



**EXPERT EVALUATION NETWORK
DELIVERING POLICY ANALYSIS ON THE
PERFORMANCE OF COHESION POLICY 2007–2013**

**TASK 2: COUNTRY REPORT ON
ACHIEVEMENTS OF COHESION POLICY**

IRELAND

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Directorate–General Regional Policy**

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EXECUTIVE SUMMARY

For many years the Irish government has had a stated policy of achieving “balanced regional development” and policies were introduced to attract manufacturing and services to areas and regions away from the relatively prosperous east of the country. This was in response to significant and persistent differences in population and employment growth as well as infrastructure and accessibility between the eastern “core” of the country (including the capital city of Dublin) and the western and north-western “periphery”. From the 1950s national and regional policies recognised the structural and locational difficulties of these peripheral areas, and such policies were complemented and strengthened by European funding since 1973. The division of the country into two NUTS II regions, the Southern and Eastern (S&E) region and the Border, Midlands and Western (BMW) region) with their own Regional Assemblies in 1999 and the retention of smaller NUTS III regions with their own Regional Authorities for co-ordinating purposes, further underlined the significant inter-regional differences. Despite some progress in recent decades the BMW region continues to lag behind the rest of the country and falls well below the EU average in relation to most economic and social indicators. The relative affluence of the S&E region has however been accompanied by serious traffic congestion and, until recently, significant increases in land and house prices especially in the Dublin area. Furthermore, a range of unemployment “blackspots”, where rates of unemployment exceed 20%, have persisted in the main cities of Dublin, Cork, Limerick and Waterford. Such intra-regional difficulties underline the need to examine data at levels below NUTS II.

By the 1980s it had become obvious that, in addition to the broad “regional problems” mentioned above, the main urban centres were experiencing significant difficulties. For example, Dublin had lost large numbers of manufacturing jobs and the main towns throughout the country showed many signs of physical and economic decline. As a result, government policy began to focus from the mid-1980s on “urban renewal” schemes via tax incentives in the main cities. During the 1990s and subsequently, such measures were extended to a whole range of small towns throughout the country.

During the 2000–06 *Operational Programme* the ERDF and Cohesion Fund (up to 2004) played central roles in developing transport and environmental infrastructure. While these concerns were also included in the 2007–13 *Operational Programmes*, most of the ERDF during this current period was used to support innovation, enterprise and urban development. A *National Spatial Strategy*, introduced in 2002 and supported and complemented by the ERDF, aimed at building up nine “Gateways” and nine “Hubs” in urban centres in both NUTS II regions. However, a “decentralisation” programme introduced in 2003 (but recently deferred) to move public sector staff from Dublin to more than 53 locations around the country overshadowed and was, in effect, in conflict with the *National Spatial Strategy*. Ireland is involved in a number of ERDF–

supported Territorial Co-operation programmes including PEACE III, INTERREG IVA (Ireland, Northern Ireland, Scotland) and Ireland–Wales. The main priority areas supported are innovation, knowledge and skills, enterprise, tourism, climate change and sustainable development.

Over the 2007–09 period, “actual expenditure” on the various policy areas fell well short of “planned expenditure” in the *Operational Programmes* due partly to the economic downturn. The economic difficulties, caused by a combination of national and international factors, has created significant new challenges. A decade-long property boom ended in 2007 resulting in a dramatic deterioration in economic growth, an increase in unemployment and a disproportionate impact on the government finances. Support for a deeply indebted banking system and the rapid reduction in tax revenue means that the government has been unable to fund several policy areas in the *Operational Programmes* at the present time. In November 2010 the Government applied for special loans from the European Commission, the European Central Bank and the International Monetary Fund in order to support and restructure the Irish banks, to deal with the shortfall in government revenue and to safeguard financial stability throughout the EU.

The main outputs and results arising from both national, ERDF and Cohesion Fund initiatives identified in the two Irish regions include:

- significant additions and improvements to research and innovation infrastructure in third level institutions via the Programme for Research in Third Level Institutions (PRTLII);
- the establishment of Applied Research Centres and Incubation Centres especially in the Institutes of Technology, resulting in additional training, employment, research capacity and increased research and industry collaboration;
- the establishment and creation of employment in micro-enterprises;
- the further development and enhancement of selected cities and towns identified as “Gateways” and “Hubs” in the *National Spatial Strategy*;
- the completion of a range of key road and rail infrastructural projects during the present and previous *Operational Programmes*;
- the extension of broadband to residences and businesses;
- the completion of a number of initiatives in relation to renewable energy.

Apart from the *Annual Implementation Reports* on which the above conclusions are based, no mid-term evaluations have yet taken place of the achievements of the 2007–13 Operational Programmes. These are scheduled to take place later in 2010. A number of evaluations relating to the 2000–06 period are summarised and a number of “impacts” identified since 2007 are outlined.

SECTION 1 – SOCIO-ECONOMIC CONTEXT

From the late 1950s Ireland began to move away from its former protectionist policies and dismantled most trade and other barriers. A range of new export-oriented agencies were established and significant grants and tax incentives were made available to attract foreign manufacturing investment. In 1973 the country, together with the UK and Denmark, joined the then European Economic Community (now the European Union). Despite some progress from the early 1960s Ireland continued to lag behind most other member states at that time. It had significant regional problems and thus became eligible for, and received, financial support from a range of Funds, including the European Regional Development Fund (ERDF) since 1975 and the Cohesion Fund from 1993 to 2002. Receipts from the ERDF came to over EUR 8 billion over the period 1975 to 2009 while Cohesion Fund receipts (terminated in 2002) amounted to over EUR 2 billion (Department of Finance, 2010). There is no doubt that this support played an important role in Ireland's progress over the last few decades.

After the recession in the 1980s Ireland began to experience significant economic and social progress from the early 1990s. Population increased significantly. Net in-migration replaced net out-migration. Economic growth and employment increased. Educational attainment at all levels improved. Despite this, significant differences persisted between the relatively prosperous and more urbanised eastern "core" of the country and the more "rural" western and north-western "periphery". For the purposes of "managing" European Union funding, and reflecting these differences, two broad (NUTS II) regions, the Southern and Eastern (S&E) Region and the Border, Midlands and Western (BMW) Region with their own Assemblies were established in 1999. While both of these regions experienced economic and social progress between 2000 and 2006, the BMW lagged behind its counterpart on most indicators (see Table 1¹).

Even during this "boom" period, inter-regional differences were clear. For example, the BMW region lagged far behind the S&E region and the European Union in relation to innovation – and in line with EU policy "innovation and the knowledge economy" became a central objective of the 2007–13 *Operational Programmes*. Furthermore, despite surpassing the BMW in many respects, the S&E region had also long-standing challenges of "inner city" unemployment and deprivation as well as traffic congestion in and between its main urban centres. (CIRCA Group Europe Ltd, 2004, Fitzpatrick Associates, 2006).

Since 2006 the growth rate of GDP deteriorated and both the employment and unemployment rates in both regions worsened. However, the BMW region again fared worse with a decline in GDP per head of 2.5% and a loss of 4.5% in productivity during 2006/07. While recent regional

¹ See Excel file for Table 1

data are not yet available, data at national level confirm that GDP fell further during 2008 and 2009 (Table 2). Interviews with Regional Assembly and Western Development Commission and Structural Funds Policy Unit personnel confirm these difficulties. In addition to the above, those interviewed in the BMW were concerned regarding the high incidence of low-value and seasonal sectors of employment, the heavy reliance on construction activities, the difficulties of attracting foreign investment and high-value employment categories and the continuing “brain drain” arising from a lack of local opportunities. They also stressed the low levels of R&D, innovation and entrepreneurship relative to the S&E region and the need to upgrade broadband. On the other hand, they emphasised the potential of the BMW region in relation to “creative industries”, renewable energies, niche foods, the marine and medical devices.

Despite the relatively superior position of the S&E region, interviews here pointed to significant challenges in rural and outlying NUTS III regions where a diverse range of problems are similar to those in the BMW region. Problems of infrastructural capacity, traffic congestion and “inner city” blackspots with unemployment rates in excess of 20% have also gone hand in hand with overall relative regional success.

Table A – Unemployment rate (%) in Ireland at NUTS II and NUTS III Levels

	March 2008	March 2010
NUTS II		
BMW Region	5.5	12.8
NUTS III		
Border	5.8	11.2
Midlands	4.9	14.8
West	5.5	13.3
NUTS II		
S&E Region	4.7	12.9
NUTS III		
Dublin	4.7	11.0
Mid East	3.5	13.1
Mid West	5.2	14.9
South East	5.8	17.4
South West	4.5	12.1

Source : Quarterly National Household Survey, Central Statistics Office, Dublin, June 2010

The above broad regional disparities are even clearer when data is examined at a NUTS III (Regional Authority) level, using the *Quarterly National Household Survey* (Central Statistics Office, 2010). It may be noted again that the NUTS III regions were left in place and still retain their own Regional Authorities but with limited executive and financial powers. See Annex I. A range of NUTS III regions throughout the country have predominantly “rural” populations, higher proportions in agriculture, lower employment rates and higher rates of unemployment. For example, over the two year period from March 2008 to March 2010 the rate of

unemployment in the BMW NUTS II region increased from 5.5% to 12.8%, while the rates in the S&E region increased from 4.7% to 12.9%. However, at a lower NUTS III level within the BMW the percentages unemployed in March 2010 were 14.8% and 13.3% in the Midlands region and in the West region respectively. Within the S&E they were 14.9% and 17.4% in the Mid West and South East Region respectively. See Table A. These are among the highest rates of unemployment in the European Union. Furthermore, youth unemployment and long-term unemployment have deteriorated significantly and now represent serious challenges in all of these areas (Central Statistics Office, 2010).

Questionnaires completed by a number of NUTS III Regional Authorities (available to the Commission) underline the need to focus more on these intra-regional disparities and “urban” concerns which are not obvious when broad inter-regional groupings are examined. For example, in the case of the Mid-West region, the closure of the DELL computer manufacturing facility in Limerick city had disproportionate knock-on effects throughout the entire region. Similarly, at a time of severe cutbacks in public expenditure Limerick city and the Mid-West region face multiple social and economic problems associated with a number of run-down and disadvantaged urban housing estates. The West Regional Authority stressed the poor condition of regional and local roads and the urgency of providing improved services in relation to water, waste and broadband. The South East Regional Authority, which has the highest rate of unemployment in the country in 2010, also pointed out that standard statistics such as GVA, disposable income and unemployment for the broader S&E region fail to capture the extent of the challenges faced by Regional Authorities.

Since 2008, Ireland has been affected by a serious economic turn-down, more so than most other EU27 countries, caused by a combination of national and international factors. The main macroeconomic changes are set out in Table 2² which shows that the average annual rate of decline of GDP was almost double the EU average in 2009 – a dramatic deterioration over a short period of two years. The early success of the “boom” was largely influenced by consumer demand, increasing productivity and a strong export performance particularly by multi-national firms. However, as a recent business survey indicated, indigenous firms played a much weaker role. By 2008, for example, the exports of Irish companies amounted to only 43% of sales compared to 94% for foreign firms. The level of exports of foreign firms were more than eight times greater than those of Irish firms (Forfas, 2008). In recent years, therefore, the economy had become heavily dependent for job creation on domestic construction activity and services related to construction.

An unsustainable “property boom” took place between 1995 and 2007. With interest rates at unprecedented low levels, lax lending and investment practices in the banks and tax incentives

² See Excel file for Table 2

designed to encourage house building, many individuals and companies borrowed heavily. Due to this and excess demand for housing, house prices rose significantly and remained seriously out of line with the consumer price index, the cost of building and average earnings over this period (Drudy, 2008). Serious risk-taking by construction companies eventually led to an over-supply of housing. Thus, private house completions almost trebled from 30,132 in 1996 to 88,211 in 2006. This inevitably contributed to a major collapse in house prices since 2007. A range of property companies have been in serious financial difficulties and a number of the major lending institutions have been nationalised or taken into part-ownership by the government. A National Asset Management Agency (NAMA) has also been established by the government to acquire and manage the devalued assets of property companies. Government borrowing and debt has increased significantly and the debt to GDP ratio is one of the worst in the European Union. Over recent years, therefore, there have been severe cutbacks in expenditure, including infrastructure, health and education. Since 2008 productivity has deteriorated and economic growth has been negative. Unemployment has increased significantly and net out-migration has resumed. In November 2010 the Government applied for special loans from the European Commission, the European Central Bank and the International Monetary Fund.

SECTION 2 – THE REGIONAL DEVELOPMENT POLICY PURSUED, THE EU CONTRIBUTION TO THIS AND THE POLICY ACHIEVEMENTS OVER THE PERIOD

THE REGIONAL DEVELOPMENT POLICY PURSUED

“Balanced regional development” has for long been a stated national objective of the Irish government and regional policy is initiated and framed in a national context after discussion with a range of national and regional institutions and agencies. The key regional agencies include the Regional Assemblies, Regional Authorities, County Councils and special agencies such as Shannon Development, County Enterprise Boards, the Western Development Commission and Udaras Na Gaeltachta – the latter body focuses on specific Irish-speaking areas. However, while these regional agencies emphasise the case for and often influence a regional orientation in policy, they have relatively weak executive and financial power. In effect, decision-making and ultimate control is heavily centralised and a range of Government Departments and national agencies, such as Enterprise Ireland, play dominant roles in relation to regional development.

Over the last few decades in Ireland considerable emphasis has been placed on “spatial” (area-based) policy rather than regional-specific sectoral policies. A number of key elements can be identified in the policy:

- Since the 1980s a move to an “urban-based” approach to the regional problem with the introduction of “urban renewal” schemes to encourage residential and office development via tax incentives in the main urban centres and small towns throughout the country.
- Since 2002 a “National Spatial Strategy” designed to develop nine “Gateways” and nine “Hubs” in the main urban centres (Government of Ireland, 2002).
- Since 2003 a “decentralisation programme” designed to re-locate public sector employees from Dublin to over 50 small and medium-sized centres throughout the country.

In general, the various regional agencies above, and in particular County Councils, were supportive of these policies. However, it may be noted that the decentralisation programme represented a broader “dispersal” policy as compared to the more efficient “concentration” or “cluster” policy proposed in the *National Spatial Strategy*. Generating much debate, the programme was only partially implemented and has now been deferred indefinitely on cost grounds.

The *National Development Plan 2007–13* placed considerable emphasis on regional development and gave a specific commitment to support the *National Spatial Strategy* and to invest EUR 300 million in the Gateways and Hubs (Government of Ireland, 2007). However, in view of the economic downturn, this investment has also been deferred and has been replaced by a more modest Gateway Challenge Fund supported by the EU.

In relation to EU funding, it is clear that Ireland’s success, although short-lived, resulted in the loss of its previous Objective 1 status. The financial allocation (ERDF and ESF) to Ireland’s two regions under the Regional Competitiveness and Employment Objective of the two *Operational Programmes* is therefore a modest EUR 750 million for the entire funding period up to 2013. This is much smaller than previous funding rounds and reflects the concentration of Cohesion Policy on the Convergence Objective across the EU and the progress of Ireland up to recent years. It now represents only 0.05% of Ireland’s GDP compared to 2% in the 1990s and 0.5% in the period up to 2006. The ERDF allocation of EUR 375 million to the two NUTS II regions over the seven year period is also modest in contrast to previous periods. This funding can also be compared to the investment of EUR 184 billion, almost exclusively from domestic sources, proposed in the *National Development Plan* over the period 2007–13 (Government of Ireland, 2007).

