ASSESSMENT OF LIFELONG LEARNING NEEDS IN THE SOUTH EAST OF IRELAND

South East Technological University

setu.ie/LLL

ACKNOWLEDGEMENTS

CONTENTS

TABLE OF FIGURES

FOREWORD

This report was commissioned in 2024 to inform South East Technological University's (SETU) response to the burgeoning need for university-level lifelong learning provision in the South East region.

SETU was established on 1 May 2022 under the Technological University Act 2018, following the merger of Institute of Technology Carlow and Waterford Institute of Technology. The University operates across multiple campuses in Carlow, Waterford, Wexford and Wicklow offering both major and non-major awards, including micro-credentials, at Levels 6-10 on the National Framework of Qualifications (NFQ). It also offers joint higher education programmes with various international and national partners (SETU, 2023a, p.10). The University has over 18,000 students and over 1,500 staff.

The University's primary objectives include fostering regional and national economic, social, and cultural progress; striving for academic excellence in teaching, research, and engagement; and maintaining strong governance, management, and operational standards (SETU, 2022, p. 7). These aspirations are outlined in SETU's Strategic Plan 2023-2028, which underscores the University's commitment to delivering inclusive education, innovation and impact in the South East of Ireland. In its strategic plan, SETU has committed to

" *Enhance its socio-economic impact, surpassing the legacy institutions in impact on addressing the skills, education and research needs of the economy at regional level"* (p. 13).

As the only university in the South East region, SETU recognises its responsibility to support economic growth through meeting regional skills needs. SETU aims to contribute to the availability of a skilled, adaptable and well-educated workforce. To that end, it played a vital role in the recent designation of Waterford as a UNESCO Learning City and continues to support the Southern Regional Assembly's longer term ambition of developing a Learning Region. SETU has expressed its commitment to elevating the skills and capabilities of the region's workforce and supporting its communities by curbing the outward migration of students from the region, particularly young people seeking higher education opportunities elsewhere (SETU, 2023, p.15).

LEARNING NEEDS IN THE SOUTH EAST AT A GLANCE

International Drivers	Digitalisation ⇩	Globalisation ⇩	Climate Change ⇩	Demographic Change ⇩
Urgent Needs	**SKILLS NEEDED NOW** • Digitalisation • Data Analysis • Green Economy • Cybersecurity	**ACUTE SHORTAGES OF** • Engineers • IT Specialists • Chefs	**TRANSVERSAL SKILLS DEFICITS** • Leadership & Management • Digital Sustainability • Languages	**SOFT SKILLS DEFICITS** • Communication • Problem-solving • Cultural Awareness
Challenges	High % of SMEs in South East	Time and capacity contraints for individuals and enterprise - full employment.	Need to re/up-skill existing workforce. Population in South East with higher education qualifications lower than national average.	Lower Gross Value Added (GVA) per person than national average (South East at 61%).
Opportunities	Potential to leverage the significance of having a technological university in the region.	Potential to provide flexible micro-credentials in transversal skills areas with broad relevance in addition to specialised provision.	Leadership role in advancing the region's capability, knowledge and infrastructure with respect to key emerging sectors e.g. Offshore Renewable Energy.	Potential to upskill individuals with adjacent skills for new industries (e.g. workers in fisheries & marine transfer skills to offshore wind).
Regional & National Drivers ⇧	Smart specialisation strategy for the Southern Region	Ambition to reduce the brain drain from the region, with 64% of students studying ouside the region.	Advance region's position on the EU Regional Innovation Scorecards (RIS) and Regional Competitiveness Index (RCI).	National Development Plan - Project 2040. Ambitious national and EU targets for lifelong learning.

Figure 1: Learning needs in the South East

1 LEARNING NEEDS FOR ENTERPRISE IN THE SOUTH EAST OF IRELAND

1 LEARNING NEEDS FOR ENTERPRISE IN THE SOUTH EAST OF IRELAND

The OECD projects that the new skills needed to adapt to technological advances, digital transformation and climate change will transform the type of skills required in society and the economy. Demand for higher-level qualifications will continue to grow as demand for workers with lower-level qualifications declines (OECD 2023, p16). In this context, it is evident that the demand to upskill and reskill the labor force that sustains Ireland's small open economy is being driven by global megatrends such as digitalisation, globalisation, demographic change and climate change. Those trends have led to ambitious EU targets for lifelong learning participation. However, in the Irish context, demand can also be attributed to the changing demographics of the working population. A national peak for traditional full-time school-leaver higher education intake is predicted for 2030. If Ireland is to meet its higher education skills needs, the existing working-age population will consequently need to be upskilled and reskilled:

" Ireland's skills ecosystem is now required to take a leap forward ... Adults will need opportunities to upskill and reskill to perform new tasks in their existing jobs, assume the duties of new jobs and adapt to new modes of work, behaviour, consumption and participation in society" (OECD 2023, p.12).

While lifelong learning participation rates in Ireland have shown improvement in recent years, the figures are still far below some of our comparator economies with participation rates of, for example, 30% in Scandinavia (SOLAS 2023d). Although strengthening participation in lifelong learning is an ongoing challenge nationally, particularly in a context of full employment, the South East faces compounding challenges.

These include the relatively high proportion of employment in small to medium enterprises (SMEs) across the region. SMEs comprise 75.2% of enterprise-based employment in the region compared with 67.5% nationally. The OECD has identified that a lack of time and capacity to assess skills needs is a particularly significant challenge for SMEs:

" SMEs in Ireland face particularly acute challenges when it comes to understanding their own skills needs, choosing appropriate education and training, and releasing staff for training" (OECD 2023, p.134)

Although improving, the South East has traditionally had a lower level of participation rates in higher education than other regions of Ireland, with the CSO's Educational Attainment Thematic Report 2023 reporting a figure of 45% of persons aged 25-64 in the South East as having a third level qualification - the lowest of any region in Ireland. The region has an opportunity to grow participation in lifelong earning given the projected growth in population along with the immediate and on-going need for up-skilling and the expected growth in areas of smart specialisation.

SETU's Strategic Plan 2023-2028 has made commitments to address these challenges. This will include expanding provision to align with regional skills and educational needs (Strategic Objective 4). The plan further commits to expanding capacity to plan for and respond dynamically to current and emerging skills and educational needs of employers (Strategic Objective 7). The research informing this report directly addresses Strategic Objective 7, action 7.1, constituting *"a comprehensive assessment of **regional lifelong and life-wide learning needs**"* (SETU, 2023, p.53) and supporting the development of SETU's Regional Engagement Plan and Lifelong Learning Strategy.

1.1   METHODOLOGY

This assessment of regional learning needs was informed by a comprehensive desk-review of relevant and recent skills reports and data. This was followed by a series of focused interviews with targeted regional stakeholders:

- The desk-review encompassed national, regional and sector-specific reports, data sources and action plans, focusing primarily on documents published since 2018, and concentrated on reports and documents published in the period 2021 to 2024 (see Appendix A).

- Eleven semi-structured interviews were subsequently conducted with representatives of national and regional agencies and key employers identified by SETU. These interviews sought to confirm and augment findings on the current and medium-term (next three-five years) learning needs identified within the desk-review, as well as hard to fill roles in the sectors under review.

The assessment identifies current and future skills needs in key enterprise sectors as per the SETU Strategic Plan, in consultation with the working group, and as prioritised in the Southern Regional Smart Specialisation Strategy. It therefore provides important context to inform SETU in responding to higher-education learning needs in the South East of Ireland.

In the sections below, the key overall findings in relation to learning needs for enterprise in the South East are set out. This is followed by a profile of the demographics and economy of the South East region. Subsequently, a consideration of learning needs for the public sector in the South East is presented. While not a focus of this research, the public sector is acknowledged as a significant employer for the region. This is followed by a series of skills snapshots presented by sector. Each skills snapshot contains a summary highlighting in demand skills and roles for the relevant sector as confirmed by the desk-review and interview.

2 KEY FINDINGS

2 KEY FINDINGS

2.1 TECHNICAL AND SECTOR-SPECIFIC SKILLS

A very large volume of information was elicited during both the secondary and primary research phases of this project, much of which is represented in the skills snapshots presented by sector in section 5. The information reflected a high level of consistency in the skills needs and contextual factors identified within and across sectors. Some key points of note include:

- **There is a shortage of engineers**: The majority of interviewees indicated a significant shortage of engineers and engineering graduates (all disciplines and NFQ levels) and related technical skills. Skills gaps and hard to fill roles in engineering were prominent across reports and discussion across a range of sectors, including manufacturing, green economy, construction, and related professional services, with a focus on traditional disciplines. According to sectoral and industry representatives interviewed, despite this demand, there are fewer engineering graduates available compared to IT or scientific fields. Employers seek both graduates and industry professionals for upskilling in automation, quality control, digitalisation, and other modern technologies.

- **ICT graduates are in demand**. ICT skills are sought across multiple sectors, for all areas within organisations. Particular skills

shortages in the ICT sector include language skills relating to Python.

- **There is a shortage of skills in cyber-security, artificial intelligence (AI) and technical sales**. AI is identified as a tool within digitalisation efforts, with the potential to enhance processes like supply chain management.

- **There is a shortage of skills for the renewable energy sector**. Offshore wind presents significant opportunities in the South East, but a lack of skilled professionals presents a significant challenge. A shortage of skills in high-voltage electrical and engineering areas was highlighted. There is, however, potential to retrain workers from parallel industries.

- **There is a better supply and demand match for finance and business graduates** in the region, according to interviewees consulted for the learning needs assessment.

- **Modern roles require the convergence of technical skills from traditionally distinct disciplines and the convergence of technical and business skills.** For example, industry requires engineers with IT and/or data analysis skills. ICT and pharma/life sciences companies require technical staff with sales and marketing skills.

2.2 TRANSVERSAL AND SOFT SKILLS

> **Transversal skills have been defined as those which are *"... typically considered as not specifically related to a particular job, task, academic discipline or area of knowledge but as skills that can be used in a wide variety of situations and work settings (IBE 2013). These skills are increasingly in high demand for learners to successfully adapt to changes and to lead meaningful and productive lives."*** (UNESCO, 2014, p. 2)

A notable finding was the high demand for transversal skills across all sectors. Research conducted by the ESRI found that these comprise approximately 20-30% of overall skills required (Whelan et al, 2024). Employers highlighted transversal skills areas that are considered crucial across multiple sectors. These commonly included:

- Sustainability
- Leadership & management
- Data analysis & data analytics
- ICT/Digital skills (particularly in cybersecurity AI, machine learning & Blockchain)
- Process improvement and/or automation
- Project management

- Regulatory compliance
- Foreign languages & cultural awareness
- Logistics & supply chain management
- Financial planning & commercialisation skills[1]

A similarly notable finding was the demand for soft skills across all sectors. These commonly included:

- Interpersonal skills
- Communication skills
- Problem-solving
- Critical thinking
- Cultural awareness and intercultural competence
- Team working.

> **The OECD defines soft skills as *"... a generic category for social and emotional skills, but the term may also include managing motivation and applying values."*** (UNESCO, 2014, p. 2)

---

[1] Commercialisation is understood here as the ability to not only develop new products, but the ability to successfully bring them to market.

2.3 IMPLICATIONS FOR UPSKILLING

"*Participation in lifelong learning can be boosted in Ireland in both the short and long term by making lifelong learning opportunities more flexible and easier to navigate and by reducing barriers to participation, such as scheduling, family responsibilities and cost*" (OECD 2023, p.106).

This learning needs assessment highlighted that time and financial constraints, especially for employees balancing work and education, present a challenge for both employers and individuals with ambitions to upskill. The OECD cites Eurostat (2022) data indicating that Ireland ranks highest on a list of only five countries in which adults report that difficulty fitting training in around other commitments (primarily family reasons, schedule and costs) is a greater barrier to participation in adult learning than a perception that the training is not needed (OECD 2023, p.113). Unsurprisingly, shorter, more flexible training options like micro-credentials are sought to meet industry needs in the South East as well as nationally. There is a demand for stackable micro-credentials to enhance existing skills across all sectors. A need was identified for short, blended learning and flexible programmes, as well as micro-credentials, to address industry-specific needs and regulatory updates across sectors.

Targeted efforts may address specific and immediate talent acquisition challenges. However, ongoing collaboration with industry stakeholders is needed to align skills development initiatives with industry needs.

Whilst employers generally support upskilling, they face specific challenges in enabling or supporting staff in this ambition. These include:

- Time release staff for training, especially within SMEs where releasing staff from operational roles is particularly challenging.
- Concerns that upskilling will lead to talent poaching and protectionism.

To add to these challenges, higher education lifelong learning providers routinely also find that both employers and employees frequently do not appreciate the time commitment required to gain significant new higher education qualifications, even in the context of online flexible course delivery models. Higher education lifelong learning providers also stress the critical importance of engaging line managers in the implementation of training strategies to help ensure that successful training outcomes are delivered, while also ensuring that the organisation continues to function effectively.

These challenges are highly relevant for SETU, as an important feature of a programme portfolio aligned to regional skills needs will be upskilling programmes targeting those currently in employment. Although the OECD has presented evidence that training leads to higher productivity growth and is often a complement to innovation in the workplace (OECD 2023, p.105), it remains evident from both desk-review and interviews conducted that there is an ongoing need to educate and inform employers on the benefits of, and how best to support their employees in upskilling. This may be particularly relevant in the context of the South East, where 75.2% of enterprise based employment in the region is based in small to medium enterprises (SMEs) (South East Regional Skills Forum, 2024, p.1). The OECD points out that provision of training to employees is not uniform. Drawing upon data from

the Irish National Employer Survey (2018), the contrast between the level of training provision by indigenous companies (85%) compared to multinationals (91%) and small enterprises (84%) compared to larger ones (93%) is particularly relevant.

Overall, there is a pressing need for upskilling and retraining across various sectors in the South East, especially in emerging fields like offshore wind energy, artificial intelligence and automation. Cross-sectoral transversal skills such as leadership & management, sustainability, data analysis and digital literacy are also crucial for workforce readiness in the evolving job market. Specific needs are highlighted in the skills snapshots by industry sector presented in section 5.

2.4 INTERVIEWEE PERSPECTIVES ON CHALLENGES AND OPPORTUNITIES FOR SETU

The interviews conducted following initial desk-based research and data analysis contributed valuable, regionally informed perspective to this learning needs assessment. Interviewees were embedded in targeted sectors across the South East, and identified relevant challenges and opportunities for SETU. These provide useful points for reflection as SETU progresses the implementation of its current strategic plan. These are summarised here to inform ongoing discussion, as well as potential further research.

Although interviewees acknowledged the potential for SETU to contribute through identifying and responding to upskilling needs in the region, the desire for SETU to provide leadership and inform industry regarding future skills needs was a consistent theme. A consistent view was expressed that:

- SETU should provide a leadership role regionally and nationally in enterprise engaged research and innovation.

- SETU should not only *respond to* needs for upskilling identified by industry, but *provide leadership* for industry, by predicting and driving skills innovation for the region. This is particularly important in relation to offshore wind energy and engineering/ advanced manufacturing generally as well as AI and digitalisation.

- SETU should harness the benefits of its new status to effectively communicate and promote the value of having a multi-campus technological university embedded in the region. Interviewees also repeatedly highlighted a need for SETU to proactively promote and communicate its offerings to employers, especially SMEs.

3 SOUTH EAST REGIONAL PROFILE

In this report, the South East is defined as comprising the counties of Carlow, Kilkenny, Waterford and Wexford.[2]

Employment

The South East accounts for 9% of employment in Ireland (227,500 persons)

Top 5 Sectors	Total employed Q3 2023	Q3 2022 - Q3 2023 change	
Health	30,700	+12%	▲
Wholesale & retail	29,400	+16%	▲
Industry	28,100	-7%	▼
Construction	18,200	+16%	▲
Agriculture	16,500	+42%	▲

Occupational* groups – South East	Q3 2023	Q3 2022-Q3 2023 change	
Professionals	41,300	-10%	▼
Skilled trades	30,200	0%	
Associate professionals	25,000	+9%	▲
Elementary	24,600	-4%	▼
Operatives	21,000	+19%	▲
Administrative	19,900	+16%	▲
Managers	19,800	+25%	▲
Caring services	19,100	+3%	▲
Sales	16,200	+16%	▲
Farmers	10,100	[+44%]	▲

* Excludes not stated

[ ] Numbers in square brackets are small and should be interpreted with caution

Figure 2: Regional Profile Infographic - South East - Q3 2023. Reproduced with Permission from SERSF & SOLAS (2023): regional-infographics_southeast_.pdf (solas.ie)

---

[2] As per national NUTS III designations, some, though not all, national and / or regional reports and statistical datasets include Tipperary South in the South East region. See, for example, the South East Regional Enterprise Plan (2019), the Ireland South East Development Office. and some CSO datasets. Due to differences in population and industry, the inclusion of South Tipperary, may in some instances, have an insignificant impact on the outcomes of this analysis. For more information on NUTS 3 regional boundaries in Ireland, please see: NUTS 3 Boundaries - Dataset - data.gov.ie

The South East region is experiencing rapid growth and has a well-distributed population. According to Census 2022 data, the region has a population of 457,410. The region's employment base is diverse, encompassing a mix of traditional manufacturing and an expanding pharma/MedTech sector. Major employers include the wholesale/retail sector, construction, hospitality, agriculture, professional, scientific, and technical services. Smaller yet significant sectors include ICT, Financial Services, and Transport & Logistics. The CSO Labour Force Survey for Q2 of 2024 lists 227,800 persons aged 15 years and over in employment in the South East. Approximately 30% of the workforce is employed in public services such as health, education, and defence (South East Regional Skills Forum, 2024, p. 1).

3.1   DEMOGRAPHICS

The combined 457,410 population of the four counties of the South East (Carlow, Kilkenny, Waterford, Wexford) represents just under 9% of the population of the State. The region experienced a similar level of growth in population to the State as a whole over the 11-year period between the 2011 and 2022 censuses (11.8% and 12.2% respectively).
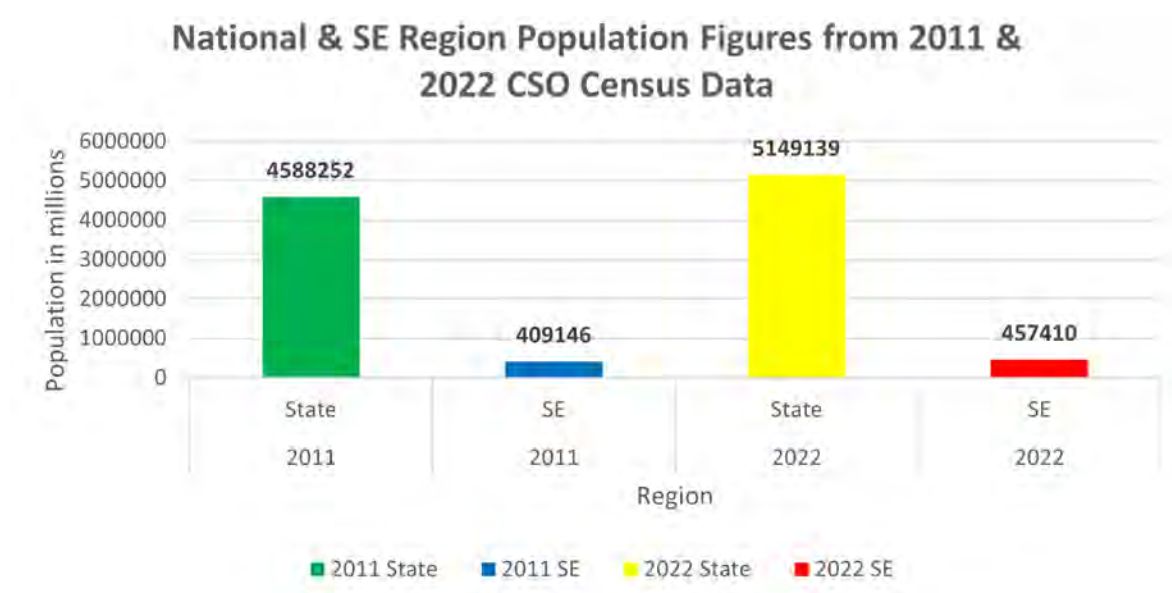
Figure 3a: **Population Change Data for the State and the SE Region in 2011 and 2022 - CSO Census Data**
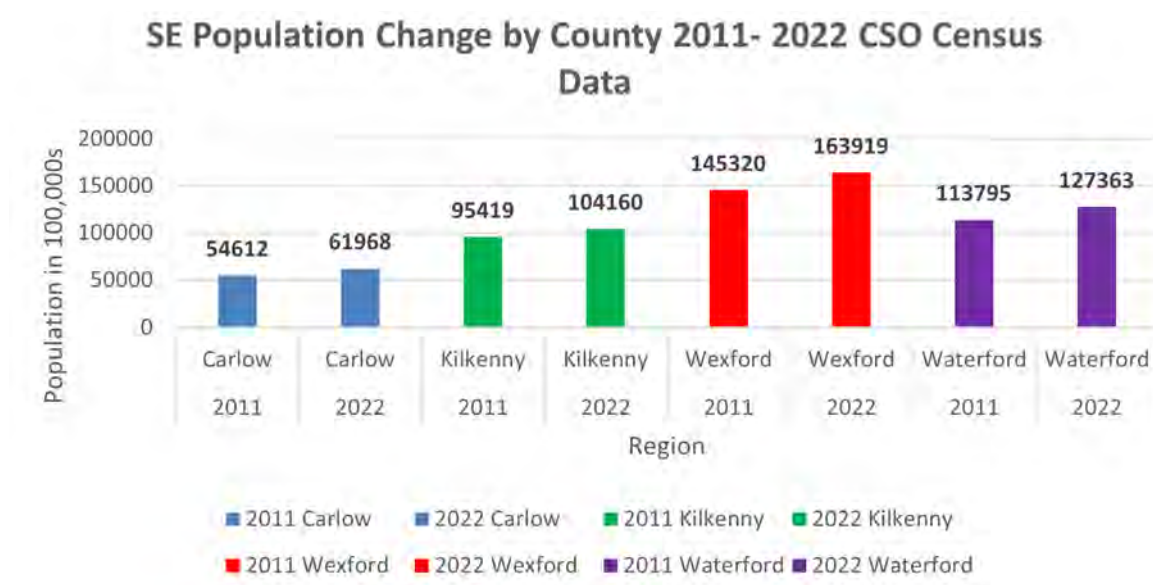
Figure 3b: **South East Population Change by County 2011 and 2022 - CSO Census Data**

