State Expenditure Priorities for 1998

Summary

In considering priority areas of public expenditure in science, technology and innovation in Ireland, the recently established Irish Council for Science, Technology and Innovation draws attention to a number of key areas of investment of national importance, and recommends the following actions:

1. **Science in Schools**

   Increase significantly the initial commitment, announced earlier this year, of £30m over five years to a range of measures to promote the use of information technology in the schools

   Provide additional resources to improve the science curriculum in primary schools, if necessary by reallocating existing expenditure

   Place increased emphasis on science, mathematics and technology subjects in secondary schools and provide the consequential additional resources

2. **Third Level Education**

   Allocate the resources required in 1997/1998 to provide for 1,000 additional third level places per year for computer science/software engineering and 750 additional places per year for technicians for the electronics industry, in line with the recommendations of the Forfás Skills Identification Group

   Provide £10m per year additional funding from 1998 onwards to redress the equipment crisis in the third level colleges

3. **Third Level Research**

   Increase support for basic research, via a fund open to all on a competitive basis, from £2m per year at present to £6m per year

4. **Industrial Innovation**

   In the context of further Structural Funds reallocations in 1998, an additional £12m should be made available for the Industry R&D Grants Scheme of the Industry Operational Programme (‘Measure 1’), including food research

   Focus the new funding to be allocated this year on encouraging new R&D performers and on building long-term research capabilities within enterprises

   Place greater emphasis under ‘Measure 1’ on promoting and supporting industrial design

   Allocate additional resources to improving the links between industry and third level colleges

5. **Structural Funds**

   Ensure that adequate funding continues to be available for science and technology activities after the current Structural Funds round ends in 1999, by initiating immediately intensive planning for the post-1999 situation

6. **Funding Areas of Strategic Importance**

   Establish a **Strategic Innovation Investment Fund**

Economic development and job creation in Ireland are increasingly dependent on a high-quality knowledge and science-based enterprise sector. Scarce public resources for science and technology should be selectively focused on those areas of strategic importance to Ireland's economic well-being. Aware of the resource constraints on Government, the Council recommends the establishment of a Strategic Innovation Investment Fund for priority investments of importance for national development purposes. To provide such a fund a levy could be applied, if necessary, to the totality of public expenditure on science, technology and innovation. This fund would be directed to finance the accelerated development of those areas of science, technology and innovation of strategic importance to Ireland's international competitive position.

State Expenditure Priorities for 1998

1. Introduction

1.1 Following its recent establishment the Council is in the process of developing a work-programme which will form the basis of its advice to the Government through the Minister for Science and Technology. A central part of that programme includes a fundamental examination of the funding of science and technology in Ireland. This work will take some time to complete to the stage of well-conceived and authoritative findings.

1.2 In the interim the Council has been requested by the Minister to provide views on science and technology expenditure priorities in the context of the 1998 Estimates. In doing so the Council stresses the need for a long-term view in setting priorities and draws attention to two underlying principles behind state investment in science and technology:

1. The national importance of promoting science and technology as a powerful instrument of the social and economic policies of the Government.
2. The national importance of promoting science and technology in the pursuit of knowledge for educational, intellectual and cultural reasons.

1.3 These two principles are not mutually exclusive - they support and complement one another. For example, the applied research so necessary for social and economic development and competitive business is not possible in the absence of a basic foundation of highly-qualified people trained and well-versed in the methodologies of scientific research, with good access to modern scientific equipment. At the same time, the availability of the resources needed to allow the pursuit of knowledge for educational, intellectual and cultural reasons is largely dependent on the success of technology-based industry in creating the necessary wealth.

1.4 TIn this context the Council has identified a number of expenditure priorities for consideration in the contest of the 1998 Estimates under two headings:

- Knowledge and Skills
- Industrial Innovation

The Council also comments on the unique role of EU Structural Funds in supporting Irish investment in science and technology and draws attention to the need for a special funding mechanism for financing priority investment areas.

2. Knowledge and Skills

2.1 Science in Schools

- Increase significantly the initial commitment, announced earlier this year, of £30m over five years to a range of measures to promote the use of information technology in the education sector
- Provide additional resources to strengthen significantly the science curriculum in primary schools, if necessary by reallocating existing spending
- Place increased emphasis on science and technology subjects in secondary schools, and provide the consequential resources.

Rationale:
A modern economy needs a scientifically literate and innovative population. We should aim to raise the performance of Irish school children into the top ten in the world in science and mathematics. This will also enable more people to study science and engineering at third level. There is a requirement for additional investment in teacher training and in facilities; the Department of Education is currently evaluating the implications of this for the budget. This is a long-term task but a start should be made in the 1998 estimates.