The main focus of both national and regional policy and ERDF allocations (i.e. “planned” expenditure) in the Operational Programmes for the 2007–13 period in both NUTS II regions was on “innovation” and the “enterprise environment” with particular emphasis given to RTDI. The enterprise environment category received an allocation of EUR 193.5 million or almost 52%

of the total (Table 3³). National and ERDF allocations were also made to road and rail transport (EUR 45 million and EUR 28.5million respectively), to environmental and energy infrastructure (EUR 51 million) and, in relation to territorial co-operation to tourism, rehabilitation and social infrastructure (EUR 50.5 million).

There is no clear distinction between the policies pursued in the different regions and thus no particular advantage is likely to accrue to the poorer BMW region or the NUTS III regions. However, the Directorate General for Regional Policy (DG REGIO) and the presence of structural funding via ERDF and ESF, though modest in comparison with the National Development Plan, have greatly influenced the orientation of Irish regional development policy. EU policy has thus been supportive and complementary to Irish policy.

Territorial Co-operation

Under the Territorial Cooperation Objective Ireland participates in ERDF-funded cross-border, transnational, and interregional INTERREG programmes as follows:

- PEACE III Programme
- INTERREG IVA (Ireland, Northern Ireland, Scotland Programme)
- Ireland Wales Programme
- Atlantic Area Programme
- North-West Europe Programme
- Northern Periphery Programme

The first three of these programmes are examined below.

The PEACE III Programme

The PEACE III Programme was established in November 2007 and since then has progressed towards full implementation. This Programme continues from previous PEACE Programmes (PEACE I and II) and is again designed to foster peace and reconciliation in Northern Ireland and the Border region of Ireland. It is part-funded by the European Union (EUR 225 million) as well as by a national contribution (EUR 108 million). The Programme, together with INTERREG IVA, is managed and implemented by the Special EU Programmes Body (SEUPB) located in Northern Ireland. Priority objectives include:

- building positive relations at a local and regional level,
- acknowledging and dealing with the past,
- creating shared space,

³ See Excel file for Table 3

- improving institutional capacity.

In view of the critical need to maintain peace and further nurture good relations within and with Northern Ireland, this Programme is of central importance. By November 2009, a total of 318 applications had been received and 110 projects had been recommended for approval with a total value of EUR 164.8 million. Some of 103 Letters of Offer have been issued with a value of EUR 151.2 million and EUR 18.3 million has been spent (Department of Finance, 2009). An evaluation of the PEACE III Programme is not yet completed.

IRELAND/N. IRELAND/SCOTLAND INTERREG IVA Programme

The INTERREG IVA Programme seeks to address the economic and social problems arising from the existence of national borders and supports strategic cross-border co-operation to encourage sustainable regional development. The programme has an allocation of EUR 256 million (EUR 192 million from the EU and EUR 64 million in national contributions). The programme was approved in November 2007 and since then has progressed towards full implementation. The key themes are

- Enterprise,
- Tourism,
- Collaboration,
- Infrastructure.

By November 2009 a total of 34 projects had been approved to the value of EUR 152.5 million. Letters of Offer of EUR 104 million have been issued and 12 of the projects were in operation with a value of EUR 82.8 million. See Table B. Recorded expenditure by end of November 2009 was EUR 16.3 million, well above the target for 2009. An evaluation is not yet completed.

Table B – INTERREG IVA Programme

	Priority allocation	Projects approved	Offers	Value
	EUR million	EUR million	EUR million	EUR million
Enterprise	70.0	33.7	27.0	12.4
Tourism	30.0	29.9	10.5	4.0
Collaboration	65.0	49.3	28.2	28.6
Infrastructure	75.0	40.2	37.8	37.8
Total	240.0	152.5	104	82.8

Source: Ireland's National Strategic Report, December 2009

IRELAND WALES PROGRAMME

The areas eligible for inclusion in this Programme are the NUTS III regions of Dublin, Mid East and South East in Ireland and Gwynedd, Isle of Anglesea, Conwy, Denbeighshire and South Wales. The purpose is to contribute to greater competitiveness and sustainable development in

the areas concerned; to improve overall economic, social and environmental well-being and to achieve a more cohesive, balanced and sustainable development of the co-operation area. A total budget of EUR 70.2 million has been allocated for 2007–13, including EUR 52.7 million from ERDF and the balance in matched funding from Ireland and Wales.

This Programme has three Priorities. The first two Priorities are broken down into themes which focus the investment in specific areas which closely correlate with the Lisbon and Gothenburg Agendas. These are:

- Knowledge, Innovation and Skills for Growth (Total Budget EUR 39.6 million)
- Climate Change and Sustainable Regeneration (Total Budget EUR 26.4 million)
- Technical Assistance (Total Budget EUR 4.2 million)

Since January 2008 a total of 56 grant applications were received and 17 have been approved. Table C shows the level of ERDF grant commitment to the programme at November 2009.

Table C – Ireland Wales Programme Key Priorities, 2007–09

Priority	ERDF Allocated	ERDF Approved	% Allocation	No. of Projects	Balance of ERDF
	EUR million	EUR million			
Knowledge, Innovative Skills	29.7	12.0	40.3	10	17.7
Climate Change, Sustainable. Dev.	19.8	9.8	49.7	7	10.0
Total	49.5	21.8	44.0	17	27.7

Source: Department of Finance, Ireland's National Strategic Report, December 2009

As regards output at the end of 2009, two joint projects to promote innovation in SMEs (out of a target of 11) had been established. Two further ongoing projects with the same target were aimed at developing entrepreneurship and cross-border clusters and 7 SMEs had been assisted. A further two projects (out of a target of 18) were ongoing in relation to climate change (*Ireland Wales Annual Implementation Report, 2009*). However, details on the impact of these projects are not yet available. A full evaluation for the period is planned for late 2010.

POLICY IMPLEMENTATION

As regards implementation of planned expenditure, data from the *S&E Annual Implementation Report* over the period 2007–09 shows that “actual” expenditure of EUR 12.2 million from the ERDF over the three year period 2007–09 represented only 8.3% of that planned for the period up to 2013. See Table D. No expenditure took place in the Urban Development category. The low expenditure pattern is explained largely by the relatively slow start of the various programmes and the reduction in demand as a result of the economic downturn since 2007. In any case, a much greater rate of implementation will be required over the remaining period. In

the case of the BMW region the actual expenditure of ERDF (EUR 72.1 million) as a proportion of that planned is rather better at 31.5% but the expenditure pattern has been weak in relation to Innovation and no expenditure took place in the Environment category. Expenditure in this region was to be heavily front-loaded but with a slow start and dormant demand, a weakening of expenditure was to be expected. However, the expenditure pattern would need to improve significantly during the remainder of the period.

Table D – ERDF: Planned Expenditure 2007–13 and Actual Expenditure 2007–09 in the S&E and BMW Regions (EUR million)*

	S&E Region		BMW Region	
	Planned 2007–13	Actual 2007–09	Planned 2007–13	Actual 2007–09
Innovation	96.00	9.05	80.60	10.76
Environment and Access	26.00	3.08	36.00	–
Urban Development	20.00	–	107.80	60.93
Technical assistance	4.60	0.06	4.40	0.41
Total	146.60	12.19	228.8	72.10

Note: * “Matched funding” from government and private sources, as required for Structural Fund programmes, would of course increase the actual expenditure in Table D.

Source: Southern and Eastern BMW Regional Assemblies, Operational Programmes, 2007-13 and Annual Implementation Reports, 2009

It should be noted too that due to the economic turndown in Ireland the Irish government renegotiated the BMW *Operational Programme* with the EU Commission, resulting in a reduction in the Irish share of planned expenditure from 60% to 50%. The economic recession is therefore impacting adversely on the continuing implementation of the *Operational Programmes* in both regions in view of the Irish government’s inability to co-finance expenditure for all planned schemes. For example, the proposed “Gateway” and “Hubs” funding of EUR 300 million has been deferred and, as outlined below, separate more modest Gateway Challenge Funds, co-financed with ERDF, have been provided in a number of centres in both regions.

THE ACHIEVEMENTS OF COHESION POLICY

It is difficult to separate out the achievements of ERDF in the Irish regions from that of policy in general. It is clear, however, that the preparation of the *Operational Programmes* and the availability and influence of ERDF support, places an onus on the recipients and on central government to ensure that expenditure is properly managed and that positive outcomes are pursued vigorously. Furthermore, since the ERDF comprises 40% of the allocation (renegotiated recently up to 50% in the BMW region) such funding must account for a significant element of any achievements identified.

We examine achievement under a range of headings as follows:

Enterprise Environment

One of the key objectives of the 2007–13 Operational Programmes is to further innovation and the knowledge economy in the regions in order to facilitate enterprise. This is also the policy of the Irish government.⁴ First, some broad indicators are provided below. These suggest some progress in relation to innovation.

- Total R&D expenditure has almost trebled in the last decade and Gross Expenditure on R&D is estimated to have risen to EUR 2.6 billion by 2008;
- BERD rose to an estimated EUR 1.8 billion by 2008;
- Higher Education R&D expenditure has via the Programme for Research in Third Level Institutions (PRTLTI) almost quadrupled in the last decade and is now at EU and OECD averages;
- Estimates of R&D activity levels point to a sharp increase in the number of firms performing significant R&D (EUR 2 million plus) – from 118 in 2005 to 164 in 2007;
- There are now 29 Science Foundation Ireland (SFI) top class research centres in operation (10 CSETs and 19 SRCs) and these are formally engaged with 40 companies. To date 302 new research posts have been created in these centres;
- SFI and PRTLTI through supports for world-class researchers in higher education institutions are creating a highly skilled stream of research talent, reflected in a significant increase in peer-reviewed publications with a record now above the EU average;
- ICT support has recently resulted in a significant improvement in broadband connections and availability.

Programme for Research in Third Level Institutions

We noted in Table D that the implementation rate in relation to innovation was relatively weak in the 2007–09 period. However, one key initiative relevant to 2000–06 and continuing in the 2007–13 period and co-funded by the ERDF is the Programme for Research in Third Level Institutions (PRTLTI). Since its establishment in 1998 the PRTLTI has been central to the rapid development of research and development in the Irish universities and other institutes of higher education. Awards have been made in four cycles to date and a fifth cycle was announced in July 2010. Details of PRTLTI projects co-funded by ERDF since 2007 under cycle 4 are provided in Annex II of this Report⁵. Annex III also provides details of the co-funded Research Facilities

⁴ See *Policy Paper on Innovation* carried out under task 1.

⁵ Details of the projects funded in the first three cycles were provided in the Report, *Policy Paper on Innovation*.

Enhancement Scheme (RFES), the Research Equipment Renewal Grant (RERF) and the Technological Sector Research (TSR). All of these represent significant ongoing recent investment.

It is important to note that the various funding cycles cannot be viewed in isolation from each other. Rather they represent a “continuum” with each cycle building on previous ones. Thus, the first cycle put in place a critical foundation for further progress in subsequent cycles and enabled and facilitated institutions to secure additional public and private funding. A number of case studies in Annex IV and PRTL I Slides in Annex V illustrate the way PRTL I has progressed through the cycles and contributed to the development of research capacity.

An evaluation of PRTL I was carried out by an international team of experts in 2004 (Higher Education Authority, 2004). This involved detailed research visits and interviews with the main stakeholders. The team concluded that PRTL I was “the beginning of a major and most beneficial transformation of the research landscape in Ireland that will help to install an innovation driven economy”. They stated that: “In our experience, PRTL I is a remarkable endeavour. It breaks new ground in research funding schemes, especially in its focus on strengthening the linkages between teaching and research, its emphasis on institutional prioritisation of research investments and its support for institutions working together to create a more competitive critical mass of research effort. The integration of these features into a single funding scheme is what differentiates and gives a high profile to PRTL I and makes this initiative one of the most innovative that we have encountered.”

Various recent reports have also commented in a positive manner regarding the key role of PRTL I. e.g. Technopolis UK and Ismeri Europa, 2006, Higher Education Authority and Forfas, 2007, Forfas and Higher Education Authority, 2009, Higher Education Authority, 2010. The general consensus of these reports is that the investment made over recent years, building on the complementarity between the PRTL I, SFI, the Research Councils, Enterprise Ireland, and other research funders, has brought about a steep change in the research environment appropriate for innovation in Ireland. An Economic Impact Assessment of the PRTL I is due for completion in January 2011.

While new physical infrastructure, new equipment and new employees do not necessarily represent innovation in themselves, they do lay the critical foundation and framework for enterprise and cohesion and within which new products, services and approaches are likely to emerge. Up to 2006 and during the current 2007–13 period the PRTL I funding allocations provided a whole range of research buildings, equipment and library space.

Under PRTL I 4, covering the period 2007–12, a total of 208 researchers and technicians as well as 76 support staff and 286 Ph.D students have been supported in the S&E region up to 2009. The BMW region procured 43 researchers and technicians as well as 44 Ph.D. students.

Over the period 2007–09 both regions achieved a total of 1,645 peer review publications, 2,870 conference presentations, 579 research awards, 59 patents, 386 additional teaching and learning courses, 103 national collaborations, 257 international collaborations, 23 collaborations with Northern Ireland and 75 industry collaborations. It may be noted that of 16 PRTL current Cycle 4 (2007–12) projects, 6 involve collaborative partnerships with Northern Irish institutions. See further details in the *Policy Paper on Innovation*.

Drawing on information received from the Higher Education Authority a number of “key impacts” of the PRTL can be identified. These are given below.

Key Impacts of the PRTL include:

1. The evolution of strategic institutions and strategic inter-institutional hubs of research activity (Centres/collaborative networks)

Progress made by institutions in focusing on research areas consistent with the national strategy and their strength has been significant. A national picture has emerged. It is also noteworthy that in large areas of research, in particular, such as the bio-medical area, which requires critical mass, national collaborative networks have evolved;

Examples of collaborative networks and initiatives include:

- i) Molecular Medicine Ireland (MMI);
 - ii) The National Programme on Biopharmaceuticals and Pharmacological Sciences;
 - iii) e-INIS – the Irish National e-Infrastructure;
 - iv) INSPIRE: Integrated Nano-science Platform for Ireland;
 - v) The Irish Food and Health Research Alliance (IFHRA);
 - vi) Irish Social Sciences Platform (ISSP).
2. Through the establishment of quality infrastructure (35 centres with in excess of 99,000 square metres of space for around 5,800 researchers), and in early cycles through the provision of seed funding to establish centres and institutes, facilitating investment from other funders, in both the public and private sectors.
 - a) Examples of how *space and specialised facility provision* enabled other funders:
 - i) 66.6% of Science Foundation Ireland’s (SFI) Centres for Science, Engineering and Technology (CSETs) and 58.3% of Strategic Research Clusters (SRCs) are hosted within PRTL facilities. Examples:
 - a. CSET: Regenerative Medicine Institute (REMEDI) is housed in the PRTL funded National Centre for Biomedical Engineering Science (NCBES), NUIG.

