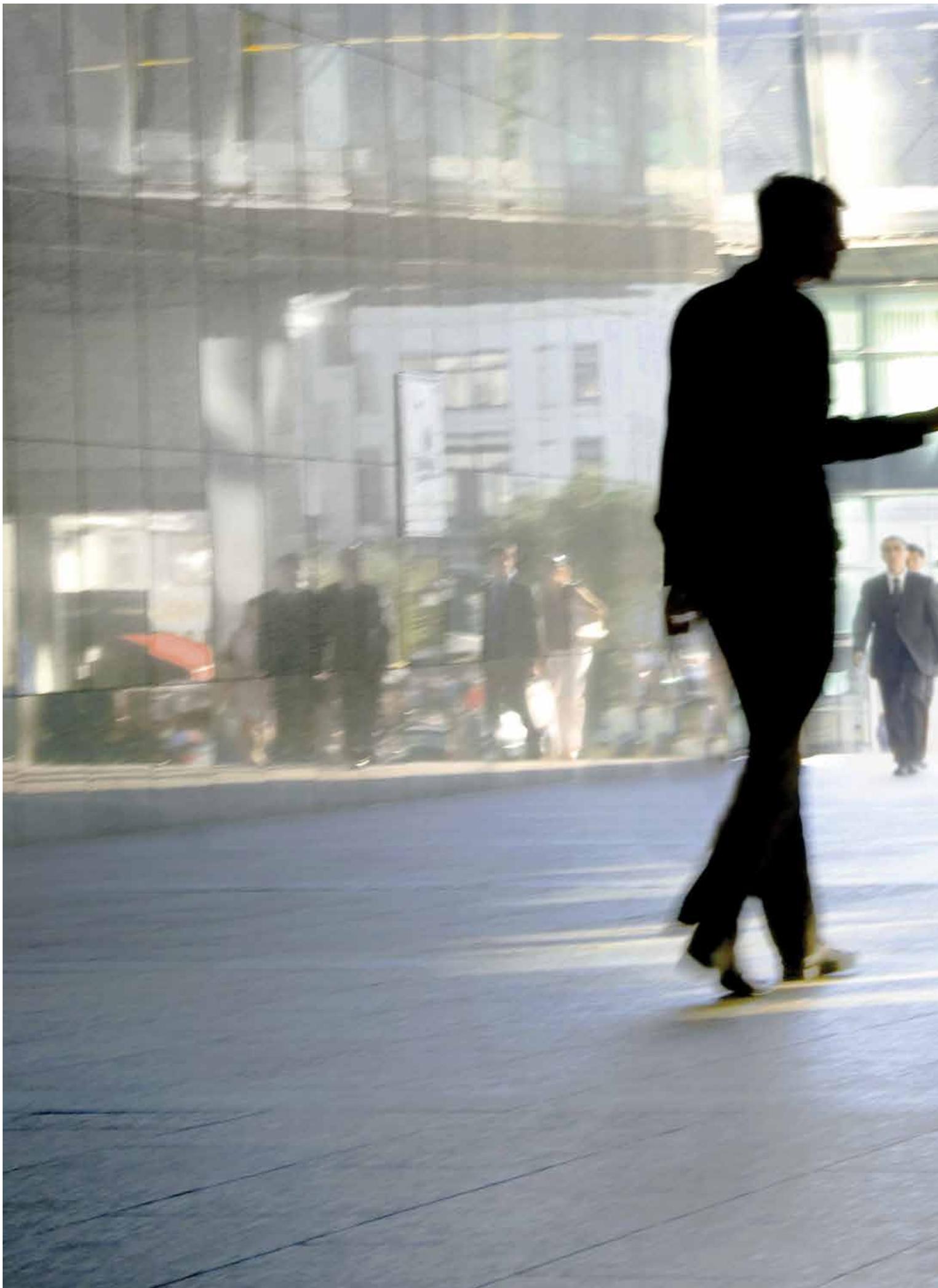


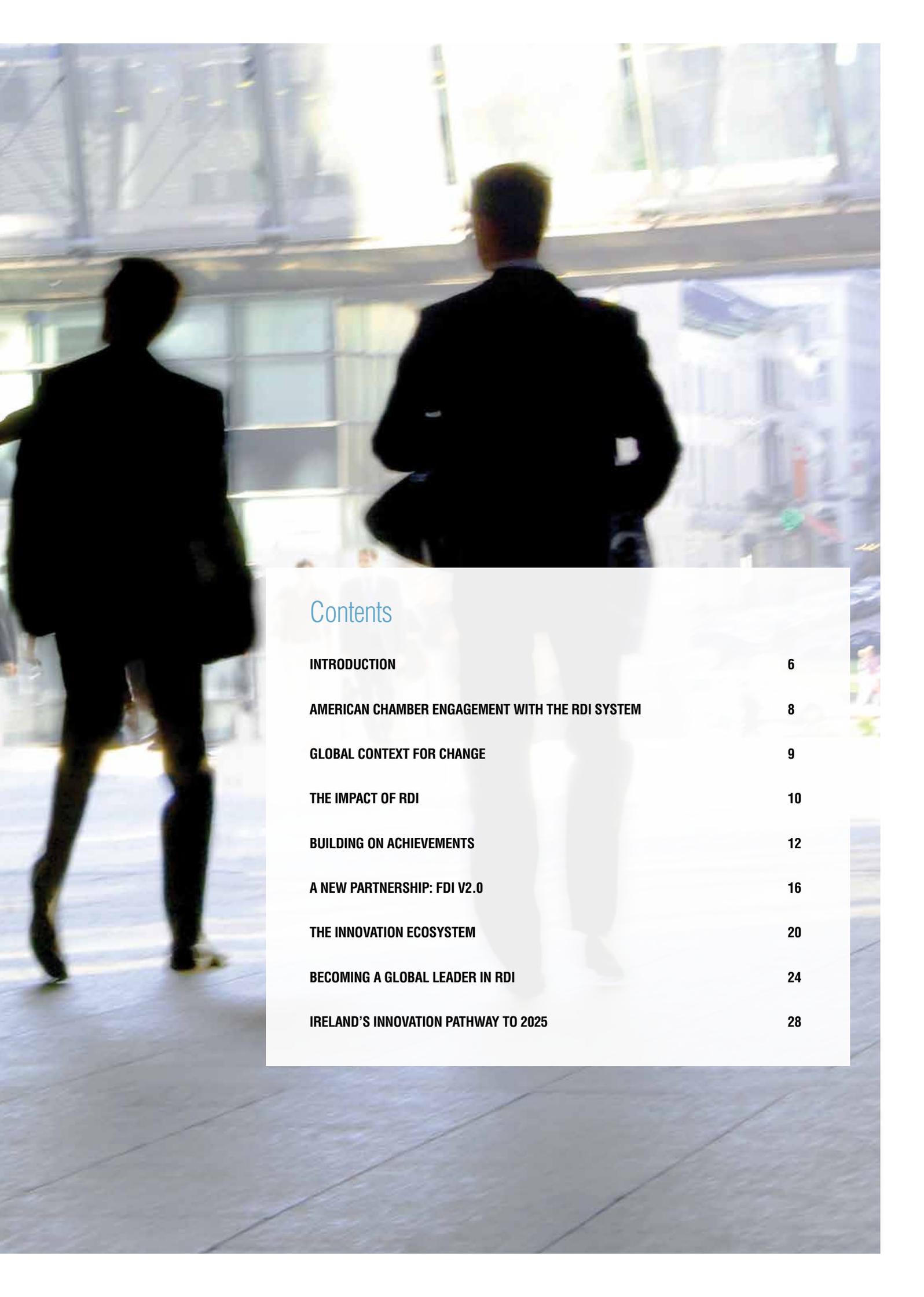


AMERICAN  
CHAMBER *of* COMMERCE  
IRELAND

**Ireland's Innovation Pathway:  
Attracting Investment; Driving Economic Growth**

[www.amcham.ie](http://www.amcham.ie)