The Council strongly endorses the views on this issue in the report of the Information Society Steering Committee. In a first response to the recommendations of the Information Society Steering Committee, which Forfás convened, the Government announced earlier this year a commitment to invest £30m over five years in a range of measures to promote the use of information technology in schools. The Council welcomes this initial commitment and recommends that, in the light of developments that have taken place since this commitment was made in April last and which emphasise even more strongly the importance of ensuring that students at all levels are familiar with, and competent in the use of, information technology, the Government should significantly increase the level of financial commitment to this area of education.

2.2 Third Level Education

- Allocate the resources required to provide for 1000 additional places per year for computer and software graduates and 750 additional places per year for technicians for the electronics industry. An initial additional capital tranche of £5m has been allocated for 1997. Total capital requirements over 5 years are estimated at some £50m, with associated current expenditure rising to £16m per year when all additional places are established
- £10m additional funding should be made available in 1998 and subsequent years to redress the equipment crisis which exists at present in the third level colleges. This fund should be allocated on a competitive basis between users, to ensure that the most urgent cases get priority and to minimise any duplication of major items of equipment.

Rationale:
Serious skill shortages are now appearing in industry. Ireland has made enormous progress in attracting many of the most sophisticated enterprises in high technology industries such as electronics, telecommunications, pharmaceuticals, software and computers. There has also been significant development and increasing technological sophistication in Irish-owned industry in these sectors. These developments, if they are to be sustained, require a parallel investment in developing the human resources for those industries. Demand for software courses, for examples, outstrips supply by a factor of five - there were about 3600 applicants last year for the 700 computer science places in third level colleges. Emerging skill shortages are also giving rise to wage inflation in particular sectors which will spill-over into more

general inflationary pressures and constrain economic development and job creation generally unless the supply of people with the skills required is increased. The situation is particularly difficult for small Irish-owned firms attempting to compete for scarce skilled people against large multinational companies. It is essential that the additional places required are provided.

The equipment crisis has resulted from long-term underfunding of equipment in colleges. Funds for equipment for the third level colleges are provided on an annual ad-hoc basis. Three years ago the Higher Education Authority estimated an overall need of at least £50m to address the equipment shortfall in the universities. Since then the position has worsened. Many laboratories are now in a critical condition, affecting the efficiency and effectiveness of education and research at undergraduate and postgraduate levels. An additional allocation of £10m per year for 1998 and subsequent years is essential, as is the need to put equipment depreciation and replacement on a sound financial footing as a routine part of the budget process.

2.3 Third Level Research

- Support for basic research, via a fund which is open to all on a competitive basis, should be increased from the current level of £2m per year to the £6m per year recommended by STIAC. Structural Funds could be allocated to meet the additional amounts required, as suggested in the mid-term review of the Industry Operational Programme. Consideration should be given to ear-marking a specific amount under the block-grant system to third-level colleges for basic research purposes.

Rationale:
Accepting the two principles outlined in the Introduction above, reasons for supporting third level basic research include:

Establishing a national reputation for excellence in research so as to expand access to international networks of scientific knowledge. Ireland can perform only a tiny fraction of world research and must develop the expertise and knowledge to be able to tap into results generated elsewhere. An excellent research environment is necessary to attract and keep in Ireland the best quality students and staff. It is also essential for attracting inward investment in advanced technology industries. At present, the research environment in Ireland is quite limited by the standards of comparable countries;

To train postgraduate students in research under a more "professional" cadre of research programme managers. Trained researchers, particularly PhDs, are being sought more and more as the technological levels of Irish industry rise. Industrial R&D is increasing rapidly but is still concentrated at the development, rather than research, end of this spectrum. The availability of additional recruits, highly trained in good research techniques, will help to move enterprises towards more innovative research areas;

Third-level institutions with a strong basic research programme will successfully attract higher quality of staff and students, resulting in an overall upgrading of standards and the "outputs" available for the business sector and for society generally. The success of a number of campus-based companies in computer software and other areas in recent years indicates what can be achieved.

3. Industrial Innovation

3.1 Industrial Research and Development.

There is to be a reallocation of Structural Funds within the existing Community Support Framework to provide an additional £27m for the Industrial R&D Grants Scheme under the Operational Programme for Industry ('Measure 1') between now and 1999. This is because the original allocation to the scheme has been exhausted some two years ahead of schedule. 'Measure 1' includes a significant allocation for food research. The Council welcomes this reallocation, recognising that public support for R&D in enterprises is necessary to help share the risks for companies involved in a wealth-creating activity where individual firms are not always able to appropriate fully the final benefits.

