Royal Academy of Engineering

supported by InterTradeIreland

Engineering Economy & Place, Ireland

A new approach to understanding Ireland's engineering economy

Contents

Foreword

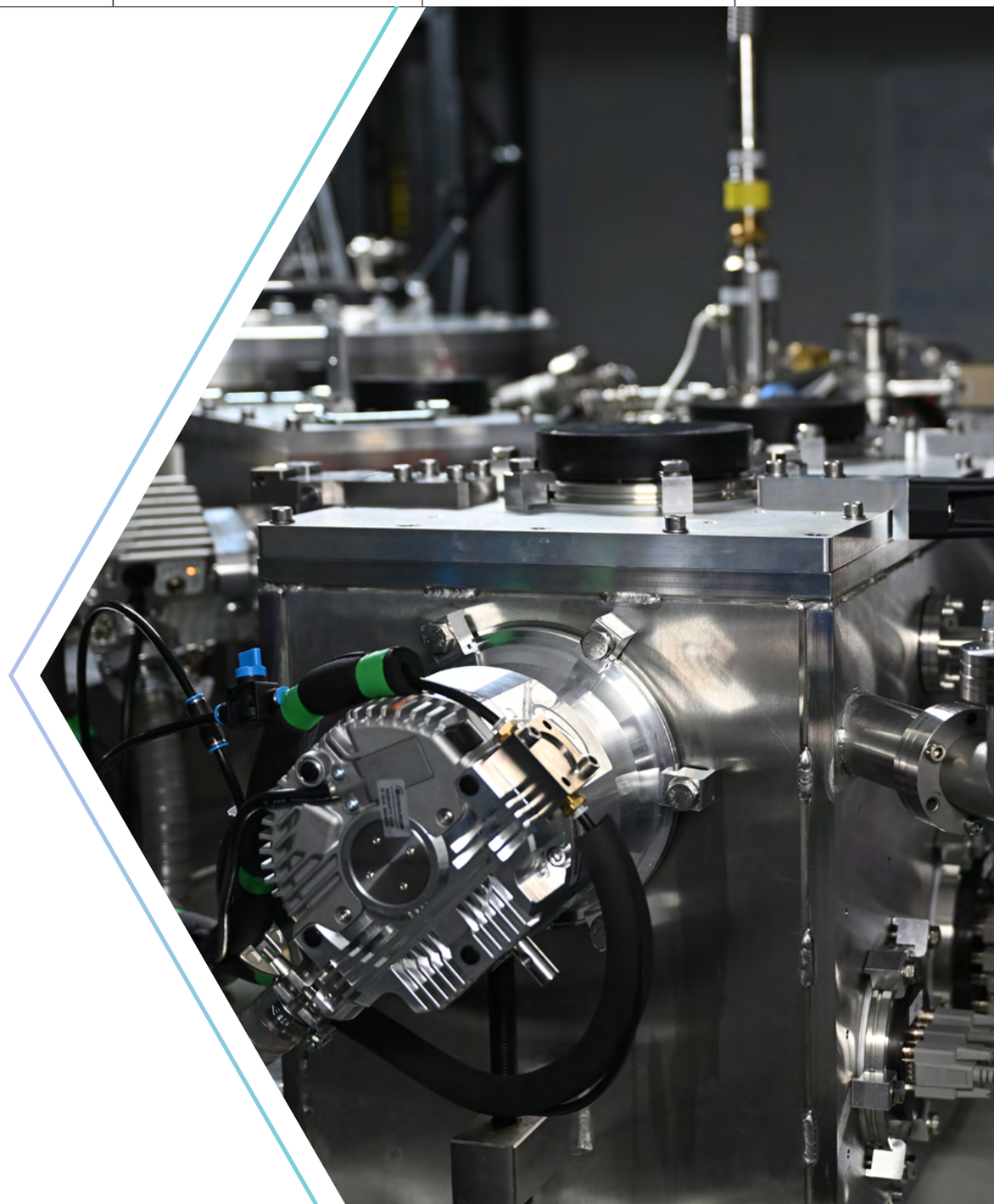
Engineering Economy and Place, a collaborative project between the Royal Academy of Engineering and Metro Dynamics, created for the first time a framework to understand the structure and value of engineering in places across the UK. Traditional analyses struggled to account for the complexity of engineering as it traverses the modern economy. Engineering Economy and Place combined indicators that looked at the engineering economy, engineering enterprise and place economics, to create a typology to describe the local and national role of engineering.

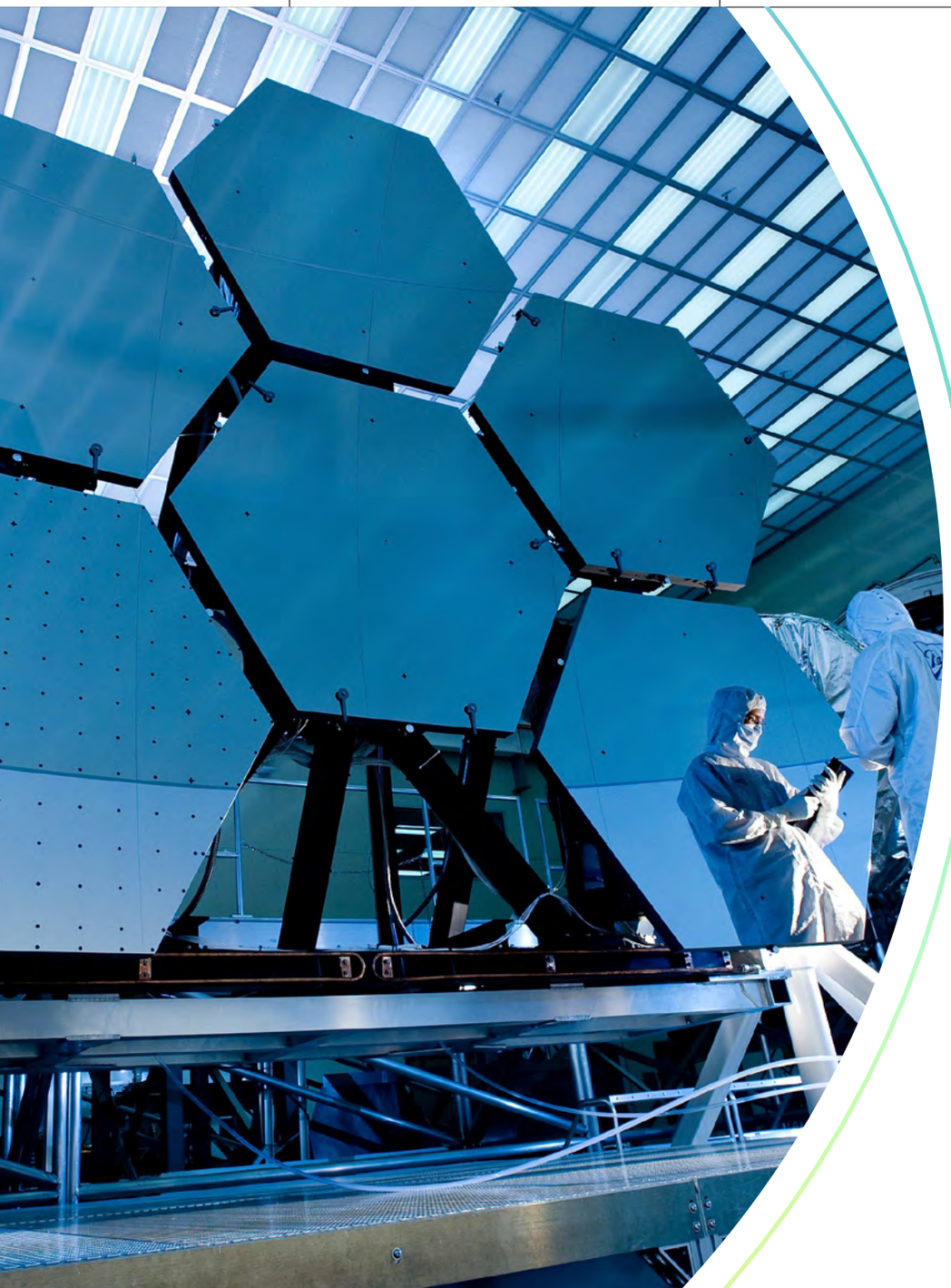
Since its 2023 release, the report and dashboard have been invaluable to the Academy, policymakers and local leaders for measuring and comparing engineering's role in different places. The Irish Academy of Engineering recognised the potential benefits from a better data-led understanding of engineering in Ireland. Together, the two Academies, with Metro Dynamics and supported by InterTradeIreland, set out to test whether the novel, place-based approach to analysing engineering developed for the UK could be successfully applied to Ireland.

Adapting the UK approach was not simple. The Irish data environment has significant differences to the UK's and in some cases greater data limitations. Nevertheless, I am pleased to say that the approach was successfully adapted to the Irish context.

We have produced a new robust and comprehensive data-led framework to describe Ireland's engineering economy, but I will leave my fellow President to say more about that. What I will say is that the enduring conclusion from the UK report that '*Engineering is everywhere, but nowhere the same*', also applies to Ireland.

SIR JOHN LAZAR CBE FRENG
PRESIDENT, ROYAL ACADEMY OF ENGINEERING





There has long been a consensus in Ireland that engineering is integral to its economy. Developing and deploying the Engineering Economy and Place approach has allowed us to not only demonstrate that engineering plays a far greater role in Ireland's economy than captured by more traditional analyses; but also takes a much more granular view of the role of engineering in the place-specific contexts of the 31 administrative counties. Sean Said "*I want to particularly thank Academy Presidents Tom Leahy and Jim Browne for leading on behalf of the Academy*".

Tom Leahy said *"We have produced a new robust and comprehensive data-led framework to describe Ireland's engineering economy. After signing the joint RAE/IAE MoU in 2022, we saw the EEP UK report published in 2023 and I knew we had to replicate this study for Ireland. The findings will help Ireland further develop our economy and leverage engineering's true potential.*"

Engineering expertise is spread across all sectors of Ireland's economy, far beyond traditionally defined engineering industries. The data shows that engineering in Ireland is a highly R&D intensive activity, driving innovation and value creation with significant growth in employment, particularly in R&D intensive activities and employment in tech-related fields.

Jim Browne said "*The typology identifies five types of engineering economies in Ireland. Spanning the Tech Heavyweights of Dublin, the Engineering Powerhouses of Cork, the Local Engines across the Border and Midlands regions, as well as Industrial Innovators like Galway, and Embedded Engineering comprising the greatest number of counties.*"

The findings in the report and dashboard will help places, policymakers and engineering businesses to develop employment and their economy and leverage engineering's true potential.

SEAN FINLAY FIAENG
PRESIDENT, IRISH ACADEMY OF ENGINEERING

Summary Insights

OVERVIEW

This report provides the first comprehensive, place-based analysis of Ireland's engineering economy, describing its scale, distribution and strategic significance at both national and county levels. Adapting a methodology previously developed by the Royal Academy of Engineering for the UK, and leveraging the 2022 Census and other national datasets, the report offers new insights into the size, nature, and role of engineering across and within Ireland.

KEY FINDINGS

This report finds that engineering plays a far greater role in Ireland's economy than previously captured by narrower definitions.