Employment levels in the South East region are currently strong. The CSO's Labour Force Survey for Q4 2023 highlighted NUTS 3 regions that experienced a decrease in unemployment over the year to Q4 2023, with the largest decrease occurring in the South East (-2,000) or -16.4% (Unemployment Labour Force Survey Quarter 4 2023 - Central Statistics Office).
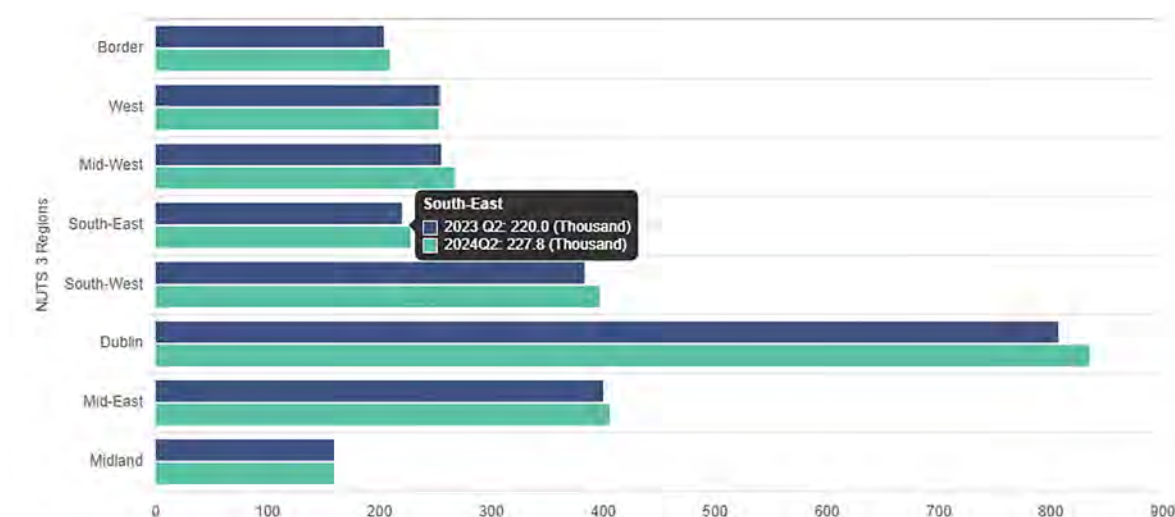
Figure 4: **Persons Aged 15 and Over in Employment by NUTS 3 Region, Quarter 4 2022 and Quarter 4 2023. Reproduced from the Employment Labour Force Survey Quarter 4 2023 - Central Statistics Office https://data.cso.ie/table/QLF08**

The educational attainment of the population in the South East is largely reflective of that of the State as a whole in both the 2011 and 2022 censuses.
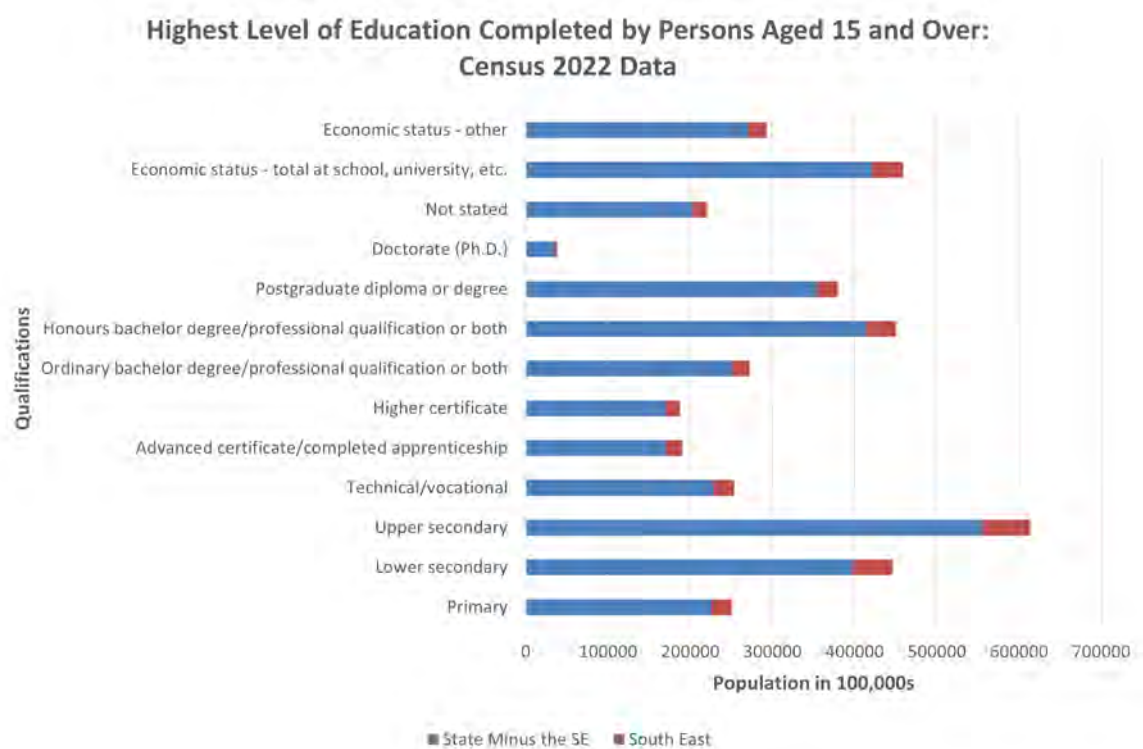
Figure 5: Highest level of education completed by persons aged 15 years and older in the State and in the SE in 2022: CSO census 2022 data

However, fewer individuals as a proportion of the population have an Ordinary Bachelor Degree or higher-level qualification in the South East than in the State as a whole. That fact remains constant between the 2011 census and 2022 census (See Figure 6 below).
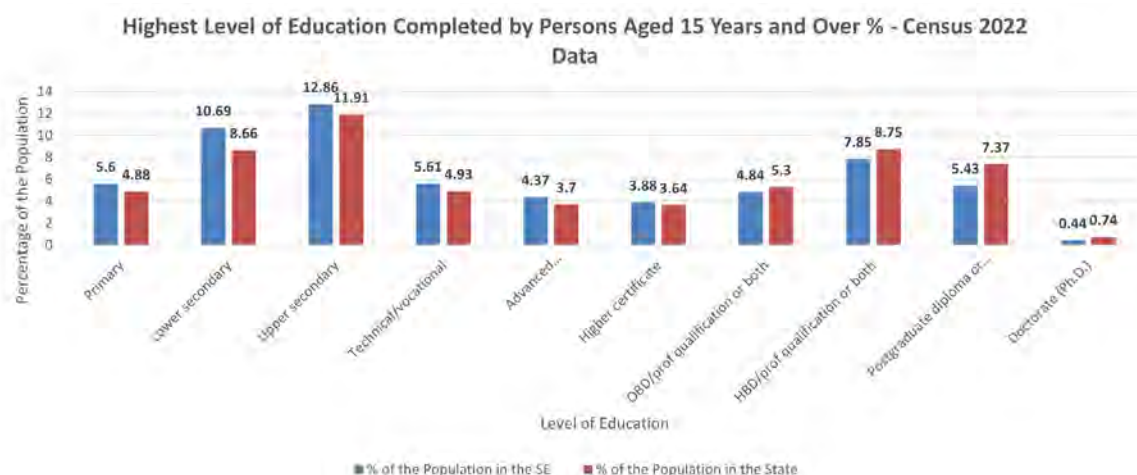
Figure 6: **Highest Level of Education Completed by Persons Aged 15 Years and Older as a Percentage of the Population. CSO Census 2022 Data**

Nonetheless, there were increases in educational attainment, with the largest increase being in those with doctoral degrees and those with Honours Bachelor Degrees.
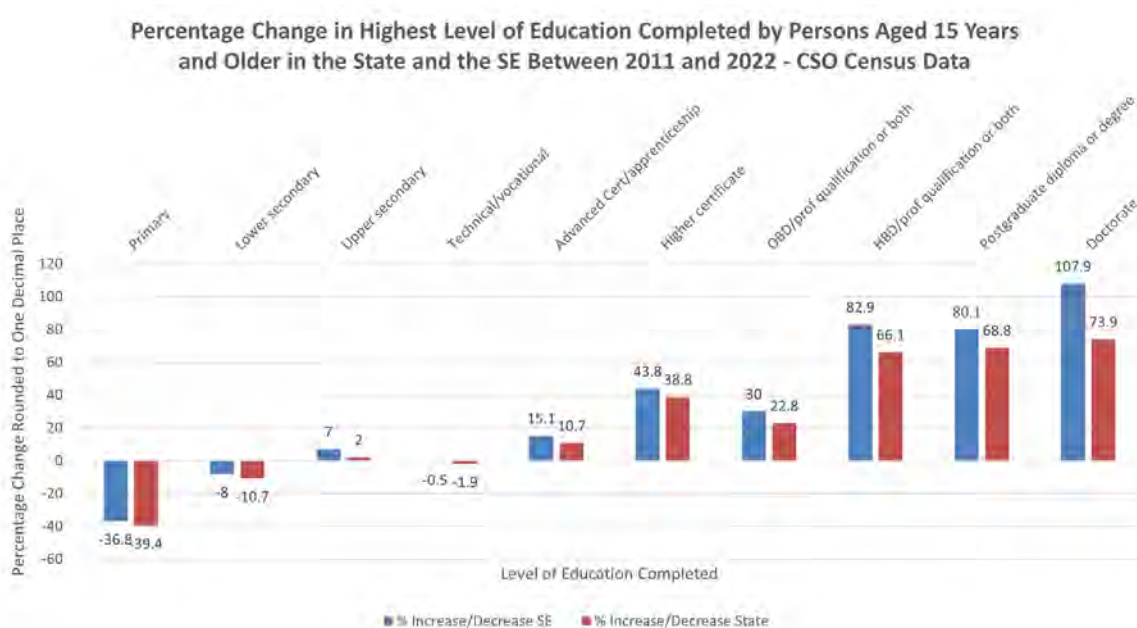
Figure 7: **Percentage Change in Highest Level of Education Completed by Persons Aged 15 Years and Older in the State and the SE Region Between 2011 and 2022 - CSO Census Data**

On a very positive note, as highlighted in Figure 7, the overall rate of increase in educational attainment was higher in the South East than in the State as as whole.
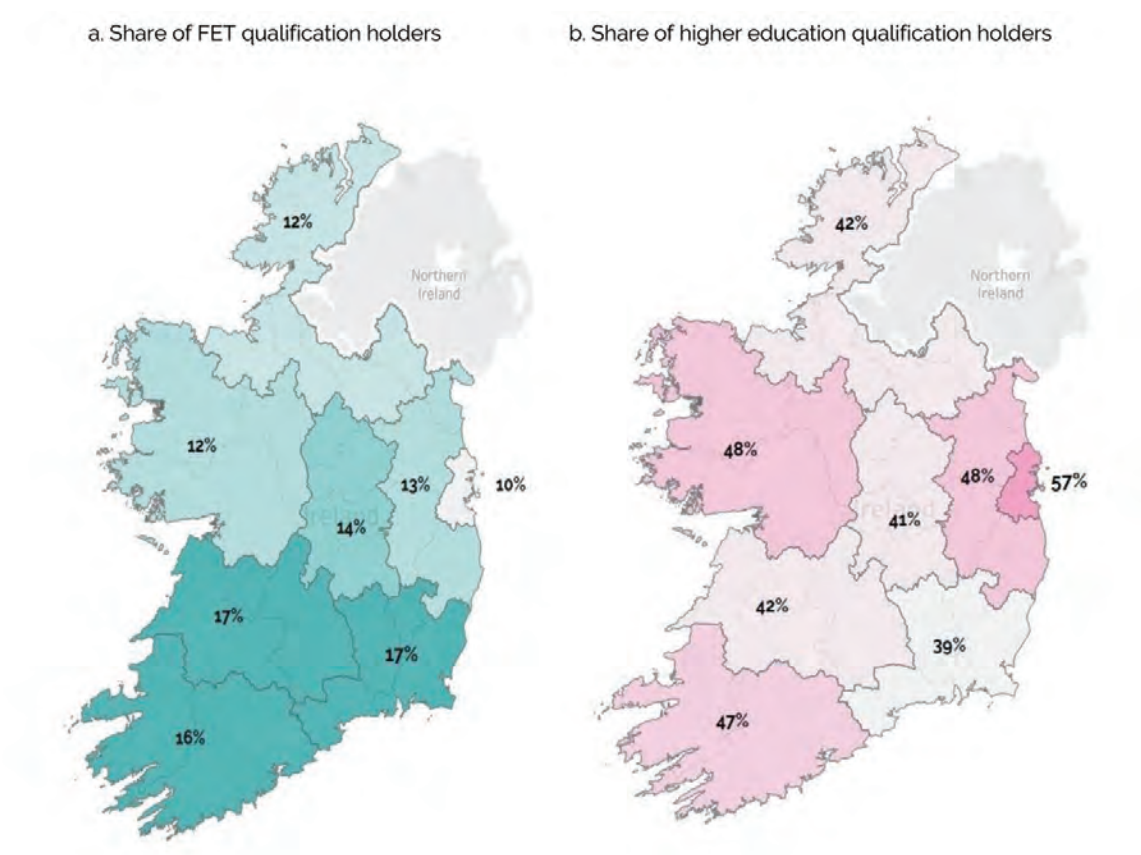
Figure 8: Shares of qualification holders by region, higher education and FET, Q2 2023. Reproduced with Permission from SOLAS, 2024, p. 58

The South East is currently a median performer nationally in terms of lifelong learning participation with 12.1% of the population of the region participating in lifelong learning in the 4 weeks preceding the study (see Figure 9 below) – as compared with a target participation rate of 30% under the same measure.
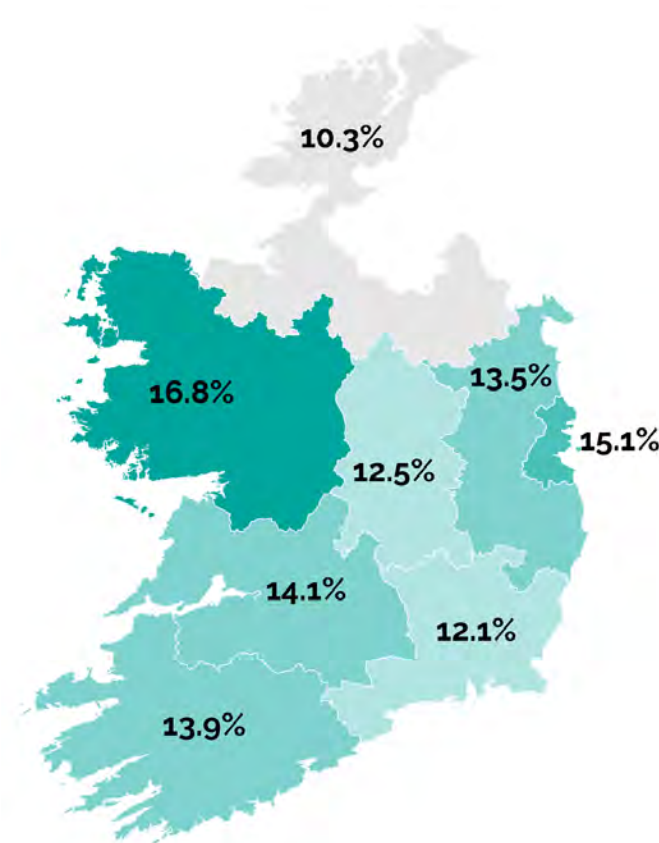
Figure 9: Lifelong Learning Rates by Region, Quarter 4 2022. Reproduced with Permission from SOLAS, 2023a, p. 8

3.2 ECONOMY

The South East Regional Skills Forum has identified a number of economic challenges for the region, which is emerging from a period of relative economic weakness. Productivity per person remains lower compared to national averages, with gross value added (GVA) in the South East at 61% of the national average. Seventy-five percent of enterprise based employment in the South East comprises SMEs by comparison with 71% in the greater Southern region. Many enterprises, particularly SMEs in hospitality, retail, wholesale, and small-scale manufacturing, face significant pressure due to rising costs (energy, labour, inputs, etc.) (South East Regional Skills Forum, 2024, p. 1). Key challenges related to skills were

identified by a number of interviewees for this research and include the migration of school leavers to study outside of the region and of higher education graduates to other areas for employment resulting in lower educational attainment levels in the South East and a relative 'brain drain' from the region (64% of full-time higher education students leave the region according to SENSER's 2023 analysis). In Q2 2023, only 45% of the South East labour force held a higher education qualification, compared to 54% nationally.

At a national level, SOLAS reported broad economic growth and healthy employment figures in the 2023 National Skills Bulletin. Sectoral variation, however, was also observed. By the end of 2022, the health and social work sector was the largest employer in the State employing 336,500 individuals, followed by industry with 323,000 employees and wholesale and retail with 320,300 employees. Together, these three sectors constituted 38% of the total national workforce (National Skills Bulletin, 2023, p. 3). However, employment remained below pre-Covid-19 levels in several sectors, particularly in the accommodation/food and agriculture sectors, with decreases of 5% (equivalent to 8,600 fewer workers) and 6% (or 6,000 fewer individuals), respectively, since 2019.

Figure 10 below illustrates national employment categorised by broad economic sector (NACE Rev 2).
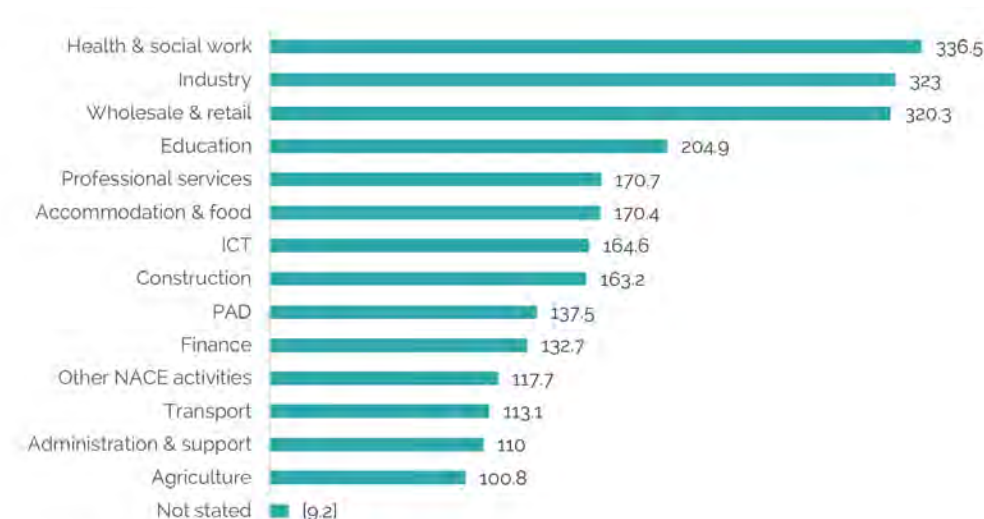
Source: SLMRU (SOLAS) analysis of CSO LFS data

Other NACE includes activities such as arts, entertainment & recreation, other service activities (e.g. repair of goods), etc.
[ ] Numbers in square brackets are small and should be interpreted with caution

Figure 10: National employment by sector (thousands), Q4 2022: Reproduced with Permission from SOLAS, 2023, p. 31

The equivalent profile by region shows the South East following a broadly similar pattern of employment by broad economic sector.
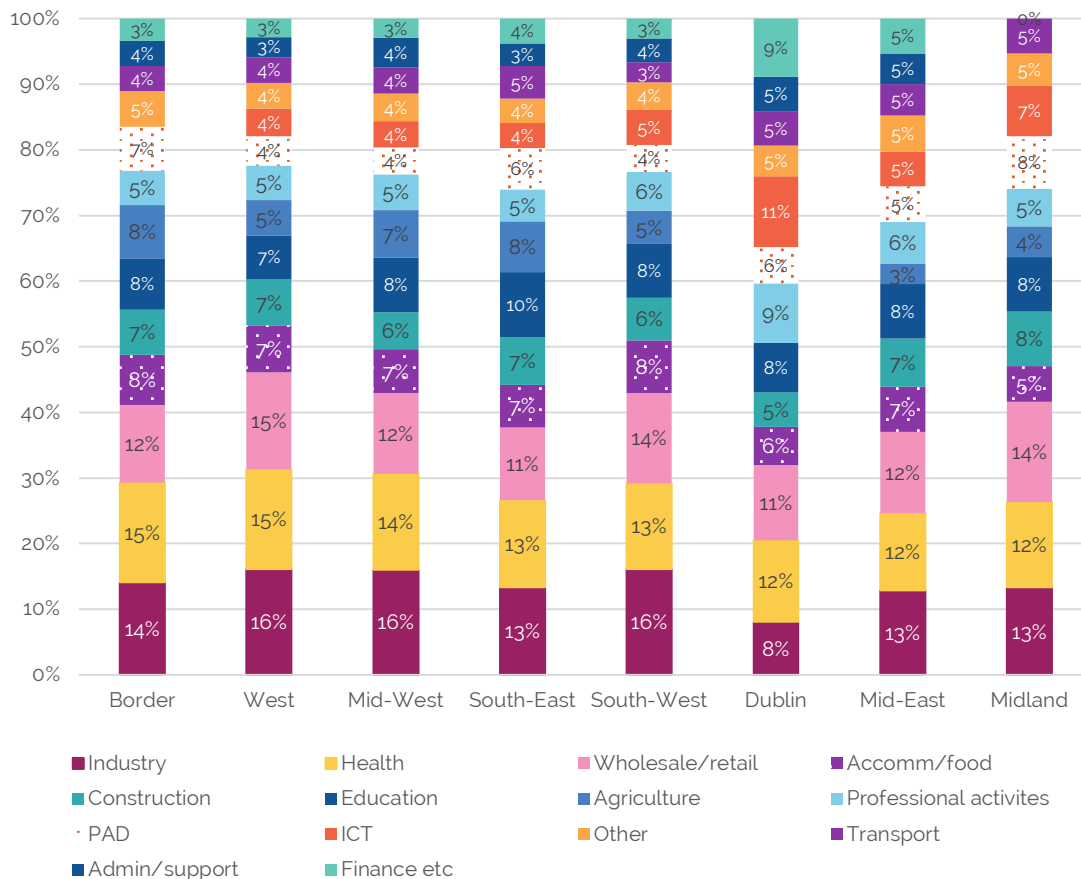
Source: SLMRU (SOLAS) analysis of CSO LFS data
*Numbers were too small to report for the ICT sector in the Border region, the finance sector in the Midland region, and the agriculture sector in the Dublin region. Excludes those who did not state a sector.