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# Strategic Recommendations

## Ireland must:

- Effectively align and scale up RDI investments
- Double Ireland's RDI investment to 3% of GDP through a new investment proposition
- Use RDI investment as a pathway to growth by demonstrating global leadership

## Key actions and new approaches:

### Refocusing and improving the RDI system

- Remove complexity within the current RDI system by evaluating the support and funding instruments and the role of the development agencies to support RDI and economic priorities.
- Provide ease of access to the RDI system by ensuring development agencies are client-centric and that the person responsible acts as an "ambassador" and as a single point of focus for the State.
- Increase investment in specific translation infrastructure to include dual purpose test and demonstration platforms for emerging and breakthrough technologies in new areas of application
- Internationally rank RDI centres in terms of their scale, scientific and engineering reputation and proven leadership in particular knowledge and technology domains.
- Evolve centres to have greater autonomy to attract the best scientists and engineers, and to focus on deeper strategic partnerships.
- Use the SSTI process to align objectives and targets to achieve a more balanced portfolio of investment with greater focus on RDI impact on the economy.
- Develop new and prioritised metrics to encourage more downstream development activity

## Creating a new FDI proposition: FDI V2.0

- Develop a strategy to implement and fund industry-led ecosystems in Ireland
- Government to initiate a process to select grand challenges and to establish the supporting flagship programmes
- Embrace a new culture of partnership
- Government to conduct international review of RDI competitiveness
- Initiate a process to identify and evaluate RDI priority opportunities that merit joint public-private investment

## Demonstrating global leadership in RDI

- Raise investment in RDI to 3% of GDP by 2025
- Establish targets to win strategic longer-term RDI investments
- Develop a cross-Government strategy to attract and retain global leaders in RDI
- Promote the quality of Ireland's talent base overseas in key markets for FDI

## Overview



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The priority for the American Chamber of Commerce Ireland is that Ireland remains the global location of choice for US foreign direct investment (FDI) into Europe, and by doing so retains and attracts further investment and jobs.

The Chamber believes that Research, Development and Innovation (RDI) is fundamental to growing the Irish economy. Increasing competition from other exporting countries and the global industry imperative to 'Innovate or Die', requires that Ireland targets RDI investment to establish global leadership niches as the primary driver of future economic and employment growth.

Achieving a global leadership position will 'future-proof' the Irish economy against disruptive technological change and global investment competition. By 2025 a successful strategy should support a US FDI base of over 1050 companies in Ireland with

an investment value of over \$480b – double today's investment levels.

The American Chamber is of the view that there is an immediate need to re-assess Ireland's proposition for FDI. The strategy suggested by the American Chamber is to immediately begin to build a robust and vibrant RDI ecosystem and based on its strengths, identify shared industry-state investment projects to take on significant societal or economic challenges and achieve world class outcomes.

The strategic goal for Ireland is to attract further public-private investment through proven partnerships between US FDI and Ireland's RDI system which would, within ten years, double national spending on RDI to 3% of GDP.

## Introduction

Ireland's Innovation Pathway is a strategy statement on Research, Development and Innovation (RDI) and the US FDI base in Ireland. It profiles the importance of the US investment base within Ireland's RDI ecosystem and the positive contribution it has made to Ireland's current competitive position for innovation-led investment. It is an authoritative statement that will drive the Chamber's engagement on RDI related matters with Government, the RDI system and education/skills stakeholders, the media and the wider public up to and beyond 2025. It articulates a concise vision for Ireland's RDI environment that will retain and attract US foreign direct investment.

The American Chamber of Commerce Ireland has conducted a review of RDI activities within the US foreign direct investment base in Ireland. That process involved the participation and input of more than 60 global companies engaged in RDI. It focused on better ways of attracting RDI-led investment, more effective ways of leveraging that investment, and most importantly - new ways of securing stronger outcomes for the companies and for Ireland. It recommends a strategic policy response to:

- Refocusing and improving the RDI system
- Effectively align and scale-up RDI investments
- Double Ireland's RDI investment to 3% of GDP through a new investment proposition
- Use RDI investment as an Innovation Pathway by demonstrating global leadership

Ireland's opportunity to lead in RDI will be based on its international reputation and credibility. Ireland has the potential to win by increasing its commitment to excellence, innovation and creating investment certainty. Science Foundation Ireland's (SFI) focus on "Excellence and Impact" is a sound strategy for inward investment.

Investment in RDI must lead directly to economic growth by being linked to visible impacts in new technology, new products or new enterprise of scale. A credible public research base exists. Now Ireland must build a balanced portfolio of RDI investments, to include application and relevance to business and with greater measurable impact on the country and the economy.

To strengthen the RDI system four significant themes emerge from member consultations: remove complexity; build ecosystems; increase investment in translation and application; and develop, retain and attract key human capital. Focusing on these themes from a policy and investment perspective has broad appeal within the FDI community.

A 'Challenge-Centric' approach to RDI investment will be critical to achieve societal or economic impacts and sustain support for public investment across the political spectrum. Investments must be focused and significant in scale. The National Research Prioritisation Exercise has been important and valuable, but 14 priorities of equal weighting are too many to be competitive on a global stage for an economy of Ireland's size .

Tax Policy remains a key differentiator and attractor for RDI driven FDI. Ireland must compete for this investment strategically by employing competitive incentives to drive the required increase in investment to 3% of GDP.

Finally, Ireland must continue to be recognised for the availability of talent. A credible national skills and talent strategy must be a top priority to maintain our competitive edge, where that factor alone is becoming increasingly important in FDI decision making for high-value investments.

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## American Chamber Engagement with the RDI Agenda

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The American Chamber has been actively engaged with the evolving RDI agenda since founding its Research and Development Working Group in 2004.



### Key proposals from the Chamber have included:

- Enterprise Strategy (2004): A more complete R&D tax credit regime, greater industry-academic collaboration and greater cohesion across all development agencies of the State.
- Higher Education Authority Third Level Reform (2006): A step-up in output of skills in science, technology, engineering and mathematics (STEM), requiring fundamental reform of teaching methodologies, performance measurement and accountability.
- Department of Education (2006): An education system with the ability to produce “world class” STEM graduates and postgraduates with work-ready team working and communications skills.
- American Chamber’s ‘Retuning the Growth Engine’ (2007): A call for Ireland’s tax and incentive regime to support and encourage risk-taking and the exploitation of IP.
- Innovation Task Force (2009): A recommendation for the creation of new enterprise focused on market and technology convergence as a significant opportunity for Ireland.
- The Research Prioritisation Process (2011-2012): A State investment strategy based on international research leadership, the ability to attract private sector co-investment, achieve critical research capability, and have the capacity to commercialise effectively.
- Forfas on ‘Key Capacity Enhancers’ for RDI (2014): The case for building an eco-system that establishes a reputation for world-class ‘know-how’ in its targeted niches.
- Advisory Science Council (2014): To explore the concept of new ‘Research Technology Organisations’ (RTOs) established outside of the remit of the Higher Education Institutions (HEIs) to boost applied research and development and grow Ireland’s entrepreneurial and enterprise capacity.
- Higher Education Authority’s Education-Enterprise Engagement (2015): The strengthening of industry-academic partnerships, making the third level skills and research system easier to navigate

## Global Context for Change

The FDI community in Ireland believe that RDI is fundamental to preserving and growing FDI here. Globally competition has intensified and this requires new thinking to establish a sustainable advantage and compelling business proposition to attract investment to Ireland. That proposition must remain competitive, where excellence in research is central to creating intellectual value.

The key imperative for the FDI sector is to successfully meet the challenge of how to “Innovate or Die”. This applies within all sectors, to the entire value chain, for both new and established companies. Corporations are increasingly focusing on the international investments that can create new value. In doing so, they evaluate their existing business to identify locations that can contribute uniquely through their innovation and research strengths. This challenging environment opens the possibility for a new FDI value proposition where Ireland becomes a preferred source of intellectual value and innovation with Ireland’s public and private sectors partnering with globally focused business to deliver broader value to citizens.

