Northern and Western Regional Assembly's Submission

on the

National Smart Specialisation Strategy

Northern & Western Regional Assembly

16th of August 2021

Northern & Western Regional Assembly

Contents

1: Introduction

The Northern and Western Regional Assembly is committed to delivering effective regional development in Ireland, and Ireland's next S3 – if developed appropriately – has the potential to notably reduce regional disparities that exist in the State and effectively support the implementation of the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES) of the Northern and Western Region.

With this in mind, it is imperative that Ireland's next S3 adopts a regional approach and fully capitalises on the wealth of knowledge and expertise that exist across each of Ireland's regions. Such an approach should aim to bring together a wide range of regional and local stakeholders – in both the public and private sectors – in order to undertake an "Entrepreneurial Discovery Process"; allowing them to identify their own region's competitive advantages, sectoral and sub-sectoral specialisms with the view of utilising these strengths in supporting their region's economies.

Applying a regional approach to S3 will allow Ireland to move away from an outdated and inefficient "one size fits all" policy and build on geographical area's distinctive sectoral and sub-sectoral strengths; allowing each region to make an enormous contribution in rebuilding their economies following the outbreak of COVID-19. The benefits of adopting a regional approach to Ireland's S3 have been noted in a recent report by the Economic and Public Policy Consultancy (EPPC), with the report noting that the RSESs offer an opportunity to reorient the country's research and innovation (R&I) governance with a stronger "place-based" focus and that such a focus generates value by identifying and connecting the many local examples of R&I excellence which exist across Ireland, which are often not very visible. By connecting these R&I assets, the report notes that Ireland can help to overcome both market size challenges and reduce fragmentation of effort, while creating a stronger presence and profile as an EU R&I 'front-runner' and improving opportunities to boost innovation efforts with EU partners of choice.

Therefore, by bringing a regional dimension to Ireland's economic recovery – through continuous and meaningful regional stakeholder forums, regional input into policy priorities and choices and support for the implementation of the RSESs – policy makers can manage funding RD&I resources in a far more efficient manner, allow each region to build on self-identified competitive advantages, while providing stakeholders with an inclusive policy framework in tackling regional economic challenges. Adopting a regional approach to Ireland's S3 and capitalising on the Northern and Western Region's sectoral, sub-sectoral and research specialisms will be crucial in tackling the challenges associated with the region's economy.

Such challenges were evident from the European Commission's decision to downgrade the Northern and Western Region from a "More Developed Region" to a "Transition Region" post-2020 – the only region in Ireland to hold such a status – while the European Parliament's Committee on Regional Development has categorised the region as a "Lagging Region", which is a region characterised by extremely low growth which is divergent from the rest of its country. Furthermore, the Northern and Western Region is now the only NUTS 2 Region in Ireland to be classified by the European Commission as a "Moderate Innovator", namely a region to record a regional innovation index score between 70 and 100 per cent of the EU average.

Within this context, and mindful of the benefits of adopting a regional approach to S3, the Northern and Western Regional Assembly welcomes the opportunity to submit our views on the development of a S3 for Ireland. The Assembly – in Section 3 of this submission – has provided views on the array of questions that were posed by the Department of Enterprise Trade and Employment (DETE) in

their consultation document on S3, focusing on topics ranging from sectoral strengths of the region to policies needed to improve the national and regional enterprise R&I system. Furthermore, the Northern and Western Regional Assembly – in Section 4 of this submission – has outlined a series of strategic topics that the Department should consider when drafting the finalised S3 for Ireland and should be used to inform the preparation of the strategy document.

2: Regional Context

2.1: Strategic Context

According to the National Planning Framework (NPF)[1], Ireland's population is expected to increase by around 1 million by 2040, requiring an estimated 660,000 new jobs and 500,000 new homes during this period. In the Northern and Western Region, population projections suggest that there will be between 160,000 and 180,000 additional people living in the region by 2040, requiring an estimated 115,000 new jobs.

Ensuring this substantial growth is managed in a sustainable and equitable manner will be key to supporting the economic and social wellbeing of all regions in Ireland. In this context, the NPF and the Regional Spatial and Economic Strategy (RSES)[2] of the Northern and Western Region provide holistic investment frameworks that will manage future population and employment growth and support effective regional development in Ireland, as the Greater Dublin Area – historically speaking – has witnessed an overconcentration of population, jobs and homes.

The consequences of these historical trends have been reflected in the European Commission's "*2019[3] and 2020[4] Semester Country Report – Ireland*", with the commission noting that regional disparities in Ireland are amongst the highest in the EU and are increasing. If these unsustainable trends remain unchecked, it will have a detrimental impact on the economic and social wellbeing of all regions in Ireland – particularly the Northern and Western Region – given its existing rural structure. The continuation of these trends may cause large segments of Ireland to experience potentially irreversible economic and social decline, leading to unsustainable pressures being placed on the Greater Dublin Area and undermining the overall performance of our national economy.

Therefore, the delivery of the vision and objectives of the NPF and the RSES could not be more important. Launched in 2020, the RSES of the Northern and Western Region – for the first time – brings together spatial planning and economic policy to provide a long term, statutory, strategic investment framework for the region, which will assist in the implementation of the NPF in the region – as public bodies and local authorities also have to ensure that their plans and programmes are consistent with the RSES.

By focusing on a wide range of interconnected strategic areas – such as population growth, sustainable housing patterns, transport mobility, health, education and social services, economic development and climate change – the RSES of the Northern and Western Region collectively identifies the region's assets, opportunities and challenges, providing an overarching policy response in the form of Regional Policy Objectives (RPOs). In doing so, the RSES of the Northern and Western Region aims to achieve sustainable population and employment growth up to 2032, while supporting the Northern and Western Region's ambition to become a region that is "**Urban**", "**Connected**", "**Smarter**", "**Specialised**" and "**Green**", consolidated by a settlement strategy focusing on "**People and Places**".

[1] https://npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf
[2] https://www.nwra.ie/pdfs/NWRA-RSES-2020-2032.pdf
[3] https://ec.europa.eu/info/sites/default/files/file_import/2019-european-semester-country-report-ireland_en.pdf
[4] https://ec.europa.eu/info/sites/default/files/2020-european_semester_country-report-ireland_en.pdf

Achieving the objectives set out in the NPF and the RSES of the Northern and Western Region will be instrumental in accommodating population growth in the region and supporting effective regional development in Ireland. In this regard, the RSES of the Northern and Western Region identifies key locations for population and employment growth, consisting of the Galway Metropolitan Area, three Regional Growth Centres – namely Sligo Town, Letterkenny and Athlone – along with eight Key Towns. Specifically, the RSES outlines compact growth targets for future housing developments, with at least 50% of all new city homes targeted in the Galway Metropolitan Area to be delivered within its existing built-up footprint, with corresponding targets of 40% and 30% in the Regional Growth Centres and Key Towns of the Northern and Western Region respectively.

Delivering the vision and objectives of the NPF and the RSES will be a key component in tackling regional inequalities in Ireland, allowing the region to develop urban centres of scale which will act as employment and enterprise hubs, building healthy and sustainable communities, enhancing the region's human capital levels and delivering sustainable population growth for the region. Central to achieving the vision and objectives of these strategic frameworks – from an economic and spatial perspective – will be the development of an S3 that adopts a regional approach; utilises regional and local knowledge and builds on each region's sectoral and sub-sectoral strengths.

2.2: Economic Context

Applying a regional approach to Ireland's S3 – and thereby building on each region's unique competitive advantages – could not be more important for the Northern and Western Region, particularly considering the performance of its economy in recent years.

This is evident from the fact that the Northern and Western Region's GDP per head of population was 78 per cent of the EU 27 average as of 2019, which was 7 percentage points lower relative to the region's corresponding ratio in 2009, and 27 percentage points lower compared to the region's previous peak of 105 per cent as of 2006[5]. As per the latest available NUTS 3 statistics, below average performances were also registered across the region, with the West's GDP per head of population at 85 per cent of the EU 27 average in 2018, which was higher compared to the corresponding ratio for the Border, which was 68 per cent. Notably, from the perspective of the Multiannual Financial Framework, the Eurostat figures with respect to the evaluation period (2015 – 2017) showed that the region's GDP per head of population was 82 per cent of the EU 27 average during this time. Such a performance resulted in the European Commission downgrading the Northern and Western Region from its previous status as a "More Developed Region" to a "**Transition Region**" for the funding period of 2021 to 2027.

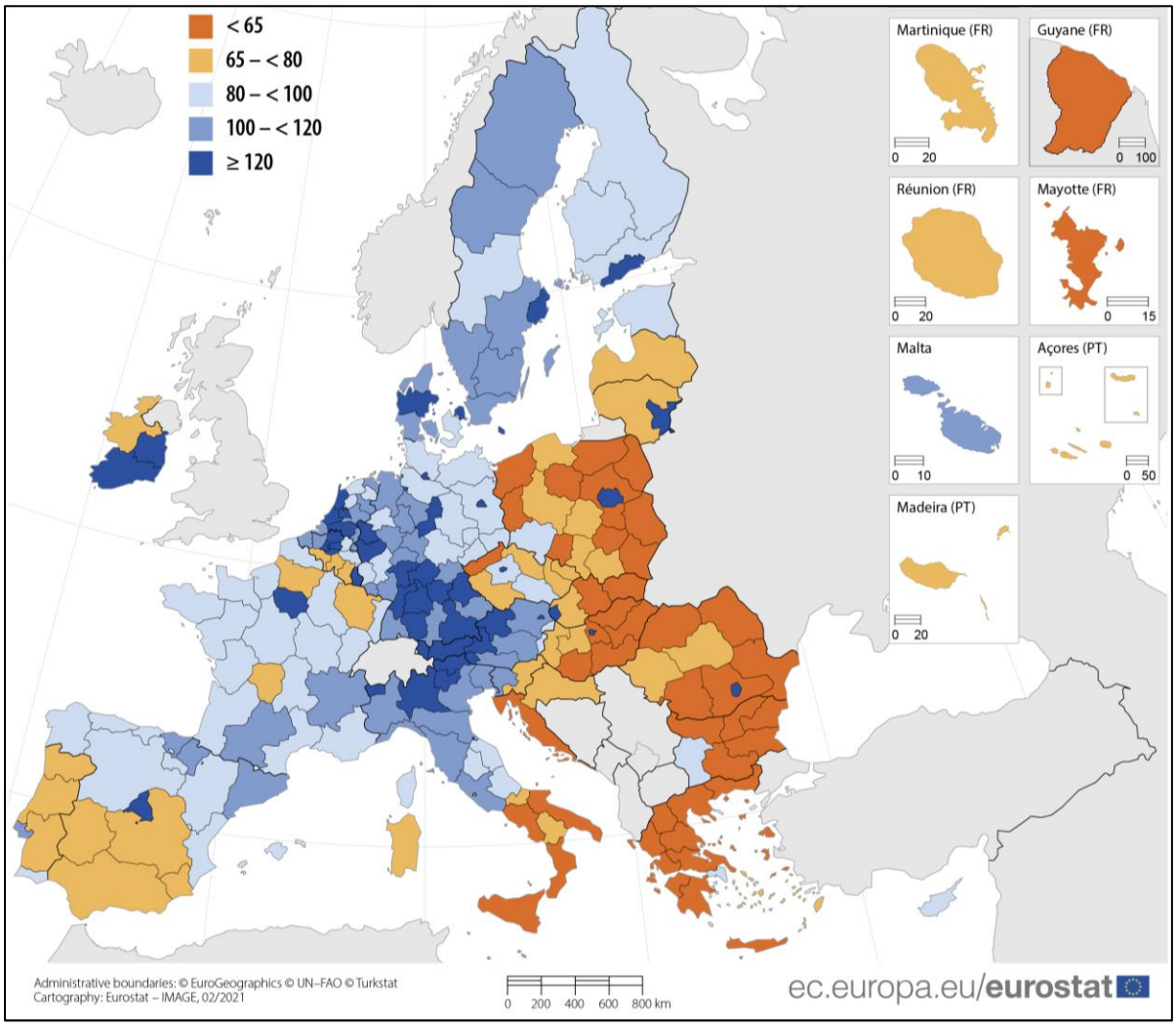
In addition to the region's recent reclassification from a "More Developed Region" to a "Transition Region", the European Parliament's Committee on Regional Development also categorised the Northern and Western Region as a "**Lagging Region**" in their report titled "*EU lagging regions: State of play and future challenges*" [6]. A "Lagging Region" faces specific development challenges across a host of areas, including relatively lower productivity and educational attainment and a weaker skills base and business environment. As a result, "Lagging Regions" – such as the Northern and Western Region – can be expected to experience low economic growth which may lead to a more complex and delayed economic recovery from the COVID-19 crisis.

[5] https://ec.europa.eu/eurostat/web/regions/data/database
[6] https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652215/IPOL_STU(2020)652215_EN.pdf

Furthermore, the EU's 2021 "Regional Innovation Scoreboard[7]", showed that the Northern and Western Region is now the only NUTS 2 Region in Ireland to be classified as a "**Moderate Innovator**" – namely a NUTS 2 Region to register an innovation index score between 70 and 100 per cent of the EU average – whereas the Southern Region and Eastern and Midland Region were classified as being "Strong Innovators", namely NUTS 2 Regions with an innovation index score between 100 and 125 per cent of the EU average.

Within this context, it is clear that a regional approach to Ireland's S3 is required. By bringing a regional dimension to Ireland's S3, policy makers can utilise RD&I funding resources in a far more efficient manner, allowing regions to utilise self-identified competitive advantages for the benefit of their own regional economies. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential.

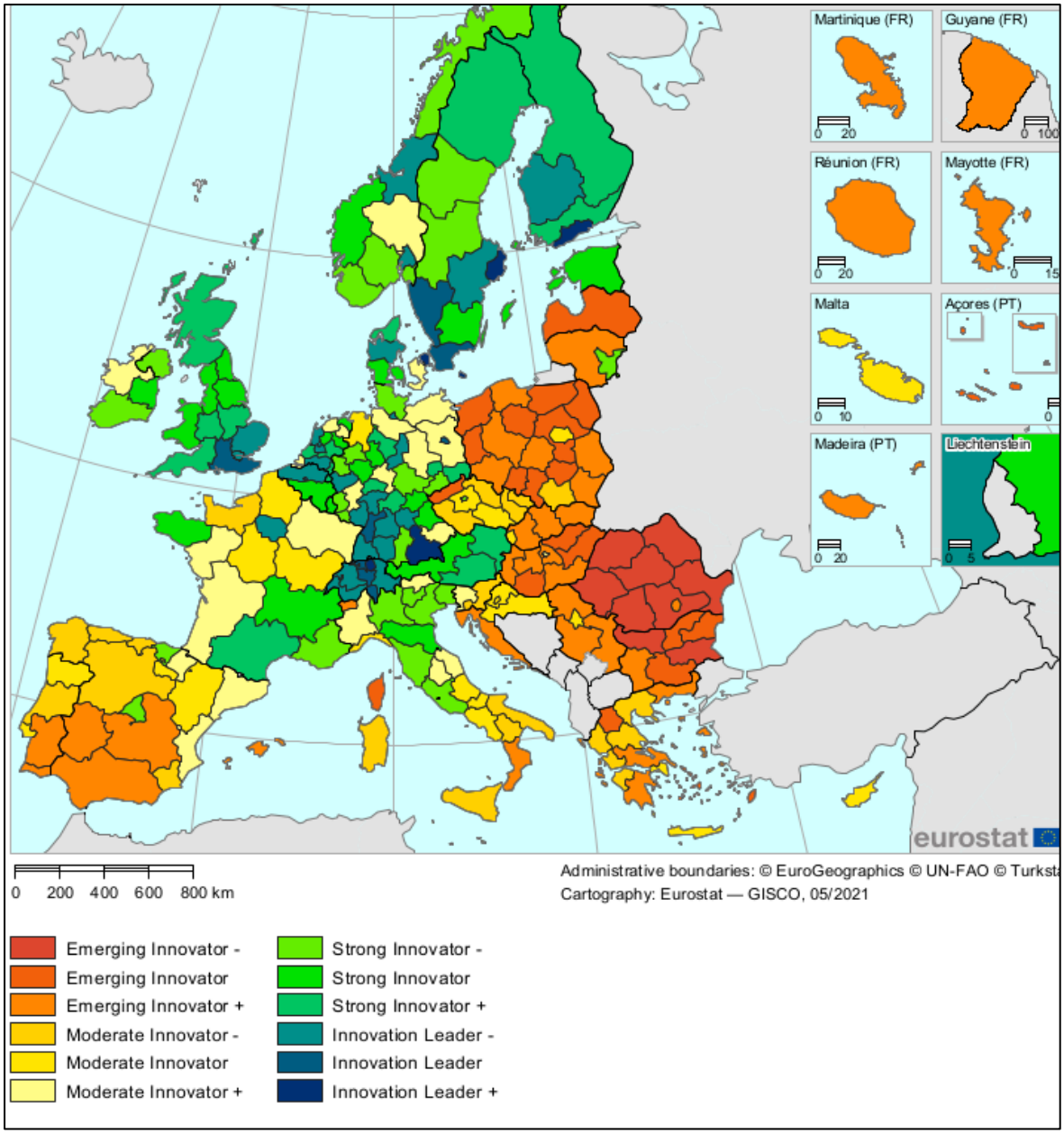
Figure 1: GDP per capita in EU Regions (% of EU 27 average) (PPS) 2019



Source: Eurostat

Figure 2: Regional Innovation Scoreboard, 2021

[7] https://ec.europa.eu/growth/industry/policy/innovation/regional_en#:~:text=The%20regional%20innovation%20scoreboard%20(RIS,a%20limited%20number%20of%20indicators.