Figure 11: **Employment by Region and Sector*, Quarter 4 2022. Reproduced with Permission from SOLAS, 2023, p. 59**

The South East Regional Enterprise Plan to 2024 states that the region is favourably placed to attract investment. Currently, there are over 10,000 individuals employed in high-value life sciences manufacturing in the region (Gov of Ireland, 2022a, p. 41). There are also significant clusters in technology, engineering, industrial technologies, and international financial services. These clusters are linked to SETU to support the development of talent development, research and innovation collaboration. The Engineering the South East Cluster acts as a crucial connection between industry leaders across a broad range of engineering and manufacturing companies, enterprise agencies, academia and training providers. The Regional Enterprise Plan to 2024 for the South East identified the presence of SETU's predecessor institutes of technology in the region as a significant advantage for local businesses, with the University further enhancing the educational profile of the region (Gov of Ireland, 2022a, p. 41).

4 SKILLS SNAPSHOTS BY INDUSTRY SECTOR

SKILLS SNAPSHOTS BY INDUSTRY SECTOR

Subsequent sections of this report provide 'skills snapshots' for key industry sectors below as set out in the SETU Strategic Plan

and as prioritised in the Southern Regional Smart Specialisation Strategy:

Agriculture and Forestry

Specialised Engineering & Advanced Manufacturing

Bio-pharma & Life Science

Blue & Green Economy

ICT, Digital & Fin-Tech

Tourism, Heritage, Arts & Design

Global Business & Financial Services

Construction
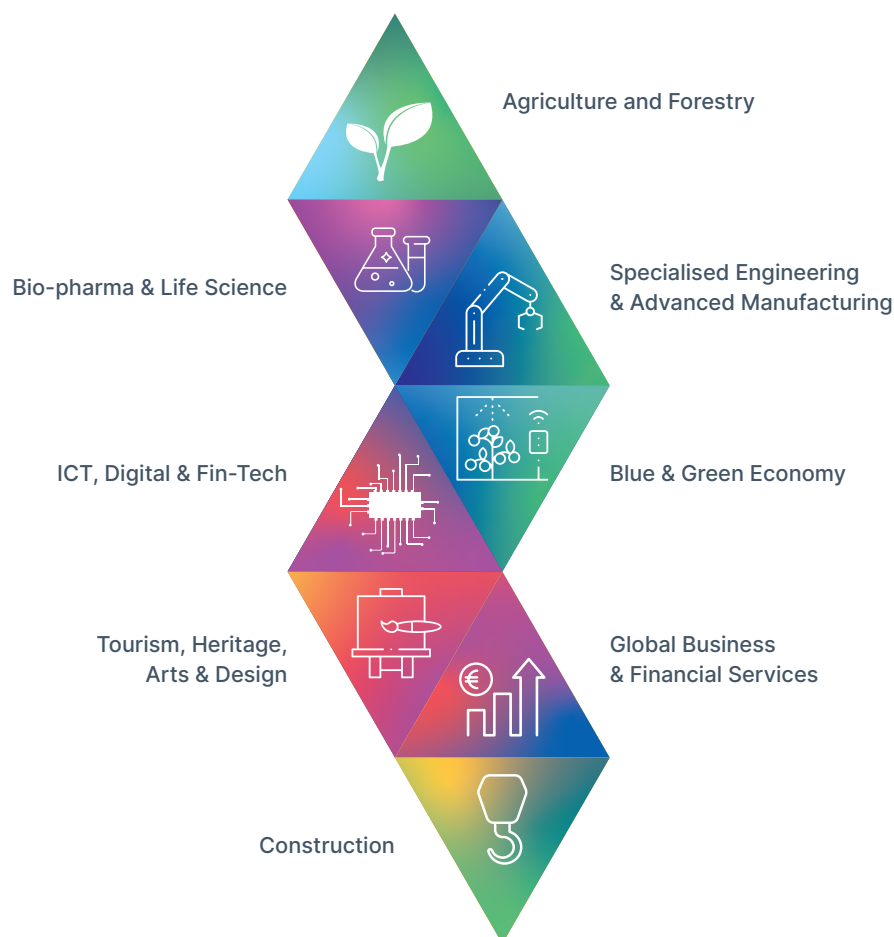
Figure 12: **Key Industry Sectors**

It is important to note that the sector designations used here do not align consistently with those used by other agencies or organisations nationally, such as the Central Statistics Office (CSO), which uses NACE 2 as the standard classification for economic activities. Instead, the designations reflect those sectors and industries of most significant economic impact in the South East region and which are prioritised through the national smart specialisation strategy.

With the exception of the hospitality sector, there is broad coherence between the sectors addressed in this report and the regional objectives outlined in the Government's South East Regional Enterprise Plan to 2024. That plan has six strategic objectives with specific actions aiming to:

- Position the South East as an **Offshore and Onshore Wind Energy** Hub.
- Develop a Strategic Approach to **Regional Green Skills** at Further and Higher Education levels.

- Support the growth of a National Centre of Excellence in **Sustainable Food, Forestry and Marine Innovation** in the South East.
- Support the growth of a National Centre of Excellence for High Performance Buildings in Wexford.
- Green Awareness – Promotion of Industry Best Practice in **Sustainability and Green Opportunities**.
- Expand and enhance industry engagement with the South East Clusters for **Engineering** and **Financial Services** Cluster.
- Assess and progress the South East **ICT** Cluster.
- Explore potential to start and grow an industry-led South East **Life Sciences** Cluster and **Agri-food, Forestry and Marine** Cluster.
- Local Enterprise Offices to develop four Regional micro-clusters in **Pharma/ Lean Manufacturing/ Green/ Digital Marketing**.
- Identify opportunities to scale and increase enterprise engagement in the **Life Sciences; Advanced Manufacturing, Agri-Food and Forestry, and ICT** innovation, research and development ecosystem in South East.

There is also some overlap between the sectors reviewed in this report and those which are the focus of interest of the South East Regional Skills Forum (SERSF), which works with industry in the region and has developed a profile of ongoing education and training needs. The SERSF has identified the following priority areas in terms of the education and training needs of industry across the region to 2024 and beyond:

- **Engineering** (from NFQ Level 4 to Level 9), as well as the provision of part-time upskilling opportunities across all **manufacturing** sectors and construction. There is a shortage of individuals undertaking programmes across all engineering disciplines.
- **Life sciences** (from NFQ Level 5 to Level 9), as well as the provision of part-time upskilling opportunities in **pharma**, food manufacturing and **MedTech** sectors.
- **ICT** graduates and part-time upskilling opportunities for same are required to support continued technological innovation and digitalisation across all sectors.
- **Financial Services** (from NFQ Level 6 to Level 9) to support the development of this sector in the region.
- Upskilling is required in the area of **sustainable construction**.
- There are chronic skills and labour shortages in the **hospitality sector**.
- Skills to support transitioning to a **low carbon economy** are required for the regionally important transport and logistics sector (South East Regional Skills Plan, p. 45).

4.1   SKILLS SNAPSHOT: AGRICULTURE & FORESTRY

Overview of the Sector

The agricultural sector remains an important part of the economy and society of the South East with the region producing 17% of national output broken down as follows in the CSO's Regional Accounts for Agriculture 2022.
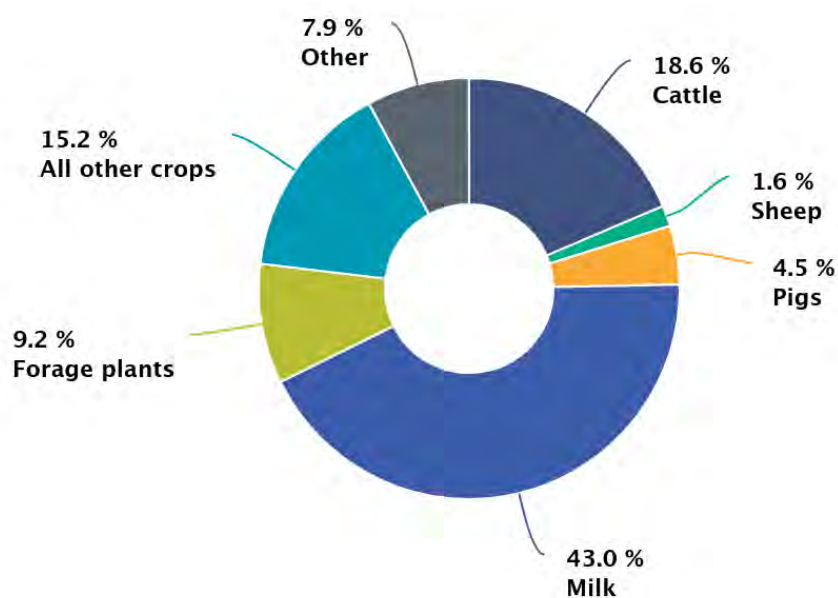
Figure 13: **Composition of Agricultural Output, South East Region, 2022**

The region is home to several major Teagasc research and education facilities including Oakpark, Johnstown Castle and Kildalton. SETU provides higher education awards in agriculture, brewing & distilling, food, horticulture and forestry, and the University is also planning to deliver veterinary medicine within the region to meet the burgeoning deficit of veterinary expertise available to meet the needs of the region. Several large food producers and exporters are based in the region, along with a host of SME's.

The CSO reports that the value of the South East's agricultural output at basic prices experienced a substantial increase of 29%, amounting to €2.2bn, with livestock contributing 29% to this output in 2022 (ibid.). Employment levels in agriculture remain static or declining slightly in some sectors. In line with Government policy for example, the Climate Action Plan 2023 and the Food Vision 2030 Strategy, sustainability and reduction of greenhouse gasses in the production of food products is a priority.

Forestry

Forestry is identified as a growth area nationally. The projected annual volume of timber harvested in the State is expected to increase from 4.75 million cubic meters in 2021 to 8.0 million cubic meters by 2035, representing an almost 80% increase in production over the time period (South East Regional Skills Forum, 2022, p. 1). The forestry sector both directly and indirectly supports approximately 9,400

jobs and contributes approximately €2.3bn to Irish GDP annually (SETU, 2024, p. 3). In addition to more narrowly defined economic goals, Ireland's Forest Strategy points to the contribution the sector can make to environmental and sustainability priorities. The strategy points to the need for "a diverse range of forest professionals, among others, foresters skilled in a range of sustainable forest management practices, ecologists, engineers and designers, data specialists, as well as skilled forest operatives. The Regional Skills Fora 2022 Insights echoes the need for skilled operatives pointing to sustained industry concern about the availability of suitably trained personnel for timber harvesting" (2022, p. 3).

Employment in the Sector

According to the National Skills Bulletin, 2022, approximately 114,000 persons (87%

male) were employed in agriculture and animal care occupations, representing 4.8% of the national workforce (p. 146). Eighty-six percent of these individuals were employed in the agriculture sector. The sector has, however, experienced a reduction in employment growth of 0.6% annually in the period 2016-2021. Contrary to trends in other sectors, 49% of those employed in the sector were aged 55 years and over (the national average is 19%), while 41% of those employed were aged 25-54 years (ibid.).

According to SOLAS, those working in the agricultural sector "had the highest share of persons employed with a lower secondary education or less, at 40% compared to 10% nationally; the percentage of those who attained a higher secondary/FET qualification (40%) was above the national average share of 35%" (ibid., p. 146).
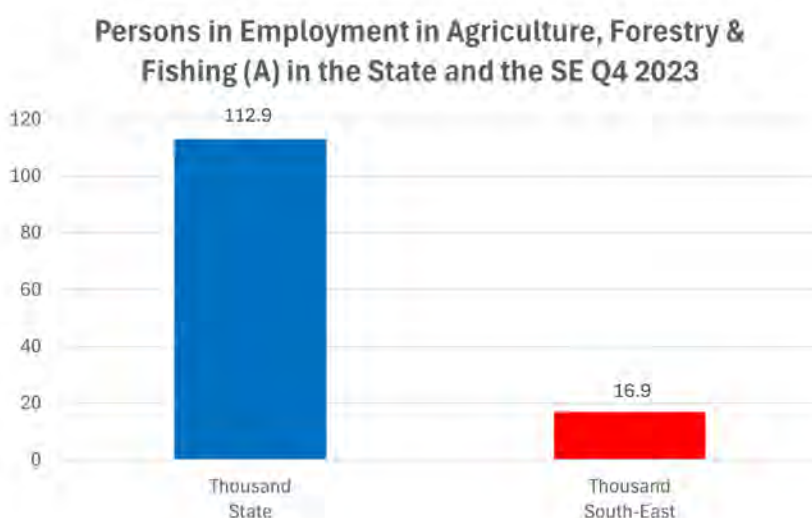
Figure 14: Persons aged 15-89 years in Employment in Agriculture, Forestry and Fishing (A) in the State and in the SE – Q4 2023. CSO Data (cso.ie)

The National Skills Bulletin, 2021 provides a breakdown of employment within the sector, as well as growth trends, as outlined in Figure 15 below:

Numbers employed, 2021 (annual average)
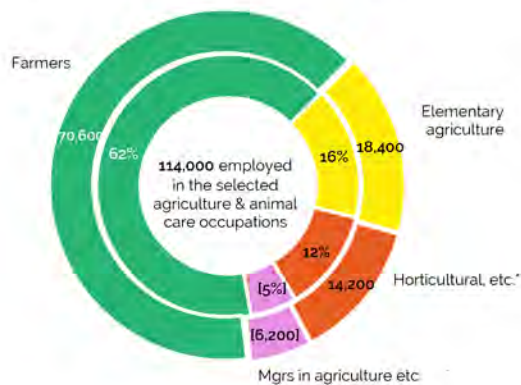
Average growth rates (%) 2016-2021
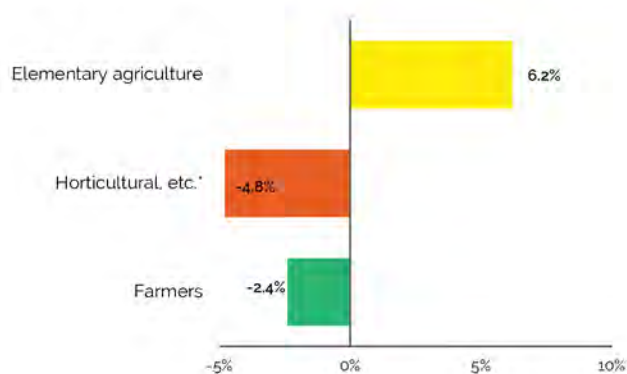
Between 2016 and 2021, overall employment declined by 3,200 (-0.6% on average annually compared to a 2.3% increase nationally).

Figure 15: **Employment in the Agriculture Sector: Reproduced from SOLAS, 2022, p. 141**

A breakdown of employment in the sector by age group and changes in that regard from the 2011 census to the 2022 census is detailed in Figure 16 below:
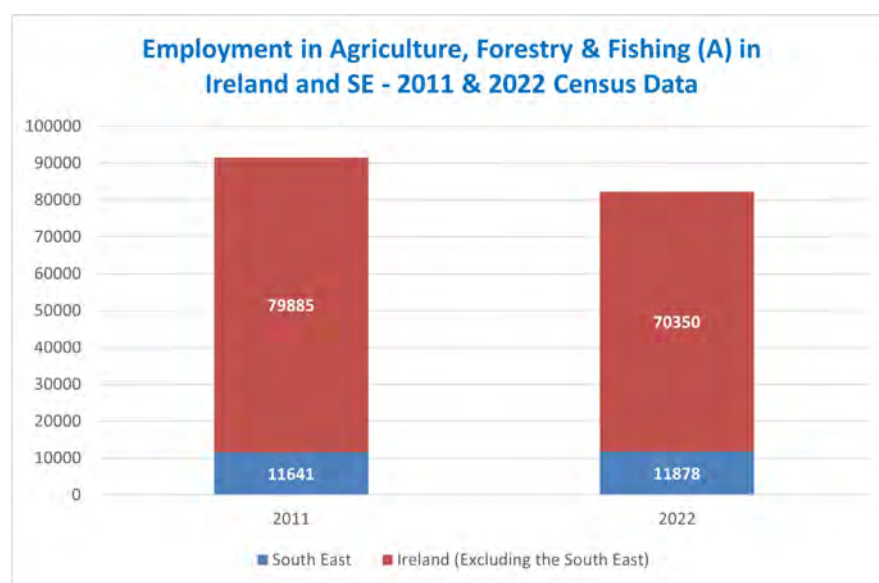
Figure 16: **Employment in Agriculture, Forestry and Fishing (A) in Ireland and the SE 2011 & 2022 Census Data. CSO Data (SE includes Tipperary)**

SETU data indicates there are currently approximately 13,600 people[6] working in the agriculture, forestry and fishing sector in the South East, with over 6,000 people in the region holding a higher education qualification in agriculture or veterinary (SETU, 2024, p. 4).

Employment forecasts for the sector, however, predict continued decline in employment figures and a need to diversify into new markets. Skills requirements relate to this diversification. The National Skills Bulletin, 2022, projected a continued decline in employment numbers in agriculture and animal care occupations

due to "Brexit, Government targets in relation to climate action, and disincentives to engage in low paid work." According to the National Skills Bulletin, 2023, "the most notable declines were for employment in the accommodation/food and agriculture sectors, which fell by 5% (8,600 fewer workers) and 6% (6,000 fewer persons) respectively over this period" (p. 8). Brexit was forecasted by the EGFSN to result in a need for more administrative staff to identify and manage new contracts outside of the UK. Language and cultural awareness skills were identified as critical in that regard (2018, pp. 37-38).

---

[6] Differences between this number and the one outlined in Figure 16 above likely result from three factors: 1) differences in the way in which the sector has been defined by the two sources; 2) the fact that the SE includes Tipperary in the CSO data; and 3) the fact that that the data sources are referring to different years.

Future Skills Needs

The SETU Department of Land Sciences published an analytical report on "Knowledge & Skills Needs in the South East: A focus on the Agriculture, Food, Forestry, Horticulture & Marine sectors" in January 2024. The report considered skills needs across 6 priority areas: Sustainable systems; Capacity to absorb research and innovation; Availability of skilled employees; Leadership development; Market development and Digitalisation.

The report pointed to a clear need to "invest in upskilling and multiskilling of employees to help better develop existing talent 'in house' while also investing in and attracting in new people in an effort to create new organisational value." It found that the key challenges with respect to the availability of talent include:

- A lack of operators and technicians (in many instances it is important to note this challenge has also been presented as a 'labour' shortage and not solely a 'skills' shortage).
- Current lack of capacity to support "in company" capability to accelerate market development.
- A lack of a skilled technical capacity to absorb new research and innovation.
- Inability to attract in and or develop mechanisms to internally generate managers of the future.
- Current lack of both the technical and softer skills at all levels across all sectors.

This report also points to the need to continue to work on delivery models for upskilling with support being expressed for 'on the job' training rather than 'losing staff for blocks of time'.

The need to integrate all aspects of sustainability (environmental, economic, and social considerations) into business strategies throughout the entire agri-food industry, encompassing farming, fishing, forestry, input provision, and food and beverage manufacturing is a strong theme of the SETU report and others. Identified gaps in knowledge and skills in this area range from primary production to the creation of end products (SETU, 2024; Gov of Ireland, 2021a). Current gaps in digital and automation capabilities are having a negative direct impact on process innovation and the ability to adopt emerging technologies. Primary producers and advisors will require continuous professional development to aid the uptake and adoption of sustainable technologies and practices particularly on climate and biodiversity (e.g.hedgerow management) (SETU, 2024; Gov of Ireland, 2021a). Subsequently the need to strengthen primary producer advisory and extension services has been identified, with a need to cover environmental and climate performance, innovation and digitalisation, as well as agronomic, animal health and welfare, technical and financial aspects (Gov of Ireland, 2021a). An overall need for advisors trained in all aspects of societal and environmental sustainability on key areas such as climate mitigation practices, water quality improvement, maintaining and enhancing biodiversity, animal health and welfare and antimicrobial stewardship is evident: "...up to date environmental resource management modules should be included in primary producer education and training." (Gov of Ireland, 2021a, p. 154).

Business development skills such as foreign languages and international selling skills are identified as both an existing skills gap and a forecast skills need for the agriculture, including the food sector, as exporters look to diversify their client base (EGFSN, 2018).

Moreover, in primary production there is continuing industry demand for staff in roles including Farm Managers, Dairy and other Operatives and Professional Foresters [Summary of Demand from Industry for Skills/Training: Agriculture, Horticulture, Forestry & Marine / Document last updated July 2024].

Summary of Skills Needs for Agriculture & Forestry
including agri-tech, food and sustainable agriculture[7]

Specialist Industry Skills
- Supply chain;
- Sourcing technology, process; automation & LEAN;
- Digitalisation and data analysis;
- Product innovation and ability to apply research for business growth;
- Regulatory affairs;
- Risk management;
- Sustainable food production;
- Specialist operative skills;
- Environment, sustainable land management and hot spot analysis.

High demand roles
- Machine engineers, technicians & operatives;
- Food & beverage R&D scientists;
- Expert food scientists, technologists and meat technicians with new product development skills;
- International sales and marketing with languages for international trade.

Transversal/Soft Skills
- Leadership & management;
- People management;
- Knowledge of sustainability and the carbon cycle;
- Commercial (and selling) skills, including social media marketing.

Internationalisation
- Cultural (non-verbal communication and awareness);
- Languages: translation, business, including Asian, French, Mandarin;
- Understanding tastes and preferences in particular markets;
- Regulatory divergence: (tailoring products to reflect specific market regulations);
- International selling skills with languages;
- Business development;
- Customs clearance;
- Trade Financing (managing VAT);
- International administration.

---

[7] Sources: EGFSN (2018) *Addressing the Skills Needs Arising from the Potential Trade Implications of Brexit*. SETU (2024) *Knowledge & Skills Needs in the South East A focus on the Agriculture, Food, Forestry, Horticulture & Marine sectors*. Government of Ireland (2016) *Ireland's National Skills Strategy 2025*. SOLAS (2022) *National Skills Bulletin 2022*. Government of Ireland (2022b) *Climate Action Plan 2030*. National Economic & Social Council (2021) *Digital Inclusion in Ireland: Connectivity, Devices & Skills*. Government of Ireland (2021a) *Food Vision (2030) A World Leader in Sustainable Food Systems*. Interviews with regional skills experts.