Research capacity is evolving in a positive way and Science Foundation Ireland’s (SFI) focus on research excellence and

economic impact has created a good basis for new investment partnerships. Ireland must increase its investment in RDI to be recognised as a global leader. This investment must include the human capacity and talent to differentiate Ireland internationally. The pursuit of excellence in a globalised world requires that Ireland develop and attract the brightest and best scientists, engineers and entrepreneurs, and to deliberately set out to dominate internationally in particular targeted areas. This skills base is the foundation for higher levels of economic growth. This RDI investment will ‘future-proof’ the Irish economy against disruptive technological change and global investment competition.



## The Impact of RDI

Advances in science and technology are core to the Irish economy. A priority of Government policy has been to ensure that Ireland is economically competitive and dynamic, with a strong focus on growing its research strengths and technological capabilities. From the Programme for Research in Third-Level Institutions (PRTL) to the Strategy for Science, Technology and Innovation (SSTI) 2006 – 2013 there has been an increasing ambition to develop a reputation for world class research and development in Ireland.

The US multinational sector in Ireland has been both a key advocate for and partner in this policy approach. The Government's ambition for RDI together with the introduction of the Research and Development Tax Credit, has caused a growing and substantial increase in RDI-led investment into Ireland by US companies. For the past decade, and despite the enormous impact of the financial crisis on Ireland, the State broadly maintained its spending commitment to R&D and US multinationals have remained committed to investing in Ireland's RDI activities. Significantly, US companies total spending on R&D in Ireland increased from \$465m in 2000 to \$1.5b in 2012<sup>2</sup>. Since 2009 there has been a 35% increase in the number of employees in the FDI companies engaged in R&D activity<sup>3</sup> and Ireland's Central Statistics Office noted that by 2011 there were

19,000 people engaged in R&D in Ireland, over two-thirds of whom worked in medium and large enterprises<sup>4</sup>.

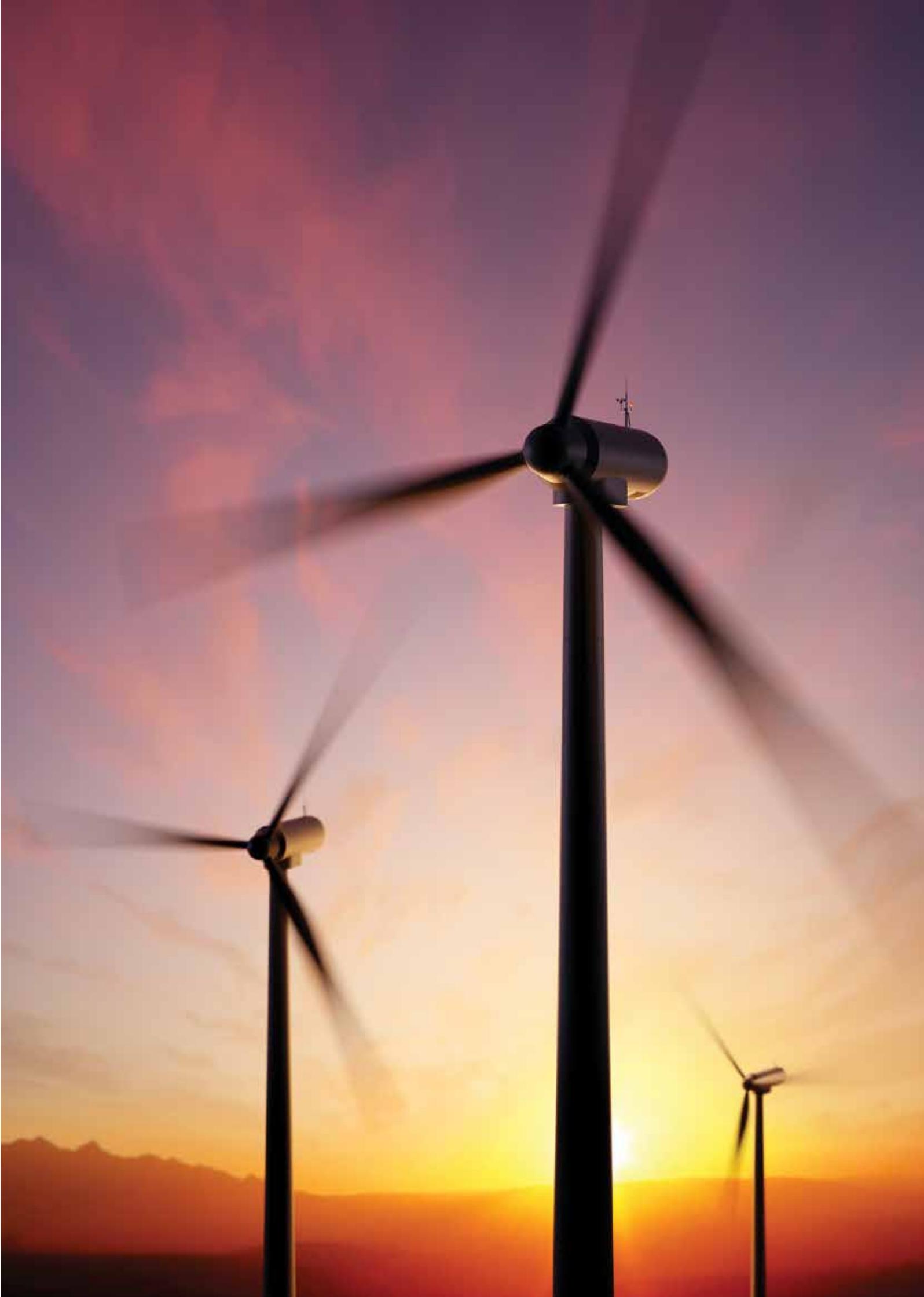
Ireland has become an increasingly significant R&D location in the past 15 years, and in the process established global credibility in such areas as immunology, nanotechnology, nutritionals, computer science and advanced materials. This is testament to the efforts, amongst others, of successive Governments, SFI, the academic and business communities. However Ireland is now at a critical juncture with a significant dilemma confronting the RDI system – the need to further prioritise. Ireland's Innovation Pathway will explore the means by which Government should reorient the RDI system and become a global leader in specific scientific and technological domains.

***In terms of both research and impact, the partnership between US firms, Ireland's research community and its indigenous enterprise base, is providing a platform for innovation of global proportions. The outcomes from this investment puts Ireland on the pathway to offering commercially viable innovations to solve the world's problems as it moves towards a mid-21st century population of 9 billion, highly connected, and with big demands on sustainable health, food and energy.***

<sup>2</sup> Joseph Quinlan, The Irish-US Economic Relationship 2015

<sup>3</sup> See IDA Strategy 'Winning Foreign Direct Investment' 2015

<sup>4</sup> Central Statistics Office/Forfás (2013) Business Expenditure on Research and Development (BERD) 2011/2012



## Building on Achievements

### Building on our achievements to date will require refocusing and improving on existing RDI strengths to deliver greater impact. To do that we must:

- Remove complexity within the current RDI system by evaluating the support and funding instruments and the role of the development agencies to support RDI and economic priorities.
- Provide ease of access to the RDI system by ensuring development agencies are client-centric and that the person responsible acts as an "ambassador" and as a single point of focus for the State.
- Increase investment in specific translation infrastructure to include dual purpose test and demonstration platforms for emerging and breakthrough technologies in new areas of application
- Internationally rank RDI centres in terms of their scale, scientific and engineering reputation and proven leadership in particular knowledge and technology domains.
- Evolve centres to have greater autonomy to attract the best scientists and engineers, and to focus on deeper strategic partnerships.
- Use the SSTI process to align objectives and targets to achieve a more balanced portfolio of investment with greater focus on RDI impact on the economy.
- Develop new and prioritised metrics to encourage more downstream development activity.

