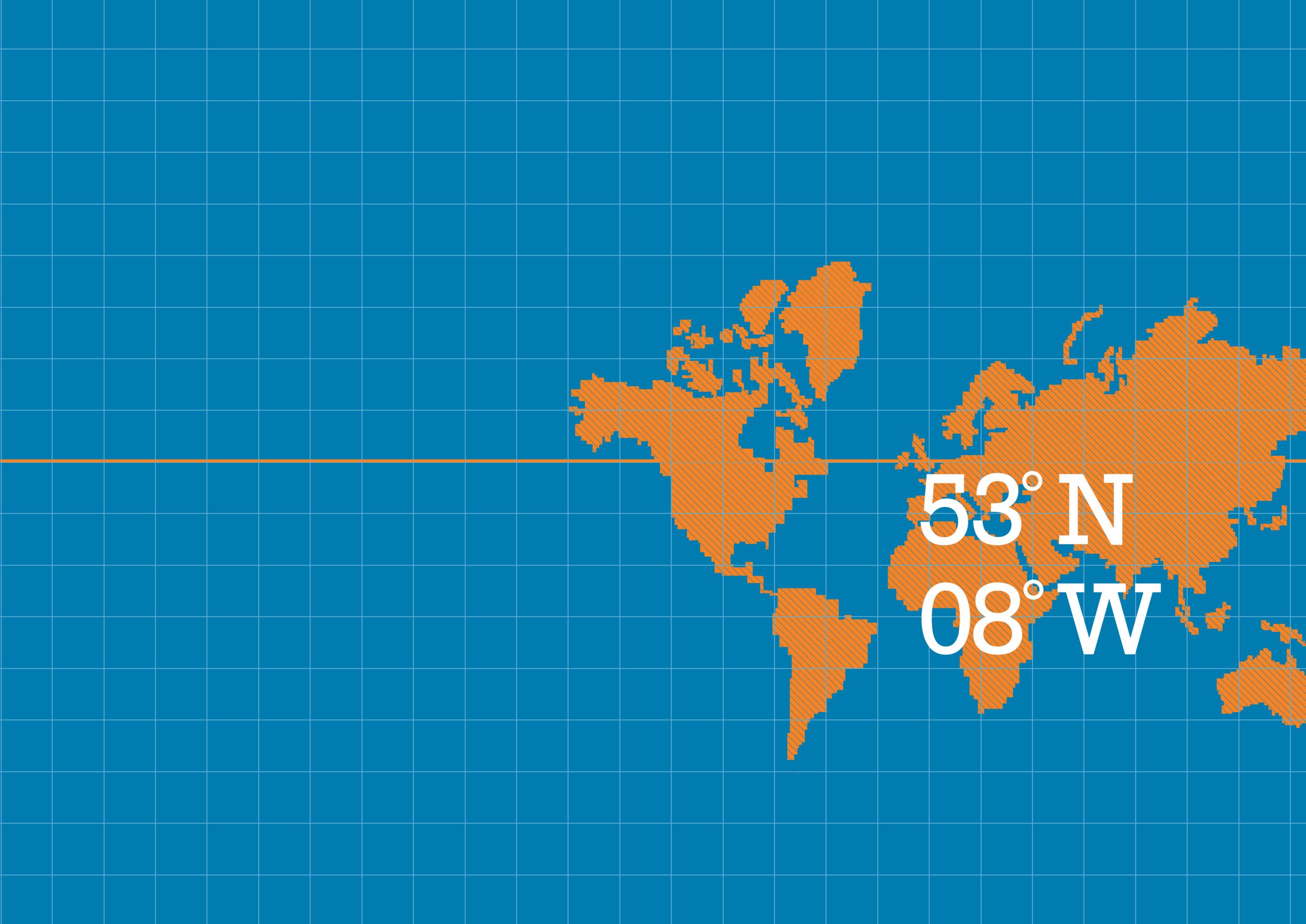