- b. CSET: Alimentary Pharmabiotic Centre (APC) is based in the PRTLTI established Biosciences Institute, UCC.
 - c. CSET: The Biomedical Diagnostics Institute based in the PRTLTI funded National Centre for Sensor Research (NCSR), DCU.
 - d. SRC: Solid State Pharmaceuticals Clusters (SSPC) is part of the PRTLTI funded Materials Surface Science Institute, UL.
 - e. SRC: Network of Excellence for Function Biomaterials (NFB) is housed within the National Centre for Biomedical Engineering Science (NCBES), NUIG.
- ii) In addition, 73.1% of SFI Researchers that are currently funded are based within PRTLTI funded facilities.
 - iii) The funding of the National Nanofabrication facility at Tyndall UCC enhanced SFI, EI, IDA and DETI investment.
 - iv) Provision of clinical research facilities underpin many HRB investments; Genome Hospital-based Clinical Resource Units at Dublin Hospitals (Mater, St. Vincents), the first of their kind in Ireland; The Institute for Molecular Medicine based in St. James's Hospital Dublin; The RCSI Clinical Research Centre at Beaumont Hospital, Dublin.
 - v) The funding of facilities at Mace Head provides a major national asset for research in environmental sciences and is a major enabler for the EPA, the Marine Institute and others.
 - vi) The provision of a small scale national GMP facility for food production will support DAFF strategic objectives.
 - vii) The PRTLTI capital investment in the Institute for Information Technology and Advanced Computation Research supported the spin-out company CREMe Software Ltd. The company which is part of the Trinity Centre for High Performance Computing was established in 2005.
- b) Examples of how *knowledge and intellectual output* has enabled other funders from both the public and private sector:
 - i) Inward private sector investment:
 - a. Beckman Coulter in partnership with the IDA awarded funding to the, National Centre for Biomedical Engineering Science NUIG to establish a four year collaborative research programme in the field of Molecular Diagnostics for Infectious Disease. The investment represents the first collaborative research project undertaken by Beckmen Coulter in Ireland.

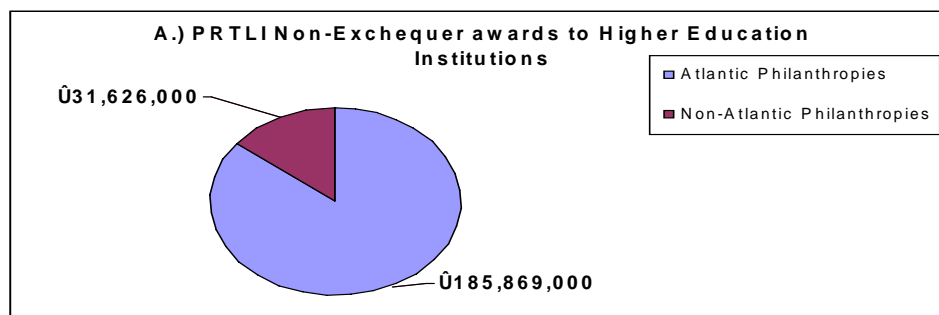
- b. GlaxoSmithKline with the support of the IDA invested in the Institute of Neuroscience in TCD in 2007. The collaboration will see EUR 14.6 million invested in research and development toward the discovery of new therapies for Alzheimer's disease.
 - c. Dublin City University and Wyeth have a project in the production of biopharmaceuticals, funded by Science Foundation Ireland and the IDA. The research will be performed at the National Institute for Cellular Biotechnology (NICB) at DCU which was established with funding received under Cycle 3 of PRTLII.
 - d. To date early stage funding, to establish and embed research centres and large programmes has enabled 194 patent applications. Further to this, 59 patents have been granted to date as a result of this early investment in research capacity through the PRTLII.
 - e. An example of leveraging from this intellectual property is a patent on nanotube technology produced through PRTLII funding in Cycle 1 in the Institute for Advanced Material Science (IAMS) in TCD. This patent provides licensing royalties to the institution. IAMS was subsequently subsumed in CRANN.
- ii) Examples of Spin-off activity;
- a. Alimentary Health Limited (AH) was originally established as a campus company in 1999 to commercialise the output of the University College Cork's (UCCs) Food and Health research programme. The Food & Health research programme has been a significant beneficiary of both EU and PRTLII funding through Cycles 1, 3 and 4 and has generated a proprietary collection of probiotic strains isolated from human intestinal tissue and have demonstrated in preclinical and initial clinical studies that certain strains demonstrate potent anti-inflammatory activity and has potential to treat gastrointestinal disorders such as irritable bowel syndrome. AH is the vehicle by which this intellectual property is commercialised. This PRTLII-supported Food and Health programme with AH as its corporate partner is the foundation of the SFI funded CSET - APC - Alimentary Pharmabiotic Centre. The Food and Health Programme at UCC also collaborates with several multi-national pharmaceutical companies including Procter and Gamble and GSK. AH currently employs twenty-five full-time scientists and has already launched a scientifically-validated pro-biotic product in America.
 - b. Founded in 2004, Glantreo was enabled through the PRTLII investment in Eco-electronics in UCC. The company also has Laboratory space in UCCs PRTLII established Environmental Research Institute, and utilizes several powerful

equipment sets in the University. Glantreo currently works with blue chip and Fortune 500 Pharmaceutical, Medical Device and Biotech companies in the greater Cork area.

- c. StarterBiotics is a campus company set up as part of the PRTL I Food and Health programme in UCC. The company specializes in bacterial cultures with applications in food industry.
- d. Triskel, a commercial campus company, has been set up in the PRTL I established National Centre for Biomedical Engineering Science (NCBES) at NUI Galway. PRTL I and EU funding enabled the research on which the company was set up. The aim of the spin-off company is to evaluate the potential of TRAIL molecules in cancer treatment and to bring the research groups findings to clinical trials in the next 3 –4 years.

3. Attraction of non-exchequer funding into higher education institutions

Significant non-Exchequer funding has been attracted to the higher education system through the requirement of the programme to have matching funding. The profile of secured upfront matching funding is shown below. Furthermore there is a target for programmes and centres to leverage further funding from non-Exchequer sources over the lifetime of PRTL I investment and subsequently.



At April 2010 a total of 10 SFI Centres and 19 Research Clusters were in operation. A total of 302 researchers were employed and the Centres were linked to 40 companies in fields such as communications, technology, energy and health.

Applied Research Centres and Incubation Centres

One key achievement has been the establishment of Applied Research Centres and Incubation Centres in Institutes of Technology. In the Southern and Eastern region a total of six new Applied Research Centres and two new Incubation Centres have been established since 2007. The final targets for employment and additional researchers in Incubation Centres were exceeded. The micro-enterprise programme is delivered with financial and other supports through the 22 City and County Enterprise Boards, mostly funded by ERDF, in the Southern and

Eastern Region. By the end of December 2009, a total of 5,342 enterprises had been supported and 108,400 recipients had received training. However, the number of jobs in assisted micro-enterprises by 2009 fell by over 1,200 below the 2007 baseline. See Table E.

Table E – Incubation Centres and Microenterprises: Southern and Eastern Region

Indicator	Baseline	Final Target	Outturn up to end-2009
No. of Incubation Centres	9	16	11
Total employed in Incubation Centres	284	434	447
No. of additional Researchers employed in the region's HEI	0	560	686
No. of training days provided to SMEs	74,294	249,249	165,462
No. of micro-enterprises supported	4,029	8,029	5,342
No. of recipients of training in micro-enterprise theme	57,159	141,159	108,446
No. of jobs created in micro-enterprises theme	24,858	32,558	23,609
No. of enterprises created in incubation centres	62	108	129

Southern and Eastern Regional Assembly, *Annual Implementation Report, 2009*

Achievement in the BMW region was more modest but one new Incubation Centre was established and an additional 14 companies became involved in these Centres thus exceeding the final target. Employment also rose slightly. See Table F. Supported again by the County Enterprise Boards with ERDF funding, the number of micro-enterprises established by December 2009 exceeded the 2013 target set while the number of training days increased significantly. However, the number of jobs created in micro-enterprises fell by almost 2,000, reflecting the difficult economic environment. See Table G.

Table F – Incubation Centres in BMW Region

Class	Indicator	Baseline	Final Target	Outturn up to end-2009
Output	No. of business incubation centres in place/ extended	5	9	6
Result	No of companies in centres	55	68	69
Impact	No of employees in these companies	187	230	193 (24 female)

Source: BMW Regional Assembly, *Annual Implementation Report, 2009*

Table G – Micro-enterprises in the BMW Region

Class	Indicator	Baseline figures as of 31 st Dec 2006	Final Target 2013	Outturn up to end-2009*
Output	No of micro-enterprises assisted	2,511	5,011	3,370
	Of which Male Promoters	1,792	3,576	2,460
	Of which Female	608	1,213	786
	Promoters Of which Promoter is company/partnership/other	111	222	124
	No of training days provided	35,572	119,572	93,319.30

	Male			43,575.5
	Female			49,635.8
	Other			108.0
Result	No. of jobs created in assisted micro-enterprises	16,684	20,884	14,743.5
	Male F/T	10,460	13,093	8,747
	Female F/T	4,324	5,412	3,997
	Male P/T	1,401	1,757	1,501
	Female P/T	2,399	3,001	2,498
	No of training recipients	26,550	61,550	45,974
	Of Which Male	12,059	27,562	21,234
	Of Which Female	14,239	33,688	24,458
	Of Which Companies /partnership/other	252	300	282

Source: BMW Assembly, *Annual Implementation Report*, 2009

The Creation of Clusters: The Gateways and Hubs Scheme

The creation or expansion of “clusters” of activity is recognized as a key element of enterprise and development. Such clusters enable firms to avail of a range of “economies” and facilities. The *National Spatial Strategy*, initiated in 2002, aimed to build up a range of key urban centres throughout the country in order to counteract and complement the dominance of the capital city, Dublin. A total of EUR 300 million expenditure was originally earmarked for the proposed Gateways but the economic downturn has resulted in the deferment of this. However, during 2009 the Southern and Eastern Regional Assembly introduced a Gateway Grant Scheme, co-financed with the ERDF. Grant assistance was made available for the 4 NSS Gateways in the Southern & Eastern Region (Dublin, Cork, Limerick/Shannon and Waterford) for projects which will improve the Gateways economically, environmentally, socially, and/or culturally and which fell within the scope of Article 8 of Commission Regulation 1080/2006. A total of EUR 11 million is available for allocation at a maximum grant rate of 50%. Work must be completed by 31st December 2010. Following assessment of proposals a Steering Committee approved the following grants and work is now in progress.

- Cork Gateway: EUR 2.8 million
- Dublin Gateway: EUR 2.4 million
- Limerick/Shannon Gateway: EUR 3.0 million
- Waterford Gateway: EUR 2.8 million

A similar co-financed “Gateway and Hub Scheme” with a fund of EUR 17.1 million is underway since 2009 in the BMW region. Grants have been provided for a range of improvements including refurbishment, environmental improvements, Art Galleries and traffic improvements in Dundalk, Galway, Tuam, Sligo, Mullingar, Athlone, Tullamore, Letterkenny, Ballina, Castlebar,

Monaghan and Cavan. Work is well advanced in most of these centres (see S&E and BMW *Annual Implementation Reports*, 2009).

Transport and Telecommunications

Road and rail transport did not receive the same priority during the 2007–13 as during the 2000–06 period. During the latter period a number of major transport projects took place when EUR 52 billion was allocated for a range of infrastructural projects by the Irish government as well as EUR 3.3 billion in EU Structural Funds and EUR 600 million in Cohesion Funds. By 2006 over EUR 8 billion had been invested in road infrastructure resulting in the development of:

- 173 km of motorway,
- 138 km of dual carriageway,
- 216 km of single carriageway.

Sixty nine major projects were completed including:

- the M1 from Dublin to Dundalk,
- the M7 Monasterevin By pass,
- the M4 Kinnegad/Enfield,
- the N11 Glen of the Downs,
- the M50 South Eastern Motorway,
- the M1 /M50 Dublin Port Tunnel.

Over 51,000 km of non-national roads were also improved, restored or maintained during the 2000–06 period (Department of Finance, 2007).

A number of road and rail transport projects, co-funded by the EU, were completed in the BMW region during the 2007–09 period and these are as follows:

- The N52 Tullamore Bypass comprises 14 km of on the National Secondary Route (N52) from Dundalk to Nenagh. The scheme supports the National Spatial Strategy by improving connectivity between the linked Midland Gateway towns of Athlone, Tullamore and Mullingar. The scheme opened to traffic on 23 October 2009. Commission Decision C (2009) 5092 dated 22 June 2009 approved the project for co-financing of EUR 53.2 million.
- The M6 Athlone–Ballinasloe scheme which opened to traffic on 23 July 2009 comprises 19.3 kilometres of National Primary Route (N6) between Athlone and Ballinasloe. The scheme is part of the M4/M6 Dublin to Galway Major Inter–Urban route and was declared Motorway on 28th August 2009. The scheme links the Galway to East

Ballinasloe Scheme and the existing Athlone Bypass. Commission Decision C (2010) 3540 dated 4th June 2010 approved the project for co-financing of EUR 84.1 million.

- In relation to public transport the completion of the removal of speed restrictions at Portarlington railway station in February 2008.
- The expected delivery of 183 new Railcars for use on the national network, including 24 serving destinations in the BMW region. Accessibility works are being carried out at Tullamore, Clara, Athlone, Ballinasloe, Woodlawn, Attymon and Atherry (Galway Route), Drogheda and Dundalk.

Expenditure on transport projects has been limited in the S&E region over the period 2007–09. However, a total of EUR 8.7 million has been spent to date on removing speed restrictions and relieving congestion at Limerick Junction which serves the main Dublin–Cork railway line.

As regards telecommunications, the key initiative under this policy area launched in both Irish regions was the National Broadband Scheme (NBS). This Scheme was launched in January 2009. As regards outputs/results, half of the planned coverage area was completed by the end of 2009 catering for a population of 110,600 and 14,500 additional businesses in the Southern and Eastern Region. It addressed over 1,000 electoral divisions that were deemed to be without adequate broadband services. All residential and business premises within the NBS Coverage Area in the Southern and Eastern Region were expected to have broadband connectivity by the end September 2010. In the BMW Region 44,689 residences had been served by December 2009 as had 2,674 businesses (S&E and BMW *Annual Implementation Reports*, 2009).

Environment and Energy

Similar plans covering both NUTS II regions are in place in relation to water. However, no significant achievements under this heading can be reported since 2007. A national pilot water source protection scheme has been initiated with the objective of putting in place a national strategy for the protection of surface and ground water sources from agricultural pollution, commercial/industrial and residential sources. A Wastewater Treatment Pilot Project was also completed in 2007. The objective of this project was to assess new cost-effective ways of providing wastewater collection and treatment systems for small rural villages and to test a range of innovative technologies for collecting and treating domestic wastewater.