### An Evolving RDI Environment

The national RDI system has made truly significant advances over the last fifteen years. Having ascended the international ranking of scientific research capability – from 36th in 2003 to 20th in 2010 (and based on citations; 1st for Immunology; 1st for Animal and Dairy; 3rd for Nanoscience; 4th for Computer Science and 6th for Materials Science)<sup>5</sup> - there is an opportunity to position Ireland's innovation capability on the international stage. Now is the time to build on Ireland's proven world-class achievements in scientific research. Understanding and recognising the evolution of Ireland's RDI system, multinational RDI leaders believe there is an opportunity to develop a stronger, broader proposition to attract and retain RDI-led investment.

*There is a consensus within industry and now supported by policy makers that Ireland must concentrate on developing its 'Innovation Ecosystem' : a new and significant investment focused on translation, application development and pre-commercial deployment of innovative solutions.*

There is strong industry support for the idea that an enterprise-led ecosystem would provide the needed vibrancy for such creative and innovative activity. It is envisioned that FDI sectors would actively participate and/or lead in this ecosystem. This engagement will range from active participation within industry and technology clusters to create the ecosystem, to more formal collaborative participation in focused RDI initiatives. FDI together with SMEs and the research community should be better enabled to participate collaboratively within the ecosystem. This participation should focus on outcomes that address specific shared challenges and where the collaborative structures are people-centric and flexible. More formal participation may be in partnership with leading research centres and/or other companies where excellence and impact are the primary goals.

### Refocusing and Improving the RDI System

Members of the American Chamber believe that tangible success from public-private research investment in Ireland now needs to be visible in terms of downstream impacts in new technology, new products or new enterprise of scale to warrant increased industry investment.

<sup>5</sup> Science Foundation Ireland, 2014 Review of Agenda 2020



The current RDI system is complex, often leading to confusion within the FDI base. This is evident in the diversity of funding instruments, centres and agencies engaged in the RDI process. It is also evident from our members that an information gap exists regarding the full suite of RDI programmes and supports that are currently available – especially from agencies and funding bodies that would traditionally not engage with FDI on a routine basis<sup>6</sup>. This complexity must not cause Ireland to lose out on RDI investment and employment opportunities to jurisdictions with a less compelling overall business proposition. Other jurisdictions, using dedicated and focused “resource ambassadors”<sup>7</sup>, avoid such complexities and enhance their responsiveness to investment opportunities. Ireland should address this competitive challenge.

The SFI Research Centre programme has successfully increased the participation of international enterprise in research and innovation in Ireland. New initiatives to orchestrate greater alignment and impact by setting minimum private funding requirements seeks to encourage deeper public-private collaboration. Multinationals are willing to engage and commit to higher levels of investment, including the level of cash contribution to

SFI’s new centres programme. Positively, this commitment causes FDI companies to critically examine their participation from their strategic perspective.

Currently SFI Research Centres must meet 30% of their budget from industry sources, 10% of which must be a cash contribution. The Chamber is concerned that an unintended consequence of SFI centres seeking multiple partners in order to make up their stated 10% cash requirement from industry partners could result in a dilution of their research mission to achieve research excellence and meaningful impact.

The SFI Research Centres strategy is strongly supported by the FDI sector. It has the capacity to achieve scale, focus and be credible on the international stage. However, there is a need to allow Research Centres more autonomy to attract the best scientists and engineers, and to focus on bigger strategic partnerships that support their research and innovation programme. Finding a mechanism to concentrate the investment priorities further and scale-up centres to an internationally significant size is seen as an immediate and strategic test for Ireland’s RDI system.

<sup>6</sup>For example, most subsidiaries of US multinational firms have the IDA as their enterprise agency point of contact and are less exposed to the suite of useful incentives that are offered by Enterprise Ireland to the indigenous sector.

<sup>7</sup>For example, providing a dedicated executive with the experience and knowledge within a jurisdiction’s entire R&D system assigned to help a firm or project expedite a research/investment proposal.

## Expanding Translation and Application of Research

The American Chamber's RDI community believe that it is critical to achieve societal or economic impact if the public investment in RDI is to be sustained. This impact would also ensure that Ireland's RDI programme is internationally credible and should attract further industry investment.

Companies point to an immediate need for investment in translation activity to apply research and development enterprise opportunities<sup>8</sup>. Investment in specific translation infrastructure, is necessary to enable valuable research and discovery to impact on new technology or product development in a focused and accelerated manner. FDI support for sharing this type of infrastructure should be explored and developed within a public-private partnership model. Such infrastructure could include dual purpose test and demonstration platforms for emerging and breakthrough technologies in new areas of application. Investment programmes have already explored such models. An example includes SmartBay Ireland<sup>9</sup> which manages the national marine test facility for the development of innovative products and services for the global ocean technology sector. Such models include trial and validation, prototype development, and the development of services based on analytics and domain knowledge all supported by an advanced physical and cyber platform for users of the facility.

Likewise the provision of full integrated circuit design and development capability, including access to semiconductor fabrication facilities and services by the Tyndall National Institute<sup>10</sup> is welcome. This provides participating industry with the capability of prototyping new products in the electronics, medical devices, energy and communication sectors.

Significant scope exists in Ireland for increased use and investment in this infrastructure ensuring that it remains at the technological cutting edge. Growth in new

technology-led sectors such as 'smart' cities and oceans can be uniquely enabled and managed by these kinds of translational infrastructure. This also has the benefit of providing opportunity for smaller technology start-ups to work with larger FDI companies in the provision of innovative solutions with potential for export markets.

The form of investment has enabled and supported other sectors including the food/nutritional and biopharma sectors. The success of the Teagasc Moorepark Research and Innovation Centre in the food sector is regarded by many leaders in the RDI field as significant. It has contributed to the growth of a high value dairy sector and is noteworthy in bringing SMEs and MNCs closer in pursuit of aligned market and product goals. In the pharma sector NIBRT is significant in supporting the development of resources in biotechnology. This technology centre has the capacity to further support translation by leveraging its industrial bioprocessing facility for process and product development.

Translation infrastructure and entities require greater industry engagement and the autonomy to retain and attract specialist talent and enterprise leadership.

Translation capacity requires investment and a supportive policy framework. This is particularly relevant to the life sciences where clinical trial infrastructure and capability is required to support high value activity in the research and development cycle.

In supporting the expansion of translation and application of research consideration must be given to a balanced form of measurement ensuring that the correct performance metrics are applied to the translation and application cycle. This should support further investment and the development of new shared infrastructure to enable this critical activity. This rebalancing of investment is required to ensure economic outcomes from the RDI system.

<sup>8</sup> 'Translation activity' is all activity relating to moving research into practical application.

<sup>9</sup> See: [www.smartbay.ie](http://www.smartbay.ie)

<sup>10</sup> See: [www.tyndall.ie](http://www.tyndall.ie)



## A New Partnership: FDI V2.0

### **Closer alignment of the RDI priorities of the FDI community, indigenous business and the public research system will drive the development of a new FDI proposition: FDI V2.0. This will require:**

- Developing a strategy to implement and fund industry-led ecosystems in Ireland.
- Government to initiate a process to select 'grand challenges' and to establish the supporting flagship programmes.
- Establishing a funding strategy for flagship programmes.
- Embracing a new culture of partnership.
- Government should conduct an international review of RDI incentives to test Ireland's competitiveness against the top ten alternative jurisdictions for mobile FDI.
- Initiating a process to identify and evaluate RDI priority opportunities that merit joint public-private investment.

Employment in US companies in Ireland has grown by approximately 5% per annum over the past five years - a testament to the relationship between foreign direct investment companies and Ireland. The Irish-US economic relationship has helped Ireland's economic development over many decades and is a crucial part of the bond that joins the two countries. American companies in Ireland have formed strong relationships with the communities in which they are located, maturing partnerships in collaboration with other companies, both domestic and foreign, and foundational partnerships with the academic and research communities.

