



an roinn fiontar, trádála agus fostaíochta
department of enterprise, trade and employment

Knowledge and enterprise clusters in Ireland

– An overview –

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1. Introduction

The island of Ireland is located in the north-west of Europe and has two separate jurisdictions, the Republic of Ireland and Northern Ireland. The island occupies a total area of 84,421 square kilometres of which the Republic of Ireland accounts for 70,282 square kilometres and Northern Ireland accounts for 14,139 square kilometres.

The population of the Republic of Ireland is approximately 4.2 million of which 1.7 million live in the Greater Dublin area. The population of Northern Ireland is estimated at 1.75 million.

In 1973, the Republic of Ireland along with Denmark and the UK, joined the European Economic Community (now the European Union) and plays an active part in its affairs. Ireland is a founder member of the European Monetary Union (EMU) and is the only English-speaking country in the EMU.

The signing of the Belfast Agreement in 1998 between the Irish and UK Governments and endorsed by the main political parties in Northern Ireland has led to greater co-operation on issues of common concern between the Republic of Ireland and Northern Ireland.

Ireland is a small, open, trade-dependent economy. In recent decades, Ireland has been transformed from an economy based on agriculture and traditional manufacturing country to an economy based on high technology and internationally traded service sectors.

The 2008 Business Environment Ranking of the Economist Intelligence Unit placed Ireland 11th globally out of 82 countries, naming it as one of the most attractive business locations in the world.

Ireland's competitiveness is not just based on an attractive tax regime (it has the lowest corporation profits tax rate in Europe at 12.5%), but on knowledge, innovation, flexibility and connectedness. We are entering a new phase of economic development when we will again become dependent for growth on successfully competing in international markets. We embark on this phase with an enterprise base that has been greatly expanded, strengthened and modernised over the last decade.

The themes of knowledge, innovation and connectedness are firmly at the heart of the Irish Government's strategy to position Ireland as a leading knowledge economy. The Government's over-arching vision is that:

"Ireland by 2013 will be internationally renowned for the excellence of its research, and will be to the forefront in generating and using new knowledge for economic and social progress, within an innovation-driven culture."

One of the most important advantages that Ireland has as an innovative country is its ability to adapt and respond quickly to change. Underpinning this advantage is our ability to work closely together. We pride ourselves on our commitment to social partnership and social dialogue. The social partnership process is accepted by most commentators as being a major contributor to the attainment of our societal goals. Partnership has been a key instrument in improving governance at all levels, by involving stakeholders in the formulation and implementation of policies, and in sharing accountability for policy outcomes.

This process will have a continuing and hopefully successful role in also addressing another of Ireland's key strategic imperatives, namely, raising productivity and innovation across the entire economy.

2. Key sectors

Ireland's enterprise development policies have resulted in a switch from a reliance on primarily food-based and traditional manufacturing industries to a focus on high tech and internationally traded service sectors.

Today, Ireland is the European base for leading corporations such as Intel, Microsoft, HP, Apple, Pfizer, Google and Amazon. Almost 1,000 overseas companies have invested in Ireland and are involved in a wide range of activities in sectors as diverse as engineering, information communications technologies, pharmaceuticals, medical technologies, financial and international services.

Indigenous enterprises are marking their mark in high tech areas such as software and medical devices and in internationally traded services.

Through the National Development Plan 2007–2013, the Irish Government is investing heavily in developing Ireland's capabilities in the areas of ICT, biotechnology, nanotechnology and sustainable energies.

3. Enterprise policy development and governance

The formulation of enterprise development policies such as networks and clusters in Ireland is the responsibility of the Department of Enterprise, Trade and Employment. The Department can draw upon the advice of Forfás, the national policy and advisory board for enterprise, trade, science, technology and innovation, in the design of new enterprise development policies.

There are a number of agencies under the aegis of the Department which are responsible for policy implementation. These include:

- IDA Ireland – the industrial development agency for inward investment;
- Enterprise Ireland – the agency that promotes the development of home-based industry and foreign trade; also provides support for R&D and innovation relevant at all stages of company development.
- Science Foundation Ireland – the agency that promotes investment in basic research, particularly in the fields of biotechnology, information and communications technologies (ICT), sustainable energies and energy-efficient technologies;
- FÁS – the national training and employment agency;
- Shannon Development – a regional development agency focusing on the mid-west region;
- The network of County and City Enterprise Boards provide business supports to micro-enterprises i.e. those employing less than 10 employees.