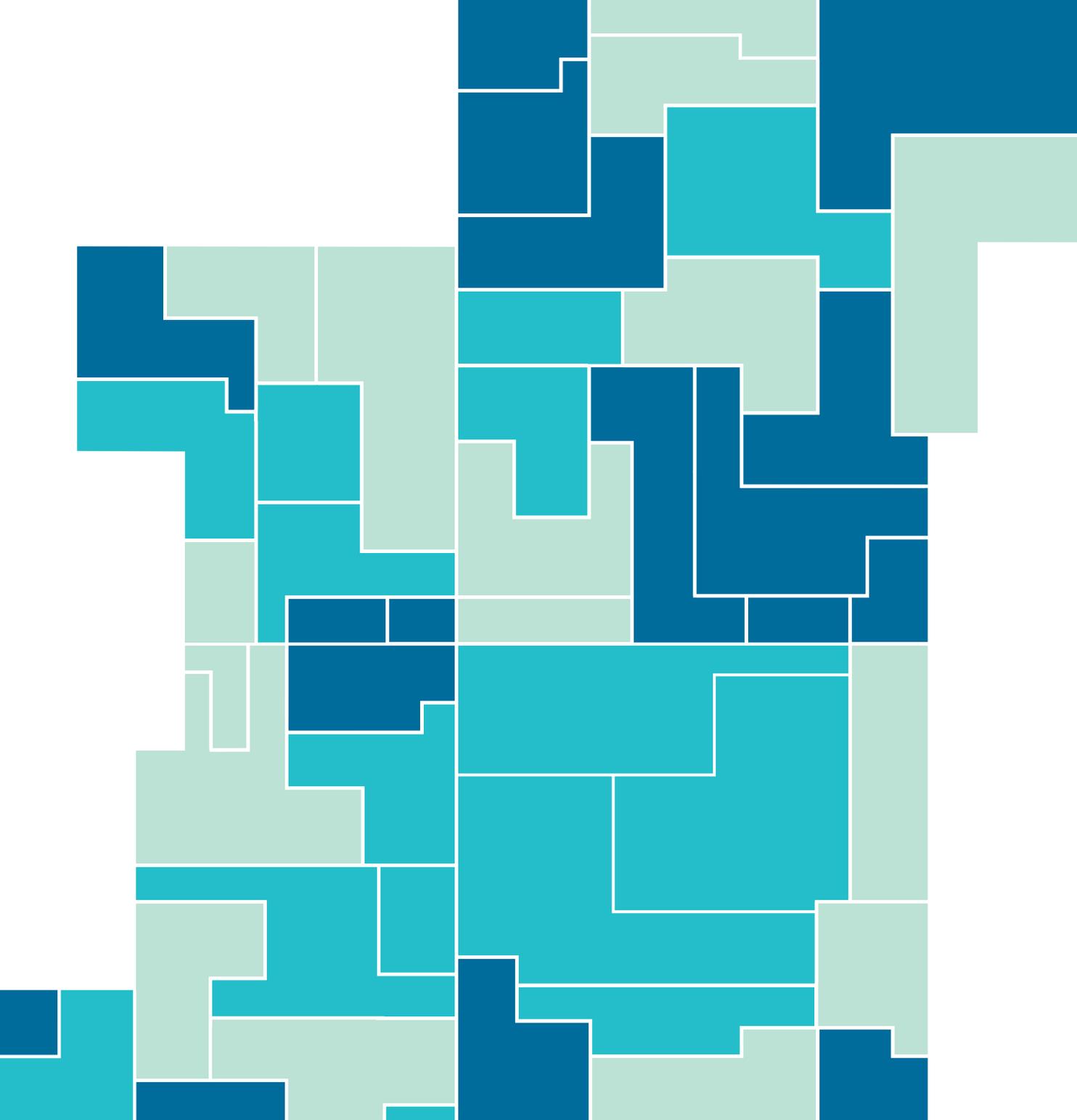