4.2 SKILLS SNAPSHOT: BIOPHARMA & LIFE SCIENCE

Overview of the Sector

The Biopharma/Chem sector[8] is a major contributor to the Irish export economy. It had a total value of €106 billion in 2020, representing 67% of the total goods exported (EGFSN, 2022, p. 22). Pharmaceuticals made up 32% of Irish industrial exports in 2022, totaling €42.3 billion. The Biopharma industry plays a vital role in the Irish economy and is experiencing significant growth. This sector encompasses both manufacturing and services, with manufacturing categorised into Small Molecule (synthetic) and Biologics (large molecule). Service subsectors include Global Business Services, Biopharma Services, and Specialty Pharma Services (Expert Group on Future Skills Needs (2024, p. 3). Although the volume of pharma exports slowed in 2021, pharma remains the largest goods exporting sector. Notably, Ireland saw a surge in exports of semiconductors and medical devices in 2021 (SOLAS, 2022, p. 125). In 2019, Ireland was the fifth largest exporter of biopharmaceutical drugs worldwide, with exports totaling €80 billion. Ireland hosts substantial operations of all the top 10 pharmaceutical companies globally, employing 42,000 directly (EGFSN, 2022, p. 22). Each year, IDA client companies invest around €2 billion in biopharmaceutical research and development. The South Region (SR) hosts a significant presence of pharmaceutical companies and research and development organisations(RDOs), conducting cutting-edge life sciences research (Gov of Ireland, 2022c, pp.132-133).

The main drivers of growth in the global (and Irish) biopharma sector are biologic therapies, notably monoclonal antibodies, along with emerging areas like advanced therapeutic medicinal products (ATMPs) or cell and gene therapies (CGTs). Traditional pharmaceutical manufacturing continues to expand alongside the growth of global business services and speciality pharma services (Expert Group on Future Skills Needs, 2024, p. 5).

Companies are spread nationwide, with significant clusters in Dublin and Cork, along with smaller concentrations in the midlands, South East, and Limerick. The sector has diversified since 2016, with growth in ancillary areas such as global business services, clinical trial management, automation, contract manufacturing, and supply chain management, all of which require new skill sets. Additionally, there is a concerted effort towards advancing next-generation treatments such as cell and gene therapies, personalised and precision medicine, genomics, connected health, and combination therapies. Recent global disruptions have underscored the industry's vulnerability, with efforts to move pharmaceutical production, notably active pharmaceutical ingredients (API), back to Europe from Asian countries. However, industry insiders cite a scarcity of skills and talent as a significant impediment to growth, modernisation, and digital transformation. The Covid-19 pandemic accelerated digitalisation, exacerbating the gap between demand and supply for tech professionals, with the biopharma and chem sector now vying for talent with the tech industry (EGFSN, 2022, pp. 22-23).

---

[8] Definitions of the sector vary (or are absent) across the reports reviewed for this analysis. Some definitions include chemicals, whilst others do not. The wider definition of life sciences often includes medical technologies, which have been included here.

Digital health technologies have been identified nationally as an adjacent area of which Ireland is well placed to take advantage. In a recent report, _Where Digital Health Thrives: Future Skills_, it is reported that the worldwide digital health sector had a value of $175.6 billion in 2021 and is anticipated to expand at a compound annual growth rate of 27.7% from 2022 to 2030, potentially reaching over $1.5 trillion by the end of that period. Ireland's exceptional health technology environment currently includes over 700 enterprises, providing direct employment to 90,000 individuals. These encompass leading global MedTech, biopharma, and digital health firms, alongside innovative startups focused on addressing unmet clinical requirements through advanced technology (IBEC, 2023, p 4). According to that report, compiled by Health XL in conjunction with Connected Health Skillnet and IBEC, demand outstrips supply for digital health skills currently.

Employment in the Sector

Between 2016 and 2022, employment within Ireland's biopharma sector grew by 61%, resulting in the generation of nearly 19,000 new jobs. The most substantial employment growth rates were observed in Biologics manufacturing (12% compound annual growth rate [CAGR]), followed closely by Biopharma Services (11%), Global Business Services, and Specialty Pharma Services (both at 10% CAGR). Biologics manufacturing experienced the highest influx of new jobs (8,928), followed by small molecule manufacturing (4,367) and Biopharma Services (3,232) (Expert Group on Future Skills Needs, 2024, p. 5).

According to the South East Regional Skills Forum's Summary of Demand from Industry for Skills / Training: Life Sciences – October 2023, there are 12,000 people employed in Pharma and MedTech in the region. Some sectors in the region are experiencing significant labour shortages in part due to skills and training needs. The sector, which includes pharmaceutical and medical device manufacturing, comprises mainly large multinational companies. The ten largest pharmaceutical companies employ 5,200 staff and the largest 10 medical device manufacturers employ 6,600 staff in the South East (South East Regional Skills Forum, 2023a, p. 1).[9] The National Skills Bulletin, 2023, noted that nearly 72% of the 86,200 people employed in high technology manufacturing in quarter 4 2022 were employed in pharmaceuticals (p. 38). The pharmaceutical sector also showed particularly strong growth in employment since 2020 (ibid. p. 17). According to the SERSF, the sector has an ongoing need for science, engineering and associate professionals, as well as semi-skilled operatives / technicians (South East Regional Skills Forum, 2023a, p. 1).

According to an analysis from Cpl Life Sciences and Vacancysoft, life sciences firms in Ireland recorded over 3,400 vacancies in 2021. This was 14.9% higher than 2020 and 4.5% higher than pre-pandemic levels. According to the analysis, roles in quality assurance, followed by research and development experts and then drug manufacturing professionals were most sought-after (Murray, 2022).

---

[9] This figure includes South Tipperary

Companies reportedly face challenges in attracting and retaining talent and a new graduate cohort that lacks core skills. Attracting senior international talent is also a challenge "due to housing shortage and other infrastructural issues; shortage of data and digital skills; and greater demands by candidates for flexible working and career development pathways" (Expert Group on Future Skills Needs, 2024, p. 6). Projected skills demands to 2027 are outlined in Figure 17 below.

As the sectors and sub-sectors designated by SETU for exploration in this research do not align directly with those on which data is collected by the CSO, extracting data on changes in employment over time in these precise areas is difficult.

Future Skills Needs

The Expert Group on Future Skills Needs recently published a comprehensive report on future skills needs in the biopharma sector in Ireland (2024). The report focuses on the needs of companies engaged in Small Molecule Manufacturing (including synthetic pharmaceuticals and non-pharmaceutical chemicals); Biologics/ Large Molecule Manufacturing; Other Manufacturing Activities; and Services

Figure 17: Forecasting Gaps Between Skills Demand and Supply 2023–2027. Reproduced with Permission from Expert Group on Future Skills Needs, 2024, p. 7

Activities, including: Global Business Services, Biopharma Services, and Specialty Pharma Services. The skills and roles needed are identified according to the primary personnel roles and positions typically found within a biopharma company, and are organised within six overarching functional domains:

- Research & Development
- Production
- Regulatory Affairs
- Quality Control
- Supply Chain/Procurement/Planning
- Environmental/Occupational Health & Safety.

The need for skilled workers with higher education qualifications is expected to rise considerably in the next decade. This will necessitate a greater number of graduates in relevant areas, as well as the upskilling and reskilling of current employees. Moreover, there will be a focus on reskilling individuals who can transition effectively to the biopharma and chem sector (EGFSN, 2022, pp. 22-23).

Demand is identified for international selling skills, cultural awareness, market research and business planning skills. Additionally, with China likely to increase its importation of life science products from Ireland, intellectual property specialists are needed (EGFSN, 2018). Interviews with industry and sector representatives indicated that within biopharma and the life sciences, knowledge and understanding of regulation and compliance standards was identified in terms of both skills needs and current hard to fill roles. In an interview with the Irish Examiner in 2022, the Irish Pharmaceutical Healthcare Association stated that "there was a wide skill base needed for the industry that goes beyond the sciences and also includes things like regulation, licensing, sales and marketing, and policy and reputation". Digitalisation of operations, personalised medicine, increased process automation and robotics has resulted in increased need for AI, digital and data skills (Expert Group on Future Skills Needs, 2024; Whelen et al, 2024).

Summary of Skills Needs for Biopharma & Life Sciences[10]

Specialist Industry Skills

- Automation (technology design, programming, use, monitoring and control, installation and maintenance);
- Good manufacturing practice (GMP);
- LEAN, six sigma & operational excellence;
- Digitalisation & data analytics, including advanced analytics, for process improvement;
- Regulatory affairs and compliance;
- Product design and software development;
- Financial planning/management;
- Research and development;
- Product approval;
- Generative AI and machine learning;
- Cloud-optimised solutions;
- Vision systems;
- Financial and tax expertise, including expertise in transfer pricing, VAT, international corporate tax & international treasury.

Transversal/Soft Skills

- Analytical thinking and innovation;
- Complex problem-solving;
- Critical thinking and analysis;
- Service Orientation;
- Management of financial, material resources;
- Leadership and social influence;
- Multi-lingual skills;
- Social media;
- Commercialisation;
- End-user adoption and user experience (UX);
- Environmental, social and governance (ESG);
- Data and digital privacy and security;
- Leadership and management;
- Sales and marketing;
- Transformation and project management.

---

[10] Sources: EGFSN (2024) Skills for Biopharma. EGFSN (2018) Addressing the Skills Needs Arising from the Potential Trade Implications. Dept. of Education and Skills (2016) National Skills Strategy, 2025. EGFSN (2022) The Expert Group on Future Skills Needs Statement of Activity 2021. South East Regional Skills Forum (2023) Summary of Demand from Industry for Skills / Training – October 2023 - Life Sciences. Murray, S. (2022) Skills shortage: Irish employers urgently need more trained and experienced workers. IBEC (2023) Where Digital Health Thrives: Future Skills Needs. SOLAS (2022) National Skills Bulletin. Interviews with sector and industry representatives.

High demand roles
- Research scientists engaged in drug discovery, formulation, delivery and process technology;
- Microbiologists, chemists, biotechnologists and biochemists;
- Biostatisticians and Bioinformatics Scientists;
- Bioprocess engineers/technicians;
- Validation engineers;
- Manufacturing technician/Operatives;
- Technical Support Specialists;
- Operational Excellence (OE) Specialists;
- Process and analytical Chemists;
- Mechanical, automation and manufacturing, software and quality engineers;
- Polymer, laboratory and process technicians;
- Quality control and quality assurance professionals;
- Production Managers in MedTech and Bioharma.

Internationalisation
- Customs clearance;
- Regulatory requirements;
- Languages (including translations of specific products and services.

4.3 SKILLS SNAPSHOT: SPECIALISED ENGINEERING & ADVANCED MANUFACTURING

Overview of the Sector

It is challenging to source information focusing on specialised engineering or advanced manufacturing in isolation. These sub-sectors are typically considered as part of the wider sectors of science and engineering, or, in the case of the National Skills Bulletin, are subsumed under the broad heading of "Industry" along with manufacturing generally, utilities and extraction/mining. The information presented here, therefore, reflects those broader categories.

The National Smart Specialisation Strategy for Innovation 2022-2027 notes that the Southern Ireland region holds particular appeal to global high-tech manufacturing firms due to its strategic connectivity to Europe and North America via both water and air routes, a skilled workforce, and the widespread use of the English language. It notes that to sustain competitiveness, however, increased emphasis on research and development (R&D) and innovation is an imperative across all enterprises in the region, ranging from startups to large multinational corporations. There is an opportunity for the Southern region to clearly articulate its R&D and innovation offerings to the manufacturing sector, thereby driving further initiatives in digitalisation and sustainability. While the region employs various advanced manufacturing technologies such as advanced robotics, additive manufacturing and materials (SEAM Technology Gateway in SETU), high-performance computing, data analytics, high precision technologies, and advanced control systems, it showcases particular expertise in competitive sub-

sectors like Sensor Technology and Networks (supported by research at Tyndall National Institute, SFI CONFIRM, TSSG/Walton Institute) and intelligent systems (backed by research at SFI CONFIRM) (Gov of Ireland, 2022c, pp. 129-130).

The report further notes that sustainable manufacturing is a prominent feature of the region and that there is substantial potential for further advancements in energy and waste-efficient production methods, along with the development of sites prioritising low-energy operations (Gov of Ireland, 2022c, pp. 129-130).

The Government's White Paper on Enterprise 2022-2030 found that the digitalisation of manufacturing and technology adoption is essential for maintaining competitiveness. However, progress in adopting digital technologies across the manufacturing sector varies, reflecting differences in innovation strategy, funding, and workforce development. The report affirms national ambition to position Ireland as a leading hub in advanced manufacturing. This transition will facilitate a move towards carbon neutrality, full digital integration, and sustainability in manufacturing (Gov of Ireland, 2022d, p. 45).

A significant challenge identified by both national reports and regional and sector representatives interviewed relates to the successful recruitment and retention of students to engineering programmes (with drop-out rates on engineering programmes being as high as 70%)[11] and of the resulting deficit of graduates across all engineering fields (IGBC, 2023, pp. 11-12).

---

[11] This has been variously attributed to a disconnect between second and third level, maths and engineering (IGBC, 2030, p. 12) and unduly low points required for entry to engineering programmes, which do not adequately reflect the academic challenge presented by such programmes (interviewees for this research).
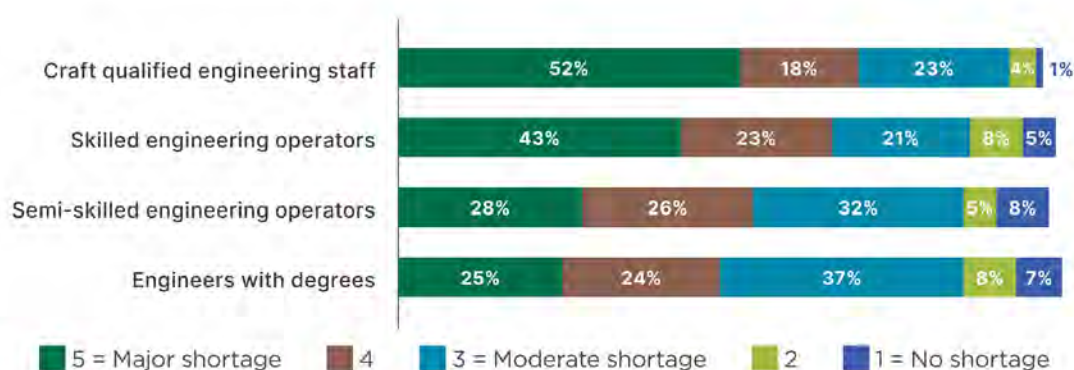
Figure 18: Engineering shortages by skill type in the South East. Reproduced with Permission from South East Regional Skills Forum & the Department of Further and Higher Education, Research, Innovation and Science, 2024, p. 23

Employment in the Sector

In Q4 2022, the industrial sector employed 323,000 individuals, constituting almost 13% of total national employment and an increase of 14% on Q4 2017. In terms of industrial employment breakdown by sub-sector, manufacturing accounted for 88% of industrial employment, employing 283,100 persons, while utilities and extraction/mining constituted 10% (31,800 persons) and 2% (8,100 persons), respectively. Low-technology manufacturing employed nearly half of the total manufacturing workers, at 48% or 137,000 persons. High-technology manufacturing employed approximately one-third, with 30% or 86,200 persons, while medium-low and medium-high technology employment comprised 14% and 7%, respectively. Among the 86,200 individuals employed in high-technology manufacturing in the fourth quarter of 2022, nearly 72% were engaged in pharmaceuticals (SOLAS, 2023, p. 33).

SOLAS reported strong employment growth for science and engineering occupations over the previous five-year period, "with above average growth across all occupations excluding technicians" (2023, p. 4). SOLAS predicts that the focus on sustainability and the green agenda will ensure that skills in this sector remain in demand across a wide range of other economic sectors, for example, education, health and ICT (ibid.).

A national increase in science and engineering occupations in 2020 has been attributed to growth in advanced manufacturing, particularly within the pharmaceutical sector (SOLAS, 2021, p. 9). The EGFSN's Skills for Zero Carbon report notes that the primary sources of new labour supply for engineering roles are tertiary education graduates and immigration. Projections indicate that approximately 9,500 additional engineers across various fields will be required to meet demand and replace those exiting the sector by the end of the decade. This translates to an average annual need of slightly under 1,000 engineers (2021, p. 98).

However, BUSI 2030 notes a forecasted shortfall of approximately 30%-40% for electrical, structural, civil and energy engineers and quantity surveyors (IGBC, 2023, p. 12).

As noted at the outset of this sector snapshot, the sectors and sub-sectors examined in this report do not align directly with those on which data is collected by the CSO. This means that extracting data on changes in employment over time in these precise areas is difficult. Nonetheless, the data in Figure 19 below gives a general indication of changes in employment in the manufacturing sector in the South East and in the country as a whole between census 2011 and census 2022. The CSO census data indicates a national growth in employment of 32% and a growth of 37% in the South East.

Employment in Manufacturing (C) in Ireland and SE, 2011 & 2022 - CSO Census Data
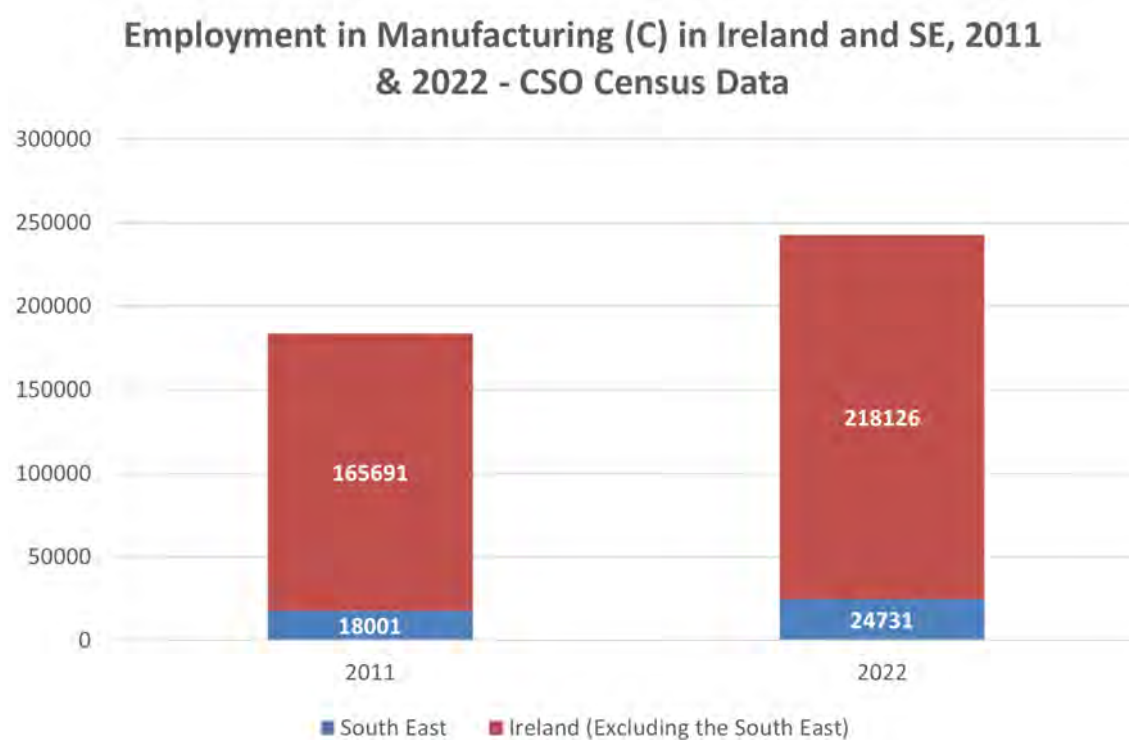
Figure 19: **Employment in manufacturing in Ireland and the South East in 2011 and 2022. CSO census data**

Future Skills Needs

The largest shortages identified in this sector were for craft-qualified engineering personnel. Degree qualified engineers were also identified to be needed but are less scarce (Gilsenan, 2023). The skills most in demand are primarily associated with traditional manufacturing roles (e.g. mechanical engineers, welders, electrical engineers, metal fabricators). However, more specialised roles are also identified, including CNC operators, automation engineers and controls software specialists (Gilsenan, 2023; DFHERIS, 2024).
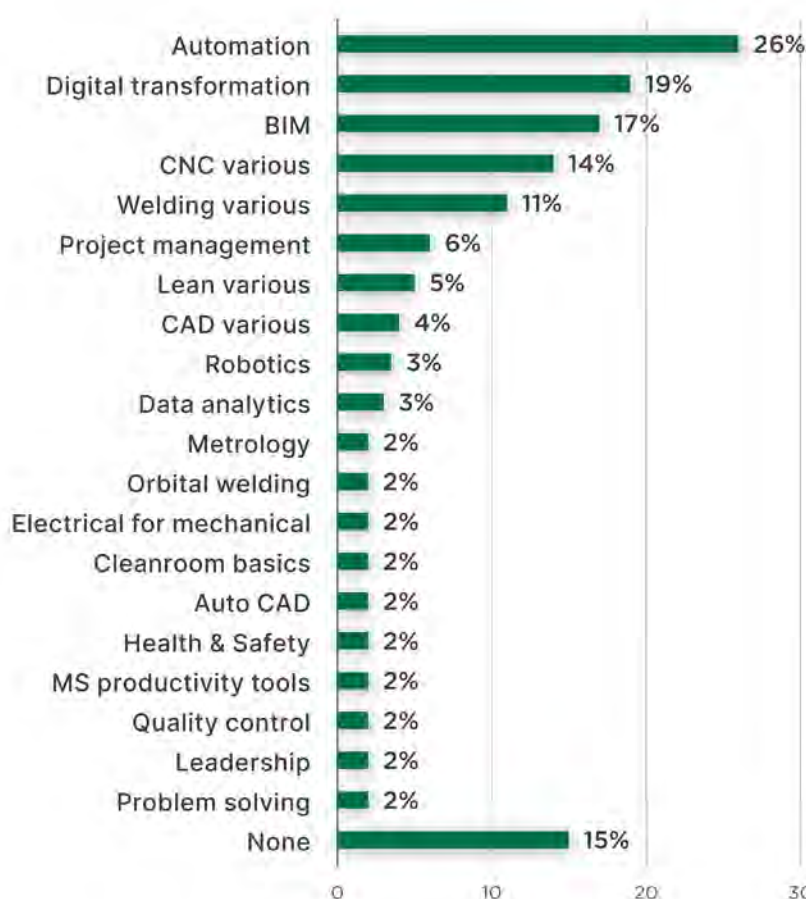
Figure 20: Upskilling Needs Identified in the South East. Reproduced with Permission from South East Regional Skills Forum & the Department of Further and Higher Education, Research, Innovation and Science, 2024, p. 15)

Current skills needs are identified in relation to automation, digital skills including data analytics, quality processes / process improvement and robotics. Looking to the future, emergent skills needs identified included sustainability skills and capabilities to engage with digital transformation and technology adoption, both of which are identified as an imperative for competitiveness in the sector. Cybersecurity is anticipated to become more important in manufacturing with increased digitalisation (ibid.).