In addition, two other bodies should be mentioned. These are Skillnets and InterTradeIreland. Skillnets is an enterprise-led support body dedicated to the promotion and facilitation of learning as a key element in sustaining Ireland's national competitiveness. InterTradeIreland, one of six North-South Implementation Bodies, is charged with enhancing the global competitiveness of the all-island economy through measures such as the creation of business development networks and clusters.

4. Clusters and networks initiatives

The concepts of clusters and networks are well known to Irish policy-makers. As far back as 1992, the report of the Industrial Policy Review Group recommended the promotion of industrial clusters focused on niches of national competitive advantage. Additionally, a number of enterprise development support programmes highlight the advantages of clusters as being desirable or necessary to improve productivity.

Irish policy-makers recognise that successful companies draw on external influences and internalise the benefits. The local availability of a critical mass of expertise — in institutions and in other businesses — significantly assists this process. The building of clusters and linkages between companies, third level institutions and international partners is vital if companies are to access local, national and international knowledge and expertise.

Ireland can be characterised by having both a policy push and bottom-up approach to cluster formation. There are a number of government-funded initiatives that seek to promote the establishment of clusters.

Additionally, a number of clusters arose as a result of Ireland's successful FDI policies. Ireland has benefited both from its focus on a number of high growth sectors such as IT and bio/pharma and its exploitation of "first-mover advantages" by which it first attracts a major company in a target sector to Ireland making it easier to entice its sub-suppliers to do likewise.

The closer integration of the two economies on the island into a rapidly evolving all-Island economy has been reflected in and reinforced by the development of an increasing number of mutually beneficial Collaborative Business Networks in areas such as software, digital media and healthcare (Biomed Ireland) on an All Island basis and regionally through initiatives such as the North West Science & Technology Partnership (NWSTP) — all of which have received facilitation and project funding from InterTradeIreland.

In addition, the Governments of the United States of America, Northern Ireland and the Republic of Ireland have come together for a unique initiative to advance scientific progress in fields that will have a significant impact on the health, well-being and economic prosperity of all their citizens.

The "US-Ireland R&D Partnership" will help link scientists and engineers in partnerships across academia and industry to address crucial research

questions. It will foster new and existing industrial research activity that could make an important contribution to the respective economies: and will expand educational and research career opportunities in science & engineering

As part of its overall remit to encourage both national and international collaboration, and specifically in the context of North-South initiatives in science and technology, Science Foundation Ireland (SFI) strongly encourages research collaboration between SFI funded researchers and researchers in Higher Education Institutions (HEIs) in Northern Ireland. To facilitate such collaborations, SFI will accept applications from existing SFI award holders (under the PI, Research Professor, PIYRA, PICA, CSET & SRC Programmes) for supplementary awards to fund collaborative projects with researchers in HEI's in Northern Ireland. These projects should be directly related to, and enhance, existing SFI peer-reviewed programmes.

For information on these two Initiatives see the following:

[Science Foundation Ireland: US Ireland R&D Partnership Programme](#)

[Science Foundation Ireland: North-South Research Partnership](#)

This trend is set to continue with assistance from EU funding through the Interreg IVa Programme.

Ireland's clusters map



There are also examples of clusters that have developed independently of any government-sponsored initiative or programme. One such example is Midas MultiMedia (M3) which is a creative and digital media cluster situated on the M1/A1 corridor between Dublin and Belfast. Local development groups in the northeast region facilitated the development of this cluster.

Clusters have arisen in sectors such ICT, bio/pharma and internationally traded services. Clusters are also emerging that have potential for significant cross-border activity between both parts of Ireland such as health/biotechnology, polymer and plastics sectors. These are being developed with the support of InterTradeIreland, Enterprise Ireland and IDA Ireland. Strategic cooperation between Enterprise Ireland, Invest Northern Ireland (the industrial development agency in Northern Ireland) and InterTradeIreland provides the critical mass to accelerate the development of all-island world-class companies.