Source: Eurostat

3: Responses to Consultation Questions

3.1: Sectoral Strengths

Q: Do you agree with the suggested areas of strength for the three regions as set out above? Are there other areas of strength in the three regions to be highlighted?

As documented in the S3 consultation paper, the DETE has identified a total of 9 high-level sectoral strengths in the Northern and Western Region, namely:

- Med Tec
- Life Sciences
- ICT
- Food / Agri-Tech
- Marine
- Financial Services
- Climate Action and Sustainability
- Manufacturing
- Audio-Visual / Creative sector.

Although the Northern and Western Regional Assembly broadly welcomes the choice of these high-level sectors and the format of focusing on sectoral strengths at a NUTS 2 regional level, the Assembly feels that the Section titled "*Regional Economic Context for Smart Specialisation*" lacks detail in terms of sub-sectoral specialisms on a NUTS 2 regional level, sectoral and sub-sectoral specialisms on a NUTS 3 regional and settlement level and the level of employment in these sectoral and sub-sectoral strengths.

The Northern and Western Regional Assembly believes that this section would have benefited from greater detail in this regard, and that such information would have further enhanced the industrial context for participating stakeholders and informed stakeholders of the unique sectoral and sub-sectoral strengths of the Northern and Western Region and its appropriate sub-regions and key settlements.

For example – given the region's rural structure – it is widely accepted that the Agriculture sector is a high-level sectoral strength of the Northern and Western Region, and this section would have benefited from outlining specific sub-sectoral specialisms that exist in the region, which would range from mixed farming, fishing and aquaculture to crop and vegetable production. Moreover, the activities involved in other selected high-level sectors – such as Manufacturing – can be quite wide ranging, with such activities ranging from the production, processing and preserving of meat, meat products and poultry to the manufacture of electrical equipment. Therefore, a sectoral strength broadly labelled as "Manufacturing" would not completely inform stakeholders of the actual manufacturing strengths of the Northern and Western Region.

In future, it would be worthwhile if the DETE – using available quantitative and qualitative sources – outlined the specialised sub-sectoral activities taking place within the listed sectoral strengths, the location of these specialisms on a sub-regional and settlement basis and – where possible – the level of employment associated with these specialisms. The omission of these details could have influenced the opinions and policy suggestions of stakeholders participating in Ireland's S3 consultation paper.

Within this context, the Northern and Western Regional Assembly believes that Ireland's next S3 should aim to target and support sub-sectoral strengths within each NUTS 2 region, given that the sole selection of high-level sectoral strengths can be of limited value in these types of analyses.

The Northern and Western Regional Assembly has – using the RSES of the Northern and Western Region and available data sources – identified sectoral and sub-sectoral specialisms operating at a NUTS 2 regional level; the details of which have been outlined under the next consultation question. Considering the legislative requirement to ensure consistency with the RSES, it is extremely important that the next S3 aligns with the region's sectoral strengths identified in Chapter 4 "Economy and Employment" of this statutory document[8]. To fully identify sectoral and sub-sectoral specialisms across the Border and West sub-regions and their key settlements would require extensive data analysis beyond the remit of this consultation. On this basis, the forthcoming Location Quotients analysis – which has been presented in the next consultation question – focuses solely on the Northern and Western Region, Galway City and the Regional Growth Centres of the region and aims to showcase the benefits of analysing sub-sectoral specialisms on a NUTS 2 regional level and settlement level.

Q: What, in your opinion, are the key sectors in your region? What are the skills, assets and capabilities within your region?

The process of developing the RSES of the Northern and Western Region included detailed analysis and consultations, with a targeted focus upon the then Department of Business, Enterprise and Innovation and associated economic development agencies, third level institutions and business thought leaders. Such a process highlighted certain sectors and classifications of companies that are of growing importance in supporting economic development in the region. On a regional level – and based on stakeholder consultations and research involved in the development of the RSES – the key sectors of the Northern and Western Region include:

- Tourism
- Renewable Energy and Low Carbon Economy
- Marine and Blue Economy
- ICT and Med Tech
- Agri-Tech and Agri-Food
- Retail
- Advance Manufacturing and Engineering

These high-level sectors have an array of assets, skillsets and capabilities which are instrumental to supporting the Northern and Western Region's economy, and whose growth will be key to achieving balanced regional development in line with the NPF and RSES. A brief overview of a sample of these sectors highlights the potential in achieving the vision and objectives of these strategic frameworks.

For example, and as outlined in the RSES, the region's tourism sector has numerous strategic assets which will continue to improve visitor numbers over the coming decades. The "Wild Atlantic Way" touring route has become a national asset, delivering substantial economic benefits to the Northern and Western Region and the entire western seaboard. The Hidden Heartlands brand – which covers west of Cavan Town, Leitrim, Galway and Roscommon – and the Ancient East brand – which covers East of Cavan Town and Monaghan – can enhance the economic performance of the Northern and Western Region's economy over the coming years. Along this route, there are numerous regional

[8] https://www.nwra.ie/pdfs/NWRA-RSES-2020-2032.pdf

destination towns – such as Galway City, Sligo Town, Letterkenny, Ballina, Westport and Donegal Town (identified as Key Destination Towns: 'Always on') – and tourism assets and natural amenities – such as the region's historical sites, beaches, lakes, rivers, walkways, greenways and blueways – which will continue to support visitor numbers across the region in the coming years.

The Northern and Western Region's Agriculture and Marine sector hosts an array of strategic assets and capabilities which will play a key role in the future growth of these sectors, as evident from the Bia Innovator Campus, the Monaghan Bio-Connect Innovation Centre (MBIC) and the array of piers and harbours located across the region.

The BIA Innovator Campus is a step change project that aims to transform the food entrepreneurship landscape in the Northern and Western Region and along the west coast of Ireland. Co-located at the Teagasc campus in Athenry, it addresses a seismic need for regional food workspace infrastructure and support services and creates an exceptional bundle of food production units and co-working kitchens, learning and innovation[9]. The MBIC will attract local and foreign companies to set up Biotech based Research and Development at MBIC, to drive employment and innovation in the region and across Ireland.

In terms of the Marine, Aquaculture and Seafood sectors, the Northern and Western's key regional assets include:

- **Galway Port, Co Galway:** The upgrade of Galway Harbour and Port continues to represent a key strategic priority for the Northern and Western Region. Such a project will allow for the facility to serve a dual role as a commercial port for cargo, and also a destination point for cruise tourism. This upscaling of the facility would increase Galway Ports influence across the wider region in terms of recreation and delivery of additional visitors into Galway City and beyond.

- **Killybegs, Co Donegal**: Acting as Ireland's primary fishing port and deep-water facility, Killybegs has developed an additional role as a destination point for Cruise Ships. Killybegs has accommodated 13,000 cruise ship visitors in 2018, increasing from 1,300 visitors in less than a decade. A significant marine cluster exists in Killybegs, which serves the North Atlantic Pelagic fleet, and boasts marine engineering expertise, boatbuilding and a further expansion of these activities should be enabled in the coming years.

- **Pairc na Mara, Co Galway**: Important steps are being taken by Údarás na Gaeltachta in the planning and development of Pairc na Mara a new marine innovation park which is to be developed in the Connemara Gaeltacht of County Galway. The development is located on a brownfield site on the southern edge of the Connemara Gaeltacht situated approximately 72km west of Galway City. The site of approximately nine hectares has the potential to provide infrastructure and facilities to support the establishment and expansion of a cross-section of marine enterprises.

- **Newport, Co Mayo:** Newport Research Cluster in County Mayo is involved in ground-breaking research in the marine biotechnology, climate change, and water quality areas. Internationally renowned scientists come to Newport to use their unique data sets and facilities to advance numerous international research projects.

[9] https://biainnovatorcampus.ie/

- **Greencastle, Co Donegal**: Greencastle in County Donegal is one of two BIM National Fisheries Colleges of Ireland and acts as a key marine asset for the Northern and Western Region.

- **The Corrib Gas Field**: Indigenous gas production from the Corrib, Kinsale Head and Seven Heads gas fields accounted for 70 per cent of the States total natural gas demand in 2017. The Corrib Field commenced production at the end of 2015 and is expected to supply on average up to 57 per cent of the State's natural gas demand. Further gas fields are expected to be discovered and developed in the same area in the future which would create a sustainable secure energy source as we transition to a low-carbon economy.

Other regional marine assets, such as Sligo Port – in terms of regional export and import transportation – and Ross a Mhíl – in terms of fish farming – play important roles in their regional and local economies.

In terms of the Information, Communications and Technology (ICT) sector, Galway has the largest concentration of these types of firms in the Northern and Western Region, and there are also significant facilities located in Letterkenny and Athlone. The Galway Metropolitan Area and the Regional Growth Centres of the region – and the presence of leading research centres and Higher Education Institutes within these areas – act as key assets in the region's ICT offering. The cross-section of new and established ICT companies potentially makes Ireland a leading European cluster for this industry. This concentration – which is particularly pronounced in Dublin – can result in spreading facilities and second facilities in our region, particularly in Galway City, Letterkenny, Athlone and Sligo Town. This sectoral specialism is evident given that there are over 190 tech companies based in Galway, including many leading Multinational companies[10]. Galway has an innovative start-up environment with initiatives such as the Portershed, which is a collaborative process between the public sector, private sector and educational institutes. The other designated regional centres have a large ICT presence including Overstock, Ericsson and Pramerica. Notably, Pramerica has developed partnerships with Letterkenny Institute of Technology – along with other education providers – to provide technology and business services for the company globally, with Pramerica acting as the largest employer in the North-West, employing almost 1,600 employees[11].

However, it is important to identify and provide more detail on the sub-sectoral specialisms that exist in the Northern and Western Region, thereby providing a greater sense of the specialisms that exist in the region; a process which should be reflected in Ireland's next S3. Using Census 2016 NACE Code employment data[12], and Location Quotients (LQ) scores, Table 1 provides greater detail of the sub-sectoral specialisms that existed in the Northern and Western Region at the time of the previous Census. It should be noted that LQ scores act as a method in identifying sectors that are specialized in a regional economy, relative to the national norm. For example, in this case:

- An LQ score of 1.0 shows that a geographical area has the same proportion of employment involved in a sub-sector, relative to the national norm.
- An LQ score greater than 1.0 shows that a geographical area has an above average proportion of employment involved in a sub-sector, relative to the national norm.
- An LQ score greater than 1.25 shows that a geographical area has a strong specialization in a sub-sector

[10] https://www.nwra.ie/pdfs/NWRA-RSES-2020-2032.pdf
[11] Employment levels at the time of the publication at the RSES
[12] 1, 2 and 3 Digit NACE Codes

- A LQ score lower than 1 shows that a geographical area has a below average proportion of employment involved in a sub-sector, relative to the national norm.

Using Q1 2021 data from the CSO's Labour Force Survey[13], the Assembly was able to develop up-to-date LQ scores for employment in the Northern and Western Region, at a 1 digit NACE Code. The results below show the high-level sectors (1 digit NACE Codes) that recorded an LQ score greater than 1:

- Agriculture, Forestry and Fishing (LQ Score of 1.88)
- Industry[14] (1.19)
- Human Health and Social Work Activities (1.10)
- Wholesale and Retail Trade (1.05)

Although regional employment data – at a 1 digit NACE Code – is available as of Q1 2021 – through the CSO's Labour Force Survey – it should be noted that due to sampling and confidentiality issues, the CSO were unable to provide Q1 2021 NUTS 2 and NUTS 3 regional employment data at a 2 and 3 digit NACE Code (sub-sectors). As a result, the Northern and Western Region Assembly was unable to identify sub-sectoral specialisms as of Q1 2021, hence the need to focus on Census 2016 data which provides 2 and 3 digit NACE codes on a county basis.

Using Census 2016 sub-sector employment data, the Northern and Western Region's LQ Scores that were greater than 1 have been categorised by their respective 1 digit NACE Code and presented in Table 1 below, thereby showing the sub-sector specialisms that existed across the region. As evident from Table 1, a wide range of sub-sectoral specialisms have been identified across the high-level sectors (1 digit NACE Codes) in the Northern and Western Region. In the Manufacturing sector, sub-sectoral specialisms – that recorded high LQ scores (i.e. greater than 1.25) – were identified in:

- Manufacture of Rubber Products (LQ Score of 2.76)
- Process and Preserving of Fish and Fish Products (2.76)
- Manufacture of Medical and Dental Instruments and Supplies (2.46)
- Manufacture of vegetable and Animal Oils and Fat (1.96)
- Manufacture of Motor Vehicles, Trailer and Semi-Trailers (1.81)
- Production, Processing and Preserving of Meat, Meat Products and Poultry (1.58)
- Manufacture of Wood and Wood Products (1.52)
- Manufacture of Electrical Equipment (1.51)
- Manufacture of Textiles (1.40)
- Manufacture of Plastic Products (1.39)
- Manufacture of Clothes, Dressing and Dyeing of Fur (1.36)
- Manufacture of Articles of Concreate, Plaster and Cement (1.30)
- Manufacture of Machinery and Equipment (1.28)

Outside of the Manufacturing sector, other specialisms were also evident across other 1 digit NACE Codes, with high LQ Scores – on a regional level – identified in sub-sectors such as:

- Fishing and Aquaculture (2.47)
- Other Mining and Quarrying (2.08), which includes quarrying of stone, sand and clay
- Growing of Crops, Fruits, Plants, Flowers and Vegetables (1.89)
- Farming of Animals and Mixed Farming (1.77)

[13] https://data.cso.ie/table/QLF07
[14] Predominantly consists of NACE C "Manufacturing"

- Forestry and Logging (1.54)
- Civil Engineering (1.48)
- Mining Support Services Activities (1.46)
- Hotels and Similar Accommodation (1.37)

Relatively weaker specialisms – but nevertheless above average specialisms (i.e. LQ score higher than 1 but lower than 1.25) – were evident in sub-sectors such as – but not limited to:

- Veterinary Activities (1.23)
- Building Completion and Finishing (1.23)
- Manufacture of Furniture (1.22)

It is important to note that these LQ scores have been presented on a regional basis, and that these scores are likely to vary greatly when examined on a sub-regional level or a settlement level, with more high-value added sub-sectoral specialisms likely to be located in our region's key settlements.