Scale and reach

- The engineering economy accounted for **31% of total employment in 2022**, with over **725,000 people** working in engineering-related industries and occupations.
- Engineering expertise permeates all sectors of Ireland's economy, with an estimated 40% of people employed in engineering occupations working in companies that are non-engineering sectors.
- While there is variation across Ireland in how much employment engineering accounts for, it is **a large part of the employment base everywhere.**

DRIVING INNOVATION AND VALUE CREATION

- Engineering in Ireland is a **highly R&D intensive sector**, with over one-fifth of those employed in the engineering economy in a role focused on R&D, three times more than across the entire economy.
- Robust growth has been observed in R&D intensive activities between 2016 and 2022.

Sustained growth

- From **2011 to 2022, engineering employment grew by 44%, compared to a 29% increase in total employment**, adding more than 200,000 jobs and increasing engineering's share of total employment.

Regional diversity

- Engineering plays a distinct role and exhibits different features in every county across Ireland, reflecting variations in scale, specialisation and local significance. Engineering Economy and Place Ireland presents a new engineering typology to capture and explain these differences.

IRELAND'S ENGINEERING TYPOLOGY

Based on the characteristics of their engineering economies (primarily volume, value, local significance, industrial specialisation and R&D intensity), Ireland's 31 administrative counties have been grouped into five engineering typology categories:

- **Tech Heavyweight:** high volume (measured by employment) and high-value engineering. With a broader economic base, engineering is less dominant locally.
- **Engineering Powerhouse:** combining scale, high value, and high local significance.
- **Industrial Innovator:** smaller economies where engineering is a major economic contributor and is particularly R&D intensive.
- **Local Engine:** engineering's local significance is very high (at least 29% of total local employment), but value and R&D intensity are lower. These counties often have a strong manufacturing base without a large technology sector.
- **Embedded Engineering:** areas that do not outperform national averages on any of the core engineering metrics.

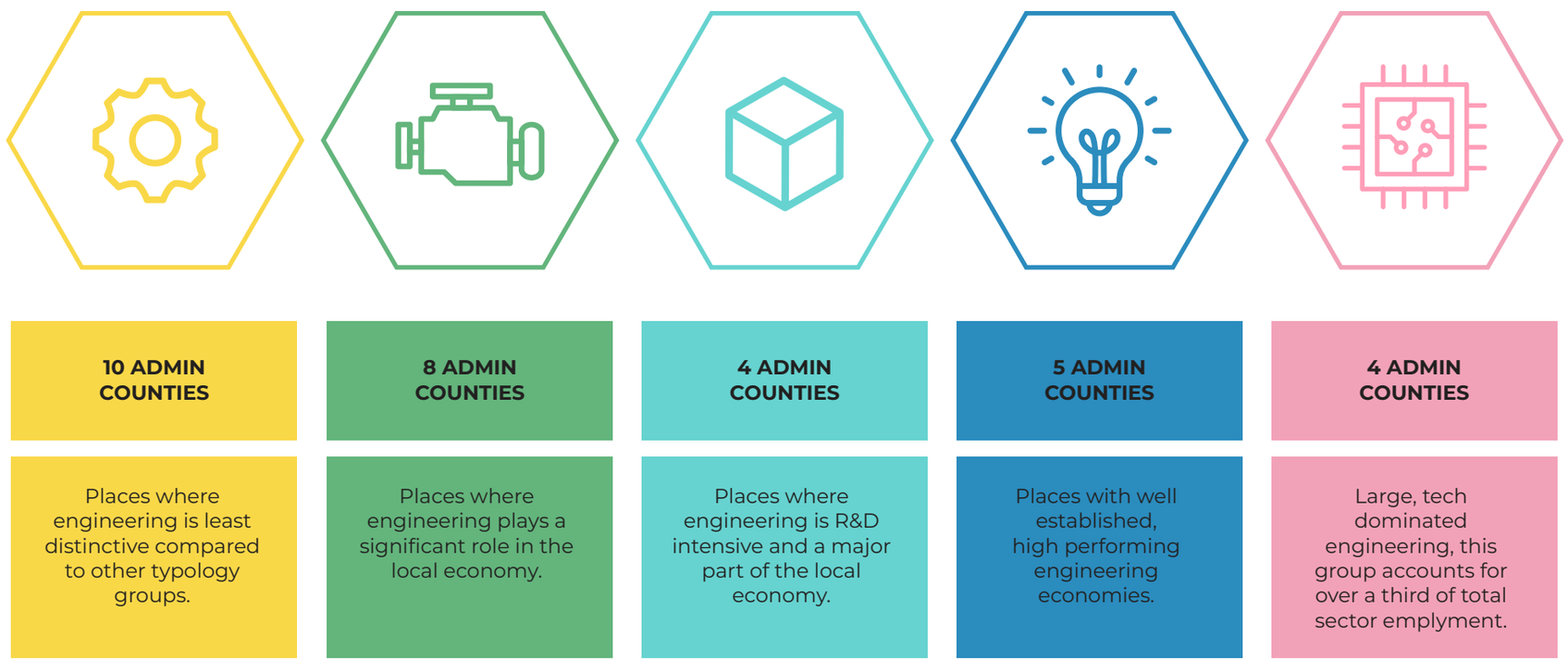
Each category is explored through in-depth place profiles which also articulate the role of local ecosystems and how engineering contributes to local economies in different ways.

CONCLUSION

Engineering is more central to Ireland's prosperity than previously measured. Analysis identifies engineering as an essential enabler of innovation and a driver of value across a broad range of sectors, underpinning infrastructure and the wider economy. At the same time, it highlights ongoing challenges and emphasises the importance of engineering capabilities for Ireland's economic resilience and continued prosperity.

Through providing analysis of data at county level, a new typology framework, place profiles, and an accompanying dashboard tool, this work aims to support policymakers, industry and stakeholders in understanding how the engineering economy creates and distributes value across Ireland. A deeper understanding of engineering within places can inform new policy development and help deliver against existing priorities by building on local strengths and addressing specific needs.

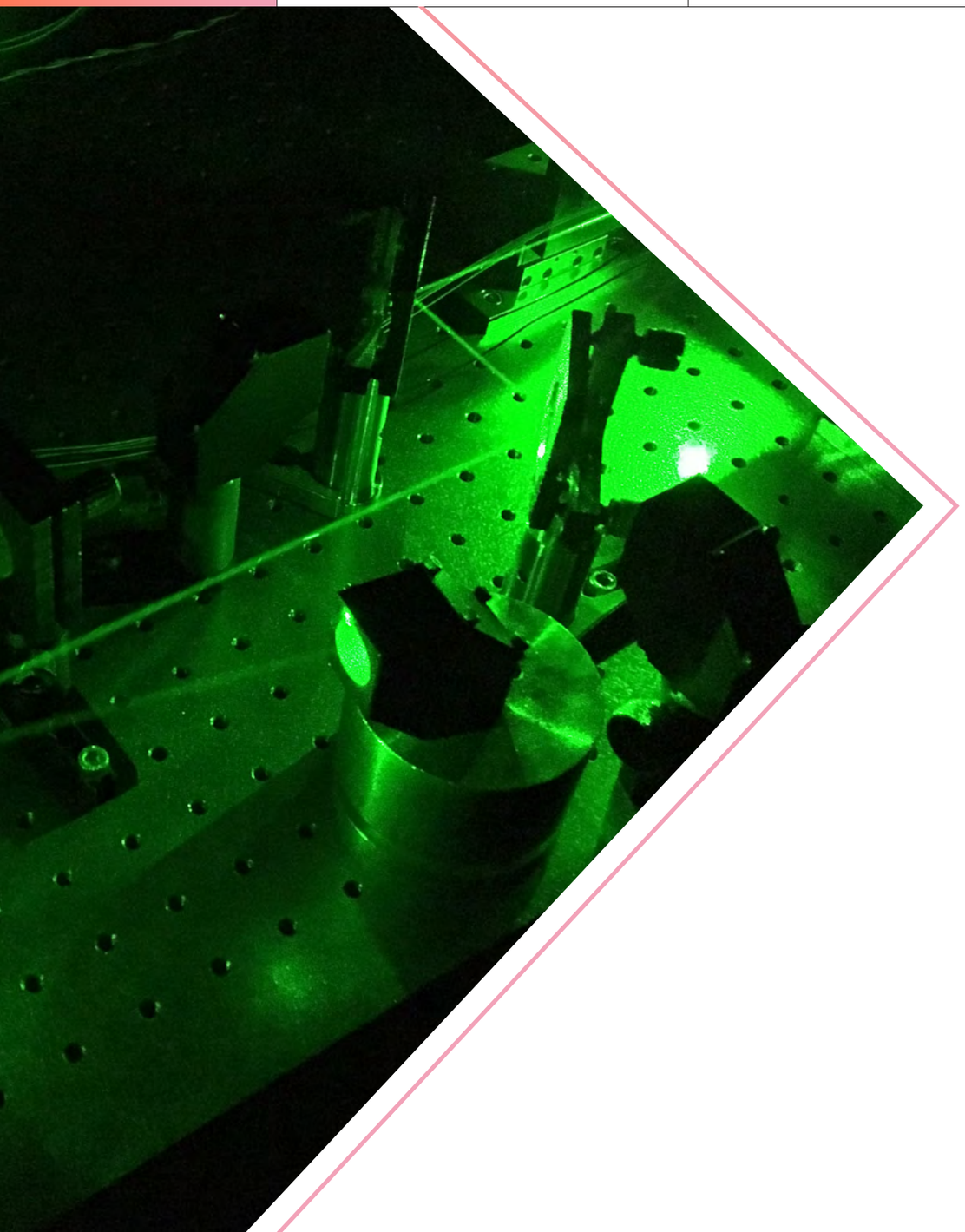
TYPES OF ENGINEERING ECONOMIES IN IRELAND



CHAPTER 01

Introduction

This new data-driven framework offers distinct insight into the spatial distribution and structural composition of Ireland's engineering sector. A new lens that enables deeper exploration and understanding of what's happening in local engineering economies across the country.



Existing understanding of engineering in Ireland

There is already a strong policy and research consensus on the strategic importance of engineering to Ireland's economy. The sector is widely recognised as a driver of innovation, productivity and long-term competitiveness. It contributes significantly to both indigenous enterprise and foreign direct investment (FDI) and is central to high-value industries such as aerospace, MedTech, automotive and ICT. These sectors are underpinned by strengths in enabling technologies including automation, precision engineering and advanced manufacturing.[1]

National agencies such as the Industrial Development Agency (IDA) Ireland and Enterprise Ireland have consistently emphasised engineering's contribution. IDA Ireland reports over 250 engineering-related client companies, employing more than 23,000 people and generating €5.6 billion in exports annually.[2] Enterprise Ireland-supported engineering firms employed over 25,700 people and contributed €2.3 billion in exports in 2022.[3]

Engineers Ireland, the national professional body for the sector, produces detailed annual insights through its Engineering Barometer.[4] The 2025 edition reported a positive outlook among its members with; strong demand for skills, salary growth, and general optimism about the sector's future.

Engineering Economy and Place (EEP) Ireland draws from and complements these existing sources, reinforcing shared findings, while providing new insights. Previous studies often rely on narrow industrial classifications or agency-supported business data, which do not always fully reflect the scale of embedded engineering activity and offer limited insight into local dynamics. This report offers another lens through which to understand the sector. It is based on a different definition and a novel approach, bringing new and distinct insight into the spatial distribution and structural composition of the sector across Ireland.

