ICSTI
IRELAND

Irish Council for Science,
Technology and Innovation

ICSTI Statement

State Expenditure Priorities for 2004

July 2003

Forfás

Established by the Government and Forfás to advise on Science, Technology and Innovation

Irish Council for Science, Technology and Innovation (ICSTI)

Functions

- To advise on science, technology and innovation policy-related issues in response to specific requests from the Government (through the Minister responsible for Science and Technology) or from the Board of Forfás;
- To advise the Minister responsible for Science and Technology, the Office of Science and Technology and the Board of Forfás on the Council's own initiative, on policy for science, technology and on related matters;
- To advise the Minister on the strategy for the preparation and implementation of national programmes in science, technology and innovation;
- To advise the Minister on the strategic direction for State investment in science, technology and innovation;
- The power to establish sub-groups and panels to assist the Council in the performance of its functions;
- To undertake, from time to time, such other functions as the Minister may decide.

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Summary

The major commitment to investment in research and innovation by Government in the National Development Plan (NDP) 2000-2006, to improve competitiveness and sustain economic and employment growth in the increasingly knowledge-based global economy has significantly improved Ireland's reputation internationally. It is already having an impact on Ireland's ability to attract leading researchers and more sophisticated industrial projects to Ireland. Sustaining this investment under the NDP is critical. In order to expand and attract multinational enterprises and enable small and medium sized enterprises (SMEs) to grow in Ireland, there needs to be an attractive environment that is stable and supportive of research and scientific and technological endeavour.

Specifically, Ireland must avoid a stop-go approach to research funding so as to send a strong signal to industry and researchers at home and abroad that it is serious about developing as a knowledge and innovation-based economy and that the State will support research, which is especially important in difficult economic times. The Council has identified a number of priorities based on work completed by the Council, which it recommends to Government.

i Increased Business R&D Key to Competitiveness and Employment

Increased business investment in research and development (R&D) is essential for sustaining competitiveness and future employment creation in the enterprise base. Measures to promote greater R&D performance in both large companies and SMEs need to be strengthened. Seventeen OECD countries, including countries with which we compete for investment such as the UK, Netherlands, France, and Spain provide R&D tax credits and allowances to stimulate R&D. The introduction of a similar R&D tax credit in Ireland would be of particular benefit in stimulating additional R&D activity by multinational and large indigenous companies. The applied research funding supports provided by the enterprise development agencies must also be enhanced and further promoted to meet the needs of SMEs and technology

based start-ups. The Business Expansion Scheme/Seed Capital Scheme, which expires at the end of 2003, is also a vital source of start-up capital to technology companies. *The Council recommends the following priorities:*

- *A tax credit at a rate of 20 per cent of qualifying expenditure for incremental R&D expenditure should be introduced in 2004 in the first instance (Department of Finance);*
- *Enterprise Ireland's and IDA Ireland's investments in applied research capacity and capability building in industry require to be enhanced and further promoted (Department of Enterprise, Trade and Employment);*
- *The Business Expansion Scheme (BES) and the Seed Capital Scheme (SCS) be extended to 2006 (Department of Finance).*

ii Stability of Funding Key to Building World Class Research Capacity

Developing Ireland's research infrastructure and capacity to world class scale and excellence in areas of strategic importance to Ireland is dependent on the effective interlinkage and partnership of the funding programmes of Science Foundation Ireland and the Higher Education Authority's (HEA's) Programme for Research in Third Level Institutions (PRTLI). It is essential that the progress achieved in building research excellence by SFI and the building up of underlying research infrastructures under the PRTLI be sustained. Enterprise Ireland's applied research and facilitation of commercialisation funding for colleges is a key element in ensuring an appropriate return on overall investment in research and needs to be enhanced. Effective research and development requires a combination of resources and talents to ensure that Ireland has the capability to drive ideas forward rapidly. In this context, achieving success in the national investment strategy in R&D requires confidence that Ireland's commitment to PRTLI and SFI will be maintained in 2004 and beyond. *The Council recommends the following priorities:*

- *The funding commitments for the PRTLI should be reinstated in 2004. There should be immediate agreement for third level institutions to exercise their statutory and legal powers to loan finance infrastructure of strategic importance to Ireland to make good the current shortfall and to continue the implementation of PRTLI initiatives (Department of Education and Science, Department of Finance);*

