Energy Storage Solutions

Green Hydrogen

Hydrogen is a strategic enabler of Ireland's energy transition. As wind capacity expands, Ireland's island grid faces challenges including curtailment and balancing supply and demand. Producing hydrogen via electrolysis using surplus renewable power offers flexible storage, reduces grid strain, and converts excess energy into a usable, exportable clean fuel.

The 2022 Green Tech Skillnet, Wind Energy Ireland, and Skillnet Ireland report Hydrogen and Wind Energy - The role of green hydrogen in Ireland's energy transition13, highlights how green hydrogen, produced from renewable electricity, can support net zero, enhance energy security, and reduce reliance on imported fossil fuels. With Ireland's strong wind resources, green hydrogen can also help decarbonise hard-to-electrify sectors such as heavy transport, shipping, and aviation.

The Government's 2023 National Hydrogen Strategy14 highlighted the importance of assessing and developing the skills needed across offshore wind and renewable hydrogen. Delivering on this opportunity requires new technical, engineering, digital, and safety capabilities across the hydrogen value chain, from production to end use. The Green Skills for Hydrogen Project (GreenSkillsforH2) directly addresses this challenge by closing the skills gap and building a future-ready workforce for Europe's emerging hydrogen economy.

Skillnet Ireland is one of 34 partners from 15 EU Member States forming the Green Skills Consortium overseeing this project. Together, the consortium is designing and implementing an innovative, effective, and sustainable Hydrogen Skills Strategy for Europe. This strategy takes a short, medium, and long-term view of the hydrogen value chain, developing specialised training frameworks, industry-aligned curricula, and recognised certification pathways that can adapt alongside technological advancement and market growth. By aligning education providers, industry leaders, policymakers, and regional stakeholders, the initiative fosters collaboration

[13] Skillnet Ireland. (2022, January 19). *Hydrogen and wind energy: The role of green hydrogen in Ireland's energy transition* (Report commissioned by Green Tech Skillnet). Skillnet Ireland. Accessible at: https://www.skillnetireland.ie/wp-content/uploads/2022/01/WindEnergy-Hydrogen-Offshore-ReportGreen-Tech-Skillnet.pdf

[14] Department of Climate, Energy and the Environment. (2023, July 12). *National Hydrogen Strategy* (Government strategy on the role of hydrogen in Ireland's energy transition). Government of Ireland. Retrieved from https://www.gov.ie/en/department-of-climate-energy-and-theenvironment/publications/national-hydrogen-strategy/

that maximises both climate impact and economic return. In Ireland, Green Tech Skillnet is rolling out targeted modules to strengthen hydrogen knowledge and technical capability.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

Scotland's "place-based" hydrogen strategy promotes supply chain localisation as a key enabler in the development and deployment of green hydrogen.15 Regional Hydrogen Energy Hubs, which are defined geographic clusters that co-locate the full hydrogen value chain, including production, storage, distribution, and diverse end-use applications, are strategically located across Scotland. They capitalise on regional strengths by successfully aligning local renewable resources, existing infrastructure, concentrated industrial demand, and workforce capability to create viable hydrogen ecosystems. They enable hydrogen to operate as a cross sectoral energy vector, linking renewable electricity generation with multiple end-users, supporting the electrification of transport, heating, and industry in the region.

By co-locating production, storage, distribution, and end-use applications, regional hubs furthermore create sustained demand for specialised skills in areas such as electrolysis operation, high-pressure systems management, hydrogen safety compliance, power electronics, and digital energy control. A geographic concentration enables firms to share expertise, standardise best practice, and build cumulative technical experience, while providing a clear demand signal for targeted, industry-aligned training programmes and SME capability upgrading. Over time, such clustering fosters a critical mass of skilled workers and specialised suppliers, strengthening regional labour markets, improving talent retention, and embedding hydrogen expertise within Ireland's broader clean energy workforce.

Many sectoral Skillnet Business Networks serve as centres of excellence in strategic regions, and they are proven to enhance knowledge-sharing among businesses of all sizes and foster collaborative approaches to addressing the emerging talent and skills needs of their local economies. This collective approach enables businesses to jointly assess their skills requirements and co-design targeted training solutions, helping firms, particularly SMEs, access high-quality, industry-relevant training that would often be too costly or complex to develop independently. A convergence of the hydrogen supply chain in one region would similarly boost expertise and facilitate coordinated skills development, collaborative innovation, and sustained regional competitiveness in the emerging green hydrogen economy.

[15] Scottish Government. (2022, December 14). *Hydrogen Action Plan* (Energy and Climate Change Directorate strategic publication). The Scottish Government. Retrieved from https://www.gov.scot/publications/hydrogen-action-plan/

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

The *Action Plan on Competitiveness and Productivity*[16] identifies skills as the cornerstone of a high-performing RD&I system, essential for generating ideas, translating research into tangible impact, and scaling innovation. Aligned with *Impact 2030: Ireland's Research and Innovation Strategy*[17], Skillnet Ireland is deepening partnerships with enterprise, research institutions, and innovation agencies to embed talent at the centre of the research and innovation ecosystem. By supporting leadership development and innovation capability within high-impact sectors and specialist areas such as renewable energy and green technologies, Skillnet Ireland plays a central role in advancing Ireland's ambition to become a centre of excellence for innovation-driven enterprise.

Continued support for advanced skills in research and technology adoption is essential to sustain the country's RD&I ecosystem. Without a skilled workforce, RD&I support has limited impact. SMEs, in particular, represent an untapped engine of in-company RD&I. For many SME companies, a lack of access to networks, partnerships, and specialist expertise limits their competitiveness and ability to innovate. In today's economic environment, business leaders must possess a blend of agility, innovation capability, and strategic systems thinking to anticipate emerging opportunities, embrace creativity, and translate new ideas into tangible commercial outcomes.

AI and digitalisation are furthermore critical enablers to RD&I in the renewable energy sector. It can underpin advanced modelling and simulation, digital prototyping, smart grid optimisation, and data-driven experimentation - capabilities that accelerate and strengthen the RD&I process by reducing development timelines, improving precision, lowering costs, and enhancing overall innovation outcomes. According to Skillnet Ireland's 2025 *Ireland's Talent Landscape Report*, 57% of respondents describe their organisation as either "advanced" or "very advanced" digitally. However, significant capability gaps remain, particularly in AI. Only 7% of business leaders report that their workforce is "very skilled" in AI, compared with 41% who say their

[16] Department of Enterprise, Tourism and Employment. (2025). *Action Plan on Competitiveness and Productivity* (whole-of-government strategic plan). Government of Ireland. Retrieved from https://enterprise.gov.ie/en/publications/publication-files/action-plan-on-competitiveness-andproductivity.pdf

[17] Department of Further and Higher Education, Research, Innovation and Science. (2022, May 18). *Impact 2030: Ireland's Research and Innovation Strategy*. Government of Ireland. Retrieved from https://www.gov.ie/en/department-of-further-and-higher-education-research-innovation-andscience/publications/impact-2030-irelands-research-and-innovation-strategy/

employees are "not at all skilled." Access to the required AI and data expertise (73%) is cited as the single greatest barrier to AI implementation among Irish businesses.[18]

A sustained focus on developing SME productivity and digital skills is therefore critical. Skillnet Ireland is actively addressing these challenges by enhancing SME leadership through management development programmes such as Mentors Work - a mentoring and learning initiative designed to empower SME owner-managers to navigate their pathway to business success - and boosting advanced digital and AI specialist capabilities through the development of initiatives such as a new state of-the-art National AI Talent Centre of Excellence, bringing together industry and academic expertise to foster collaboration, research, and innovation.

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Developing a skilled workforce is essential to overcoming barriers to industrial deployment of electrification and green hydrogen technologies. Skills enable faster, safer, and more efficient project delivery, ensure compliance with regulatory and safety standards, and support complex system integration across transport, heat, and industrial sectors. They strengthen local supply chains and SME participation, reduce investment risk by improving operational reliability, and foster innovation through knowledge transfer and on-site adaptation of technologies.

Green Tech Skillnet offers a wide array of programmes that directly address the technical expertise, safety knowledge, and operational understanding for the industrial deployment of electrification technologies across heat, transport, and energy systems. They include:

- Heat Pump Installer
- Retrofitting Domestic Buildings for Energy Efficiency
- Certificate in High Voltage Electrical Systems
- QQI Level 6 Industrial Electrical Safety and Systems
- Certificate in Industrial Instrumentation Calibration
- Electricity Grid Operation
- Power Systems Dynamics and Control
- Grid Connection Process in Ireland
- Grid Analysis and Modelling
- Battery Technician Lab Programme

[18] Skillnet Ireland & Ipsos B&A. (2025). *Ireland's Talent Landscape 2025: Future skills challenges of Irish business* (research report). Skillnet Ireland. Accessible at https://www.skillnetireland.ie/insights/irelands-talent-landscape-2025

- Innoenergy - Energy Storage Training Licences
- Fundamentals of Modern Energy Storage Solutions

Programmes such as *Heat Pump Installer* and *Retrofitting Domestic Buildings for Energy Efficiency* provide technicians and engineers with practical skills to deploy low-carbon heating solutions at scale, ensuring the workforce can implement energy-efficient electrified heating systems in both residential and industrial settings.
Courses like *Electricity Grid Operation*, *Power Systems Dynamics and Control*, *Grid Connection Process in Ireland*, and *Grid Analysis and Modelling* train professionals to manage and optimise electricity networks that support increased loads from electrified heat and transport.
Qualifications such as *Certificate in High Voltage Electrical Systems*, *QQI Level 6 Industrial Electrical Safety and Systems*, and *Certificate in Industrial Instrumentation Calibration* focus on industrial-scale electrification infrastructure. Professionals gain critical knowledge in safety, instrumentation, and systems operation, which is essential for industrial projects deploying electric heating, electric vehicle (EV) charging infrastructure, and other electrified industrial processes.
Courses like *Battery Technician Lab Programme*, *Innoenergy Energy Storage Training Licences*, and *Fundamentals of Modern Energy Storage Solutions* equip the workforce to implement, operate, and maintain energy storage systems. This is vital for supporting transport electrification (e.g., EV charging infrastructure), load shifting for heat pumps, and balancing intermittent renewable generation.

Beyond technical training, Green Tech Skillnet programmes also integrate safety, certification, and industry best practices to ensure the workforce is ready for practical deployment and compliant with regulatory standards. This holistic approach ensures that professionals are not only skilled in installation and operation but also in managing projects efficiently and safely.
As aforementioned, the *Green Skills for Hydrogen Project (GreenSkillsforH2)*, of which Skillnet Ireland is a partner, is also building a future-ready workforce for Europe's emerging hydrogen economy and Green Tech Skillnet is rolling out targeted modules to strengthen hydrogen knowledge and technical capability in support of its industrial deployment.

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

Skills shortages have intensified in line with the scale and urgency of the green transition. As highlighted in the Expert Group on Future Skills Needs (EGFSN) *Skills for Zero Carbon* report (2021)[19], the supply of appropriately skilled talent is a critical constraint on meeting Ireland's 2030 climate and energy targets.

[19] Expert Group on Future Skills Needs. (2021, November 24). *Skills for zero carbon: The demand for renewable energy, residential retrofit and electric vehicle deployment skills to 2030* (EGFSN report).

Significant gaps persist across multiple occupational categories as evidenced in research reports published by Skillnet Ireland and Green Tech Skillnet such as *Talent for Ireland's Green Economy* (2022); *Hydrogen and Wind Energy - The role of green hydrogen in Ireland's energy transition* (2022); *Charged Horizons - Exploring the Energy Storage Landscape and Workforce Potential in Ireland* (2023), and the aforementioned *Building our Potential: Ireland's Offshore Wind Skills and Talent Needs* report (2024). The challenge is further compounded by the fact that many of the skills required in renewable energy, particularly in electrical, engineering, and construction disciplines, are also in high demand across other priority sectors such as housing and infrastructure. This competition for talent intensifies recruitment pressures and underscores the need for coordinated workforce planning.

At Skillnet Ireland, we are committed to building a sustainable pipeline of skilled talent capable of meeting this demand. Skillnet Ireland's enterprise-led learning model has proven highly effective in aligning training with the evolving needs of industry. Skillnet Ireland's industry-led approach ensures that programmes are directly aligned with real-time business needs enabling rapid deployment of targeted, flexible, and accredited training across emerging green sectors.

Green Tech Skillnet is our flagship business network facilitating the workforce and development needs of the Irish renewable energy industry. Reflecting the diversification of Ireland's energy system and with an overarching responsibility to EU targets and the mitigation of climate change, the network supports the optimisation of renewables on the Irish grid in the short, medium, and long term through learning and development initiatives. In this regard, the network aims to deliver impactful training and networking events to a growing workforce, facilitate thought leaders within the renewables sector whilst contributing to Ireland's deep decarbonisation and energy transition. Programmes in renewable technologies include Solar PV, Micro Generators, and Energy Storage.

In addition to Green Tech Skillnet, the Skillnet Offshore Wind Academy, while primarily focused on workforce development for offshore wind, is strategically positioned to support upskilling across a much broader spectrum of adjacent energy and green technology sectors. Offshore wind sits at the intersection of multiple engineering, digital, environmental, and infrastructure disciplines, many of which are directly transferable across the wider clean energy ecosystem.