[1] Engineering Industries Ireland Strategy 2022 - 2025, IBEC
[2] Ireland's Engineering Sector, IDA
[3] Engineering, Enterprise Ireland
[4] Engineering 2025: A Barometer of the Profession in Ireland, Engineers Ireland

About this report

EEP Ireland is the outcome of an exploratory research project undertaken by the Royal Academy of Engineering (RAE) and the Irish Academy of Engineering (IAE), in collaboration with Metro Dynamics and independent economist Maureen O'Reilly and supported by InterTradeIreland. The project set out to test whether the novel, place-based approach to analysing engineering developed by the RAE in the UK in 2023, (which includes England, Scotland, Wales and Northern Ireland data) could be successfully applied to Ireland.

EEP UK was a collaborative project between the RAE and Metro Dynamics, drawing on the Academy's deep understanding of engineering and Metro Dynamics' knowledge of local economies across the UK.

At its core, the approach moves beyond traditional definitions of the engineering sector, offering a broader and more nuanced analysis on how and where engineering activity takes place. It uses national datasets to explore how much, what type, where, and in what context engineering is happening, providing a richer, more place-sensitive understanding.

By applying EEP UK methodology to Ireland data (primarily the 2022 Census), the project delivers new national and county-level estimates of the size and nature of engineering activity. It introduces a new typology for EEP for Ireland - a framework for classifying counties based on shared characteristics of their engineering economies. This is paired with indicators for Ireland's engineering economy, including a model for R&D-focused occupations, to explore both scale and intensity.

Approach

For EEP Ireland a multistage approach was taken to understand engineering activity at a local level, replicating as closely as possible the method developed for the 2023 UK EEP report.[5] The following sections summarise the methodology used with more detail available at the report Annex.

[5] Royal Academy of Engineering, Engineering, Economy and Place, 2023. https://raeng.org.uk/eep

Stage 1: Defining engineering

The definition of engineering used in EEP Ireland follows that of EEP UK and the 2018 study undertaken by Engineering UK, the Engineering Council and the Academy, where a jointly agreed binary definition of UK engineering was developed using Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes.[6]

Termed the **'Engineering Footprint'**, the definition is intentionally broad, emphasising that engineering is essential to a large part of economies and is present in a range of activities. The definition aims to include all aspects of design, building and the use of machines and infrastructure.

This definition allows us to describe the structure of the engineering economy as shown in Table 2.

TABLE 1
Engineering businesses and engineers – EEP UK definition

Engineering businesses	Engineers
Businesses in a set of sectors are defined as engineering.	Engineers are those employed in occupations defined as engineering.
This constitutes 295 SIC codes, all of which form the Engineering Footprint definition.	This constitutes 102 SOC codes, most of which derive from 'Core' and 'Relative' occupations in the engineering footprint, plus the addition of six SOCs and the removal of one more.
All employees in these businesses – regardless of their job title – are included in the total engineering economy employment figures.	All in these engineer-specific occupations, regardless of the activity of the business they work in, are included in the total engineering economy employment figures.

TABLE 2
The structure of the engineering economy

The engineering economy			Everything else
Engineers working in engineering businesses.	Engineers working in non-engineering businesses.	Non-engineers working in engineering businesses.	Non-engineers in non-engineering businesses.
e.g. Mechanical engineering in vehicle manufacturing.	e.g. software engineers in consultancy.	e.g. finance officers in civil engineering.	e.g. waiters in restaurants.

[6] Engineering UK, Defining the engineering sector: the engineering footprint, 2018

Stage 2: Defining Ireland's engineering economy

Ireland and the UK draw their classification of industries and occupations from international standard classifications (such as the EU's NACE industry codes). Using the UK SIC and SOC engineering definitions as the starting point, these were mapped with Ireland's Detailed Industrial Groups (DIGs) and Detailed Occupational Groups (DOGs). In total, 101 DOGs (out of 360) were identified as engineering occupations, and 59 DIGs (out of 146) were identified as engineering industries. These groups make up Ireland's engineering footprint.

Because of the broad nature of the engineering footprint, this study aims to understand the different types of engineering industry across Ireland. To support this aim, DIGs within Ireland's engineering footprint definition have been grouped into four broad categories (see Table 3).

TABLE 3
Broad types of engineering industries

Broad Industry Group	Description
Construction	Construction accounts for seven DIGs, including construction of buildings, civil infrastructure and other specialised activities such as demolition or architectural activities.
Manufacturing	Manufacturing accounts for 30 DIGs, including all types of production and manufacturing (ranging from food and beverage, to metals, chemicals, equipment, furniture, or the manufacture of motor vehicles).
Technology	Technology accounts for 12 DIGs, including all activities related to technology (both hardware, such as the manufacturing of electronics and electrical equipment, and software, such as IT services or media production).
Utilities	Utilities account for 10 DIGs, including the extraction, generation and distribution of key utilities such as electricity, gas, water, and waste.

Stage 3: Reviewing occupational activities in the engineering economy

All occupations in the engineering footprint have been categorised to understand the types of activities in engineering (Table 4). This was achieved by mapping Ireland DIGs to the occupational definitions previously developed for EEP UK.

This step provides insight into the balance of employment in R&D and 'deploy and deliver, focused roles, and on jobs in the engineering economy for non-engineers.

In describing these categories, it is important to highlight that the activities do not necessarily follow a linear sequence, nor do they generally happen in isolation. As an example, testing and evaluation often leads to further research, or deployment can flow back into development and design. While occupations are mapped to categories, sectors span the entire spectrum. With this in mind, the spectrum has been considered in a more interconnected way to better reflect real-world development processes.

Engineering occupations include develop, evaluate, deploy, and deliver categories. On the other hand, research, support and other occupational categories do not form the engineering footprint definition. ◆

TABLE 4
Occupations in the engineering economy

Research & Development				**Practical Application**		**Support**	**Other**
	Research	**Develop**	**Evaluate**	**Deploy**	**Deliver**		
Description	Research into new and innovative forms of engineering involving the creation of new technologies or materials.	Development of new forms of engineering and technology including AI, digital design and polymers.	Testing and evaluation of both new and proven products, including quality control, planning and prototyping.	Technical production and application of products and technologies.	Standardised operation of existing products, processes, machinery, and technologies.	Underpinning activities of engineering, supporting the running of businesses and the sale and distribution of products.	Refers to any other jobs in which people are employed in engineering businesses that are not represented in the other categories.
Keywords	Researches, conducts experiments, observes, applies, models.	Develops, designs, plans, determines, diagnoses, establishes.	Tests, advises, control, quality control, plans, analyses, calculates.	Repairs, mechanic, electrician, builds, installs, constructs.	Operates machinery, processes, manages.	Sales, finance, human resources.	N/A
Examples of occupations	Research & development managers, chemical scientists, physical scientists.	Civil engineers, mechanical engineers, electrical engineers, software developers.	Quality assurance technicians, engineering technicians, IT and telecommunica-tions professionals.	Electricians and electrical fitters, IT engineers, vehicle technicians, mechanics, and electricians.	Process operatives, machine operatives.	Human resources professionals, sales managers, finance professionals.	Caretakers, cleaning services, security guards, storage occupations.

Stage 4: Creating an engineering typology for Ireland

With a definition of engineering in place, the next step is to measure its scale and structure across Ireland. This requires not only estimating how many people are employed in engineering, but also understanding where those jobs are located, what kinds of activities they involve, and how significant they are to local economies.

To do this, a set of indicators were developed across three themes:

1. Engineering Economy
2. Engineering Performance
3. Place Metrics

Consideration was given to the availability of open data in developing the most appropriate mix of indicators to build a detailed picture of Ireland's engineering economy (more detail in the data section).

Table 5 presents the indicators used for each theme. The five core engineering economy indicators are the primary mechanism by which places have been categorised. These are the features which capture the fundamentals of engineering economies; including volume, value, local significance, industry specialisation and R&D intensity.

Together, these measures provide the foundation for a new typology of places, which groups counties according to the distinctive role that engineering plays in their economies. ◆

TABLE 5.
Engineering economy indicators

	Indicators		
	Tier 1: Engineering Economy	**Tier 2: Engineering Performance**	**Tier 3: Place Metrics**
Purpose	The core indicators to assess the different types of engineering economies.	Indicators to describe engineering enterprise associated with the different engineering economies.	Indicators to describe the types of economies and places in which engineering is present.
Indicators	**Volume (Vol):** total employment in the engineering economy. **Value (Val):** average wage in the engineering economy. **Local significance (LS):** % of total employment in the engineering economy. **Industrial specialisation (LQ):** compares the concentration of engineering businesses in a place to the national average. **R&D intensity (R&D):** proportion of engineering jobs in R&D.	**Size of engineering business:** average number of employees per engineering business. **Engineering employment growth:** Compound Annual Growth Rate (CAGR) of employment in engineering economy (2016–2022). **Earnings gap:** % difference between engineering wage and average wage.	**Education:** proportion at third level education. **Wages:** mean annual earnings . **Population density.** **Business density.** **Pobal Rank:** deprivation score.

Data

This study aimed to replicate, as closely as possible, the methodology developed in the 2023 EEP UK study and to produce the strongest possible analysis using Ireland's publicly available and trusted official data sources with a view to repeating the study in the future if successful. The methodology here draws on multiple data sources provided by the Central Statistics Office (CSO) in Ireland including the 2022 census, business demography statics from the Business Register and commuting data.
Unless otherwise specified, the analysis in this report uses data from 2022.

LIMITATIONS
The 2022 census was the only data source on the CSO that could provide the most granular information on employment in industries and occupations in each administrative county. The use of census data here means that future updates of this study will only be possible every five years, coinciding with the next census update.

As data from the census is collected at the individual's level, the location of employment reported is based on where people live, rather than where they work. To counter this, commuting data was used to understand the disparities in employment between where workers live and where they work, and to estimate employment figures more accurately for workplaces rather than residences.

The census data breaks down employment by each detailed industrial group and detailed occupational group for each of the 31 administrative counties in Ireland. This is presented as two separate datasets and is insufficient to understand the occupational breakdowns within each industry needed to calculate employment in the engineering economy. To achieve this, the CSO produced employment data by DIG and occupational category in Ireland, as shown in Table 6, using occupational category definitions provided. This data covers all industries, not just those in the engineering definition.

This data was used to calculate the proportional breakdown of occupational categories in each DIG. These proportions can then be applied to employment by each DIG to estimate the size of the engineering footprint in each administrative county.

TABLE 6
Sample of bespoke data request from the Census - employee numbers

Detailed Industry Group	Research	Develop	Evaluate	Deliver	Deploy	Support	Other	Not stated
0190 Farming (farming of animals, mixed farming)	61	17	36	536	201	792	63,390	379
0190 Growing of crops, fruits, plants, flowers ad vegetables	26	12	19	453	66	488	2,904	209
0192 Other agricultural activities and agricultural activities n.e.c.	92	35	13	139	296	420	2,805	135
0200 Forestry and logging	27	13	17	95	32	233	1,549	72
0300 Fishing and aquaculture	16	13	19	116	62	163	1474	45
0400 Horseracing activities	31	16	7	53	79	570	3,929	73
0600 Extraction of crude petroleum and natural gas	<6	14	<6	10	12	23	13	8
0700 Mining of metal ores	41	47	24	378	162	84	73	11
0800 Other mining and quarryin/Mining and quarrying of coal and lignite	41	49	37	661	282	1,140	586	79

IRELAND'S ADMINISTRATIVE COUNTIES

Wherever possible the data collected for this study is at the administrative county level. In Ireland, there are 31 administrative counties, and they represent the local government councils across the country. There are 26 County Councils, three City Councils (Cork, Dublin and Galway), and two City and County Councils (Limerick and Waterford).