As can be seen in Table 2, the "Manufacture of Medical and Dental Instruments and Supplies" in Galway City[15] – with an LQ Score of 5.96 – performed well above the corresponding regional specialism (LQ Score of 2.46) and the national norm (1), highlighting the degree to which this sub-sector is concentrated and specialised in Galway City. Other sub-sectoral specialisms were also evident in the Manufacturing sector, with high or above average LQ Scores – in Galway City – identified in sub-sectors such as:

- Manufacture of other Transport Equipment (1.70), which includes manufacture of equipment in ships, boats, railway locomotives and rolling stock, aircraft and related machinery
- Manufacture of Machinery and Equipment (1.62)
- Manufacture of Other Computer, Electronic and Optical Products (1.54)
- Manufacture of Computers and Peripheral Equipment (1.50)
- All Other Manufacturing (1.33)
- Manufacture of Motor Vehicles, Trailers and Semi-Trailers (1.14)
- Processing and Preserving of Fruit and Vegetables (1.07)

Outside of the Manufacturing sector, other strong specialisms were also evident in the majority of high-level sectors (1 digit NACE Code), with high LQ scores – in Galway City – identified in sub-sectors – including but not limited to:

- Hotels and Similar Accommodation (1.83)
- Restaurants and Mobile Food Service Activities (1.78)
- Retail Sale of Furniture, Lighting Equipment and Household Articles" (1.74)
- Event Catering and Food Service Activities (1.61)
- Hospital Activities (1.56)
- Scientific Research and Development (1.55)
- Computer Programming, Consultancy and Information Service Activities (1.55)
- Movie, Video and Television Programme Production, Sound Recording and Music Publishing Activities (1.55)
- Creative Arts and Entertainment Services (1.54)
- Mining Support Services Activities (1.38)

[15] Galway City Local Authority boundary

Relatively weaker specialisms – but nevertheless above average specialisms – were also evident in sub-sectors such as:

- Retail Sale of Clothing in Specialised Stores (1.17)
- Sports Activities and Amusement and Recreation Activities (1.16)
- Technical Testing and Analysis (1.16)

Greater detail of these results has been outlined in Tables 1 and 2.

Table 1: LQ Scores of the Northern and Western Region for the sub-sectors with a score greater than 1, by their appropriate high-level sector (i.e. 1 digit NACE Code), Census 2016

LQ Scores (Employment)	Northern and Western
Strong Sub-Sectoral Specialism (LQ Score greater than 1.25)	
Above Average Sub-Sectoral Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Agriculture, forestry and fishing (A)	
Farming (farming of animals, mixed farming)	1.77
Growing of crops, fruits, plants, flowers and vegetables	1.89
Other agricultural activities and agricultural activities n.e.c.	1.31
Forestry and logging	1.54
Fishing and aquaculture	2.47
Mining and quarrying (B)	
Other mining and quarrying	2.08
Mining support service activities	1.46
Manufacturing (C)	
Production, processing and preserving of meat, meat products and poultry	1.58
Processing and preserving of fish and fish products	2.76
Manufacture of vegetable and animal oils and fat	1.96
Manufacture of bakery and farinaceous products	1.18
Manufacture of textiles	1.40
Manufacture of clothes; dressing and dyeing of fur	1.36
Manufacture of leather and related products	1.01
Manufacture of wood and products of wood and cork, except furniture Manufacture of articles of straw and plaiting materials	1.52
Manufacture of rubber products	2.76
Manufacture of plastic products	1.39
Manufacture of glass and glass products	1.05
Manufacture of articles of concrete, plaster and cement	1.30
All other manufacture of other non-metallic mineral products	1.08
Manufacture of fabricated metal products, except machinery and equipment	1.20
Manufacture of electrical equipment	1.51
Manufacture of machinery and equipment n.e.c.	1.28
Manufacture of motor vehicles, trailers and semi-trailers	1.81
Manufacture of other transport equipment	1.25
Manufacture of furniture	1.22
Manufacture of medical and dental instruments and supplies	2.46
All other manufacturing n.e.c.	1.08
Water supply; sewerage, waste management and remediation activities (E)	
Water collection, treatment and supply	1.14
Construction (F)	

Development of building projects and construction of residential and non-residential buildings	1.08
Civil engineering	1.48
Demolition and site preparation	1.29
Plumbing, heat and air-conditioning installation	1.07
Building completion and finishing	1.23
Other specialised construction activities	1.11
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	
Wholesale and retail trade and repair of motor vehicles and motorcycles	1.13
Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.03
Retail sale of food, beverages or tobacco in specialised stores	1.06
Retail sale of automotive fuel in specialised stores	1.22
Retail sale of hardware, paints and glass in specialised stores	1.16
Retail sale of furniture, lighting equipment and household articles n.e.c.	1.08
Transportation and storage (H)	
Freight transport by road	1.11
Accommodation and food service activities (I)	
Hotels and similar accommodation	1.37
Other provision of short-stay accommodation	1.20
Beverage serving activities (incl. bars and coffee shops)	1.14
Professional, scientific and technical activities (M)	
Technical testing and analysis	1.05
Veterinary activities	1.23
Public administration and defence; compulsory social security (O)	
Garda Síochána	1.08
All other public administration; compulsory social security	1.06
Education (P)	
Pre-primary education	1.07
Primary education	1.17
Secondary education	1.19
Human health and social work activities (Q)	
Hospital activities	1.13
Dental practice activities	1.02
Medical practice activities	1.11
Residential care and social work activities	1.17
Other service activities (S)	
Activities of membership organisations	1.07

Source: Northern and Western Regional Assembly calculations using CSO Census data

Table 2: LQ Scores of Galway City for the sub-sectors with a score greater than 1, by their appropriate high-level sector (i.e. 1 digit NACE Code), Census 2016

LQ Scores (Employment)	Galway City
Strong Sub-Sectoral Specialism (LQ Score greater than 1.25)	
Above Average Sub-Sectoral Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Mining and quarrying (B)	
Mining support service activities	1.38
Manufacturing (C)	
Processing and preserving of fruit and vegetables	1.07
Manufacture of computers and peripheral equipment	1.50
Manufacture of other computer, electronic and optical products	1.54
Manufacture of machinery and equipment n.e.c.	1.62
Manufacture of motor vehicles, trailers and semi-trailers	1.14
Manufacture of other transport equipment	1.70
Manufacture of medical and dental instruments and supplies	5.96
All other manufacturing n.e.c.	1.33
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	
Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.02
Retail sale of food, beverages or tobacco in specialised stores	1.12
Retail sale of information and communication equipment in specialised stores	1.15
Retail sale of electrical household appliances in specialised stores	1.24
Retail sale of furniture, lighting equipment and household articles n.e.c.	1.74
Retail sale of cultural and recreation goods in specialised stores	1.67
Retail sale of clothing in specialised stores	1.17
Retail trade n.e.c.	1.27
Transportation and storage (H)	
Taxi operations	1.31
Accommodation and food service activities (I)	
Hotels and similar accommodation	1.83
Other provision of short-stay accommodation	2.48
Restaurants and mobile food service activities	1.78
Event catering and food service activities	1.61
Beverage serving activities (incl. bars and coffee shops)	1.26
Information and communication activities (J)	
Publishing of books, newspapers, magazines, software and other publishing services	1.01
Movie, video and television programme production, sound recording and music publishing activities	1.55
Computer programming, consultancy and Information service activities	1.55
Financial and insurance activities (K)	
Insurance, reinsurance and pension funding, except compulsory social security	1.09
Professional, scientific and technical activities (M)	
Technical testing and analysis	1.16
Scientific research and development	1.55
Other professional, scientific and technical activities	1.06
Administrative and support service activities (N)	
Services to buildings and landscape activities	1.26
Public administration and defence; compulsory social security (O)	

Defence activities	1.13
Education (P)	
Higher education	2.46
Adult and other education not elsewhere classified	1.03
Human health and social work activities (Q)	
Hospital activities	1.56
Dental practice activities	1.31
Medical practice activities	1.31
Other human health activities	1.24
Arts, entertainment and recreation (R)	
Creative arts and entertainment activities	1.54
Libraries, archives, museums and other cultural activities	1.05
Sports activities and amusement and recreation activities	1.16
Other service activities (S)	
Repair of computers and personal and household goods	1.25
Washing and dry-cleaning of textile and fur products	1.09
Hairdressing and other beauty treatment	1.04
Other service activities n.e.c.	1.07

Source: Northern and Western Regional Assembly calculations using CSO Census data

Tables 3, 4 and 5 also highlight the sub-sector specialisms that existed across the Regional Growth Centres of the Northern and Western Region – namely Letterkenny, Athlone and Sligo Town – at the time of the Census. For instance, as evident from Table 3, a wide range of sub-sectoral specialisms have been identified across the high-level sectors (1 digit NACE Codes) in Athlone. In the Manufacturing sector, sub-sectoral specialisms – that recorded high LQ scores (i.e. greater than 1.25) – were identified in:

- Manufacture of Computer, Electronic and Optical Products (LQ Score of 9.67)
- Manufacture of Plastic Products (3.71)
- Production, Processing and Preserving of Meat, Meat Products and Poultry (2.44)
- Manufacture of Pharmaceuticals, Medicinal Chemicals and Botanical products (2.37)
- Manufacture of Medical and Dental Instruments and Supplies (1.87)
- All other Manufacture of Non-Metallic Mineral Products (1.76)

Outside of the Manufacturing sector, other specialisms were also evident across other 1 digit NACE Codes, with high LQ Scores – on a regional level – identified in sub-sectors such as:

- Defence Activities (7.14)
- Telecommunication (2.91)
- Scientific Research and Development (2.12)
- Hotels and Similar Accommodation (1.97)
- Technical Testing and Analysis (1.85)
- Restaurants and Mobile Food Service Activities (1.57)
- Computer Programming, Consultancy and Information Service Activities (1.37)

Greater detail of the Athlone results can be found in Table 3 below and the full results of LQ analysis of Letterkenny and Sligo Town have been outlined in Tables 4 and 5.

Table 3: LQ Scores of Athlone for the sub-sectors with a score greater than 1, by their appropriate high-level sector (i.e. 1 digit NACE Code), Census 2016

LQ Scores (Employment)	Athlone
Strong Sub-Sectoral Specialism (LQ Score greater than 1.25)	
Above Average Sub-Sectoral Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Manufacturing (C)	
Production, processing and preserving of meat, meat products and poultry	2.44
Manufacture of pulp, paper and paper products	1.21
Manufacture of coke, refined petroleum products, chemicals and chemical products	1.06
Manufacture of pharmaceuticals, medicinal chemicals and botanical products	2.37
Manufacture of plastic products	3.71
All other manufacture of other non-metallic mineral products	1.76
Manufacture of other computer, electronic and optical products	9.67
Manufacture of medical and dental instruments and supplies	1.87
Construction (F)	
Other specialised construction activities	1.29
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	
Wholesale of household goods	1.12
Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.38
Retail sale of food, beverages or tobacco in specialised stores	1.45
Retail sale of automotive fuel in specialised stores	1.19
Retail sale of hardware, paints and glass in specialised stores	2.02
Retail sale of electrical household appliances in specialised stores	1.07
Retail sale of cultural and recreation goods in specialised stores	1.55
Retail sale of clothing in specialised stores	1.61
Retail sale of footwear and leather goods in specialised stores	1.13
Transportation and storage (H)	
Taxi operations	1.16
Transport via railways	2.00
Post and courier activities	2.31
Accommodation and food service activities (I)	
Hotels and similar accommodation	1.97
Restaurants and mobile food service activities	1.57
Event catering and food service activities	1.08
Beverage serving activities (incl. bars and coffee shops)	1.07
Information and communication activities (J)	
Programming and broadcasting activities	1.02
Telecommunications	2.91
Computer programming, consultancy and Information service activities	1.37
Professional, scientific and technical activities (M)	
Technical testing and analysis	1.85
Scientific research and development	2.12
Advertising and market research	1.05
Administrative and support service activities (N)	
Services to buildings and landscape activities	1.42
Public administration and defence; compulsory social security (O)	

Defence activities	7.14
Education (P)	
Higher education	1.31
Arts, entertainment and recreation (R)	
Gambling and betting activities	1.07
Other service activities (S)	
Repair of computers and personal and household goods	1.17
Washing and dry-cleaning of textile and fur products	1.06
Hairdressing and other beauty treatment	1.12
Funeral and related activities	1.83

Source: Northern and Western Regional Assembly calculations using CSO Census data

Table 4: LQ Scores of Letterkenny for the sub-sectors with a score greater than 1, by their appropriate high-level sector (i.e. 1 digit NACE Code), Census 2016

LQ Scores (Employment)	Letterkenny
Strong Sub-Sectoral Specialism (LQ Score greater than 1.25)	
Above Average Sub-Sectoral Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Agriculture, forestry and fishing (A)	
Fishing and aquaculture	1.29
Manufacturing (C)	
Production, processing and preserving of meat, meat products and poultry	1.24
Processing and preserving of fish and fish products	2.75
Manufacture of bakery and farinaceous products	1.33
Manufacture of clothes; dressing and dyeing of fur	1.03
Manufacture of motor vehicles, trailers and semi-trailers	1.53
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	
Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.19
Retail sale of food, beverages or tobacco in specialised stores	1.39
Retail sale of automotive fuel in specialised stores	1.18
Retail sale of information and communication equipment in specialised stores	1.11
Retail sale of electrical household appliances in specialised stores	2.11
Retail sale of furniture, lighting equipment and household articles n.e.c.	1.89
Retail sale of cultural and recreation goods in specialised stores	1.89
Retail sale of clothing in specialised stores	1.59
Retail sale of footwear and leather goods in specialised stores	1.30
Transportation and storage (H)	
Taxi operations	1.03
Accommodation and food service activities (I)	
Hotels and similar accommodation	1.56
Other provision of short-stay accommodation	1.26
Restaurants and mobile food service activities	1.83
Event catering and food service activities	1.04
Beverage serving activities (incl. bars and coffee shops)	1.42
Information and communication activities (J)	
Programming and broadcasting activities	1.05
Computer programming, consultancy and Information service activities	2.81
Financial and insurance activities (K)	
Insurance, reinsurance and pension funding, except compulsory social security	2.81
Activities auxiliary to insurance and pension funding	1.71
Administrative and support service activities (N)	
Services to buildings and landscape activities	1.01
Public administration and defence; compulsory social security (O)	
Garda Síochána	1.79
All other public administration; compulsory social security	1.23
Education (P)	
Primary education	1.29
Secondary education	1.69
Higher education	1.17

Adult and other education not elsewhere classified	1.12
Human health and social work activities (Q)	
Hospital activities	2.13
Dental practice activities	1.06
Medical practice activities	1.17
Other human health activities	1.25
Arts, entertainment and recreation (R)	
Creative arts and entertainment activities	1.21
Other service activities (S)	
Activities of membership organisations	1.12
Hairdressing and other beauty treatment	1.22

Source: Northern and Western Regional Assembly calculations using CSO Census data

Table 5: LQ Scores of Sligo Town for the sub-sectors with a score greater than 1, by their appropriate high-level sector (i.e. 1 digit NACE Code), Census 2016