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IRELAND°
A WINNING PROPOSITION FOR
HIGH VALUE MANUFACTURING



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01_IRELAND – A PRIME LOCATION FOR HIGH VALUE MANUFACTURING

Global companies choose Ireland as a manufacturing location because of our highly-skilled workforce, low tax and pro-business environment.

The manufacturing sector has undergone enormous change in the last twenty years. Globalisation, technology advances and the growth of emerging market economies have driven ever-increasing competition. One response by MNCs has been a new focus on optimising the global supply chain.

Ireland has adapted to these changes. We have moved our manufacturing facilities up the value chain and expanded their activities so that many have become strategic sites for their parent companies. This transition has been achieved by targeting high value manufacturing operations which are knowledge, capital and skills intensive. It has been facilitated by an Irish workforce with a reputation for adaptability, creativity and innovation.

A unique feature of the Irish business environment is the productive collaboration between industry, academia and Government agencies. These stakeholders work together as a national team to consolidate Ireland's position as a knowledge-based economy and as a prime location for high value manufacturing incorporating Research, Development and Innovation (RD&I).

IDA Ireland works closely with companies to ensure that they have the facilities, resources and support that they need to establish and expand their high value manufacturing operations. We ensure they continue to flourish here as a key component of Ireland's future economic success.

IRELAND: YOU WILL BE IN GOOD COMPANY



02_CHANGES AND CHALLENGES IN MANUFACTURING TODAY

Globalisation, the rapid development of communications technologies and the growth of emerging market economies present profound challenges to the traditional manufacturing sector.

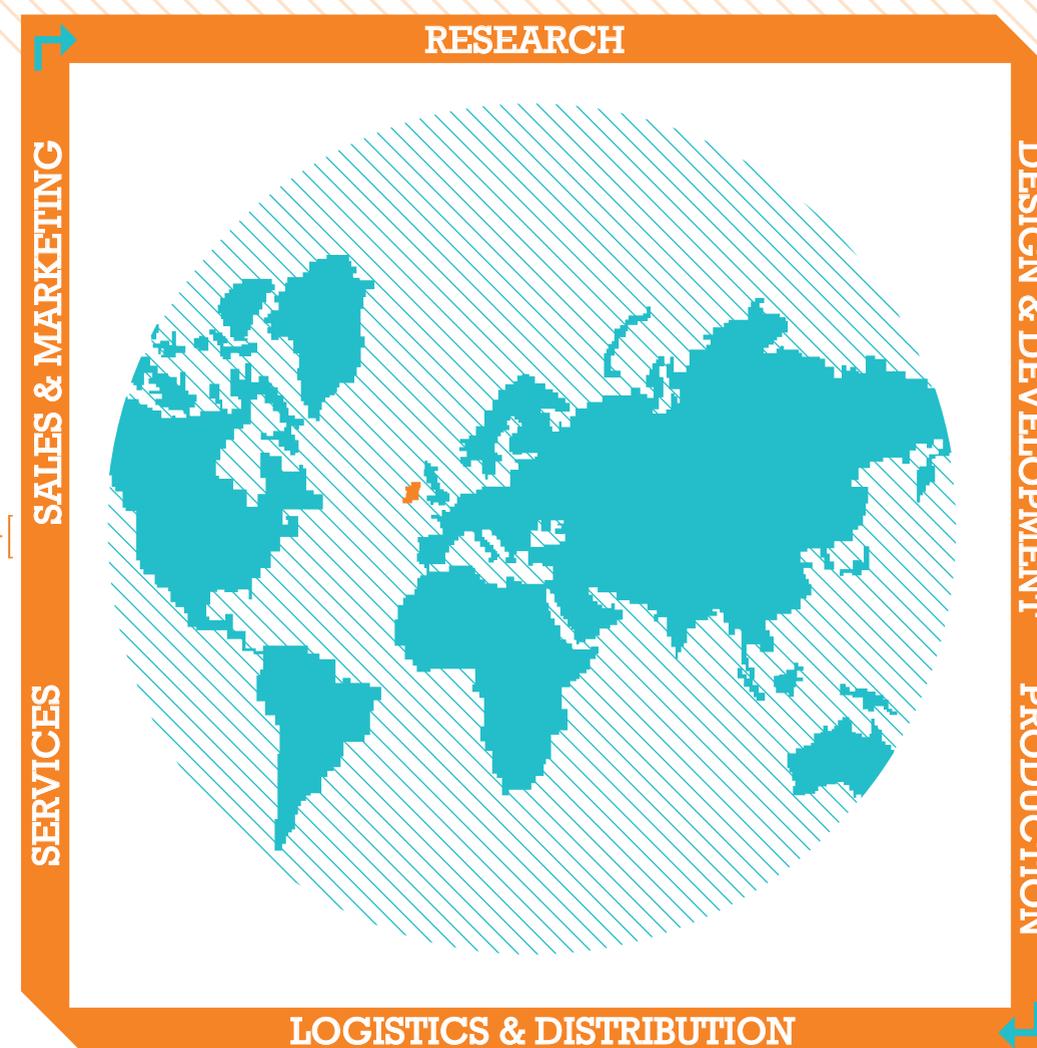
As companies focus on optimising their global supply chains, there is an increasing differentiation between the manufacture of low-cost, relatively basic goods and the manufacture of high value products requiring high-level skills and processes.