- In the context of further Structural Funds reallocations in 1998 an additional £12m should be made available for 'Measure 1'
- The new funding should be focused on encouraging new R&D performers and on building long-term, relevant research capabilities within companies
- In view of the importance of industrial design to product innovation, the 'Measure 1' scheme should make greater use of its power to promote and support industrial design
- Greater efforts are needed to improve industry-college links, with the aim of increasing the transfer of knowledge and expertise between industry and the third level colleges. This is particularly important for indigenous industry

Rationale:
In the context of limited public funds to support industrial research and development it makes sense to focus expenditures in such a way as to promote key national policy objectives in this area. One such objective is to involve more enterprises in performing R&D for the first time; statistics show that over half of industrial firms in Ireland do no research and development at all, while another 30% have only a minor involvement in R&D. State funds should be utilised to encourage enterprises to become involved in R&D and, for those already with some involvement, to facilitate and encourage a long-term commitment and capability in research and development. The Council agrees that food research should remain a national priority.

3.2 Government Research Institutes

The government research institutes, which are generally sector-focused, have a significant role to play in servicing the R&D needs of the sectors that they serve and in advising associated government departments on R&D issues. The capability of some of these institutes has been seriously eroded over the years and there is now a serious need to revitalise these services to enable them to play a full role in support of innovation and technological advancement.

Applied Research and Technology Transfer: Applied research and applications development are essential to the industrial relevance of a research programme. These components are required to transform a public research programme from being scientifically interesting to being useful and innovative. In particular, the inclusion of applied research and applications development in a public programme is essential in supporting industry in adopting new products and processes and in the capacity to support the technological development of firms.

The public sector institutes in Ireland play a vital role in these areas. The STIAC Report and the White Paper on Science, Technology and Innovation stress the central importance of technology transfer and of the various S&T services provided by the State institutions. In the

Irish context of an overwhelming concentration of SME's in the economy, the Council stress the continuing importance of the State institutions in the areas of applied research, application of appropriate available technologies and the provision of a range of technical services to ensure that the performance of firms is not impaired.

4. EU Structural Funds

The Council recognises the important contribution of Structural Funds to the development of the Irish science and technology system in recent years and welcomes the fact that the mid-term review of Structural Funds programmes has highlighted science and technology as an important national investment priority.

- Government should ensure that, when the current round of Structural Funds runs out in 1999, adequate funding remains available for S&T activities, either from new Structural Funds programmes or though a replacement of EU funds by exchequer finance
- Preliminary planning for the post-1999 situation has already started but needs to be intensified. The Council will make specific proposals in this area

Rationale:
Since the introduction of major new initiatives for Irish science and technology with the Structural Funds programmes that began in 1989 the levels of research and development in Ireland have risen from amongst the lowest in Europe to around the EU average. This has contributed to the significant growth in output, exports, productivity and employment over this period. The mid-term review of the Community Support Programme recognises the crucial importance of R&D to competitiveness and growth, and comments on the enormously important role of the CSF in promoting increased R&D in Ireland. It is vital to maintain this level of public commitment into the future. The challenge for Ireland lies in the extent of dependence in the past on EU funds and the danger that recent achievements will be dissipated when the current ERDF round finishes in 1999.

5. Funding Areas of Strategic Importance to Ireland

- Establish a **Strategic Innovation Investment Fund.**

The Council recognises the resource constraints on Government in the context of the public finance objectives set out in the Programme for Government. Within those constraints it is considered that investment in science, technology and education along the lines proposed here needs to be given priority status because of its impact on the knowledge, skills and employment prospects of the Irish labour force in the immediate and more distant future. Economic development and job creation in Ireland are increasingly dependent on a high-quality knowledge and science based enterprise sector. The Council wishes to ensure that available public resources for science and technology are selectively focused on those areas of strategic importance to Ireland's economic well-being. The Government has already acknowledged the need for action by establishing new organisational structures for this area - a Cabinet Committee and an Inter-Departmental Committee for science and technology.

These initiatives should be complemented and given effective teeth by the establishment of a Strategic Innovation Investment Fund. This fund would be directed to finance the accelerated development of those areas of science, technology and innovation of strategic importance to Ireland's international competitive position.

To provide such a fund a levy could be applied, if necessary, to the totality of public expenditure on science, technology and innovation. The impact of such a levy on individual programmes need not be significant but the contribution it would yield to the Government's commitment to science and technology as a critical arm of social and development policy would be very high. The creation of such a fund would represent a significant step towards a priority-driven system of S&T investment.

A Strategic Innovation Investment Fund should have two clear operational guidelines. It should be based strongly on the concept of excellence and national competitiveness, with competition for scarce resources being the key driver. Secondly, it should be carefully monitored, with a post-allocation justification and analysis of effectiveness of all investments and a maximum level of transparency and accountability.

6. Conclusions

The Council welcomes the structural changes for improved decision-making in relation to public expenditure on science and technology which are set out in the Government Programme and are now being put into place by the Government. The new Interdepartmental Committee of senior civil servants, chaired by the Minister for Science and Technology, will bring a more co-ordinated and strategic approach to the setting of science and technology budgets within government departments and agencies. The purpose of this Statement is to help the Minister and the Committee in their deliberations leading to the 1998 budget allocations.