Initiatives which have a cluster development component include:

- **Strategic Research Clusters:** This initiative funded by Science Foundation Ireland (SFI) provides support for linking researchers in academia and industry currently within twelve Strategic Research Clusters ;
- **Centres for Science, Engineering and Technology:** Science Foundation Ireland has funded the establishment of currently nine Centres for Science, Engineering and Technology with the aim of significantly advancing knowledge and exploiting opportunities for discovery and innovation — these Centres involve research partnerships between Irish universities and leading multinational companies;
- **Competence Centres:** This initiative jointly promoted by IDA Ireland and Enterprise Ireland involves the establishment of collaborative entities led by industry and resourced by highly-qualified researchers associated with research institutions who are empowered to undertake market focused strategic research for the benefit of industry. The objective of the Competence Centre initiative is to achieve competitive advantage for industry in Ireland by accessing the innovative capacity of the research community;
- **Technology Transfer Offices:** The Government is committed to significantly increasing the support for Technology Transfer Offices in third-level institutes to ensure better economic returns from R&D investment — these offices work with the researchers to identify commercial opportunities, negotiate with enterprises, and protect and manage intellectual property;
- **Industry-Led Networks Pilot programme:** Enterprise Ireland is currently providing funding for such activities through its Industry-Led Networks Pilot programme, which is designed to support industry-led networks

undertaking collaborative projects that contribute in some way to national economic objectives;

- **Innovation Partnerships:** Supports joint R&D projects involving companies and colleges, where the bulk of the R&D is carried out within a third level institute or a public research organisation. Funding is provided to the research performing body, which also receives support from the collaborating company.
- **Applied Research Enhancement:** This programme provides funding for the establishment of applied research centres in Institutes of Technology, aimed at building sufficient scale to allow them to make an impact on industry in their locality through collaboration. Support is provided to Institutes of Technology to cover the capital, personnel, materials and other directly associated costs.
- **Skillnets:** Skillnets is an enterprise-led support body dedicated to the promotion and facilitation of learning as a key element in sustaining Ireland's national competitiveness. Skillnets supports over 150 networks of enterprises in Learning Networks, which are led and managed by the enterprises themselves;
- **Fusion:** Fusion is an ongoing all-island network initiative managed by InterTradeIreland that supports business innovation and increased capability by developing and facilitating partnerships and projects between businesses, higher education institutions and graduates.

5. Clusters

There are a number of major clusters in Ireland which involve several desirable aspects of a national system of innovation:

- Close linkages between industry and higher education;
- Effective knowledge flows between suppliers and customers; and
- Collaborative, focused attention to common problems.

The three major cluster groupings in Ireland are Bio/pharma, Information and Communications Technology (ICT) and internationally traded services.

Each of these three clusters is described in more detail below.

For details of current Science Foundation Ireland-funded Strategic Research Clusters see:

[Science Foundation Ireland: Strategic Research Cluster Awards](#)

5.1 Bio/pharma cluster

The bio/pharma cluster incorporates a number of important sub-sectors including pharmaceuticals, pharma, biotechnology and medical devices.

The first foreign direct investment in the Irish bio/pharma sector began almost 40 years ago when Squibb (now Bristol-Myers Squibb) became the first overseas pharmaceutical company to locate in Ireland. Since then Ireland has become a key global location for the bio/pharma sector.

Currently thirteen of the top fifteen bio/pharma companies in the world have substantial operations in Ireland. In total, there are eighty-three facilities employing more than 17,000 people in Ireland.

The Pharmaceutical sub-cluster in Ireland is supported by a sophisticated infrastructure of serviced sites, public utilities as well as specialist support companies and services.

There is a significant geographical congregation of pharmaceutical companies in the Cork city area and significant linkages have been established with the two main higher education institutions in Cork, University College Cork and Institute of Technology, Cork. Additionally, the Cork pharmaceutical cluster is supported by a range of business services in areas such as plant design, construction, supply chain and recruitment services.

There are also smaller geographical groupings of pharmaceutical companies in the mid-west and south-east regions. In Dublin, Wyeth, which has been operating in Ireland since 1974, has established one of the largest integrated biopharmaceutical campuses in the world. It is the only facility in Europe to manufacture biotech, vaccines and small molecules under one roof.