Many of the Academy's current micro-credential offerings can accelerate capability building in other emerging sectors such as floating offshore wind, wave power, hydrogen production, and industrial electrification. Offshore wind is not a standalone sector. It is a cornerstone of future integrated energy systems. By developing advanced engineering, digital, and regulatory

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Department of Enterprise, Trade and Employment / Future Skills Ireland. Retrieved from https://www.egfsn.ie/media/2eng44zf/5119-dete-egfsn-skills-for-zero-carbon-web.pdf

expertise within offshore wind, the Academy simultaneously builds a skills base that underpins Ireland's entire green transition.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland?

Targeted public investment will be critical to accelerating the development of green technologies in Ireland. In particular, greater strategic use of the National Training Fund to support upskilling and reskilling initiatives, including through Skillnet Ireland, would help address workforce gaps that are constraining growth. Ring-fenced funding for industry aligned programmes, micro-credentials, and flexible training pathways would enable workers from adjacent sectors to transition into emerging green industries more quickly. Strategic investment in future-ready upskilling will also strengthen innovation capacity and deliver the skills required to drive business transformation. Skillnet Ireland's recently launched 20262028 strategy identifies three key enablers that will allow enterprises to leverage new opportunities: sustainability, digitalisation, and artificial intelligence. [20] By proactively investing in future-focused skills through the National Training Fund, Government can strengthen domestic capability, enhance competitiveness, and ensure that Ireland captures the full economic and employment benefits of the green transition.

8.Are there existing supports that should be expanded or improved?

As the national business support agency of the Government of Ireland, Skillnet Ireland works in close partnership with industry to develop a skills framework that enhances Ireland's capacity to accelerate the green transition across multiple sectors and disciplines. Our proven enterprise-led model ensures workforce development is directly aligned with both immediate and emerging industry needs, particularly within high-growth areas. Sustained support for our mandate and increased Government investment from the National Training Fund will secure a strong and sustainable talent pipeline, enabling the rapid mobilisation of critical skills required to deliver Ireland's integrated energy transition and strengthen national competitiveness in the renewable economy

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Planning and Infrastructure

Planning and infrastructure are key structural components influencing the pace and scale of Ireland's renewable energy development and wider transition to a low-carbon economy. A

[20] Skillnet Ireland. (2026). Empowering Enterprise 2026–2028: A strategy for next-generation capability. Skillnet Ireland. Accessible at Empowering Enterprise 2026-2028 | Skillnet Ireland

coordinated and forward-looking approach to spatial planning can contribute to cost efficiency, reduce project uncertainty, and support alignment between land use, grid expansion, and transport infrastructure in line with national decarbonisation objectives. Greater coherence across these systems can facilitate the timely delivery of renewable generation and associated infrastructure.

Integrated planning processes play an important role in identifying suitable locations, sequencing development, and assessing cumulative environmental impacts. Early coordination between project promoters, planning authorities, and grid operators can help manage environmental considerations while supporting the development of wind farms, solar parks, and transmission infrastructure. Such coordination can also assist in addressing potential bottlenecks within consenting and grid-connection processes.

Transport and Logistics
Transport and logistics infrastructure similarly influence the delivery timelines of renewable energy projects. The availability of heavy-lift capability, appropriate port and road infrastructure, and adequately scaled supply chains can affect construction risk and scheduling for wind, solar, storage, and grid developments. Measures such as designated transport routes, specialised equipment, and cross-border coordination for large components may help streamline construction and commissioning processes.

Housing
In addition, aligning housing and urban development with energy infrastructure and public transport networks can influence energy demand patterns. Coordinated spatial development may enable the co-location of distributed energy resources, such as battery storage, EV charging infrastructure, district heating, and microgrids, in higher-density areas. This approach can contribute to system efficiency, support peak demand management, and facilitate the integration of renewable energy within communities.

These interconnected sectors all require continued skills development to ensure they have the technical expertise, digital capability and leadership capacity required to drive change and support the delivery of large-scale renewable energy and infrastructure projects. Skillnet Ireland is actively supporting these sectors, and through targeted Business Networks such as Construction Professionals Skillnet, CiTA Skillnet, CILT Mobility & Supply Chain Skillnet, and others, we are helping to equip key sectors with the skills needed to support Ireland's renewable energy ambitions and deliver the infrastructure required for a successful energy transition.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green energy technologies.

Skillnet Ireland's Business Networks model, which brings together clusters of private sector companies based on sector or region to collaboratively address skills needs, provides a practical mechanism for supporting the workforce dimension of the renewable energy

transition. By operating at sectoral and regional level, the Networks are well placed to identify emerging skills gaps linked to renewable energy deployment and green technologies, particularly where these intersect with existing industries such as construction, logistics, engineering, manufacturing, and transport.

Through structured engagement with member companies, the Networks can surface opportunities for firms to diversify their service offerings into renewable energy supply chains or low-carbon technologies. For example, businesses operating in traditional infrastructure, mechanical, electrical, or transport services may be supported to assess how their existing capabilities could be adapted to serve wind, solar, storage, electrification, or energy efficiency markets.
The collaborative nature of the model also enables peer learning and knowledge sharing. Companies can gain insight into evolving regulatory requirements, technical standards, and market developments associated with the green transition. Targeted upskilling and reskilling programmes, designed in response to identified industry needs, can equip employees with competencies in areas such as renewable system installation and maintenance, grid integration, sustainable logistics, digitalisation, and energy management.

Importantly, because the Networks are employer-led, training provision is closely aligned with real-time business demand. This reduces barriers to entry for firms considering expansion into renewable energy or green technology markets and supports a smoother transition for workers whose roles are evolving due to decarbonisation policies.
In this way, the Skillnet Ireland model can contribute to broadening participation in renewable energy supply chains, strengthening domestic capability, and ensuring that the workforce evolves in step with Ireland's climate and sustainability objectives.

For example, CILT Mobility & Supply Chain Skillnet works with businesses across the logistics, transport, and supply chain sectors to strengthen workforce capability in areas such as supply chain management, transport operations, and infrastructure logistics. These capabilities are critical to ensuring that the equipment, materials, and components required for renewable energy projects can be transported, installed, and maintained efficiently.
Construction Professionals Skillnet provides programmes focused on modern methods of construction, sustainable building practices, project management, and leadership, helping construction firms adapt to the growing demand for renewable energy infrastructure and low-carbon building solutions.

CiTA Skillnet supports architecture, engineering, construction, and operations businesses through the provision of innovative ICT upskilling programmes and knowledge sharing initiatives, including Building Information Modelling (BIM), a tool that can streamline renewable projects like wind farms or grid upgrades by modelling logistics routes, environmental impacts, and infrastructure integration early.

Green Tech Skillnet furthermore offers a range of programmes on Environmental Impact

Assessments, including the newly launched *Landscape Visual Impact Assessment* programme, *Environmental Essentials for Engineering Projects*, and an *Advanced Diploma in Planning and Environmental Law* to support planning and infrastructure delivery.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Scotland's *Green Industrial Strategy*, published in 2024, integrates skills development as a core pillar focusing on rapid upskilling, just transition pathways, and employer-aligned training to support 60,000+ green jobs by 2030.[21] Through the Just Transition Fund it will continue to support skills interventions that support the transferability of workforce across sectors to meet the needs of the net zero transition. This includes commitments to advancing the *Energy Skills Passport* - a digital platform that enables professionals to map and showcase their skills, expertise, and qualifications, helping them access new career opportunities across the energy sector.[22] It is also committed to supporting regional programmes of upskilling and reskilling such as the *Energy Transition Skills Hub* launched in 2025 and strategically located near 75% of Scotland's installed and planned offshore wind pipeline [23], and the *National Energy Skills Accelerator* – a collaborative initiative established in 2021 between Robert Gordon University, the University of Aberdeen and North East Scotland College, and supported by Skills Development Scotland, the national skills body, to help create a more flexible and resilient workforce for the UK's energy sector in areas such as Hydrogen, Offshore Wind, and Carbon Capture, Utilisation and Storage (CCUS).[24]

The *Green Jobs Workforce Academy* online platform, delivered by Skills Development Scotland since 2021, also empowers current and future workers to consider how their skills and experience can be built upon to launch a green career in renewables, construction, transport, and other key sectors in the green economy.[25]

In Norway, the *Egersund Energy Hub* serves as a centre for environmental technology and renewable energy, offering training and education in both onshore and offshore wind power. The Hub is a collaborative initiative involving companies that provide services, foster business development, and drive innovation across wind energy, other renewables, environmental technologies, energy efficiency, and related fields.[26]

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[21] Scottish Government. (2024, September 11). *Green industrial strategy* (ISBN 9781836016847). The Scottish Government. Retrieved from https://www.gov.scot/publications/green-industrial-strategy/

[22] Empower Your Energy Career | Energy Skills Passport

[23] ETZ Ltd | Skills Campus

[24] NESA | Introducing NESA

[25] New Green Jobs Workforce Academy - gov.scot

[26] About Egersund Energy Hub - Egersund Energy Hub

In France, *WEAMEC (WEst Atlantic Marine Energy Community)* unites the marine renewable energy ecosystem in the Pays de la Loire region, spanning research, innovation, and training. Its membership includes organisations from both industry and the tertiary sector, with support from European, regional, and metropolitan authorities, as well as dedicated funding mechanisms.[27]

12. If so, how might similar approaches be adapted to the Irish context?

Many of these international approaches are reflected in Ireland's current plans, including the establishment of a National Offshore Wind Skills Training Hub, led by the Department of Further and Higher Education, Research, Innovation and Science. Drawing on the collaborative models seen in other jurisdictions, the proposed Hub is designed to provide a framework for partnership and knowledge-sharing in offshore wind education and training, facilitating engagement between tertiary education providers and industry.

Complementing this, Skillnet Ireland is developing a new Offshore Wind Energy Careers Development Platform, a national resource to support sector-wide skills development and help accelerate Ireland's renewable energy ambitions. Mirroring the successful Skillnet MMC Accelerate platform for the construction sector, the OWE platform will serve as a central interface connecting industry, education providers, and prospective talent. It will promote upskilling, learning, and career development, while providing clear learning pathways and job profiles to strengthen the talent pipeline across the offshore wind sector.

SMEs

12. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Supporting SMEs to be competitive requires a different approach to that of larger companies. SMEs often face financial, human, and technological constraints, so development interventions must be practical, cost-effective, and deliver high impact. Capability building, grounded in strategic skills and talent development, plays a pivotal role in advancing SME-led innovation. By strengthening technical expertise, leadership capacity, and commercial acumen, SMEs are better equipped not only to develop cutting-edge solutions but also to successfully deploy and scale them in a rapidly evolving energy landscape. One of Skillnet Ireland's lead objectives in its new 2026-2028 strategy - *Empowering Enterprise* - is accelerating business transformation, and we have identified three key transformation enablers for businesses to unlock new opportunities for growth and long-term competitiveness - Digital Transformation; Sustainability Transformation; and AI Enabled Transformation.[28]

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[27] Home | Weamec

[28] Skillnet Ireland. (2026). *Empowering Enterprise 2026–2028: A strategy for next-generation capability*.

Together, these priorities ensure that SMEs have the capabilities, skills, and strategic support needed to innovate, adapt, and thrive in the transition to a more digital and sustainable economy.

To develop and commercialise the next generation of renewable and clean energy solutions, SMEs need access to highly specialised expertise that is often in short supply. Expertise in renewables, energy storage, grid integration, and energy management systems remains limited. There is a shortage of engineers and technicians who can bridge traditional electrical systems with digital and smart grid technologies. Digital capability is another constraint with many SMEs lacking foundational digital and data literacy skills, limiting their ability to harness AI, analytics, and cloud technologies.

As highlighted in Skillnet Ireland's 2025 *Talent Landscape Report*, in this era of accelerating technological change, businesses, and especially SMEs, need to harness new technologies as strategic opportunities. Large enterprises are leading the charge, leveraging technologies such as AI, cloud computing, and big data analytics to enhance productivity and competitiveness. However, the adoption of advanced digital skills remains uneven, with smaller businesses having less capacity to effectively harness these technologies. 42% of Irish SMEs reported difficulties recruiting talent, particularly in technology, engineering, and digital roles.[29] Targeted investment in specialised training and upskilling is essential to strengthening SME competitiveness and enabling their participation in complex energy deployments.

The Draghi Report furthermore highlights the opportunity for SMEs to strengthen productivity and competitiveness through improved management practices, particularly those aligned with the digital and green transitions.30 SMEs form the backbone of Ireland's economy, yet many struggle to implement the tools and processes that could drive innovation and sustainability. Adopting such practices opens the door to boosting the innovation capacity of businesses, enabling SMEs not only to modernise operations but also to contribute more effectively to Ireland's and the wider EU's broader competitiveness and climate goals.

While 46% of SME leaders engaged in upskilling in the past year, primarily in business and leadership development, continued support is critical. [31] Skillnet Ireland is committed to

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Skillnet Ireland. Accessible at Empowering Enterprise 2026-2028 | Skillnet Ireland

[29] Skillnet Ireland & Ipsos B&A. (2025). *Ireland's Talent Landscape 2025: Future skills challenges of Irish business* (research report). Skillnet Ireland. Accessible at https://www.skillnetireland.ie/insights/irelands-talent-landscape-2025

[30] Draghi, M. (2024). *The future of European competitiveness: A competitiveness strategy for Europe* (Report). European Commission. https://commission.europa.eu/topics/competitiveness/draghireport_en

[31] Skillnet Ireland & Ipsos B&A. (2025). *Ireland's Talent Landscape 2025: Future skills challenges of Irish business* (research report). Skillnet Ireland. Accessible at https://www.skillnetireland.ie/insights/irelands-talent-landscape-2025

supporting SMEs enhance their leadership and capacity for innovation. Initiatives such as Skillnet Ireland's Mentors Work programme aims to strengthen leadership, management, and organisational capability via a structured, 12-week development journey, combining mentoring, learning, and peer collaboration. For green technology developers, a programme like this could enhance their business models to accelerate innovation and scale-up.