### **The Changing Face of the Partnership**

The American Chamber has explored the changing FDI landscape in Ireland with its members to understand the value and impact of investing in Ireland. There is consistent and clear feedback that global competition for RDI is intense and that Ireland's current proposition, while substantial, is insufficient to attract RDI investments of scale. There are numerous global headwinds - with intensifying competition for this valuable source of growth and innovation. Other locations are making targeted efforts to improve their attractiveness for investors by liberalising trade and commercial activity, opening up to external investment, and improving incentives.

The American Chamber welcome IDA Ireland's ambition to increase employment in the FDI base by +20% (+35,000 jobs) by 2020. However, as the number of "technology and manufacturing-capable" nations is steadily rising, Ireland needs to remain vigilant about maintaining its place in the global value chains of U.S. multinationals. Realising higher value activities within Ireland's FDI base, while maintaining

or increasing the total number of people employed, is especially challenging given Ireland's cost base. It is also impacted by the capacity of Ireland's infrastructure, the increasing capital and intellectual intensity of businesses and the ready availability of future skills to support this investment expansion.

While it is true that successful RDI investment will create downstream value-add, equally companies will seek out the best location to develop that value, reflecting the globalization of the world's supply chain. In fact the leadership in most Chamber companies can easily identify their location of choice for "low cost", and indeed for "innovation" and for "incentives". What the Chamber's review of the FDI sector suggests is that there is an opportunity for Ireland to enhance its own unique selling proposition in each.

For this partnership to grow Ireland's investment proposition must be strengthened and capable of competing with key international locations also focused on mobile foreign direct investment.

### A Differentiated Investment Opportunity

The American Chamber is of the view that there is an immediate need to re-assess Ireland's RDI proposition for FDI. Increasing competition from other countries and the global imperative to 'Innovate or Die', requires that we target RDI investment as the primary driver of future growth. The changing investment landscape in the international context has created both urgency

and opportunity. Ireland's success and solid building blocks coupled with a long standing partnership with FDI companies creates the basis for a new and stronger proposition: FDI V2.0.

Countries that compete for RDI investment, or who are regarded as strong in RDI, all invest circa 3% of GDP in R&D annually.

World R&D Ranking 2012/2013			
R&D Expenditure (2013 stat unless stated)			
Rank	Country	Expenditure (\$Bn)	% GDP
1 <sup>st</sup>	United States	\$396.7 (2012)	2.8% (2012)
2 <sup>nd</sup>	People's Republic of China	\$ 294.6	2.00%
3 <sup>rd</sup>	Japan	\$ 141.4	3.40%
4 <sup>th</sup>	Germany	\$ 86.4	2.90%
5 <sup>th</sup>	France	\$ 45.7	2.20%
6 <sup>th</sup>	United Kingdom	\$ 36.2	1.60%
7 <sup>th</sup>	South Korea	\$ 64.6	4.10%
8 <sup>th</sup>	Russia	\$ 24.7	1.10%
9 <sup>th</sup>	Spain	\$ 15.3	1.20%
10 <sup>th</sup>	Turkey	\$ 10.0	0.90%
16 <sup>th</sup>	Sweden	\$ 11.4	3.30%
17 <sup>th</sup>	The Netherlands	\$ 12.8	1.90%
18 <sup>th</sup>	Israel	\$ 9.9	4.20%
20 <sup>th</sup>	Switzerland	\$ 9.9	2.9% (2012)
25 <sup>th</sup>	Finland	\$ 5.8	3.30%
26 <sup>th</sup>	Singapore	\$ 7.1 (2012)	2.20%
28 <sup>th</sup>	Norway	\$ 4.3	1.60%
35 <sup>th</sup>	Ireland	\$ 2.7	1.5% (2012)
41 <sup>st</sup>	New Zealand	\$ 1.4 (2011)	1.2% (2011)

Source: OECD <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

As the table overleaf shows, the USA is ranked first globally for nominal level of R&D expenditure which amounts to just under 3% of its GDP. From a US FDI perspective, companies regard the USA as their own home “hotspot” for innovation with its internationally recognised clusters and ecosystems. This significant investment in R&D makes the US the largest innovation foundry in the world. It is also home to the most successful pre-commercial technology procurement programme that supports Small Business Innovation Research (or SBIR). That programme channels \$2.5 billion annually to ensure that federal RDI expenditure in large scale programmes (the 11 federal agencies with large research budgets including education, defence, energy, agriculture and healthcare) activity supports the development of SMEs and Start-Ups<sup>11</sup>.

Other countries such as Israel spend closer to 4% of GDP on R&D, and their contribution to the development of new technology and its application is internationally recognised. Israel is focused on attracting and retaining a pool of top scientists to ensure its capacity to adapt and respond to future change, with less explicit emphasis on the direct “downstream” economic outcomes. The Israeli model deliberately aims for indirect and positive spill-over economic impacts from its RDI system investment. In Asia, both Japan and South Korea are globally ranked in the top 10 with investment at over 3% of GDP and are increasingly attractive to mobile international research funding.

Finland and Sweden, long regarded for their innovation and ability to create new enterprises, invest approximately 3% and continue to attract international research investment. Closer to Ireland, both the UK and the Netherlands, who currently invest close to 2% of GDP, are actively targeting this mobile RDI investment using a similar incentive package to Ireland<sup>12</sup>.

Given the intensity of competition for mobile RDI investment, differentiation for ecosystems in the international market will come down to the scale of sustained funding, the credibility of commitments on investments in delivering significant impacts, and the proven ability to give enterprise access to unique resources and infrastructure.

### A Fit for Purpose RDI Proposition

Many MNCs in Ireland have demonstrated the RDI leadership and technical capacity to contribute to their corporate value chain through modest investments in research and innovation.

In many instances subsidiaries have successfully promoted Ireland as a place of innovation, with excellent operational know-how that can create value in new ways and provide access to internationally sought-after skills. Accessing the best people with unique skills, a reputation for ‘intrapreneurship’ and proven multidisciplinary experience can be a strategic differentiator.

Building on the reputation of being responsive to change, much of the RDI investment is opportunity driven – in that it is derived through access to a talent pool or the confidence that the skills required can be assembled rapidly in Ireland. It is significant in that it has opened doors to mobile RDI investment and it has built credibility within corporate R&D organisations. The key objective from this point of development onwards is to win strategic longer-term RDI investments that will make Ireland significant on firms’ technology and research roadmaps – with projects that are critical to the long term plans of technology and strategic planners.

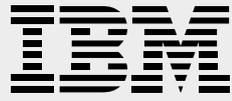
<sup>11</sup>Symantec is a notable example of an MNC with its origins in SBIR but which has since achieved global scale. See: [www.sbir.gov/success-story/symantec-recognized-small-business-administratio](http://www.sbir.gov/success-story/symantec-recognized-small-business-administratio)

<sup>12</sup>Eurostat Gross domestic expenditure on R&D (GERD): [http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020\\_20&plugin=1](http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_20&plugin=1)

The US-Ireland Research Innovation Awards, a joint initiative by the Royal Irish Academy and American Chamber of Commerce Ireland, recognise excellence in research innovation that has taken place on the island of Ireland as a result of US FDI. Awards are presented in a number of categories including: the Irish operations of a US company; an Irish SME that has links with a US Company and an Irish Higher Education Institute or Research Centre that has collaborated with US companies. The 2015 US company nominees are below.



Design & build of an end to end production line that manufactures a medical device every 3 seconds.



Innovation in big data analytics for urban transport.



Connecting research, design, silicon, software, solutions, manufacturing. Customers and partnerships in the 'Internet-of-Things'.



Creating a new online sports experience on MSN.com for a global consumer audience.



Designing a new class of microchip to enable next generation high-end electronic equipment.