In the high value sector there is a demand for value added not just in production but across the whole product lifecycle from RD&I to design, distribution, marketing and support services. Building and sustaining competitive advantage needs advanced skills, expertise and experience spanning this complex range of activities.

The challenges driving change are also creating new opportunities: access to global supply networks is easier than ever before while increasing convergence between different sectors and technologies is generating potential for new manufacturing opportunities.

Clean technology manufacturing opportunities also exist for companies operating in Ireland, through for example, the development of renewable energy generating systems or less energy intensive processes and services in support of low carbon activities.

+_AN EXTENDED DEFINITION OF HIGH VALUE MANUFACTURING



Manufacturing today encompasses a broad range of activities from research and development through design, production, logistics and distribution to marketing and after sales service.

03_FOCUS ON HIGH VALUE MANUFACTURING IN IRELAND

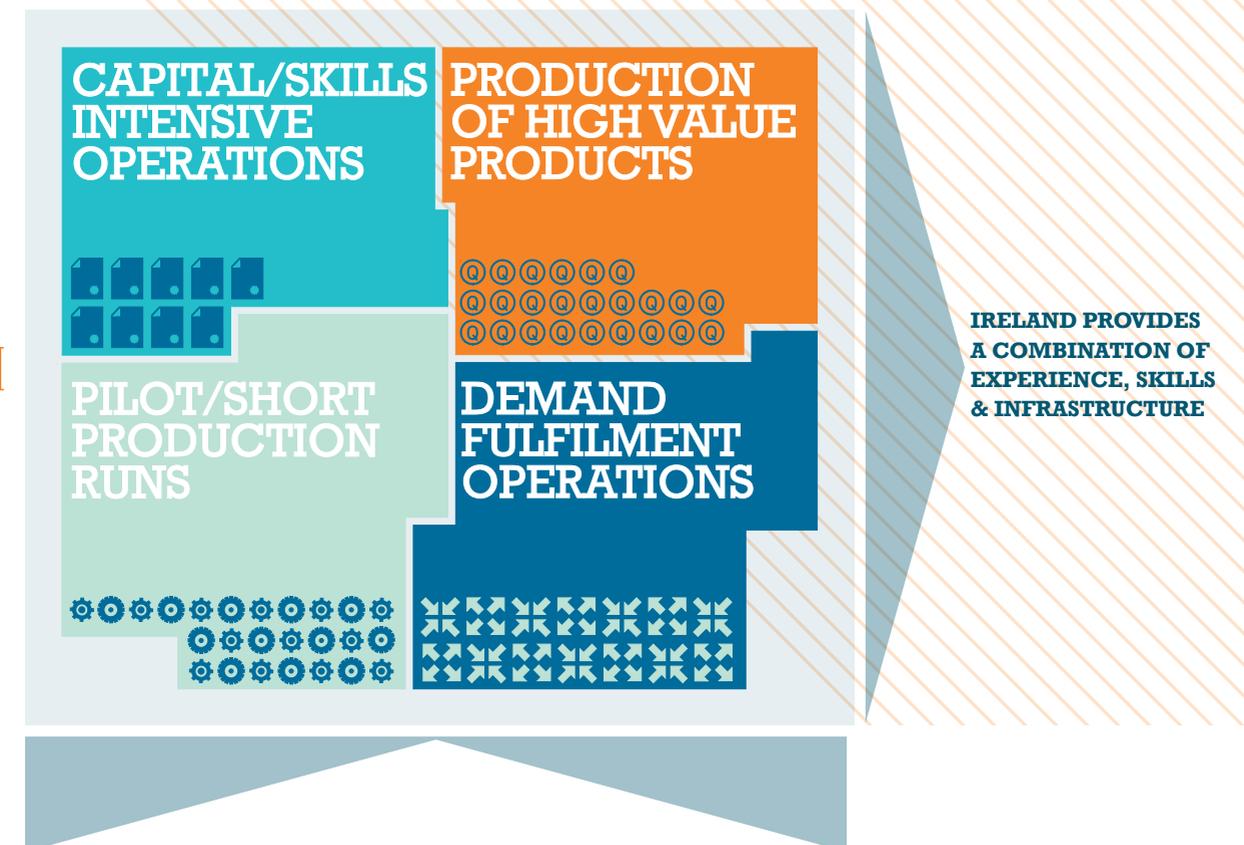
Ireland offers a highly-skilled workforce, world-class Research, Development and Innovation (RD&I) and advanced manufacturing technologies that deliver continuous innovation and sustainable success in high value manufacturing. Global companies in the Life Sciences, ICT and Engineering sectors, like Merck, Apple and ABB have been in Ireland for more than 30 years and have expanded their Irish manufacturing operations to span the full range of business functions.