Market access is also another key component to supporting SME participation in green tech. The Skillnet Innovation Exchange offers a unique framework that empowers scaling SMEs by connecting them with large corporates, helping them gain a comprehensive understanding of the innovation journey, from ideation and validation through to procurement. This structured engagement strengthens product development while sharpening sales and marketing strategies, creating clear value for all participants.

For SMEs, the Innovation Exchange delivers far more than a qualified sales pipeline. By building the right internal capabilities and engaging directly with prospective customers through the programme, scaling companies gain valuable industry insights, actionable market intelligence, and real-time feedback. This deeper market understanding enables them to refine their solutions, accelerate commercial readiness, and compete more effectively at scale. Aligning SME capabilities with demand from energy system stakeholders in a similar manner could be transformative to the energy ecosystem, facilitating matchmaking of technology gaps with innovative solutions.

Finally, the *Green Growth Strategy* could include targeted measures to simplify SME access to talent and innovation supports. For example, Skillnet Ireland is currently working with the Department of Further and Higher Education, Research, Innovation and Science (DFHERIS) on the rollout of a targeted SME incentivisation scheme aimed at reimbursing the cost of upskilling and reskilling of employees. The scheme aims to boost SME participation in lifelong learning and the development of critical future-ready skills, including those demanded by the digital transition.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

The aforementioned Expert Advisory Group on Offshore Wind Skills which ensures the timely identification of emerging and evolving skills needs, provides a structured oversight model that would equally enable proactive monitoring of green technology challenges and opportunities from a cross-sectoral multi-agency perspective.

Built on sustained collaboration between businesses, sectoral representative bodies, and the education and training system, Skillnet Ireland's enterprise-led model also provides structured channels to systematically monitor developments in green technologies. Continuous, direct engagement with employers enables early identification of shifts in technology adoption, regulatory requirements, supply chain standards, and market demand. As companies develop and integrate renewable energy solutions, they reveal practical challenges such as skills

shortages, certification gaps, procurement barriers, and technological interoperability issues. These insights can be captured and analysed at Business Network level, offering a clear, evidence-based view of where green technology deployment is advancing successfully and where obstacles remain.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Skillnet Ireland welcomes continued engagement with the Department of Enterprise, Tourism and Employment to identify opportunities for collaboration and alignment with the *Green Growth Strategy* and associated funding frameworks, ensuring a coordinated, strategic, and high-impact approach to delivering Ireland's clean energy ambitions. By building the capabilities needed to lead in electrification and clean energy innovation, Ireland can position itself as a global hub for emerging green technologies, generate high-quality green employment, and secure a resilient, competitive, low-carbon energy system for decades to come.

Tionól Réigiúnach an Deiscirt
Southern Regional Assembly

Southern Regional Assembly – Submission on Green Growth Public Consultation

In March 2024, Powering Prosperity – Ireland's Offshore Wind Industrial Strategy marked a significant milestone as the first strategy of its kind for Ireland. Powering Prosperity set out 40 actions to be delivered across 2024 and 2025, to ensure we are well placed to capture the full economic potential of Ireland's offshore wind sector and the Government's plan-led approach to offshore wind.

We are keenly aware, however, that offshore wind cannot sit on its own and needs to be viewed in the wider energy system. As such, the Action Plan on Competitiveness and Productivity published in September, contained an action to "Publish a green industrial growth strategy focused on the development and industrial deployment of green technologies to support sectoral growth and unlock economic opportunities across all regions.".

To truly harness the potential of our abundant renewable energy resources, we must expand our focus beyond offshore wind alone. To increase the potential gains from an industrial strategy, we must examine the potential of offshore renewable energy technologies beyond wind. Our closest neighbours are already diversifying into marine energy — including floating and fixed offshore wind, wave energy, and tidal stream technologies – and there may be opportunities here for Ireland also.

It is envisaged that the proposed green growth industrial strategy will focus primarily on supporting companies developing certain green technologies, including innovation and in-company research and development, and the required supply chain for deployment rather than developing any policy for these technologies. The growth of the renewable energy sector should be the focus for this strategy. Similar to Powering Prosperity, it is proposed that the new strategy focus on the economic opportunities presented by the green transition, specifically focussing on those green technologies which would benefit from a strategic level intervention as described above.

It is worth noting that the range of green technologies is vast and it will be impossible to focus on everything. Therefore, it is proposed that the strategy focus on a set of key technologies related to the energy system, with offshore wind remaining at the core of this work, as well as broadly covering;

- offshore renewable energy
- onshore renewable energy
- storage technologies
- grid technologies
- green hydrogen and its derivatives
- carbon capture technologies

Your feedback will help shape an important, future-focused strategy — one that not only powers Ireland's green transition but also unlocks long-term economic resilience, global leadership in clean innovation, and prosperity for generations to come.
When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.
The Southern Regional Assembly welcomes the progress made under Powering Prosperity, and the impact that this is having on the Southern Region's ORE sector.

The publication of the first Draft Designated Maritime Area Plan (DMAP) for the South Coast, has directly supported early-stage project development in the region, providing clarity for developers, supply-chain planning, and early feasibility work.

Actions under PP have also supported research alignment with regional universities and innovation networks that are strong in the South–West, such as UCC's MaREI centre, enhancing growth of indigenous capabilities.

The complete and in progress outcomes as showcased in the 2025 Implementation Progress Report are strengthening attention and development of port readiness and supply-chain opportunities in the Southern Region, with ongoing opportunities to support balanced regional development.

The Southern Regional Assembly intend to build on this work through the review of the Regional Spatial and Economic Strategy for the Southern Region which will commence on 26th March and will include relevant policy objectives including the Regional Renewable Energy Strategy.

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

The SRA supports the ambitions of the Green Growth Strategy and the expansion of renewable technologies and enabling infrastructure in line with Ireland's decarbonisation commitments under the Climate Action and Low Carbon Development Act (as amended). These priorities align strongly with the Regional Spatial and Economic Strategy (RSES), particularly RPO 85 (Renewable Offshore Energy), RPO 95 (Sustainable Renewable Energy Generation), RPO 104 (Energy Storage and Carbon Capture), and RPO 221 (Renewable Energy Generation and Transmission Network).

ORE remains a key strategic opportunity for the Southern Region, which has set a target of delivering 900 MW of offshore wind capacity by 2030. The Region's coastline, its proximity to major urban centres of Cork, Limerick and Waterford, and the significant progress underway at the ports of Cork, Waterford, Rosslare and Shannon Foynes position it as a national leader in offshore generation, supply-chain development, and technology deployment. Continued support for port infrastructure and associated enabling works will be critical to fully realising this opportunity.

At the same time, onshore renewable energy should continue to be prioritised, given the Region's strong resource potential, existing infrastructure, and the proven commercial viability of mature technologies. This balanced approach strengthens energy security while supporting regional economic growth.

There are additional areas where the Green Growth Strategy can play an important role in unlocking future opportunities:

- Bioenergy: Consistent with RPO 109, the development of a Bio-Energy Implementation Plan offers significant potential for value-addition within the agriculture and land-use sectors. Existing assets, such as the Lisheen innovation hub, and the Region's strong research capabilities provide a strong foundation for scaling bio-energy solutions.
- Green hydrogen: With clear links to port infrastructure and opportunities to support both energy system balancing and industrial decarbonisation, green hydrogen represents a high-potential emerging sector. Continued emphasis on R&D and commercialisation, as

reflected in RPO 102 on Energy Research Funding, will be essential to positioning the Region competitively in this fast-evolving field.

3. Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

The bioeconomy requires targeted supply-chain development, particularly upstream feedstock reliability, where conflicting resource uses continue to pose commercialisation challenges. Government publications, such as the National Policy Statement on the Bioeconomy and the Bioeconomy Action Plan 2023–2025, highlight the complexity of bio-based value chains and the need for structured coordination, which emphasise feedstock management, circularity, and the need for integrated supply-chain planning.

Smart grid systems need support for components that manage fluctuations in supply and demand, including digitalisation, grid-flexibility technologies, and system-services integration. The SEAI Smart Grid Roadmap identifies critical infrastructure and communications systems required to enable high renewable penetration and demand-side management, reinforcing the need for continued investment in advanced grid technologies.

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Further feasibility work is required to understand the optimal role of green hydrogen, especially its integration with offshore renewables and port infrastructure. The National Hydrogen Strategy recognises hydrogen's potential but highlights uncertainties around end-uses, cost trajectories, and required infrastructure, reinforcing the need for enhanced R&D, regulatory development, and demonstration projects.

Sustained R&D and workforce development are needed to support long-term operations and maintenance capabilities, particularly for wind energy. Reports such as the EirGrid Annual Innovation Report stress the importance of developing technical skills and research capacity to maintain a resilient and secure renewable-led power system, reflecting the need for investment in training, innovation ecosystems, and specialist facilities.

Addressing skills shortages will also be a key requirement, and the Regional Assemblies has undertaken a number of initiatives in this regard including the development of Towards a Learning Region document (attached).

5. Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Not answered

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

- Skills shortages, particularly in engineering and construction, limiting deployment capacity.
- Commercialisation challenges for emerging technologies such as floating offshore renewables and green hydrogen due to technical complexity and high costs.
- Infrastructure constraints, including the need to upgrade grid and smart-grid systems, and expand port capacity to support offshore deployment.
- High capital costs and limited access to finance, with Irish firms facing challenges competing with larger foreign investors; ports also unable to fund large-scale upgrades independently (Economic Impact of Southern Region Ports).
- Uncertainty around long-term demand, making large-scale investment decisions more difficult for industry.
- Land-use pressures, including limited space in key strategic locations (e.g. ports) and conflicts arising from zoning changes or competition for land.
- Planning-system delays, including lengthy approval processes, grid-connection bottlenecks, and judicial review risks that slow project delivery.
- Behavioural and systemic barriers, such as reliance on solid-fuel heating slowing consumer-level decarbonisation.
- Barriers to scaling indigenous companies, with the Action Plan on Competitiveness and Productivity highlighting ongoing difficulties accessing finance and supports for growth.
- Community engagement/buy in.

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

To support the development of green technologies, several Government and State-agency interventions should be considered. The SRA already advances this agenda through key RPOs in the Regional Spatial and Economic Strategy, including RPO 57 (National Policy Statement on the Bio-economy), RPO 87 (Low-Carbon Energy Future), RPO 95 (Sustainable Renewable Energy Generation), RPO 104 (Energy Storage and Carbon Capture), RPO 109 (Bio-Energy Implementation Plan), RPO 99 (Renewable Wind Energy), and RPO 221 (Renewable Energy Generation and Transmission Network). These are further strengthened by participation in EU-funded Smart Specialisation and skills initiatives.

Government interventions should focus on:

- Strengthening collaboration, especially cross-sectoral RD&I and skills development.

- Reducing friction in the planning system to ease bottlenecks for renewable infrastructure.
- Investing in regional infrastructure, including grid upgrades and local distribution capacity.
- Supporting key strategic hubs, such as ports, as centres for scaled renewable deployment and technology testing.
- Facilitating long-term finance for strategic national projects and enabling access to EU-level funding.
- Helping indigenous firms scale, including partnering with international expertise.
- Ensuring regional economic benefits, particularly for communities directly affected by green-technology developments.
- Community Engagement buy in.

8. Are there existing supports that should be expanded or improved?
As above

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?
The Strategy should prioritise aligned sectors such as agriculture, rural industries, and land-use–based enterprises, given their central role in the emerging bioeconomy, onshore renewable generation, and land management. Early and continuous engagement with these sectors is essential to navigate potential land-use conflicts, e.g. between farming, solar deployment, and wayleave requirements for large-scale ORE-supporting infrastructure, and to ensure that rural stakeholders are included in emerging opportunities.

Similarly, strong engagement with rural and coastal communities located near potential renewable energy sites is vital. Proactive dialogue can maximise community benefits, reduce friction, and help identify wider socio-economic opportunities such as skilled jobs, supply-chain services, and local enterprise development. Broader considerations, including housing availability and community infrastructure, are increasingly important, especially as evidence shows that investment decisions can be influenced by constraints such as worker accommodation.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?
A Green Growth Industrial Strategy could identify complementary-sector companies by working closely with Chambers of Commerce, Regional Enterprise Plans, Local Authority Development Plans, and relevant sectoral bodies, innovation hubs, and clusters. These networks provide strong visibility of firms with transferable capabilities and help highlight opportunities in the

green economy.

Diversification could be encouraged by providing supports and opportunities for collaboration, including matchmaking between industry, academia, and technology developers. Access to test sites or demonstration projects, supported through funding for time, skills, or capital, will help companies trial technologies, de-risk investment, and better understand potential positive impacts.

Additional supports could include targeted capability-building programmes, innovation vouchers, and regional cluster initiatives that promote knowledge-sharing and accelerate adoption of renewable and green technologies.