Regional and sector representatives highlighted that multinationals are looking for skills in automation and digitalisation. In contrast, while indigenous SMEs are trying to embrace these areas, current needs are more traditional. Interviewees also indicated that given the significant change the sector is facing, there is a strong need for management development and management skills.

Summary of Skills Needs for Specialised Engineering & Advanced Manufacturing[12]

Specialist Industry Skills
- Design and development skills;
- Logistical and Distribution skills;
- Good Manufacturing Practice;
- LEAN & Six Sigma;
- Project Management;
- Introductory Automation;
- Digitalisation & digital transformation;
- Data Analytics for process improvement;
- Environmental Health & Safety;
- Supervisory Management & Management Development;
- Quality Control;
- CAD and Auto CAD;
- Clean room basics;
- MS productivity tools.

High demand roles
- Process, Automation and Manufacturing Engineers;
- Mechanical and Electrical Engineers;
- Engineering Project Managers;
- Electronic hardware designers;
- Craft Qualified Electricians, Mechanical Automation and Maintenance Fitters, Welders and Metal Fabricators;
- Computer Numerical Control and Skilled Machine Operatives;
- Global procurement managers.

Transversal/Soft Skills
- Customer service/support skills;
- Leadership;
- Problem solving.

Internationalisation
- Global and international management skills;
- International sales skills;
- International marketing skills;
- Foreign languages and cultural awareness;
- Customs clearance.

---

[12] Sources: EGFSN (2018) Addressing the Skills Needs Arising from the Potential Trade Implications. South East Regional Skills Forum (2023b) Summary of Demand from Industry for Skills / Training – February 2023. Gilsenan, J. (2023) SE Engineering Skills Survey - Draft Report. PP Presentation. Unpublished. Government of Ireland (2022) White Paper on Enterprise 2022-2030. South East Regional Skills Forum & Department of Further and Higher Education, Research, Innovation and Science (2024) Evaluation of the Engineering Skills and Training Needs of Manufacturing and Construction Sectors in the South East. Interviews with sector and industry representatives.

4.4   SKILLS SNAPSHOT: BLUE & GREEN ECONOMY

Including renewable energy, the circular economy, ports, fisheries and the wider blue economy potential

Overview of the Sector

Renewable energy, sustainability and green skills are emerging as an important theme for Ireland overall with various climate change initiatives taking priority over the coming decade (for example, the Climate Action Plan 2023 and Skills for Zero Carbon). Focus areas include sustainable mobility, new farming practices, building retrofits (Climate Action Plan 2023), as well as domestic retrofit (EGFSN, 2021); renewable energy (Climate Action Plan 2023, Skills for Zero Carbon); built environment energy efficiency and sustainable transport; electric vehicles (EGFSN, 2021). The Climate Action Plan 2023 notes that:

> *Our bioeconomy is a powerful enabling tool which can address the key challenges that the climate transition poses while providing sustainable sources of proteins, bioactivities, energy, biobased fertiliser, locally sourced feed for our animals, nature-based building materials, and many other innovative sustainable products; while ensuring both the continued success of our agri-food and forestry sector and contributing to our emissions targets and the development of a circular economy (2022b, p. 125).*

The Government's Rural Development Policy 2021-2025 views the emerging Green Economy, encompassing sectors such as retrofitting, renewable energy, the Circular Economy, clean transportation, and sustainable agriculture, among others, as offering lucrative employment opportunities and as a significant driver of job growth in the coming decades. Specifically, the advancement of Ireland's wind energy, geothermal resources, forestry, water and waste management, and carbon sequestration sectors are positioned as holding significant potential for creating sustainable employment, particularly in rural areas (2021b, p. 74). Research from the Economic and Social Research Institute (ESRI) reveals that smaller Irish enterprises exhibit lower levels of preparedness for the climate transition, with 83% of micro firms lacking a climate plan (Gov of Ireland, 2022d, p. 25).

Fishing holds longstanding economic and social significance in Ireland. Ireland has an extensive coastline of 7,500 kilometres supporting the prosperity of local fishing industries. Ireland's objectives for sustainable fisheries align with the EU's Common Fisheries Policy (CFP), which establishes the framework for the ongoing conservation and sustainability of fish stocks. The Programme for Government outlines an ambitious agenda aimed at fostering a sustainable seafood industry, including implementing technical measures to enhance sustainability and address the issue of marine waste (Gov of Ireland, 2021b, p. 83). The European Maritime and Fisheries Fund Operational Programme for Ireland allocated €12 million in funding to seven Fisheries Local Area Groups (FLAGs) between 2017 and 2021. This

funding aimed to promote the socio-economic growth and diversification of coastal communities and offshore islands that have historically relied on fishing. The FLAG initiative will continue to support investments by small seafood enterprises, initiatives in marine tourism and leisure, and broader projects within the marine sector (ibid. p. 91).

Particular emphasis has been placed on the development of offshore renewable energy, and wind energy specifically, in the South East. The Government has committed to offshore wind energy playing a crucial role in fulfilling both national objectives and European targets (Gov of Ireland, 2022b, p. 243). Ireland has set an ambitious target to achieve 5 Giga Watts (GW) of grid-connected offshore wind energy, along with an additional 2 GW from non-grid solutions, by 2030. This objective forms part of the Government's larger aim to derive 80% of Ireland's electricity from renewable sources by the same year. Additionally, there is a long-term goal to install 37 GW of offshore wind capacity by 2050. The Irish offshore wind industry reached a significant milestone with the issuance of the first Maritime Area Consents under the new Maritime Area Planning Act in late 2022. Ireland's potential in this area presents an attractive opportunity in terms of GVA and full-time equivalent jobs for the Irish economy.

Critical factors to achieving Ireland's offshore wind energy ambitions include a high functioning supply chain with both local and international reach and strategies to develop the industry to exploit potential export opportunities. In that regard, Ireland lacks a pre-existing supply chain such as the oil and gas industry in the UK, making it essential to educate and support the Irish supply chain to effectively leverage the economic opportunities presented by offshore wind deployment in Ireland

(GreenTech Skillnet & BVG Associates, 2024, p. 8). The South East of Ireland has also been identified as having the best solar resource in Ireland, with average horizontal irradiation levels of over 1000 kWh/m2 (Gov of Ireland, 2022c, p. 132).

Recent reports have focused on the potential of the Irish maritime area for wind and green energy exploitation (for example, Green Tech Skillnet & BVG Associates, 2024). The Department for Housing, Local Government, and Heritage is responsible for overseeing marine spatial planning in the Irish maritime area, encompassing Ireland's exclusive economic zone (EEZ). The EEZ features varied water depths suitable for both fixed and floating offshore wind projects. Offshore wind developments in this maritime area will be located within designated zones identified by the Department of Environment, Climate and Communications (DECC). Stakeholders involved in the designation of maritime area plans (DMAPs) to pinpoint areas appropriate for offshore wind projects will include the Department of Housing, Local Government, and Heritage, the Department of Environment, Climate and Communications, and the Maritime Area Regulatory Authority (MARA) (Green Tech Skillnet & BVG Associates, 2024, p. 12).

There are a number of projects currently approved or in development since mid-2023, many in the South East. These are listed in Figure 21.

Project Name	Capacity (GW)	Currebt Status	Fixed or Floating	Developer(s)	Estimated (COD)
Arklow Bank - phase 1	0.025	Fully commissioned	Fixed	GE Energy	2004
Arklow Bank - phase 2	0.80	Concept/early development	Fixed	SSE Renewables	2028
Codling Wind Park*	1.3	Concept/early development	Fixed	Fred Olsen Renewables, EDF	2028
Dublin Array*	0.82	Concept/early development	Fixed	RWE	2028
North Irish Sea Array (NISA)*	0.5	Concept/early development	Fixed	Statkraft	2028
Oriel Wind Farm	0.38	Concept/early development	Fixed	ESB, Parkwind	2028
Sceirde Rocks*	0.45	Concept/early development	Fixed	Corio	2030

* Projects successful in ORESS 1 auction, announced in June 2023.

Figure 21: **Offshore wind projects in Ireland awarded a MAC since mid-2023. Reproduced with Permission from Green Tech Skillnet & BVG Associates, 2024, p. 15)**

Employment in the Sector

In 2022, the Expert Group on Future Skills Needs (EGFSN) modelled labour market demand from various elements of the green economy to 2030: see figures 23 and 24 below.

The report outlines the skills and numbers in those roles needed to achieve Government objectives. A significant increase is forecasted in employment within the renewable energy and residential retrofit sectors by the end of the decade, with numbers expected to increase from around 3,000 to 9,000 in wind and solar sectors, and from slightly under 4,000 to 17,400 in building retrofit. Moreover, there will be a need to transition the existing Internal Combustion Engine (ICE) vehicle mechanic workforce to work on electric vehicles (EVs) (EGFSN, 2022, p. 8).

The Irish marine sector employs around 15,373 individuals and comprises 1,993 registered fishing vessels, 296 aquaculture sites spread nationally, and a network of 101 seafood processors, collectively contributing to a reported GDP of 1.3 billion (SETU, 2024, p.3). In 2018, Ireland's "ocean economy" generated a turnover of
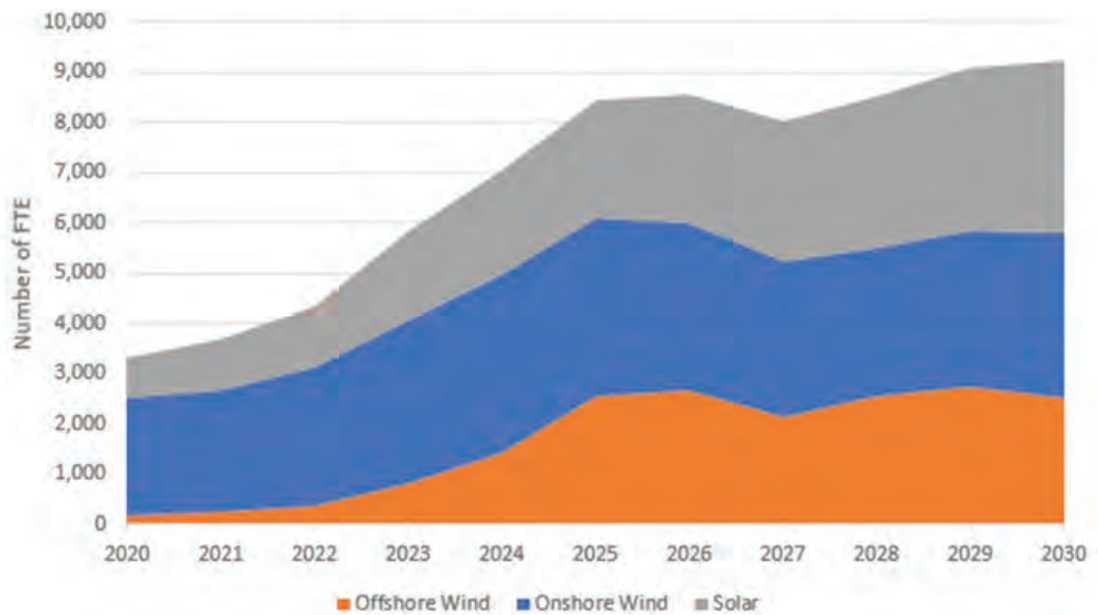
Figure 22: Modelled labour demand from offshore wind, onshore wind and grid-scale solar energy, 2021-2030. Reproduced with Permission from EGFSN, 2022a, p. 7
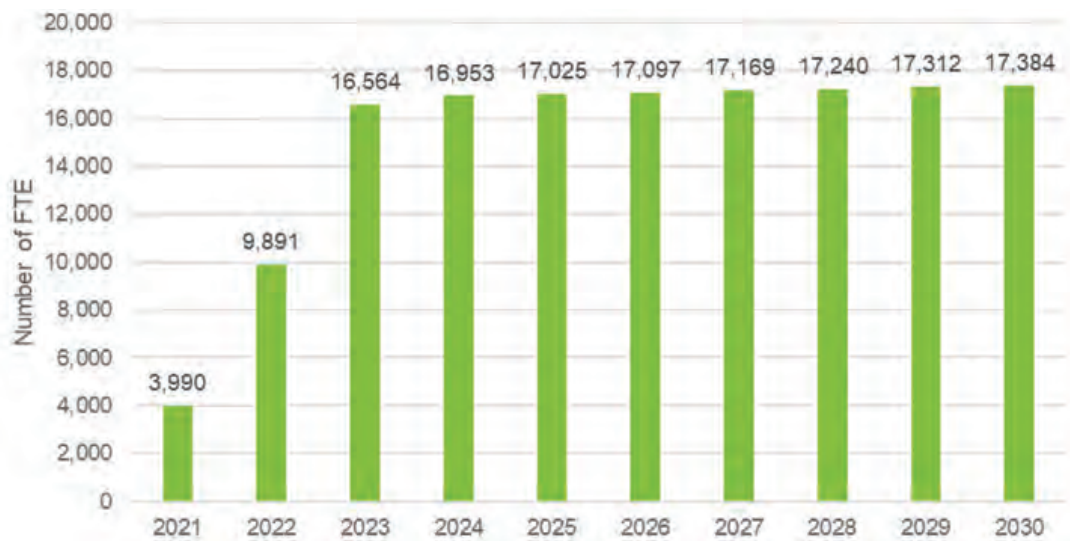
Figure 23: Modelled FTE labour demand for domestic retrofit, heat pumps and solar PV, 2021-2030. Reproduced with Permission from EGFSN, 2022a, p. 8

€6.2 billion and supported employment for 34,132 individuals. The sector's total GVA amounted to €4.19 billion, constituting 2% of GDP (Gov of Ireland, 2021b, p. 83).

Although direct experience in offshore wind in Ireland is limited, there is relevant capability in most segments of the supply chain. The *Building our Potential - Ireland's Offshore Wind Skills and Talent Needs* report predicts significant opportunities in project development, project management, tower manufacture, onshore infrastructure, and in the operations and maintenance phase. The report anticipates that a significant number of additional jobs are likely to emerge in all phases of the development of Ireland's offshore wind energy capacity, particularly in tower and substructure foundation manufacture, as this is where Ireland has the greatest potential to increase its local content (GreenTech Skillnet & BVG Associates, 2024, p. 4). In the development and project management phase, the report notes that parallel capabilities to those needed exist in Ireland's onshore wind and engineering industries. A transfer of these skills to offshore wind will help successfully leverage the existing skills base (ibid. p. 28).

Cumulative projected full time equivalent jobs in Ireland to 2040, split by lifecycle phase.
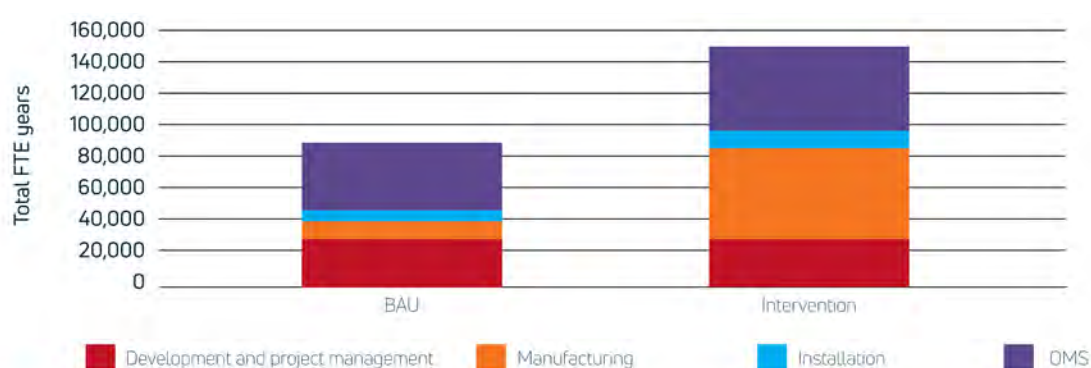
Cumulative number of FTEs						
Scenario	Year	Development and project management	Manufacturing	Installation	OMS	Total
BAU	2030	11,000	4,800	1,400	2,300	19,500
	2040	25,900	11,000	6,900	42,500	86,300
Intervention	2030	12,000	12,000	3,700	2,700	30,400
	2040	28,000	56,700	12,200	49,800	146,700

Cumulative projected full time equivalent jobs in Ireland, split by year and lifecycle phase.

Figure 24: Breakdown of projected job demand in two scenarios (Business as Usual and Intervention) for each lifecycle phase for 2030 and 2040. Reproduced with Permission from Green Tech Skillnet & BVG Associates, 2024, p. 5)

All reports note the deficits in domestic skills needed to reduce reliance on inward migration to meet critical skills needs. A prominent means of addressing the projected skills shortages for the development and project management phase is the adaptability of existing skills for offshore applications. Despite Ireland's robust onshore wind sector and ample pool of engineering and management expertise, there is a pressing need to expedite and efficiently manage the upskilling process for offshore endeavours (GreenTech Skillnet & BVG Associates, 2024, p. 35).

In terms of training needs, the Expert Group on Future Skills Need's 2021 report, *Skills for Zero Carbon, The Demand for Renewable Energy, Residential Retrofit and Electric Vehicle Deployment Skills to 2030*, indicated that a deficiency in local training for grid-scale solar technicians is unlikely to severely impede the establishment of solar farms in the near future. Nonetheless, the provision of additional training to existing electrical workers and electricians may be beneficial in this area (p. 102). The Southern Regional Assembly in its report, Towards a Learning Region, notes a lack of uptake by learners for strategically important courses, particularly renewable energy, stating:

> There is a difficulty in selling renewable energy courses as it is associated with construction in which there is currently a skills shortage. People working in construction, often do not want to return to education. They may not have engaged in education previously and may feel apprehensive about doing so now, they may be too busy in their current job or firms did not want to give up staff time (p. 48).

This gap between availability of appropriate educational offerings and uptake by learners for same was also noted by a number of regional and sectoral representatives interviewed for this report. Reasons provided for this gap ranged from a lack of knowledge by school leavers, their parents and career guidance teachers of the career opportunities to which such courses may lead; high drop-out rates resulting from a mismatch between the points required for entry to programmes and the knowledge and skills needed to successfully engage with the subject material and the challenges faced by both employers and staff in facilitating or engaging in upskilling. Challenges identified centered on lack of time or inability to release key staff in technical roles; a lack of truly flexible programme offerings (with flexibility being narrowly interpreted in terms of class scheduling only, rather than in terms of course design and assessment methodology) and a fear of the risks associated with investing in staff upskilling only to lose those staff to new employers on the basis of their enhanced skillsets.

Future Skills Needs

Skills shortages are identified for engineering, environment, planning, legal & professional, construction, emerging/ niche renewable energy occupations and particularly craft and retrofit. SETU has been identified as a strategically significant partner in the South East for the realisation of the region's objectives in this space (Waterford City and County Council, 2022a, p. 18). There is a predicted increased demand for jobs in higher-skilled roles in this sector. In particular, training needs have been identified that will increase the availability and capacity of built environment professionals with sustainability skills.

There is a deficit of published information pertaining to skills needs and labour market gaps available for the wider marine sector. The National Skills Strategy, 2025 (2016) states that the marine and maritime sector is under-utilised and has unrealised potential (p. 14). The dearth of available information indicates that focused research on potential development and associated skills needs may be warranted in this sector. The European Commission reported that sectors such as renewable offshore energy production, blue eco-tourism, clean maritime transport, blue biotechnology, and sustainable aquaculture increasingly demand expertise in science, technology, engineering, and mathematics, as well as proficiency in digital, green, and blue skills (2020, p. 20). The Commission notes that:

> *We also need to prepare the blue economy workforce to face a challenging economic transformation. New emerging sectors will create new types of jobs and will require new qualifications. Tomorrow's blue economy will have to attract talented individuals with cutting-edge professional skills who will increasingly need to understand, interact and create at a cross-disciplinary and cross-sectoral level. Therefore, we need to intensify mobility between academia, authorities and industry and to harmonise education programmes, adapted to emerging competence needs (2020, p. 27).*

Recommendations emerging from reports in this sector suggest that some needs can be addressed through upskilling existing engineering, environmental and legal professionals, electrical workers and electricians in zero carbon skills, including through micro credentials and other CPD opportunities. The potential for pathways to be opened to emerging and niche occupations may result in specialisation of existing professionals (e.g. engineering, legal, financial) in addition to new roles that may emerge. One example of this is Health and Safety skills, especially for people with technical skills but working in new environments (e.g. offshore wind). The safety risks for working with electric vehicles were also identified, as there are additional hazards that people working in motor vehicle repair are exposed to due to the high voltage components and cables capable of delivering a fatal electric shock. Another is digital skills for mechanics undertaking diagnostics on EV vehicles.

A number of emerging and niche skills and occupations within or adjacent to this sector are identified in relation to offshore wind energy. However, it may be too early in the development of the wind energy sector to usefully distinguish between emerging and current needs. To that end, reports indicate that while there is a need to upskill existing maritime workers, no specific offshore wind-related skills are required for vessel crews other than experience of the industry in general. The European Commission has highlighted the necessity of upskilling and reskilling maritime workers, specifically "utilising the current ecological imperatives for the upgrading of blue skills… science, technology, engineering and mathematics, digital, green and blue skills" (European Commission, 2020, p. 20).

Notably, although potential skills shortages have been identified for this sector (and are summarised in the graphic below), it

is considered that employer actions could help mitigate these, e.g., through provision of higher wages or internal training.

Additionally, it is broadly identified that an increased availability of electrical engineering programmes to meet demand from zero carbon activities and increased exposure to the renewable energy

sector within third level undergraduate engineering programmes is needed, alongside the need to build sustainability into curricula across all disciplines.

Important transversal skills are identified, which are not specific to the renewable energy sector, but which are considered critical to its success.

Summary of Skills Needs for Blue and Green Economy [13]

Specialist Industry Skills
- Offshore wind vessel experience (for crews);
- Renewable offshore energy production (design, construction, maintenance);
- Blue eco-tourism;
- Clean maritime transport;
- Blue biotechnology;
- Sustainable aquaculture and specialist ecology expertise;
- Environmental Impact Assessment (EIA) and environmental management;
- High Voltage Direct Current (HVDC) knowledge for onshore and offshore substation maintenance, cables and turbine maintenance;
- Offshore consenting expertise, especially knowledge of the Irish consenting process;
- Legal, financial and procurement expertise for engineer, procure, construct and install (EPCI) and multi-supplier contracts, including for offshore major infrastructure;
- Project and construction management skills for large scale offshore projects;
- Surveying and subsequent analysis.

Transversal/Soft Skills
- Problem solving, adaptability, capability to work in multi-disciplinary teams;
- Effective communication, customer care, psychology and collaboration;
- Digital and technology skills;
- Leadership, strategic planning and innovation;
- Project management and planning.