Working with companies of this calibre, Ireland has developed value propositions for four distinct areas of high value manufacturing where we offer an unbeatable combination of experience, skills and infrastructure.

1. Capital and skills intensive operations
2. High value products
3. Short production/pilot runs
4. Demand fulfilment

Longstanding and recent MNCs in Ireland are now availing of Irish expertise by operating strategic high value manufacturing sites in one or more of these four areas. The following sections explain how Ireland provides the optimum conditions for these facilities to flourish.

+_MANUFACTURING VALUE PROPOSITIONS



SUPPORT FOR COMPANIES MAKING THE REQUIRED CHANGES TO BE AT THE LEADING EDGE IN TERMS OF PRODUCTION PROCESSES, GLOBAL BUSINESS MODELS AND ORGANISATIONAL STRUCTURES.

*CAPITAL AND SKILLS INTENSIVE OPERATIONS

Examples include: Pharmaceutical, biotechnology and semiconductor fabrication operations where labour as a proportion of total cost is low.

Sector essentials: These operations require high-level skills as well as the abilities to protect Intellectual Property Rights (IPR) and satisfy stringent regulatory requirements.

Ireland's Unique Value Proposition:

- › Availability of strategic serviced site solutions, some with pre-approved planning
- › Plant engineering and construction expertise
- › Experience in managing large-scale construction projects
- › Process engineering expertise
- › Developed sub-supply base
- › Skilled and experienced technical workforce
- › Excellent record in FDA compliance
- › Strong IPR legal protection
- › 12.5% Corporate Tax rate

CASE STUDIES

+ Intel Corporation

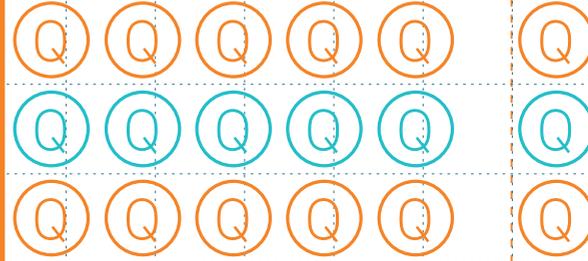
Intel has been operating in Ireland since 1989. Today Intel employs 5,000 people in Ireland and the Intel Technology Campus Europe is their largest site outside the United States. The campus is home to two semiconductor wafer fabrication facilities – Ireland Fab Operations (IFO) and Fab 24. IFO is critical to the Intel Fab network and has the highest product mix and most complex processes of Intel operations worldwide. Fab 24 is one of Intel's most technologically advanced, high volume manufacturing plants building multi-core processors. The Campus is also home to the Intel Innovation Centre (IIC) which has global responsibility to research and develop innovative IT solutions and associated technologies and The Technology Research for Independent Living (TRIL) Centre, with Dublin City University (DCU). TRIL is part of Intel's Digital Health Initiative and works on technology to enable older people to live independently.