For some datasets, including the business demography statistics, data was only available for the 26 counties. In this case, engineering employment is used to weight business counts and allocate them to the administrative counties in Cork, Dublin and Galway.

APPROACH TO INDICATORS

Volume: total employment in the engineering economy

Following on from the methodology described above, the data takes a bottom-up approach by aggregating engineering occupations and industries to calculate the total size of the sector. In this study, the size (or volume) of the engineering economy includes:

- engineering occupations in engineering industries
- engineering occupations in non-engineering industries
- non-engineering occupations in engineering industries.

Total employment in the engineering economy is calculated as total employment excluding non-engineering occupations within non-engineering industries (Table 2).

Value: average wage in the engineering economy
In the EEP UK report, the value of the engineering economy was measured by calculating the engineering footprint's gross value added (GVA) per worker. While it may be possible to replicate this for Ireland, it is advised against, on the basis that the strong presence of multinational corporations often inflates GVA and GDP figures, resulting in misleading distortions of value. As an alternative measure for Ireland, the value was measured by the mean annual earnings of workers in the total engineering footprint.

The calculated value figure includes the earnings of non-engineers in engineering industries; therefore, further research was conducted to understand the average earnings of engineering occupations, outlined later in this report. One drawback of using earnings data is that it does not reach the same geographical level as employment data from the census. Instead, earnings data by industry from the CSO is only available at the broader county level, not the administrative county level. This means that the administrative counties of Dublin City, Dun Laoghaire-Rathdown, Fingal and South Dublin are merged into Dublin County, while Cork City and Galway City merge with their respective counties to form a single data point. As a result, the value for each of these administrative counties is the same as that of others in the same county.

Local significance: % of total employment in the engineering economy
Local significance is calculated as the share of total employment in each administrative county that constitutes the engineering footprint; therefore, it utilises the same census data as volume. Despite using commuting data to improve the accuracy of the volume indicator, this did not enhance the accuracy of local significance, as commuting data is not available by industry or occupation.

Specialisation: compares the concentration of engineering businesses in a place to the national average
To calculate the industrial specialisation of engineering across Ireland, Business Demography statistics from the Business Register were used. Business demographics data gives the number of active enterprises and persons engaged by industry (broken down by 2-digit industrial groups) and county. The main caveat is that the Irish Business Register counts a business and all employees at its registered address. Businesses with multiple premises are only counted once, and the total employment for these businesses will all be counted where the business is registered rather than where it may be located.

R&D intensity: proportion of engineering jobs in R&D
R&D Intensity is calculated from the same census as used to calculate volume. It is the proportion of employment in the engineering footprint represented by R&D occupations: Research, Develop and Evaluate.

As for Local significance, relevant commuting data by R&D intensity is not available and accuracy could not be enhanced in the same was as for volume.

DEVELOPING THE TYPOLOGY
The typology is intended as a descriptive tool that captures the current state of local engineering economies. For this reason, it focuses on static indicators in the core set, (Tier 1), which are used to categorise places. The categorisation takes a positive approach, highlighting areas of high performance, relative to the national context. The approach is data-driven and contextual, with thresholds for high performance chosen based on the national distribution of the indicators and informed by insights and experiences from different local economies.

Places with the same combination of standout features are grouped together, and through this process, five typology groups have been identified. Engineering Performance and Place factors are then used to build a more detailed understanding of the types of places grouped together.

Ireland's engineering typology and categorisation process has been guided by quantitative patterns and analytical insight. The methodology followed that of the 2023 EEP UK study as closely as possible to ensure consistency in approach. Together, this work provides a data-driven, context-rich framework for deeper exploration of what's happening at a local level across Ireland. ◆

CHAPTER 02

Engineering and the Economy

In 2022, Ireland's engineering economy employed 725,000 people, 31% of the Irish workforce, with over one-fifth of those employed in a role focused on R&D intensive activities.

Engineering and the Economy

Engineering makes up a major share of Ireland's economy. In 2022, over 725,000 people, almost one in three workers, were employed in engineering roles or in businesses that depend on engineering. These jobs are not only numerous, but also among the highest value in the labour market, with average earnings well above the national level.

This section sets out the scale and structure of the engineering economy; how many people it employs, what kinds of activities they are engaged in, and how these patterns vary across the country. It also introduces the indicators used to compare counties, which form the basis of a new typology showing the different ways engineering contributes to local economies across Ireland.

IRELAND'S ENGINEERING ECONOMY

In 2022, the engineering economy in Ireland employed 725,000 people, 31% of all employment in Ireland (Figure 2). These are high-value jobs, spread across the whole of the economy, with engineering playing a role in all broad sectors and making a major contribution to employment nationally and in each county. In 2022, the engineering sector accounted for over 1 in 10 (12%) of businesses in Ireland (Figure 2), a smaller share than employment, suggesting engineering businesses are larger on average than non-engineering businesses.

Of the 725,000 employees in the engineering economy, 513,000 (approx 71%) are in engineering occupations (Figure 3). Of the 513,000 engineering occupations, 330,000 are people in engineering businesses, demonstrating that engineering businesses dominate the employment of engineering occupations. The remaining 183,000 people employed in engineering occupations include those who perform engineering roles but are not in engineering businesses, such as software engineers working for a financial services company. 212,000 employed in the engineering economy are non-engineering occupations being performed in engineering businesses, such as a human resources manager in a manufacturing company. While not engineering occupations, they still contribute to the engineering economy by working in engineering businesses.

To understand the value being created by the engineering sector, the average earnings in the engineering economy have been calculated. At €59,300 in 2022, were 14% higher than the overall average, indicating that the engineering economy generates a higher value of output on average. Both the engineering economy and the total average earnings have grown since 2011, but the engineering economy earnings have grown at a faster rate (2.9% on average each year, and the gap in growth has stretched from 9% in 2011 to 14% in 2022. High inflation across this period has also contributed to significant average increases in nominal pay.

FIGURE 2
Scale of the engineering economy

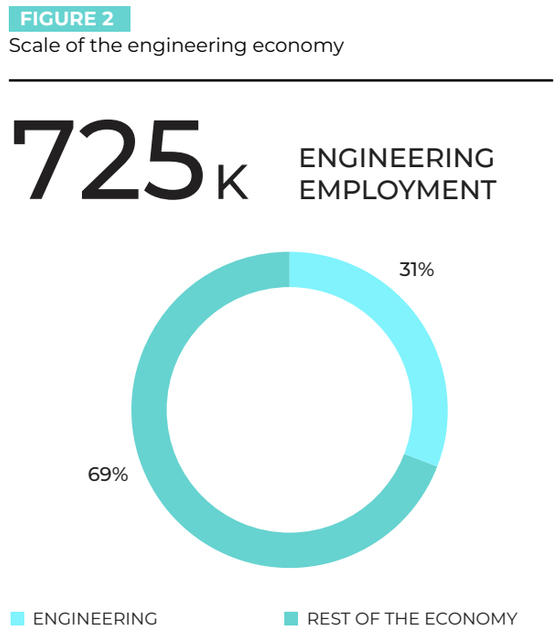
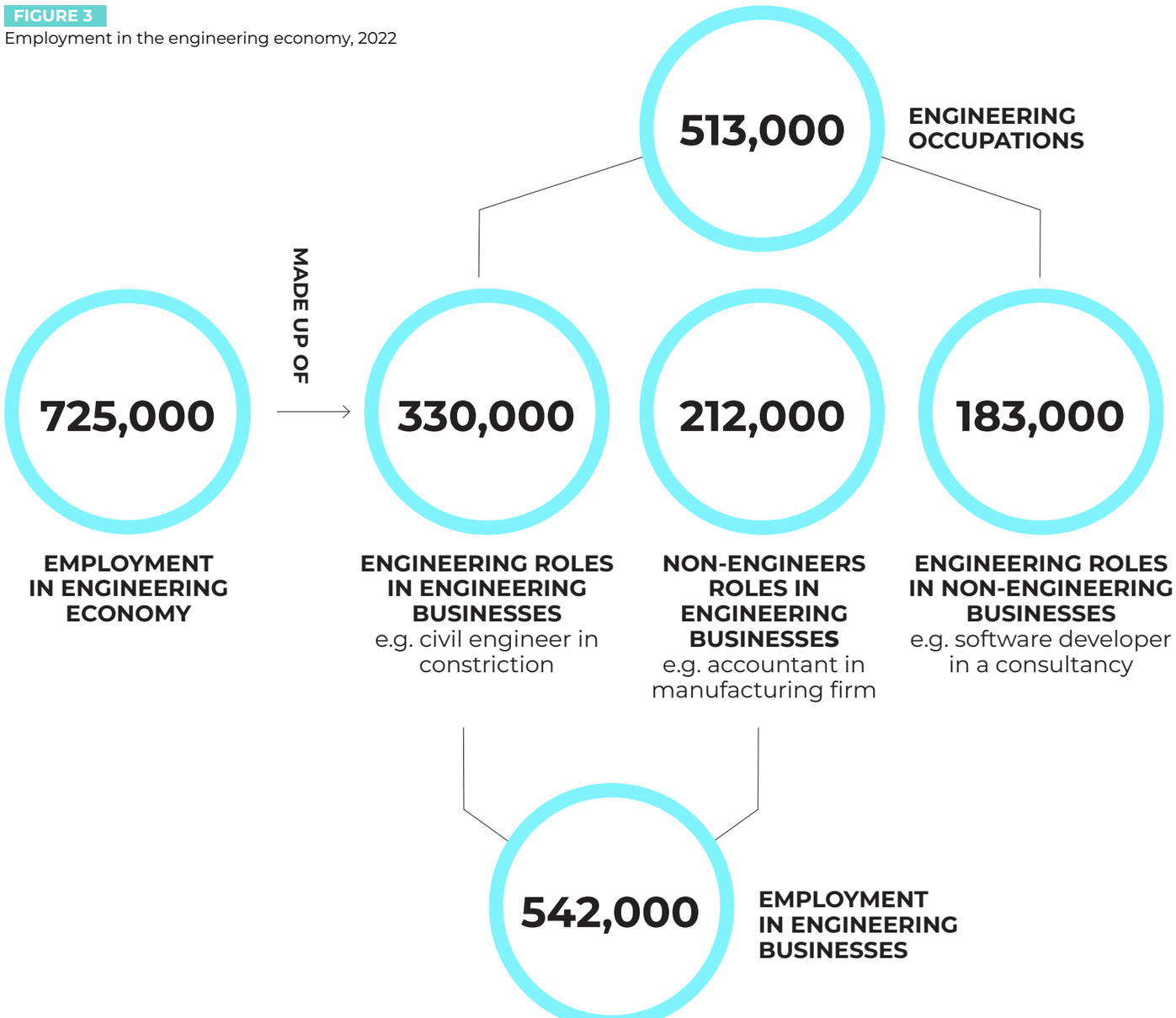


FIGURE 3
Employment in the engineering economy, 2022



Note on average earnings

Average earnings are taken from national statistics, modelled from average earnings by industry data. While informative and a good indicator of value, we know from occupation wages, Engineering Ireland's salary survey, and other sources that these averages mask a very wide salary range in the sector, with many earning wages much higher than the averages. In addition, EEP analysis includes wages of non-engineering occupations in engineering businesses. A more detailed analysis of earnings is at Annex B: Spotlight on earnings

Figure 4 demonstrates that Ireland's engineering sector has a much higher R&D intensity than the wider economy, with over three times the share of people employed in occupations that are focused on Research, Develop or Evaluate activities. In total, 22%, of workers in the engineering economy are in R&D roles, 14 percentage points more than the 7.5% share in the total workforce. The engineering economy also has a much higher share of deliver and deploy occupations (50%) and only a small share of employment in other occupations (10%).