[13] Sources: Green Tech Skillnet & BVG Associates (2024) Building our Potential - Ireland's Offshore Wind Skills and Talent Needs. European Commission (2020) Proposed Mission: Mission Starfish 2030: Restore our Ocean and Waters. SETU (2024) Knowledge & Skills Needs in the South East. A Focus on the Agriculture, Food, Forestry, Horticulture and Marine Sectors. Gov of Ireland (2022b) Climate Action Plan 2023. Irish Green Building Council (2023) BUSI2030. SOLAS (2021) National Skills Bulletin 2021. Green Tech Skillnet & BVG Associates (2024) Building our Potential - Ireland's Offshore Wind Skills and Talent Needs. EGFSN (2021) Skills for Zero Carbon The Demand for Renewable Energy, Residential Retrofit and Electric Vehicle Deployment Skills to 2030.South East Regional Skills Forum (2023) Summary of Demand from Industry for Skills / Training – February 2023. Interviews with sectoral and industry stakeholders.

Summary of Skills Needs for Blue and Green Economy

(continued)

Emerging High demand roles

- Offshore wind energy and installation engineers;
- Civil, electrical, grid, geotechnical, structural and mechanical engineers;
- Supervisory Control and Data Acquisition (SCADA) engineers;
- Mechanical, electrical and wind turbine technicians and cable jointers;
- Geographic Information Systems (GIS) technicians;
- Marine equipment and Remotely Operated Vehicle (ROV) operatives;
- Marine/naval engineer; naval architect;
- Master mariners, harbour pilots, able seafarers, naval officers and other vessel crew;
- Boat maintenance technicians;
- Marine ecologists and ornithologists;
- Grid commercial leads and package managers;
- Health and safety coordinators;
- Offshore Environmental Impact Assessment (EIA), consents and quality managers;

- Resource analysts, commercial analysts and bid managers;
- Supply chain and offshore logistics managers;
- Construction management skills;
- Quality control;
- Retrofit design and specialised engineering for sustainable renovation;
- Specialised ecology and environmental expertise;
- Energy engineering and solar technicians;
- Marine, civil, structural, geotechnical and mechanical engineering;
- Green construction and building services;
- Life cycle environmental assessment;
- CSRD legal reporting and carbon accounting; for Scope 1, 2 and 3;
- Electricity trading;
- Coupled analysis and designing offshore components suitable for serial production;
- Health and safety.

4.5   SKILLS SNAPSHOT: ICT, DIGITAL TECHNOLOGY & FINANCIAL TECHNOLOGY

Overview of the Sector

ICT continues to be an important sector nationally. Artificial intelligence (AI), Big Data and Analytics, Blockchain, Cloud Computing, Cybersecurity, the Internet of Things, Micro- and Nano-electronics and 3D Printing are identified as important within the Irish economy (EGFSN, 2019). Strong growth in the sector was identified between 2017-2022. The Technology Skills 2022 report notes that the sector is experiencing growth which is driving increased demand for high-level ICT skills (Dept. of Education & Skills, 2019).

The publication of the Digital Ireland Framework in February 2022 marked a significant milestone in Ireland's endeavour to become a frontrunner in the digital space, positioning itself at the forefront of European and global digital advancements. This framework sets out objectives and action plans aimed at advancing digital transformation across various sectors of the economy and society. Progress in implementing this strategy is underway with annual progress updates. Notable initiatives include the introduction of a National Artificial Intelligence Strategy for Ireland in 2021, a Digital and ICT Strategy for the Public Service in March 2022, launch of a Digital Connectivity Strategy in December 2022, the launch of a new Digital Strategy for Schools in April 2022, and the establishment of an Enterprise Digital Advisory Forum (Gov of Ireland, 2021c, p.7).

Government (and sector and regional representatives interviewed for this research) has stated that it is crucial for companies to be prepared for a shift to greater use of digital technologies to increase and enhance productivity (Gov of Ireland, 2021b, p. 34). Research conducted by the European Investment Bank indicates that Irish companies lag behind the EU average in terms of both the utilisation of advanced digital technologies and strategic business monitoring. Moreover, this research highlights that firms that embraced digital technologies were more adept at navigating the disruptions caused by the Covid-19 pandemic. Research from the Economic and Social Research Institute (ESRI), cited in the Government's White Paper on Enterprise, reveals that smaller Irish enterprises exhibit lower levels of preparedness for the climate transition, with 83% of micro firms lacking a climate plan. Smaller enterprises tend to also be less prepared for the digital transition (Gov of Ireland, 2022d, p. 25). Government aims to ensure that at least 90% of small and medium-sized enterprises (SMEs) achieve a basic level of digital proficiency by 2030. Digital technologies also offer unprecedented opportunities for small businesses to overcome barriers related to size, enabling them to innovate, expand globally, and grow. However, many SMEs lack the resources to undergo digital transformation independently, with one-third of them lacking any digital plans (ibid., p. 44).

Ireland has emerged as a key location for the strategic operations of major technology firms, with technology now constituting approximately 60% of our exports and contributing to 6% of total employment (Gov of Ireland, 2022d, p. 44). Data from the Annual Employment Survey indicates that the total full-time employment within foreign-owned companies reached a record high of 265,000 in 2021. Whilst the majority of that employment is in the services sector (56.3% of total full-time employment), sectors such as ICT, Modern Manufacturing (including pharmaceuticals), and Business, Financial & Other Services have witnessed notable growth over the past decade (ibid. p. 19).
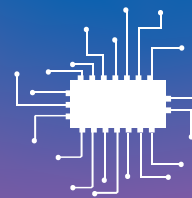
Ireland is the world's second-largest exporter of computer and IT services, generating €50 billion in exports annually. The broader Southern Region (SR) excels in semiconductor production, having secured 29 patents in this field between 2015 and 2019, positioning it as one of Europe's premier manufacturing regions in this sector. With the highest ICT research capacity in Ireland, the SR possesses infrastructure conducive to facilitating digital transformation across various industries, including manufacturing, energy, transportation, agriculture, and healthcare. The ICT ecosystem in the SR is well-developed, featuring a comprehensive support network comprising R&D centres, industry-led cluster groups, venture capital firms, technology incubators and accelerators, business innovation centres, and numerous entrepreneurial and coworking spaces (Gov of Ireland, 2022c, p. 135). Applied Internet of Things (IoT), Cybersecurity, SportTech, Photonics and Quantum Computing have been identified as particularly important to the region (ibid.).

Ireland has experienced significant expansion in the financial technology (FinTech) sector in recent years, positioning itself as a global center for technology and financial services. Ireland has an established financial and technological hub, servicing over 40% of global hedge fund assets. The payments sector currently dominates the Irish FinTech landscape. Despite economic uncertainties, global investors remain highly interested in this sector. While neobanks[14] have surged in the mobile banking industry, traditional banks are increasingly prioritising customer experience, embedding customer value and ESG principles into their core objectives. Those capable of harnessing organisational agility, customer-centric strategies, and technology partnerships stand to maintain the trust of their customers. The emergence of neobank partnerships with traditional banks and major tech companies offering comprehensive banking services is expected to reshape the industry in the future (KPMG, 2023).

In addition to payments, another burgeoning area within FinTech is RegTech. Despite the global tech slowdown, RegTech is poised for continued growth as financial services entities seek solutions to navigate data-driven regulatory oversight. To sustain its ongoing success, Ireland must continue to facilitate the integration of RegTech technologies with regulatory systems and databases, reducing reliance on manual processes. Other issues to be addressed within the regulatory landscape, include anti-money laundering and crypto/digital assets (ibid.).

---

[14] Forbes defines neobanks as "FinTech firms that offer apps, software and other technologies to streamline mobile and online banking. These FinTechs generally specialise in particular financial products, like checking and savings accounts. They also tend to be more nimble and transparent than their megabank counterparts, even though many of them partner with such institutions to insure their financial products." Available at: What Is A Neobank? – Forbes Advisor

Employment in the Sector

The ICT sector had strong recoveries post Covid-19, with higher employment levels in Q2 2022 compared to pre-pandemic levels in Q2 2019. These sectors are experiencing tighter labour market conditions, as evidenced by the significant number of unfilled job vacancies (Gov of Ireland, 2022d, p. 27; SOLAS, 2023). It was reported in 2018 that employment in the ICT sector had increased by over 35% in the previous decade (IGEES, 2018, p. 1).

According to the South East Regional Skills Forum, there had been an average of 9,270 employed in the ICT sector in the region in the year to Q3 2022 (South East Regional Skills Forum, 2023, p. 1). The sector encompasses various specialised ICT firms. Additionally, most medium to large companies (with over 50 employees) have dedicated ICT personnel internally. The demand for ICT skills remained robust throughout 2022, with significant competition from major employers based in Dublin facilitated by remote and flexible work arrangements. Ireland's continued economic growth and diversified industrial base are likely to sustain ongoing demand for ICT skills. The array of ICT roles advertised generally fall into the following categories:

- Software Development & Analysis
- Computer Usage
- Database and Network Design and Administration.

The National Skills Bulletin, 2023 reported that growth in employment in ICT increased by 29% over the previous three-year period. Although the sector demonstrated greater resilience during the pandemic, it experienced a slight decline in growth of 1% in the previous year (SOLAS, 2023, p. 8).

A number of reports and surveys note that ICT roles are particularly hard to fill (e.g., SETU, 2023b).

Future Skills Needs

The workforce is seeing an increased demand for individuals who have technical skills alongside more general business and language capabilities and transversal skills. As a result, skills gaps often pertain to the workforce as a whole rather than the ICT sector exclusively. For example, digital proficiencies and data analysis capabilities were identified as a skills gap for employees across sectors. Similarly, automation, robotics and agile skills were identified as gaps in the non-IT workforce (IDA Ireland and Skillnet Ireland, 2024).

There is a growth in demand for individuals who are able to manage complex global supply chains. Also important is Big Data to identify the potential for efficiencies which has led to an increase in the demand for data analysts while the increasing technological requirements of moving goods has led to increased requirement for IT specialists in the field (EGFSN, 2018). The intersection of ICT with other sectors has implications for transdisciplinary skills programmes. A recent study, *A Research Cluster's Vision for a Pilot Factory in the South East Technological University of Ireland*, highlights an overlap between engineering/manufacturing and ICT noting that traditional manufacturing is moving towards intelligent manufacturing, which ultimately will require development of new skills i.e., engineers will need to have IT skills as well as ability to analyse data and understand data storage and protection (Doyle-Kent, et. al., 2022). This perspective was echoed in interviews with regional and sector representatives.
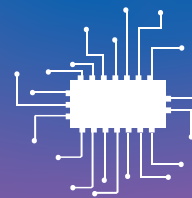
There are major skills shortages in cybersecurity, and a lack of expertise or technical skills to understand cybersecurity across industry. Unsurprisingly, AI is an area in which additional upskilling and expertise will be needed. Interviewees anticipate, for example, that all technology companies will want to have AI built into their products. Moreover, across industry more generally companies will seek to identify ways in which AI can be used to enhance their business, automating processes and delivering efficiencies in meeting business requirements.

The OECD's assessment of Ireland's National Skills Strategy, released in May 2023, highlighted a lack of digital literacy in Ireland and identified digital transformation as pivotal. This skills deficit was noted in a recent survey of companies across multiple sectors in the South East conducted by SETU and the South East Regional Skills Forum (South East Regional Skills Forum & SETU, 2023). Fifty-five percent of respondents in the survey indicated that their proficiency in AI is lacking or very low. Similarly, almost half of the respondents rated their expertise in human computer interaction (HCI) as either lacking or very low, which is concerning given the crucial role of user experience / user interaction (UX/UI) in software development. Mobile application development also appears to suffer from a shortage of skills and expertise, as nearly half of the respondents (45%) rated their proficiency as lacking or very low (South East Regional Skills Forum & SETU, 2023, p. 7).

Summary of Skills Needs for ICT, Digital Technology & Financial Technology [15]

Specialist Industry Skills

- Software development technologies (Tech Stack incl Python, .NET, SQL, Java and Javascript) for product and service design;
- Cloud computing;
- Cybersecurity and Blockchain;
- Networking and infrastructure;
- Data analytics (Tableau, Power BI);
- User experience and interaction (UX/UI);
- Machine learning & artificial intelligence;
- Mobile technology;
- IT operations & governance.

High demand roles

- IT project managers; systems analysts, support engineers and cybersecurity professionals;
- Software developers, design engineers and testers;
- Mobile web developers;
- Cloud and Data Architects;
- Geographic Information Systems Technicians.

Transversal/Soft Skills

- Leadership and management;
- Business analysis;
- Financial services and distribution;
- Digital sales and marketing;
- Languages.

Internationalisation

- Data literacy and skills (input, analysis, validation, manipulation and visualisation);
- Digital problem solving;
- Document design and presentation;
- Digital communication and collaboration;
- Cybersecurity.

---

[15] Sources: EGFSN (2018) *Addressing the Skills Needs Arising from the Potential Trade Implications*. SOLAS (2023) *National Skills Bulletin*. Department of Education & Skills (2016). *Ireland's National Skill Strategy 2025*. IDA Ireland and Skillnet (2024). *Study of data and digital skills for all non-IT roles across multiple industries*. South East Regional Skills Forum (2023c). *Summary of Demand from Industry for Skills / Training – February 2023*. South East Regional Skills Forum & SETU (2023) *ICT Skills Survey of Companies In the South East*. Government of Ireland (2022d) *White Paper on Enterprise 2022-2030*. Interviews with regional skills experts.

4.6   SKILLS SNAPSHOT: TOURISM, HOSPITALITY & CULTURE

Overview of the Sector

Reports confirm that the South East has significant tourism potential. The sector in the South East has the capacity to employ 20,000 persons directly (South East Regional Skills Forum, 2021, p. 5). In order to help realise that potential, Failte Ireland has formulated an Ancient East Tourism Action Plan for the region. Skills shortages, however, threaten the success of these plans. In 2022, Fáilte Ireland reported that "three in ten businesses in hospitality and tourism believe they face closure if recruitment and retention challenges are not resolved." (Murray, 2022).

The South East region hosts a number of firms across the creative economy, particularly in business-oriented design. Census records indicate that 2,400 individuals in the South East possess qualifications in areas such as audiovisual techniques, media production, design, or craft skills. Additionally, the design sector benefits from the presence of key institutions like the Design and Crafts Council of Ireland and the National Design & Craft Gallery (Gov of Ireland, 2022c, p. 130).

All counties in the South East region have a creative industry presence. While a variety of creative businesses operate across the region, certain industries tend to cluster in specific areas. For instance, Crafts businesses are notably concentrated in Kilkenny, which has hosted the national Design and Crafts Council since the early 1970s, where they make up approximately 20% of the identifiable creative enterprises. In Wexford, the Music, Performing Arts, & Visual Arts sector may partly cluster around the National Opera House, although other factors may also contribute. All identified creative industries in the South East are classified as SMEs, though they may vary widely in terms of turnover and employment (Rikon, 2024, p. 57).

Irish animation production experienced a 27% rise in 2021 following a decade marked by substantial growth. In 2019, the sector quadrupled in size, comprising nearly half of all production activity. Recent data indicates that Irish studios now employ over 2,000 personnel. There are aspirations to further double the sector's value within the next five years and boost industry employment figures by as much as 50% (Animation Ireland, 2022, p. 3). There has also been strong growth in the television and film industry in Ireland, with 2021 being the busiest year on record for the industry (Screen Ireland, 2023).

Employment in the Sector

Employment in the sector declined at the outset of the Covid-19 pandemic in early 2020, but experienced strong growth throughout 2022, marked by an annual increase of nearly 14,000 individuals, effectively restoring employment figures to pre-pandemic levels. More than half of the employment was concentrated in the "other NACE activities" sector, encompassing arts, entertainment, and various other services (SOLAS, 2023, p. 5). Employment in the hospitality sector also improved in 2022, with an increase of 28,000 individuals compared to 2021. However, despite this improvement, employment figures remained slightly lower than 2019 levels (ibid. p. 160).

Despite a below-average growth rate in employment for hospitality managers over the previous five years, there was a significant increase in employment between 2021 and 2022, with an additional 5,700 individuals employed, surpassing 2019 levels. Approximately one-third of those employed in these roles were non-Irish citizens, which is higher than the national average. Employment permits issued were primarily for roles such as restaurant managers, hotel managers, duty managers, and accommodation managers. Vacancies listed on Department of Social Protection's 'Jobs Ireland' vacancy portal were mainly for restaurant managers, but also included positions for catering managers, food and beverage managers, and hotel managers. The future demand for hospitality managers will hinge on the performance of various segments within the hospitality sector, with a greater demand expected for restaurant managers compared to managers in accommodation-related roles. A shortage of chefs was also noted (SOLAS, 2023, p. 160).

Sources indicated that the hospitality and retail sectors have experienced a shortage of experienced supervisors and managers arising from the impact of the pandemic (South East Regional Skills Forum, 2021). This has resulted in many staff being promoted to roles e.g. supervisors / managers with insufficient education & training (ibid). The risks to the sector have been emphasised by industry bodies:

> *"Tourism and hospitality is a labour intensive business, with the quality of personal service a key value. With effective full employment levels, the tourism and hospitality industry is facing an existential challenge, with upward pressure on wages inevitable and the risk of a further deterioration in the already depleted supply of critic skills" (ITIC 2023).*

It was further noted that the hospitality sector is struggling to recruit across all roles. Issues identified include the industry not being viewed as attractive / competitive enough due to low pay, lack of career pathways and unsociable hours, resulting in low take-up of relevant courses and qualified chefs leaving the sector. One interviewee noted that hospitality, retail and wholesale have struggled to recruit candidates. The strategic importance of a vibrant hospitality sector to the SE region was also noted.

Employment in Arts, Sports & Tourism occupations experienced a decline at the start of the Covid-19 outbreak in early 2020. However, employment was effectively restored to pre-pandemic levels in 2022. More than half of the employment was concentrated in areas such as arts, entertainment and various services (SOLAS, 2023, p 162).
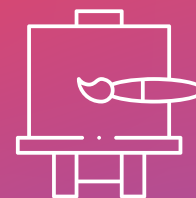
Figure 25: Annual Average Employment (2022) & Annual Average Growth Rates (2017-2022). Reproduced with Permission from SOLAS, 2023, p. 159
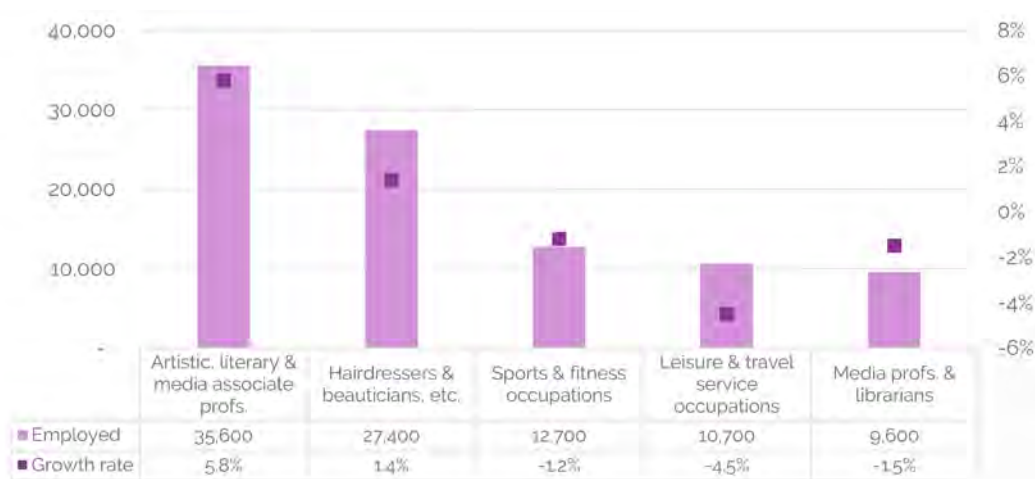

Figure 26: Annual Average Employment (2022) & Annual Average Growth Rates (2017-2022). Reproduced with Permission from SOLAS, 2023, p. 161

Future Skills Needs

Key skills that can be delivered by higher education in the hospitality sector relate primarily to management and leadership. The 2021 South East Hospitality Industry Training & Education Review with

Recommendations outlines how skills needs in the sector can be addressed by both higher and further education institutions e.g., through a combination of stackable micro-credentials which combine theory and practice.

Summary of Skills Needs for Tourism & Heritage
Including arts & culture, design and craft industries [16]

Specialist Industry Skills

Hospitality

- Culinary arts;
- Supervisory skills for sector;
- Accounting & finance for sector.

Creative Industries

- Digital technology;
- Risk and mitigation;
- Artificial intelligence.

High demand roles

- Hospitality and retail staff (general);
- Hospitality and retail supervisors;
- Hospitality and retail managers;
- Chefs.

Transversal/Soft Skills

- Leadership and management;
- ICT and digital skills;
- Time management, meeting deadlines;
- Teamwork, communication, problem-solving and conflict management;
- Social, interpersonal; cultural awareness/intercultural competence;
- Language skills;
- Receiving Feedback – from both peers and supervisors;
- Multitasking and prioritising.

[16] Sources: South East Regional Skills Forum (2021) *South East Hospitality Industry Training & Education Review With Recommendations*. Animation Ireland (2022) *Skills Gaps in The Irish Animation Sector Research Report*. Rikon (2024) *Measuring the South East Creative Economy*. SOLAS (2023) *National Skills Bulletin*, 2023. Interviews with sector and industry representatives. Restaurant & Hospitality Skillnet (2023) The Future of Irish Hospitality - Attracting and Retaining Talent, November 2023. Interviews with regional skills experts.

4.7   SKILLS SNAPSHOT: GLOBAL BUSINESS SERVICES AND FINANCIAL SERVICES

Overview of the Sector

SOLAS reported that employment in the finance sector has shown consistent growth in recent years, with an additional 70,000 individuals employed since 2017. While the financial sector has generally performed well, it encounters significant skills-related challenges due to shifting consumer preferences toward retail banking, digitalisation and the emphasis on sustainable financing. Given the ongoing changes driven by digitalisation, automation, and the growing emphasis on sustainable finance, upskilling and reskilling will be imperative for professionals in both business and financial occupations in the years ahead to effectively navigate these transformations (SOLAS, 2023, p. 4). Critical business skills drawn from Spotlight on Skills highlighted human resource management, leadership, communication, and project management as in demand across various sectors (ibid.).

