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Interdepartmental Committee on
Science, Technology and Innovation
23 Kildare Street
Dublin 2

23rd March 2015

Dear Sir / Madam,

Please find attached Mergon Group's submission on the "Consultation Paper: For Successor to Strategy for Science, Technology and Innovation".

On behalf of the Mergon Group, we are pleased to offer our comments, ideas and suggestions that we believe will assist in achieving significantly successful outcomes if implemented.

If you have any questions or concerns please feel free to contact me.

Yours Sincerely,

Pat Beirne
CEO - Mergon Group

Mergon Group's Submission - Consultation Paper: For Successor to Strategy for Science, Technology and Innovation

23rd March 2015

On behalf of the Mergon Group, we are pleased to offer our comments, ideas and suggestions that we believe will assist in achieving significantly successful outcomes if implemented.

Although we have provided individual comments under Pillars 1 – 5 below, there are two distinct policy items that we would consider to have potentially major disruptive positive effects for Ireland's endeavours to be the 'best little country in the world to do business'. These are:

1. A Complementary Market Focussed Research Centre (as suggested under Pillar 5 and practically described under Pillar 2).
2. Employee Mobility and Embedding on a global basis but with equal commercial emphasis.

In our comments on the individual pillars, it can be seen that the above two concepts are capable of having a pervasive impact at funding, academia, corporate and Government levels. This has the added advantage of having a global perspective that defines Ireland not just as geographical island off the edge of Europe but of an Ireland that is connected to the world and vice versa.

1. *Pillar 1 Investment in STI and key goals/targets*

Key areas to be explored include:

- **What should Ireland's ambition be in STI?**
- **Ireland is currently an innovation follower and lags other small developed countries in R&D intensity. Should we have more ambitious targets for investment?**
- **How can that level of ambition be justified? Where would we target increased funding and how could this be justified?**

We believe that monitoring and pursuing National targets such as GBAORD % GNP / GDP sets clear metrics for the benchmarking and pursuit of a vibrant innovation based economy. The 0.42% GBAORD for GDP as of 2013 should have yearly incremental targets that are monitored and leads to a set target 5 years from now. This allows earlier responses to any deviations that may occur in the annual performance.

Practical and simple systems that encourage indigenous Irish companies to increase BERD investment should be incentivised. Whilst the nature of a 'Knowledge Box' maybe expected to have a wider scope that may not necessarily be fully black and white in terms of qualification criteria, it should nevertheless include complementary elements that are clearly prescribed.

2. Pillar 2 Prioritised Approach to Public Research Funding

Key areas to be explored include:

- **How can research prioritisation better serve our national objectives of a strong sustainable economy and a better society?**
- **How best do we identify emerging areas of opportunity and challenge i.e. horizon scanning?**

We welcome the clear identification of the 14 priority areas as currently prescribed. We believe Innovation in Services and Business Processes (ISBP) is the area that has the greatest potential impact as evidenced by the promise for the growth of the Internet of Things (IOT). The individual technology platforms as prescribed require innovative ways of 'doing business' that leverage the inter-disciplinary fusion of technologies. For the ISBP to be successful it needs strong orchestration – and a level of orchestration that presents potentially disruptive opportunities.

Mergon, like a lot of industry has a strong antenna for detecting the direction and growth of emerging technologies and concepts. In Mergon's case, this would include the changing landscape within the automotive industry – our close relationships with world leading automotive companies such as BMW, VW, Audi, Toyota, Nissan, Tesla, Jaguar etc means we are ideally placed to identify the growth areas (horizon scanning). However, this is bigger than just Mergon or any one automotive customer. Mergon would like to see new modes of collaborative working across academia, industry and the Government agencies that will facilitate not just 'hard' spin-out companies, but also the strengthening and growth of 'clusters'. For Mergon, a successful participation in an automotive based initiative would then allow similar strategies to be developed for our other divisions including healthcare.

Industrially focused 'horizon scanning' can address the 'continuum from basic to applied research, and ultimate commercialisation'. We understand that academia has strong interest to publish and to engage in basic research. Mergon does welcome academia to engage in basic research that is aligned to potential commercialisation. However, just as the Barcelona Summit of 2012 reported a 2:1 ratio for private to public funding, a broad ratio of 'applied research': 'basic research' is potentially

required. This should be benchmarked particularly in our 'peer' countries – Denmark, Singapore, Belgium etc. In order to encourage debate of this topic, we suggest a 9:1 ratio in favour of applied.