Renewable Energy

A number of achievements covering the two NUTS II regions are set out below. Implementation has commenced on the Renewable Energy, Research and Development and Deployment Programme, the CHP and ReHeat (Bioheat) Programme and the Energy for Business Programme. An Ocean Energy Development Unit (OEDU) has been established to implement the Government's policy decision to accelerate the development of Ocean Energy (Wave and Tidal)

in Ireland. It was established to advance the deployment of ocean energy technologies in Ireland by increasing the capacity for research and development both with academic institutions and commercial entities developing devices in Ireland. Achievements over the period 2007–09 under this heading include:

- 49 new small-scale gas-fired CHP installations;
- 37 biomass projects completed;
- 2,440m² solar thermal projects completed;
- leveraged investment of EUR 18.8 million in CHP;
- leveraged investment of EUR 17.3 million in ReHeat;
- 1,660 SMEs registered for energy efficiency supports;
- 1,240 mentoring sessions for business;
- Estimated energy savings of EUR 140 million in large industry and EUR 5.7 million in SMEs;
- 11 public sector bodies implementing world class energy management systems;
- Ocean wave energy fund developed and grants awarded to 8 companies. One tidal and one wave energy technology selected for full tests.

Source: Regional Assemblies, S&E and BMW regions, *Annual Implementation Reports, 2009*

SECTION 3 – EFFECTS OF INTERVENTION

The European Regional Development Fund (ERDF) and, until 2004, the Cohesion Fund have played central roles in Irish regional and Cohesion Policy over the past thirty years. In earlier Operational Programmes they have been particularly important sources of funding for improving transport and infrastructural networks throughout the country. However, ERDF is now operating in certain niche areas seeking to promote growth of research, knowledge transfer and support for micro-enterprises. Despite its reduced size, the importance of ERDF in the Irish regions should therefore not be under-estimated in relation to the cohesion objective since Irish national policy tends to have a relatively weak regional orientation. It is also one critical stimulus at a time of severe cutbacks. This view was strongly confirmed by all of those interviewed. While the results of mid-term evaluations of the 2007–13 Programmes are not yet available, the interviews conducted suggest the following wider effects of EU Cohesion Policy:

- Cohesion Policy has influenced the orientation of Irish expenditure in the regions.
- The focus on innovation, enterprise and the knowledge economy during the 2007–13 Programme has laid a framework for sustainable development.

- Despite adverse economic conditions Structural Funds are preparing the ground for entrepreneurship and innovation in the future.

SECTION 4 – EVALUATIONS AND GOOD PRACTICE IN EVALUATION

Apart from the relevant data provided in the *Annual Implementation Reports* on which this Report is largely based, no evaluations have been carried out of the 2007–13 *Operational Programmes* at this stage. Mid-term evaluations in both regions are planned for late 2010. A selection of evaluations relating to the 2000–06 period are briefly reviewed here. It must be stressed, however, that some of these studies do not focus on “impact”, “effectiveness” or “results”. However, they offer helpful insights into the nature and causes of problems and challenges being experienced in the different regions and the approaches being adopted. They also suggest relevant changes required if progress is to be made. A number of studies offer helpful indicators of the “impact” of policy.

Two studies fit into the “problems” category. The first is an *Audit of Innovation in the BMW Region* (CIRCA Group Ltd, 2004). Drawing on a range of sources, and interviews, this Report critically examined the long-standing problems of this region, summarised earlier. The volume of start-ups, entrepreneurship and innovation fell far behind the more prosperous Southern and Eastern region. The presence of only one university and Institutes of Technology with relatively weak research records placed the region at a considerable disadvantage. The Report argued for a number of key changes. In particular it stressed the need for a change of “culture and enabling conditions”, including the development of networks and clusters with particular reference to the proposed Gateways and Hubs in the *National Spatial Strategy*.

The second study in this category is by Fitzpatrick Associates et al., (2006). Again, it draws on a range of published sources as well as the results of interviews. At the height of the “boom” the S&E Region contrasted sharply with the BMW Region on many social and economic indicators. In relation to innovation, it lagged behind the EU average for RTDI capacity, but it was far ahead of the BMW Region in this respect, accounting, for example, for eight out of every ten third-level researchers in the country. It also had a relatively hi-tech industry base and a high proportion of third level graduates in its population.

However, the S&E Region had, and still has, some of the worst pockets of unemployment and deprivation in the country, especially in the main urban centres of Dublin, Cork and Limerick as well as in the South East Region. Long distance commuting, infrastructural deficits and traffic congestion represent serious diseconomies. These are likely to be exacerbated in the future in the light of the recent internal and external economic and financial crisis. This is a balanced and critical study in the “problems” category. These problem-based studies and the data set out earlier in this Report raise fundamental questions regarding Irish and EU policies (See also

BMW and S&E Regional Assemblies, 2008, BMW Regional Assembly, 2009 and Western Development Commission, 2010).

Several studies offer broad evaluations of the *Community Support Framework 2000–06*. For example, Fitzpatrick Associates (2005) concluded that the CSF had a considerable “impact” via the various Operational Programmes including the two Regional Programmes. The authors drew on a wide range of sources as well as detailed interviews. This is a helpful Evaluation in that it identified the following broader impacts:

- in “policy terms”, EU involvement influenced prioritisation of a number of policy themes which might not have occurred to the same extent otherwise. These included gender and equality, the environment, innovation, regional development, and North–South co-operation;
- in “confidence” terms due to the reassurance of a major multi-annual public investment programme in key areas of the economy, supported by large and high profile EU assistance. This provided an important signal to businesses and to other key stakeholders of EU commitment to Irish convergence, and Irish commitment to taking advantage of the opportunity on offer; and
- in expenditure “programming” terms, the requirements of the CSF contributed to the development and expansion of multi-annual programming, to more extensive adoption of a partnership approach at national and local level, and to a greater level of formal monitoring and evaluation of Programmes. Within the 2000–06 CSF, a more consistent level of investment had continued to be achieved in co-financed than in non-co-financed parts of Ireland’s *National Development Plan*.

Fitzgerald et al. (2003) carried out a further Mid-Term evaluation of the *National Development Plan* and the *Community Support Framework (CSF) 2000–06*. Having studied the effects of investment in a number of key sectors such as education and analysed a range of data, the authors concluded that the CSF had the macro-economic effect of raising GNP by 1.4% over the period 2000–02. It also had a long-run impact on GNP of 0.6%, representing a high rate of return of 18%. Apart from this, the collaboration between the European Union and the Irish government had a most positive influence in minimizing “transaction costs”, by the introduction of long-term planning, more rigorous evaluation of alternative investments and securing better value for money.

Fitzpatrick Associates et al. (2009) carried out a study of innovative actions in the BMW region. This evaluation carried out over the period 2006–08 was designed to improve the capacity of SMEs to:

- Acquire and absorb technological data and information;

- Engage in collaborative research with research centres and third level institutions within BMW;
- Create conditions needed to expand capacity to translate knowledge and technology into market opportunities.

A range of interviews were carried out with respondents in selected SMEs and agencies. The study pinpointed a number of key obstacles which the BMW region must overcome. These included the lack of an “innovation culture”, the time constraints on companies demand for some programmes, the difficulties experienced by some firms in finding suitable knowledge partners and the need for a mainstream business support agency. The key “outputs” of the Programme were as follows:

- Research and intelligence briefings on four major R&D topics;
- Innovation management training for 20 participant companies;
- Take-up of research voucher support among 24 companies;
- Assistance to 50 companies under the Food Technology Transfer programme;
- Assistance to 35 companies under the Business Mentoring for Winners programme;
- Completion of a feasibility study on R&D links between SMEs, multinational companies and knowledge institutions.

As shown earlier, the Programme of Research in Third Level Institutions (PRTLTI) has been one of the key approaches to improving innovation and enterprise in Ireland. An international panel carried out an evaluation of the PRTLTI programme in 2004 (Higher Education Authority, 2004). This involved detailed research visits and interviews with the main stakeholders. As outlined above, the assessment concluded that PRTLTI was “the beginning of a major and most beneficial transformation of the research landscape of Ireland that will help to install an innovation driven economy”. A further study in 2007 confirmed this positive view (Higher Education Authority and Forfas, 2007). A study by Technopolis UK and Ismeri Europa (2006) likewise concluded that PRTLTI had achieved a great deal in relation to R&D. However, impact in the BMW region needs to be enhanced by better networking between the universities, Institutes of Technology and SMEs. Inter-regional links also need to be further developed.

Evaltech (2005) evaluated the IDA’s Research and Development Capability Grants Scheme. The scheme, introduced in 2000, provided grants to companies towards the cost of establishing a major R&D operation in Ireland or expanding an existing facility. Over a three year period examined, 31 firms were examined in detail. They provided EUR 109.5 million themselves and received supporting grants of EUR 32.2 million. The evidence suggested that projects supported would yield substantial positive impacts and benefits. The scheme was considered to

be an excellent use of state money due to the increase in R&D staffing levels, as well as further and high-value employment.

The European Commission Enterprise Directorate facilitated a study assessing Irish government support for innovation (INNO Policy Trend Chart, 2009). This Study offers an evaluation of policy and competitiveness. Investment has followed “best practice” in other small successful European countries and progress has been made. Nevertheless, the Report calls for further emphasis on “outcomes” and “impacts” of the policy in Ireland. The main areas for improvement identified are:

- The approach to evaluations should encompass a more programmatic approach based on the new policy measure groupings rather than an individual measure approach, e.g., to assess whether the industry R&D initiatives could achieve their targets and how they interact;
- Additional innovative measures are needed to assist medium-sized indigenous companies with growth potential/capability to increase their R&D expenditure;
- There needs to be greater attention to industry research within third-level institutions;
- Ireland needs to address its broadband deficiencies – to improve access throughout the country and achieve significantly higher speeds at a reasonable cost;
- The number of rapidly expanding high-tech service or manufacturing companies needs to be increased;
- New measures are needed to get new Ph.D. researchers into private companies;
- Need to better define the role and contribution of third-level institutions in national and regional development at NUTS 3 level;
- Develop a new strategy for the third-level sector (currently under way);
- How does Ireland ensure that investment in innovation and knowledge results in the creation of a knowledge economy and knowledge society?
- New research, international comparisons and studies are necessary to see how best to meet this challenge.

SECTION 5 – CONCLUDING REMARKS – FUTURE CHALLENGES

There are many remaining challenges. These include:

- The current economic climate and budget cuts are seriously affecting the achievement of cohesion and competitiveness in Ireland and are likely to exacerbate these problems in the years ahead;

- The level of unemployment and the resulting loss of taxation are impacting adversely on the country's capacity to deal with its financial difficulties. The retention of existing jobs and the generation of new ones must therefore become a top priority;
- The BMW region has a range of locational and structural difficulties and continues to lag behind the S&E region;
- Regional policy needs to take proper account of specific regional potential and needs;
- There is a need to focus on the development of local and regional indigenous industry and resources, including tourism;
- Road, rail and telecommunications infrastructure as well as water resources and renewable energy remain key elements in sustainable development;
- Maintain and strengthen links between third level institutions and industry to forge specific research, innovation and enterprise beneficial to the regions;
- Strengthen the links between third level institutions in order to create critical mass for innovation and enterprise;
- Focus on untapped industries and growth sectors for the future e.g. creative industries, food, renewable energy.

This report raises fundamental questions regarding Irish and EU policies. It seems clear that, despite some progress, many serious problems and challenges remain in both the BMW and S&E (NUTS II) regions as well as in the Regional Authority (NUTS III) regions. Are existing policies achieving a better quality of life for all our people? Are they focussed sufficiently on key concerns such as employment, health, education and housing for all? Has "innovation and the knowledge economy" emphasised activities in which the majority of the population is unlikely to participate as argued in a number of interviews and submissions? Are the investment policies oriented sufficiently towards the development of indigenous industry and services rather than "footloose" multinationals? Have we adequate policies to resolve the multiple problems which persist in urban and rural "unemployment black-spots"? Is sufficient attention being paid to vulnerable groups such as those living in poverty and people with disabilities? Are the policies actually achieving the "cohesion" which is so urgently required? Irish and EU policies need to focus more clearly on these fundamental challenges in the years ahead.

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INTERVIEWS

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Mr Barry Harrington, Administrative Officer, Sectoral Policy Division, EU Structural Funds Policy Unit, Department of Finance, Dublin

Mr Jim Fitzpatrick, Managing Director, Fitzpatrick Associates, Dublin

Ms Eileen O'Malley, EU Research Programmes, Higher Education Authority, Dublin

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Mr T. Stewart Roche, Management Accountant, Higher Education Authority, Dublin

Completed Questionnaires

Mr Jim McGovern, Director, Western Regional Authority

Mr Liam Conneally, Director, Mid-West Regional Authority

Mr Michael Moroney, Director, South-East Regional Authority

(Completed printed questionnaires available to Applica and Commission if required.)

The cooperation of those interviewed and those who completed questionnaires is much appreciated but they are not of course responsible for the conclusions reached.

TABLES

See Excel file for Tables 1, 2 and 3

Table 1: Regional disparities and trends

Table 2: Macro-economic developments

Table 3: Financial allocation by main policy area

ANNEX I

REGIONAL ASSEMBLIES

The regionalisation arrangements negotiated by the Irish Government in the context of Agenda 2000 resulted in the designation of Ireland into two (NUTS II level) Regions for EU Structural Funds purposes: The Border Midland & Western Region (BMW) and the Southern & Eastern Region (S&E). Following upon this, two new Regional Assemblies were established and came into effect in July 1999. Their main responsibilities are:

- to manage and monitor their respective Regional Operational Programmes under the Structural Funds (they performed a similar role for the Regional Operational Programmes under the 2000–2006 National Development Plan);
- to promote coordination in the provision of public services across their areas;
- to monitor and make proposals in relation to the general impact of EU funding;
- to make public bodies aware of the regional implications of their policies and plans

The Assemblies also host and undertake various key functions relating to INTERREG/Territorial Cooperation programmes on behalf of Ireland.

The two regions were recognised as being at different stages of development. For the 2000–2006 Structural Funding period the BMW availed of Objective 1 status for the full period while the S&E had a phasing out regime for Objective 1 until the end of 2005 (with the exception of the NUTS III South–East region which enjoyed this designation for a further 12 months). Under the current Structural Funds programming period both regions are classified as being 'Competitiveness' regions ('Objective 2) though the BMW remained a 'Phasing-in' region (entitling it to higher funding intervention rates) while the S&E is a 'Competitiveness & Employment' region.

Membership of the Regional Assemblies

There are no direct elections to the Regional Assemblies. Instead they are comprised of elected representatives nominated by the local authorities from the membership of the Regional

Authorities within each region. Each local authority has a certain number of nominations to an Assembly, based loosely on the population of the local authority area. The BMW Assembly has a total of 29 members and the S&E Assembly has 41 members.

Structure of the Regional Assemblies

The Regional Assemblies also have an Operational Committee, which is composed of Chief Executive Officers of public authorities in the region and the Directors and Cathaoirleach (Chairpersons) of the Regional Authorities in the region. This committee is chaired by the Cathaoirleach of the Regional Assembly and its key tasks are to advise and assist the Assembly in the discharge of its functions. The Regional Assemblies also have a Monitoring Committee for the implementation of the Regional Operational Programme in the region. The general role of this committee is to: (1) satisfy itself as to the effectiveness and quality of the implementation of all expenditure; (2) to consider the progress and impact of both co-financed and non-co-financed expenditure in the region; and (3) to make recommendations to the Regional Assembly, the relevant implementing government department at national level and the Department of Finance. Each Regional Assembly has a Director and a number of policy, programme and administrative staff.