# The Innovation Ecosystem

## The Building-out of Ecosystems

The existence of a recognisable and robust ecosystem is regarded as the greatest gap in Ireland's RDI system. Once believed to be a significant constraint to the development of start-up and smaller enterprises, the evidence from the FDI base shows that larger companies seeking new FDI value, are also looking for a vibrant ecosystem.

International ecosystems, or innovation "hotspots", such as the 'Silicon Fen' ecosystem orbiting Cambridge University in England, or the equivalent surrounding MIT in New England or Stanford in Silicon Valley, compete directly with Ireland for RDI investment. Those centres are rich in producing and exploiting IP, and act as magnets drawing in creative, design and technology expertise around them. But more importantly, they draw people with market knowledge, like entrepreneurs and investors, who regard such ecosystems and hotspots as a foundry for new enterprise, and thus impact. Other forms of ecosystem include Singapore's knowledge-based industrial clusters concept<sup>13</sup>. They derive value from large-scale advanced knowledge creation programmes and active public policy support to accelerate the development of new enterprise that is attracting worldwide attention from multinational businesses.

FDI seeks out these international ecosystems that have the ability to attract other technology companies of all sizes and stages of maturity. Investors are increasingly focused on this international ecosystem geography, and what was once solely the interest of ICT and technology companies is now also the interest of other sectors such as financial services, medical technologies and those focused on the use of natural resources.

While the value of ecosystems is well understood, the dynamic that causes an ecosystem to function is less so. Combining publically funded research, FDI and indigenous enterprise together must seek to create opportunities for technology transfer, market access and attracting early stage investment. An increasing number of American Chamber member companies, engaged in RDI, now seek such opportunities as they also focus on

the use and application of their vast research output. Importantly, many of those companies believe that there is additional value generated from a 'collision' of ideas, knowledge and experience from leading talent interacting within the ecosystem.

*Focus and intellectual leadership based on a proven capacity to discover, innovate and create impact, is the hallmark of any successful centre within a thriving ecosystem. Creating value from RDI investment in the form of intellectual property, that is necessary for product or service development, is the intended RDI outcome.*

But equally other intended outcomes might be less tangible and include:

- a) access to new discoveries from collaborative research,
- b) increase revenue through license or royalty income,
- c) strengthen own RDI capacity through research or innovation partnerships.

Companies that seek new RDI partnerships to strengthen their market position, test pathways for future opportunity and explore areas that require new competencies. While RDI centres often provide the focal point, the real value sought by the company lies within the less defined ecosystem, exploiting the connections and formal linkages between enterprises and research communities that surround a leading centre. Despite Ireland's reputation for networking and ease of doing business, it is felt that much more is required from all stakeholders to create the Irish ecosystem and make it effective.

For centres within the eco-system to succeed they must be recognised to be of sufficient scale, renowned for holding the best scientists and engineers, and have proven leadership in particular domains. Most importantly, these centres must be surrounded by an ecosystem that is vibrant with a celebrated international reputation.

<sup>13</sup> The A\*STAR agency supports and oversees the work of a number of subsidiaries in mission-oriented research to advance scientific discovery and develop innovative technology in Singapore.

The development of an industry-led ecosystem in Ireland needs to be focused on economic outcomes. Encouraging and linking new and existing accelerators and incubators to industry clusters will enable the ecosystem to function and allow companies access to new markets and technology. The American Chamber recommends a much stronger partnership culture between the State and industry to enable multidisciplinary teams of people to innovatively address difficult challenges, in Ireland and beyond.

This culture must be based on meaningful and trusted engagement that is focused on a common purpose and a willingness to go forward together. It must be based on respect and generosity so that risk-taking is shared and reward can be long term. In order to encourage the creation of a culture of trusted partnerships a code of conduct should be developed to drive a sense of purpose and collegiality ahead of any formal obligations that are established by contractual commitments.

The graphic below represents elements of the Innovation Ecosystem:



## Challenges Driving Investment

The American Chamber believes that the long term expansion of RDI investment must be ‘challenge-centric’ – assigned to a mission that will address a national challenge with a positive socio-economic outcome, so that its impact is obvious and measurable. Creating internationally significant flagship programmes will link and align RDI investment (public and private) and attract key scientists and industry investment. Hence the recommendation that Ireland commit to establish and invest in a small number of ‘grand challenges’ that create national alignment and prioritisation of RDI investment. Horizon 2020, the EU funding programme for R&D, is oriented to address a number of societal challenges and as such investment in grand challenges in Ireland can be aligned to that programme and facilitated in an EU context.

The rapid expansion of the ecosystem needs to be fuelled by State/EU investment in flagship programmes. An active ecosystem would catalyse FDI companies to cultivate and harvest small enterprise and identify unique sets of talent and capability. The creation of such programmes should seek to also encourage the movement of experienced talent and know-how between the public and private sector. There is both scope and appetite within industry to support the extension of career paths and encourage this fluidity of movement of expertise and know-how. These programmes could give rise to movement of talent between organisations: public-private and private-private. Such flows could make Ireland unique internationally by helping to bridge industry-research gaps and enhancing the ability of the RDI system to impact on society and/or the economy.

This ambition should be a shared common objective of government, higher education and public research, industry, and the investment community. The flagship programmes should be designed within a policy framework that enables all pillars of government to align to a common approach with a reduced set of shared

priorities. The programmes should include projects of scale that excite and attract leading international companies, which are inclusive of indigenous companies, and utilise and exercise the national centres of research and innovation. The policy should embed public and private partnership as a means to achieve a reputation for Ireland as an ‘Innovation Hotspot’.

Attracting the top scientists and engineers remains at the strategic centre of Ireland’s RDI proposition. Retaining and building its leadership is currently the most important immediate challenge to this proposition. Critically this supports a credible skills and talent strategy that must remain a top priority to maintain a competitive edge.

Increasing Ireland’s RDI spend in technologies and know-how of future importance will attract the top research and technology brains and is vital to building the value proposition. Providing competitive incentives through tax or grant mechanisms is necessary to retain and attract capital investment. The careful design of tax regimes and grant/awards in tandem is now required to win new investment.

## Reshaping Ireland’s Incentives

Tax policy remains vitally important in the attraction of FDI. It has proven to be an internationally important attractor that has resulted in high value employment, the development of a supply and technology base, and the creation of internationally significant sectors here in Ireland.

Ireland’s 12.5% corporate tax rate is a fundamental part of Ireland’s tax offering and brand. This tax policy is necessary but it is by no means sufficient. Other aspects to attracting greater innovation-led investment to Ireland include: continued investment in education, the quality of our IP protection regime (including an effective commercial court system) and incentives for collaboration with public laboratories and universities.

The focus by international companies on higher value opportunities is now critical to contribute to shareholder

value. This will focus greater attention on other forms of value including access to leading talent, the identification of potential acquisitions, investment opportunities and an appreciation for emerging technology. This increasing participation in the ecosystem will mutually benefit the indigenous and FDI base.

Ireland's R&D Tax Credit Regime has successfully encouraged companies to increase their investment in research and innovation activities. Further incentives will be required to encourage FDI companies to participate and lead innovation and enterprise development through the translation and commercialisation process.

Genuine incentives to encourage successful inventors, innovators, entrepreneurs and enterprise investors to reinvest in the pursuit of an expanding RDI system, are necessary. Capital tax is a disincentive to successful entrepreneurs seeking to re-invest and is thereby reducing the investment capacity. This will be further exacerbated if personal tax causes professionals with experience to be attracted away from Ireland.

Reframing Ireland's suite of innovation tax policy instruments, including the R&D tax credit system, as well as re-examining the use of other incentives such as Scientific Research Allowances for direct RDI emoluments, will require a broadening of the RDI investment definition from a tax perspective. The Irish tax code needs to extend its reach beyond a traditional definition of 'research and development' to recognise new sources of knowledge capital and innovation underpinning economic growth and in doing so include the application of technology resulting in service, process and product innovations.