- *The essential investment in achieving research excellence through Science Foundation Ireland requires to be sustained for 2004 in line with the National Development Plan to build in Ireland research of globally recognised excellence and of nationally significant economic performance (Department of Enterprise, Trade and Employment);*

- *EI's applied research funding for colleges and facilitation of the commercialisation process requires to be enhanced (Department of Enterprise, Trade and Employment).*

iii Science Education and Awareness Key to Improving Take-up of Sciences

The growth of Ireland as a knowledge economy is dependent on having the science and engineering skills required by enterprises in the knowledge economy. There is a need to make careers in and the study of the sciences attractive by improving science curricula, teaching methods and facilities and by developing coherent, integrated national approaches to promoting science awareness and understanding. *The Council recommends:*

- *An allocation of €14.6 million be provided in 2004 to initiate implementation of the Report of the Task Force on the Physical Sciences (Department of Education and Science). An additional €1 million should be provided in 2004 to implement a national integrated public awareness and promotion programme for science, engineering and technology. (Department of Enterprise, Trade and Employment).*

iv Maintain Momentum of Research in Health and Natural Resources

Investment in research and technological innovation in health and natural resource-based industries such as agriculture/food, marine, the environment and forestry is behind schedule relative to commitments in the National Development Plan. Strategies must be developed to achieve the R&D objectives of the NDP in these areas and the required funding reinstated in 2004 *(Department of Agriculture and Food; Department of Communications, Marine and Natural Resources; Department of Environment and Local Government; Department of Health and Children)*.

1. Introduction

Science, technology and innovation increasingly determine the performance of modern economies and the competitiveness of industries. They influence overall economic performance in the areas of employment, production and trade and they contribute to economic prosperity by supporting the emergence and expansion of new industries, encouraging organisational change and driving productivity improvements.

The EU has placed the development of a European Research Area at the heart of its Lisbon Strategy to make Europe the *"...most competitive knowledge based economy in the world by 2010."* Specifically, the EU Heads of State at Barcelona in 2002 agreed a target for Europe of research intensity of 3 per cent of Europe's GDP by 2010, an increase from 1.9 per cent for Europe over the last decade. Two-thirds of the increase is to come from the private/enterprise sector. Ireland's investment in research and development (R&D) is currently equivalent to 1.36 per cent of GNP, a level substantially below that of other knowledge intensive economies, such as Sweden (3.8%), Finland (3.22%), Denmark (2.06%), Netherlands (2.05%) and the UK (1.87%).

As part of its strategy to develop as a knowledge and innovation-based economy Ireland has significantly increased its investment in science and technology to build its reputation in areas of strategic importance to the country over recent years. In current prices, the Government's Science and Technology Budget increased from €980 million in 1999 to an estimated €1.6 billion in 2003. However, while this is a significant increase over the period, it is a decline from about 4.9 per cent to 4.2 per cent of total Government expenditure over the same period.

It is critical that the good progress and momentum achieved under the National Development Plan over recent years of increased investment in research capacity and capability and establishing an international reputation for Ireland as a centre for world class research be maintained and further developed. There is a need for certainty and stability of public funding for science, technology and research at the overall level and in the allocations of individual

Government Departments if Ireland is to build on the progress achieved. There is also a need for partnership and synchronisation of public and private investment to ensure that all elements are supported. Based on work completed by ICSTI, the Council proposes a number of priorities for Government. This is the first of a series of annual statements on priorities.

2. Increased Business R&D Key to Future Competitiveness

The level of business expenditure on research and development (BERD) in Ireland is low for an economy whose output and exports are dominated by high technology sectors. Total BERD amounted to €917m in 2001 (0.92% of GNP), up from €784m in 1999. The average annual growth rate of BERD in the two year period 1999-2001 was 4.0% in real terms, compared to a rate of 11.8% in the 1997-1999 period. These growth rates reflect a real slowdown in expansion of R&D activity by the business sector.