FIGURE 4
Occupational breakdown of employment

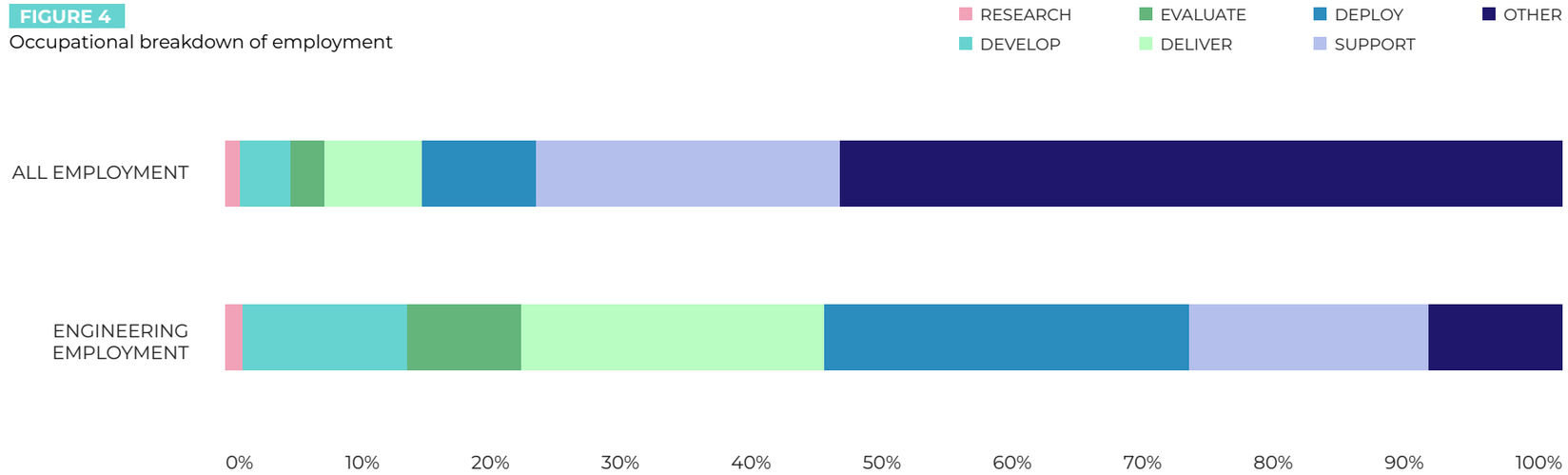
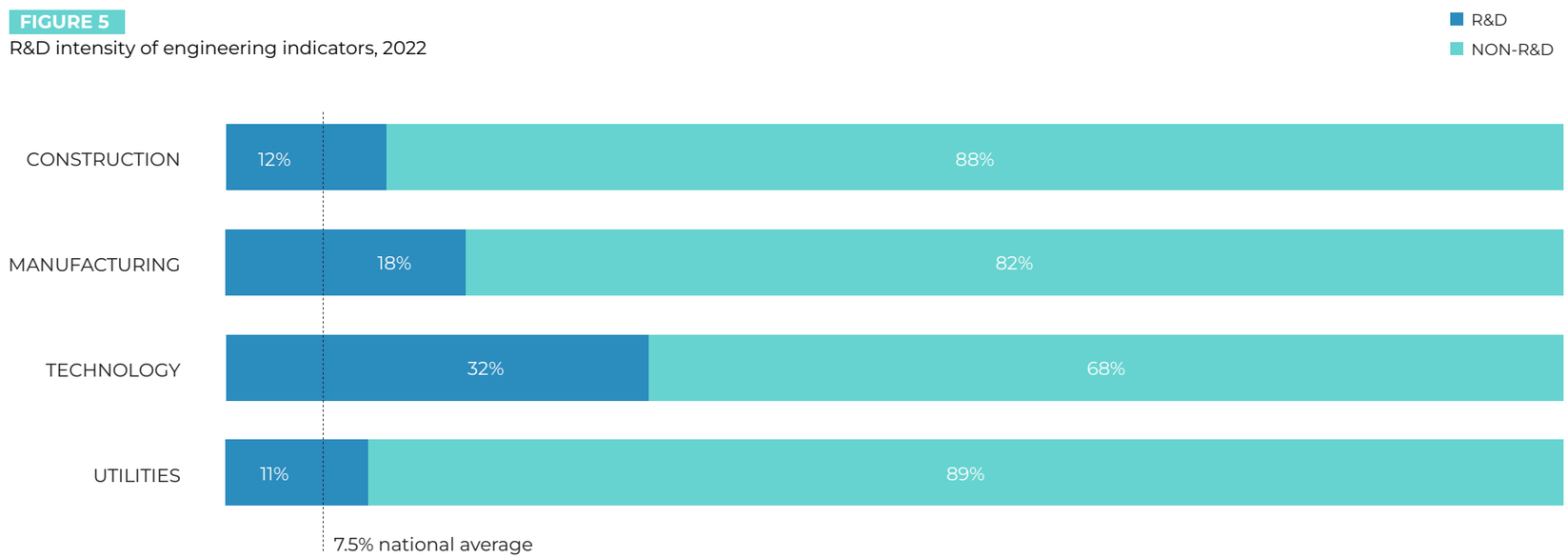


Figure 5 shows the share of employment in R&D roles across the different types of engineering industries. The highest R&D intensity is in the technology industry workforce, where it is almost of a third of employment, followed by manufacturing at 18%. However, all four types of engineering industries have a higher share of R&D jobs than the full workforce average.

FIGURE 5
R&D intensity of engineering indicators, 2022



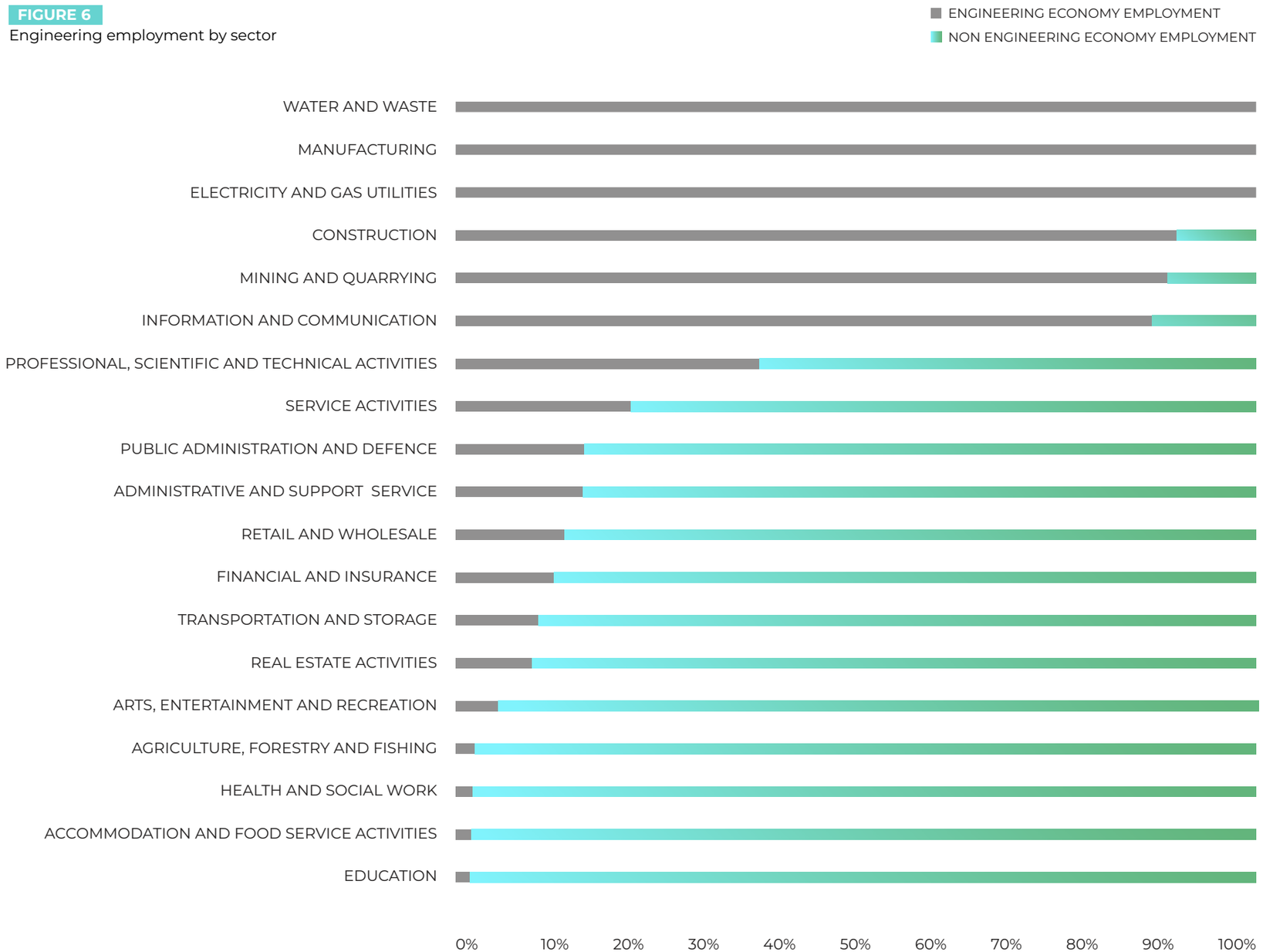
Distribution by sector

Industry-occupation analysis shows that engineering occupations provide key capabilities across the economy, playing a role in all major sectors.

The distribution of engineering employment across sectors of the economy and the size of the role it plays is estimated by combining occupations and sector data. There is a large variation in the share of employment that engineering accounts for, from the Utilities sectors and Manufacturing, where the entirety of the activity taking place is encompassed in the engineering economy definition, to areas such as Health and Social work and Education, where it accounts for less than 5% of employment.

This analysis, shown in Figure 6, highlights the importance of engineering to Ireland's economy and the extent of its influence. Engineering occupations are across all sectors of the economy.

FIGURE 6
Engineering employment by sector



Local engineering economies

The findings of this research have provided new estimates of the size of the engineering economy and its role in the national economy. As well as this new understanding of the national landscape, this research has developed estimates for the distribution of activity at the local level, showing the geography of the sector across Ireland and the role which it is playing in different parts of the country.