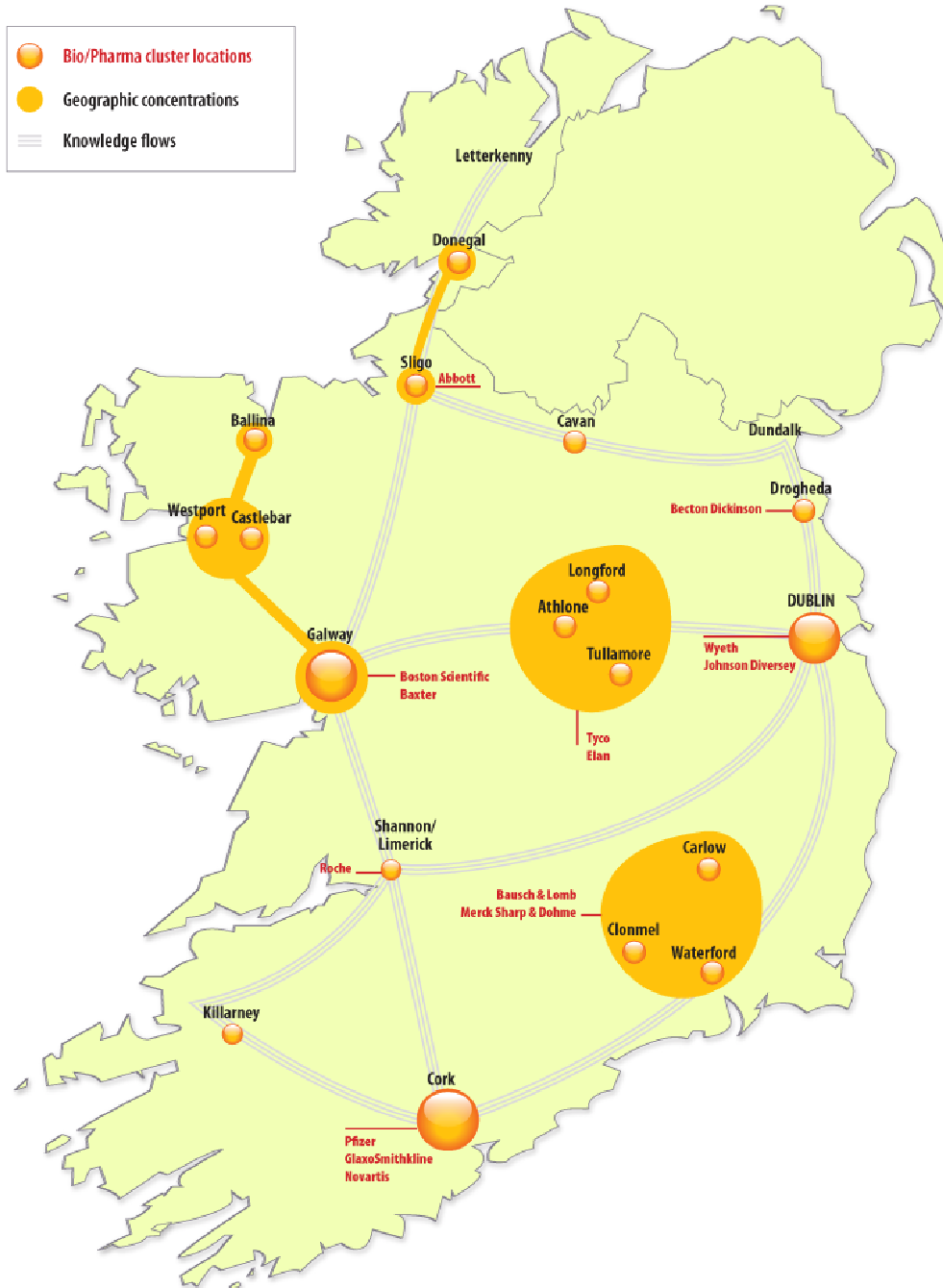
The bio/pharma cluster also incorporates a medical devices cluster based primarily around Galway city which originated with the arrival of several large multinational companies. This in turn created the development of an indigenous sub-supply base and, assisted by Enterprise Ireland, a number of these Irish-owned companies have become significant international players in their own right within the medical device sector.

Sligo and the midlands region are also medical device “hot-spots”.

The bio/pharma cluster in Ireland is commencing a new phase of development triggered by the multi-billion euro investment that the Irish Government is making in basic research in biotechnology and ICT. This investment is being co-ordinated by Science Foundation Ireland which is spearheading initiatives to forge closer links between Ireland’s higher education institutes and industry.

The map below illustrates the main geographic locations of the bio/pharma clusters in Ireland and highlights some of its leading companies.