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Not answered

12. If so, how might similar approaches be adapted to the Irish context?

Not answered

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

Ireland can better position SMEs in green technology by closing the funding and support gap with MNEs—particularly the equity-finance gap—and by working with regional and local bodies to address place-specific challenges and opportunities, as recommended in the Action Plan for Competitiveness and Productivity.

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

The SRA would recommend that the Strategy adopts a structured, forward-looking approach, while utilising and integrating with existing EU- or international frameworks. This might include leveraging regional and national innovation networks, using insights from existing enterprise supports and funding programmes, and aligning monitoring efforts with international reporting standards.

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

The SRA would recommend that the Strategy considers short- and long-term skills development, lifelong learning, and training pathways, ensuring that the workforce can meet future demands of the green economy. The new strategy should also embed Just Transition and inclusive-growth principles, ensuring that communities hosting green technologies, particularly coastal and island communities, as emphasised in RPO 83, benefit directly from new investment. Finally, DETE

should consider how green growth can further strengthen regional economic development, recognising the Southern Region's role as a key driver of national growth and in delivering balanced, distributed economic opportunity across the country.

Green Growth Strategy

SSE Submission

4 March 2026

sse

Who we are

At SSE, we are driven by our purpose: to provide the energy needed today while building a better world of energy for tomorrow. SSE develops, owns, and operates low carbon infrastructure to support the transition to net zero, this includes onshore and offshore wind, hydro power, electricity transmission and distribution networks, alongside providing energy products and services to customers. With current interests across the island of Ireland and Great Britain, in addition to carefully selected international markets, including East Asia and Europe, SSE is both growing its footprint and its range of expertise in our bid to lead the transition to net zero by 2050.

Since entering the Irish energy market in 2008, we have invested significantly in our Irish businesses, with a total economic contribution of over €2.2bn in the last 4 years alone, and currently employ 1300 people across the island of Ireland. SSE Renewables (SSER) owns 700MW of onshore wind capacity across 27 windfarms on the island, and operates a total of over 1,000MW. This includes Galway Wind Park, one of Ireland's largest and best performing onshore wind farms (co-owned with Greencoat Renewables). SSER is currently constructing additional onshore wind capacity in Ireland, as well as offshore wind projects like Arklow Bank Wind Park 2, and an emerging solar and battery pipeline. SSER has operated a voluntary Community Fund in Ireland since 2008, donating over €12m so far to local community groups in the vicinity of our onshore assets.

SSE Airtricity supplies electricity and gas to over 740,000 home and business customers across the island and delivers home energy upgrades through our one stop shop, the Generation Green Home Upgrade, which aims to deliver 50,000 home energy upgrades by the end of the decade.

In addition to our renewable generation assets, SSE's Thermal business owns and operates 672GW of dispatchable generation in Ireland providing vital security of supply. SSE Thermal is developing new lower carbon capacity including Tarbert Next Generation which will run on 100% sustainable biofuels.

SSE is committed to sustainability. We have built the largest renewable electricity portfolio in the UK and Ireland and in 2020 committed to achieving net zero greenhouse gas (GHG) emissions across all operations by 2050 at the latest, covering scope 1, 2 and 3 GHG emissions. Recognising the international importance of decarbonising the power sector as quickly as possible, SSE also aims to achieve net zero across scope 1 and 2 emissions by 2040 at the latest including through investment in low-carbon dispatchable power generation options such as Carbon Capture and Storage, Hydrogen and electricity storage.

SSE response

SSE welcomes DETE's proposal to develop a Green Growth Industrial Strategy and recognises the importance of Powering Prosperity – Ireland's Offshore Wind Industrial Strategy as a strong foundation on which to build. The offshore wind strategy demonstrated the value of close government–industry collaboration, clear prioritisation and alignment between policy certainty, deployment pathways and supply chain development.

Focus on established technologies

SSE strongly supports the principle that an effective Green Growth Strategy needs to prioritise established technologies with policy certainty, defined regulatory frameworks and clear routes to market. These are the technologies capable of delivering near and medium-term emissions reductions, economic value and durable supply chain investment.
Through the Climate Action Plan, Ireland has set out green technology priorities that align both with national and EU climate goals, and which could unlock major economic opportunities. Focus should remain of technologies which have biggest impact in the near to medium term to decarbonise how Ireland produces, stores, distributes and uses energy

In the Irish context, this clearly points to onshore and offshore wind and electrification as the core focus of the Green Growth Strategy.

In a renewables-led power system, Ireland will need flexible, low-carbon generation to ensure energy security. Biomethane represents a credible low carbon alternative to gas and a transition pathway to net zero given its compatibility with existing gas infrastructure. Economic and policy barriers to the deployment of biomethane in the power sector should be addressed to enable this to occur.
Hydrogen powered flexible generation offers a potential long-term decarbonisation solution for Ireland. The EU Hydrogen Strategy treats hydrogen as *"essential to support the EU's commitment to reach carbon neutrality by 2050"*, including by enabling:

- Seasonal energy storage;
- Backup and balancing for variable renewables (wind & solar);
- Decarbonisation of flexible thermal generation assets

SSE is progressing Tarbert Next Generation - a 300MW flexible generation plant which will run on 100% sustainable biofuels with the potential to convert to hydrogen, reflecting our commitment to supporting the electricity system in Ireland while laying the foundations for a low-carbon future. SSE's Platin power station (170MW) in County Meath will also have potential to convert to hydrogen. Converting to hydrogen is contingent upon the development of support schemes / business models across the hydrogen value chain to overcome cost competitiveness challenges and full value chain development across production, storage, transport and offtake as noted in Ireland's Hydrogen Strategy.
SSE is also exploring CCS opportunities in Great Britain at Peterhead through the Scottish Cluster (alongside Albrough Hydrogen Pathfinder). Legal and regulatory barriers to CCS would need to be addressed should Ireland decide to pursue this technologies
While SSE recognises the long-term potential of emerging technologies such as green hydrogen, carbon capture and storage (CCUS) and long duration energy storage, these technologies currently lack the policy clarity, market frameworks and deployment certainty required to underpin meaningful industrial or supply chain strategies. As such, full scale supply chain strategies around these technologies would be premature in the absence of policy certainty.
A Green Growth Strategy can play an important role in setting long-term strategic direction. However, detailed industrial and supply chain interventions should be sequenced to follow clear government policy intent and credible regulatory and market frameworks.

Onshore and offshore wind as renewables backbone

Onshore wind and fixed bottom offshore wind should remain the anchor technologies for Ireland's green industrial development. Within offshore wind, a hierarchy and sequencing of technologies would be most beneficial:

- Fixed bottom offshore wind should remain the immediate priority, reflecting its maturity, cost competitiveness, and its central role in delivering Ireland's Phase 1 offshore wind ambitions
- Deep-water fixed offshore wind should be supported as a natural extension of this market, building on existing capabilities and infrastructure.
- Floating offshore wind should be recognised as an important longer-term opportunity, but one that should be pursued where and when it is economically, spatially and system appropriate, and not at the expense of near-term delivery.

Supply chain and industrial strategy should be built around this sequencing, ensuring that investment and capability development is anchored in technologies that are deliverable this decade, while retaining flexibility to pivot as floating offshore wind matures. SSE welcomes the work undertaken by Enterprise Ireland in establishing the offshore wind cluster, recognising the strategic importance of supporting Irish companies to access to gain experience in other markets which could in time be applied to the Ireland

The development of the first phase of offshore projects offers a significant opportunity for Irish supply chain companies across a range of disciplines. SSE notes that supply chain companies who may be contracted to support Phase 1 projects would be well positioned to support future phases of offshore wind projects including floating.

With regard to onshore wind, Ireland has a considerable pipeline of projects which is continuously increasing. Opportunities in relation to Green Energy Parks should be considered not just in the context of offshore wind, but also onshore wind, and particularly in those areas of the country where there are significant network constraints. SSE sees substantial opportunities in North Mayo where there is strong renewables potential, a pipeline of projects and IT infrastructure. County Mayo is the landfall location for two transcontinental data communication fibre cables linking the USA with Europe. SSE notes additional opportunities in the Midlands in County Offaly which is proximate to Dublin and being effected by growing grid constraints.

Supply chain Focus

The opportunities and challenges across green technologies differ significantly depending on their maturity, policy readiness and deployment timelines. A key risk in the proposed Green Growth Industrial Strategy is that limited supply chain capacity, public funding and institutional focus are spread too thinly across technologies at very different stages of maturity. Until clarity is provided by Government regarding the roles that floating offshore wind, biomethane, hydrogen, and CCUS will play in Ireland's power system, industrial and supply chain interventions in these areas should not be central to the strategy.

SSE looks forward to the outputs of the SEAI's Decarbonising Electricity System Study which aims to map out the technologies that will be needed to decarbonise the power system post 2030 and to inform Government policy. DETE's Green Growth Strategy should be aligned with the outputs and policy which may emerge from the DESS.

Conclusion
To maximise impact and credibility, SSE recommends that DETE prioritise technologies that:

- Are clearly identified as government priorities with enabling policy and regulatory frameworks
- Have support mechanisms either in place or actively under development; and
- Are aligned with national spatial planning, grid development and energy system planning.

In parallel, there is a clear imperative to deliver coherent supporting frameworks across departments to underpin Ireland's overall industrial green growth objectives. One example is Private Wires, which sits within the broader DCEE-led policy landscape. While the policy has been approved in principle, it has not been enabled in practice as primary legislation and secondary regulations are still required to allow delivery on the ground.

Finally, the Green Growth Industrial Strategy should be fully aligned with the outputs of the SEAI's DESS Study (as noted above), the National Designated Maritime Area Plans (DMAPs); onshore regional spatial and energy strategies; and Large Energy User policy frameworks.

TRIFECTA IRELAND

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The coordinated approach carried out in Powering Prosperity, which linked supply chain development, research and innovation, regional growth, and enterprise support, was extremely effective and should now be applied to storage, smart grids, and electrification. This framework recognised that achieving offshore wind targets requires more than project delivery and understood that cross-agency alignment:

- reduces uncertainty
- strengthens investment signals
- increases the likelihood that Ireland captures durable economic value rather than importing it.

The emphasis on measurable enterprise outcomes, including supply chain participation, clear performance targets and innovation activity, was also significant, as it signals that domestic capability building is an explicit objective.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

Ireland's primary barriers are not the availability of renewable generation but system integration, flexibility, and delivery speed. Priority should therefore be given to green technologies associated with grid enhancement, energy storage, floating offshore wind, demand flexibility and digitalisation that both enable rapid decarbonisation and strengthen long-term system competitiveness.

Grid-enhancing and smart grid technologies fulfil the dual goal of**:**
1. Complementing conventional grid expansion at a time of significant execution constraints.
2. Building exportable capability in advanced grid and digital systems.
Commercially mature technologies such as dynamic line rating, advanced monitoring and flow control technologies can unlock capacity from the existing network within months, reducing curtailment and accelerating renewable integration. Dynamic line rating alone has resulted in capacity uplifts of 10–30% without major new infrastructure.

System flexibility is foundational in a high-renewables system with storage (including longer-duration storage):

- improving price stability
- reducing dispatch down
- strengthening the security of supply.

The time has passed for a series of long pilots without any follow-on implementation. Mature technologies are already proven in other markets, making clear regulatory treatment and route-to-market visibility crucial for efficiently scaling flexibility.

Offshore renewable energy, particularly floating offshore wind, represents a considerable economic opportunity for Ireland. Therefore, focusing on these technologies is crucial to leverage Ireland's enviable comparative advantage in its domestic renewable resources.

Demand flexibility and electrification technologies, such as heat pumps, EVs, and demand response, must be treated as core system enablers. Flexible power demand must evolve alongside renewable supply, supported by coherent tariff and retail pricing frameworks that send clear behavioural signals.

Digitalisation and delivery acceleration technologies, including AI-enabled planning and grid operations, can also materially shorten permitting timelines and reduce delivery risk. This outcome is especially important in an Irish context, with Ireland identified in Draghi's 2024 report, The future of European competitiveness, as one of the EU countries with the longest permitting timelines for solar and wind. Additionally, AI operating tools can assist:
1. System operators - supporting automated grid balancing and real-time scenario evaluation as system complexity grows, enabling more efficient operational decision-making.
2. Consumers - automatically carrying out consumer preferences, optimising cost, and dynamically adjusting consumption based on price signals.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
Supply chain development determines how efficiently renewables are integrated and how much long-term economic value Ireland retains. Therefore, Ireland must focus on system-enabling technologies: grid optimisation, storage integration, offshore wind support, advanced power electronics, and electrification platforms.

Supply chain support for commercially mature grid-enhancing technologies should prioritise:

- domestic capability in system integration
- digital optimisation
- advanced operational modelling
- specialist engineering within EirGrid and ESB Networks

Scaling storage requires predictable pipelines and clear regulatory treatment. Ireland must avoid a scenario in which assets are deployed, but system knowledge remains externalised. Therefore, it needs to prioritise support in: grid-scale system design and integration

- power electronics and inverter technologies
- control systems and optimisation software
- longer-duration solutions
- specialist O&M capability.

Offshore wind requires the development of associated ports. This development requires significant support made even more pressing by concerns that Ireland's current development model is not conducive to offshore wind development.