Financing of the Regional Assemblies

The Regional Assemblies are funded by the Department of Finance in carrying out their functions as the managing authorities for the Regional Operational Programmes. The costs of the other activities of the Regional Assemblies are funded by their constituent local authorities.

REGIONAL AUTHORITIES

The 8 Regional Authorities were established by the 1991 Local Government Act and came into existence in 1994. Under this Act, the Regional Authorities have two main functions: to promote the co-ordination of public service provision and to monitor the delivery of EU Structural Fund assistance in the regions. The Regional Authorities have specific responsibility for: Reviewing, as appropriate, the Development Plans of the Local Authorities in and, where relevant, adjoining the Region to consider the consistency of plans with one another and with the overall development needs of the Region; preparing Regional Planning Guidelines and Regional Economic and Social Strategies; - promoting consultation, cooperation, and joint arrangements and actions among local authorities and other public bodies, including consideration by Public Authorities of the implications for, or the effect of, their decisions, activities or services on the Region.

Membership of the Regional Authorities

The members of the Regional Authorities are not directly elected, but nominated from among the elected members of the local authorities in the region. Each local authority has a certain

number of seats on a Regional Authority, based loosely on the population of the local authority area. The size of the Regional Authorities varies from 21 members in the Mid–East region to 37 members in the Border region.

Structure of Regional Authorities

To assist the Regional Authority in undertaking its functions, each has an Operational Committee and an EU Operational Committee. The Operational Committee is chaired by the Cathaoirleach (Chairperson) of the Regional Authority and is composed of senior management from the constituent local authorities and other relevant public sector agencies operating in the region. It helps prepare the work of the Regional Authority and assists and advises it on matters relating to its functions. Also, each Regional Authority has a designated city/county manager (chief executive of a local authority) from one of its local authorities to further enhance the linkages between the local authorities and the Regional Authority.

The EU Operational Committee has a similar, but broader, composition and assists the Regional Authority in matters relating to EU assistance and reviewing the implementation of various EU Operational Programmes in a region.

Each Regional Authority has a Director, assisted by a number of policy and administrative staff.

Financing of the Regional Authorities

The financing of the activities of the Regional Authorities is largely borne by their constituent local authorities.

ANNEX II

Projects funded under the PRTL I cycle 4

The Programme for Research in Third Level Institutions (PRTL I) Cycle Four was launched in August 2007. Seventeen projects were awarded a total of EUR 260 million in funding under the cycle. This brings the total awarded to PRTL I over the past ten years to EUR 865⁶ million. Please see the table below for a full breakdown across cycles.⁷

⁶ The figures quoted include exchequer and matching funding. EUR 35 million Science Centre not included in project figures.

⁷

Cycle	Capital	Recurrent	Total
PRTL I Cycle 1 [1999–2003]	EUR 177,479,000	EUR 28,569,000	EUR 206,048,000
PRTL I Cycle 2 [2000–2004]	EUR 48,819,000	EUR 29,663,000	EUR 78,483,000
PRTL I Cycle 3 [2002 – 2006/7]	EUR 176,371,000	EUR 143,601,000	EUR 319,972,000
PRTL I Cycle 4 [2007 – 2011/12]	EUR 131,318,000	EUR 129,447,000	EUR 260,764,000

Below is a list of the projects funded under Cycle 4 followed by a brief on each.

Bioscience and Biomedical Projects

1. The National Programme on (Bio) pharmaceuticals and Pharmacological Science
2. Molecular Medicine Ireland Clinician Scientist Fellowship Programme
3. National Biophotonics and Imaging Platform (NBIP)
4. The Centre of Applied Science for Health
5. Irish Food and Health Research Alliance (IFHR)
6. Biosciences and Cell Signalling

Chemical and Physical Sciences Projects

7. Network Mathematics

Information and Communication Technologies (ICT) Projects

8. e-INIS: The Irish National e-Infrastructure
9. The Graduate School of Creative Arts and Media (GRADCAM)
10. Serving Society : Management of Future Communications Networks and Services
11. NEMBES : Network Embedded Systems
12. Lero : The Irish Software Engineering Research Centre and Graduate School

Platform Technologies Projects

13. INSPIRE : Integrated Nanoscience Platform for Ireland

Humanities Projects

14. Humanities Serving Irish Society (HSIS)

Social Sciences Projects

15. The Irish Social Sciences Platform (ISSP)
16. Irish Social Science Data Archive (ISSDA)

Environment and Marine Projects

17. Environment and Climate Change : Impacts and Responses Graduate Programme

Bioscience and Biomedical

1. The National Programme on (Bio) pharmaceuticals and Pharmacological Sciences

The National Programme on (Bio) pharmaceuticals and Pharmacological Sciences is a national collaborative programme between DCU, TCD, UCC and UCD building on a consortium of higher education institutions that established the National Institute of Bio-processing Research and Training (NIBRT), funded by a EUR 72 million grant from the IDA.

Highly important for industry in Ireland is the provision of graduates with the necessary skills and training to enable an increase in (Bio) pharmaceutical R&D. The programme will form a HEI academic-led 'bio-pharmaceutics corridor' from Belfast to Cork where in excess of 80% of Irelands (bio)Pharmaceutical and Life Sciences companies lie, by incorporating all four Schools of Pharmacy on the island.

This programme will not only match the demand for researchers but also exceed it in order to stimulate further demand and build our knowledge-based economy. This programme will contribute to the delivery of the SSTI's goal of encouraging industrial placements and transferable postgraduate courses, both practical and theory based with built-in industrial expertise, which will significantly contribute to the professional development of our researchers.

These programmes will also address a national crisis in manpower for the Biopharmaceutical Sciences, estimated to be 2,800 skilled graduates in the short-term for companies that have committed to establish new plants in Ireland. Strategic goals are to provide postgraduate education and research experience, via a research platform that underpins development of the Pharmaceutical Industry in Ireland.

This initiative and NIBRT will position Ireland as a European region for Bio-pharmaceutics and, more broadly, Pharmaceutical Sciences. It will consolidate the initial investments in PRTL I Cycles 1–3 to ensure effective exploitation of the personnel and infrastructure as a national resource for research, teaching and learning, knowledge transfer and outreach programmes in BPS.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
DCU	National Programme on (Bio)pharmaceutical & Pharmacological Sciences	6,427	6,018	12,446
UCC	National Programme on (Bio)pharmaceutical & Pharmacological Sciences	500	687	1,187
UCD	National Programme on (Bio)pharmaceutical & Pharmacological Sciences		5,368	5,368
TCD	National Programme on (Bio)pharmaceutical & Pharmacological Sciences	250	690	940
TOTAL		7,177	12,763	19,941

2. Molecular Medicine Ireland Clinician Scientist Fellowship Programme

The Clinical Scientist Fellowship Programme will deliver the next generation of clinician scientists with the unique and specialised knowledge essential to fulfil Ireland's translational research needs. Clinician scientists trained to PhD level are vital for fulfilling Ireland's ability to provide rigorous training in critical thinking and translational research skills necessary to bridge the divide between increasingly inter-dependent areas of expertise – basic and clinical biomedical research. There is a strong correlation between the number of PhD Clinician Scientists per capita and economic well being. Ireland lags significantly behind its Western European counterparts with respect to PhD Clinician Scientists per capita and a main aim of this programme is to address this deficit. The paucity of clinician researchers has been highlighted in the HEA / Forfás Research Infrastructure in Ireland review.

The Molecular Medicine Ireland Clinician Scientist Fellowship Programme will comprise at least 19 Fellows competitively selected from medical graduates at registrar level who wish to undertake PhD training (3 years). The Fellowship Programme will be organised on a national basis by Molecular Medicine Ireland and delivered by the participating institutions: National University of Ireland, Galway, Royal College of Surgeons in Ireland, Trinity College Dublin, University College Cork and University College Dublin.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UCD	MMI Clinician Scientist Fellowship Programme		4,129	4,129
UCC	MMI Clinician Scientist Fellowship Programme	–	1,846	1,846
TCD	MMI Clinician Scientist Fellowship Programme	–	2,236	2,236
RCSI	MMI Clinician Scientist Fellowship Programme	–	2,438	2,438
NUIG	MMI Clinician Scientist Fellowship Programme	–	2,778	2,778
TOTAL			13,427	13,427

3. The National Bio-photonics Imaging Platform (NBIP)

The National Bio-photonics Imaging Platform (NBIP) is a national collaborative programme between DCU, DIT, NUIG, NUIM, RCSI, UCC and UL.

NBIP has been in informal existence since December 2004 grouping the seven Universities, DIT, RCSI and CNRS (France), represented by a leading Institutional Principal Investigator, to promote collaborations using imaging facilities in the Institutions, and addressing issues of access and advanced training. The NBIP is a development programme aiming to build on existing

institutional human and capital resources in imaging and bio photonics so as to create a structured national network of accessible research and training facilities and to sustain internationally competitive research programmes in Molecular, Cellular, Animal and Human Imaging.

The NBIP provides a national framework to support and encourage the development of an integrated national network of access and training infrastructure in research, education, technology development and industry collaboration for the State's investment in Bio-photonics and Imaging of complementary centres of expertise. In this way each of the institutional partners provides individual core facilities and research expertise, which in turn are integrated into the complete NBIP proposal.

Provision of core sites will greatly enhance the national research infrastructure and ensure that recent investments translate to an increased efficiency of usage which in turn should provide a solid foundation for development of key research areas. The NBIP research programme will bridge the Physical and Life Sciences interface linking cognate research groups in the Mathematical, Physical, Chemical, Engineering, Computational and Life Sciences to develop new collaborative research opportunities and advanced tools in Photonics and Imaging.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
DCU	National Biophotonics & Imaging Platform	2,224	4,751	6,975
DIT	National Biophotonics & Imaging Platform	1,946	1,642	3,588
NUIG	National Biophotonics & Imaging Platform	500	1,219	1,719
NUIM	National Biophotonics & Imaging Platform		933	933
RSCI	National Biophotonics & Imaging Platform	3,573	7,331	10,904
UCC	National Biophotonics & Imaging Platform	3,700	950	4,650
UL	National Biophotonics & Imaging Platform	238	1,052	1,290
TOTAL		12,181	17,878	30,059

4. The Centre of Applied Science for Health

The Centre of Applied Science for Health is led by the Institute of Technology, Tallaght and incorporates a number of partnerships including, DCU, NUIM and the AMNCH.

The Institute of Technology, Tallaght will develop its expertise in translational molecular cell biology research through leverage of the core expertise in microbial disease prevention and control, medical device technology and anticancer treatments amongst established multi-

disciplinary research teams within ITT Dublin and through relationships with industry, its partnering institutes and its teaching hospital partner.

The Applied Science for Health at the Institute will carry out research and educational programmes that are relevant to regional, national, societal and industrial needs. Through direct contact with companies such as Wyeth Medica, and via the Pharmaceutical Advisory group, skill shortages have already been identified for scientists, engineers and technicians working in the Technology Transfer area.

The education programme associated with the Centre will identify and prioritise key areas for taught MSc and 4th level short courses in order to address such shortages not addressed currently in traditional educational qualifications. Each of the institutions in this partnership will contribute in highly complementary fashion to each research phase, with a particularly strong clinical perspective being provided by Adelaide and Meath Hospital incorporating the National Children's Hospital (AMNCH).

Below is the breakdown of funding that has been allocated.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
ITT	Centre of Applied Science for Health	6,050	4,600	10,650

5. The Irish Food and Health Research Alliance

The Irish Food and Health Research Alliance [formerly Food Ireland] is a national collaborative programme which is a formal joint venture between University College Dublin, University College Cork and the University of Limerick.

The infrastructure is designed to put in place the facilities to allow a contribution in an internationally competitive way to the National Food and Health Research Programme. National facilities for Good Manufacturing Practise (GMP) and Human Dietary Intervention Studies in the programme will enable research into functional foods and omega-3 rich oils, the role of foods in healthy aging and the impact of nutrient intake on diseases of aging, e.g. osteoporosis and Alzheimer's disease. The programme also includes a marine functional food research programme.

The objective of the programme is to establish a cohesive and integrated national framework for research and training in the area of food and health and associated agri-food related areas, in line with the objectives of SSTI, as well as being responsive and adaptable to needs of stakeholders. This programme is designed to deliver a world-leading set of capabilities in food and health research. The Irish Food and Health Research Alliance will exploit its many established International (US, UK and Europe) collaborative links and recognises the advantages of collaborating with other centres of expertise (nationally and internationally) to acquire new

capabilities and technologies. The programme will also benefit from the Science Centre, based in UCD that will be funded under cycle four, which will develop facilities to house the further development of the programme.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Project	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UCC	IFHRA	4,060	754	4,814
UCD	IFHRA		862	862
UL	IFHRA	405	333	738
TOTAL		4,465	1,949	6,414

6. Biosciences Cell Biology and Cell Signalling

Biosciences Cell Biology and Cell Signalling is a programme led by UCC. The objective of this proposal is to increase the capacity for research and PhD training in the general area of cell biology and cell signalling related to different normal and diseased states. A major emphasis is on cancer biology and neuroscience research, with more than 30 investigators engaged in different aspects of cell biology and cell signalling in these areas.

As part of its overall strategic plan, UCC plan to further develop cancer research on three fronts: fundamental scientific research, translational research, and clinical research. This proposal will also fund additional space for cell biology and cell signalling research. The primary purpose of the new space is to support PhD training in cancer biology, aimed at increasing the critical mass and capacity for high quality research out put and PhD training.

The basic cancer biology research at UCC is focused on the key underlying defects associated with the genesis and progression of cancer. Research is linked with extensive translational studies as well as phase I/II clinical trials on novel mechanisms of gene and drug delivery ongoing at the Cork Cancer Research Centre and the University Hospitals. These include studies on gene therapy and novel delivery mechanisms, tumour immunology, and clinical cancer prevention. Collaborations also exist with the Tyndall Institute in the development of microelectrodes, Dept Pharmacy, UCC in the development of nano-particles for gene delivery and the Dept. Microbiology in viral gene delivery.

All of the cancer research programmes at UCC have extensive links with researchers in Ireland, international cancer research institutes and industry. The ultimate objective here is to identify new treatment targets and strategies through a better understanding of cancer cell biology, signalling networks and immunology.

Below is the breakdown of funding that has been allocated.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UCC	Biosciences Cell Biology and Cell Signalling	3,000	-	3,000

Chemical and Physical Sciences

7. Network Mathematics

Network Mathematics: Bridging the Gap between Theory & Applications is a proposal that brings together two high profile research teams, the Hamilton Institute (NUIM) and Centre for Telecommunications Value Chain Research (TCD), with the aim of creating a co-ordinated research and training programme.

The project aims to directly capitalise on prior investment with a view to realising synergies, minimising duplication of effort and create the infrastructure to form a strong platform for future growth.

The aim of the project is also to address the skills deficits within Ireland in network mathematics linked to key technologies, and reinforce current strengths. Key areas have been identified and the project will enhance research capacity in these areas through targeted PhD scholarships. It will also develop a coordinated structured PhD programme, including development of advanced graduate training modules, strengthening international linkage via close collaboration with researchers at the Berlin Mathematical School, Technion, and Yale. This will allow access to the wide range of skills of partners for input into graduate education programmes. The programme will also lead to the creation of a shared experimental network testbed and will build upon existing experimental test-beds at NUIM and TCD to create a shared experimental platform.

