



PRIORITY AREA L
MANUFACTURING COMPETITIVENESS ACTION PLAN
JULY 2013

Manufacturing Competitiveness (Priority Area L)

Context

The Forfás Strategy for Manufacturing 2020: Making it in Ireland, emphasises the importance of maintaining a focus on production - the manufacturing of things - as a key element of economic policy. By 2020 manufacturing will be different from what it is today. European research has identified three types of factories at the forefront of these new models, each with primary characteristics, namely: Smart, Virtual and Digital. In broad terms they are characterised as follows:

- Smart Factories offer agile manufacturing (flexibility and short-time cycles) and customisation involving process automation control, planning, simulation and optimisation technologies, robotics, and tools for sustainable manufacturing; Smart factories are underpinned with Lean and ICT systems, characterised as energy efficient, reliable, and cost-effective production operations.
- Virtual Factories are global networked operations built on pervasive ICT systems. Seamless integration of intelligence from all aspects of the business (regardless of where located and including external partners and suppliers) facilitate and drive decision-making. In simple terms, a complex global network of operations functions as one.
- Digital Factories offer greater simulation, modelling, evaluation and knowledge management and deliver enhanced Product Lifecycle Management (PLM) from the product concept level through to manufacturing, maintenance and disassembly/recycling; and facilitate better real-time decision making and quality control throughout the production process.

The Challenge

A key driver of the manufacturing industry is competitiveness. Competitive manufacturing employs a systematic approach to produce high quality products, components and materials at the least cost and with the least waste. Competitive manufactures use highly talented innovative people to design and develop products and processes that utilise inputs such as materials, components, energy and scientific knowledge. These inputs are then transformed into innovative products that both define and meet customer needs. Ireland needs to be internationally known as a hub of excellence for manufacturing competitiveness in order to sustain and grow this industry nationally. Irrespective of size or ownership, the adaption and utilisation of new knowledge is critical for manufacturing competitiveness.

Publicly Funded Research Landscape

Research in this area is more focussed on horizontal research priorities around traditional and future sectors, including energy efficiency of factories, deployment of ICT and automation. According to information gathered by Forfás for input into the National Research Prioritisation Exercise, approximately 42% of active public research funding is invested in research areas of potential relevance to this priority area. This

investment has resulted in citation impact factors above world average in research areas such as materials; physics; maths; and automation and control systems. It is important to highlight that the majority of research is currently not focused on manufacturing itself and in general the research activity tends to be focus more on research than development. That said, a number of research centres exist that focus on this industry (for example, The Irish Centre for Manufacturing Research & Ireland's Energy Efficiency Research Centre). These centres host open innovation networks comprising academic researchers and industry (both Irish and foreign owned) who are jointly working to seek technological and knowledge management solutions for increased manufacturing competitiveness.

Pre-Requisite Actions

The following three reports contain recommendations that are critical for Ireland to be able to address the challenges facing today's evolving Irish based manufacturing industry.

1. The Manufacturing 2020 Strategy: Making it in Ireland, published by Forfás in April 2013.
2. The report on manufacturing skills undertaken by the Expert Group on Future Skills Needs, published in April 2013.
3. Food Harvest 2020 published by DAFM.

Manufacturing Competitiveness

Vision/opportunity: To further enhance the innovative capacity of the manufacturing base (for increased competitiveness and productivity) by harnessing new knowledge to underpin this industry with the core competencies required to be energy and resource efficient, ICT enabled, and a leader in quality. By 2020 Ireland will be:

- Creating more resource efficient and effective manufacturing systems;
- Securing manufacturing technologies against scarcity of energy and other resources;
- Creating innovative products and processes by embracing leading edge technologies;
- Developing new agile, more cost effective manufacturing processes and technologies; and
- An internationally recognised hub for “quality” in manufacturing.

PRIORITY AREA L: MANUFACTURING COMPETITIVENESS

Objective 1	To fund research to meet the strategic needs of the manufacturing industry for increased competitiveness.
Objective 2	To ensure the availability of appropriately skilled researchers to meet the needs of industry and to ensure that a critical mass of researchers is in place to deliver on the vision.
Objective 3	To create an environment to bring together the necessary disciplines from enterprise and academia, and also drawing on the relevant State functions (e.g. regulators), to work collectively on opportunities in the manufacturing competitiveness area at both early stage and applied research.
Objective 4	To ensure that research is focused on: identifying potential impacts on the environment and human health; informing regulatory processes; and developing solutions to support compliance with both the regulatory environment and industrial standards.