R&D intensity in the manufacturing sector, as measured by the level of R&D related to industry output, continues to be poor and has declined relative to 1999 levels. The low relative intensity in Pharmaceuticals and Electronics is a particular concern and is evidence of the lack of integration of multi-nationals into the national economy in these sectors.

There is a strong economic rationale for public support for business expenditure on R&D. The social returns from investment in R&D by business are higher than those that accrue to the business itself and, therefore, there may not be the necessary incentives for businesses to increase their R&D, in particular in a tougher economic environment.

A number of studies[1] have found that while the private returns, i.e. to the firm, of investment in R&D average 25 per cent, the social return can be between two and three times the private rate of return.[2] These returns are likely to be higher for a country, such as Ireland, that is further behind the technological frontier.

The repositioning of the Irish enterprise sector higher up the economic value chain is dependent on stimulating and strengthening business R&D. A mix of support measures is required to best meet the needs of different types of enterprises. Tax credits are particularly effective for large firms and for attracting mobile enterprise R&D activities. Direct funding of R&D and Business Expansion and Seed Capital Scheme funding is a more suitable mechanism for small and medium sized firms and technology-based start-ups. (See Box 1).

1 For a review of literature, see *The Economic Appraisal System for Projects Seeking State Support from the Industrial Development Agencies,* Forfás, May 2003.
2 Jones and Williams (1998), *Measuring the Social Rate of Return to R&D,* Quarterly Journal of Economics, Vol 73, reviewed numerous econometric studies and found that the social return to industry from R&D averaged around 100 per cent.

Box 1: Mix of R&D Supports Required for Industry

"SMEs are typically involved in smaller technology projects than larger multinational corporations and have limited internal technological expertise. Public financing for technology projects can, therefore, have an important catalytic role. Such assistance helps companies to take the first critical step. Packaged support for R&D performers, such as, tax breaks, loans, state subsidised R&D programmes, capabilities development and capital allowances are becoming increasingly important for small firms. It is very important that such incentives are counter cyclical rather than tied to and, therefore, amplifying Private Equity and Venture Capital support.

From personal experience, we found the 150% tax allowance provided by the Australian Government for R&D expenditure a valuable incentive for research in small firms. I would highly recommend that the Irish Government look closely at this scheme."
Angela Kennedy, Megazyme International Ireland Ltd.

"Research and development is critical to the long term viability of Irish companies as new products provide the basis of future business particularly in internationally traded goods as well as supporting local markets in an ever increasing competitive trading environment. It is essential that we have tax credits against our R&D spending so that we can continue to exist in an extremely competitive market."
Dennis Dempsey, VP and General Manager, Analog Devices

Research and innovation supports in Ireland require to be competitive with those available to enterprises in other countries and should be responsive to the changing economic environment. Specifically, the current approach requires matching funding from private sector venture capital partners in order for the State to take an equity stake in technology-based firms. However, securing private funding is tighter during economic downturns and valuations of technology-based firms are lower. Alternative counter-cyclical funding arrangements are needed to take account of changing economic conditions so as to encourage enterprise research activities of scale,

and to maintain the flow of research in SMEs. A comparative study of support for R&D by SMEs in competitor countries should be carried out in 2004 to compare the relative attractiveness and effectiveness of R&D supports in Ireland.

2.1 Introduce R&D Tax Credits to Stimulate Business R&D

Tax incentives are widely used to stimulate business R&D in other advanced economies including those with which we compete such as the UK, France, the Netherlands and Spain. Seventeen OECD countries offer tax credits, or enhanced tax allowances, for R&D. The UK recently introduced a 150% tax allowance for R&D expenditure by SMEs, and 125% for large companies (see Box 2). Similarly, R&D expenditure qualifies for a tax allowance of 200% in Hungary and a 20% tax credit in Norway.

Box 2: Increased R&D to Drive Productivity Growth and Innovation in the UK

The UK is concerned at a productivity gap with the US and is targeting increased investment in science, technology and innovation to bridge this gap. The UK introduced R&D tax credits in 2000 for SMEs, and in 2002 for large companies, and the attractiveness of these was further improved in 2003, in particular for SMEs.