The Chamber welcomes the intention of the Government to introduce a "best in class" Knowledge Development Box (KDB). The novel use of the proposed KDB, alongside existing incentives such as Ireland's capital allowances for IP acquisition, the R&D Tax Credit regime, or traditional grant mechanisms, to encourage IP development and

use within the ecosystem will be necessary to ensure that Ireland has a competitive overall RDI proposition. Given the current international tax environment it is imperative that Ireland continues to articulate the certainty and attractiveness of its tax regime.

### Public-private Infrastructure Investment

Ireland's RDI strategy requires a significant increase in investment to support the expansion of the system. The development of a novel and shared approach to capital investment between public and private sectors in Ireland is suggested as a pragmatic approach in what remains a relatively constrained fiscal context. The use of public-private partnerships in the development of transport infrastructure should be examined as an approach to the development of a shared RDI infrastructure.

The American Chamber recommends that the Government should initiate a process to identify and evaluate RDI opportunities that merit joint public-private investment and can support multi-million euro RDI partnerships. The drivers for such partnerships must include the ability to demonstrate global leadership, international collaboration, and a capability to support one of the country's identified 'grand challenges'.

## Becoming a Global Leader in RDI

### For Ireland to attain and maintain global leadership in RDI we must demonstrate our intent through the following actions:

- Raising investment in RDI to 3% of GDP by 2025.
- Establish targets to win strategic longer-term RDI investments.
- Cross-Government strategy to develop, retain and attract specialist talent.
- Develop a strategy to attract and retain global leaders in RDI.
- Promote the quality of Ireland's talent base overseas in key markets for FDI.



The review with the multinational companies in Ireland suggests that achieving the 3% of GDP target for RDI reflects the value placed on research and innovation by a country. It is a fundamental requirement to attain a global leadership position in RDI. Success in attracting significant strategic investment can only be assured if Ireland is one of the top ten global locations for mobile RDI investment.

### Leadership Through Grand Challenges

To achieve the required scale of investment, Ireland must be more ambitious. The American Chamber believes that Ireland should focus on grand challenges that exploit the finest minds in a search for novel solutions that disrupt the business-as-usual approach. Such challenge-centric programmes would attract public and private funding, be suited to a collaborative approach, and like all 'big ideas' would attract the 'big brains' of the sector globally.



### Horizon 2020 and Economic and Societal Challenges

Horizon 2020, the EU funding programme for RDI, reflects the policy priorities of the Europe 2020 strategy in addressing societal challenges. It aims to 'bring together resources and knowledge across different fields, technologies and disciplines, including social sciences and the humanities. This will cover activities from research-to-market with a new focus on innovation-related activities, such as piloting, demonstration, test-beds, and support for public procurement and market uptake'. Funding will focus on:

- Health, demographic change and wellbeing;
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy;
- Secure, clean and efficient energy;
- Smart, green and integrated transport;
- Climate action, environment, resource efficiency and raw materials;
- Europe in a changing world - inclusive, innovative and reflective societies;
- Secure societies - protecting freedom and security of Europe and its citizens

Source: Horizon 2020 The EU Framework Programme for Research and Innovation <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/societal-challenges>

The introduction of a new public-private investment model for RDI that seeks to address grand challenges, through significant flagship programmes, would create a new and positive dynamic for Ireland in a global RDI investment market. The attraction of FDI as investment partners to specific consortia, analogous to strategic defence or space programmes in other jurisdictions, would enable Ireland to develop a unique strategic response in areas such as healthcare, education and training, natural resource development, and/or global financial or environmental services to name a few potentials.

A focus on a few large flagship programmes would cause a faster and stronger alignment of all actors in the value chain and lead to higher potential business and economic activity. It would create an associated ecosystem that is domain-led and clearly challenged to achieve specific outcomes and economic impact. This collective focus on impact, and not activity, will give greater clarity to investors and position the research community as a valued contributor and enabler.

This approach additionally will seed new enterprise and start-up technology companies within, and external to, FDI companies. It has the potential to create a vibrant foundry of new technology and solutions to address difficult challenges.

Mostly, it will prepare new generations and ensure that the future requisite skills and leadership are ever present within Ireland's workforce to meet the changes and challenges ahead.

### Human Capital in the Right Place

The American Chamber recognises the successful development of human capital is necessary to sustain and support RDI. The increased skills base at masters and PhD level is welcome, but we are concerned for Ireland's ability to retain and reorient this talent pool into the broader RDI system. The successful attraction of additional investment by FDI subsidiaries on the basis of access to valued talent is a significant strength of Ireland's proposition.

Ireland must become a preferred location for the top international scientists and engineers who lead discovery, invention and the development of new technology. They must be the core around which Ireland builds its future investment in RDI. It is the successful translation of this investment that will create the maximum economic impact and requires that Ireland also attracts entrepreneurs and investors into the ecosystem.

A concentration on leading human capital, the creation of intellectual value, and investment in innovation for purpose, will propel Ireland into a leadership RDI

position. A focus on 'research only' skills and capabilities will not be sufficient. To this end, the development of multi-disciplinary teams of scientists, technologists, entrepreneurs and engineers must be an objective of research and innovation programmes in Ireland. Ireland must ensure that it has the capacity to supply and retain the leadership necessary to attract RDI investment. While the attraction of international talent is positive and always desirable an over-reliance is challenging, creating a persistent investment 'flight risk' unless longer term commitments are made to retaining talent. Losing this talent base from Ireland to other jurisdictions could cost a decade of RDI investment. Ireland's dependence on overseas talent highlights again a continued challenge to the education system to adequately address the skills needs of industry.

To support the country's RDI ambition the education system must adjust to meet the future needs of the economy. The opportunity to leverage learning and development know-how and integrate this with internationally focused companies resident in Ireland offers the education system here an unprecedented opportunity to address identified future skills deficits. It offers Ireland a unique opportunity to differentiate itself by positioning key future skills and develop pools of available talent through a proactive education system. The education system should avail of new learning and development tools; American Chamber member companies wish to engage with education partners to ensure greater flexibility, responsiveness and impact.

## Ireland's Innovation Pathway to 2025

The American Chamber believes that effective investment in RDI must lead directly to economic growth. Furthermore the investment instrument itself must form an 'innovation pathway' to give focus and alignment to all stakeholders participating in the investment. On this basis it makes a number of recommendations that will help Ireland become a globally recognised location of RDI.

Multinational companies are of the view that the successful pathway to economic growth is through strategic and increased investment in RDI. This investment must focus on impact and be challenge-centric. It must be recognised as significant in scale internationally.