+ Johnson & Johnson

Johnson & Johnson has more than 250 operating companies in 57 countries employing 119,400 people. Their family of companies includes the world's largest and most diverse medical devices and diagnostics company; the world's third largest biologics company and the sixth largest pharmaceutical company in the world. Johnson & Johnson has been operating in Ireland since the 1920's and today has six operations in Ireland manufacturing medical devices such as drug delivery systems, orthopaedic devices and contact lenses by Cordis, DePuy and Vistakon and pharmaceuticals and biopharmaceuticals by Alza, Janssen and Centocor. These operations employ over 1,800 people. J&J also has a sales and marketing and European Treasury operation in Ireland employing 300 people.

+ Takeda Pharmaceutical Company Limited

The largest pharmaceutical company in Japan and a global industry leader, Takeda first set up operations in Ireland in 1997 manufacturing products for the European and US markets. The formulation plant manufactures three of Takeda's top-selling drugs for the European/US markets. As sales grew, Takeda chose Dublin as the location for its first active pharmaceutical ingredient (API) facility outside of Japan: Ireland's experience in the manufacture of ingredients and finished products for the pharmaceutical industry, highly skilled workforce and proximity to key markets were the main deciding factors. The new API facility manufactures ingredients for new products for clinical trials right through to full commercialisation.



*PRODUCTION OF HIGH VALUE PRODUCTS

Examples include: Medical equipment and high value engineering products.

Sector essentials: IPR protection, quality control and advanced manufacturing practices that meet international regulations are of crucial importance.

Ireland's Unique Value Proposition:

- › Excellent reputation as a centre of manufacturing excellence and advanced manufacturing management practices (e.g. Lean, Six Sigma, Kaisen and Kanban)
- › Experienced manufacturing operations management
- › Strong technical skills
- › Flexible, proactive workforce with a reputation for adaptability and continuous improvement in efficiency
- › Experience and skills to manage complicated supply chains on an international scale
- › Long experience in supplying international markets
- › Strong track record in logistics management
- › 'C' mark accreditation in Europe for new medical technology products
- › 12.5% Corporate Tax rate

CASE STUDIES



+ Liebherr

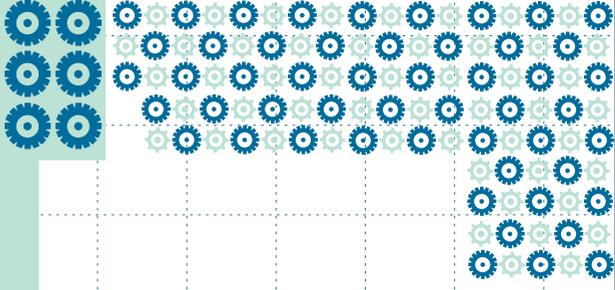
Liebherr International AG, the German, family-owned, leading manufacturer of cranes and construction machinery has been in Ireland since 1958. By the mid-'70s the Irish facility had responsibility for worldwide R&D, design, manufacturing, marketing, installation and after-sales service of Liebherr's container cranes. The facility has continuously improved its technical ability and in 2004 Liebherr Ireland started a strategic expansion of RDI activities to develop new products from concept, to production, to product launch and to manage on-going enhancements and modifications. The company employs 560 people in Ireland.

+ Medtronic

Global leading medical technology company Medtronic has been manufacturing vascular products in Ireland for over 20 years. Production of lower-value products was transferred overseas, while the Irish operation has moved up the value chain to develop and manufacture stents, stent delivery systems and angioplasty balloons, all requiring complex technology and advanced manufacturing techniques. The excellent RDI and production performance of the Vascular Division's facility in Ireland led to Medtronic setting up a Cardiac Rhythm Management Division in 2002 to develop and manufacture products used in heart failure therapy applications. Medtronic Ireland is now a strategic manufacturing site, fully integrated from product development and manufacturing through to customer service employing 1,750 people. The company is also involved in several Irish industry/academic collaborations, including REMEDI, the Regenerative Medicine Institute based at the National University of Ireland (Galway).

+ Millipore

Millipore Corporation is a life sciences industry leader, producing a broad portfolio of products, tools and services for bioscience research and biopharmaceutical manufacturing. Millipore Ireland is recognised as a key quality manufacturing and innovation site within Millipore Corporation and today the Irish operation manufactures 85% of Millipore's global membrane output and 100% of its life sciences device output. In 2008, Millipore Ireland opened a new IC2 Membrane Casting Area which will double production capacity.