No	Action	Deliverable	Benefit	Lead	Support	Timeline
Objective 1		To fund research to meet the strategic needs of the manufacturing industry for increased competitiveness.				
L 1.1	Adopt a coordinated approach to funding and measuring success in manufacturing research across all relevant funding agencies.	A coordinated approach to funding and measuring success in manufacturing research across all relevant funding	Co-ordination across the relevant funding agencies.	SFI EI DAFM EPA	DJEI (through TI)	Q3, 2013

No	Action	Deliverable	Benefit	Lead	Support	Timeline
		agencies.				
L 1.2a	<p>Update and maintain intelligence on the research needs of industry.</p> <p>Within this context, attention should be given to targeting engagement with the engineering / industrial products cohort which is currently under represented in terms of R&D activity.</p> <p>Information generated during the NRPE and other relevant available sources of information such as the Manufacturing Strategy, Food Research Ireland and other PAG Action Plans should be utilised.</p>	Up-to-date knowledge of the research needs underpinning the manufacturing industry across funding agencies.	<p>Better understanding of the needs of the manufacturing industry.</p> <p>Better able to position the public research system as a partner to industry.</p>	EI IDA	DAFM SFI	Q1. 2014
L1.2b	Update and maintain intelligence on research activity and research strengths relevant to this area	Up-to-date knowledge of the research landscape relevant to	Better able to position the public research system as a	SFI EI	DAFM EPA	Q1, 2014

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	<p>across the higher education sector.</p> <p>Information generated during the NRPE and other relevant available sources of information such as the Manufacturing Strategy should be utilised.</p>	manufacturing.	partner to industry.		IDA	
L 1.2c	Based on 1.2a and 1.2b, identify research gap and address gaps by utilising existing instruments.	Addressing research gaps required for delivering on the research needs of the manufacturing industry.	Better able to position the public research system as a partner to industry.	SFI	EI EPA DAFM	Q1, 2014
L 1.3	Maintain and grow Ireland's participation in EU and other international collaborative research. Within this context ensure active strategic participation in relevant research policy initiatives /	<p>Leveraging of Irish funding to access international funding.</p> <p>Establishment of valuable</p>	<p>Leveraging of Irish funding to access international funding.</p> <p>Establishment of</p>	EI	SFI EPA DAFM	Q4, 2012

No	Action	Deliverable	Benefit	Lead	Support	Timeline
	funding vehicles.	knowledge networks.	valuable knowledge networks.			
L 1.4a	The relevant funders to develop a medium term vision (with required actions) for optimising collaboration across publicly funded research groups and centres (existing and new).	A coordinated vision for optimising collaboration across publicly funded research groups and centres.	A shared vision with the required actions for optimising collaboration across publicly funded research groups and centres (existing and new).	EI IDA SFI DAFM EPA	DJEI (through TI)	Q3, 2013
L 1.4b	In the short term, continue to utilise the current and evolving research centre landscape to increase industrial collaboration with the higher education sector for manufacturing research. In the medium to long term, asses if an infrastructure deficit exists in the applied	Understanding of the infrastructure requirements for manufacturing research.	Establishment if an infrastructure deficit exists for manufacturing research and how best to address.	EI	DJEI (through TI)	Q3, 2013

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	<p>research space (for testing, prototyping etc.). Based on defined the infrastructural research needs of industry and proven industrial demand:</p> <ul style="list-style-type: none"> ▪ Explore if the extension of the R&D remit of the SFI research centres can address this need; or ▪ Carry out a feasibility study to investigate if the RTO (research and technology organisations) as described in the ACSTI study “Sustainability of Research Centre” presents as a potential applied research infrastructure for manufacturing. 					
L 1.5	Draw lessons from the experience gained in the pilot	A marketing tool to help industry	Create a sense of critical mass in	DJEI (through TI)		Q2, 2014

No	Action	Deliverable	Benefit	Lead	Support	Timeline
	initiative on branding and marketing undertaken by Technology Ireland in the context of the Therapeutics Action Plan.	<p>understand what research capability is available in Ireland and how it can meet their needs.</p> <p>An influencing tool to encourage existing and new research centres/individuals to collaborate and co-market their capability.</p>	<p>research in this area through consolidation of brands without requirement for radical increase in spend or immediate consolidation of centres.</p> <p>Unified and coherent marketing message around Ireland's research strengths in this area.</p> <p>Facilitate easier and faster access by industry to knowledge & expertise to meet specific research challenges.</p>			