Low-inertia system management, grid-forming technologies, smart charging, and demand aggregation represent high-value segments aligned with Ireland's strengths in the digital and engineering sectors. Support must emphasise R&D-commercialisation pathways, pilot environments, and workforce training.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

RD&I support should focus on accelerating the deployment of commercially mature system-enabling technologies, not solely on early-stage invention. This support should focus on grid technologies, storage, flexibility and advanced power electronics and digitalisation. Notably, across sectors, regulatory conservatism, slow approvals, and misaligned price signals remain persistent barriers. Addressing these structural constraints is as important as increasing funding.

A significant contributing factor to the innovation gap for grid technologies is institutional capability. Their system integration is limited due to regulatory lag, conservative deployment thresholds, and limited operational test environments. Support must prioritise:
-applied system integration research

- TSO/DSO-linked pilots
- regulatory incentives tied to measurable network outcomes
- AI-enabled grid optimisation
- grid enhancement technologies

For storage and flexibility, uncertainty around market structures creates barriers, leading firms to be reluctant to invest in in-house RD&I or scale innovation domestically. These barriers must be reduced through clearer long-term signals and structured innovation funds targeted at flexibility solutions.
In advanced power electronics and digitalisation, stronger industry–academic collaboration and commercialisation pathways are needed to bridge research and operational deployment.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

Industrial deployment must prioritise grid-enhancing technologies, storage and flexibility technologies and electrification and flexible demand. Crucially, Ireland's binding constraint is predominantly integration and execution speed rather than technology availability. Standardisation/modular approaches, calling for explicit assessment and incentivisation of standardised designs, are essential to reduce cost and time risk and should be prioritised alongside digital tools (including digital twins and AI-enabled permitting/compliance) that are central to faster, cheaper delivery by identifying issues earlier and reducing delay risk.

Industrial deployment support for grid-enhancing and smart grid technologies must focus on:

1. Accelerating the adoption of proven tools and grid technologies that increase capacity and/or reduce dispatch down.
2. Introducing outcome-focused incentives that reward timely energisation and efficient system performance.

Storage and flexibility technologies require clearer regulatory treatment and route-to-market certainty. Deployment support should reduce delivery risk for longer-duration assets.

Electrification and flexible demand must scale alongside generation. Support should enable infrastructure and market participation pathways that allow electrified demand to provide system value.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

The principal barriers are increasingly institutional and structural rather than technological. While renewable generation technologies are mature and globally available, deployment is constrained by lengthy and fragmented planning processes, grid connection delays, and slow regulatory approval pathways for system-enabling technologies. Significant barriers to scaling renewable energy and green technologies include:

1. The absence of effective performance-based incentives that suitably reward measurable system outcomes, such as reduced curtailment, faster energisation, or improved network efficiency.
2. Market design uncertainty, particularly around storage, flexibility and hybrid models, that dampens investor confidence.
3. Skills gaps in specialist engineering, digital grid systems, advanced power electronics, and project delivery further constrain scaling capacity.
4. Long lead times between project award and commissioning increase time risk and discourage in-company innovation investment.
5. The pace of adoption of system-enabling technologies, such as AI-assisted grid optimisation, required to coordinate an increasingly large portfolio of renewable energy and green assets.

Government Supports

7. Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

Interventions should aim to remove friction in the system rather than simply introduce additional funding streams. In many areas, the relevant technologies already exist and have been deployed in other countries. The Government's role, therefore, should be to accelerate their adoption within the Irish system and ensure that regulatory frameworks support rather than hinder their integration. Interventions should include:

1. Performance-based regulatory frameworks that reward system outcomes rather than capital

expenditure alone
2. Structured pilot environments directly linked to TSO/DSO deployment.
3. Multi-year visibility on deployment pipelines that reduce investment risk and strengthen domestic supply chain participation.
4. Innovation supports that focus on system integration and flexibility solutions, with clear pathways from research to operational deployment.
5. Accelerated and digitalised permitting pathways, including structured adoption of digital tools to shorten approval timelines.
6. Stronger cross-agency coordination between enterprise, energy and innovation bodies, which ensures that industrial development aligns with infrastructure deployment.

8. Are there existing supports that should be expanded or improved?
Improving coordination, clarity and incentives within existing frameworks will deliver greater impact than introducing entirely new schemes. Trifecta Ireland promotes that:

1. Enterprise and innovation funding mechanisms should be more explicitly linked to system deployment priorities, particularly in grid optimisation, storage integration, and digital energy platforms.
2. Route-to-market clarity for storage and flexibility requires further refinement, particularly regarding tariff exposure and revenue stacking frameworks.
3. Greater emphasis on digitalisation and operational optimisation within network regulation would improve outcomes without requiring large-scale new infrastructure.
4. More structured collaboration between TSOs/DSOs, universities, and SMEs would help translate research excellence into deployment capability.

Aligned Sectors
9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?
Supporting aligned sectors that contribute to system integration, delivery capability and export competitiveness strengthens both domestic deployment capabilities and export potential.
In particular, three aligned sectors must be considered central to Ireland's green growth strategy:

1. Advanced engineering, power electronics and system engineering should be developed as renewable penetration increases, and the grid becomes more digitally managed and inverter based.

2. Software, data, and digital services, an area in which Ireland is already strong, should be mobilised to support energy-focused digitalisation, which can play a role in accelerating project delivery, improving regulatory approvals, and reducing megaproject risk.

3. The financial services ecosystem should be supported through strengthening green finance expertise to reduce financing friction and improve competitiveness.

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

Companies in complementary sectors are most effectively engaged when policy provides clarity, visibility and structured pathways into the energy transition.

Identifying firms with adjacent capabilities should be supported through coordinated mapping exercises led jointly by enterprise and energy agencies. Clear multi-year infrastructure pipelines and transparent technology roadmaps will reduce uncertainty and allow firms to assess market opportunities with confidence.

Encouragement should focus on integration mechanisms such as structured pilot and test environments linked to live projects, innovation sandboxes involving system operators, targeted procurement frameworks that enable SME participation, and cluster models connected to universities and research centres. Skills programmes aligned with anticipated deployment phases will further lower entry barriers.

International examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

Structured innovation funding, modular infrastructure delivery, and anticipatory grid investment have been shown to speed up deployment and strengthen domestic capacity in different countries:

1. The UK's Strategic Innovation Fund (SIF), administered by Ofgem in partnership with UK Research and Innovation, was an effective intervention. This funding is tied to performance and measurable outcomes rather than an isolated grant mechanism, creating accountability, reducing regulatory lag, and shortening the pilot-to-deployment path.

2. Denmark's modular and standardised infrastructure delivery is a clear example of how Ireland can benefit by moving away from bespoke infrastructure construction. This strategy can be applied to substations, grid reinforcement and other repeatable energy infrastructure assets, shortening delivery timelines and reducing costs.

3. Several European jurisdictions have adopted more proactive approaches to grid and enabling infrastructure investment, deploying innovative technologies and capacity ahead of immediate constraint where long-term need is clear. This anticipatory approach reduces curtailment, strengthens investor confidence, and avoids delay-driven inefficiencies.

12. If so, how might similar approaches be adapted to the Irish context?

1. Ireland should create a dedicated innovation and flexibility mechanism, like SIF, tied to measurable system outcomes and performance that directly incentivises system operators to

adopt commercially mature smart grid, digitalisation and flexible technologies at pace.

2. Ireland should adopt a similar modular infrastructure model to Denmark, which explicitly prioritises standardisation. This principle has clear relevance for substations, grid reinforcement, and other repeatable energy infrastructure assets.

3. Ireland must incorporate anticipatory investment principles within regulation and planning frameworks, with a shift towards performance and innovation-driven oversight, benchmarking system operators against TSOs in similar countries.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

SMEs will participate where opportunities are visible, risk is manageable, and commercial routes are viable. To facilitate this environment and increase SME involvement, Ireland must:

1. Introduce standardised product categories and repeatable opportunities to reduce uncertainty, accelerate deployment, and support SME scaling.

2. Focus on creating credible pathways to commercialisation through access to operational testing environments, structured routes from funding to deployment, and clear regulatory frameworks for innovation incentives.

3. Ensure coherent signals across networks, retail, and wholesale so SMEs can build sustainable business models around flexibility services, digital grid tools, and electrification solutions.

4. Develop targeted training pathways aligned with the needs of high-renewable systems so SMEs can avoid labour constraints.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

Ireland should adopt a structured, performance-based and forward-looking approach that isn't based solely on installed capacities. Instead of measuring only installed MWs, indicators reflecting system performance and resilience should be tracked, as this is essential to driving efficiency and accountability. Monitoring should include systematic benchmarking against comparable countries, as this can highlight whether Ireland is deploying technologies at pace, whether regulatory lags exist, and whether infrastructure costs and timelines are competitive. Formal advisory mechanisms connecting academia, industry and system operators could also provide early insight into emerging technologies. Monitoring should be proactive, not reactive,

and should be assisted by digital twin and data analytics tools that can provide early identification of challenges and opportunities.

Other considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Trifecta Ireland encourages DETE to place greater emphasis on delivery governance and time risk within the industrial strategy. Large-scale energy transition is effectively a megaprogramme of megaprojects, and success depends as much on institutional capability as on technology choice. The strategy should therefore incorporate explicit mechanisms to reduce time risk, including clearer ownership of delivery outcomes, structured reference-class benchmarking against comparable jurisdictions, and regular performance reviews tied to measurable system outcomes.

The technologies required to facilitate large-scale energy transition are also already being deployed internationally at scale. Ireland's success will therefore depend less on technological discovery and more on recognising and operationalising solutions that are already proven.

Ireland has a unique and enviable comparative advantage in its domestic renewable resources, and our energy transformation state of maturity means our grid is relatively advanced. This bounty, coupled with our human resources and digital capabilities, means the potential for our nation to lead at the nexus of clean energy/grid and intelligent electrification is enormous. However, without intervention, Ireland will import a disproportionate share of value rather than capturing it domestically and building new capabilities to export to the world.

Finally, Ireland would benefit from a more formalised national master planning approach that aligns grid, generation, demand, and industrial development within a single, outcome-led framework. Embedding delivery capability at the core of the strategy will determine whether Ireland captures both climate and economic opportunity.

WESTERN DEVELOPMENT COMMISSION TO THE GREEN GROWTH PUBLIC CONSULTATION-

Questions

The Western Development Commission (WDC) is a statutory body with a remit to promote and encourage economic and social development in the Western Region (counties Donegal, Sligo, Leitrim, Mayo, Galway, Roscommon, and Clare). The WDC operates under the aegis of the Department of Rural and Community Development and the Gaeltacht.

We welcome the opportunity to make a submission on the Green Growth Industrial Strategy. The Western Region has significant potential in most of the areas for Green Growth outlined, which provide significant opportunities for the economic development of the Western Region. We have followed the format of the questions in Forms for the consultation. If you would like to discuss any of this further, please get in touch. Contact details are below.

Powering Prosperity

1.Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The inclusion of the balanced regional development pillar in Powering Prosperity was very significant. In terms of actions, the focus on Offshore Wind (OSW) in the Regional Enterprise Plans (REPs) was an important starting point for developing networks and understanding of the needs of different regions in relation to the development of the sector. It was very effective in the West and North West regions where a number of projects have focused on what is needed especially in terms of infrastructure and skills and on some opportunities including for marine engineering, and demand side potential in areas such as in Green Energy Parks.

The widened focus on Green Growth, as it relates to the energy sector, should be a key element of the next REPs which are currently in development. It is important, however, than the Plans also continue to build on the work that specifically focused on Offshore Renewable Energy (ORE). While the actions under the REPs were a very effective starting point, they need to advance further into more practical development actions, either through the REPs or other mechanisms.

The emphasis on balanced regional development in the Green Growth Industrial Strategy must be maintained. These technologies, which are usually located in less developed regions and provide important opportunities for more high value economic activity. While the actions in Powering Prosperity for balanced regional development were welcome, and important, we think that this could be enhanced in the new strategy, with a particular emphasis on enabling the regions to be ready for development in this area of industry. Anticipatory infrastructural development is also a key part of ensuring that the opportunities from these developing technologies available in regions such as the north west which have long faced the challenges of infrastructure deficits.

Green Technologies

2.Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

While there is significant potential in all of the areas to be covered under this Green Growth Strategy, we believe that the greatest future opportunities will be in the Floating Offshore Wind sector (FLOW). This is a less established technology than many of the others listed so there is greater potential for innovation and processes which could provide very substantial returns and could also lead to establishment supply chain elements in Ireland. FLOW is also a key area because of the very significant potential for its development off our west and north west coasts so that innovation, technological development, manufacturing and supply can be located close by. In addition, given the challenging conditions in this ocean, products and innovations

developed here will have applicability globally. With the decision not to progress Action 27 in Powering Prosperity it is important that Test sites (both quarter scale and full scale) are an element of the Green Growth Strategy. This is key to allowing research and innovation and linking enterprises operating in the green growth sectors with international developers using such sites.
Given the emphasis on wind generation both on and offshore, and limited grid interconnection with other jurisdictions, there is also significant demand for long term storage and potential for innovative development in this sector. Associated with long term storage is the potential for green hydrogen, which as well as providing a fuel for a variety of markets, will also provide some solution to grid restrictions.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.
Supply chain supports should be focused on the newer areas of technology, and those with the highest levels of competition and innovation. Onshore wind is well established and has well developed supply chains, while offshore wind (especially FLOW) is much less established and has a longer, more complex supply chain. At the same time, it is the technology which has the potential for the most benefit for Ireland. Thus, a clear focus in this area would be important. There is also significant potential in storage, while the challenges in grid development in the north west mean that this region is an ideal test bed for exploring innovations in this sector. However, A detailed supply chain analysis is necessary for these technologies recognising that it can be difficult in areas, such as long term storage, where the dominant technologies have not yet become established. As part of the development of the Industrial Strategy DETE should conduct detailed examinations the supply chains for each of the technology, establish where the opportunities for Irish industry lie, and where supports are most needed.