Below is the breakdown of funding that has been allocated.

Institutions	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
NUIM	Network Mathematics		2,255	2,255

Information and Communication Technologies (ICT)

8. e-INIS: the Irish National e-Infrastructure programme

e-INIS: the Irish National e-Infrastructure programme is a national collaborative programme between DIAS, TCD, NUIG, NUIM and UCC.

The aim of the programme is to provide researchers with controlled, secure, seamless, easy and economical access to shared science and engineering resources, enabled by the provision of a fully integrated advanced information and communication infrastructure. Such national e-

infrastructure is a necessary step towards full participation in European e-Infrastructure projects which will be built as a federation of national e-Infrastructural initiatives.

e-INIS addresses a clearly identified national need expressed across almost all sectors in the HEA/Forfás survey for professionally managed and operated high-level infrastructure in the areas of:

- High-performance computing,
- Management, storage and organisation of large data sets,
- High-bandwidth communications, and
- Middleware tools, including Grid technologies

While the provision of physical resources is a crucial part of e-INIS, the development and conservation of the human resources and expert skills base required for professional support and training is equally as important.

As a generic enabling technology e-INIS will enhance, inter alia, the priority research areas identified in the technology foresight exercise as well as the SSTI. E-INIS recognises that the computer science issues of e-infrastructure form an important area of current ICT research (here the participation of TCD, NUIG and UCC and the cooperation of QUB is directly relevant), and that Bioinformatics (NUIM, UCD, TCD) is regarded as a key component in modern Biology.

Through provision of professional training and support in the use of advanced computational and data analysis techniques, both stand alone and as part of graduate schools, e-INIS will contribute to the enhancement of the graduate learning experience and the quality of graduate training, thereby contributing to the national objective of doubling the output of high-quality PhD graduates. In addition, through knowledge exchange with civic society generally e-INIS will contribute to, and support, the development of such important emerging areas as e-government, e-health and e-commerce. e-INIS will be established initially as a federation of the three core infrastructure providers, HEAnet, Grid-Ireland and ICHEC together with DIAS and certain University partners but backed by all the universities.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UCC	e-INIS	250	250	500
NUIM	e-INIS	-	234	234
NUIG	e-INIS	772	248	1,020
TCD	e-INIS	500	671	1,171
DIAS	e-INIS	4,230	5,303	9,533
TOTAL		5,752	6,706	12,458

9. The Graduate School of Creative Arts and Media (GradCAM)

The Graduate School of Creative Arts and Media (GradCAM) is an inter-institutional initiative between the Dublin Institute of Technology (DIT), and the National College of Art and Design (NCAD) and in collaboration with the University of Ulster and the Institute of Art and Design & Technology, Dun Laoghaire (IADT) (the latter two entities not in receipt of funding through Cycle 4).

Ireland has lagged behind other OECD countries, such as Australia, the UK and US, in PhD programmes, infrastructural support and graduate opportunities for the creative arts and media. The *Graduate School of Creative Arts and Media* rectifies this anomaly by establishing a graduate school for advanced research training and development across the creative arts and media, underpinned by a dynamic interdisciplinary, real-world oriented practice-based framework.

The project will consolidate the work of all institutional partners, who together constitute the largest cohort of postgraduate students and research expertise in the creative arts and media on the island. GradCAM will deliver a new interdisciplinary model of graduate education in/for the arts, drawing on international best practice, providing research-relevant placement and intern opportunities, and an infrastructure for evolving research communication strategies in partnership with the creative/cultural industries. GradCAM will greatly expand opportunities for PhD studies and graduates in the creative arts and media, and ensure a dynamic synergy between the academy and society.

The project will also provide the national infrastructural framework to support and sustain the creative arts and media in Ireland with initial focus on design, the visual arts and music. The three disciplines will consolidate partner expertise, and provide a critical platform for active engagement with collaborators and the creative and cultural industries in Ireland, and across Europe.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution		Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
DIT	GradCAM	-	1,048	1,048
NCAD	GradCAM	-	1,100	1,100
TOTAL			2,148	2,148

10. Serving Society: Management of Future Communications Networks and Services

Serving Society: Management of Future Communications Networks and Services is a programme led by the Telecommunications Software and Systems Group (TSSG) at WIT in collaboration with NUIM (The Hamilton Institute and the Department of Sociology), UL (Interaction Design Centre), and several international partners.

The Programme connects Irish research and Irish based industry to the global research community and builds on the established strategic alliance with major industrial players as well as the key international academic collaborators. The objective is to ensure Ireland's leadership in the development of the communications infrastructure for the future Internet and as a consequence a location for continued economic investment.

The three project partners have strong track records in the areas of: communications network and service management (WIT-TSSG); network performance analysis (NUIM-Ham); interaction design and usability (UL-IDC); and analysis of usage patterns of ICT (NUIM-Soc). They are ideally positioned to collaborate on the development of a framework for creation, deployment and management of communications services that serve societal needs.

The programme will address three related research strands:

- “Future Communications Services”,
- “Future Communications Networks”, and
- “Capturing and Addressing Societal Needs”.

Also included in this programme is the specific capital project; an Integrated Research Building that will act as enabling infrastructure to support the programmatic area. On review of research infrastructure within the Institute as part of the HEA / Forfás review of national research infrastructure in 2006, WIT identified a spatial deficit of approximately 8,500 m² required to accommodate the existing needs and projected growth in research activity at the Institute. In line with the Institute's prioritisation of investment in strategic areas of research this proposal serves to specifically target the infrastructural deficit which currently exists within the above mentioned areas.

This integrated building will provide the quality research infrastructure required to support world class research and thereby broaden the base of academic research at the Institute, in the region and nationally. It will provide adequate meeting and demonstration and purpose built laboratories. It will provide a forum for researchers from a diversity of backgrounds to meet and exchange ideas. It will provide quality research infrastructure required to support the growth of postgraduate teaching and research at the Institute.

Below is the breakdown of funding that has been allocated.

Institution		Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
WIT	Serving Society: Management of Future Communications Networks and Services	-	3,817	3,817
WIT	WIT Integrated Research Building	4,124	-	4,124
TOTAL		4,124	3,817	7,941

11. NEMBES: Network Embedded Systems

NEMBES: Network Embedded Systems is led by Cork Institute of Technology's – Centre for Adaptive Wireless Systems (CAWS) which was set-up in 2000. The project is led by CIT with partners from UCD, Tyndall National Institute, Cork University Hospital, UCC, Cork City Council and TCD.

The overall project aim is to bring together the key national experts in the field and make Ireland a recognised international centre of research, education and innovation in networked embedded systems research and applications. The research aim is to address Networked Embedded Systems R&D from an application focused, whole system viewpoint. The core strategy of the CIT Centre for Adaptive Wireless Systems is to use a multidisciplinary approach that integrates hardware, networking and software to allow whole system research. Nationally, no other single group offers this skill set and its success is reflected in CAWS' rapid growth since 2000.

NEMBES strengthens CIT's strategy of closer involvement with the Tyndall Institute and UCC while also widening its network of research collaborators nationally. In particular, NEMBES strategy foresees tighter integration with Tyndall, with NEMBES eventually becoming a systems research centre utilized by Tyndall under the concepts agreed within the CIT/UCC MOU signed in 2006. NEMBES will create educational programmes and opportunities for undergraduate and postgraduate research, making Ireland not only a leading location for NES education but also for those who will be NES industrial and commercial innovators.

The NEMBES project will create an integrated NES Programme, putting in place the infrastructure and state-of-the-art facilities to enable this programme to build up the capacity and structures to drive high quality research, education and knowledge transfer programmes into the future.

Below is the breakdown of funding that has been allocated.

Institution		Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
CIT	NEMBES	6,447	7,631	14,078

12. Lero – the Irish Software Engineering Research Centre and Graduate School

Lero – the Irish Software Engineering Research Centre and Graduate School is a consortium led by the University of Limerick and involves DCU, TCD and UCD.

The centre was established in November 2005 following the award of EUR 11.7M, under the Science Foundation Ireland's CSET programme. Lero's mission is to work with industry to advance the state of the art in key software engineering domains and to develop world class human resources. The proposal provides a new building, allowing for continued operation and expansion of the CSET and consolidating all of the Lero centre activity at UL.

The new Lero building will accommodate Lero's UL research and central staff. The Lero Graduate School in Software Engineering (LGSSE) will be administered from UL, with the four partner universities offering taught modules to student researchers across four locations and providing Lero researchers as supervisors. Lero's partner universities have agreed to establish a structured PhD programme which will prepare graduates for the demands of tomorrow's software engineering world. The programme will strengthen ties between Irish researchers, while establishing links with industry and with leading international institutions.

By complementing the funding committed by SFI for the operation of Lero, this project will help ensure the establishment of a national software engineering research centre which will be internationally recognised for its results, its education and its industrial linkage. The project will provide appropriate accommodation for Lero, on the UL campus, adjacent to the CSIS department, so that Lero can expand and deliver the research, technology transfer and fourth level education that will be the foundation of Ireland's future software industry.

Below is the breakdown of funding that has been allocated.

Institution		Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UL	Lero	5,197	2,136	7,333

Platform Technologies

13. **INSPIRE: Integrated Nanoscience Platform for Ireland**

INSPIRE: Integrated Nanoscience Platform for Ireland is a project coordinating the National Nanotechnologies Initiative joining CRANN/TCD, CIT, DCU, DIT, NUIG, UCC/Tyndall, UCD and UL.

The programme is designed to enable each partner to build on their core capabilities, whilst allowing Ireland to engage in key new interdisciplinary areas such as nanotoxicology and nanomedicine. Infrastructure derived from this programme will be shared nationally. The proposal is designed to deliver a world-leading set of capabilities in nanoscience materials, devices, systems research, characterisation, and bio-nanoscience.

INSPIRE will create a national integrated nanoscience and nanotechnology activity which will result in building collaborations across the nanoscience community nationally, leveraging existing capabilities and elevating the national activity to be internationally leading. The aims of the programme are:

- The creation of a shared national infrastructural capability that will fill the acknowledged gaps, and be serviced effectively by trained support staff, in order to enhance the

national capacity for delivering innovative research in nanoscience and nanoscale technologies;

Graduate School:

- The development of shared national nanoscience graduate programmes that will have international appeal and will enable an increase in graduate numbers aligned with stated SSTI goals;
- The expansion of existing institutional linkages to facilitate new collaborations, locally, regionally and nationally across institutions and across disciplines.

INSPIRE will also benefit from the Science Centre that will be based in UCD, which will be funded under this cycle, and which will develop facilities to house the further development of the programme.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institutions	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
NUIG	INSPIRE	1,998	681	2,679
CIT	INSPIRE	750	1,072	1,822
DCU	INSPIRE	1,809	663	2,472
DIT	INSPIRE	2,092	2,168	4,260
TCD	INSPIRE	4,500	1,714	6,214
UCC	INSPIRE	6,100	1,805	7,905
UCD	INSPIRE		1,528	1,528
UL	INSPIRE	3,478	2,301	5,778
TOTAL		20,727	11,932	32,659

Humanities

14. Humanities Serving Irish Society (HSIS)

Humanities Serving Irish Society (HSIS) is a national collaboration programme between DCU, NUIG, NUIM, RIA, TCD, NCAD, UCC, UCD, and DKIT, ESRI, ITT, SPCD, outside of cycle four funding as well as international partners QUB and UU. The initiative is committed to building a National Platform for the Humanities and an all-island inter-institutional research, teaching and training infrastructure.

This HSIS consortium represents a major change in the scope and capacity for humanities research, teaching and training in Ireland, and these endeavours will be linked to analogous enhancement of humanities research, teaching and training in QUB and UU.

The mission of this national collaboration is to serve three ends:

- i) the creation of an infrastructure (Digital Humanities Observatory), to be managed by the RIA;
- ii) the enhancement of the teaching and learning experience of research students in humanities in Ireland's HEIs by linking it to novel pedagogic actions stemming principally from the work of the DHO;
- iii) the better co-ordination of humanities research in Ireland.

Through the HSIS programme, researchers in humanities disciplines in all HEIs in Ireland will, for the first time, come together in a common forum.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institutions	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
DCU	HSIS		390	390
NUIG	HSIS	340	2,975	3,315
NUIM	HSIS	3,700	2,989	6,689
TCD	HSIS	6,804	3,984	10,788
UCC	HSIS	200	1,236	1,436
RIA	HSIS		3,528	3,528
NCAD	HSIS		152	152
UCD	HSIS		2,610	2,610
TOTAL		11,044	17,864	28,908

Social Sciences

15. Irish Social Science Platform (ISSP)

Irish Social Science Platform (ISSP) is a national collaborative programme between DCU, NUIG, NUIM, UCC & UL.

ISSP comprises an all-island programme of fundamental, applied, and comparative research and graduate training on Knowledge, Innovation, Society and Space. It links together significant and complementary centres of social science and humanities expertise across all institutions involved. The proposed partnership is a scaling-up of existing successful collaborations (e.g.

PRTL, Atlantic Alliance) across disciplines and institutions. It will draw upon existing international collaborations of partners where necessary.

This national research programme will focus on three inter-related areas:

- Innovation and the building of the knowledge society/economy;
- Social inclusion and the creation of sustainable communities;
- Spatial strategies and promoting balanced development and competitiveness.

Each of these are of critical policy importance given the imperative to secure Ireland's economy through innovation, to sustain social progress through enhanced social capital and social entrepreneurship, and to improve sustainability through sectoral and spatial planning and cross-border cooperation.

Graduate School: The national programme will provide a platform for the sharing of research and teaching expertise and resources across partners which will enable the creation of national graduate programmes in each of the three research areas identified.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
DCU	ISSP		887	887
NUIG	ISSP	230	10,354	10,584
NUIM	ISSP	3,700	3,498	7,198
UCC	ISSP		919	919
UL	ISSP		2,509	2,509
TOTAL		3,930	18,167	22,097

16. The Irish Social Science Data Archive (ISSDA)

The Irish Social Science Data Archive (ISSDA) will be managed jointly by UCD and the Economic and Social Research Institute, with the collaboration and support of the Central Statistics Office.

ISSDA holds an ever-increasing quantity of machine-readable data from surveys and official statistics (such as the Census) and makes them readily available to users in the academic, public and commercial sectors. PRTL support will expand and coordinate data acquisition and management and build on the Irish Social Science Data Archive and will directly address structural concerns raised in the Forfás/HEA review on infrastructures, with the database filling a long recognised need in Ireland.

The enhancement and expansion of the ISSDA to create a national resource for social science data and provide new infrastructure in key areas such as data management and will bring a core research programme within the Archive for the first time.

As the Archive grows and develops, it is envisaged that it will contain an ever-expanding range of datasets of use to the Irish social science research community. These will include:

- CSO datasets, such as the Small Area Census Data (SAPS), the Household Budget Survey, and the Quarterly National Household Survey;
- ESRI datasets, such as the School Leavers Survey;
- Full election results under PR-STV, including data from all counts for all constituencies;
- Data from the National Election Study;
- International comparative datasets, such as the Eurobarometer and ISSP series.

Data will be distributed both on CD-ROM and via the Internet, and ISSDA is committed to investigating and deploying new technologies such as NESSTAR and MISSION to ensure the safest and most efficient dissemination of data in the future.