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L 1.6	Coordinate and support industry co-funded programmes to enhance resource efficiency across all business sectors in-line with EU priority actions.	Improved practices within individual companies which will also serve as templates for similar actions across an entire sector.	Reduced operating costs and environmental impact through control of product/process inputs and pro-active management of waste arising.	EPA	EI, SFI, + any other relevant agency	Q4, 2012
L 1.7	Continue to fund research in underpinning platform technologies and sciences of relevance to manufacturing competitiveness through bottom up calls.	Mechanism for allocating research funds for underpinning platform technologies and sciences.	The underpinning research requirements of manufacturing are addressed.	SFI, EI	SFI DAFM + any other relevant agency	Q1, 2013

No	Action	Deliverable	Benefit	Lead	Support	Timeline
Objective 2	To ensure the availability of appropriately skilled researchers to meet the needs of industry and to ensure that a critical mass of researchers is in place to deliver on the vision.					
L 2.1	<p>Ensure the availability of appropriately skilled researchers to meet the needs of industry and to ensure that a critical mass of researchers is in place to deliver on the vision.</p> <p>(refer to the Future Skills Report on Manufacturing Skills to identify the required skills for manufacturing)</p>	An increase in the number of industrially relevant researchers at the appropriate skills level with capability to support an innovative manufacturing ecosystem.	An increase in the number of industrially relevant researchers at the appropriate skills level with capability to support an innovative manufacturing ecosystem.	Refer to the Future Skills Report on manufacturing skills with HEA		Q3, 2013
L 2.2	Launch the employment based postgraduate research programme.	Critical mass of graduates with skills required by industry.	Skills to drive innovation in the manufacturing industry.	Irish Research Council		Q3, 2013

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No	Action	Deliverable	Benefit	Lead	Support	Timeline
Objective 3		To create an environment to bring together the necessary disciplines from enterprise and academia, and also drawing on the relevant State functions (e.g. regulators), to work collectively on opportunities in the manufacturing competitiveness area at both early stage and applied research.				
L 3.1	Engage key enterprises (both indigenous and FDI) with strengths in the manufacturing field to discuss research opportunities arising from action 1.2.	Company awareness of the opportunities in the manufacturing research area is enhanced.	Enterprise will have the opportunity to utilise manufacturing research.	EI, IDA, HEA	DAFM	Q4, 2013
L 3.2	Ensure appropriate funding mechanisms are made available to facilitate the identified enterprises collaborating with the relevant research expertise on both early stage and applied research on an on-going basis.	Focused enterprise and research collaboration.	Key capabilities are supported to work together to realise the commercial potential in the research areas.	EI, SFI, HEA	DAFM	Q4, 2013
Objective 4		To ensure that research is focused on: identifying potential impacts on the environment and human health; informing regulatory processes; and developing solutions to support compliance with the regulatory environment and industrial standards.				

No	Action	Deliverable	Benefit	Lead	Support	Timeline
L 4.1	Develop a suite of funding instruments (new, existing or modifications of existing) across all relevant departments and agencies which will include a programme of research to understanding the toxicological properties and environmental fate of new materials through their life cycle.	<p>Reports to manufactures, health & environmental policy makers on emerging issues.</p> <p>Development of capacity/ expertise necessary to respond to next generation products and process requirements for manufacturing. This can yield competitive advantage for a company in the market place.</p> <p>Strong interaction between</p>	<p>New business opportunities in clean tech</p> <p>Improved certainty for industry on regulatory processes.</p> <p>Societal benefits in terms of a safer workplace and cleaner environment.</p> <p>Consumer confidence in emerging areas such as nanomaterials.</p>	EPA	SFI, DAFM, Industry; regulatory bodies standards bodies; and any other relevant industry.	Q3, 2013

No	Action	Deliverable	Benefit	Lead	Support	Timeline
		Regulators, the industry base and Irish research base.				
Cross Referencing	Therapeutics Action Plan Objective 3: To leverage investment in academic research on therapeutics manufacturing to help ensure continuation of Ireland's reputation for strong supportive responsive regulatory environment for the therapeutics development and manufacturing sector					
G 3.1	To promote increased linkages between the academic research base and the IMB to assist the IMB in maintaining the knowledge and expertise to respond to next generation processes for Therapeutics manufacturing. Particular focus on linking regulators with academic opinion leaders with unbiased expertise in novel processes or analytical methods	Continued strong, supportive and responsive regulatory environment for Therapeutics sector Strong interaction between Regulators, the industry base and Irish research base.	Sustained attractiveness of Ireland as a location for development and deployment of novel processes for innovative and complex Therapeutics (e.g. drug-device combinations, biosimilars, biobetters and next generation therapies like	IMB	EI,IDA,PCI, SFI	Q4, 2012

No	Action	Deliverable	Benefit	Lead	Support	Timeline
			stem cells/RNAi).			

Forfás



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