The importance of ensuring that Ireland's finance sector possesses the necessary expertise to support achievement of Ireland's climate goals has been noted. The International Sustainable Finance Centre of Excellence prioritises research, talent enhancement, and leadership initiatives to aid the transition towards a net-zero economy both domestically and globally. The Sustainable Finance Skillnet has allocated over €1 million toward enhancing skills and creating new training programs for the industry, such as Europe's inaugural accredited course in 'Sustainable Finance for Compliance Professionals' (Gov of Ireland, 2022b).

Employment in the Sector

Employment in business and financial occupations has seen consistent growth, with an increase of 70,000 individuals since 2017. The National Skills Bulletin, 2023, notes that despite the financial sector's overall positive performance, it has notable skills-related challenges due to evolving consumer preferences in retail banking, heightened digitalisation, and the transition toward sustainable financing. Data from Spotlight on Skills highlights human resource management, leadership, communication, and project management as pivotal business skills sought across various sectors. Consequently, upskilling and reskilling efforts will be imperative within business and financial occupations to effectively adapt to changes stemming from digitalisation, automation, and the growing emphasis on sustainable finance (SOLAS, 2023, p. 4).

The financial activities sector constitutes more than a third of employment in the business and finance sector. In 2022, more than 4,300 employment permits were issued for the sector, indicating continued demand. The Department of Finance's Retail Banking Review for 2022 highlighted substantial job losses in retail banking, particularly following the exit of Ulster Bank and KBC from the Irish market, posing retention challenges for remaining banks (National Skills Bulletin, 2023, p. 137). There is strong demand for the following professionals: accountants and tax experts; management consultants, business analysts and project managers; actuaries, economists and statisticians; financial

analysts and insurance underwriters; other business associate professionals (e.g. accounting technicians, estimators, valuers); and financial managers and directors (ibid.).

Employment by Sector (000s), Quarter 4 2022
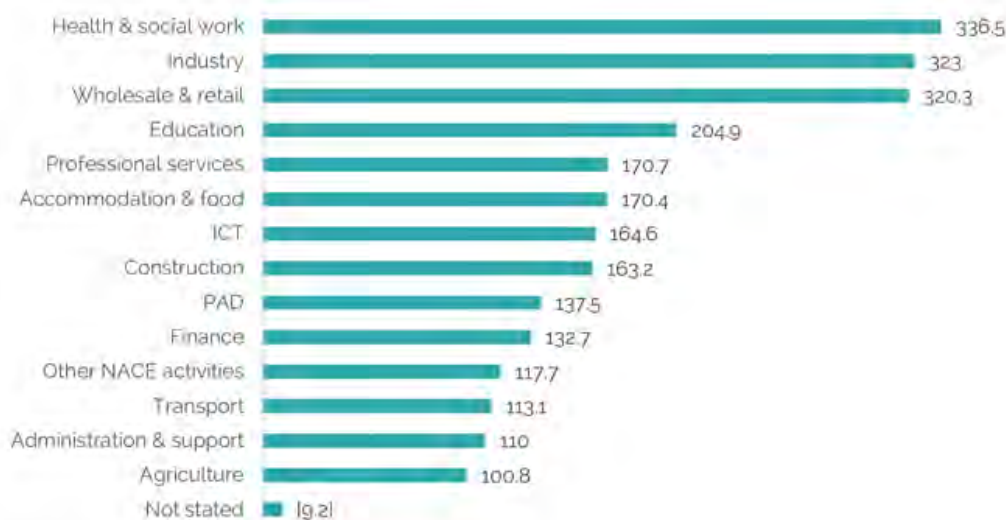
Source: SLMRU (SOLAS) analysis of CSO LFS data

Other NACE includes activities such as arts, entertainment & recreation, other service activities (e.g. repair of goods), etc.
[ ] Numbers in square brackets are small and should be interpreted with caution

Figure 27: **Employment by Sector (000s), Quarter 4 2022. Reproduced with Permission from SOLAS, 2023, p. 31**

Annual Average Employment (2022) & Annual Average Growth Rates (2017-2022)

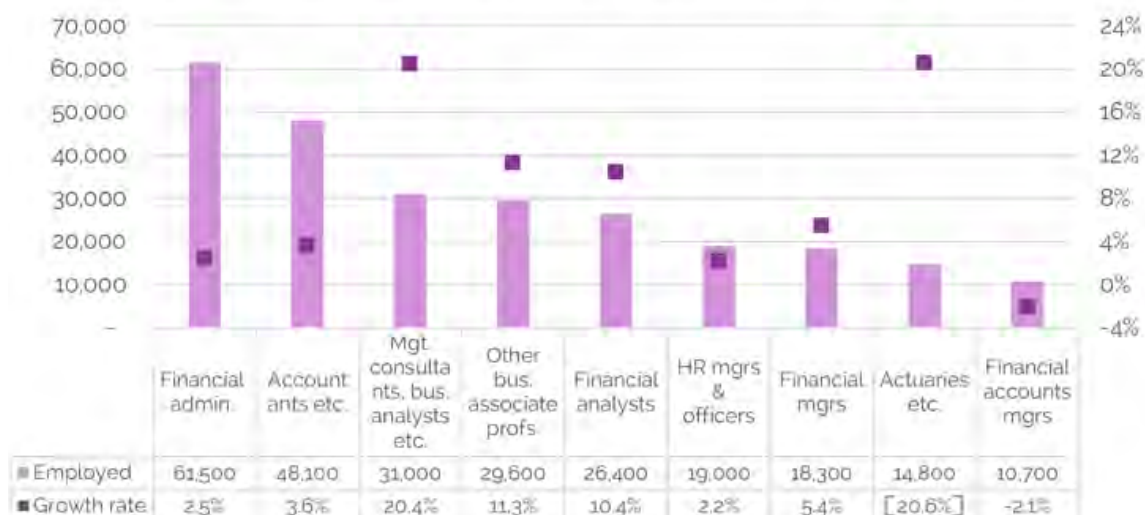|	Financial admin.	Account ants etc.	Mgt. consulta nts, bus. analysts etc.	Other bus. associate profs	Financial analysts	HR mgrs & officers	Financial mgrs	Actuaries etc.	Financial accounts mgrs
Employed	61,500	48,100	31,000	29,600	26,400	19,000	18,300	14,800	10,700
Growth rate	2.5%	3.6%	20.4%	11.3%	10.4%	2.2%	5.4%	[20.6%]	-2.1%

Figure 28: **Annual Average Employment (2022) & Annual Average Growth Rates (2017-2022) in business and financial occupations. Reproduced with Permission from SOLAS 2023, p. 135**

In the South East, the Financial Services sector employed an estimated 9,075

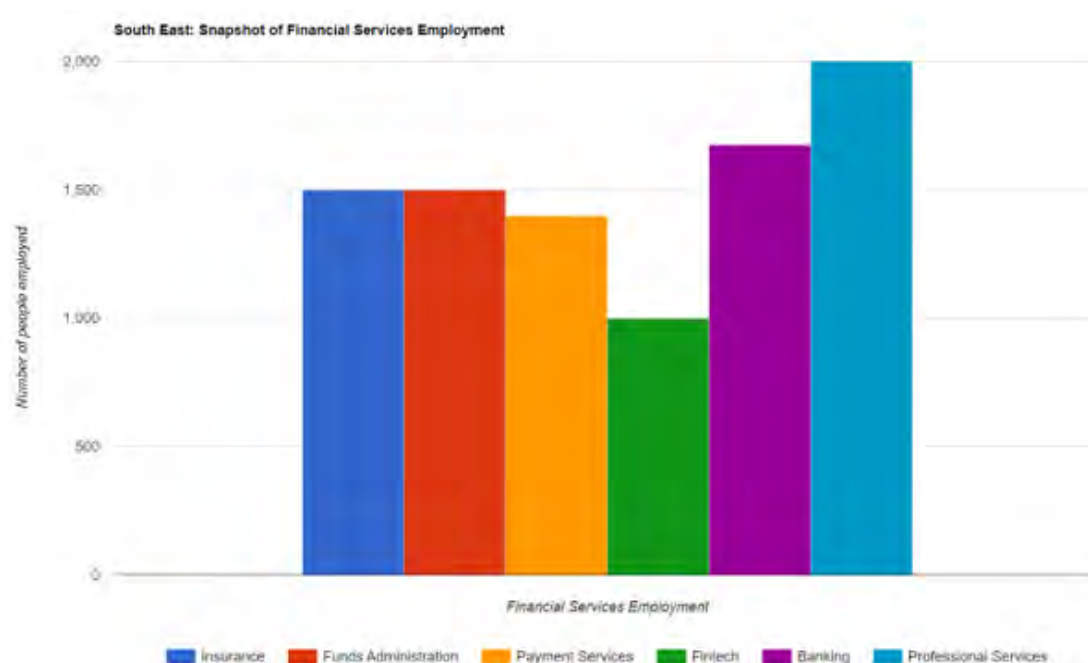individuals in February 2023 as follows:

South East: Snapshot of Financial Services Employment

Financial Services Employment

Insurance — Funds Administration — Payment Services — Fintech — Banking — Professional Services

Figure 29: **Snapshot of Financial Services Employment in the South East**

A significant number also work in financial and business roles within industry and other entities in the region (South East Regional Skills Forum, 2023d, p. 1).

Future Skills Needs

This is a complex sector which encompasses a breadth of roles, from customer facing staff in credit union and bank branches, the insurance and investment industry, Fintech specialists and treasury operatives. However, across the board there is an ongoing requirement identified to upskill staff in digital technologies as the financial services sector continues to experience significant digital transformation. Enterprise Ireland's Spotlight on Skills data highlights

a demand for financial skills combined with transversal and digital / IT skills in this sector (SOLAS, 2023). Emerging needs are at the intersection of sector specific knowledge and specialist IT skills. Notably, skills in this area are characterised as fast moving and needs are changing on a rapid basis. This suggests a need for targeted micro-credentials that can be developed and address needs quickly (EGFSN 2024).

A 2022 report on financial services in Ireland highlighted skill gaps in areas like data analytics, digital transformation, risk and compliance, leadership, and GDPR/cybersecurity (IFS Skillnet, 2022). Insights from the Spotlight on Skills data underscored the importance of human

resource management, leadership, communication, and project management as critical business skills sought across various sectors. Upskilling and reskilling initiatives are deemed essential within business and financial occupations to effectively manage digitalisation, automation, and the heightened emphasis on sustainable finance (SOLAS, 2023, p. 137).

There is a high need for expertise associated with risk, compliance and the regulatory environment, including in the context of cybersecurity. The National Skills Strategy, 2025 identified the following skills gaps: risk, compliance, accounting, business intelligence, ICT and data analytics. Although less prominent in published skills reports, a major skills gap in taxation (technical knowledge and tax solutions for companies) was identified in interviews with sector representatives. Recent research also indicates that there are seven high-growth potential sub-sectors which currently account for 95% of employment in the international financial services sector. These are classified as FinTech and payments, asset management, investment funds and securities services,

insurance and reinsurance, international banking, wholesale capital markets and aircraft leasing and finance (EGFSN 2024).

Particular skills needs identified in the financial services sector included transferrable skills such as effective business reach to customers; design thinking and innovation; improved accuracy and efficiency in notetaking, documentation and logging. Project management and communication / emotional intelligence skills were identified as important. A 2024 report published by the Expert Group on Future Skills Needs identified that the introduction of environmental social and governance (ESG) standards across the international financial services sector and the requirements of sustainable finance practices had been identified as the greatest opportunity for the Irish financial services sector by industry respondents. Subsequently, ESG and related sustainable finance skills were considered to be essential to address skills gaps for the sector (EGFSN 2024, p.55).

An ongoing need for customer facing or frontline staff and associated skills within banking and credit unions is also evident in skills reports for this sector.

Summary of Skills Needs for Global Business Services and Financial Services[17]

Specialist Industry Skills	Transversal/Soft Skills
• Data Analytics, including high-level Microsoft Excel;	• Human Resource Management (HRM), supervisory management, project management, change management and leadership;
• Robotic Process Automation (RPA);	• Customer relationship management and customer service;
• Software validation/quality assurance;	• Design thinking, critical thinking, problem solving and communication skills;
• Anti-Money Laundering (AML);	• Sustainability skills and ESG;
• Carbon accounting, ESG awareness and sustainable finance;	• Cultural awareness, interpersonal and negotiation skills;
• Accountancy, funds accounting / administration;	• Collaboration, teamwork, influencing, empathy & emotional intelligence;
• Central Bank approved minimum competence qualifications;	• Adaptability, resilience, learning agility;
• Asset management and taxation;	• Commercial acumen, and marketing;
• Business analysis and financial forecasting;	• Accuracy and efficiency in logging, note taking and documentation;
• Financial literacy and quantitative skills;	• Data analysis skills.
• Regulation, legal, risk & compliance, GDPR and cybersecurity.	

---

[17] Sources: South East Regional Skills Forum (2023d) *Summary of Demand from Industry for Skills / Training - Financial Services*. SOLAS (2022) *National Skills Bulletin 2022*. SOLAS (2023) *National Skills Bulletin 2023*. IFS Skillnet (2022) *Financial Services in Ireland – Skills of the Future*: Department of Education & Skills (2016) *National Skills Strategy, 2025*. Expert Group on Future Skills Needs (2024) *Skills for International Financial Services. An Assessment of the Future Skills Requirements in High Potential Sub-Sectors of Ireland's International Financial Services Sector to 2027*. Interviews with regional skills experts.

Summary of Skills Needs for Global Business Services and Financial Services

(continued)

Aviation

- Technical skills (financial and engineering);
- Legal and financial modelling skills;
- Marketing - communication and promotion of the sector;
- Integrated Risk Management;
- Contract Management Skills.

Emerging Needs

- Digital transformation; digitalisation of assets;
- Data analytics;
- Cloud computing;
- Technical understanding of products;
- Artificial intelligence and machine learning;
- Blockchain and fin-tech;
- Futurisation.

High demand roles

- Software developers, digital process engineers; technical architects, technologists and IT specialists;
- Specialised project managers;
- Data and quantitative analysts;
- Artificial Intelligence and machine learning specialists;
- Blockchain developers;
- Credit operations, accounts & payments and lending officers;
- Member services advisers;
- Collateral managers;
- Agency operation;
- Underwriters, actuaries and claims handlers;
- Audit operations analysts;
- Ecosystem Engineers;

- Cybersecurity specialists;
- Risk and compliance specialists and managers;
- Trust officers;
- Investor services specialists;
- Custody associates;
- Transfer agents;
- Asset and sustainable wealth managers;
- Fund accounting and administration managers;
- Treasury and investment;
- Analysts and managers;
- General Ledger Accountant;
- Aviation finance solicitors, auditors and financial analysts (aircraft leasing);
- Pricing specialists.

4.8 SKILLS SNAPSHOT: CONSTRUCTION

Overview of the Sector

It emerged as a strong theme for Ireland overall and the South East in particular (e.g., Southern Regional Assembly, South East Regional Skills Forum), with housing and construction demand due to increase by the end of the decade and shortages identified in this area (SOLAS, 2023; EGFSN, 2018; Southern Regional Assembly).

A detailed overview of housing needs in Ireland is articulated in Build Up Skills - Ireland 2030 (IGBC, 2023), which reiterates a call for a State-owned national sustainable home building agency (p.20). This entity would also address skills needs in the industry. BUSI 2030 reports 2020 figures for the construction industry. As per those figures, there were 62,664 construction enterprises in Ireland in 2020, with 62,640 of these classified as SMEs. This was a 5.9% increase from 2019. The construction sector was the second largest contributor to the number of Irish SMEs, accounting for 21.5%, and also contributed the highest percentage share of turnover at 83.4%. Additionally, SMEs employed 91.6% of the total workforce engaged in the construction sector in 2020 (IGBC, 2021, p. 61).

A number of reports also noted that the shift toward a zero-carbon economy and the growing use of modern construction methods will bring about substantial changes in construction-related skill requirements. This transformation will likely necessitate significant levels of upskilling and reskilling across various existing occupations as the skills mix evolves (IGBC, 2015; SOLAS, 2023).

Employment in the Sector

Employment levels in the construction sector have rebounded since the brief decline experienced during the Covid-19 pandemic. It is expected that demand for construction-related skills will continue, influenced by Government objectives around housing and climate action. It is estimated that around 50,000 new workers will be needed across all skill levels from 2023 to 2030 solely to meet Government targets for housing and retrofitting initiatives.

Figure 30: **Persons Aged 15-89 in Employment in the Construction Sector (F) in Q4 2023. (SE includes South Tipperary). CSO Data**

The South East Regional Skills Forum reports that approximately 15,700[18] persons were employed in construction in the region in 2022 across a diverse range of companies as follows:

- Construction of buildings & infrastructure – housing / commercial / industrial / roads / bridges
- Professional Services e.g. architects, consulting engineers and quantity surveyors
- Specialist Construction Services e.g. Mechanical & Electrical Contractors, Heating, Ventilation, Air Conditioning (HVAC)
- Trades persons – many sole traders and micro enterprises – carpentry, plumbing, block laying, plastering, tiling, etc.

- Construction materials & components manufacture & supply (South East Regional Skills Forum, 2023e, p. 1)

The shift towards a zero-carbon economy and the increased adoption of modern construction methods will significantly impact construction-related skills, necessitating a substantial amount of upskilling and reskilling for various existing occupations to adapt to the changing skill requirements (National Skills Bulletin, 2023, p. 5). It is estimated that a 46% increase in the current workforce, or an additional 120,579 workers across all construction professions and trades, is needed to achieve the targets outlined in the Housing for All and Climate Action Plan by 2030 (IGBC, 2021, p. 11).

---

[18] Difference in employment figures between the SERSF and the CSO may relate to the inclusion of South Tipperary in the CSO data and differences in employment between 2022 and 2023.

Job Title	Current Workforce	Required for 2030 Targets	Workforce Forecasting Projection	Required
Site Manager/Supervisor	4,600	8,518	5,190	3,329
Project Manager	2,000	3,704	2,374	1,329
Architecture and Construction	9,400	17,407	16,034	1,373
Architecture and Town Planning				
Civil Engineer	11,900	22,036	12,014	10,022
Quality Surveyor	4,800	8,889	5,141	3,748
Electrical Engineer	5,429	10,053	6,582	3,472
Mechanical Engineer	3,692	6,837	7,235	-
Structural Engineer	384	712	570	142
Energy Engineer	5,893	10,913	6,174	4,739
Plumber	9,400	17,407	12,752	4,655
Electricians	38,800	71,849	49,590	22,259
Bricklayers & Plasterers	11,800	21,851	9,556	12,295
Painters & Decorators	6,600	12,222	5,124	7,098
Carpentry and Joiners	17,700	32,777	17,968	14,809
Other (i.e. Machine Drivers, Crane Drivers, General Operatives)	32,000	59,257	35,113	24,144
Total	164,398	304,430	183,851	120,579

Figure 31: Overview of Workforce (Current, 2030 required, and forecasted). Reproduced with Permission from Technological University of the Shannon and IGBC, 2023, pp. 13-14

Future Skills Needs

Skills gaps identified for this sector overlap with those identified for other sectors in relation to renewable energy and manufacturing in particular. A need for digital skills development, especially for SMEs, clients and suppliers, is emphasised (Department of Further and Higher Education, Research, Innovation and Science, 2023b). For example, potential future shortages are noted in relation to experienced construction and building trades supervisors and construction project managers, both general and to support offshore wind projects (EGFSN, 2021).

A shortage of at least 100,000 people is forecasted in the construction labour market over the coming years across a number of trades, crafts and professions. Technicians are required at all grades to support in installation, optimisation,

management and maintenance of installed technologies and digitalisation of planning processes. It is noted that published analyses indicate the majority of staff required for delivery of house building targets are in skilled trades. More modest total requirements are evident for managerial and professional workers (IGBC, 2023).

To meet Ireland's renewable energy targets, more engineering and technician roles are needed, including: civil, electrical/electronic, mechanical, marine, production and process engineers; quality control and planning experts; telecommunications experts; IT and energy specialists. There will also be demand for a range of built environment jobs, including construction and building trades; supervisors; construction occupations; health and safety officers; chartered surveyors (Government of Ireland, 2022b).

Summary of Skills Needs for Construction[19]

Specialist Industry Skills

- Building Information Modelling (BIM) systems and CAD;
- Wet Trades for house construction: plumbing and carpentry;
- Electrical trades: electrical instrumentation and High Voltage Electrical (HVE);
- Site management;
- LEAN Construction;
- Estimating;
- Digital skills development for construction & built environment;
- Sustainable construction methods;
- BER calculations post construction;
- Green economy skills;
- Zero carbon sustainability and green design.

Transversal/Soft Skills

- Internationalisation and management capability;
- Project management;
- ICT.

Emerging

- Sales and technology skills;
- Languages;
- Customs;
- Procurement;
- Logistics.

High demand roles

- Chartered surveyors;
- Construction and building trades supervisors and project/site managers;
- Civil, structural and building services engineers;
- Sustainable energy engineers;
- Estimators;

- Electricians, high voltage technicians and engineers;
- Health and safety officers;
- Quantity and chartered surveyors;
- Civil, electrical and mechanical engineers;
- Maintenance technicians;
- Site administrators.

---

19 Sources: Department of Education & Skills (2016), *Ireland's National Skills Strategy 2025*. SOLAS (2023a) *National Skills Bulletin*. Expert Group on Future Skills Needs (2021) *Skills for Zero Carbon*. Department of Further and Higher Education, Research, Innovation and Skills (2023b) *Regional Skills Fora 2022 Insights*. Government of Ireland (2022b) *Climate Action Plan 2023*. SOLAS (2023b) *Recruitment Agency Survey on difficult-to-fill vacancies – Nov 2023*. IGBC (2023) BUSI2030. Regional Skills South East (2023) *Summary of Demand from Industry for Skills / Training – February 2023*. Department of Further and Higher Education, Research, Innovation and Science (2023a) *Careers in Construction Action Plan*. Department of Further and Higher Education, Research, Innovation and Science (2022) *Report on the Analysis of Skills for Residential Construction & Retrofitting, 2023 to 2030*. EGFSN (2018) *Addressing the Skills Needs Arising from the Potential Trade Implications of Brexit*. Interviews with industry and sector representatives.

5 LEARNING NEEDS IN THE PUBLIC SECTOR IN THE SOUTH EAST OF IRELAND

This report primarily focuses on skills needs in defined fields in the enterprise sector. While the public sector was not identified as a sector for exploration in this research, it is a major employer in the South East region. The total workforce in the South East is estimated at 227,500 (SOLAS, 2023) which represents 9% of the national workforce. The national data for the workforce in the public sector (excluding semi-states) is 389,500 (CSO Labour Force Quarter 2, 2023). Extrapolating this figure to an estimate in the South East region, the public sector represents a workforce of between 35,000 to 40,000 or about 17% of the workforce in the South East.