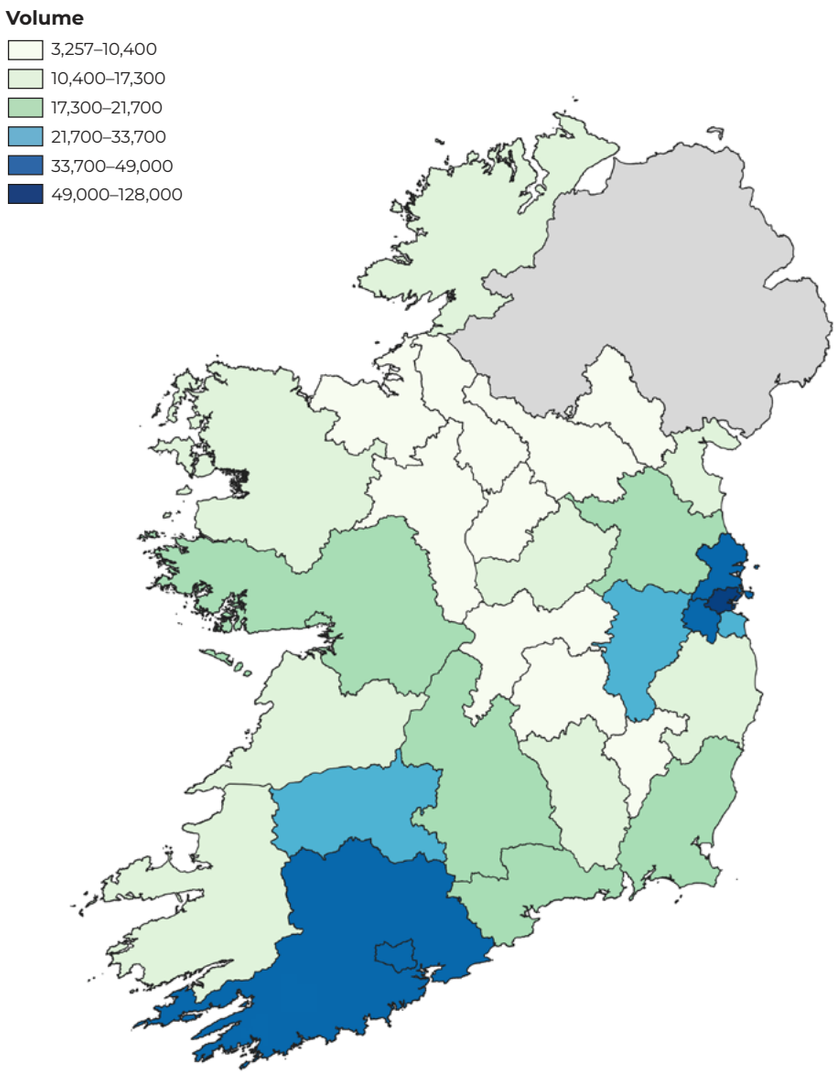
Understanding what activity is taking place and where is crucial to understanding the role of engineering in and across Ireland, and how the major indicators used look at a county level. To do this, five core indicators describing engineering economies are used:

Core indicators

- **Volume (Vol):** Total employment in the engineering economy.
- **Value (Val):** estimated average engineering wage.
- **Local Significance (LS):** % of total employment in the engineering economy.
- **Industrial Specialisation (LQ):** compares the concentration of engineering businesses in a county to the national average.
- **R&D Intensity (R&D):** share of engineering jobs in R&D roles.

The maps presented on the following pages show these core indicators by administrative county.

FIGURE 10
Employment in the engineering economy



SIZE OF LOCAL ENGINEERING ECONOMIES

Engineering volume, the measure of the scale of local engineering activity closely reflects population and overall job density. Dublin City,[7] has the highest volume of engineering jobs with 128,000 people employed in engineering, which accounts for 18% of the total engineering footprint in Ireland, very close to the city's share of total employment in Ireland of 19%. Cork City and County also have a relatively high engineering footprint with over 97,000 employed in engineering across the two combined, accounting for 13.4% of Ireland's total engineering footprint versus 11.5% of total employment. The smallest volume estimates are the three counties which have the smallest total employment numbers, with Leitrim, Longford and Roscommon each with an estimated volume of less than 7,000 employed in the engineering economy, accounting for 2.25% of Ireland's total engineering footprint.

LOCAL ROLE OF ENGINEERING

As well as the size of engineering employment, the role it plays within places is a key dimension to understand. Local significance, defined as the share of total employment which engineering accounts for, allows us to compare this across counties. The highest local significance is in Cork City and Cork County, where the engineering employment accounts for over 36% of total employment, followed by Cavan (34%) and Galway County (33.9%).

The sector plays a larger role in smaller cities outside of Dublin than in the capital. While Dublin is by some distance the largest centre of engineering, engineering accounts for a smaller share of total employment than it does in all other places. In other words, while engineering is hugely significant nationally, it doesn't dominate the large capital city economy.

Employment share is one way of viewing the role of the sector locally, the degree of Industrial

[7] Dublin City Council's administrative area

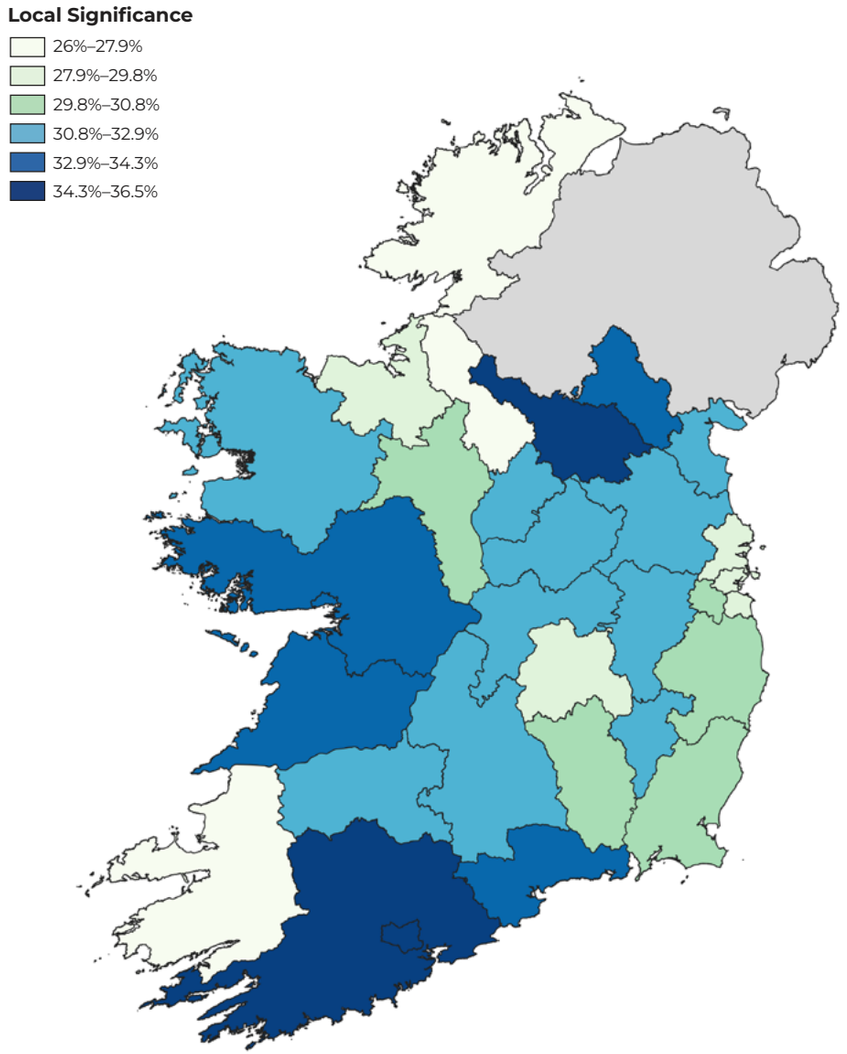
Specialisation gives another perspective. This is measured by the business Location Quotient (LQ), which compares the concentration of engineering businesses in a county to the national average. An LQ above 1 means that there is a higher concentration of engineering businesses in that county than the national average. Higher concentrations are often taken as a signal of specialism in a sector, signalling some degree of clustering with a sector 'over-represented' among the local business base. Industrial Specialisation is greatest in Cork City and County at 1.19, meaning engineering businesses in these places make up 19% more of the business base than the national average. Other counties which have a higher concentration of engineering firms in their business base are Waterford and Carlow, each with an LQ above 1.1.

Laois, Wicklow and Kilkenny each have a high LQ, but lower local significance, suggesting that engineering businesses are either smaller on average in these counties, or that there is a lower proportion of engineering jobs in non-engineering sectors. On the other hand, Cavan and Galway City & County have a high local significance, but lower industrial specialisation, suggesting that engineering businesses are larger on average in these counties[8].

This shows that a high employment share does not always coincide with high business concentration, and vice versa. Some places have relatively low employment but high specialisation, where engineering is concentrated in a few firms or niches. Others have high employment but low specialisation, typically larger and more diverse economies where engineering is important but balanced by other sectors.

[8] Another possible cause of this would be a higher than average proportion of engineering jobs in non-engineering sectors, analysis suggests this is not the case.

FIGURE 11
Local significance of engineering



Value of engineering economies

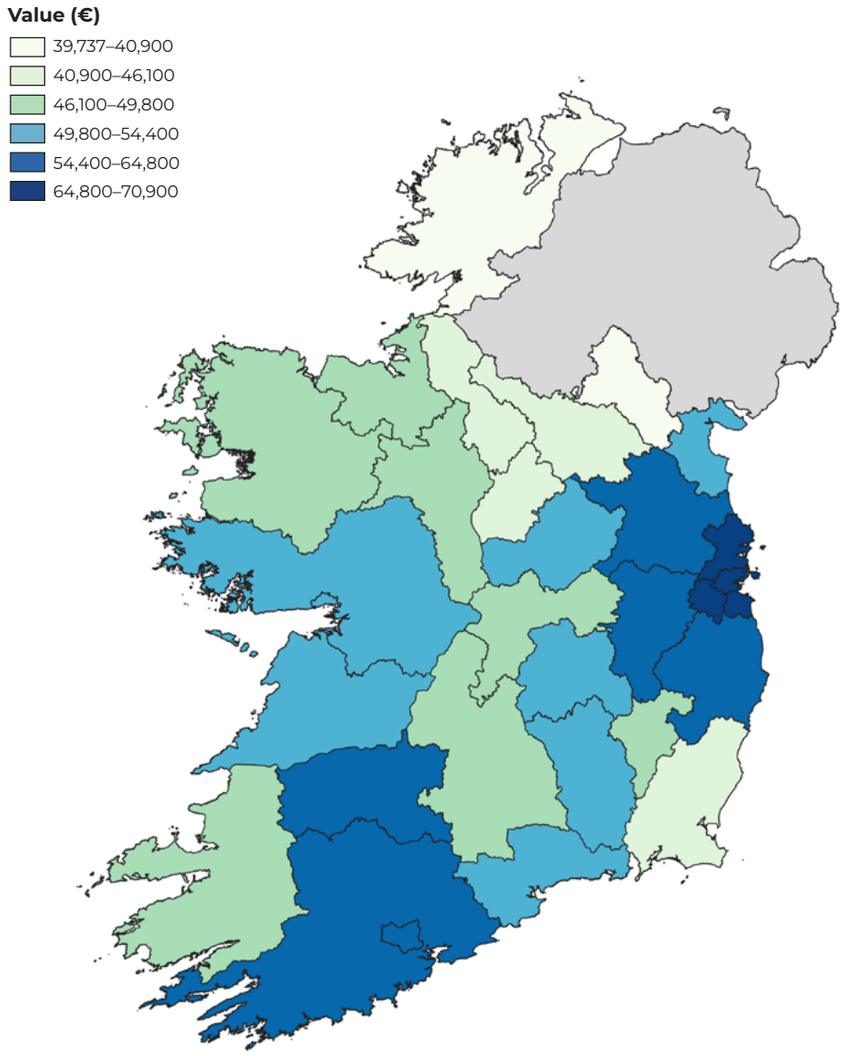
The analysis shows that the engineering economy is higher in value with average earnings as a proxy than the national average. Average earnings are not a perfect proxy for value, but as they reflect the relative productivity and economic contribution of labour in a sector, they are a good signal and allow for comparison across places and sectors[9]. (Annex B provides more detail on average earnings in the engineering economy).