LQ Scores	Sligo Town
Strong Sub-Sectoral Specialism (LQ Score greater than 1.25)	
Above Average Sub-Sectoral Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Manufacturing (C)	
Manufacture of bakery and farinaceous products	2.21
Manufacture of clothes; dressing and dyeing of fur	1.55
Manufacture of wood and products of wood and cork, except furniture Manufacture of articles of straw and plaiting materials	1.01
Manufacture of pharmaceuticals, medicinal chemicals and botanical products	1.88
Manufacture of rubber products	38.83
Manufacture of plastic products	2.19
Manufacture of motor vehicles, trailers and semi-trailers	1.82
Manufacture of medical and dental instruments and supplies	2.52
All other manufacturing n.e.c.	1.11
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	
Wholesale of wood, construction materials and sanitary equipment	1.01
Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.23
Retail sale of food, beverages or tobacco in specialised stores	1.02
Retail sale of information and communication equipment in specialised stores	1.01
Retail sale of electrical household appliances in specialised stores	1.26
Retail sale of furniture, lighting equipment and household articles n.e.c.	1.03
Retail sale of cultural and recreation goods in specialised stores	1.34
Retail sale of clothing in specialised stores	1.76
Retail sale of footwear and leather goods in specialised stores	1.50
Retail trade n.e.c.	1.22
Transportation and storage (H)	
Taxi operations	1.28
Accommodation and food service activities (I)	
Hotels and similar accommodation	1.87
Other provision of short-stay accommodation	1.71
Restaurants and mobile food service activities	2.02
Event catering and food service activities	1.52
Beverage serving activities (incl. bars and coffee shops)	1.59
Professional, scientific and technical activities (M)	
Technical testing and analysis	1.33
Administrative and support service activities (N)	
Services to buildings and landscape activities	1.36
Public administration and defence; compulsory social security (O)	
All other public administration; compulsory social security	1.45
Education (P)	
Pre-primary education	1.75
Higher education	1.47
Human health and social work activities (Q)	
Hospital activities	1.82
Residential care and social work activities	1.36

Arts, entertainment and recreation (R)	
Creative arts and entertainment activities	1.53
Libraries, archives, museums and other cultural activities	1.15
Other service activities (S)	
Activities of membership organisations	1.36
Repair of computers and personal and household goods	1.16
Washing and dry-cleaning of textile and fur products	1.35
Hairdressing and other beauty treatment	1.43
Other service activities n.e.c.	1.62

Source: Northern and Western Regional Assembly calculations using CSO Census data

To provide some sense of the sub-sectoral specialisms that have existed across the region in more recent times, the Northern and Western Regional Assembly – in a separate piece of research on "Traded Clusters" – has also undertaken a similar exercise to the above LQ analysis, except using the GeoDirectory commercial database as of September 2020, and the European Cluster Observatory's definitions of "Traded Clusters" [16], which would be a agglomeration of a variety of different 3 and 4 digit NACE Codes across different 1 digit NACE Codes.

GeoDirectory are a public body that regularly provides databases on commercial buildings across every part of Ireland, showing whether a commercial building is occupied, whether it's vacant, its geographical location, and the sector the unit operates within, using detailed NACE Codes that can be provided at a 2, 3 and – in some instances – a 4 digit NACE Code. Using the GeoDirectory commercial database and the European Cluster Observatory's definitions of "Traded Clusters", the Northern and Western Regional Assembly has been able to calculate the LQ scores for commercial units – with a designated NACE Code – for the region. Traded clusters – which aggregate various 3 and 4 digit NACE codes across a variety of 1 digit NACE Codes – capture those industries that are serving markets beyond their own geographical locations and that are fully exposed to competition from other locations. Traded clusters concentrate across regions and their high wages and innovation make them the drivers of regional economic activity. Unlike the previous LQ analysis – which involved Census employment data across 1 digit NACE Codes – this LQ analysis would exclude data relating to the local economy and would focus solely on activities involved in the defined "Traded Clusters".

It should be noted that the GeoDirectory commercial database only provides information on the number of commercial units by NACE code; and would not consider the employment numbers of a commercial unit. Up-to-date employment levels – at this level of detail in terms of geographical location and sector – was not available. Therefore, this information can only act as a limited guide to our region's "Trade Cluster" specialisms – as of September 2020 – and this analysis would not consider the employment intensity of any "Trade Clusters", regardless of its LQ score. Further information would be needed from qualitative sources to fully identify recent sub-sectoral specialisms that exist in the region.

In Table 6 – and using the GeoDirectory commercial database – the Northern & Western Region's LQ scores that were greater than 1 have been presented for each of the available "Traded Clusters", thereby providing some sense of the latest "Traded Cluster" specialisms of the region. High LQ scores (greater than 1.25) for commercial units – in the Northern and Western Region – were identified in "Traded Clusters" ranging from Oil and Gas Production and Transportation,

[16] Definitions of "Traded Clusters" can be found in the attached link: https://ec.europa.eu/docsroom/documents/16527/attachments/1/translations/en/renditions/native

Manufacture of Medical Devices, Manufacture of Footwear, Manufacture of Apparel, Manufacture of Furniture, Vulcanized and Fired Materials and Hospitality and Tourism. Similar results were also developed for Galway City and Suburbs[17] and the Regional Growth Centres of the Northern and Western Region – namely Letterkenny, Athlone and Sligo Town – with these results presented in Tables 7 to 10. For example, in Table 7, high LQ scores for commercial units – in Galway City and Suburbs – were identified in "Traded Clusters" ranging from Manufacture of Medical Devices, Insurance Services, Manufacture of Footwear, Production Technology and Heavy Machinery, Recreational and Small Electric Goods, Education and Knowledge Creation activities, Biopharmaceuticals and Financial Services.

Notably, high LQ scores for commercial units – in the Regional Growth Centres of the Northern and Western Region – were identified in a variety of high valued "Traded Clusters", including but not limited to, the Manufacture of Medical Devices, Manufacture of Plastics, Biopharmaceuticals, Information Technology and Analytical Instruments, Vulcanized and Fired Materials and Education and Knowledge Creation activities.

Table 6: LQ Scores for commercial units of the Northern and Western Region for the "Traded Clusters" that were greater than 1, using GeoDirectory 2020 commercial data

Northern and Western Region Table	LQ Score
Strong "Trade Cluster" Specialism (LQ Score greater than 1.25)	
Above Average "Trade Cluster" Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Oil and Gas Production and Transportation	4.75
Manufacture of Medical Devices	1.70
Manufacture of Footwear	1.48
Textile Manufacturing	1.41
Manufacture of Apparel	1.40
Non-Metal Mining	1.36
Manufacture of Furniture	1.34
Vulcanized and Fired Materials	1.30
Manufacture of Wood Products	1.27
Hospitality and Tourism	1.26
Upstream Metal Manufacturing	1.25
Water Transportation	1.24
Recreational and Small Electric Goods	1.21
Environmental Services	1.18
Construction Products and Services	1.17
Manufacture of Plastics	1.12
Production Technology and Heavy Machinery	1.10

Source: Northern and Western Regional Assembly calculations using GeoDirectory commercial data

[17] CSO defined settlement boundary of Galway City and Suburbs

Table 7: LQ Scores for commercial units of Galway City and Suburbs for the "Traded Clusters" that were greater than 1, using GeoDirectory 2020 commercial data

Galway City and Suburbs Table	LQ Score
Strong "Trade Cluster" Specialism (LQ Score greater than 1.25)	
Above Average "Trade Cluster" Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Manufacture of Medical Devices	7.81
Printing Services	4.30
Insurance Services	3.13
Manufacture of Footwear	3.04
Production Technology and Heavy Machinery	1.87
Recreational and Small Electric Goods	1.65
Education and Knowledge Creation	1.60
Water Transportation	1.44
Biopharmaceuticals	1.35
Financial Services	1.25
Hospitality and Tourism	1.21
Business Services	1.18
Information Technology and Analytical Instruments	1.12
Communications Equipment and Services	1.04
Textile Manufacturing	1.01

Source: Northern and Western Regional Assembly calculations using GeoDirectory commercial data

Table 8: LQ Scores for commercial units of Letterkenny for the "Traded Clusters" that were greater than 1, using GeoDirectory 2020 commercial data

Letterkenny Table	LQ Score
Strong "Trade Cluster" Specialism (LQ Score greater than 1.25)	
Above Average "Trade Cluster" Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Manufacture of Medical Devices	4.50
Manufacture of Apparel	3.57
Music and Sound Recording	1.92
Biopharmaceuticals	1.26
Textile Manufacturing	1.26
Marketing, Design and Publishing	1.16
Vulcanized and Fired Materials	1.13

Source: Northern and Western Regional Assembly calculations using GeoDirectory commercial data

Table 9: LQ Scores for commercial units of Athlone for the "Traded Clusters" that were greater than 1, using GeoDirectory 2020 commercial data

Athlone Table	LQ Score
Strong "Trade Cluster" Specialism (LQ Score greater than 1.25)	
Above Average "Trade Cluster" Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Manufacture of Medical Devices	8.12
Paper and Packaging	6.09
Manufacture of Plastics	2.28
Downstream Chemical Products	1.98
Metalworking Technology	1.48
Information Technology and Analytical Instruments	1.25
Construction Products and Services	1.11
Vulcanized and Fired Materials	1.02

Source: Northern and Western Regional Assembly calculations using GeoDirectory commercial data

Table 10: LQ Scores for commercial units of Sligo Town for the "Traded Clusters" that were equal to or greater than 1, using GeoDirectory 2020 commercial data

Sligo Town Table	LQ Score
Strong "Trade Cluster" Specialism (LQ Score greater than 1.25)	
Above Average "Trade Cluster" Specialism (LQ Score greater than 1 but less than or equal to 1.25)	
Manufacture of Medical Devices	5.66
Manufacture of Plastics	2.12
Performing Arts	2.00
Vulcanized and Fired Materials	1.90
Video Production and Distribution	1.43
Information Technology and Analytical Instruments	1.17
Education and Knowledge Creation	1.03

Source: Northern and Western Regional Assembly calculations using GeoDirectory commercial data

Q: Which sectors could achieve critical mass in Ireland over the next seven years? Where are the opportunities and what needs to be done to unlock these opportunities?

In the coming years, the accelerating impact of greenhouse gas emissions on our climate will significantly alter the manner in which all global economies operate; with such trends requiring policymakers to deliver major policy and legislative changes that will facilitate a low – and eventually – a zero carbon future. By 2030 alone, the Irish Government has committed to a 51 per cent emissions reduction and climate neutrality by 2050.

As a result of such trends, it is likely that the low-carbon economy and its associated sub-sectors are uniquely positioned to achieve critical mass within the next seven years. Notwithstanding the fact that the transition to a low carbon economy poses substantial economic and social challenges to Ireland, it is evident that such a transition also provides considerable economic opportunities for Ireland's enterprise base, primarily through new climate oriented innovations, efficiencies, products, services, employment and export markets.

Within this context – and considering the time sensitive nature of Ireland's ambitious climate targets – the Northern and Western Regional Assembly – through research and stakeholder consultations in the development of the RSES – believes that the below sub-sectors are likely to achieve or expand towards critical mass within the next seven years:

- Energy Efficiency Technologies
- Offshore Wind Energy
- Onshore Wind Energy
- Solar Energy
- Tidal Energy
- Sustainable Agriculture and Bioeconomy Practises
- Carbon Sequestration
- Hydrogen Production
- Afforestation Services
- Environmental Engineering and Ecosystem Services
- Electric Vehicle (EV) and Hybrid Technologies

The basis of the RSES's choice of these activities is predominantly based on the need for Ireland to achieve time sensitive climate targets but also given the existing challenges that need to be overcome in order to achieve these targets. For example, as per latest available CSO statistics[18][19], only 20 per cent of domestic buildings audited in Ireland registered either a Building Energy Rating (BER) of "A" or "B", with below-average proportions recorded in all of the counties of the Northern and Western Region, with the corresponding ratio for non-domestic buildings being only 15 per cent.

Using energy efficiency technologies – such as heat pumps and retrofitting – to improve the BERs of these residential and non-residential buildings – and the subsequent employment required to do so – provides a significant opportunity for high-value added job creation across our regions, particularly in the Northern and Western Region where a notably low and below average proportion of audited residential and non-residential buildings recorded an BER between "A" and "B".

Unlocking these opportunities will ultimately require considerable investment, from both the public and private sectors, and will need to delivered using a regional approach which supports the vision

[18] https://www.cso.ie/en/releasesandpublications/er/dber/domesticbuildingenergyratingsquarter12021/
[19] https://www.cso.ie/en/releasesandpublications/er/ndber/non-domesticbuildingenergyratingsq12021/

and objectives of the NPF and the RSES. On this basis, it is imperative that the DETE supports the following "Regional Policy Objectives" (RPOs) which have been outlined in the RSES of the Northern and Western Region, namely:

- RPO 4.16 which aims to identify potential renewable energy sites of scale in collaboration with Local Authorities and other stakeholders within 3 years of the adoption of the RSES.

- RPO 4.17 which aims to position the Northern and Western Region to avail of the emerging global market in renewable energy by:

    - Stimulating the development and deployment of the most advantageous renewable energy systems
    - Supporting research and innovation
    - Encouraging skills development and transferability
    - Raising awareness and public understanding of renewable energy and encourage market opportunities for the renewable energy industry to promote the development and growth of renewable energy businesses
    - Encouraging the development of the transmission and distribution grids to facilitate the development of renewable energy projects and the effective utilisation of the energy generated from renewable sources having regard to the future potential of the region over the lifetime of the Strategy and beyond.

- RPO 4.18 which aims to support the development of secure, reliable and safe supplies of renewable energy, to maximise their value, maintain the inward investment, support indigenous industry and create jobs.

- RPO 4.19 which aims to support the appropriate development of offshore wind energy production through the adequate provision of land-based infrastructure and services, in line with national policy and in a manner that is compatible with environmental, ecological and landscape considerations.

- RPO 4.20 which aims to support and encourage the development of the bio-economy sector, and facilitate its development for energy production, heat, and storage distribution, in particular advocating Combined Heat and Power Units integrated into District Heating networks, in combination with Pyrogenic Carbon Capture and Storage (PyCCS) or Bio-Energy Carbon capture and storage (BECCS) all to be done in collaboration with EPA and other regulators.

- RPO 4.21 which aims to promote innovative new building design and retrofitting of existing buildings, both private properties, and publicly owned, to improve building energy efficiency, energy conservation and the use of renewable energy sources following National Regulations, and Policy

- RPO 4.22 which aims to safeguard and support the strategic role and function of existing test and development sites, for example, the Atlantic Marine Energy Test Site (AMETS). The test site forms part of Ireland's Ocean Energy Strategy and is being developed following the Offshore Renewable Energy Development Plan.

- RPO 4.26 which supports the further development of AgInnovation clusters in the Northern and Western Region - pushing convergence between farm, research, technology and commercialisation.

- RPO 4.27 which supports the exploration of opportunities in the circular resource-efficient economy, including undertaking a bioeconomy feasibility study for this region. This feasibility study will aim to identify (and map) areas of potential growth to inform the National Transition Agenda, enabling a Low Carbon, resilient nation.

- RPO 4.28 which supports the potential creation of appropriately scaled local multi-feedstock bio-refining hubs across the region as well as potential creation of bio-districts/clusters

- RPO 4.29 which supports the future-proofing of infrastructure planning to allow for the potential upgrading of existing industrial sites to bio-refining plants while also supporting the use of bio-renewable energy for the sustainable production of bio-based products

- RPO 4.33 which aims to facilitate where possible Marine Renewable Technology Projects off the West and North West coasts of Ireland, and subject to environmental and amenity considerations (feasibility studies), and where applicable, enable National Grid connection.