On 9th April 2003, the UK Chancellor of the Exchequer noted in his Budget speech that *"...two thirds of the productivity gap with America is due to the poorer quantity and quality of innovation... having launched the successful R&D tax credits last year, we are – following representations from the CBI and others – announcing improvements in the credits' scope and value...because two thirds of the R&D credit is paid to manufacturing, this is of special help to manufacturers in our regions."*

The Chancellor also announced that he has asked the UK Inland Revenue to *"...report on further help for already tax exempt research and technology organisations so that Britain can lead the world in new discoveries, and then new industries and jobs."*

The US offers a tax credit of 20% on incremental R&D spending whilst Canada offers a volume based tax credit of 20%[3]. In Singapore, enhanced deductions are available for current expenditure on qualifying R&D and capital allowances are also available, including accelerated depreciation on prescribed equipment. Singapore also provides tax exemptions for foreign sourced royalties and interest where used for R&D purposes.

The effectiveness of these incentives to boost productivity growth and innovation has been established by a series of empirical studies[4], particularly among large firms in high-tech sectors where the need for greater research intensity is most pronounced in Ireland.

Global competition for the location of new manufacturing and R&D facilities is fierce. A tax credit for R&D would reduce, though not eliminate, Ireland's competitive disadvantage as a location for internationally mobile R&D-related investment.

The Council recommends that a tax credit for incremental R&D expenditure be introduced in 2004 in the first instance. The tax credit should be at the rate of 20 per cent of qualifying expenditure – this is at the lower end of the range for such incentives internationally. The proposal seeks to provide an effective incentive to industry to increase R&D without placing an unreasonable burden on the Exchequer (Department of Finance).

2.2 Improve Support for Applied Research in Industry

In real terms the introduction of an R&D tax credit will be of use primarily to large firms and multinationals, which currently account for two thirds of Ireland's BERD. Priority requires to be given to strengthening measures supporting industry R&D, including the Research and Technological Innovation (RTI) Competitive Scheme. Measures to support the exploitation and commercialisation of research are also important to realising the returns to the economy and society of public support for research. The RTI scheme supports applied research by both overseas and indigenous companies and is

3 As an illustration, a 20% tax credit would increase the tax benefit per euro of expenditure for an enterprise from €0.1250 currently from normal corporation tax deductions to €0.3250 per euro.

4 Hall, B. & Van Reenen, J. 2000. *'How Effective Are Fiscal Incentives for R&D: A Review of the Evidence',* Research Policy (29).

key to achieving the goal of encouraging and supporting companies to increase their commitment to R&D and to realise the benefits of that investment. *The Council recommends that Enterprise Ireland's and IDA Ireland's investments in applied research capacity and capability building in industry and in commercialising research require to be enhanced and further promoted (Department of Enterprise, Trade and Employment).*

2.3 Extend the Business Expansion and Seed Capital Schemes for Start-Ups

The Business Expansion Scheme (BES)/Seed Capital Scheme (SCS) has provided a valuable source of funding for Technology start-up companies over the recent years. The Scheme is due to expire on 31st December 2003. *The Council recommends that the Business Expansion Scheme (BES) and the Seed Capital Scheme (SCS) be extended for a further 3 years, from 31st December 2003 until 31st December 2006 and that the limits on the size of investment on which an individual investor can claim SCS tax relief be doubled from €31,750pa to €63,500pa to reflect wage inflation between 1993 and 2006. This would mean also doubling the overall personal limit of €182,560 to €368,000. The overall limit of BES funds invested in any one company would remain unchanged at €750,000 (Department of Finance).*

2.4 Retain Patent Tax Incentives to Stimulate Invention

The Finance Act, 1973 and subsequent amendments have provided tax exemption for patent royalty income. This is an important incentive for encouraging and rewarding inventor entrepreneurs, third level researchers and enterprise to protect, manage and exploit intellectual property from research. It is particularly relevant for encouraging technology-based start-ups and for encouraging the exploitation of third-level research. This incentive is currently the subject of a review by the Department of Finance. *The Council recommends that the Patent Tax Incentive be retained (Department of Finance).*

2.5 Reinforce Commitment to Low Rate of Corporation Tax

The competitive tax regime in place in Ireland for many years has been an important factor in the growth of industry here, as highlighted in the ICSTI Statement *Embedding the PharmaChem Industry in Ireland,* February 2003. There is increasing competition internationally for the location of new production facilities. Firm statements by Government about continuing the 10% manufacturing tax rate until 2010 and, thereafter, introducing a rate of 12.5% have reinforced Ireland's position as a European base for many established multinational companies. In this regard, *the Council recommends the inclusion of a clear statement in the 2004 Budget reinforcing the Government's long term commitment to a low corporate tax rate (Department of Finance)*.