*PILOT OR SHORT PRODUCTION RUNS

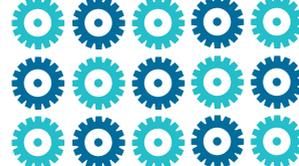
Examples include: Pharmaceutical and biotechnology operations where clinical trial batches of product are made either for regulatory testing and approval or for high volume manufacturing validation.

Sector essentials: High level skills to manage product development, implement rigorous testing procedures, meet international regulatory requirements and protect IPR.



Ireland's Unique Value Proposition:

- › Excellent reputation for product development and innovation
- › Experience in applying technical engineering skills to product enhancement
- › Experience in customising products to meet needs of different markets
- › Ability to formulate existing products to prolong life cycles in European markets
- › Combined technical, logistical, customer support and communications strengths to enable rapid response to market changes
- › 12.5% Corporate Tax rate



CASE STUDIES

+ **Merck & Co. Inc**

Merck & Co. Inc, a leading global healthcare company and seventh largest pharmaceutical company in the world, has been in Ireland since 1976. The company recently began construction of its third Irish manufacturing plant, a strategic facility that will support Merck's expanding global business in human vaccines and biologics. The highly skilled workforce at the new site will be involved in the research, development, manufacture and marketing of vaccines and medicines that address worldwide medical needs.

+ **Pfizer Inc**

Pfizer Inc, the world's largest pharmaceutical company, set up operations in Ireland in 1970 and in 2008 announced that it would construct a new €190 million biologics facility near its existing manufacturing site. Biologics are large-molecule medicines based on proteins, peptides and antibodies that primarily come from molecular biology developments: their manufacture requires highly specialised and controlled processing plants. The new facility will develop and produce small-scale quantities of products entering into phases two and three clinical trials. This will be the first time Pfizer has placed its internal biopharmaceutical clinical production and process development activities outside of the US.

+ **Genzyme**

Genzyme Corporation of Cambridge Massachusetts set up a multi-phase manufacturing facility in Ireland in 2001. Phase one saw the establishment of a state of the art pharmaceutical facility and the establishment of laboratory and a pilot plant R&D facility, which is involved in the development of tablet manufacturing processes and the development of further product line extensions. The company then established a sterile facility for the formulation and filling of biological proteins and enzymes (biopharmaceuticals) and in 2004 the company set up a liquid and capsule development centre. This centre manufactures clinical materials in both liquid and capsule format and develops formulations of these dosage forms. Genzyme has since expanded the scale of on-site activity to incorporate additional products areas and employs 600 people.



*DEMAND FULFILMENT OPERATIONS

Examples include: A wide range of industries where the plant is the hub for supply chain management and close proximity to markets is crucial.

Sector essentials: Ability to respond rapidly to short-term demand peaks and market trends combined with a flexible workforce and technical skills.



Ireland's Unique Value Proposition:

- › Proven ability to ramp up production volumes at short notice
- › Workforce with reputation for flexibility and adaptability
- › Proximity to major European markets
- › Multilingual workforce with excellent customer relationship skills
- › Minimum restrictive work practices and ability to use temporary workers when needed
- › Excellent logistics planning and experience in the use of IT in flexible manufacturing systems
- › 12.5% Corporate Tax rate



CASE STUDIES

+ Apple

Apple's Irish operation was set up in 1980 to manufacture the Mac computer. The facility has expanded its mandate to become a centre of excellence across a broad range of functions including advanced manufacturing, financial shared services, supply chain management, customer and technical support, telesales, treasury, software testing and localisation. The successful integration into Ireland of functions and processes previously located in various locations across Europe, has added real value to Apple Inc. The availability of a highly skilled, multi-disciplinary workforce has been a key factor in Apple's ongoing expansion of its Irish operation. Apple's Irish facility is now the headquarters for the EMEA region and employs 1,400 people.

+ Cameron

Cameron, one of the world's leading providers of oil and gas pressure control equipment and services to the global oil and gas exploration industry, set up in Ireland in 1978. The Irish operation has specific responsibility for the manufacture of sub-sea chokes and actuators for the oil and gas exploration markets. The products are used in drilling operations to regulate the flow of oil and gas both at sub-sea level and above the surface. The Irish operation has evolved to take on the manufacture of new products, extending its mandate and its markets. In 2004 the company set up an R&D Centre which has resulted in the development and manufacture of new products. In 2008 Cameron expanded its manufacturing and R&D facility in Ireland as a result of its highly successful track record in the R&D and manufacturing of critical components.