Higher average earnings across the engineering economy suggest that engineering contributes to greater prosperity in places. While there is variation in the size of the gap between average engineering economy wages and the average across all occupations, it is always positive, with higher average earnings in the engineering economy in every administrative county[10]. This is true for each but there are variations across the country, with larger places (defined by population) tending to also be highest in value, led by Dublin which is followed by Kildare, Wicklow and Cork. Value is on average higher in places where engineering is R&D intensive.

[9] The alternative, and the approach implemented in the UK study would be to estimate GVA per worker, however given the less spatially and sectorally granular national accounts available in Ireland this approach was not feasible.

[10] As earnings data was available at the county level, not administrative county, where a county is split into multiple administrative areas the value estimate is the same.

FIGURE 12
Value of local engineering economies

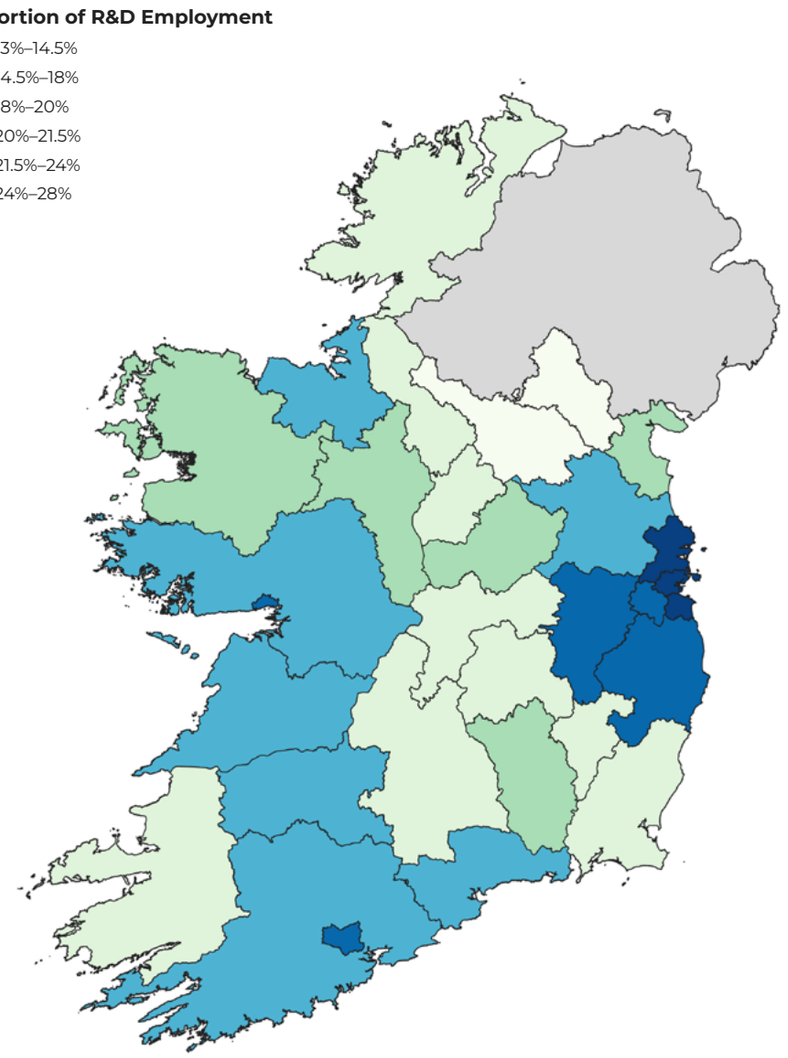


R&D intensity of engineering

Figure 13 shows the R&D intensity of the engineering sector in each administrative county in Ireland measured by the share of engineering jobs that are in R&D roles. In total, 22% of engineering jobs in Ireland are in R&D occupations with a high degree of variance by place, from 13% in Monaghan to 28% in Dun Laoghaire-Rathdown. The variation in R&D intensity highlights that while engineering is a major part of local economies everywhere, there are large differences in the type of engineering activity taking place.

The importance of cities and higher education institutes in the engineering innovation ecosystem is clear, with high levels of R&D intensity across Dublin, Cork and Galway. Dublin's influence (and the spread of its labour market) is likely to be a contributor to higher R&D intensity in neighbouring counties, particularly Wicklow. More rural areas across the border counties and parts of the Midlands, which do not have the same density of population and higher education activity tend to have much lower R&D intensity.

FIGURE 13
R&D intensity of engineering employment



Spotlight: Employment growth in the engineering economy

Between 2016 and 2022 engineering has seen strong growth across the country and in particular, strong R&D employment growth. This suggests increasing strength in innovation and shifts towards higher value activity across Ireland.

Figure 14 shows employment growth in the engineering economy since 2011. Employment across the engineering sector is 44% higher than it was in 2011, with total employment rising 29% over the same period. Over this time engineering has grown in size, by over 200,000 jobs and accounts for a greater share of all jobs.

The rate of growth in engineering employment, which has been higher than total growth in employment likely reflects a combination of the growing strength of the sector as well as recovery from the impacts of the 2007 banking crisis which may have disproportionately impacted engineering employment, particularly given the impact on the construction industry.

With 24% overall growth in engineering employment numbers between 2016 and 2022 all parts of the country have seen increases to volume in this period. Areas of particularly strong growth are spread across the country, led by Cork City, a standout region for engineering, with high value and R&D intensity, along with growth. Large local economies in Dublin and Meath have also seen high rates of growth.

Importantly, growth has not been confined to the area of existing scale and strength, there has been high growth in counties in the Northern Ireland border region and also Longford, parts of the country where engineering does not make up a large share of the local economy (relative to other places).

FIGURE 14
Change in employment (2011=100)

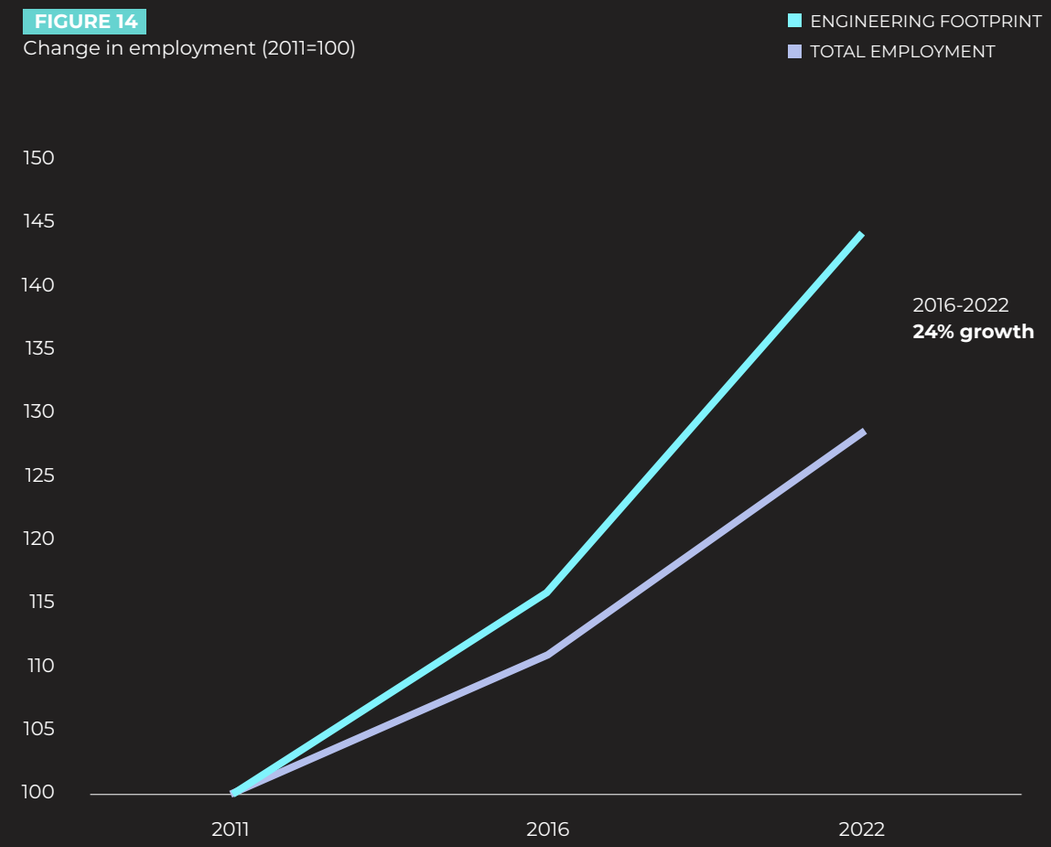


FIGURE 15
Growth in engineering employment and R&D employment within the engineering economy