2.6 Abolish Stamp Duty on Intellectual Property Transfer

ICSTI published its Statement on *Industrial Design and Development* in 2003. It outlines a number of recommendations to help position Ireland as a design leader for manufactured goods in international markets. A key issue that arises is the ownership and transfer of intellectual property rights (IPR) related to industrial design. In Ireland, stamp duty is applicable on the transfer of IPR. This puts Ireland at a disadvantage relative to other countries that do not levy stamp duty on IPR and is a serious impediment to trading in IPR in the State. The UK abolished stamp duty on IP transfer in March 2000. *It is recommended that stamp duty should be abolished on the transfer of IP in Ireland (Department of Finance)*.

3. Developing World-Class Research Infrastructure and Capacity

Ireland's research infrastructure has improved significantly over recent years. This has been achieved through a combination of initiatives including the Higher Education Authority's Programme for Research in Third Level Institutions (PRTLI), which is part funded by the private sector; Science Foundation Ireland's investment in research excellence; and Enterprise Ireland's investment in commercialisation infrastructures. These programmes have provided a range of world class facilities in areas of strategic importance to Ireland that have significantly improved conditions for Irish researchers and improved Ireland's attractiveness to world class researchers to establish leading edge research teams here. However, the sustainability of this progress is threatened by a stop-go approach to funding.

Science Foundation Ireland has recently allocated substantial investment in creating three new Centres for Science, Engineering and Technology (CSETs). SFI has focused considerable resources on these awards because building top-class teams between academia and industry is one of the most important steps any country can take in building a lasting indigenous research base and generating ideas, products and jobs based on knowledge. More importantly, Ireland's future depends on harnessing the ideas and the creativity of its talented researchers. SFI is planning to invest in more Centres so it is essential to continue this strategic investment.

PRTLI is currently implementing Cycle 3 of its funding programme, involving total funding of €320 million to 2006, composed of €260 million public funding and €60 million private partners. However there was a pause in the public funding for capital and infrastructural requirements for 2003, amounting to a shortfall of €80 million. The impact of the pause is significant. It has resulted in delays in building programmes, deferral of equipment purchase and installation, including equipment part funded with private sector donors. From an industrial development perspective, a number of key research centres that would have improved dramatically Ireland's attractiveness for high value adding activity, for example to attract major bio-industries, are on hold. (See Box 3).

Box 3: Return on Investment in Research at Risk due to Stop-go Approach to Public Funding

"Delays attributable to the PRTLI pause in construction and investment in highly sophisticated equipment are slowing research progress and adversely affecting staff training. The 'stop-go' nature of funding in Ireland has serious implications on the credibility of the Irish Government's commitment to scientific research and training at an international level."
Dr. Pierre Meulien, Chief Executive, Dublin Molecular Medicine Centre (DMMC)

"The PRTLI pause has impacted our ability to attract new researchers, as we cannot guarantee that critical equipment will be available for their proposed research. It is also having a negative impact on our ability to recruit SFI Investigators and Fellows, due to a loss of confidence in the future level and consistency of Irish research funding at a national level. While HEA PRTLI-funded research programmes will certainly be delayed due to the pause, potentially much more serious is the impact on research projects, funded from other agencies, e.g. SFI, Enterprise Ireland and the Health Research Board where funding was secured based on proposal submissions that assumed certain infrastructure and equipment would be in place."
Dr. Terry Smith, National Centre for Biomedical Engineering Science at NUI Galway

The stop-go approach has given rise to questions internationally as to the seriousness and certainty of Ireland's commitment to investment in research and building a knowledge based economy. The types of outstanding researchers which Irish institutions are trying to attract have a choice of careers anywhere in the world, in particular in the US where there is a high constancy of funding. Delays in infrastructure investment will also have cumulative effects to other funding areas. SFI grants, in some cases, have been allocated to complement existing infrastructure, so this could lead to loss of SFI potential downstream.