Ireland's bio/pharma cluster map



5.2 ICT cluster

The Information and Communications Telecommunications cluster owes its origins to Ireland's success in attracting leading computer hardware and software companies to locate their European manufacturing and service operations in Ireland. These companies include Intel, Dell, IBM, Microsoft and Apple to name but a few.

The decision of these industry majors to locate in Ireland had a number of beneficial impacts. Firstly, it led to many of their major sub-suppliers such as RR Donnelly (Banta) to also establish operations in Ireland. Secondly, it created a demand for goods and services that many indigenous companies were able to supply. One of the spillovers from the presence of major OEMs in Ireland is a highly successful indigenous software sector. Today, the ICT cluster in Ireland which comprises of over 220 companies employs nearly 40,000 people and accounts for €50 billion in exports.

The ICT cluster in Ireland has three main locations: Limerick where Dell has a major manufacturing operation, Cork (Apple Computer) and Dublin where Intel, IBM and Microsoft are based. There are smaller concentrations in Galway and Dundalk.

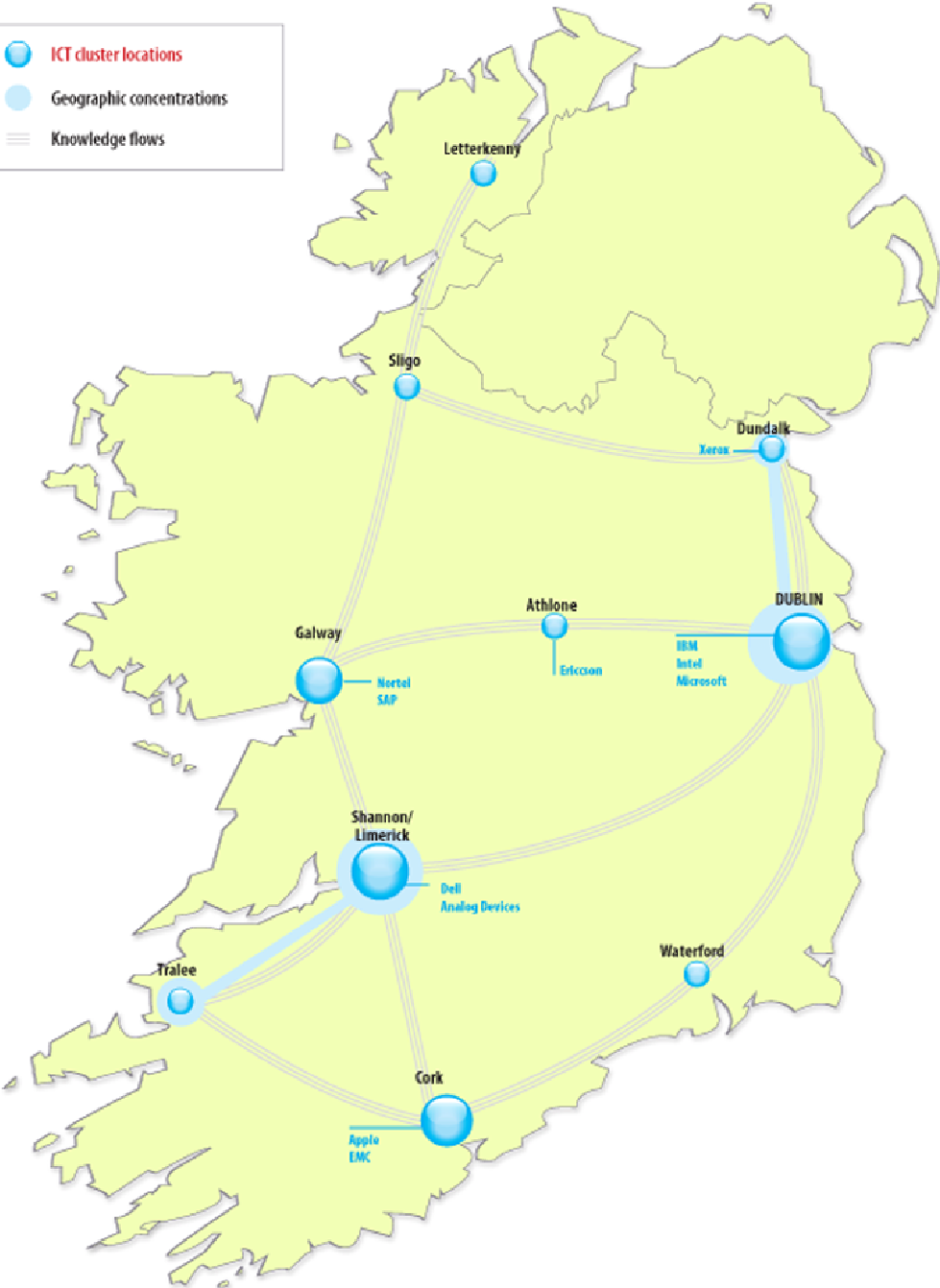
Though their initial investment in Ireland was as a manufacturing base for the European market, many of the Irish operations of these international companies are increasingly involved in research and development. They have been developing their linkages with the higher education sector in Ireland which has been the recipient of a massive expansion in Government funding for basic research in ICT.