3.2: Digitalisation and Digital Transformation

Q: Is digitalisation impacting your sector or region? How?

The continued digital transformation of our region's economy will be central to the implementation of the NPF, the RSES of the Northern and Western Region, and the government's rural development strategy "*Our Rural Future*"[20]" which aims to – amongst other things – reduce the gap in urban-rural digital connectivity.

In transitioning to a more digital oriented economy, the Northern and Western Region is currently facing a number of significant challenges, ranging from the lack of access to digital technologies – such as high-speed broadband – low levels of basic digital skills and below average levels of employment in digital industries.

Access to Digital Technologies: The lack of access to high-speed broadband in Ireland – particularly in rural communities – has been cited in the European Commission's "*2019[21] and 2020[22] Semester: Country Report – Ireland*" – henceforth known as the "*Country Reports*" – for contributing to regional imbalances in Ireland with respect to skilled labour, productivity and competitiveness, with this issue representing a significant strategic challenge for the Northern and Western Region.

Of the three NUTS 2 regions of Ireland, households based in the Northern and Western Region recorded the lowest level of access to fixed broadband in 2020, with the region recording a connection rate of 76 per cent. This was considerably lower compared to the State average (85 per cent), the Southern Region (83%) and the Eastern and Midland Region (90%)[23]. The lack of access to high-speed broadband was also evident on a NUTS 3 regional level, with below average fixed broadband connection rates also registered in the Border (73%) and the West (79%) in 2020.

Basic Digital Skills: In conjunction to the lack of access to high-speed broadband, it should be noted that the European Commission's *"2020 Country Report*" also highlighted how relatively low levels of basic digital skills in the Irish workforce were acting as a barrier for greater uptake of innovation; with this issue of particular relevance to the Northern and Western Region. Although relevant regional statistics aren't readily available, the lack of basic digital skills in the region is evident from the fact that:

- 25 per cent of individuals based in the Northern and Western Region never used the internet as of 2020, which was significantly higher than the corresponding State average of 6 per cent[24].

- Only 60 per cent of individuals based in the Northern and Western Region used the internet on a daily basis in 2020, which is considerably lower compared to the State average (84%), the Southern Region (88%) and the Eastern and Midland Region (92%).

[20] https://www.gov.ie/en/publication/4c236-our-rural-future-vision-and-policy-context/
[21] https://ec.europa.eu/info/sites/info/files/file_import/2019-european-semester-country-report-ireland_en.pdf
[22] https://ec.europa.eu/info/sites/info/files/2020-european_semester_country-report-ireland_en.pdf
[23] NUTS 2 data obtained through a private request from the CSO. NUTS 3 data available via attached CSO link: https://www.cso.ie/en/releasesandpublications/ep/p-isshh/informationsocietystatistics-households2020/householdinternetconnectivity/
[24] https://ec.europa.eu/eurostat/web/regions/data/database

- Only 47 per cent of individuals based in the Northern and Western Region used the internet to exchange information and services with government and public administrations in 2020, which is notably lower than the State average (62%), the Eastern and Midland Region (65%) and the Southern Region (67%). The Northern and Western Region's ratio in this regard is also considerably lower compared to leading European regions in Denmark, Norway and Iceland.

- 53 per cent of individuals based in the Northern and Western Region used the internet to order goods or services for private use in 2020, which is lower than the State average (74%), the Southern Region (77%) and the Eastern and Midland Region (84%). The region's performance in this regard is also considerably lower relative to leading European regions in Iceland, Denmark, Sweden and Norway.

- Only 48 per cent of individuals based in the Northern and Western Region used internet banking in 2020, which is notably lower than the State average (69%), the Southern Region (71%) and the Eastern and Midland Region (78%). The Northern and Western Region's ratio in this regard is also considerably lower compared to leading European regions in Finland, Denmark, Norway and Iceland.

Employment in Digital Sectors: The Northern and Western Region's underperformance in terms of access to digital technologies – such as high-speed broadband – and relatively low levels of digital skills is also reflected in the fact that the region is less reliant on technology-oriented sectors, with these sectors only accounting for 5.9 per cent of the region's employment base in 2020, which is lower relative to the corresponding ratios for Ireland (9.2%), the Southern Region (9%) and the Eastern and Midland Region (10.5%)[25]. Such an underperformance was also evident in the European Commission's 2021 "Regional Innovation Scoreboard[26]" with the Northern and Western Region recording an index score – in terms of employed ICT specialists – below the EU 27 average.

Q: Could your business or sector benefit from new digital technologies? What support would you need to adopt these technologies? / Q: How can we improve the alignment of the country's ICT and digitalisation expertise, initiatives and investments?

Providing the region's citizens and enterprise base with the latest available digital technologies opens up an array of opportunities for the Northern and Western Region, including but not limited to, growing the region's economy – through productivity gains – to improving the quality of life offering of the region, through the use of smart technologies in the private and public sectors.

Evidently, it is widely accepted that economic growth in leading regional economies is being increasingly driven by businesses operating within the technology and knowledge intensive economy – and will continue to do so in the coming years – with the availability and use of new digital technologies allowing enterprises to develop new commercial opportunities, high-valued jobs, productivity gains, innovative products, services and market efficiencies.

[25] https://ec.europa.eu/eurostat/web/regions/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_BQqmHeCfV1BE&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view
[26] https://ec.europa.eu/growth/industry/policy/innovation/regional_en

Using digital technologies to deliver these type of economic benefits to the Northern and Western Region's economy could not be more important, considering the decision of the European Commission to downgrade the region's economy from a "More Developed Region" to a "Transition Region" but also given that in the previous labour market recovery between 2012 and 2019, the Northern and Western Region's enterprise base had been unable to attract as many technology oriented jobs compared to the Irish norm; a trend which is likely to have contributed to the region's below average GDP performance.

Between 2012 – when the Irish labour market began to recover from the financial crisis – and 2019, employment in "High-Technology" sectors – namely employment involved in high-technology manufacturing and knowledge-intensive high-technology services – accounted for only 2.9 per cent of total jobs created in the Northern and Western Region's labour market recovery, which was considerably lower relative to the corresponding share for Ireland (7.9%)[27]. The contribution of "High-Technology" sectors to the Northern and Western Region's previous labour market recovery was also lower relative to the corresponding ratios recorded in the Southern Region (11.5%) and the Eastern and Midland Region (7.8%). Although numerous factors are likely to have led to the region's reclassification, it is likely that the region's inability to attract more technology-oriented jobs – and the subsequent economic benefits associated with these jobs – contributed to the region's redesignation from a "More Developed Region" to a "Transition Region".

Within this context, it is imperative that additional resources are provided to deliver greater access to digital technologies, provide our citizens the relevant skillset to utilise these technologies and to align digital expertise with government investments. On this basis, additional resources should be deployed to:

- Improve the digital infrastructure and equipment of the Northern and Western Region's Education and Training Board's (ETBs) and Higher Education Institutes.

- Fastrack the delivery of the National Broadband Plan to communities based in the Northern and Western Region.

- Ensure the new Connacht-Ulster Technological University has sufficient resources to provide digital courses that are industry relevant and support the industrial strengths of the Northern and Western Region.

- Ensure more students and workers can be taught on digital oriented courses provided under the Human Capital Initiative. In this regard, additional funding should be provided to initiatives – including but not limited to Springboard courses – that are deemed to be essential to supporting skills development, upskilling, lifelong learning and work readiness in digital sectors and the provision of such resources should be informed by our region's appropriate Higher Education Institutes, the Regional Skills Managers, and key stakeholders.

- Expand funding for digital oriented skills courses that are offered by employer lead training networks such as "Skillnet" and further promote the availability of such courses in the Northern and Western Region.

[27]Eurostat data refers to period of 2012 to 2019: https://ec.europa.eu/eurostat/web/regions/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_BQqmHeCfV1BE&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view

- Provide additional training subsidies or direct grants to Small and Medium Enterprises (SMEs) that allow their employees to undertake digital training courses in the Northern and Western Region's ETBs or Higher Education Institutes. Specifically, policymakers should – using the Northern and Western Region as a pilot scheme – incentivise SMEs that allow employees undertake skills development courses. The purpose of this would be to further ease the short-term financial concerns of SMEs while their employees are participating in relevant training courses. Such schemes could be delivered through the ETBs or Higher Education Institutes of the Northern and Western Region and would specifically relate to training courses that cannot be provided free of charge by these organisations.

- Ensure sufficient resources are provided to the Northern and Western Region's Higher Education Institutes and ETBs in providing more Micro Credentials to workers and learners that want to enhance their digital skills. The provision of Micro Credentials will be an important measure in developing the digital skills profile of workers and learners who wish to enhance their own skillset through courses that are short, low cost and flexible. Such programs should also ease the associated financial concerns of SMEs owners, as such courses will limit employee's time away from the day-to-day operations.

- Enhance the use of Smart Technologies across all public services and public authorities, thereby supporting the development of "Smart Cities" and a "Smart Region". Smart technologies are critical enablers in improving the efficiency and delivery of public services. Key to implementing and integrating the use of smart technologies across our regions will be Smart City initiatives. Although there is no single definition of a smart city, at its simplest, the concept envisages a smart city as one that has digital technology embedded across all public services. Smart City initiatives aim to solve complex challenges and improve public services through technology, and it involves a systematic integration of ICT in the planning, design, operations and management of our cities, towns and villages for the benefit of the citizen.

- Support the development of mentoring programmes for entrepreneurs involved in ICT (RPO 4.41) and enable peer learning and exchange platforms to develop business links, address business concerns, exchange views and promote best practice (RPO 4.42).

3.3: Green Transformation for Enterprise

Q: What opportunities can you see as arising from Green Transformation for your sector or region?

Through an array of economic and environmental benefits, the transition to a low carbon economy provides a major opportunity to revitalise the Northern and Western Region's economy and enhance the quality of life offering of the region. Such a transition provides ample opportunities to generate sustainable employment creation, research and development activity, innovation and knowledge diffusion, productivity and efficiency gains, while building climate resilience, enhancing our natural assets, supporting sustainable settlement and mobility patterns and improving the quality of life of our citizens.

Considering the Northern and Western Region's natural endowments – which range from its geographical location alongside the west coast of Ireland to its research capabilities – the region is well positioned to capitalise on the potential economic and environmental opportunities of this transition, with significant opportunities available to the region with respect to:

- Energy Efficiency Technologies
- Onshore and Offshore Wind Energy
- Solar Energy
- Tidal Energy
- Smart and Sustainable Agriculture Practises
- Carbon Sequestration
- Hydrogen Production
- Afforestation Services
- Environmental Engineering and Ecosystem Services
- Electric Vehicle (EV) and Hybrid Technologies

The below overview showcases how the region is uniquely positioned – in terms of capacity, existing research capabilities and sectoral specialisms – to fully capitalise on the potential benefits of the transition to a low carbon economy.

Energy Efficiency Technologies: Based on the latest available CSO statistics[28][29], it is clear that there are ample commercial, employment and environmental benefits available to the Northern and Western Region in utilising energy efficiency technologies in improving the relatively low BER of the region's built environment. The capacity to improve the region's BER performance – and thereby support sustainable employment creation in the region's energy efficiency sector – is evident from the fact that only 20 per cent of domestic buildings audited in Ireland registered a BER between "A" and "B", with below-average proportions found in all of the counties of the Northern and Western Region, namely Roscommon (9% of homes to registered a BER between "A" and "B"), Leitrim (11%), Donegal, Mayo (both 12%), Sligo (13%), Galway City (14%), Cavan, Galway County (both 15%) and Monaghan (19%)[30]. Similar regional trends were also evident for audited non-residential buildings.

EV Charge Technologies: Expanding the EV charge network – as a means of supporting EV and Hybrids sales – provides a notable opportunity for rural oriented regions such as the Northern and Western Region to reduce the carbon footprint and travel costs of commuters, while also supporting

[28] https://www.cso.ie/en/releasesandpublications/er/dber/domesticbuildingenergyratingsquarter12021/
[29] https://www.cso.ie/en/releasesandpublications/er/ndber/non-domesticbuildingenergyratingsq12021/
[30] Homes audited between Q1 2021 and 2009

employment in the expansion of the public and private EV charging network. The capacity to support job creation in this regard is evident from the fact that there was only 21 ESB EV "Fast Chargers[31]" and only 1 ESB EV "High Powered Charger[32]" based in the Northern and Western Region as of December 2020, while EV and Hybrid vehicles only accounted for 17.1 per cent of all new private cars licensed for the first time in the Northern and Western Region in 2020, which was below the corresponding ratio for the State average (19.7%). The availability of publicly available EV chargers will be central to supporting greater sales in EVs and Hybrids and the development and maintenance of such infrastructure will support employment creation within the region.

Onshore and Offshore Wind Energy: The Northern and Western Region has an installed onshore wind energy capacity of 1,502 MW as of July 2020, representing 35.1 per cent of Ireland's installed wind energy capacity[33], thereby highlighting the existing strength of the region's onshore wind energy sector. Considering the future economic and environmental benefits associated with offshore wind energy and given the region's existing expertise in wind energy production, the Northern and Western Region is well positioned to utilise potential opportunities in this regard; albeit such opportunities will be dependent on the delivery of sufficient improvements to the region's grid infrastructure.

Notably, some of the region's leading research assets are well positioned to capitalise on potential opportunities available through offshore wind energy. For example, Ireland has a unique test site infrastructure allowing developers to move from laboratory test facilities at the Lir National Test facility in Cork to a quarter scale test bed in Galway Bay and to a full test facility at the Atlantic Marine Energy Test Site (AMETS) near Belmullet, County Mayo. This is part of an international regime of test sites including Hawaii, Ireland and Scotland. This international chain of test sites brings devices through the various technology readiness levels which ensures investment in the technology is made on a standardised footing. It also illustrates the unique strategic position the Northern and Western Region has in relation to offshore renewable energy research and development.

In this regard, the SEAI is developing the Atlantic Marine Energy Test Site (AMETS) to facilitate the testing of full scale ocean energy converters both wind and wave, in an open ocean environment. It is located off Annagh head, west of Belmullet in Co Mayo and will be connected to the national grid. AMETS will provide for full scale test opportunities in extreme Atlantic conditions and is intended as the ultimate test site for pre commercial stage devices. The site will be focused on wave energy and will provide two separate test locations at various depths of water to allow for a range of devices to be tested. It is envisaged that the test site will provide a grid connected national test facility, to which full scale wave energy converters could be coupled during their final stages of pre-commercial development. The test site will comprise of both onshore and offshore components.

In terms of the offshore wind energy market, it should be acknowledged that the Northern and Western Region's marine assets include:

- Galway Port, Co Galway
- Killybegs, Co Donegal
- Pairc na Mara, Co Galway

[31] https://www.esb.ie/ecars/how-to-charge-your-ev/fast-charging#:~:text=Fast%20chargers%20are%20generally%20found,car%20type%20and%20battery%20size.
[32] https://esb.ie/ecars/how-to-charge-your-ev/high-power-charging#:~:text=How%20to%20charge%20your%20electric,as%20little%20as%20six%20minutes.
[33] Data provided by Wind Energy Ireland

- Newport, Co Mayo
- Sligo Port, Co Sligo
- Ross a Mhil
- Greencastle, Co Donegal

Given the nature of the offshore wind energy market – whether it be floating or fixed-foundation offshore wind turbines – the region's marine assets have significant growth potential to capitalise on commercial opportunities in this sector. It should be noted that the degree to which the region can take advantage of these commercial opportunities will be dependent on many factors, including but not limited to, research and development output, technological advances, feasibility and environmental assessments and the enhancement and connection of the region's electrical grid network to future offshore wind energy sites. This potential is evident through the RSES of the Northern and Western Region – and specifically RPO 4.37 – which aims to examine the potential of the region's ports to expand facilities to enable them to become ports with enhanced regional significance in areas such as renewable energy. Additionally, the RSES supports the further examination of the feasibility of pursuing the designation of Galway Port and Killybegs Port as EU TEN-T Ports.