ISSDA aims include:

- To ensure wider access to datasets, both Irish and international;
- To encourage secondary analysis of older data in order to track trends over time;
- To offer training and advice in the access and exploitation of available datasets;
- Through links with equivalent archives in other countries, to advance the promotion of much-needed international comparative studies of the Irish economy and Irish society;
- To make datasets available for analysis by postgraduate, and in the longer term, undergraduate students, to facilitate the wider acquisition of data analysis skills.

Below is the breakdown of funding that has been allocated.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UCD	Irish Social Science Data Archive		750	750

Environment and Marine

17. The Environment & Climate Change: Impacts and Responses Graduate Programme

The Environment & Climate Change: Impacts and Responses Graduate Programme is a national collaboration between CIT, NUIM, NUIG, TCD, UCC and UL.

Environment and Climate Change is of great importance both nationally and globally and researchers with cross-disciplinary knowledge in areas of marine, environment, computational

mechanics and geo-science areas will be needed in the formulation of European-wide research efforts in Climate Change. As a result, this project will develop a specific Graduate Research Education Programme in Environment and Marine research.

In addition, under the capital component of this programme NUI Galway will develop the Mace Head research institute as a national resource through acquiring key platform technologies and equipment. The upgrading of the unique world-leading Ocean-Atmosphere super-site at Mace Head will enable advanced research into aerosol formation, aerosol-cloud interactions, air-sea exchange and CO₂ uptake at a prime geographical location for such research. The upgrading of the Mace Head site was identified as a key national and indeed European research infrastructure in the 2006 HEA/Forfás review.

Below is the breakdown of funding that has been allocated to each partner institution involved.

Institution	Programme	Capital EUR Thousand	Recurrent EUR Thousand	Total EUR Thousand
UCC	Environment & Climate Change: Impacts and Responses Graduate Programme	450	1,017	1,467
TCD	Environment & Climate Change: Impacts and Responses Graduate Programme		1,309	1,309
NUIG	Environment & Climate Change: Impacts and Responses Graduate Programme	4,431	1,382	5,813
NUIM	Environment & Climate Change: Impacts and Responses Graduate Programme		299	299
UL	Environment & Climate Change: Impacts and Responses Graduate Programme	-	618	618
CIT	Environment & Climate Change: Impacts and Responses Graduate Programme	1,250	800	2,050
TOTAL		6,131	5,425	11,556

ANNEX III

Research Facilities Enhancement Scheme (RFES)

The SSTI states that “*world class research requires first class people and the supporting infrastructure within which to carry out that research*”. It further identifies a ‘*shortfall in the provision for buildings, equipment and support services*’. The HEA/Forfás Research Infrastructure Review published 2006 further identified research facilities that are “in poor condition and not fit-for-purpose”.

The Research Facilities Enhancement Scheme (RFES) targets the elimination of sub standard research facilities. It serves two principal purposes. Firstly, it permits institutions to undertake the necessary refurbishment, conversion and / or upgrade of facilities in their ownership so as

to permit the conducting of high-quality research in line with institutions' strategic priorities. The scope of the scheme extends both to existing facilities in use for research purposes as well as facilities planned to be adapted for exclusive use for existing research purposes. Secondly, the scope of the scheme extends to enabling institutions to acquire necessary equipment for the conducting of such research as is mentioned above.

A total of EUR 57.9 million under the RFES scheme was awarded in 2008; this breaks down as EUR 47.3 million for the S&E region and EUR 10.6 million for the BMW region. See awards per HEI and brief project descriptions below.

Institution	Award
UL	1,565,000
TCD	3,170,000
UCD	8,109,000
NUIM	2,900,000
UCC	5,040,000
UL	2,280,000
WIT	2,035,000
Dundalk IT	800,000
DCU	3,765,000
Cork IT	325,000
Limerick IT	500,000
GMIT	1,494,900
IT Sligo	68,265
NUIG	6,147,900
IT Tralee	1,024,000
AIT	1,813,055
DCU	430,000
IT Tallaght	1,400,336
Letterkenny IT	278,871
UCC	2,211,027
ITB	160,971
St Pats Drumcondra	400,000
DCU	840,000
NUIM	2,000,000
UL	972,000
UCD	2,060,000
Mary Immaculate College	35,000
WIT	1,200,000
TCD	1,700,000
TCD	3,200,000
IT Sligo	71,525
Total:	57,996,850

BMW Region**Athlone Institute of Technology– AIT Postgraduate Research Hub**

Refurbish, convert, and upgrade AIT's postgraduate research hub and social space.

Dundalk Institute of Technology– The National Centre for Freshwater Studies

Expansion of the National Centre for Freshwater Studies for increased space and specialised equipment.

Galway–Mayo Institute of Technology– Development of an Integrated Centre for Marine and Freshwater Research

Refurbish the existing "old library" to accommodate the Integrated Centre for Marine and Freshwater Research.

Institute of Technology, Sligo– Business and Humanities Research Centre

Establishment of a group office space for business and humanities research students by the conversion of an existing computing workshop and storage space. This will represent a significant development for the School of Business and Humanities and lead to the recruitment of postgraduates in the Institute's strategic research priority area of socio-economic research. It will also address a space deficit in a number of areas in the School, providing a permanent resource for postgraduate students.

Institute of Technology, Sligo– Centre for Design Innovation Research and Prototyping Laboratory

Conversion of a recently-built, laboratory space in the Institute's Business Innovation Centre into a research and prototyping laboratory for the Centre for Design Innovation Research.

Letterkenny Institute of Technology– Refurbishment of Science Research Facilities

Expand, consolidate, and improve the existing science research facility and to include space for inflammatory biological research.

National University of Ireland, Galway– Biomedical Science and Engineering

Provides for the upgrading of existing research laboratories in the thematic areas of biomedical science and engineering, identified as strategic priorities in NUIG's *Strategy for Research 2007–2011*, and for the purchasing of equipment that will facilitate the practise of novel research approaches and improve extant infrastructure to allow for the realisation of inter-institutional and inter-sectoral collaborative opportunities.

S&E Region**Cork Institute of Technology– Biopharmaceutical Chemical Research**

Redevelopment of existing space to provide wet-lab facilities, autoclave room, meeting area and bioinformatics facility for the expansion of the research cluster.

Dublin City University– Bioanalytical Science Facility

Refurbishment of vacated space in old college buildings to house additional workstations which were integrated with specialist facilities in bioanalytical and bioengineering sciences.

Dublin City University– School of Computing Research Facility

Conversion of undergraduate space in the School of Computing into fit-for-purpose research space to support large-scale research ventures involving inter-institutional collaborations and industrial partnerships between the Faculties of Engineering and Computing.

Dublin City University– Humanities and Social Sciences Research Facility

Created a quality, fit-for-purpose research space for 3 University Designated Research Centres within the Faculty of Humanities and Social Sciences, thereby fostering innovative collaborative links.

Institute of Technology, Blanchardstown– Engineering Research Laboratory

Creation of a dedicated, hardware-centred research laboratory space within the Engineering Department for researchers in the areas of clinical engineering (incorporating medical device test, measurement, and sensor development) and roads infrastructure management (incorporating machine vision, GPS, and sensor fusion).

Institute of Technology, Tallaght– Applied Research Capacity Enhancement

Increased laboratory research space in the areas of bioscience and engineering in order to facilitate the development and strengthening of inter-institutional collaborations. Funding also to upgrade equipment to support ongoing research activities.

Institute of Technology, Tralee– Establishment of a Mammalian Cell Culture Facility

Upgrading of laboratories in applied biotechnology including a clean air facility dedicated to postgraduate training and applied biotechnology research in mammalian cell culture techniques.

Limerick Institute of Technology– Enhancement of Department of Applied Science Infrastructure

Funding to equip a new laboratory in the Department of Applied Science which has an active core research team in analytical and forensic science.

Mary Immaculate College– Upgrading of Postgraduate Research Centre

Upgrading of accommodation in the Postgraduate Research Centre including IT facilities and equipment.

National University of Ireland, Maynooth– Callan Building Enhancement

Creation of new and refurbished laboratory and office space in the area of the biosciences, thereby consolidating and enhancing existing analytical facilities and services into a single, more effective unit.

National University of Ireland, Maynooth– Refurbishment of St. Anne’s House

Renovation of a 1960s’ building to accommodate research groups in the areas of climate change and the Innovation Value Institute (IVI)—two of NUI Maynooth’s key research areas and areas of strategic growth.

St. Patrick’s College, Drumcondra– DORAS FEASA: Refurbishment and Enhancement of Digital Research Tools and Facilities

To increase SPD’s research–focused ICT capacity and expertise through the development of a high–quality repository of research literature, theses, reports, teaching materials, and digitized records with open access options.

Trinity College Dublin– Trinity SFI Centres Enhancement Plan

Adaptation and refurbishment of space in the Trinity Technology & Enterprise Campus (TTEC), and to procure core equipment for research in the areas of nanoscience and biological immunology.

Trinity College Dublin– Sir Patrick Dun’s Laboratories for Translational Research, St. James’s Hospital Campus

Re–development of the translational medical research laboratories on the St. James’s hospital site with a view to establishing a fit–for–purpose, fully–integrated modern and well–equipped translational research facility.

Trinity College Dublin– Arts Technology Research Laboratory

Adapt and equip two units in the Trinity Technology and Enterprise Centre (IITEC) as a dedicated postgraduate media arts and technology research facility, namely, the Arts Technology Research Laboratory (ATRL).

University College Cork– Kane (Science) Building: Core Research Facilities for the Chemical and Physical Sciences

Refurbishment of laboratory space in the Kane Building constructed in the 1970’s and housing the Departments of Chemistry and Physics and the computer network for the UCC campus. Upgrading of the core electrical services and network connectivity of the building.

University College Cork– Mammalian Cell and Microbial Culture

Refurbishment of laboratory space and replacement of obsolete equipment and in the Food Science Academic Building, thereby addressing both capacity and health and safety issues.

University College Dublin– Science Centre Research Development

Refurbishment of existing space in the Science Centre to provide additional research capacity and to create fit-for-purpose laboratory facilities.

University College Dublin– Nano-biology and Energy Research Development

Creation of a dedicated Energy Centre with a nano-fabrication laboratory and provision of new imaging facility including a transmission electron microscope.

University of Limerick– Composite and Glass Materials

Refurbishment of laboratory space and replacement of equipment for the Composites and Glass Research Cluster (CGRC) within the Materials and Surface Science Institute (MSSI). This upgrade facilitated the cluster's development in nano-composites – an increasingly important application of nanotechnology.

University of Limerick– Food and Health

Restructuring the space and provision of equipment-intensive analytical laboratories and postgraduate workstations for the food and health research group working in the core areas of functional foods, food safety, human metabolism, bioenergetics, health and physical activity.

University of Limerick– The Charles Parsons Initiative (CPI) on Energy and Sustainable Environment

Refurbishment of rooms in the Main University Building for use by the CPI and renewal of equipment for this research group.

Waterford Institute of Technology– Pharmaceutical & Life Sciences Cluster

Conversion and upgrading of space to accommodate the Pharmaceutical and Life Sciences research cluster and provision of core items of equipment.

Waterford Institute of Technology– Telecommunications Strand

Provides for the complete refurbishment of accommodation and the purchasing of essential equipment for the Telecommunications Software & Systems Group (TSSG), the Optics Research Group (ORG), and the Mobile Telecommunications Group (MTG) – groups with a complementary focus that work collaboratively

Research Equipment Renewal Grant

Under the Research Equipment Renewal Scheme, EUR 28.02 million was made available to universities and other higher education institutes in 2007 for replacement, updating and renewal of research equipment. The Scheme addresses the need for small and middle sized items, costing more than EUR 15,000 and less than EUR 1 million, whilst very large equipment might be obtained through PRTL. The funding is additional to approximately EUR 135 million which has been invested in equipment over the past eight years under the Programme for Research in Third Level Institutions (total PRTL investment EUR 533 million).

The Scheme will provide equipment for researchers in all disciplines in line with identified strategic and prioritised areas of research for institutions, enhancing the quality of the equipment to support research in the higher education sector. Institutions are encouraged to procure equipment so as to address deficiencies identified in the HEA/Forfás Research Infrastructure Review or other national policy statements.

This scheme was part of a coordinated call for equipment proposals which is being extended from three agencies that support science research in Ireland: Enterprise Ireland (EI), the Higher Education Authority (HEA) and Science Foundation Ireland (SFI). The purpose of these schemes is to allow researchers in Higher Education Institutions (HEI) access to state of the art equipment that will enhance their abilities to perform highly competitive research. Each agency will provide its own scheme that will address different groups within the higher education community. The agencies will also coordinate their awards to provide synergy in funding, and ensure that the equipment provided best serves the total higher education community.

The Scheme provides equipment for researchers in all disciplines in line with identified strategic and prioritised areas of research for institutions, enhancing the quality of the equipment to support research in the higher education sector. Institutions are encouraged to procure equipment so as to address deficiencies identified in the HEA/Forfás Research Infrastructure Review or other national policy statements.

Of the EUR 28.5 million, EUR 24.7 million funding is for S&E Higher Education Institutions and EUR 3.3 million for the BMW region.

All HEIs awarded RERG funding

HEI	Award
Athlone	184,000.00
Blanchardstown	50,000.00
Carlow	130,000.00
CIT	289,209.00
DCU	1,789,000.00
DIT	757,202.94
Dun Laoghaire	23,000.00
Dundalk	77,000.00
GMIT	286,918.00
IT Sligo	132,002.53

Letterkenny	31,000.00
Limerick	72,618.32
Mater Dei	19,000.00
MIC	306,604.44
NCAD	257,000.00
NUIG	2,686,425.00
NUIM	1,735,000.00
RCSI	378,974.00
Tallaght	260,000.00
TCD	6,086,000.00
Tralee	26,998.73
UCC	3,145,000.00
UCD	6,228,000.00
UL	2,528,000.00
Waterford	544,000.00
Total	28,022,952.96

REG Performance Indicators – Increased Physical Infrastructure

- 366 separate pieces of equipment were purchased under the scheme. Of these, 327 pieces were purchased by higher education institutions in the S&E region.
- One of the aims of the REG was to address deficits identified in the HEA/Forfas Infrastructure review. Some examples related to the S&E region, are demonstrated in the below table.