Mergon would suggest the following as a practical model not just for identifying the opportunities, but also for their ultimate commercialisation so that "Ireland Inc" fully benefits:

- a) Invite individual companies that have common 'end-user' markets. (As an example, in terms of automotive industry, this could include Irish companies, both indigenous and foreign owned. These companies have a quarterly 'innovation session' amongst themselves. The guiding principle for these 'innovation sessions' be that they are forward looking and strategic in nature, but at same time incorporating the 'horizon scanning' from the market. These sessions can include invited Government players – EI / IDA / SFI etc.
- b) In parallel, to the company based quarterly innovation sessions, a similar exercise should take place between academia so that a national perspective rather than a sole institutional perspective is fostered.
- c) The outcomes of a) and b) are then integrated so that technologies / concepts are selected for support. These supports will include both basic research as well as applied research within the existing academia laboratory settings.
- d) From the lab results in c), selected technologies with industrial participation are then piloted in a 'seed funded' commercial setting – ideally within existing incubation space adjoining the research centre. However, this will require Government investment in the capital equipment etc for the selected technologies / concepts. This can be considered 'Technology Nurturing' with a strong commercial / industry presence (again as a tick box activity for the proposed 'knowledge box' legislation).
- e) The pilot production capabilities that emerged in d) can be made available to industry on a commercial basis – 'loan or rental use of the equipment / results'. (Yet again another tick box for a qualifying 'knowledge box' activity).
- f) With industry now 'driving' these basic-to-applied centre transformations, the technology and equipment can be then commercialised formally.
- g) The above cycle repeats for each selected technology / concept. However, we now have a 'translational' environment that seeds the basic research and then spawns the applied research.

Mergon would be willing to support & drive such an initiative within the automotive industry as a pilot project in collaboration with all stakeholders, as part of the evolution of a new model of working.

In terms of emerging areas of opportunity, we have direct experience of reluctantly rejecting (some) commercially viable customer projects, as the necessary research infrastructure / facilities have not been in place, and due to the short time demands that globally leading OEM's require to translate concepts into products / processes. These include 'assembly / bonding / joining' of dis-similar and similar materials – a huge growth area that becomes increasingly important as technologies and materials cross-over. For example, this includes the fusion of composite plastics and thermoplastics and their integration with other components and assemblies.

3. Pillar 3 Enterprise-level R&D and Innovation Performance

Key areas to be explored include:

- **A review of the outcomes of SSTI 2006-2013 shows that targets for the public research base were largely achieved or exceeded. Opportunities exist for further progress in regard to enterprise RD&I activity. How can public policy best support and more effectively optimise the impacts of enterprise RD&I investment - what actions could be taken to:**
 - o **strengthen the number of innovation performers in the multinational sector?**
 - o **broaden RD&I activity in the indigenous sector and build absorptive capacity?**
- **Do we need to enhance the suite of enterprise support programmes to further drive innovation in industry and/or is there scope for consolidation of the existing range of support programmes?**
- **How can we incentivise firms that are R&D active to scale their research efforts?**

Mergon see these questions as requiring a holistic approach that integrates stakeholders as outlined in our 'test bed' proposal in Pillar 2. This model advocates that clustering of ideas / technologies / concepts can steer the research direction, and with the appropriate incentives in place will enable a greater number of SME's to become involved and thereby contributing to an ever increasing pool of knowledge, resources, capex, human expertise that is not confined to a single stakeholder – be it industry or academia.

The proposed 'knowledge box' can, if structured correctly and if compliant with OECD, be turned into a vehicle that is 'world class' and that contributes to both the intellectual growth of both Ireland and Europe. Since this is a new concept / way of working, it may be able to avail of funds under Horizon 2020.

4. Pillar 4 International Collaboration and Engagement

Key areas to be explored include:

- **How can we further increase/strengthen the effectiveness of our international collaboration and engagement across all areas of STI investment in pursuit of economic and societal goals?**
- **What additional measures can be taken to maximise the engagement of industry as a partner in this regard?**
- **What additional measures could be taken to enhance Ireland's participation in Horizon 2020 and other EU Programmes – industry, academia, SMEs and MNCs?**
- **Are there research policy or programme developments taking place at EU level where enhanced engagement by Ireland could provide opportunities for research collaboration and ultimate economic or societal benefit?**

Mergon would encourage the development of effective policies that would enable industry to be a partner in International Collaboration and Engagement. Whilst there are existing inter-relationships at academia level for cross border researcher exchange / transfer, there is limited opportunity or incentive for this at the enterprise to enterprise level. Indeed it could be argued that the participation in these activities, would impact negatively on the company's existing operational activities. However, the strategic benefits from having a wider internationalised perspective are immense with impacts at both corporate and national level.