Carbon Sequestration: Carbon sequestration is the process of capturing carbon dioxide (CO2) from the atmosphere and storing it in plant material or soil and is considered an important tool in reducing Ireland's carbon emissions in the coming years. Given the nature of its industry, the Agriculture and Forestry sector is primed to take advantage of this process and since the Northern and Western Region has an above average reliance on these sectors, the region is well positioned to take advantage of any new industries that supports this emerging industry. As of Q1 2021, Agriculture, Fisheries and Forestry accounted for 8.8 per cent of total employment within the Northern and Western Region, which was well above the corresponding State average of 4.7 per cent.

Q: What challenges exist for enterprises trying to reduce emissions or introduce sustainable practices?

A number of challenges exist for businesses that are trying to reduce their own emissions or introduce sustainable practices to their operations, with the main challenges including the:

- Cost of decarbonisation measures
- Lack of knowledge on decarbonisation measures
- Low carbon economy skills deficits

Cost of Decarbonisation Measures: According to the results of the June 2021 SSE Airtricity "Green Business Sentiment Index"[34], Irish businesses see the cost of introducing sustainable measures as a significant challenge in reducing their carbon emissions, with 47 per cent claiming that financial costs were main hurdle in this regard. This proportion was unchanged compared to the previous year's publication. Such findings are in line with separate research undertaken by the Tipperary Energy Agency when similar challenges were highlighted by residential households[35].

Lack of Knowledge on Decarbonisation Measures: Further findings from the June 2021 SSE Airtricity "Green Business Sentiment Index" highlight how a sizable proportion of enterprises have a lack of knowledge on renewable energy, methods of decarbonisation and the process involved in

[34] https://www.sseairtricity.com/news/green-business-sentiment-index/
[35] https://superhomes.ie/finance-and-poor-information-main-barriers-to-home-energy-retrofits/

retrofitting, which this lack of knowledge affecting their ability to reduce their emissions and introduce sustainable practises. Such research found that:

- 47 per cent were unaware if their energy is renewable or not – which was unchanged from the July 2020 publication
- 15 per cent of businesses in Ireland don't have enough information on methods of decarbonisation
- 31 per cent of businesses in Ireland don't know what retrofitting involves, which was up 4 percentage points from July 2020 publication.

Low Carbon Economy Skills Deficit: Based on consultations with key stakeholders involved in the education and training sectors, it was noted that there was an underlying lack of demand for training courses with respect to the low carbon economy, particularly with respect to retrofitting, renewable energy, circular economy, environmental engineering and other sustainable engineering practises. As a result, it was noted that this underlying lack of demand was affecting the supply of workers capable of carrying out decarbonisation measures; a factor which may be preventing enterprises from reducing their carbon footprint. Stakeholders noted that existing construction workers were generally most suitable for these types of courses, however these workers generally did not want to return to education for a variety of reasons, including apprehension about returning to education, lack of previous engagement with the education system and demanding work schedules in their existing jobs.

Overall, the consequences of these challenges seem to be evident in the latest available CSO BER statistics[36] for non-domestic buildings, with a low proportion of non-domestic buildings across Ireland – particularly in the Northern and Western Region – recording BERs between "A" and "B". Between 2009 and Q1 2021, only 15 per cent of non-domestic buildings audited in Ireland registered a BER between "A" and "B". In the Northern and Western Region, below-average proportions were recorded in the majority of Local Authority areas, with Leitrim recording the lowest proportion at 10 per cent, following by Roscommon (11%), Sligo, Galway City (both 12%), Cavan (13%) and Mayo (14%). Above average – but nevertheless low ratios – were also registered in Monaghan (16%), Galway County (17%) and Donegal (18%).

Q: How could government or enterprise agencies assist you in meeting those challenges?

Considering the previously mentioned challenges facing enterprises in this regard, it is imperative that any additional financial resources provided by government should aim to:

- Reduce Upfront Costs of Decarbonisation Measures
- Provide Clearer Information on Decarbonisation Measures
- Develop Low-Carbon Economy Training Centres

Reduce Upfront Costs of Decarbonisation Measures: Any additional resources provided by government need to reduce the upfront costs associated with decarbonisation measures for enterprises, with a particular focus on retrofitting practises, renewable energy and energy efficient technologies such as heat pumps. In this regard, further resources should be provided to SEAI to enhance the grant relief rates available to enterprises for energy efficient and renewable energy technologies; thereby reducing the high upfront costs associated with decarbonisation measures. Given that 78 per cent of businesses feel government supports would help influence them in considering retrofitting – as per the findings of the June 2021 SSE Airtricity "Green Business

[36] https://www.cso.ie/en/releasesandpublications/er/ndber/non-domesticbuildingenergyratingsq12021/

Sentiment Index" – it is clear that financial grants – and their accompanying grant relief rates – will have a significant influence on the degree to which enterprises can reduce their carbon emissions or introduce sustainable practices.

Provider Clearer Information on Decarbonisation Measure: To improve the level of knowledge on decarbonisation measures, it is important that future details on financial grants and the process involved in undertaking such measures are outlined in a clear and uncomplicated manner using "Plain English" descriptions. Such descriptions should be in line with best practise examples that have been used by EirGrid[37]. Such information should aim to clearly outline the details of the scheme, the degree of risk involved in the process and the associated financial and environmental benefits of taking part in these schemes, and this information should be easily and solely available through one designated State body with the view of simplifying citizens searches on decarbonisation measures.

Develop Low-Carbon Economy Training Centres: In line with Skillnet Ireland's publication titled "*Our Climate Neutral Future Zero by 50*"[38], it will be important that centres of training excellence – which shall support the future development of new skills and retraining in the low carbon economy – are established across the three key sectors identified in this study, namely retrofitting, renewable energy and the electrification of the transport and heating sectors. Given the existing expertise available through our region's ETBs and Higher Education Institutes, there is potential to develop and locate these centres of training excellence in our existing Higher Education and Further Education and Training assets.

Furthermore, this analysis has identified the hydrogen economy as a critical part of the transition a low carbon economy, which is an area which could offer significant job creation in future years. Therefore, establishing a centre of excellence now would allow Ireland to capitalise on the potential economic and environmental benefits associated with the hydrogen economy.

[37] https://www.eirgridgroup.com/newsroom/plain-english-award-winne/
[38] https://www.skillnetireland.ie/wp-content/uploads/2021/03/Zero-by-50-Our-CLimate-Neutral-Future-Green-Tech-Skillnet.pdf

3.4: Innovation Diffusion

Q: What are the barriers for innovation diffusion in Ireland? How can these barriers be broken down? Are their regional differences in these barriers?

Barriers for Innovation Diffusion: According to the European Commission's "*2020 Country Report*[39]", Ireland's research and innovation system has many strategic weaknesses that need to be addressed. These underlying weaknesses are acting as significant barriers for innovation diffusion in Ireland, particularly the Northern and Western Region as evident from the region's recent status as a "Moderate Innovator" as per the 2021 "Regional Innovation Scoreboard[40]". Some of the most significant barriers for innovation diffusion in Ireland include:

- Lack of collaboration between domestic enterprises, multinational companies and public research centres
- Low level of investment in research and development (R&D) activities by domestic enterprises
- Low levels of public R&D expenditure
- Lack of awareness of R&D tax credit initiative
- Lack of direct funding instruments for R&D

On a national level, the "*2020 Country Report*" raises issues in terms of collaboration between firms and public research centres, with an increasing share of Science Foundation Ireland (SFI) collaborations credited to multinational companies while the share of SMEs has declined. Furthermore, domestic sourcing by multinational companies remains limited, highlighting the limited level of collaboration taking place between these two sets of firms.

As per the findings of the "*2020 Country Report*", R&D investments by domestic firms are much lower compared to multinational companies and the lack of investment in this regard is limiting domestic enterprise's productivity growth and widening the performance gap between domestic-owned firms and foreign-owned firms. Such investment trends are consistent on a macro level, with relatively low levels of R&D investment – in both the private and public sectors – highlighted as a continued concern for the Irish economy. The report notes that Ireland's R&D intensity – namely gross domestic expenditure on R&D as a share of GDP – was 1.15 per cent in 2018 compared to an EU average of 2.11 per cent. Likewise, the Commission notes that public R&D expenditure is still lower than past levels of investment, both in absolute terms and as a percentage of GDP. Another underlying barrier to innovation diffusion is the lack of awareness of Ireland's R&D tax credit, which provides a relatively high proportion of total public support for companies undertaking R&D activities. The "*KPMG Innovation Monitor*"[41], found a lack of awareness of the R&D tax credit scheme among SMEs surveyed, with just 50 per cent of them being aware of the incentive. Furthermore, the "*2020 Country Report*" highlighted the lack of direct funding instruments for R&D activities for SMEs.

Overcoming Barriers for Innovation Diffusion: To overcome these challenges and improve innovation diffusion channels in the Northern and Western Region, the research and innovation capacity of the region needs to be improved. Enhancing the region's research and innovation capacity will allow the Northern and Western Region's Higher Education Institutes and research assets to undertake more collaborations with our region's enterprise base, focus on more relevant

[39] https://ec.europa.eu/info/sites/default/files/2020-european_semester_country-report-ireland_en.pdf
[40] https://ec.europa.eu/growth/industry/policy/innovation/regional_en
[41] https://home.kpmg/ie/en/home/insights/2019/08/irelands-r-and-d-outlook.html

industry projects, develop more research partnerships with industry and induce more domestic enterprises – particularly SMEs – to undertake R&D activities. To achieve this, the following priorities – which were outlined in the Assembly's submission on the National Research and Innovation Strategy[42] – need to be supported by the DETE, namely:

1. **Enhance the research infrastructure and equipment of the Higher Education Institutes and research assets of the Northern and Western Region.** In this regard, greater investment should be allocated to the research facilities of individual Higher Education Institutes, research centres and technology gateways based in the Northern and Western Region.

2. **Provide greater financial resources to support more research and PhD positions in the Northern and Western Region's Higher Education Institutes and research assets.** Additional resources in this regard should aim to enhance the capacity of these organisations to undertake high quality and industry relevant research for our region's enterprise base, particularly for SMEs

3. **Adopt a regional approach for Ireland's S3.** RD&I resources provided through Ireland's S3 should be delivered using a regional approach, allowing the research and innovation system of the Northern and Western Region to support the region's actual sectoral strengths, using regional and local knowledge from a wide range of stakeholders. This will ensure that policy makers fully utilise RD&I resources in a far more efficient manner, while allowing regions to utilise self-identified competitive advantages that will further support their regional economies. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential.

4. **Develop regularly organised regional "Smart Specialisation" forums to encourage greater collaboration between the Northern and Western Region's enterprise base and our research assets / Higher Education Institutes.** Greater networking opportunities – through regularly organised regional smart specialisation forums – could provide opportunities for enterprises and researchers to discuss potential areas of collaboration, which may lead to the development of future commercial opportunities or operational efficiencies in our region's enterprise base. Furthermore, additional resources should be provided for greater regional promotional activities of the research services offered by our region's research assets and Higher Education Institutes and the financial incentives and grant schemes that are available to enterprises undertaking research and development.

5. **Enhance grant relief rates on R&D funding schemes and incentives and provide more direct funding to enterprises undertaking research and development activities.** The "*2020 Country Report"* noted that Ireland can improve the productivity of Irish firms — particularly SMEs — by using more direct funding instruments to stimulate research and innovation and that the lack of investment in research and innovation in domestic enterprises remains an underlying weakness in the Irish economy. Stimulating greater R&D activity – by providing more direct R&D funding instruments and enhanced grant relief rates – could encourage more research partnerships and collaborations between the region's enterprise base, Higher Education Institutes and research assets.

6. **Reinforce the importance of the ERDF and Horizon Europe in supporting research and innovation in Ireland.** Through successful industry case studies of collaboration in the

[42] https://www.nwra.ie/news/new-national-research-and-innovation-strategy-consultation/

Northern and Western Region, the next S3 should highlight the benefits of enterprises that have collaborated and successfully applied for funding under the ERDF and Horizon 2020 for R&D activities.

7. **A reasonable proportion of national research funding streams for research projects should be specifically ring-fenced for research and innovation projects that incorporate an all island dimension**. Based on Higher Education Authority data, the Higher Education Institutes based in the Northern and Western Region received below average "research capital funding" – per capita – in 7 out of the last 11 years inclusive (2010-2020).

Regional Differences: Although the previously mentioned challenges associated with innovation diffusion were outlined at a national level, it seems that the culmination of these trends have notably affected the Northern and Western Region's innovation capacity, as evident from the latest trends in terms of research and innovation.

For example, as per the 2021 results of the European Commission's "Regional Innovation Scoreboard", the Northern and Western Region is now the only NUTS 2 Region in Ireland to be classified as a "Moderate Innovator" – which is a region to record an innovation index score between 70 and 100 per cent of the EU average – whereas the Southern Region and Eastern and Midland Region are classified as being "Strong Innovators" i.e. regions with an innovation index score between 100 and 125 per cent of the EU average. Although the region's overall innovation index score has improved since 2014, the Northern and Western Region continues to record notable weaknesses - relative to the EU average in 2021 - in terms of:

- Research and development expenditure in the private sector
- Research and development expenditure in the public sector
- Employed ICT specialists
- Employment in knowledge-intensive activities
- Patent applications
- Trademark applications
- Design applications.

Regional differences in innovation diffusion were also evident in recent regional trends in R&D activity and staffing levels by the private sector. In 2019, total level of private sector expenditure on R&D recorded in the Northern and Western Region stood at €277.3 million, representing a decline of €50.1 million or 15.7 per cent relative to the corresponding base year in 2017. Out of the three NUTS 2 Regions in Ireland, the Northern and Western Region was the only region to record a decline in expenditure over this time period. Per head of population, total private sector expenditure on R&D activities in the Northern and Western Region amounted to €318.58 per head of population in 2019, down from the corresponding ratio of €385.20 that was recorded in 2017. The Northern and Western Region's ratio in this regard was also lower relative to the State average (€661.65), the Southern Region (€488.96) and Eastern and Midland Region (€900.77) in 2019.

Furthermore, a total of 3,506 people were engaged as R&D staff – in the private sector – in the Northern and Western Region in 2019, accounting for 0.8 per cent of the region's labour force. This was below the corresponding share for Ireland (1.1%). Relative to the base year of 2017, the total number of people engaged as R&D staff – in the private sector – in the Northern and Western Region fell by 16.3 per cent, whereas the corresponding figure for the State showed growth of 1 per cent over this period. Similar trends are evident when these figures are examined on a Full Time Equivalent basis.

Q: What channels for diffusion are used by your business or sector?