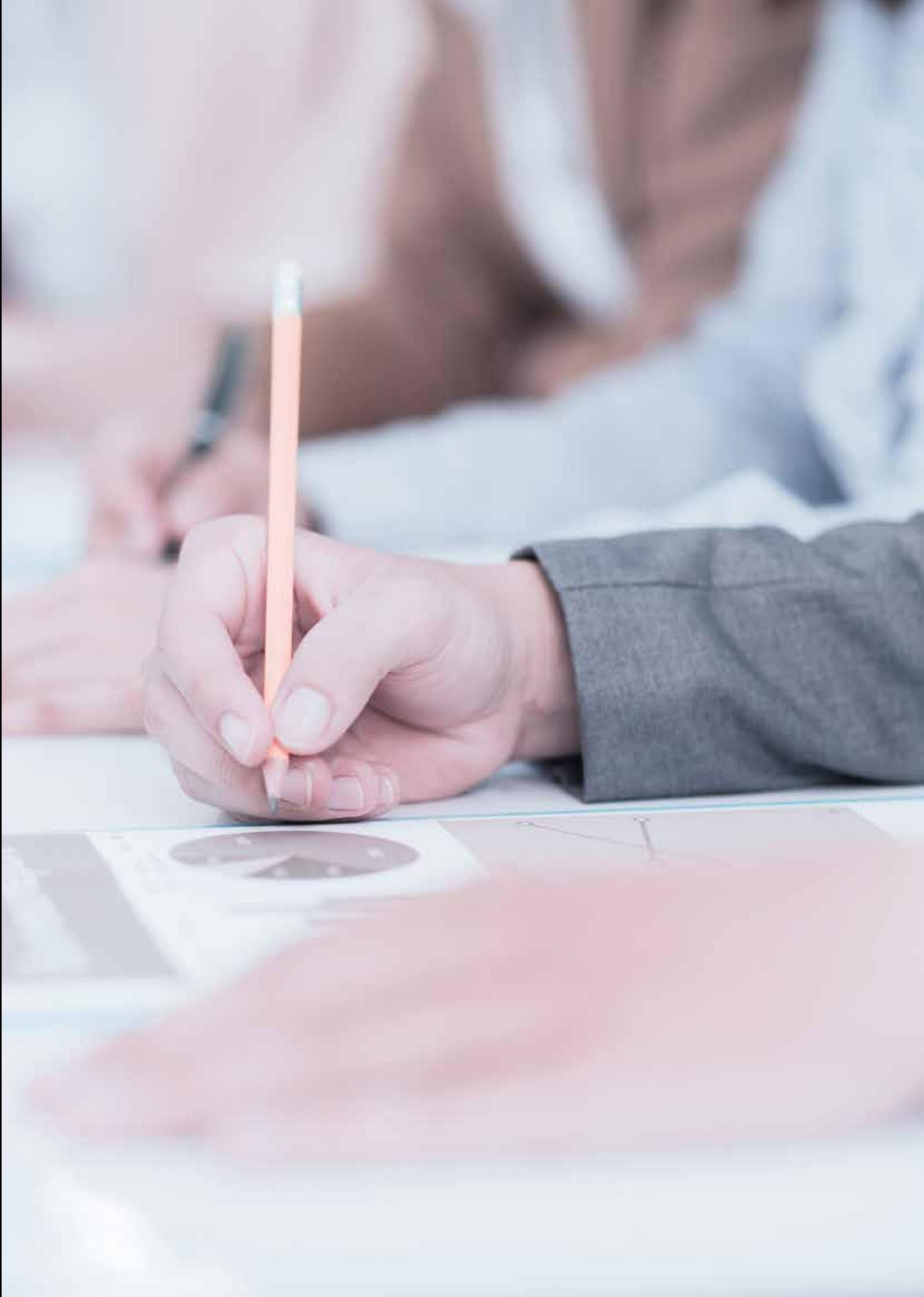
The strategy of achieving economic growth through innovation must become an explicit driver of economic policy and create a new dynamic within Ireland that will be based on a deeper public-private partnership, inclusion through ecosystems, and a concentration on intellectual and enterprise capacity. The review with members concluded that this would create a substantive, globally recognised 'Innovation Hotspot'.

FDI companies in Ireland are willing to partner with government and the indigenous ecosystem to achieve these goals and so that to help maintain and grow their investment base. In addition, companies in Ireland can position themselves strategically within their corporate entities as significant RDI locations that can contribute to shareholder value.

In this context the FDI base seeks to participate in and support government in three recommended RDI action areas including;

1. The Refocusing and Improvement of the RDI System
2. The Creation of a New FDI Proposition: FDI V2.0
3. The Demonstration of Global Leadership in RDI

The strategy suggested by the American Chamber is to immediately begin to build a robust and vibrant RDI ecosystem and based on its strengths, identify shared pathways (thematic programmes) to take on significant societal or economic challenges and achieve world class outcomes. The strategic goal for Ireland would be to attract further public-private investment through proven partnerships between US FDI and Ireland's RDI system which would, within ten years, double national spending on RDI to 3% of GDP. Achieving this could support a US FDI base of over 1050 companies in Ireland and an investment value of over \$480b by 2025 – double today's investment levels.

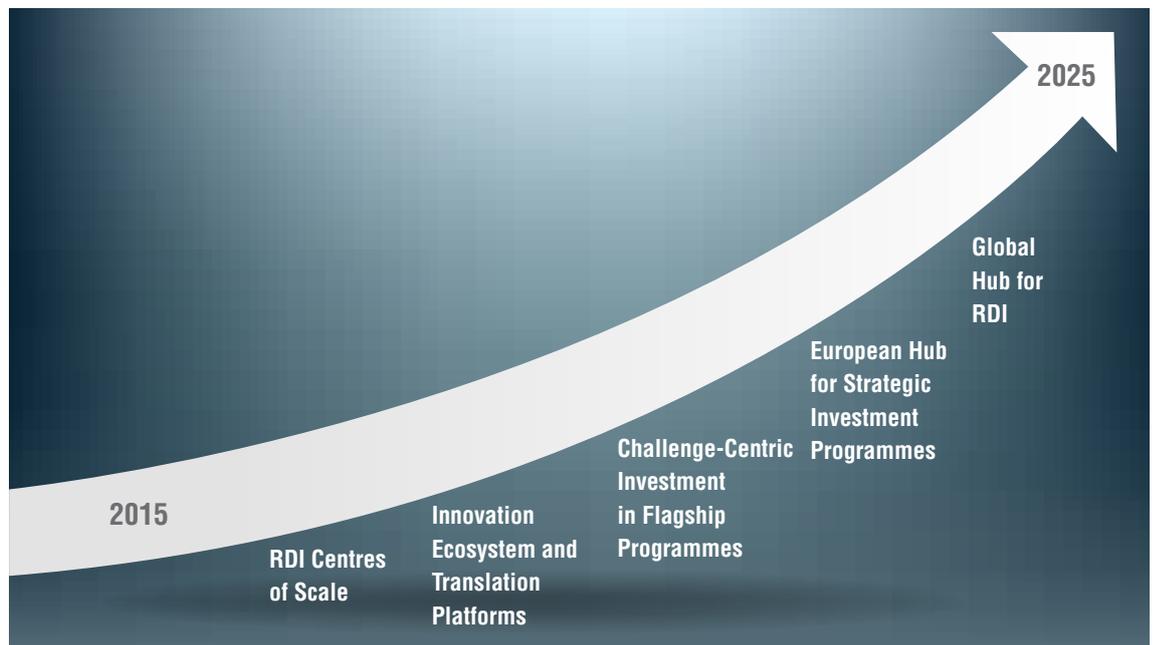


**We set out below our Innovation Pathway to 2025:**

- Ireland's RDI investment is refocused and evolves into a number of RDI Centres of scale. These centres are internationally significant and support key EU investment priorities. The centres achieve a balanced multi-annual investment profile with significant industry participation.
- The Innovation Eco-system and related Translation Platforms are built out and become a key differentiator for Ireland making it a top EU and International 'hotspot' for Innovation. Ireland is regarded internationally as a preferred location for product and technology development and for access to high value small enterprise and resources.
- Ireland becomes the global leader in the use of Challenge-Centric Investment through Flagship Programmes to deliver socio-economic impacts. Ireland achieves unique economic

outcomes in the transformation of its public services and the sustainable development of its natural resources.

- Ireland's new reputation within the EU for sustained economic growth, coupled with its RDI strategy, position it to lead a number of key EU initiatives. Those EU investment programmes create significant global advantage for Europe in areas of strategic importance including food production, renewable energy, and the development of new materials and technologies.
- By 2025, the successful development of Ireland through its RDI strategy establishes it as a Global Centre for RDI in its chosen domains of research and innovation. It attracts corporate centres of research and innovation to locate in Ireland and, in specific industries, to locate their R&D HQ in Ireland. It will support a US FDI base of over 1050 companies in Ireland and an investment value of over US \$480b.



FDI in Ireland has proven to be robust and resilient, providing a source of stability for the Irish economy. The American Chamber believes that Ireland can win investment by focusing on excellence, innovation and sustaining investment certainty and that our suggestions in the paper will enhance our attractiveness for new investment to retain and grow employment in Ireland.



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