+ EMC

EMC Corporation, a world leader in information infrastructure solutions, established its first international manufacturing facility in Ireland in 1988 and has grown to become the most diversified of all EMC's facilities. The Irish operation now has responsibility for a broad cross-section of functions including manufacturing, international customer support, sales, technical solutions and international finance. In 2008 EMC announced a major RD&I investment focusing on software development for EMC's storage systems and resource management software products. Today the company employs 1,600 people in Ireland.

04_DELIVERING FOR HIGH VALUE MANUFACTURING

Ireland provides a competitive high value manufacturing location for foreign companies enabled by the pragmatic, pro-business approach of the Irish Government, a 12.5% corporate tax rate and a 25% tax credit for RD&I.

Ireland's Universities and Institutes of Technology provide companies with a pool of highly educated people with the right skills and they play a vital role in the research landscape.

Ireland's **Centres for Science, Engineering & Technology (CSETs)**, supported by Science Foundation Ireland (SFI), link scientists and engineers from academia and industry to work on leading-edge research. Three examples are:

- › The **Centre for Research on Adaptive Nanostructures & Nanodevices (CRANN)** based in Trinity College Dublin, with collaboration from Intel and Hewlett Packard
- › The **Tyndall National Institute**, a leading centre for European semiconductor research, based in University College Cork with industry participants including IBM, Sony, Analog Devices, Siemens, ST Microelectronics, Infineon and Philips Semiconductor

- › The **Biomedical Diagnostics Institute (BDI)**, based at Dublin City University carries out cutting edge research programmes focused on the development of next generation biomedical diagnostic devices. Industry partners include, Becton Dickinson & Co., Hospira and Analog Devices. Other academic institutions involved in the BDI are the National University of Galway, the Royal College of Surgeons and the Tyndall National Institute

The **National Institute for Biotechnology Research and Training (NIBRT)** established by IDA Ireland, is an innovative collaboration between four leading academic centres on world-class research and training programmes in biotechnology, ensuring an ongoing supply of skilled Irish workers for the sector.

IDA Ireland in partnership with Enterprise Ireland is also involved in establishing industry led applied research **Competence Centres**, staffed by highly qualified researchers from industry and academia working on market-focussed RD&I in specific industry areas, including manufacturing technologies and productivity enhancement. Current projects are in technology areas such as applied nanotechnology, energy efficiency in manufacturing, advanced manufacturing productivity, bioenergy, composites materials, and advanced CMOS circuit design.

05 _THE IRISH ADVANTAGE

Ireland is a proven location for high value manufacturing with a successful track record across industry sectors. Our success is based on the unique combination of benefits we offer to global business:

- › A stable political environment and respected regulatory regime
- › A pro-business environment with a 12.5% corporate tax rate, tax credits for RD&I activities and an extensive double tax treaty network with 45 countries
- › A high-skills, knowledge-based economy delivering quality, highly productive employees with excellent technical, managerial and multi-lingual customer service skills
- › A reputation for flexibility, responsiveness and innovation
- › Forty years' experience working with MNCs to establish and expand operations across a wide range of sectors
- › Clusters of global leaders in key high tech industries including pharmaceuticals, medical devices and ICT
- › Experienced and innovative leaders focused on proactively identifying and solving business challenges
- › Strong Government support for RD&I focused on highly productive alliances between industry and academia
- › Excellent legal expertise for the exploitation and protection of intellectual property rights

+ _CONTACT IDA IRELAND



IDA Ireland offers information, advice and ongoing support to companies setting up or expanding High Value Manufacturing Operations in Ireland. Support is available to companies making the required changes to be at the leading edge in terms of production processes, global business models and organisational structures.

IDA Ireland is Ireland's inward investment promotion agency. The agency works with foreign companies to secure new investment and collaborates with existing foreign investors in Ireland to help expand and develop their businesses. To learn more log on to www.idaireland.com or contact any IDA office.

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