The following agencies and institutions are central to innovation diffusion in the Northern and Western Region, namely:

- National University Ireland of Galway
- Galway Mayo Institute of Technology
- Sligo Institute of Technology
- Letterkenny Institute of Technology
- St Angela's College Sligo
- Enterprise Ireland (EI)
- IDA
- Science Foundation Ireland (SFI)
- Marine Institute
- Teagasc
- Government Departments
- Higher Education Authority
- SEAI
- EPA

Some of the key individual research centres[43], technology gateways[44] and technology centres[45] based in the Northern and Western Region include:

- CÚRAM, SFI Research Centre for 'Smart' Medical Devices
- INSIGHT, SFI Research Centre for Data Analytics
- ICHEC, National centre for High-Performance Computing
- WiSAR, EI Technology Gateway for Wireless Solutions
- PEM, EI Technology Gateway for Precision Engineering and Manufacturing
- MET, EI Technology Gateway for Medical and Engineering Technologies
- National Centre for Laser Applications (NCLA)
- Centre for Chromosome Biology (CCB)
- Regenerative Medicine Institute (REMEDI)
- National Centre for Biomedical Engineering Science (NCBES)
- Network of Excellence for Functional Biomaterials (NFB)
- Whitaker Institute
- Ryan Institute
- Power Electronics Research Centre
- St Angela's Food Technology Centre
- Centre for Research in Social Professions (CRiSP)
- Centre for Environmental Research Innovation and Sustainability (CERIS)
- EpiCentre
- Wind Energy Centre
- Cavan Institute
- Marine and Freshwater Discovery Centre
- Centre for Integrated Sustainable Energy Technologies
- Monaghan Institute

[43] https://www.idaireland.com/doing-business-here/activities/research-development-and-innovation
[44] https://www.technologygateway.ie/wp-content/uploads/2021/04/EI-Technology-Gateway-April-2021-1.pdf
[45] https://www.enterprise-ireland.com/en/Research-Innovation/Companies/Collaborate-with-companies-research-institutes/Technology-Centres.html

Figure 3: Organisations key to "Innovation Diffusion" in the Northern and Western Region

Source: RSES of the Northern and Western Regional Assembly[46]

Q: How can we enhance collaboration between industry and the higher education sector?

Develop Regional "Smart Specialisation" Forums: The DETE should aim to enhance collaboration between industry and the higher education sector by supporting the development of regularly organized regional "Smart Specialization" forums. Such regional forums will provide opportunities for industry and higher education bodies to expand working networks, display best practice in terms of research and innovation, share knowledge on relevant research projects and discuss potential areas of collaboration. Regularly organized regional "Smart Specialization" forums may lead to greater cross-border and regional innovation and knowledge diffusion and such forums could lead to the development of future industrial partnerships, while also supporting commercial opportunities or efficiencies across Ireland's regions. All-island collaborations will be particularly important for the growth of the forthcoming Connacht-Ulster Technological University.

Support All-Island Collaborations: The DETE should cooperate with the Department of Further and Higher Education, Research, Innovation and Science in ring-fencing a reasonable proportion of

[46] https://www.nwra.ie/pdfs/NWRA-RSES-2020-2032.pdf

national research funding streams for research projects that incorporate an all-island dimension and support cross border collaborations; thereby enhancing possibility of further industry and Higher Education partnerships.

Promote EU Funding Streams: The forthcoming S3 should reinforce the importance of the ERDF and Horizon Europe in supporting collaborations across industry and the Higher Education sector. Using case studies in the Northern and Western Region, the forthcoming S3 should highlight the benefits of enterprises that collaborated with Higher Education bodies in successfully applying for funding under the ERDF and Horizon 2020. These case studies should also highlight how such research activities enhanced the financial wellbeing of these enterprises or their contribution to the region's economy while working with EU partners.

Improve the Region's RD&I Capabilities to Support Collaboration: The DETE should aim to enhance the research capabilities of the Northern and Western Region's Higher Education Institutes and research assets by:

- Upgrading the research equipment and infrastructure of the Northern and Western Region's Higher Education Institutes, research centres and technology gateways.

- Providing greater financial resources to support more research and PHD positions in the Northern and Western Region's Higher Education Institutes and research assets.

Additional resources in this regard should aim to enhance the capacity of these organizations to undertake high-quality and industry relevant research for our region's enterprise base, particularly for SMEs.

3.5: International Collaboration on R&I

Q: What areas of research or industry sectors does Ireland have an international competitive advantage in? How can we build on that advantage? / Q: In what areas or sectors should we be concentrating our international research collaboration activity? What supports do these areas or sectors need to be competitive on a world stage?

Considering their contribution to Ireland's GDP, employment, wages, research and innovation levels and the viewpoint of government enterprise agencies[47], it is evident that Ireland has a global competitive advantage in the following sectors, namely:

- Pharmaceuticals and Chemicals
- Computer Services
- Business Services
- Financial Services and Insurance
- Agriculture, Food and Beverage
- Medical Devices

On a regional level – and based on stakeholder consultations and research involved in the development of the RSES – the key sectors of the Northern and Western Region – which have an international competitive advantage based on their ability to compete in global markets – include:

- ICT and Med Tech
- Renewable Energy and Low Carbon Economy
- Tourism
- Agri-Food and the Bioeconomy
- Marine and Blue Economy
- Advance Manufacturing and Engineering

Greater detail of some of the sub-sectoral specialisms that exist in the Northern and Western Region have been outlined in Sub-Section 3.1 of this submission document. To capitalise on these sectoral competitive advantages, support growth, enhance these sector's ability to compete on a world stage and to encourage collaboration between research partners and companies within these sectors, the DETE needs to support the following "Regional Policy Objectives" (RPOs). These RPOs have been outlined in the RSES of the Northern and Western Region and have been categorized in the high-level sectoral strengths that have been identified in the RSES.

ICT and Med Tech

- RPO 4.38 which aims to support the work of the IDA, Enterprise Ireland and LEOs in providing platforms for the ICT and MedTech industry thought leaders to share knowledge and to identify and advocate the delivery of critical competencies and skills needed to align with emerging business models

- RPO 4.39 which intends to target academic research, training and development of a talent pool to support the ICT and Med Tech industry

[47] https://www.idaireland.com/invest-in-ireland/ireland-economy

- RPO 4.40 which seeks to encourage the convergence of MedTech with ICT to establish the region as a global destination for connected healthcare solutions

- RPO 4.41 which aims to support the development of mentoring programmes for entrepreneurs within the ICT and Med Tech sectors.

- RPO 4.42 which seeks to enable peer learning and exchange platforms to develop business links, address business concerns, exchange views and promote best practise within the ICT and Med Tech sectors.

Renewable Energy and Low Carbon Economy

- RPO 4.16 which aims to identify potential renewable energy sites of scale in collaboration with Local Authorities and other stakeholders within 3 years of the adoption of the RSES.

- RPO 4.17 which aims to position the Northern and Western Region to avail of the emerging global market in renewable energy by:

    - Stimulating the development and deployment of the most advantageous renewable energy systems
    - Supporting research and innovation
    - Encouraging skills development and transferability
    - Raising awareness and public understanding of renewable energy and encourage market opportunities for the renewable energy industry to promote the development and growth of renewable energy businesses
    - Encouraging the development of the transmission and distribution grids to facilitate the development of renewable energy projects and the effective utilisation of the energy generated from renewable sources having regard to the future potential of the region over the lifetime of the Strategy and beyond.

- RPO 4.18 which aims to support the development of secure, reliable and safe supplies of renewable energy, to maximise their value, maintain the inward investment, support indigenous industry and create jobs.

- RPO 4.19 which aims to support the appropriate development of offshore wind energy production through the adequate provision of land-based infrastructure and services, in line with national policy and in a manner that is compatible with environmental, ecological and landscape considerations.

- RPO 4.20 which aims to support and encourage the development of the bio-economy sector, and facilitate its development for energy production, heat, and storage distribution, in particular advocating Combined Heat and Power Units integrated into District Heating networks, in combination with Pyrogenic Carbon Capture and Storage (PyCCS) or Bio-Energy Carbon capture and storage (BECCS) all to be done in collaboration with EPA and other regulators.

- RPO 4.21 which aims to promote innovative new building design and retrofitting of existing buildings, both private properties, and publicly owned, to improve building energy

efficiency, energy conservation and the use of renewable energy sources following National Regulations, and Policy

- RPO 4.22 which aims to safeguard and support the strategic role and function of existing test and development sites, for example, the Atlantic Marine Energy Test Site (AMETS). The test site forms part of Ireland's Ocean Energy Strategy and is being developed following the Offshore Renewable Energy Development Plan.

Tourism

- RPO 4.1 which seeks to work with relevant landholders and recreational/tourism agencies to increase access to the countryside and our coastal areas, and to ensure maintenance and access to the existing network of trails, paths, ways etc.

- RPO 4.2 which aims to support the maintenance of, and enhanced access to state lands, such as National Parks, Forest Parks, Waterways together with Monuments and Historic Properties, for recreation and tourism purposes.

- RPO 4.3 which aims to support the reparation and implementation of Visitor Experience Development Plans (VEDPs) within the Northern and Western Region, to underpin the overarching regional tourism benefits and to promote the natural and cultural assets of the region.

- RPO 4.4 which advocates for the upgrading of the Wild Atlantic Way touring network and visitor attractions, with the view of catering for the growth in visitor cars, buses and cyclists using the route.

- RPO 4.5 which seeks to enhance access to the region's tourist assets, including the development of a Coastal Walking/Cycling Route along the Western Seaboard, which extends generally along the Route of the WAW, and incorporates existing resources, such as beaches, ports, harbours, piers and marinas.

- RPO 4.6 which aims to ensure provision is made for the expansion in accommodation and facilities within Destination Towns. Supporting infrastructural investment will also be provided, including improvements to the public realm, transport links, accommodation, night-time economy and the sustainable development of our natural and built heritage.

- RPO 4.7 which seeks to establish potential tourist and amenity attractions of scale in the Cavan/Monaghan region, in partnership with Fáilte Ireland and the relevant local authorities.

- RPO 4.8 which aims to ensure that 'Discovery Points' targeting Irelands Ancient East are included for Cavan/ Monaghan as enablers for increasing bed nights and visitor numbers.

- RPO 4.9 which aims to ensure provision is made for the expansion in accommodation, and facilities within key destination towns, such as Carrick on Shannon, Cavan, Roscommon Town and Athlone, together with necessary supporting infrastructural investments

- RPO 4.10 which aims to ensure orientation and information points targeted at 'Slow Tourism' market are provided at key Towns, such as Carrick on Shannon, Athlone, and Ballinasloe as an enabler for increasing bed-nights, and visitor numbers.

- RPO 4.11 which seeks to upgrade public transport facilities in Destination Towns, including the provision of Transport Hubs/Links, and additional accommodation

- RPO 4.12 which aims to developed the water-based leisure sector in the Northern and Western Region

- RPO 4.14 which seeks to promote the development of integrated walking, cycling and bridle routes throughout the Northern and Western Region

- RPO 4.15 which aims to protect and preserve our Coastal Heritage, archaeological and built heritage, and to restore/regenerate our key coastal assets

Agri-Food and the Bioeconomy

- RPO 4.23 which aims to create a stronger and more resilient region by protecting and stimulating gastronomy as part of our cultural heritage and also by identifying new opportunities for economic development.

- RPO 4.24 which supports the growth of the region's Agrifood industry, and its SME's. This includes the expansion of the sector where already established in rural areas, as well as in small towns, and villages, where expansion should be supported.

- RPO 4.25 which supports the upscaling of businesses, exports, and internal collaborations within the value chain to allow more products from the region to have access to transformation and export processes, and increasing the added value contribution through R&D – in both product and process – and the implementation of advanced manufacturing technologies.

- RPO 4.26 which aims to support the further development of AgInnovation clusters in the Northern and Western Region - pushing convergence between farm, research, technology and commercialisation.

- RPO 4.27 which supports the exploration of opportunities in the circular resource-efficient economy, including undertaking a bioeconomy feasibility study for this region. This feasibility study will aim to identify (and map) areas of potential growth to inform the National Transition Agenda, enabling a Low Carbon, resilient nation.

- RPO 4.28 which supports the potential creation of appropriately scaled local multi-feedstock bio-refining hubs across the region as well as potential creation of bio-districts/clusters

- RPO 4.29 which supports the future-proofing of infrastructure planning to allow for the potential upgrading of existing industrial sites to bio-refining plants while also supporting the use of bio-renewable energy for the sustainable production of bio-based products

Marine and Blue Economy

- RPO 4.31 which supports the protection, upgrade and expansion of our region's key fisheries ports of Killybegs, Greencastle and Ross a Mhil, and to ensure adequate continued in investment in facilities to ensure their ongoing success.

- RPO 4.32 which aims to expand marine research and innovation, gas and oil production and seafood innovation through Greencastle, Killybegs, Pairc Na Mara and other BIM fishery centres.

- RPO 4.33 which aims to facilitate where possible Marine Renewable Technology Projects off the West and North West coasts of Ireland, and subject to environmental and amenity considerations (feasibility studies), and where applicable, enable National Grid connection.

- RPO 4.34 which aims to enable the development of a number of strategic Marine Resource Innovation Parks, including locations at Greencastle, Killybegs, Co. Donegal and Cill Chiaran, Co. Galway, (Pairc na Mara), to increase aquaculture and seafood sectoral growth in the Marine Economy.

- RPO 6.4 which aims to support the development of utilisation of data and insight-driven technology, sensors and the IoT in our airports, seaports/harbours in their transition towards becoming Smart Ports

Q. How can Ireland's regions use Ireland's international links and memberships to support their strengths and emerging areas of future opportunity?

In terms of utilising international links, Ireland's forthcoming S3 should capitalise on the deep and historical economic, social, cultural and interdependent relationships that exists between communities based in the Northern and Western Region and Northern Ireland, while also enhancing our existing links with European Institutions and international partners, particularly in the United States of America.

In supporting all-island linkages, the S3 should aim to support R&D activities in sectors that are specialised in both the Republic of Ireland and Northern Ireland, through all-island collaborations and partnerships, innovation and knowledge diffusion and regular networking events. In doing so, the next S3 will be able to enhance the economic and social wellbeing of all parts of the island of Ireland. Therefore, Ireland's next S3 should explicitly support the need for greater networking and collaboration between our region's research bodies and equivalent bodies in Northern Ireland.

To support further all-island collaboration on research and innovation, the Northern and Western Regional Assembly feels that the next S3 should articulate the importance of providing greater networking opportunities, through regularly organized regional "Smart Specialization" forums. Such forums will provide opportunities for research bodies across the island of Ireland to expand working networks, display best practice in terms of innovation, share knowledge on relevant research projects and discuss potential areas of collaboration. Regularly organized regional "Smart Specialization" forums may lead to greater cross-border innovation and knowledge diffusion and such forums could lead to the development of future partnerships, while also supporting commercial opportunities or efficiencies in the Northern and Western Region. All-island collaborations in terms of research will be particularly important for the growth of the Connacht-Ulster Technological University.

To support all-island collaborations in this regard, the DETE should support the ring-fencing of a reasonable proportion of national research funding streams for research projects that incorporate an all-island dimension. This could encourage all research bodies to explore potential opportunities in collaborating and interacting with research bodies in Northern Ireland.

Furthermore, the next S3 should also reinforce the importance of collaborating with European Institutions and in capitalising on potential funding opportunities available through the ERDF and Horizon Europe. Likewise, the next S3 should aim to support collaboration between the Northern and Western Region's enterprise base, research bodies and Higher Education Institutes and similar organisations based outside the EU, particularly in the United States of America. Using case studies in the Northern and Western Region, the next S3 should also highlight the benefits of enterprises and Higher Education bodies that have collaborated with EU institutions, successfully collaborated and applied for funding under the ERDF and Horizon 2020 and worked with international organisations for R&D activities.

3.6: Actions to improve the national or regional enterprise R&I system

Q: Which RD&I initiatives have been successful for your sector/region? Which programmes should continue? Which RD&I programmes for enterprise are not working?

Competitive Base Funding System: RD&I competitive based funding initiatives largely have merit in ensuring the most appropriate projects are selected, thereby supporting high-quality research output in Ireland. That said, the distribution of RD&I funding initiatives seems to be overly concentrated in the Eastern and Midland Region; with the below average research funding levels received in the Northern and Western Region. This is evident from recent trends in the distribution of Higher Education Authority (HEA) "research capital funding" to Higher Education Institutes based in Ireland.