Investment in PRTLI will enhance and build on previous investments and, furthermore, facilitate the attraction of investments from other sources e.g. SFI and the EU Framework Programmes.

The key objective must be to keep the PRTLI on target. The current low interest rate environment does provide potential for research institutions to find alternatives. In this regard, the Council welcomes a proposal submitted by the HEA to the Department for Education and Science and the Department of Finance for a borrowing arrangement to make good the shortfall in funding and recommends that the proposal be given early consideration.

Consideration should also be given to approaches for the establishment of multi-annual funds for research infrastructure development to ensure sustained investment by the Government in the future.

The Programme for Government did also commit to multi-annual cycles for the PRTLI. Support is required for Cycle 4 of the PRTLI, which would result in a call for proposals being issued in 2004, with any potential impact on the public finances in the second half of 2005.

A key element in ensuring that the State achieves an appropriate return from public funding of research in science and technology is the development of the national commercialisation infrastructure. Enterprise Ireland's applied research and facilitation of commercialisation funding for colleges is an important element in building the commercialisation infrastructure and needs to be further enhanced.

Finally, the Council welcomes the progress achieved by the Irish Research Council for the Humanities and Social Sciences and the Irish Research Council for Science Engineering and Technology in promoting and supporting research. It is important that the progress achieved be sustained in 2004 and beyond.

The Council recommends that the funding commitments for the PRTLI should be reinstated in 2004 (Department of Education and Science).

There should be immediate agreement for third level institutions to exercise their statutory and legal powers to loan finance infrastructure of strategic importance to Ireland to make good the current shortfall and to continue the implementation of PRTLI initiatives (Department of Education and Science, Department of Finance).

The Council recommends that the essential investment in achieving research excellence through Science Foundation Ireland requires to be sustained for 2004 in line with the National Development Plan to build in Ireland research of globally recognised excellence and of national significant economic performance (Department of Enterprise, Trade and Employment).

Enterprise Ireland's applied research funding for colleges and facilitation of the commercialisation process requires to be maintained to ensure an appropriate return on overall investment in research (Department of Enterprise, Trade and Employment).

4. Science Education and Awareness

4.1 Implement the Report of the Task Force on the Physical Sciences

The recent trends of declining uptake of the sciences at second level, in particular among girls and declining applications for science courses at third-level, must be addressed if Ireland is to provide the career scientists and engineers and postgraduate researchers required to underpin the development of Ireland's research base in the physical sciences.

The Council strongly supports the recommendations of the Department of Education and Science's *'Task Force on the Physical Sciences – Report and Recommendations'*, published in 2002, and the goal articulated for Ireland to achieve *"scientific literacy for all"*. The implementation of the recommendations is crucial for the development of Ireland as a centre for world-class research and knowledge economy. A high priority requires to be given providing resourcing for schools to support the new curricula at primary and Junior Cycle (second level) and for pre-service and in-service science training.

The Council recommends that an allocation of €14.6 million should be provided in 2004 to initiate implementation of the recommendations of the Task Force on the Physical Sciences. This is to provide resources required for the new Junior Cycle science curriculum, for the establishment of a National Education Science Service for teacher training in the sciences, to support a business, third level colleges and schools links and access schemes, and the development of a Collaborative Centre for Teaching and Learning in the Sciences (Department of Education and Science).

4.2 Integrate National Science Awareness Programmes

There is currently a great diversity in the number, scale, objectives, styles, target audiences, budgets and geographic coverage of initiatives to promote science[5]. However, the Department of Education's Task Force on the Physical Sciences Report noted that the effectiveness of the many promotional efforts *"... is compromised by a range of factors, including geographical localisation, poor information*

5 These range from programmes such as the *Schering-Plough Introduction to Science Programme for Primary Schools, the Forfás Science, Technology and Innovation (STI) Awareness Programme*, the *National Skills Awareness Campaign* and the *STEPS* Programme.

flow, lack of partnership, limited funding... diversity of messages... limited collaboration; best practice is not shared."