Strategic targeting of MNC's and IDA targets by providing industrial and corporate linkages to the Irish indigenous companies would have multiplier type benefits – knowledge transfer, championing Ireland Inc, and facilitation global linkages into Ireland / Europe. Mergon would encourage that these linkages be developed on a global basis including emerging economies, Japan, USA etc.

5. Pillar 5 Organisational/Institutional arrangements to enhance research excellence and deliver jobs

<p>Key areas to be explored include:</p> <ul style="list-style-type: none"> • What could we do to further enhance our landscape and institutional arrangements to maximise the impact of research excellence and deliver jobs? • Is there a need for a complementary market focused research centre structure in Ireland and how should that be organised? • How can Ireland optimise its strategic advantages of location, scale and environmental quality as a fundamental component of its research infrastructure? • How can we further increase/strengthen the effectiveness of our national collaboration and engagement across all areas of STI investment in pursuit of economic and societal goals?

Mergon fully believe that a 'market focussed research centre' as outlined / organised in our explanation under Pillar 2 would be a potential game changer. We would envisage that over time these 'research centres' would develop across Ireland – but they should be based in 'Commercial settings' near to / on academic campus's. These centres would become the vehicle for translating research into an innovation society and create knowledge intensive jobs.

#	Activity	Corporate	Academia	Government
10	Organise Industrial Groups with common market interests	Lead	Representation	Representation
20	Industrial Groups brainstorm 'Horizon Scanning' based on real market feedback and employee embedding	Lead	Representation	Representation
30	Technology Exchange with Academia	Representation	Representation	Lead
40	Concepts selected for Development	Lead	Representation	Representation
50	Lab / Based Research	Representation	Lead	Representation
60	Periodical Results Review	Lead	Representation	Representation
70	Filter Lab / Based Research Results for 'Innovation Setting' Development	Lead	Representation	Representation
80	Pilot Scale Development - Full Capex and Process / Product Refinement	Lead	Representation	Representation
90	Commercialisation / Transfer to Industry	Lead	Representation	Lead

Suggested Framework for Market Focussed Research Centre

In the Block Diagram above, the research has two distinct stages:

1. Phase 40 – Basic and Applied Research components
2. Phase 80 – Applied Research Component

Having the research off-site from companies allows companies to focus on their existing operational and R&D activities. Typically, these will veer towards incremental type improvements, with limited risk. Accordingly 'disruptive' type technologies may be less likely to dominate.

Enabling fully funded 'disruptive' technologies to develop in an off-site setting, but with strong industrial leadership, will accelerate their final commercialisation – possibly with the involvement of early stage industrial stake-holders.

For effective academia / commercial initiatives to work, they need to be user friendly and flexible so as to meet the changing needs of industry and companies like Mergon. The challenge is for the motivation for companies to become involved in these initiatives must be strong. Company participation must not be restrictive or have excessive red tape. Involvement must be seen as having direct concrete relevance for the company's strategic direction. If industry and academia are to work successfully together both parties have to be able to work at a similar pace to ensure opportunities can be exploited. This currently is not the case. The model proposed allows Irish companies to inculcate a greater level of strategic thinking to develop rather than a dominant operational thinking.

For our graduates, the talent gaps in industry will now have conduit for nurturing and developing skill-sets that are at the leading edge of global industry. This strengthens Ireland as the 'go to' location for translating research and entrepreneurial ideas into reality.

In brief, the future is about 'people' (networks), technology and opportunity. A key strength of Ireland Inc is the ability to communicate and 'win friends'. By encouraging 'employee embedding' as part of Phase 20 for 'Horizon Scanning' we start to build solid foundations for accelerating growth and also for involving foreign IDA targets etc.

We remain open and available to discuss any aspect of this letter with DJEI / STI and are excited about the future opportunities that can emerge from a more connected approach that actively orchestrates outcomes.

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