The Tyndall National Institute is an example of the Irish Government's approach to increase linkages not only between the higher education institutions in Ireland but also with industry. Tyndall which was established in 2004 brings together the complementary activities in photonics, electronics and networking research of University College Cork and Cork Institute of Technology. Tyndall's objective is to be a focal point for ICT research in Ireland and with the backing of substantial Science Foundation Ireland funding it has formed research clusters with international and indigenous companies in Ireland such as Intel and Alcatel.

The main ICT cluster locations are shown in the map below.

Ireland's ICT cluster map

- ICT cluster locations
- Geographic concentrations
- ≡ Knowledge flows



5.3 Internationally traded service cluster

In recent years, Ireland has witnessed an explosion in exports from its burgeoning service sector. The rapid growth of Ireland's internationally traded service sector has been fuelled by a number of factors. The first has been the diversification of business support activities undertaken by foreign companies in Ireland. These companies originally set up manufacturing facilities in Ireland and then increasingly added business support functions including shared services, logistics management, data centre hosting and technical support services. Apple Computers is a good example of this. It established its European manufacturing plant in Cork in 1978 and while production of its products has been largely outsourced to the Far East, employment in Cork has increased substantially because Apple Ireland now hosts a range of service divisions including European telesales, European Apple store support and European technical support.

Secondly, the success of IDA Ireland in attracting global service companies such as Google, Amazon, Yahoo and eBay to locate operations in Ireland. Google which established its EMEA headquarters in Dublin now employs over 1,200 people.

Thirdly, the decision by the Irish Government to develop the International Financial Services Centre (IFSC) in Dublin in 1987 has been another remarkable Irish success story. Dublin is now globally recognised as a leading location for a range of internationally traded financial services, including banking, asset financing, fund management, corporate treasury management, investment management, custody and administration and specialised insurance operations. The IFSC is host to half of the world's top 50 banks and to half of the top 20 insurance companies. Merrill Lynch, Sumitomo Bank, ABN Amro, Citibank, AIG, JP Morgan (Chase), Commerzbank, BNP and EMRO are just some of the big-name operations that have chosen to locate in the Centre.

Lastly, the increased focus of Enterprise Ireland on the development of the indigenous internationally traded service companies has paid dividends. A number of smaller clusters and networks have been established in the digital media sectors including the Digital Hub in Dublin and the Midas Multi-Media in the north-east.

The map below illustrates the main locations of the internationally traded service sector in Ireland.

Ireland's internationally traded services (ITS) cluster map



6. Further information

More information on clusters and networks in Ireland can be obtained through the links below:

Government of Ireland	www.irlgov.ie
Department of Enterprise, Trade and Employment	www.entemp.ie
Forfás	www.forfas.ie
IDA Ireland	www.idaireland.com
Enterprise Ireland	www.enterprise-ireland.com
Science Foundation Ireland	www.sfi.ie
FAS	www.fas.ie
Shannon Development	www.shannondev.ie
County and City Enterprise Boards	www.enterpriseboards.ie
Skillnets	www.skillnets.com
InterTradeIreland	www.intertradeireland.com
Higher Education Authority	www.hea.ie
Irish Universities Association	www.iua.ie
Institutes of Technology Ireland	www.iota.ie
Royal Irish Academy	www.ria.ie
Central Statistics Office	www.cso.ie
Irish Business and Employers Confederation	www.ibec.ie
Irish Congress of Trade Unions	www.ictu.ie