The Task Force recommended that one publicly funded body should take charge of drawing together all the many science promotional activities and that industry and professional bodies should formally co-ordinate, or integrate, their promotional efforts with this national strategy. It recommended that recurrent funding of €3 million per annum be provided for this initiative.

The Council supports this proposed approach to optimise the national science promotional effort and notes that a strategy and proposals for a national integrated promotional programme is being developed by the Department of Enterprise, Trade and Employment and Forfás. *The required funding of an additional €1 million should be allocated in 2004 to implement a national integrated public awareness and promotion programme for science, engineering and technology, building up to €3 million as recommended in the Report of the Task Force (Department of Enterprise, Trade and Employment).*

4.3 Establish a National Science Centre

There is a need to promote science in the wider arena, among parents and the general public, as well as among the student body. Ireland currently lacks one important resource for such promotion and teaching of science in primary and second level schools which exists in all other EU Member States in some form, which is, a national science centre and/or a regional network of science centres. The Council[6] has previously noted that the establishment of science centres could contribute significantly to increasing the confidence of school students and of the general population in understanding science and technology. *The Council recommends that Government take an early positive decision to develop a national science centre and/or a regional network of science centres, as such centres are recognised in other countries as an important component of science promotion and teaching.*

6 *State Expenditure Priorities for 1999,* ICSTI, November 1998.

5. Health Research Funding

Health research is a key factor in promoting health, combating disease, reducing disability, improving the quality of care and making the health services more efficient and effective. Health research also has significant economic benefits through the generation of intellectual property and training of a skilled workforce, particularly in areas such as biotechnology, biopharmaceuticals, medical devices and information and communications technologies.

The Government published its strategy for health research ***'Making Knowledge Work for Health – A Strategy for Health Research'*** in 2001. However, despite an increase in funding, based on current trends, the funding targets set for the five years to 2006 will not be achieved[7]. Health research in Ireland remains under-funded in terms of GDP/expenditure on health relative to other countries and has not kept pace with the overall increase in health spending over the last five years[8]. The key priority must be the implementation of funding commitments in the Health Research Strategy to ensure that the health system maximises its contribution to the national system of health and innovation *(Department of Health and Children)*.

7 The implementation of the science for health elements of the Strategy for Health Research would require annual revenue expenditure of €33 million in 2001 prices by 2006, compared with just under €15m in 2003. The establishment of an R&D function in the health services would mean an increase in annual revenue expenditure from €3 million in 2003 to €44 million by 2006.

8 Estimated expenditure on health research in Ireland in 1998 was equivalent to 0.3% of public health expenditure, compared with 1.7% in the US, 1.9% in the UK and 2.3% in Finland.

6. Research and Innovation in the Natural Resource-Based Industries

Investment in research and technological innovation in natural resource-based industries such as agriculture/food, marine, the environment and forestry will have a major impact on economic growth, sustainability and innovation. The National Development Plan (NDP) committed significant increased funding for research in the natural resources, but much of this investment is behind schedule. For example, in 2003 the NDP Marine research budget was reduced from a scheduled amount of €4.4 million to €1.4 million, a reduction of €3 million (68% in one year).

It is critical that the momentum of increased investment in public research, in-company research, and technology transfer in the natural resources be sustained. The shortfall in funding is impacting on the ability of the relevant agencies to achieve the objectives of their research programmes to optimise the use of existing capacity and infrastructures, such as the marine research vessel, and to participate in international collaborations. Strategies must be put in place to achieve the research and development objectives of the NDP in each of these areas by 2006 and the required funding reinstated in 2004 *(Department of Agriculture and Food; Department of Communications, Marine and Natural Resources; Department of the Environment and Local Government)*.

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ICSTI Statements (1997-2003 To Date)

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Utilising Intellectual Property for Competitive Advantage	Feb. 2003
Embedding the PharmaChem Industry in Ireland	Feb. 2003
Design and Development	Sept. 2002
Measuring and Evaluating Research	Aug. 2002
Report on Biotechnology	Feb. 2002
Commercialisation of Publicly Funded Research	Feb. 2001
Benchmarking School Science, Technology and Mathematics Education in Ireland Against International Good Practice	Feb. 2000
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