4.Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.
While all of the technologies which will form the basis for the green growth industrial strategy require, and would benefit from further research in a variety of contexts, providing test sites for FLOW innovations is an essential element of R&D which could potentially provide very significant industrial spin offs. For this reason, despite the challenges they have already faced, we emphasize the importance of developing test sites. There are then opportunities for developing clusters adjacent to test areas, where the practical innovations and processes can be further developed and networks of knowledge established.

5.Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.

As noted above in relation to supply chains, detailed, robust sectoral analysis should underpin the decisions about areas for support for industrial deployment. This would provide in this about areas in particular need of development for each of the technologies, bottlenecks, and the opportunities which have most potential for Irish industry.

6.What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance)?

As discussed throughout this submission, lack of infrastructural investment has long been a barrier to scaling in these sectors, (for example grid restrictions for onshore renewables, and both grid and port development for offshore renewable energy along with regulatory and policy certainty. The necessity for a whole of government approach is discussed elsewhere but having strong overarching policy goals which are broken down into achievable targets, and a focus on the anticipatory investments necessary, underpins all potential development for green growth industries.

While we have discussed the potential for cutting edge innovation in FLOW and other technologies and the opportunities that this may bring, there are very often significant financial barriers for those developing solutions. The large scale at which much renewable energy generation and associated technologies take place, and the challenging environment in which they often operate means that the many physical innovations require substantial long term investment and often go through innovations and development at different points of scale. This means innovations are expensive to develop and when the market is uncertain or there is competition for adoption finance is an important barrier. Options for early stage investment, and supports for R&D can help, along with recognition of the long time horizon associate with bring innovations to market.

The WDC operates the Western Investment Fund which provides seed investment to small scale early stage enterprises and while it takes a long term view it does not have funds of scale required for many of the investments needed in this sector though it can play a role in the development of some start ups, as it has done very successfully in the medical devices sector. Likewise, given the very significant risks associated with the technology development including very high prototype deployment costs and risks and a large number of potential technologies, consistency of funding for technology development is important, and it is likely that some of the more strategic risks will need to be carried by the state.

Ensuring the availability of appropriate skills is of course essential to the development of this sector. There has, been a focus on this area for a number of years and this should continue. Alongside the more general shortage of engineering skills, uncertainly about the scale and timing of developments in this sector can provide a barrier to skills available as people may be more inclined to work in a more established sector. From a regional perspective, those who develop skills locally may have to seek work elsewhere in the country or globally, and while this can prove skill enhancement and experience, lack of local employment may deter people from training to work in the sector.

Ensuring a clear regional development focus in this industrial strategy is important. Developing clusters and networks of those who have relevant skills in industry, at universities or other sites

of research or are working in aligned industries is important, both for skills and knowledge sharing, and also to provide job opportunities for those already in the sector. Clusters of employment allowing for movement between jobs which makes a sector and location a more attractive employment prospect. This is particularly important in remoter areas with less concentrated employment which are often the site of many of these green growth technologies. Green technologies also have very significant potential for regions such as the Western Region and clustering or developing networks in these areas can contribute to the goal of more balanced regional development. Where a region is not yet ready for a more formal cluster, it remains important to develop networks and establish the contacts that will in future form the basis of the fully supported cluster. It is also possible to develop networks that align with existing clusters such as the Killybegs Marine Cluster allowing for transfer of knowledge and activity in a variety of areas.

While there has been an improvement in regulatory certainty, clear overarching objectives for regulation are important in particular where there are overlaps across regulations (e.g. climate action and planning, or energy and waste). Therefore, clear regulation and clear pathways and timelines for decisions (in whichever field) all improve information flows and make scaling easier.

Government Supports

7.Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland? Are there existing supports that should be expanded or improved?

While the focus of this consultation is on an industrial strategy for Green Growth one of the most important actions is to ensure a predictable policy environment and clear sectoral development pathways that provide certainty for those involved or becoming involved in the sector. Many of these technologies require very long term investment decisions which are based on projected demand and rely on other steps such as infrastructural investments to be completed. It is therefore essential that there is policy certainty.

In terms of the more innovative green growth technologies, providing test sites, test market access and pilot projects which are set up to understand challenges and develop processes as well as technologies all have a role to play as part of the industrial strategy.
The focus of this consultation is on an industrial strategy in Green Growth, and it aligns with DETE responsibilities, market development is essential to allowing the industry to develop. Providing clear market signals in this highly regulated market along with policy certainty is essential to achieve successful development in the sector. This it is important that DETE continues to work with other government departments as part of this process.

8.Are there existing supports that should be expanded or improved?

As noted above, test sites can present significant opportunities for enterprise and industrial development in a sector and the cancellation of the action in Powering Prosperity relating to test sites is disappointing. Quality test sites, such as that which was being developed in Galway Bay and the AMETS site, can provide important opportunities for both Irish and foreign enterprises

operating in the sector and the potential for development of sub supply and supply chain enterprises. In addition to allowing for technology and equipment testing they also provide valuable insights into process and practices in the field.

In the Green Growth Industrial Strategy we need a focus on coordinating or enabling the development of test sites so as to allow Ireland to be associated with innovation that takes place in proximity to the testing locations. Future development of testing facilities, it is important to ensure that there are facilities and encouragement for cluster or network development adjacent to these sites and structured links with the wider research community in relevant universities.
There are important research opportunities associated with these green growth technologies and challenge funding for such research can help stimulate this. In addition, collaborative projects funded by the EU, under both HORIZON and various Interreg programmes provide Irish universities, researcher and enterprises with valuable opportunities to learn from and about relevant practices in other countries, and participation in quality projects should be encouraged.
As the focus of the Strategy has widened it would be useful to build on supports already offered by EI for both research and supply chair development. Where programmes are in development, broadening their potential participants to other technologies, or replicates previous supports in these other areas.

There is perhaps an opportunity for some elements of challenge funding to stimulate investment, or to provide a longer term backing than is easily available to markets, although we recognise this is complex to administer and operate in an area of rapid technological change.

Aligned Sectors

9.Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

Sectors which have a strong emphasis on engineering, marine and digital solutions can all potentially align with or provide solutions, skills and investments in the green growth technologies. In addition to areas which align with the specific technologies there are also opportunities for the provision of more generic skills and ancillary services as green growth industries develop.

10.How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

It will be important to continue to raise awareness of the specific needs of the green growth sectors in the strategy in terms of skills, innovations and challenges. In addition to a broad promotion of the potential for green growth tech, it is essential to be specific about the types of skills and engineering solutions which may be required in the Green Growth. Companies operating in other sectors may not be aware of the potential for overlap or expansion into the

sector, but they are most likely to be attracted to specific opportunities rather than a more general promotion. However, one of the key challenges could be the slow development of supply chain in particular in relation to the more innovative technologies and enterprises may be hesitant to become involved where there is no clear long term pathway of demand.

International examples

11.Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

As noted above, those countries or regions which have provided policy certainty and a clear backing for developments in this sector have benefitted from this approach.

Scotland is a leader in this area, especially in relation to ensuring that remoter regions benefit for the development of the sector. This is part of a long-term Scottish approach in relation to renewables, which has applied for onshore wind, as well as biomass technologies.

Investment in infrastructure which have allowed for market development along with supports for training which allow stills to be transferred from other sectors, have all been useful. Green Freeport competitions in the UK provided an incentive for ports collaboration, and for the development of green technology parks in specific areas. Many of the actions are discussed here

https://www.gov.scot/publications/update-2020-offshore-wind-policy-statementscotlands-offshore-wind-ambition-2/pages/3/

Of course, in addition to learning from international examples of successful industrial policy development in the green growth areas, there is also benefit in understanding what drove the successful development of significant industries and clusters in Ireland (such as the Galway medical device cluster) and seeing what transferable policy interventions or other actions might be applicable for green growth.

12.If so, how might similar approaches be adapted to the Irish context?

It is clear that a whole of government approach is key, and while the specifics of policy are important, the context in which the interventions are made is also key. Rather than being specific about particular policy actions it would be useful for to DETE to examine the development approaches used in a number of comparable regions and to understand their context and how they could be made applicable in an Irish context. As has been mentioned throughout this submission, industrial policy is only one part of the process necessary to develop this sector. Looking at the processes and integrations of different policy drivers may also be useful as part of the development of this green growth strategy for Ireland.

SMEs

13.How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

As noted above there are very significant opportunities among many of the Green Growth technologies, but it can be difficult for existing SMEs, with their limited capacity, to become

involved in the sector and its supply chains. It is likely that an emphasis on developing networks which can both showcase the opportunities and also connect the small scale suppliers (of skills or tech) to those already established in the areas, either in Ireland or overseas. Sub supply or sub contracting are likely to be important steps for SMEs looking to become more involved in Green Growth technologies

Monitoring

14.How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

As the opportunities and relative importance of different green growth technologies is likely to change in the coming decade with some become more established and others falling away, regular ongoing monitoring of the trends in these sectors and adjustment of policy focus in response to what is happing in the markets in this sector is essential. This is a period of rapid change, there is a high number of 'potential' technologies and it is important that there is flexibility for the government to respond to developing needs and to pull back in areas which are either well established and not in need of support, or which are less likely to be a part of green energy solutions in the future. In monitoring technologies, it is useful to have a particular focus on how they are being used in regions with similar characteristics to Ireland.

Other considerations

15.Is there anything else you would advise DETE to consider in developing this new industrial strategy?

Powering Prosperity had a specific objective of balanced regional development and ensuring that the benefits of ORE would be spread across the country. The Green Growth Strategy needs to maintain the focus on how the projects and enterprises in this area can be enabled to provide economic benefits to the wider regions in terms of new high quality jobs and provide an important driver of balanced regional economic development.

Conclusion

We welcome the opportunity to make a submission to the consultation on the Green Growth Industrial Strategy. The Western Region has important green growth opportunities, both on and offshore and It is important that this new industrial strategy stimulates development of this sector, spreading the benefits and ensuring a regional development focus is an important part of this.

WIND ENERGY IRELAND

Wind Energy Ireland Submission to the DETE Proposed Green Growth Industrial Strategy Consultation

Date: 04/03/2026

Contact:

Introduction

Wind Energy Ireland (WEI) would like to thank the Department of Enterprise, Tourism and Employment (DETE) for the opportunity to provide a submission on the Proposed Green Growth Industrial Strategy consultation published on the 6th February 2026. WEI welcomes early engagement on the development of this Strategy, as well as DETE's recent publication of the closely linked Large Energy Users Action Plan (LEAP) in January.

Overall, a Green Growth Industrial Strategy for Ireland should look to support the transformation of Ireland into a nation that leads the clean energy transition, harnessing renewable electricity, storage, and electrification to drive economic growth, societal benefits and energy security. This is a vision which is central to the work of Wind Energy Ireland.

Who we are

WEI is Ireland's largest renewable energy organisation with over 200 members who have come together to plan, build, operate and support the development of Ireland's onshore and offshore wind generation. We work to promote wind energy as an essential, social, economic, and environmentally friendly part of the country's low-carbon energy future. As a leader in Ireland's fight against climate change, wind energy creates and maintains jobs, invests in communities, and reduces CO2 emissions and contributes to our security of energy supply.

Summary of recommendations

- The Green Growth Industrial Strategy should focus on a relatively narrow set of technologies and, importantly, the infrastructure enablers required to deploy renewable energy at scale.
- The technologies included should be those which have the greatest policy certainty and can have the biggest impact in the near-medium term to decarbonize how Ireland produces, stores, distributes and uses energy.
- There should be greater emphasis placed on the wider ecosystem and implementing tangible industrial policy deliverables, underpinned by appropriate supports and incentives to support renewable energy, green technologies and the associated supply chain. These supports should be considered in terms of short-term and long-term priorities.
- The Strategy should publish periodic implementation progress reports over its lifetime and in tandem with the Large Energy User Action Plan to provide clarity on ongoing policy and action alignment and delivery.
- WEI recommend retention of a joint Government and industry forum to ensure ongoing engagement, collaboration, knowledge sharing and alignment across broader energy and climate policies between industry, DETE and other relevant stakeholders.
- There is a need for GW-scale demand strategies to be developed across multiple regions to complement sites identified for offshore wind, but consideration must also be given to

co-location opportunities with LEUs around the country, particularly in areas where there are significant network constraints impacting onshore renewables.

Consultation Questions

Powering Prosperity

1. Which specific actions in Powering Prosperity – Ireland's Offshore Wind Industrial Strategy were most impactful or effective? Could similar actions be applied to support other green technologies? Please identify the action(s) and, where possible, provide evidence or examples to support your view.

The publication of an industrial strategy for offshore wind in Ireland in 2024 was a welcome development and one which WEI has been very supportive of since its inception and throughout its development.