THEMATIC AREA	DEFICIT IDENTIFIED	ADDRESSED BY REG
Arts & Humanities, Education, Creative Arts & Media	Lack of major data repositories, a national depository for qualitative data, & a repository for research papers.	Equipment was purchased in the area of Digital Archives and Research Repositories (UCD and MIC)
Library Facilities	Absence of adequate library provisions	A number of pieces of equipment were purchased in relation to library equipment: Book scanners, Library Management Server System, Digital Scanning Station, Laser Printers etc. (TCD, UL, MIC)
Education	Infrastructure for research in areas of education is non-existent Lack of Postgraduate seminar rooms with AVC equipment	Various pieces of audiovisual and videoconferencing equipment were purchased in the areas of Teacher Education, Social & Educational Research, and Creative Arts & Media (DIT, NCAD, MIC, TCD)
Psychology & Social Sciences	Psychology facilities often out-dated in comparison with other Social Sciences research	A number of pieces of equipment were purchased within the Psychology domain including items for a Psycho-physiological Research Laboratory Suite (EUR 114,000 MIC) ; a 128 channel human EEG (EUR 80,000 NUIM); Behavioural and Neuro-imaging Research Equipment (EUR 300,000 TCD)
Biological & Medical Sciences	High-resolution TEM, Rheometers, Calorimeters Solid state NMR (Nuclear Magnetic Resonance) Low-resolution NMR	A Transmission Electron Microscope was purchased in UCC (EUR 700,000) A Rheometer was purchased in UCD (EUR 81,000) A Calorimeter was purchased in UL (EUR 35,000)
Chemistry	Need for some basic analytical equipment	Large pieces of equipment, costing above EUR 100,000 were purchased for a Forensics lab in UCD e.g. Non-linear

		Magnetophoretic Separator, Invert Microscope Magnetic Tweezers, Flow Cytometer. A number of pieces of basic analytical equipment were bought in various disciplines – Chemistry, Biotechnology, Life Sciences etc. At least 4 Mass Spectrometers were purchased in the Biosciences area ranging from EUR 100,000 – 500,000 (UCD, IT Tallaght, UL)
Clinical research facilities	The positioning of a research MRI scanner on a university campus, as opposed to adjacent to a hospital. Need for dedicated resources for data acquisition, visualisation, and storage.	Resources for data acquisition, visualisation and storage: DCU (Biophotonics): networked mass image database storage and high speed networked image transfer server (EUR 48,000) TCD (Biopharma): Consolidated IT system for spectroscopic data management (EUR 20,000)
Pre-clinical facilities	Need for micro-injector equipment Specialised clinical research equipment for large animal studies, including imaging equipment, needs investment	Imaging equipment was acquired as follows: RCSI (NBIP): Intravital cell imaging system (EUR 300,000) DCU: (NBIP) PIE FLIM for live cell imaging (EUR 400,000) and 3D Laser / texture imaging system (EUR 123,000) DIT (NBIP): Jobin Yvon Imaging Raman System (EUR 520,000) and Perkin Elmer Spotlight Imaging FTIR (EUR 300,000)
Computer Sciences/ Physical Sciences and Mathematics	Research Resources in the form of physical library provision are necessary A national approach to the development of an electronic depository for theses was cited as a useful infrastructural project.	TCD (Nanoscience): Video/Web Conferencing (EUR 72,000) UL (Nanoscience): Video & Tele Conferencing (EUR 60,000) DCU (Nanoscience): Audiovisual Equipment (EUR 72,000)
Earth, Atmosphere, and Ocean Sciences	Geology is an area that lacks basic equipment Specifically lacking: an Aerosol Mass Spectrometer	A number of pieces of equipment were purchased within the Geological Sciences domain including a Multi-Collector Thermal Ionisation Mass Spectrometer (EUR 680,000 UCD); High-precision Lapping and Polishing machine (EUR 125,000 TCD) and a Coulter Laser Granulometer (EUR 100,000 TCD)

Technological Sector Research (TSR) is a funding programme directed at the institutes of technology. It involves three strands which include a:

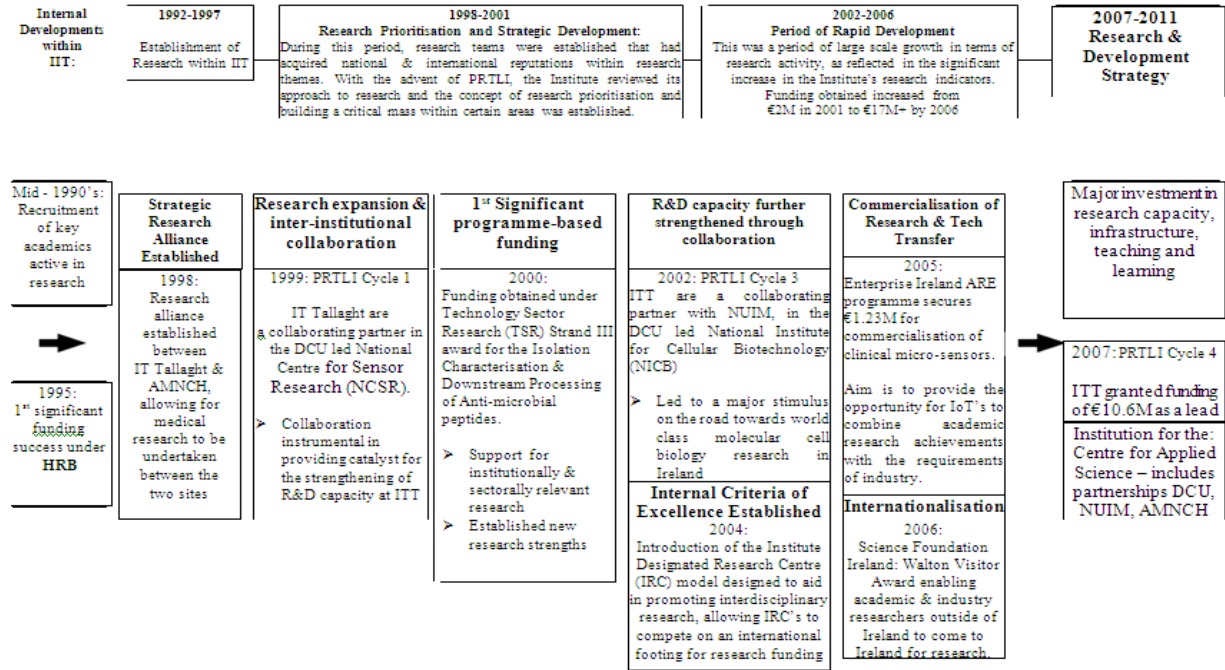
- Postgraduate Research and Development Skills Programme;
- Enterprise Platform Programme;
- Core Research Strengths Enhancement Programme.

The TSR was established by the DES with a total fund of £30 million (EUR 38 million) to be made available from 2000 – 2006 specifically targeted at the development of capacity for research and development in the IoT sector. In 2007, the TSR was allocated around EUR 6 million per annum across the three strands. Only awards made to the BMW region are eligible for ERDF funding under the 2007 – 2013 (N+2) round.

ANNEX IV

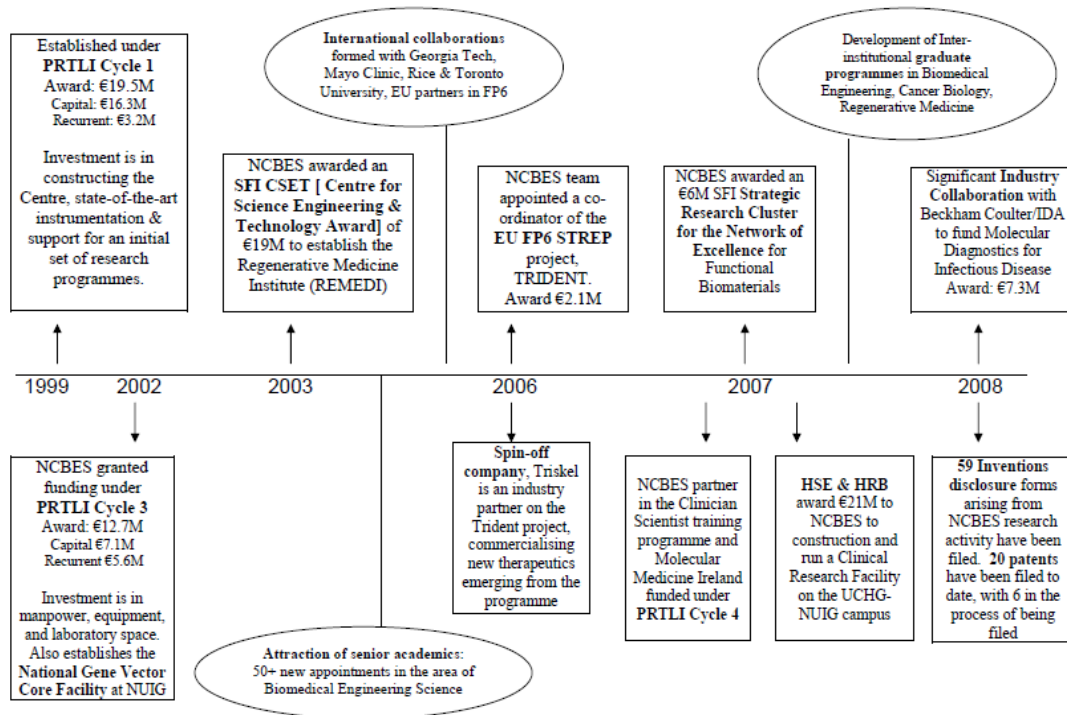
Case Study 1 PRTL

Case Study: Institute of Technology, Tallaght Evolution of Applied Health Research



Case Study 2 PRTL I

Case Study: National Centre for Biomedical Engineering Science



ANNEX V

Excerpt from HEA slides on the development of the PRTLI and the ERDF process

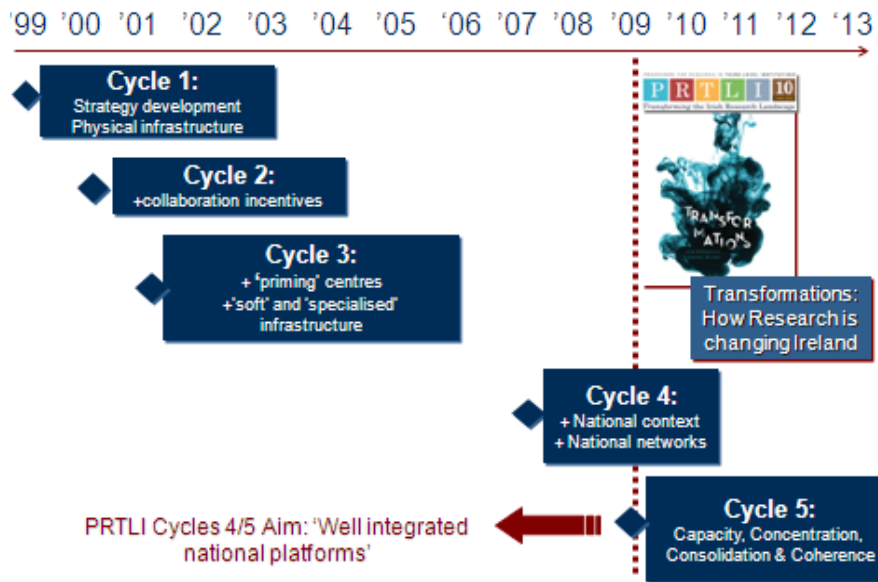




HEA and the PRTLI

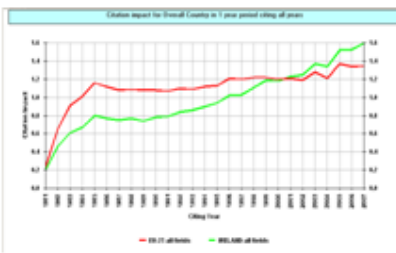
- Research and Infrastructural Funding *Delivered by the Higher Education Authority (HEA)*
- Support for all disciplines & areas of research
- Focus on Institutional Strategy
- Funding assessed on basis of Research Excellence
- Strategic Collaborations (Nationally and Internationally) Encouraged
- Link to teaching and education
- Focus of PRTLI Funding
 - Provision and enhancement of infrastructure and capabilities for research....
 - Supporting and enabling strategic development and collaboration....
 - Enhancement of quality of research, education and training.....graduate education

PRTLI Past & Future ...





Key Impacts: Higher Education Sector Reputation



Ireland now outstrips the European cumulative citation impact

Average cumulative citations to cumulative papers 1981-2007
Source: National Science Indicators (Thomson Reuters)

1. Enhanced Sector Reputation
2. Enhanced non-Exchequer investment
3. Enhanced publication & academic talent
4. Enhanced IP output
5. Enhanced industry development



2



Key Impacts: Direct and Indirect Private Sector Involvement



- Enhanced Private Sector collaborations e.g. Under PRTL Cycle 3, 40+ industry collaborations established
- Enhanced non-Exchequer contributions
- Increasing research activity amongst smaller companies and Multi-National Corporations;
- In 2007 IDA concluded negotiations for 114 new investments, 40% of which were in the area of R&D;
- The number of research personnel employed in R&D activities across the business sector in Ireland rose to 13,861 in headcount terms in 2007, many of them having relocated from the US, Canada, Japan, the UK, Switzerland and elsewhere, attracted by the dynamic Irish R&D environment.



4

Background

- Department of Finance sought co-financing of the National Development Plan (NDP) 2000-2006 (N+2) under the European Regional Development Fund (ERDF).

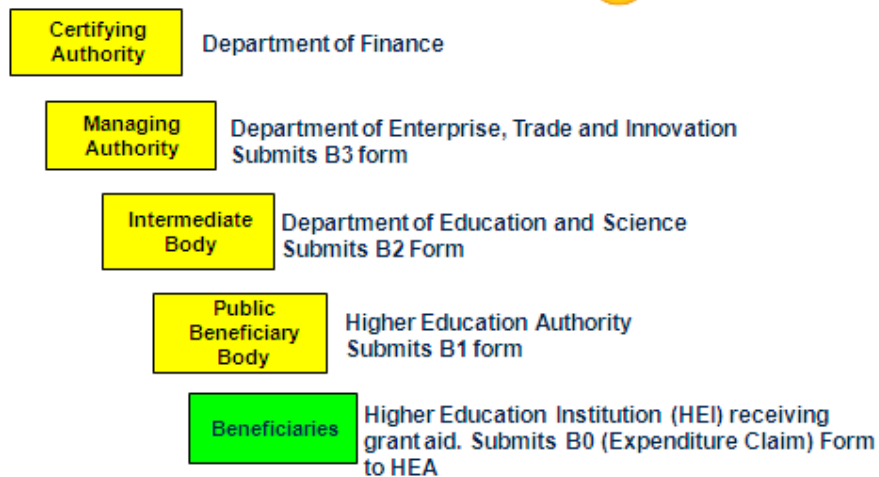
Education Sector – Research Related Activities

- Programme for Research in Third-Level Institutions (PRTLII)
 - Capital and Recurrent
- Strategic Innovation Fund (SIF)
- Technological Sector Research (TSR)
- Project Based Individual Research (PBIR)

5

ERDF Cascade Structure 2000-2006 (N+2)

Ireland



Eligible Expenditure Claimed under ERDF 2000-2006 (N+2)

Measure	BMW Gross (75% co-financing rate)	S&E Gross (50% co-financing rate)
	€	€
PRTL I Capital	26,242,570.00	70,607,970.00
PRTL I Recurrent	1,500,000.00	-
SIF	3,000,000.00	-
TSR	1,800,000.00	-
PBIR	2,619,000.00	-
Total	35,161,570.00	70,607,970.00

→ The Irish Exchequer recouped **€61.6M** from ERDF claims for 2000-2006 (N+2) Programme



Target reached for 2000-2006 (N+2) Programme

NDP 2007- 2013 (N+2)

- National Development Plan (NDP) 2007-2013 (N+2) Co-financed under the European Regional Development Fund (ERDF).

Education Sector – Research Related Activities

- Programme for Research in Third-Level Institutions (PRTL I)
- Capital & Recurrent in BMW and S&E
- Research Facilities Enhancement Scheme (RFES) BMW and S&E
- Research Equipment Renewal Grant (RERG) S&E only
- Technological Sector Research (TSR) BMW only