Using data provided by the HEA and examining such information on a per capita basis between 2010 and 2020, Higher Education Institutes based in the Northern and Western Region collectively received below average "research capital funding" – per head of population – in 7 out of the last 11 inclusive years[48]. Becoming a global innovation leader with high research output should be an important ambition for the next S3, but it is imperative that the public funding system reflects the need to support balanced regional development in Ireland; in line with the vision and objectives of the NPF and the RSES.

To improve the ability of our research assets in applying for RD&I funding initiatives in the future, the DETE should support the enhancement of the bidding capacity of the Northern and Western Region's Higher Education Institutes and research bodies, in line with the seven priorities outlined in Section 3.4 (Q1) of this submission. If public funding structures provided greater resources to the Northern and Western Region's Higher Education Institutes and research assets, this could allow these institutes to enhance their research capabilities, allowing them to capture a greater share of RD&I funding initiatives, thereby increasing the possibility of more innovative solutions and products being developed in the Northern and Western Region, which in turn would support the region's economic recovery.

Furthermore, the next S3 should also aim to ring-fence a reasonable proportion of national RD&I funding initiatives for projects that incorporate an all-island dimension or that support research and innovation in the Northern and Western Region, considering the region's designation as a "Transition Region", "Lagging Region" and "Moderate Innovator". This will encourage all Higher Education Institutes and research assets to explore potential opportunities in collaborating and interacting with research bodies based in Northern Ireland and the Northern and Western Region of Ireland.

Direct RD&I Funding Streams: Although the R&D tax credit – which consists of the bulk of public support for R&D activities – provides valuable support in stimulating RD&I activity in Ireland, a sizeable share of this funding stream is claimed by large and foreign owned firms. Interlinked with this issue is the fact that R&D investments by domestic firms – particularly SMEs – are much lower compared to Multinational companies, and that the lack of investment in this regard is limiting domestic enterprise's productivity growth and widening the performance gap between them and foreign-owned firms, as per the findings of the "*2020 Country Report*".

[48] Northern and Western Regional Assembly's calculations based on data provided by the Higher Education Authority

Given the often high-risk nature of RD&I investments and the limited resources associated with domestic SMEs, it seems that these types of enterprises are less receptive to the R&D tax credit initiative, which may be contributing to the low level of investment in R&D by these types of firms. To counter this issue, and in line with the policy suggestions expressed in the "*2020 Country Report*[49]", the Northern and Western Regional Assembly feels that more priority should be provided for direct RD&I funding instruments in order to stimulate R&D activity and to improve the productivity levels of SMEs, particularly small and micro firms.

Q: How do we generate a stronger, unified ecosystem approach to RD&I across the country to strengthen the visibility of our RD&I supports?

The Northern and Western Regional Assembly is of the opinion that a regional approach should be adopted for Ireland's S3 process, and that a regional approach to S3 in Ireland – with significant input from a wide range of regional and local stakeholders – would strengthen the visibility and output of government RD&I supports. Utilising regional knowledge and building on each region's unique sectoral and sub-sectoral strengths will only further enhance the effectiveness and efficiency of RD&I supports. This is evident from a recent report – "*Expert Advice and Support on Smart Specialisation Strategy (RIS3) in Ireland*" – by the Economic and Public Policy Consultancy (EPPC).

The EPPC report notes that:

> "*as a priority, Ireland will require to adopt a more strategic and cohesive approach to Smart Specialisation if it is to benefit from this agenda. This is likely to challenge established 'thinking' concerning the future direction for the country's wider R&I policy framework. Five key topics should be addressed which will support the country to make the shift necessary. These are: governance, place-based focus to policy making, cooperation, digitalisation and a revised SME support programme*".

Insights from the EPPC report highlight the need for a more regionally focused S3 in Ireland and the importance of the regions and the RSES in this regard. Specifically, the report notes that:

- Ireland's approach to research and innovation (R&I) is strongly centrally driven by the national government. Therefore, it lacks sensitivity to and awareness of local issues (both successes and challenges).

- The recently launched RSESs offer an opportunity to re-orient the country's R&I governance with a stronger place-based focus. This could also address the concern expressed by several regional actors during the consultation programme of being 'left behind' in relation to targeted R&I capacity building support and investment, especially in rural Ireland.

- A 'place-based' emphasis generates value by identifying and connecting the many local examples of R&I excellence which exist across the country (e.g. in clusters and Institutes of Technology) which are often not very visible. By connecting these efforts, the country can help to overcome both market size challenges and reduce fragmentation of effort. In addition, this can also support Ireland to create a stronger presence and profile as an EU R&I 'front-runner', improving opportunities to boost innovation efforts with EU partners of choice.

[49] https://ec.europa.eu/info/sites/default/files/2020-european_semester_country-report-ireland_en.pdf

By adopting a regional approach to Ireland's S3, policy makers can utilise funding resources in a far more efficient manner, allowing regions to build on self-identified sectoral strengths; thereby further supporting economic growth and resilience across our regions. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential.

In the context of the European Regional Development Fund (ERDF) Regional Programmes, it is important to note that a key enabling condition for funding interventions under "Policy Objective (PO) 1: Smarter Europe" is the development of and alignment with the Member State's S3. Funding interventions under "PO 1: Smarter Europe" – which will seek to promote innovative and smart economic transformation – will act as a key support mechanism in the implementation of the RSESs. Therefore, adopting a regional approach to Ireland's S3 will simultaneously satisfy a key enabling condition under the ERDF Regional Programmes, while supporting the implementation of the economic elements of the RSESs. Furthermore, a regional approach to Ireland's S3 would align with the economic strategies of the RSESs, with "Smart Specialisation" being one of the key economic principles adopted in each of these high-level statutory frameworks. In doing so, adopting a regional approach to S3 in Ireland would have a statutory basis through the RSESs, and would ensure that Ireland's S3 is aligned with the State's overarching spatial strategy, namely the NPF and the RSESs. Therefore, such a regional approach to S3 would complement the work of the NPF and the RSESs in creating an effective market-led business ecosystem, allowing all regions to fully utilise their competitive advantages with respect to RD&I and to fully maximise growth in their economies.

Q: How do we target RD&I spend in a way which maximises impact for the economy

In order to maximise the economic impact of RD&I expenditure supports, the Northern and Western Regional Assembly feels that the distribution of these resources – where possible – needs to support the delivery of the following high-level objectives:

1. Adopt a regional approach to distributing RD&I expenditure in order to address regional and sub-regional disparities and support the delivery of balanced regional development in Ireland.

2. Support the overarching vision and objectives of the NPF and the RSESs

3. Support the priorities of the forthcoming ERDF Regional Programmes.

4. Utilise regional and local knowledge from a wide range of stakeholder through a collaborative governance model and regional "Smart Specialization" forums; thereby allowing regions to identify and support their own industrial and research competitive advantages.

5. Target the industrial and research specialisms of the Northern and Western Region's economy and its key settlements, namely the Galway Metropolitan Area, the "Regional Growth Centres" of Sligo Town, Letterkenny and Athlone and the "Key Towns" of Ballina, Castlebar, Cavan, Ballinasloe, Carrick-on-Shannon, Monaghan, Roscommon and Tuam.

6. Regularly review, update and monitor priority areas – in terms of industrial and research competitive advantages – to align with changing market dynamics and to consider regional economic developments and potential market or policy failures.

7. Enhance the placemaking credentials of the Northern and Western Region, with the view of enhancing the quality of life offering of the region.

Furthermore, to fully capitalise on the benefits of RD&I supports, it is clear that the overall research and innovation capacity of the Northern and Western Region will have to be enhanced, ensuring our enterprise base and research assets can compete for RD&I funding initiatives and support R&D activities and innovation diffusion across the region. To achieve this, the DETE should support the following priorities, namely:

1. **Adopt a regional approach for Ireland's S3.** Resources provided through Ireland's S3 should be delivered using a regional approach, allowing the research and innovation system of the Northern and Western Region to support the region's actual sectoral strengths, using regional and local knowledge from a wide range of stakeholders. This will ensure that policy makers fully utilise RD&I resources in a far more efficient manner, while allowing regions to develop self-identified competitive advantages that will further support their regional economies. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential.

   Furthermore, in the context of the European Regional Development Fund (ERDF) Regional Programmes, it is important to note that a key enabling condition for funding interventions under "Policy Objective (PO) 1: Smarter Europe" is the development of and alignment with the Member State's S3. Funding interventions under "PO 1: Smarter Europe" – which will seek to promote innovative and smart economic transformation – will act as a key support mechanism in the implementation of the RSES. Therefore, bringing a regional dimension to the S3 process in Ireland will simultaneously satisfy a key enabling condition under the ERDF Regional Programmes – where the Northern and Western Regional Assembly acts as a Managing Authority – while supporting the implementation of the economic elements of the RSES.

2. **Facilitate greater collaboration between the Northern and Western Region's enterprise base and our research assets / Higher Education Institutes.** Greater networking opportunities – through regularly organised regional smart specialisation forums – could provide opportunities for enterprises and researchers to discuss potential areas of collaboration, which may lead to the development of future commercial opportunities or operational efficiencies in our region's enterprise base. Furthermore, additional resources should be provided for greater regional promotional activities of the research services offered by our region's research assets and Higher Education Institutes and the financial incentives and grant schemes that are available to enterprises undertaking research and development.

3. **Enhance grant relief rates on R&D funding schemes and incentives and provide more direct funding to enterprises undertaking research and development activities.** The consensus among international bodies is that governments must support research and development activity because the costs and risks for business – particularly for SMEs – are notably high but the economic benefits for the economy are well documented. Furthermore, the "*Country Report"* noted that Ireland can improve the productivity of Irish firms — particularly SMEs — by using more direct funding instruments to stimulate research and innovation and that the lack of investment in research and innovation in domestic

enterprises remains an underlying weakness in the Irish economy. Within this context, it is imperative the policymakers explore the possibility of enhancing the grant relief rates associated with research and development incentives and schemes for enterprises – particularly for SMEs – and in providing more direct funding sources to enterprises undertaking research and development activities.

4. **Enhance the research infrastructure and equipment of the Higher Education Institutes and research assets of the Northern and Western Region.** In this regard, greater investment should be allocated to the research facilities of individual Higher Education Institutes, research centres and technology gateways based in the Northern and Western Region.

5. **Provide greater financial resources to support more research and PhD positions in the Northern and Western Region's Higher Education Institutes and research assets.** Additional resources in this regard should aim to enhance the capacity of these organisations to undertake high quality and industry relevant research for our region's enterprise base, particularly for SMEs.

6. **Reinforce the importance of the ERDF and Horizon Europe in supporting research and innovation in Ireland.** Through successful industry case studies in the Northern and Western Region, the new S3 should highlight the benefits of enterprises that have successfully applied for funding under the ERDF and Horizon 2020 for research and development activities. These case studies should also highlight how such research activities enhanced the financial wellbeing of these enterprises or their contribution to the region's economy.

7. **A reasonable proportion of national research funding streams for research projects should be specifically ring-fenced for research and innovation projects that incorporate an all island dimension**. Based on Higher Education Authority data, the Higher Education Institutes based in the Northern and Western Region received below average "research capital funding" – per capita – in 7 out of the last 11 years inclusive (2010-2020).

4: Strategic Topics for Ireland's S3

Future and continuous consultations on Ireland's forthcoming S3 will be a key component in ensuring regional and local stakeholders – across the three NUTS 2 Regions of Ireland – can provide adequate input into the development of this strategically important strategy. On this basis, and to further support the Department's efforts in preparing Ireland's next S3, the Northern and Western Regional Assembly would like to pose a series of questions to the DETE to guide the development of the forthcoming S3.

In the finalised strategy, it is crucial that these strategic topics are acknowledged and provided for, namely:

- To what degree will Ireland's S3 be based on regional and local stakeholder involvement?
- How will the next S3 support the "Entrepreneurial Discovery Process" in testing possible new sectoral opportunities?
- How will Ireland's next S3 identify sectoral and sub-sectoral strengths across each NUTS 2 Regions? Will the choice of sectoral strength be evidence-based and – if so – will this evidence base consist of both qualitative and quantitative sources? Will this information be presented for the key settlements of each NUTS 2 Region?
- Will the next S3 set innovation and knowledge-based development priorities? In this regard, how will potential areas of future activity be identified? How will it support the upgrading of existing activities?
- Will Ireland's next S3 identify appropriate actions and how will progress on these actions be measured on a regional level?
- Will the next S3 be outward-looking and how will it promote critical mass?
- Will Ireland's next S3 align with the NPF and RSESs as required by legislation
- Will the next S3 produce synergies between different policies and funding sources? How does it align and leverage EU/national/regional policies to support upgrading in the identified areas of current and potential future strength?
- Will the next S3 set achievable and measurable goals? How will the S3 support a process of policy learning and adaptation?

5: Conclusion

The Northern and Western Regional Assembly strongly believes that Ireland's next S3 has to adopt a regional approach and fully utilise the wealth of knowledge and expertise that exists across each of Ireland's regions. Applying a regional approach to S3 will allow the DETE to move away from an outdated and inefficient "one size fits all" policy and build on geographical area's distinctive sectoral strengths; allowing each region to make an enormous contribution in rebuilding their economies following the outbreak of COVID-19.

As evident from research and stakeholder consultations undertaken by the Northern and Western Regional Assembly in the development of the RSES, the region processes an array of high-level sectoral strengths, ranging from Tourism, Renewable Energy and the Low Carbon Economy, the Marine and Blue Economy, ICT and Med-Tech, Agri-Tech / Food, the Bioeconomy, Retail, Advance Manufacturing and Engineering. A subsequent Location Quotients (LQ) analysis – using Census 2016 employment and GeoDirectory 2020 commercial data – showcases the need for the next S3 to identify and support the sub-sectoral specialisms of the Northern and Western Region, its sub-regions and key settlements.

The Assembly's LQ analysis found significant sub-sectoral specialisms across a large number of activities in the region, ranging from – but not limited to – the manufacture of medical and dental instruments and supplies, manufacture of plastic products, rubber products and electrical equipment, civil engineering activities, animal and mixed farming, fishing and aquaculture and manufacture of clothing and furniture, with specialisms varying on a settlement level as evident from the Galway City and Regional Growth Centre results.

The benefits of adopting a regional approach to Ireland's S3 have been noted in a recent report by the Economic and Public Policy Consultancy (EPPC), with the report noting that the RSESs offer an opportunity to reorient the country's research and innovation (R&I) governance with a stronger "place-based" focus and that such a focus generates value by identifying and connecting the many local examples of R&I excellence which exist across Ireland, which are often not very visible. By connecting these R&I assets, the report notes that Ireland can help to overcome both market size challenges and reduce fragmentation of effort, while creating a stronger presence and profile as an EU R&I 'front-runner', improving opportunities to boost innovation efforts with EU partners of choice.

Furthermore, a key enabling condition for funding interventions for the ERDF under "Policy Objective (PO) 1: Smarter Europe" is the development of and alignment with the Member State's S3. Funding interventions under "PO 1: Smarter Europe" – which will seek to promote innovative and smart economic transformation – will act as a key support mechanism in the implementation of the RSESs. Therefore, adopting a regional approach to Ireland's S3 will simultaneously satisfy a key enabling condition under the ERDF Regional Programmes and would be aligned with the State's long-term spatial strategy, namely the NPF and the RSESs.

Overall, it is clear that by bringing a regional dimension to Ireland's next S3, policy makers can manage funding RD&I resources in a far more efficient manner, allowing each region to build on self-identified sectoral and sub-sectoral strengths, supporting the implementation of the NPF and the RSESs, while providing stakeholders with an inclusive policy framework in tackling regional economic challenges. In doing so, Ireland's S3 can support the delivery of balanced regional development in Ireland, ensuring all of our regions can prosper.