The 40 actions in Powering Prosperity were set out under 4 pillars. We understand this new Green Growth Strategy is not intended to replace, but be a successor to, and build on Powering Prosperity, broadening the scope beyond solely offshore wind. The new strategy, however, must be given sufficient time to bed in if it is to be as effective and impactful as possible. To avoid distracting from the most viable near-medium term opportunities, WEI suggest the Green Growth Strategy should focus in on a relatively narrow set of technologies and infrastructure enablers (e.g., grid delivery) as outlined in our response to question 2 below. WEI would recommend that greater emphasis in the Strategy is placed on the wider ecosystem and on tangible industrial policy deliverables, underpinned by appropriate supports and incentives to support green technologies and the supply chain.

WEI would also support the publication of periodic implementation progress reports on the Strategy and key actions, as was done for Powering Prosperity, and in tandem with similar for the Large Energy User Action Plan, but would suggest that DETE avoid revising policies or strategies too frequently before they have a chance to deliver real impacts and lessons learned.

WEI would also recommend retention of a joint Government and industry forum over the lifetime of the Strategy to ensure ongoing engagement, collaboration, knowledge sharing and alignment across broader energy and climate policies between industry, DETE and other relevant stakeholders.

Green Technologies

2. Noting the broad set of technology areas mentioned previously, are there particular green technologies related to the energy system that Ireland should focus on to meet climate targets and maximise economic opportunities from the green transition?

As stated in the Wind Energy Ireland Strategy 2026-2030, Delivering Energy Independence, Powering Growth[32], generating renewable power is only part of the story. From WEI's perspective, to unlock the full potential of wind energy, we must ensure it is used effectively to support the energy transition, grow Ireland's economy, create new industries, minimise wasted generation and provide value to consumers. We must focus on the transformation of Ireland's energy system through the electrification of heat, transport and industry and the integration of key enabling technologies such as energy storage, demand flexibility and green fuels. WEI support the growth in clean electricity demand and optimising the use of wind energy while building the supply chain and partnerships that secure long-term economic and societal value.

Ireland has set out clear green technology priorities that align both with national and EU climate goals and which could unlock major economic opportunities. As mentioned previously, the focus of this new Strategy should remain on those technologies which have the greatest policy certainty (i.e., regulatory frameworks and a clear route to market in place already) and can have the biggest impact in the near-medium term to decarbonise how Ireland produces, stores, distributes and uses energy.

WEI would support DETE's intention for offshore wind (fixed and floating) to remain at the core of the Strategy given our substantial resource, but more emphasis is required on how we maximise offshore generation and ensure viable routes to market for future sites. There is a need for GW-scale demand strategies to be developed across multiple regions, to complement sites identified for offshore wind (i.e., via the existing South Coast DMAP, and the National DMAP currently under development), and grid capacity studies across similar regions. This should be a specific action set out in the Green Growth Strategy.

In addition to offshore wind, onshore wind should be high up the priority list of technologies as it presents the most tangible near-term opportunity for Ireland. The Future Onshore Wind Study[33] commissioned by Wind Energy Ireland in 2025 confirms that onshore wind will continue to provide the backbone of renewable electricity delivery through 2030 and into the mid-2030s. Ireland is already a global leader in installed onshore wind capacity per capita, having surpassed 5 GW last year, and over the course of 2025, one-third of Ireland's electricity came from wind power. Ireland has a considerable pipeline of projects which is continuously increasing.

Consideration must be given to Large Energy Users (LEUs) not just in the context of offshore wind, but also particularly in those areas of the country where there are significant network constraints. There is a significant opportunity to market Ireland as a destination for investors to co-locate with

[32] Strategic Plan
[33] https://windenergyireland.com/images/files/241008-future-onshore-wind-study-report-f1-20250423.pdf

onshore renewables. Without this, due to constraints, there is a considerable risk that some wind farms may never get built, as well as wind power that will never get used[34]. With it, we not only build them and grow the economy by attracting investors but make the positive case for onshore renewables by being able to point to the job creation and investment that will come because those wind farms were built.

In addition to wind, WEI suggest inclusion of the following within the scope of the Strategy:

- A focus on infrastructure enablers, particularly grid infrastructure delivery
- Energy storage (battery and LDES) to support variable renewables and balance of supply and demand as well as to increase grid resilience. Expanding storage will also facilitate higher renewables penetration.
- Increased electrification[35] of heat and transport and the wider industrial base, as well as supporting technologies which enable increased energy efficiency.
- Solar – while it is less developed than onshore wind, capacity is growing with falling costs and increased efficiencies.

WEI recommend the above technologies be the focus of the Strategy in the immediate term. Longer term considerations could look to include wider technologies such as green hydrogen and its derivatives and building future export industries, the effective development of further interconnection, where it supports growth of indigenous renewable energy, and broader supporting technologies, particularly related to innovation and optimisation.

3.Which of these technologies do you consider need additional support in terms of supply chain development? What part of the supply chain requires support? Please note the relevant technology/technologies and provide evidence to support this.

The biggest supply chain gaps in Ireland today are largely around offshore wind, energy storage and advanced grid technologies. These areas, however, also offer the biggest reward for local jobs and export opportunities if Ireland focuses on building domestic capabilities rather than importing the majority of services and products etc. Another consideration is the infrastructure needed to enable vehicle-to-grid and vehicle-to-home charging. This has the potential to significantly reduce the cost of Electric Vehicle (EV) ownership in Ireland, while stabilising the national grid.

As mentioned in our response to Question 1 above, the new Strategy should focus on tangible actions and provision of appropriate supports and incentives for the supply chain, which can help to reduce costs of development. Sufficient levels of funding should be made available for skills and supply chain support schemes.

[35] https://irelandelectrified.ie/wp-content/uploads/2025/12/ESI_ElectrificationActionPlan_Online.pdf

Significant support is also required for the development of ports for offshore wind in Ireland, and there are significant concerns that the development model for ports in Ireland is not currently suitable.

[1] The latest EirGrid report shows that in 2025, over 13% of wind power, the equivalent of over 2 million MWh, across the island was never used due to dispatch down orders. That wind power was lost which would have been enough to power over half a million homes at a value of hundreds of millions of euros. In some months, that figure rose to nearly as high as 20%.

In addition, it is worth noting that floating wind will have its own specific port infrastructure requirements, aspects of which will differ from that required for fixed-bottom offshore wind. These port requirements have been well researched and documented through various studies over recent years – such as the WEI National Ports Study (2022)[36], and the We Can Build Them (2023)[37] report. More recently, the WEI Floating Offshore Wind Committee developed a report on the specific Port Requirements for Floating Wind in Ireland[38], which to date, has been shared with the Department of Transport. This theme is also something which has been a core focus of research projects, including the De-risking Ireland's Floating Offshore Wind Targets (DIFOWT) project[39].

4. Which of these technologies do you consider need additional support in terms of broad/system research, development and innovation and in-company RD&I? Are there specific barriers to innovation or R&D in these sectors that Government could help address? Please note the relevant technology/technologies and provide evidence to support this.

Significant research has been completed or is underway across many green technologies, particularly floating wind. WEI work in partnership with industry and academic partners across a number of national and international research projects. For more information on our active projects, please see the research section on the WEI website[40].

WEI would strongly urge that research activity should be industry-led to ensure practical and tangible outputs that will help to address real world industry and/or technology challenges and

[36] https://windenergyireland.com/images/files/final-national-ports-study.pdf
[37] https://windenergyireland.com/images/files/20230329-final-irish-ports-funding-study.pdf
[38] https://windenergyireland.com/images/files/20250919weiportrequirementsforfloatingoffshorewindinireland. pdf
[39] https://windenergyireland.com/blog/where-in-ireland-can-port-infrastructure-be-developed-to-support-thedelivery-of-floating-offshore-wind
[40] https://windenergyireland.com/policy/research/research-homepage

which will ultimately help to reduce costs and accelerate development and deployment of projects.
DETE should avoid duplication of effort in relation to RD&I supports, ensuring alignment or collaboration with existing initiatives already in place or being developed. For example, the SEAI are currently developing an ORE Innovation Roadmap, building on the previously published ORE Technology Roadmap.

WEI are also aware that the Department of Finance recently launched the Research and Development Tax Credit and Innovation Compass41. This document considered improvements to the existing R&D tax credit, as well as options to incentivise innovation, which is defined as businesses' application of existing technologies in new ways. and new R&D tax credit for businesses, where they can demonstrate the application of existing technologies in new or innovative ways.
These existing or developing initiatives should be taken into account when designing the Green Growth Strategy in terms of available supports and offerings, ensuring their applicability and accessibility across those technologies covered in the scope of the Strategy. For example, an innovation tax credit may currently be inaccessible for floating wind, as there are currently no sites in Ireland in which to test innovative solutions or concepts.

***5.* Which of these technologies do you consider need additional support in terms of industrial deployment? Please note the relevant technology/technologies and provide evidence to support this.**
Additional support requirements related to industrial deployment should be prioritised based on what technologies will help us to achieve our climate targets. This should be considered under two separate streams – **(1) Short-term priorities, and (2) Long-term priorities.** WEI have provided some high-level considerations under both of these streams in the following tables.

Short-Term Priorities (e.g., to 2035)
Focus on rapid emissions reduction, energy security and supporting delivery of Ireland's climate targets (i.e., enabling 80% renewable electricity)

Technology	Strategic role for Ireland	Key gaps	Priority industrial support actions

[41] https://www.gov.ie/en/department-of-finance/publications/research-and-development-tax-credit-andinnovation-compass/

Onshore wind	• Backbone of renewable electricity • Fastest deployable large-scale technology	• Planning delays • Grid congestion • Repowering barriers	• Streamlined planning reform • Accelerated grid reinforcement • Repowering policy clarity
Offshore wind (fixed)	• Large-scale power generation • Key to meeting climate targets	• Offtake certainty • Port readiness • Supply chain immaturity • Permitting timelines	• Grid infrastructure delivery • Strategic port upgrades • Accelerated maritime consents & planning
Floating wind	• Unlocks deeper Atlantic resource • Long-term export potential	• Higher capital costs • Limited progress on demo projects • Offtake certainty • Supply chain & port readiness	• Concrete plan and funding for demonstration projects • Port infrastructure for large-scale floaters • Early industrial partnerships
Grid-scale batteries & LDES	• Capture of lost energy • Increase grid utilisation • Security of supply through partial displacement of fossil fuel peakers	• Network Tariffs • Implementation of ESPF action 10 • Hybrids and flexible connections	• CRU to complete Network Tariff review • EirGrid to provide roadmap for LDES procurement • Implementation of full hybrids regulation and flexible connections
Smart Grids & Demand Response	• Reduces peak demand and system costs	• Limited market participation • Digital integration gaps	• Demand-side flexibility markets • SME digital grants • Smart meter optimisation & time-of-use pricing
Solar PV (utility & rooftop)	• Diversifies supply • Supports peak daytime demand • Complements wind	• Installer capacity • Grid connection timelines • Land-use coordination	• Expanded microgeneration incentives • Solar zoning guidance • Workforce expansion • Faster grid approvals

Long-Term Priorities (2035-2050)

Focus on deep decarbonisation of industry, transport and hard-to-abate sectors; export-led clean energy economy.

Technology	Strategic role for Ireland	Key gaps	Priority industrial support actions

Green hydrogen	• Can support decarbonisation of heavy industry, transport and dispatchable power	• High production costs • Lack of hydrogen transport & storage backbone	• Hydrogen hubs (linked with ports) • Electrolyser manufacturing incentives • Clear regulatory framework
Synthetic fuels	• Can support decarbonisation efforts of broader sectors such as aviation and maritime • Export opportunity	• Early-stage economics • Certification and demand certainty	• Large-scale demonstration funding • Industrial offtake agreements • EU-aligned certification frameworks
Increased interconnection	• Can enhance security of supply and balance variability • Export potential	• Long lead times • Financing complexity/high capital costs • Broader market price considerations (Irish electricity prices compared to other jurisdictions)	• Infrastructure investment and competitive regulation to ensure benefits reach consumers and industry • Industrial and supply chain support for flexible energy resources and domestic renewables • Ongoing monitoring of market design arrangements to ensure efficient cross-border trading and risk management
Broader ORE (wave & tidal)	• Indigenous resource advantage • Exportable IP and technology	• Technology maturity • Capital intensity/financing risk	• Testbed expansion • Innovation-to-commercialisation bridge funding • Targeted R&D tax incentives

6. What are the main barriers to scaling renewable energy and green technologies in Ireland (e.g. regulatory, skills, infrastructure, finance*)?*

There are many well-established technologies that are not rolling out at scale in Ireland yet, largely due to the fact that projects remain too risky, expensive or are slow to receive the necessary consents and permissions.

To implement and deliver on Ireland's climate targets and energy independence ambitions, the system – i.e., the State and State bodies, must have sufficient capacity and be appropriately resourced to reflect the ambition of what we are trying to achieve and ensure there is consistent and coordinated collaboration across all relevant departments and agencies to deliver.

The main blockers worth noting include:

High Upfront Capital Costs for Some Technologies

While wind and solar costs have fallen significant, many next-generation green technologies still face substantial upfront capital expenditure (CAPEX) barriers in Ireland.

- Offshore wind, particularly floating wind, requires large-scale investment in turbines, subsea cables, foundations, and grid reinforcement. Early projects carry first-mover risk and higher financing costs.
- Grid-scale battery storage and LDES require high initial investment with revenue streams that are still evolving.
- Green hydrogen production is capital-intensive and lacks mature domestic demand at present.

It must also be noted that there are rising interest rates and supply chain inflation that have increased financing costs for projects more broadly.