The public sector includes the Civil Service, An Garda Síochána, Irish Defence Forces, Education, Irish Prison Service, Regional Bodies and Health. Education and Health are the largest sub-sectors within the public sector representing 70% of all public sector jobs (CSO, 2023). As the total workforce in education is 111,900 (CSO Labour Force Quarter 2, 2023) we estimate a workforce of over 10,000 in education in the South East. There is a relative dearth of focused analysis on this sector in the published literature. While documentation such as the Civil Service Capability Framework[4] and Civil Service Renewal 2024 Action Plan[5] do outline the skills development needs of those services (skills to facilitate digital delivery and innovation in services for example) they lack the granular information typical of sources such as the National Skills Bulletin. The skills needs across the breath of public sector are therefore not considered in detail as part of this report. The more detailed objective analysis of the National Skills Bulletin does, however, profile three occupational employment areas where the

preponderance of employment lies in the public sector; Healthcare, Education, and Social and Care occupations.

Although health and social care extends beyond the public sector, these are presented together within this report due to the significant overlap in known skills gaps. The importance of these sectors is identified particularly as the demographics profile in Ireland changes i.e. a fall in the number of 0-4-year-olds and the increasing number of those aged 65 years and older in the population, "which will be the primary driver of employment in these occupations in the coming years" (National Skills Bulletin 2021). A 2022 ESRI report estimates that the healthcare workforce (e.g. doctors, nurses, healthcare assistants, various therapists) will need to grow by between 1.7% and 2.1% or by between 12,400 and 15,500 WTE posts on average annually for the forecast period to 2035 in order to meet recruitment demands in acute hospitals alone arising from a number of factors (including the implementation of Sláintecare) (National Skills Bulletin, 2023).

Challenges have been identified in the recruitment of primary and secondary school teachers; medical practitioners; nurses; healthcare assistants; and care workers. Shortages of STEM teachers as well as Irish, modern foreign languages and home economics teachers have been identified. At primary level the recruitment of substitute teachers is a challenge (Department of Education, 2021). In particular, there are significant difficulties in recruiting Maths and Irish teachers (National Skills Bulletin, 2023).

SETU has identified the gap in teacher supply as a strategic priority (SETU Connecting for Impact 2023-2028) and

---

[4] https://publicjobs.ie/en/information-hub/capability-framework
[5] https://www.gov.ie/en/publication/47061-civil-service-renewal-2024-action-plan/

highlights the need for increased provision of initial teacher education programmes for the South East. Data indicates up to 2,000 students leave the South East region to take up teacher education programmes primarily in Dublin and Limerick (HEA, 2021). This figure does not include students who for economic, social or cultural reasons chose to study outside of Ireland or are excluded from teacher education programmes in Ireland due to the financial costs of studying outside of their region (i.e. the South East).

Appendix REFERENCES

Animation Ireland (2022) Skills Gaps in the Irish Animation Sector Research Report. Available at: https://www.screenireland.ie/images/uploads/general/Skills_Gaps_in_the_Irish_Animation_sector.pdf [Accessed: 30 April 2024]

Chambers Ireland (2023) Chambers Ireland Submission to the Department of Enterprise, Trade and Employment on the Review of the Occupations lists for Employment Permits. Available at: https://chambers.ie/wp-content/uploads/2023/08/Chambers-Ireland-Submission-to-the-Department-on-the-Review-of-the-Occupations-lists-for-Employment-Permits_FINAL_v.1.pdf [Accessed: 30 April 2024]

Conor, K, Brick, A. García-Rodríguez, A. and Hill, L. (2022) Projections of Workforce Requirements for Public Acute Hospitals in Ireland, 2019–2035 A Regional Analysis Based on the Hippocrates Model. ESRI. Available at: RS147.pdf (esri.ie) [Accessed: 30 April 2024]

CSO (2023) Regional Accounts for Agriculture 2022. Available at: https://www.cso.ie/en/releasesandpublications/ep/p-raa/regionalaccountsforagriculture2022/south-eastregion/ [Accessed: 30 April 2024]

CSO (2024) Labour Force Survey Quarter 4 2023. Available at: Employment Labour Force Survey Quarter 4 2023 - Central Statistics Office [Accessed: 30 April 2024]

Department of Education and Skills (2016) Ireland's National Skills Strategy 2025. Available at: 0f5f058feec641bbb92d34a0a8e3daff.pdf (assets.gov.ie) [Accessed: 30 April 2024]

Department of Education and Skills (2019) Technology Skills 2022 Ireland's Third ICT Skills Action Plan. Available at: https://assets.gov.ie/24698/50fcbc8f80ab4a828ab7f44e2114aa7b.pdf [Accessed: 30 April 2024]

Department of Education (2020) Developing a Teacher Demand and Supply Model for Ireland 2021-2038. A Technical Report. Available at: https://www.gov.ie/en/publication/462697-developing-a-teacher-demand-and-supply-model-for-ireland-2020-2036/ [Accessed: 30 April 2024]

Department of Education (2022) Technology Skills 2022 Ireland's Third ICT Skills Action Plan Available at: https://www.gov.ie/pdf/?file=https://assets.gov.ie/24698/50fcbc8f80ab4a828ab7f44e2114aa7b.pdf [Accessed: 30 April 2024]

Department of the Environment, Climate and Communications (2022) The Digital Connectivity Strategy for Ireland. Available at: https://www.gov.ie/en/publication/69fb88-digital-strategy-for-schools/ [Accessed: 30 April 2024]

Department of Further and Higher Education, Research, Innovation and Science (2022) Report on the Analysis of Skills for Residential Construction & Retrofitting, 2023 to 2030. Available at: gov - Report on the Analysis of Skills for Residential Construction & Retrofitting, 2023 to 2030 (www.gov.ie) [Accessed: 30 April 2024]

Department of Further and Higher Education, Research, Innovation and Science (2023a) Careers in Construction: Action Plan. Available at: https://www.gov.ie/en/publication/2733a-careers-in-construction-action-plan/#full-report-and-documents [Accessed: 30 April 2024]

Department of Further and Higher Education, Research, Innovation and Science (2023b) Regional Skills Fora 2022 Insights. Available at: gov - Regional Skills Fora 2022 Insights (www.gov.ie) [Accessed: 30 April 2024]

Department of Public Expenditure and Reform (2022) Connecting Government 2030: A Digital and ICT Strategy for Ireland's Public Service. Available at: https://www.gov.ie/en/publication/136b9-connecting-government-2030-a-digital-and-ict-strategy-for-irelands-public-service/ [Accessed: 30 April 2024]

Doyle-Kent, M., O'Neill, B., Walsh Shanahan, B., Organ, J., Doyle, L., O'Neill, S., Costello, O. & Donnelly, N. (2022) A Research Cluster's Vision for a Pilot Factory in the South East Technological University of Ireland. IN: IFAC-PapersOnLine, Volume 55, Issue 39, pp. 159-164. Available at: https://doi.org/10.1016/j.ifacol.2022.12.028 [Accessed: 30 April 2024]

European Commission (2020) Proposed Mission: Mission Starfish 2030: Restore our Ocean and Waters Report of the Mission Board Healthy Oceans, Seas, Coastal and Inland Waters. Available at: https://pq-ue.ani.pt/content/eventos/12332_relatorio-da-missao-starfish.pdf [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2018) Addressing the Skills Needs Arising from the Potential Trade Implications of Brexit. Available at: https://skillsireland.ie/all-publications/2018/addressing%20the%20skills%20needs%20arising%20from%20the%20potential%20trade%20implications%20of%20brexit.pdf [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2019) Forecasting the Future Demand for High-Level ICT Skills in Ireland, 20172022. Available at: https://enterprise.gov.ie/en/publications/publication-files/forecasting-future-demand-high-level-ict-skills-ireland-2017-2022.pdf [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2021) Skills for Zero Carbon The Demand for Renewable Energy, Residential Retrofit and Electric Vehicle Deployment Skills to 2030. https://skillsireland.ie/all-publications/2021/5119-dete-egfsn-skills-for-zero-carbon-web_.pdf [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2022) The Expert Group on Future Skills Needs Statement of Activity 2021. Available at: https://www.egfsn.ie/all-publications/2022/egfsn-annual-activity-statement-2021_.pdf [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2022b) Projections of workforce requirements for public acute hospitals in Ireland, 2019–2035:a regional analysis based on the Hippocrates model. Available at: https://www.esri.ie/system/files/publications/RS147.pdf [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2024) Skills for Biopharma Researching and Forecasting the Current and Future Skills Needs of the Biopharma Sector in Ireland to 2027. Available at: skills-for-biopharma.pdf (skillsireland.ie) [Accessed: 30 April 2024]

Expert Group on Future Skills Needs (2024) Skills for International Financial Services. An Assessment of the Future Skills Requirements in High Potential Sub-Sectors of Ireland's International Financial Services Sector to 2027. Available at: https://skillsireland.ie/all-publications/2024/skills-for-international-financial-services.pdf [Accessed: 28 August 2024]

Forbes (2021) What Is A Neobank? Available at: What Is A Neobank? – Forbes Advisor [Accessed: 30 April 2024]

Gilsenan, J. (2023) SE Engineering Skills Survey - Draft Report. PP Presentation. Unpublished

Government of Ireland (2019a) Regional Enterprise Plan to 2020. SOUTH-EAST. Available at: south-east-regional-enterprise-plan-to-2020.pdf [Accessed: 30 April 2024]

Government of Ireland (2019b) Technology Skills 2022 Ireland's Third ICT Skills Action Plan. Available at: https://assets.gov.ie/24698/50fcbc8f80ab4a828ab7f44e2114aa7b.pdf [Accessed: 30 April 2024]

Government of Ireland (2021a) Food Vision 2030 – A World Leader in Sustainable Food Systems. Available at: https://www.gov.ie/en/publication/c73a3-food-vision-2030-a-world-leader-in-sustainable-food-systems/#food-vision-2030 [Accessed: 30 April 2024]

Government of Ireland (2021b) Our Rural Future: Rural Development Policy 2021-2025. Available at: https://www.gov.ie/en/publication/4c236-our-rural-future-vision-and-policy-context/#our-rural-future-rural-development-policy-2021-2025 [Accessed: 30 April 2024]

Government of Ireland (2021c) Economic Recovery Plan 2021. Progress Report. Available at: https://www.gov.ie/pdf/?file=https://assets.gov.ie/225900/4b762783-8d57-4612-8000-29f9d21eceb1.pdf#page=null [Accessed: 30 April 2024]

Government of Ireland (2021d) AI - Here for Good A National Artificial Intelligence Strategy for Ireland. Available at: https://enterprise.gov.ie/en/publications/publication-files/national-ai-strategy.pdf [Accessed: 30 April 2024]

REFERENCES

Government of Ireland (2022a) Regional Enterprise Plan to 2024. South East. Available at: south-east-regional-enterprise-plan-to-2024.pdf [Accessed: 30 April 2024]

Government of Ireland (2022b) Climate Action Plan 2023. Cap23. Changing Ireland For The Better. Available at: gov - Climate Action Plan 2023 (www.gov.ie) [Accessed: 30 April 2024]

Government of Ireland (2022c) National Smart Specialisation Strategy for Innovation. Available at: https://enterprise.gov.ie/en/publications/publication-files/national-smart-specialisation-strategy-for-innovation-2022-2027.pdf [Accessed: 30 April 2024]

Government of Ireland (2022d) White Paper on Enterprise, 2022 - 2030. Available at: white-paper-on-enterprise-2022-2030.pdf [Accessed: 30 April 2024]

Government of Ireland (2022e) Harnessing Digital - The Digital Ireland Framework. Available at: https://www.gov.ie/en/publication/adf42-harnessing-digital-the-digital-ireland-framework/ [Accessed: 30 April 2024]

GreenTech Skillnet & BVG Associates (2024) Building our Potential - Ireland's Offshore Wind Skills and Talent Needs. Available at: https://www.skillnetireland.ie/uploads/attachments/Building_Our_Potential-Ireland%E2%80%99s_Offshore_Wind_Skills_and_Talent_Needs_Jan_2024.pdf [Accessed: 30 April 2024]

HEA (2024) System Performance Framework 2023 – 2028 KPI Dashboard. Available at: https://hea.ie/statistics/data-for-download-and-visualisations/institutes-performance/system-performance-framework-dashboard-23-28/ [Accessed at: 16 September 2024]

IBEC (2023) Where Digital Health Thrives. Available at: https://www.ibec.ie/digitalhealth [Accessed: 30 April 2024]

IDA Ireland and Skillnet Ireland (2024) Study of data and digital skills for all non-IT roles across multiple industries. Available at: https://www.skillnetireland.ie/uploads/attachments/Study-of-Data-and-Digital-Skills-for-all-non-IT-Roles-across-Multiple-Industries.pdf [Accessed: 30 April 2024]

IFS Skillnet (2022) Financial Services in Ireland – Skills of the Future: International Financial Services Skillnet. Available at: https://www.skillnetireland.ie/uploads/attachments/Financial-Services-in-Ireland-%E2%80%93-Skills-of-the-Future-report_%282%29.pdf [Accessed: 30 April 2024]

IGBC (2015) BUILD UP Skills – Ireland National Roadmap for Energy Training in Construction. Available at: BuildUpSkillsRoadmaplowresUpdate_0.pdf (igbc.ie) [Accessed: 30 April 2024]

IGBC (2023) Build Up Skills Ireland 2030: Analysis of the National Status Quo (BUSI20230). Available at: https://igbc.ie/wp-content/uploads/2023/10/Analysis-of-the-National-Status-Quo-Ireland.pdf [Accessed: 30 April 2024]

Irish Government Economic & Evaluation Service (IGEES) (2028) Automation and Occupations: A Comparative Analysis of the Impact of Automation on Occupations in Ireland. Available at: https://www.gov.ie/pdf/?file=https://assets.gov.ie/224204/54b0a186-a30b-44a0-bd51-9a7f7a67fbe3.pdf#page=null [Accessed: 30 April 2024]

ITIC (2023) The Competitiveness of Irish Tourism Review & Outlook, Irish Tourism Confederation, 28 June 2023. Available at: https://www.itic.ie/RECOVERY/competitiveness-2023/ [Accessed 28 August 2024]

Kilkenny County Council (2023) Kilkenny Local Economic and Community Plan 2023 – 2028. Available at: https://kilkennycoco.ie/eng/your_council/council_meetings/kilkenny_county_council_ordinary_meetings/2023-council-meetings/4-kilkenny-local-economic-and-community-plan-2023-2028.pdf [Accessed: 30 April 2024]

KPMG (2023) The Future of FinTech. What can be done to support FinTech in Ireland? Available at: The Future of FinTech - Neobanks & RegTech - KPMG Ireland [Accessed: 30 April 2024]

Murray, S. (2022) Skills shortage: Irish employers urgently need more trained and experienced workers. IN: Irish Examiner. 28 Feb 2022. Available at: Skills shortage: Irish employers urgently need more trained and experienced workers (irishexaminer.com) [Accessed: 30 April 2024]

National Economic & Social Council (2021) Digital Inclusion in Ireland: Connectivity, Devices & Skills. Available at: http://files.nesc.ie/nesc_reports/en/154_Digital.pdf [Accessed: 30 April 2024]

OECD (2019) OECD Future of Education and Skills 2030 Conceptual learning framework. Concept note: Attitudes and Values for 2030. Available at: Attitudes and Values for 2030.pdf (oecd.org) Accessed: 30 April 2024]

OECD (2023) Skills Strategy Ireland - Assessment and Recommendations – 2023. Available at: OECD Skills Strategy Ireland: Assessment and Recommendations | en | OECD [Accessed: 30 April 2024]

Restaurant & Hospitality Skillnet (2023) The Future of Irish Hospitality - Attracting and Retaining Talent, November 2023. Available at: https://www.skillnetireland.ie/uploads/attachments/The-Future-of-Irish-Hospitality-%E2%80%93-Attracting-Retaining-Talent.pdf [Accessed 28 August 2024]

Rikon (2023) Waterford 2024 Regional City of Scale. Strategic Investment in Waterford. Available at: RIKON-Waterford-2040-Regional-City-of-Scale.pdf (waterfordchamber.ie) [Accessed: 30 April 2024]

Rikon (2024) Measuring The South East Creative Economy. Unpublished

Screen Ireland (2023) The Skills Challenge for the Screen Sector in Ireland 2023. Available at: https://www.screenireland.ie/images/uploads/general/The_Skills_Challenge_for_the_ Screen_Sector_in_Ireland_2023.pdf [Accessed: 30 April 2024]

SENSER (2024) South East Economic Monitor – Winter 2023. Available at: http://www. senser.ie/resources/SE_Eco_Monitor_2023-compressed(1).pdf [Accessed: 30 April 2024]

SETU (2022) Annual Quality Report. Reporting Period May – December 2022. Available at: South East Technological University Annual Quality Report 2023.pdf (qqi.ie) [Accessed: 30 April 2024]

SETU (2023a) Connecting for Impact 2023 – 2028. Available at: SETU | Strategic Plan 2023 - 2028 [Accessed: 30 April 2024]

SETU (2024) Knowledge & Skills Needs in the South East: A focus on the Agriculture, Food, Forestry, Horticulture & Marine Sectors.

SOLAS (2021) National Skills Bulletin 2021. Available at: https://www.solas.ie/f/70398/x/ fcee571661/solas_nsb_report.pdf [Accessed: 30 April 2024]

SOLAS (2022) National Skills Bulletin 2022. Available at: https://www.solas.ie/f/70398/ x/3554445a46/national-skills-bulletin-2022.pdf [Accessed: 30 April 2024]

SOLAS (2023a) Lifelong Learning in Ireland. Available at: lifelonglearning-report.pdf (solas. ie) [Accessed: 1 May 2024]

SOLAS (2023b) National Skills Bulletin 2023. Available at: https://www.solas.ie/f/70398/ x/940b9df162/national-skills-bulletin-2023.pdf [Accessed: 30 April 2024]

SOLAS (2023c) Recruitment Agency Survey on difficult-to-fill vacancies – Nov 2023. Available at: solas-difficult-to-fill-vacancies-survey.pdf [Accessed: 30 April 2024]

SOLAS (2023d) Lifelong learning amongst adults in Ireland. Available at: https://www.solas. ie/f/70398/x/e23020bc16/lifelong-learning_report.pdf (Accessed: 16 September 2024)

SOLAS (2024) Monitoring Ireland's Skills Supply 2023. Trends in education and training awards. Available at: monitoring-irelands-skills-supply-2023.pdf (solas.ie) [Accessed: 30 April 2024]

South East Regional Skills Forum (SERSF) (2021) South East Hospitality Industry Training & Education Review With Recommendations. Available at: https://www.gov.ie/pdf/?file=https://assets.gov.ie/281144/2856ee41-0524-40da-b338-785821b227a4.pdf#page=null [Accessed: 30 April 2024]

South East Regional Skills forum (SERSF) (2022) Assessment of training need for forest harvesting operations with recommendations. Available at: https://mcusercontent.com/5022a479ede2060ea00e2b0ee/files/6d96726c-05bb-6c2a-b7e1-dea0687f5d80/Regional_Skills_Forest_Harvesting_Training_Need_Report_June_2022.pdf [Accessed: 30 April 2024]

South East Regional Skills Forum (SERSF) (2023a) Summary of Demand from Industry for Skills / Training: Life Sciences – October 2023 Unpublished

South East Regional Skills Forum (SERSF) (2023b) Summary of Demand from Industry for Skills / Training: Manufacturing / Engineering – February 2023. Unpublished

South East Regional Skills Forum (SERSF) (2023c) Summary of Demand from Industry for Skills / Training: ICT – February 2023. Unpublished

South East Regional Skills Forum (SERSF) (2023d) Summary of Demand from Industry for Skills / Training: Construction – February 2023. Unpublished

South East Regional Skills Forum (SERSF) (2023e) Summary of Demand from Industry for Skills / Training: Financial Services – February 2023 Unpublished

South East Regional Skills Forum (2024) South East Regional Outlook. Unpublished

South East Regional Skills Forum & Department of Further and Higher Education, Research, innovation and Science (2024) Evaluation of the Engineering Skills and Training Needs of Manufacturing and Construction Sectors in the South East. Available at: https://www.gov.ie/pdf/?file=https://assets.gov.ie/284567/5bc03b69-6024-414a-9c34-0282d281eb30.pdf [Accessed: 30 April 2024]

South East Regional Skills Forum (SERSF) and SETU (2023) ICT Skills Survey of Companies in the South East. Available at: https://www.gov.ie/pdf/?file=https://assets.gov.ie/284569/a11fd553-c559-4a5e-b64d-6598f24ce49d.pdf#page=null [Accessed: 30 April 2024]

South East Regional Skills Forum & SOLAS (2023) Regional Infographic – South East. Available at: regional-infographics_southeast_.pdf (solas.ie) [Accessed: 1 May 2024]

REFERENCES

Southern Regional Assembly, Towards a Learning Region. Available at: https://www.southernassembly.ie/uploads/general-files/Final_Web_Version_-DO_NOT_DELETE.pdf [Accessed: 30 April 2024]

UNESCO (2014) Skills for Holistic Human Development. IN UNESCO Asia-Pacific Education Policy Brief. Volume 2. Available at: unesdoc.unesco.org/ark:/48223/pf0000245064/PDF/245064eng.pdf.multi [Accessed: 30 April 2024]

Waterford City and County Council (2022a) Waterford Economic Strategy 2022-2040. Available at: Waterford Economic Strategy 2040 - Waterford City & County Council (waterfordcouncil.ie) SOLAS [Accessed: 30 April 2024]

Waterford City and County Council (2022b) Waterford City and County Development Plan 2022-2028. Available at: https://consult.waterfordcouncil.ie/en/consultation/waterford-city-county-development-plan-2022-%E2%80%93-2028 [Accessed: 30 April 2024]

Whelan, A., McGuinness, S., Staffa, E. & Redmond, P. (2024) Skill Requirements for Emerging Technologies in Ireland. Economic and Social Research Institute (ESRI). Available at: https://www.esri.ie/system/files/publications/RS191.pdf [Accessed: 18 September 2024]

Websites Referenced

Data.Gov.ie: NUTS 3 Boundaries - Dataset - data.gov.ie

Enterprise Digital Advisory Forum: https://enterprise.gov.ie/en/publications/enterprise-digital-advisory-forum.html

Eurostat NACE Rev. 2 - Statistical classification of economic activities: https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-ra-07-015

Ireland South East: https://irelandsoutheast.com/

SETU: SETU and WWETB welcome Waterford's UNESCO Learning City designation. Available at: SETU | SETU and WWETB welcome Waterford's UNESCO Learning City