Significantly Constrained Grid (capacity constraints/curtailment/dispatch down)
Grid constraints are widely regarded as the most immediate structural barrier to scaling renewables.

- Limited transmission capacity – renewable generation is concentrated in the west and southwest, far from demand centres in Dublin and the east.
- Curtailment and Dispatch Down – wind farms are frequently instructed to reduce output due to system stability or transmission constraints, affecting project revenues.
- Connection delays – projects often have to wait years for grid connection offers and necessary reinforcement works.
- System stability limits – Ireland operates one of the highest shares of non-synchronous renewable generation globally. EirGrid manages a technical cap (SNSP limit) to maintain system stability.

Without accelerated grid reinforcement and digitalisation, renewable deployment will continue to outpace system integration capacity. The revised National Development Plan and Price Review (PR) 6 have both allocated significant levels of additional funding to support the delivery of grid infrastructure over the coming years, and this Strategy should look to align itself with those plans.

Slow Consenting and Planning Processes
Planning and consenting timelines in Ireland can significantly delay renewable and green infrastructure projects.

- Lengthy decision timelines at local authority and at An Coimisiún Pleanála (ACP).
- Judicial reviews can further delay projects, even after approval.
- Environmental and habitat assessments are complex, particularly for offshore wind which is still in its infancy in Ireland.
- Community opposition can arise around issues such as visual impact, biodiversity or grid infrastructure routes.

- Policy evolution – new regulatory regimes are still maturing (e.g., Planning & Development Act) or wider EU policy requirements must be transposed into national policy (e.g., RED III), which can lead to transitional uncertainties.

While rigorous planning is essential, unpredictability in timelines increases financing risk and can deter investment.

Pipeline and Route-to-Market/Offtake Uncertainty

Revenue certainty is critical for scaling green technologies, but route-to-market challenges persist.

- Auction dependence – many projects rely on Ireland's RESS. Gaps between auction rounds, or uncertainty in future auction design creates pipeline uncertainty.
- The CPPA market is still developing – while growing, Ireland's CPPA market is smaller than in some EU states.
- Curtailment risk impacts revenue modelling, making it harder to secure project finance.
- While sites for floating wind are to be identified through the National DMAP process, there is no clarity on a specific route-to-market design for initial demonstration projects to kickstart floating development in the Irish market.
- Hydrogen and e-fuels lack clear offtake markets domestically, with industrial demand still emerging.
- Electricity market volatility can both create opportunity and add risk, complicating financing modelling.

Investors require long-term visibility on support schemes, market design and demand signals to commit capital at the scale required.

Lack of Port-Ready Infrastructure

Ireland's offshore wind ambitions depend heavily on suitable port infrastructure which is currently a key bottleneck.

- Marshalling and assembly capacity – large offshore turbines require deep-water ports with heavy-lift capability.
- Limited suitable sites – only a small number of Irish ports have the draft depth and quay strength required at present, although a number of sites have ambitions plans to expand their infrastructure and on-site facilities.
- Competition with other EU projects - developers may rely on UK or continental ports, increasing costs and complexity.
- Upgrade timelines – Port redevelopment or expansion requires significant public and private investment.

- Supply chain localisation challenges – without domestic port readiness, Ireland risks losing economic value from offshore wind deployment.

Government Supports

***7.* Are there particular interventions from the Government or State agencies that should be considered to support the development of green technologies in Ireland?**

Targeted Government supports and incentives are needed at the right time which will ultimately help to de-risk commercial projects.

Financial incentives which provide greater revenue certainty and help to unlock private finance options are one such mechanism. For example, this could be via route-to-market mechanisms which create the right conditions to support investment and business cases (e.g., indexation in renewable energy auctions, or electricity policy reforms such as changes to network charges for battery storage).

As referenced in the WEI Offshore Wind Action Plan (2025)42 – although relevant across the wider energy sector - more emphasis must be placed on the development, delivery and investment in the critical enablers which are required to support the deployment of renewable energy and green technologies at pace and scale, including delivery of grid infrastructure, expanding opportunities for demand growth to increase domestic offtake options (such as progressing clustering or green energy park concepts focused on colocation), and investment in port infrastructure which can support project build out and the creation of supply chain hubs and local jobs for coastal communities around Ireland.

As mentioned in our response to Question 6, there is a need to scale up investment in every agency that has a role to play in the energy transition. Billions of euros of public and private investment is going into housing and infrastructure – this needs to be matched to support Ireland's energy security and independence for the long-term, and not resisting investment in the staffing of vital agencies required to achieve it.

8. Are there existing supports that should be expanded or improved?

The EU Innovation Fund[43] could be used to support green technology projects in Ireland. However, the long lead times involved in developing projects in Ireland due to regulatory barriers mean that that fund is typically not applicable.

Furthermore, the EU Innovation Fund is very challenging to access as an SME. The specific innovation criteria requirements and parameters of this Fund in many cases are prohibitive for Irish companies and projects to meet. Where this is the case and this Fund is not a viable option

[42] https://windenergyireland.com/images/files/web-offshore-wind-strategy-may-2025-12-page-a4-260525am.pdf

[43] https://climate.ec.europa.eu/eu-action/eu-funding-climate-action/innovation-fund_en

to support Irish projects, there should be a national fund or scheme which can cater for and provide an alternative route to funding to progress projects.

In addition, the Clean Industrial Deal State Aid Framework (CISAF)[44] allows for additional state aid support in terms of accelerated depreciation and tax credits. This is something which should be explored by Irish policy makers to identify tangible opportunities to support the development of green technologies.

Generally, there is a need for greater transparency and access to EU funding. There are significant pots of money that Ireland does not, or cannot, tap into. There are in many cases a number of requirements that can make it more challenging for smaller EU Member States like Ireland to avail of these programmes and initiatives and WEI recommends that there should be further consideration, with the European Commission, as to how these funds could be tiered to cater towards smaller projects.

Aligned Sectors

9. Are there aligned sectors of the economy that this new industrial strategy should be seeking to support and develop to support our renewable energy and green transition ambitions?

WEI suggest that in the context of the broader green energy transition, support for aligned sectors should be focused on those which are the key drivers of electricity demand in Ireland. DETE should consider adjacent sectors that depend on clean energy and can help make it viable at scale, such as:

- Construction & built environment (broad electrification)
- Manufacturing & industrial demand decarbonisation
- Transport
- Digital/Data Services
- Agriculture

WEI also acknowledge that the Large Energy User Action Plan (LEAP) published by DETE in January 2026, is focused primarily on new concepts and new FDI, but we must not forget about existing industrial and commercial sectors and ensuring that there are appropriate incentives and supports in place to enable the transition, particularly those harder to decarbonise sectors (For information, the National Energy Demand Strategy (NEDS)[45] states that 28% of demand flexibility should come from industrial and commercial sectors).

[44] https://competition-policy.ec.europa.eu/about/contribution-clean-just-and-competitive-transition/cleanindustrial-deal-state-aid-framework-cisaf_en

[45] https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.diviomedia.com/documents/NEDS_Biannual_Update_Q3.pdf

10. How can companies in these complementary sectors be identified and encouraged to broaden their work to include renewable energy and or green technologies?

WEI sees a specific role here for Government and Semi-State bodies, such as IDA, Enterprise Ireland and the SEAI, to drive this activity forward.

Through this new Strategy there should flexible funding made available which allows customers to innovate and test different approaches, noting that there will not be a one size fits all approach that will be applicable or relevant across all adjacent sectors.

International Examples

11. Based on your experience, are there industrial development policy interventions from other countries that you consider particularly effective?

12. If so, how might similar approaches be adapted to the Irish context?

Taking Questions 11 and 12 together, WEI have reviewed a number of international examples and models which have implemented various different industrial supports, and which Ireland could consider further as part of the development of this Strategy. We have shared a few of these examples below:

- Provision of large scale, targeted subsidies and tax incentives or low-cost credit and financing lines for renewable tech producers and/or manufacturers which can help cut costs, scale production rapidly as well as support local value addition and reduce import dependence.
- Public procurement guarantees (e.g., for products or services) which can help to enable early markets and demand.
- Industrial cluster pilot policies which tie fiscal support to innovation systems – with R&D funding, preferential financing, and tech incubators for example.
- Industrial policy interventions which support the development of ports that have proven highly effective in creating industrial hubs and capturing GVA, while at the same time derisking the delivery of green technologies.

These kinds of measures can have the benefit of helping to accelerate cost declines and innovation outputs, supporting export competitiveness and domestic deployment.

Case Study: Denmark – Green Transition Driven by Municipalities

The Danish Government have identified 11 industrial parks in Denmark where the area already has or will build the required infrastructure for the park[46]. The necessary infrastructure includes water, electricity, generation and transport. The parks are targeted at different manufacturing industries based on the regions the park is to be established. The designated municipality supports the development of the industrial park.

The Danish industrial park policy is exemplified by the Kasso Industrial Park in the Aabenraa Municipality. It hosts the world's first large-scale commercial e-methanol facility[47]. It is adjacent to a 304 MW solar farm and substantial high voltage grid infrastructure. This was realised through a strong strategy that had unanimous council support and political prioritisation, a fast permitting process, active citizen engagement and using green growth as a business strategy for the region. All of which is underpinned by clear national policy and implementation plans.

It is worth noting that there are already strong Irish examples of leadership in this space. Offaly County Council is a prime example. Across Offaly, more than 1.5 GW of renewable energy projects are currently operational or in development. Offaly County Council are engaging and working with key stakeholders, focused on addressing infrastructural challenges and opportunities shaping the future of energy in the Midlands, including future development, the growth pipeline and opportunities for co-location in the region with LEUs.

SMEs

13. How can Ireland ensure that SMEs are well placed to participate in the development and deployment of green technologies related to the energy system in Ireland? Please note this is distinct from companies decarbonising or becoming more sustainable in their current practices and processes.

SMEs make up the vast majority of enterprises in Ireland and therefore it is essential to integrate these companies into the development and deployment of renewable energy and wider green technology projects. While there will be a requirement to work collaboratively with the international supply chain, integrating domestic companies into the process will ensure capacity and capability building for SMEs and that many of the economic benefits of the green transition remain in Ireland, rather than predominantly flowing out to large foreign developers/multinationals and equipment suppliers.

The Green Growth Industrial Strategy should include an action to develop best practice guidance on what good procurement and contracting looks like, which provides accessibility and tangible opportunities to embed local suppliers, services and products into contracts to develop large scale energy projects. This action should be carried out in collaboration with industry. An

[46] https://www.em.dk/aktuelt/temaer/industriparker

[47] https://europeanenergy.com/2025/05/13/kasso-e-methanol-facility-officially-inaugurated/

increase in meet the buyer events and transparency on procurement opportunities would also be welcomed.

In addition, there should be a particular focus in the Strategy on accessibility to financial support for SMEs and removal of administrative barriers to entry. It is often far more challenging for SMEs to meet minimum requirements (e.g., upfront cashflow) in isolation, with joint venture or partnership arrangements required between smaller companies to meet entry eligibility requirements. One helpful action would be to work closely with Chambers Ireland to facilitate increased B2B matchmaking events for SMEs to identity suitable partnership opportunities to increase the ability to avail of funding and win contracts.

Monitoring

14. How should Ireland monitor the development of these green technologies and identify emerging technologies and sectors in the future?

There are a number of options which could be considered which would support ongoing monitoring of the development of green technologies and emerging technologies/sectors, which WEI have outlined below.

In general, the best way to achieve this is to ensure ongoing engagement with industry to facilitate knowledge sharing and lessons learned. WEI recommend that DETE maintain a joint Government and Industry forum to support this over time.

Some additional considerations include, but are not limited to:

- Monitoring should be focused around having a system for early-warning and identifying opportunities.
- Do not reinvent the wheel - utilise, and if necessary, adapt existing initiatives to facilitate this monitoring over time.
- The Strategy could include an action to investigate this and if needed, establish a cross-government unit or forum which tracks clean energy investments and deployment rates, as well as supply chain shifts (this would need to incorporate energy, enterprise and finance departments at a minimum).
- There are examples in markets such as Denmark and Germany which have both have this function embedded in their energy agencies and research ministries/institutes and may be a tangible option for Ireland to also adopt.

Other Considerations

15. Is there anything else you would advise DETE to consider in developing this new industrial strategy?

A clear plan must be provided with the publication of this Strategy which outlines how the Strategy will interact and align with broader energy and climate policy, in particular (but not limited to) the

LEAP Action Plan and the forthcoming DETE Enterprise 2035 Plan as well as the LEU policy decision and legislation around Private Wires.

Conclusions

As WEI has set out in this response, generating renewable power is only part of the story. To unlock the full potential of renewable energy, we must ensure it is used effectively to support the energy transition, grow Ireland's economy, create new industries, minimise wasted generation and provide value to consumers. We must focus on the transformation of Ireland's energy system through the electrification of heat, transport and industry and the integration of key enabling technologies such as energy storage, demand flexibility and green fuels. WEI support the growth in clean electricity demand and optimising the use of wind energy while building the supply chain and partnerships that secure long-term economic and societal value. The development of a Green Growth Strategy for Ireland can go a long way to support these efforts.

We would like to once again thank DETE for the opportunity to provide feedback on the Proposed Green Growth Industrial Strategy Consultation. We hope you consider the comments and recommendations made within our submission and we would welcome the opportunity for ongoing engagement as the Strategy is developed further over the coming months, ahead of publication.

Yours sincerely,

[redacted]

Wind Energy Ireland