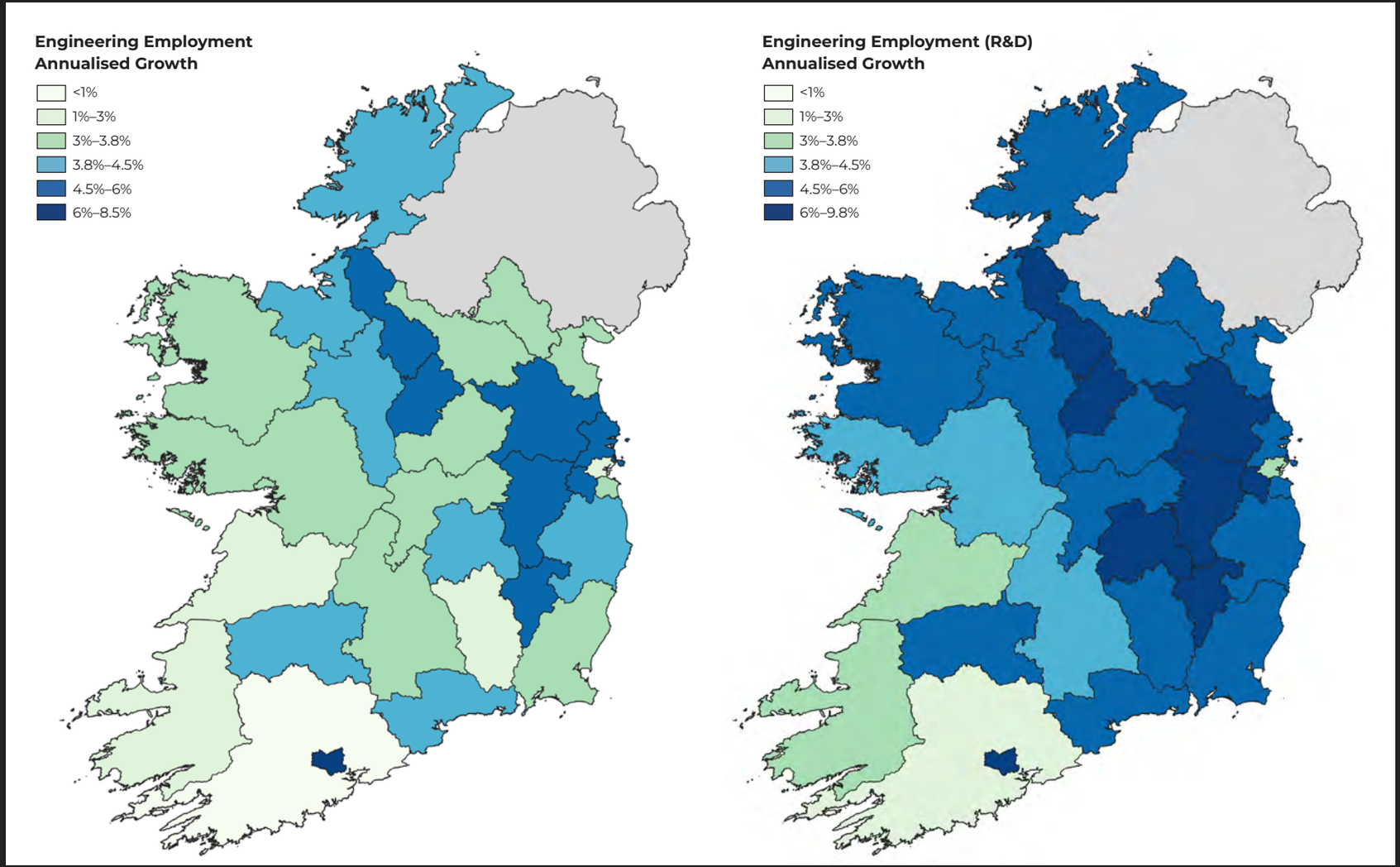


Figure 15 shows the change in R&D employment in engineering, which has grown fastest in Cork. This analysis also highlights strong growth (albeit from a lower base) in Leitrim, Longford and Laois, where engineering R&D intensity grew faster than total engineering footprint. This growth reflects an element of catch-up as they still fall behind other counties. A shift in the composition of the sector in these places, if sustained, is also likely to generate greater value creation and support the growth of higher-paid jobs in local economies (with R&D roles, on average, paying higher wages than the other occupation groups in the occupation categorisation).

CHAPTER 03

A typology for Engineering Economy & Place

Engineering is more central to Ireland's prosperity than previously measured. Places with the same combination of standout features have been grouped together, with five typology groups identified. Engineering performance and place factors then build a more detailed understanding of these groups.

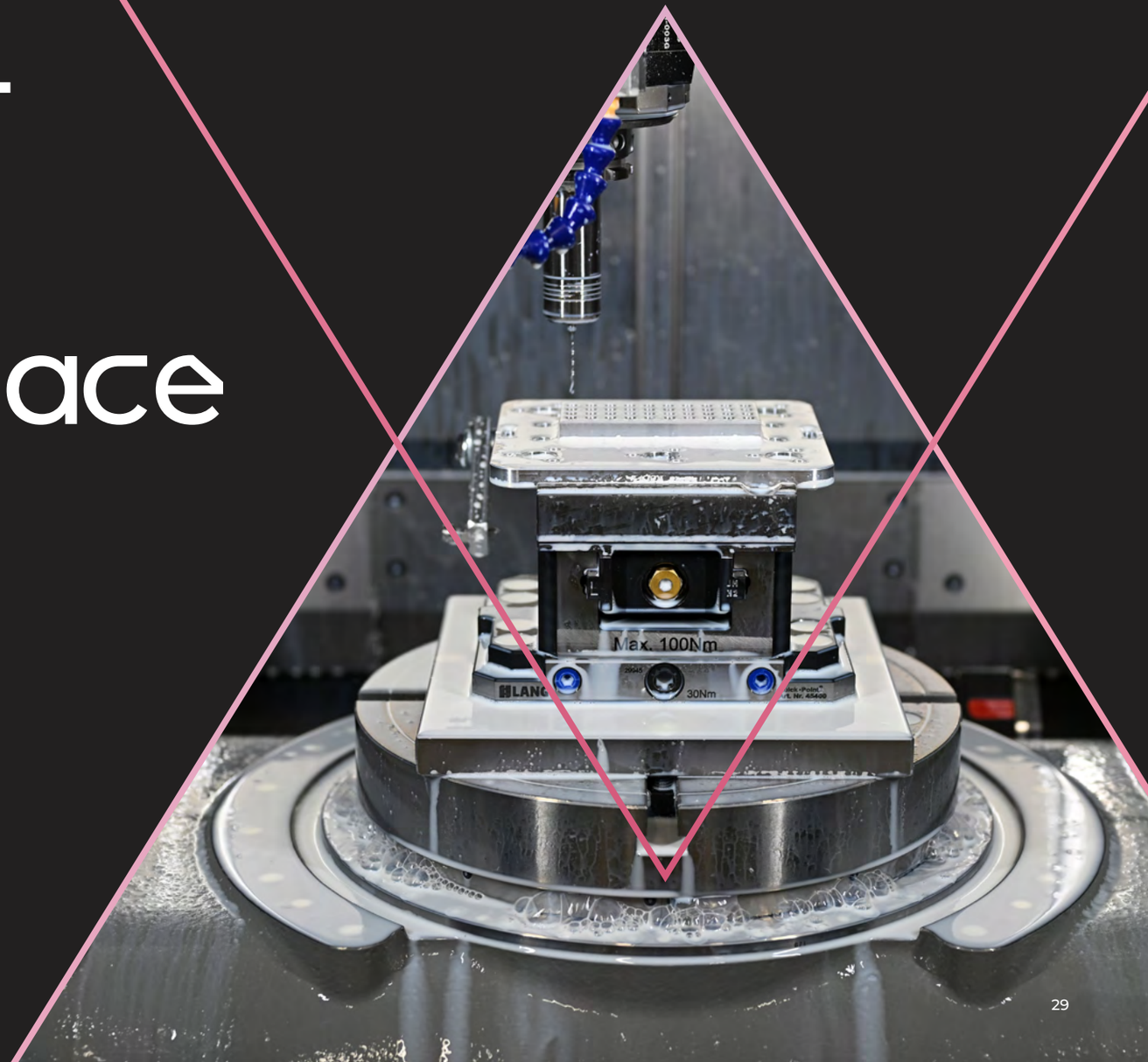
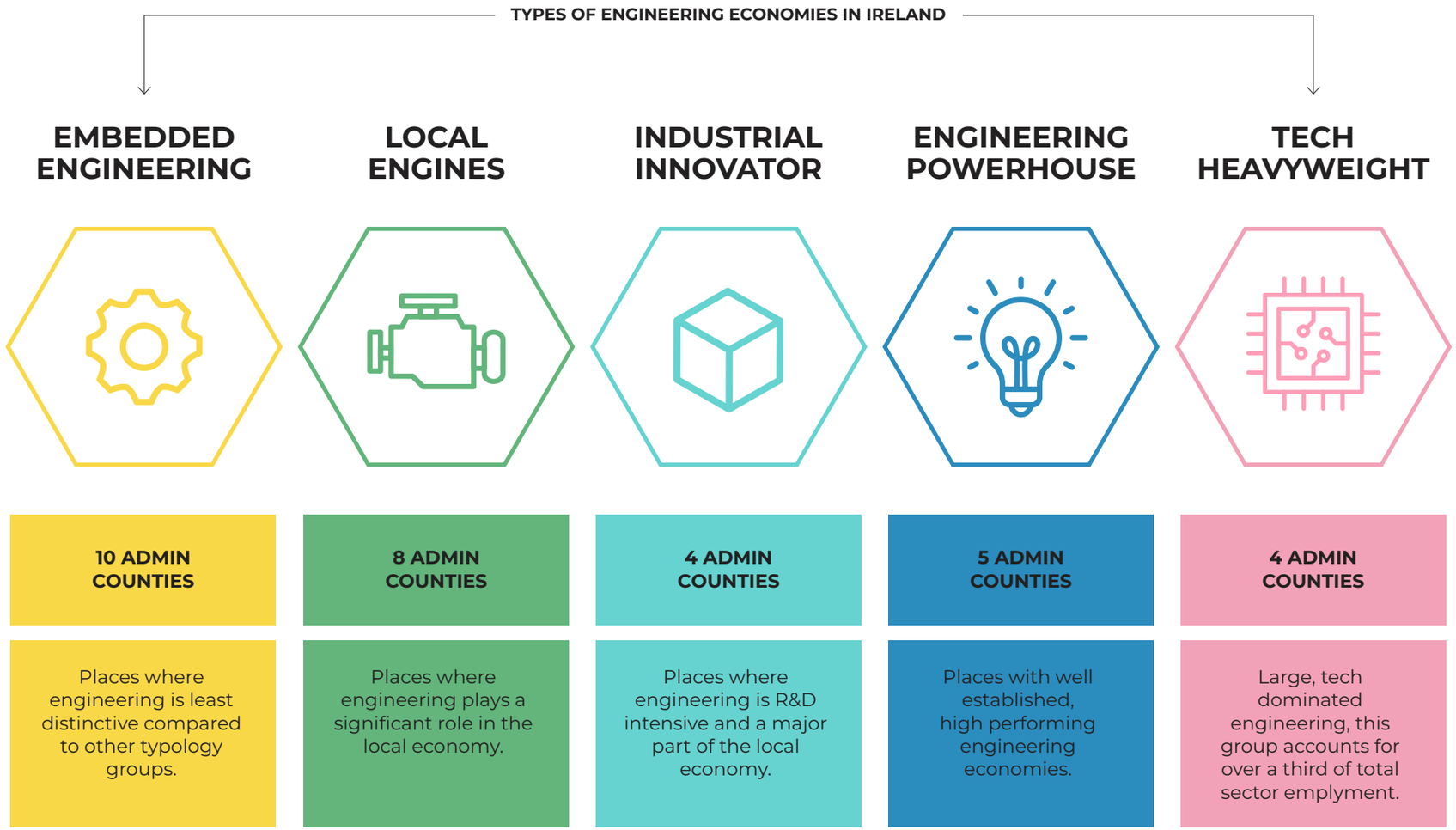


FIGURE 16
Engineering typology groups



Across sectors and places, engineering plays a major role in Ireland's economy. The findings of this research give granular estimates of the size and characteristics (composition and performance) of the sector at the county level. As well as the importance of engineering, the analysis shows the diversity of the sector. The engineering typology has been developed as a tool to describe different engineering economies and help articulate the role of engineering in different places.

The typology is built from a set of indicators grouped under three themes:

1. Engineering Economy
2. Engineering Performance
3. Place Metrics

These themes have been used to categorise Ireland's 31 administrative counties into five groups (Figure 16). The core engineering economy indicators introduced earlier (volume, value, local significance, industrial specialisation and R&D intensity) are the primary basis for this categorisation, reflecting the fundamentals of each county's engineering economy. The broad typology categories are explored at Table 7. ▲

TABLE 7
Typology categories

	EMBEDDED ENGINEERING (10 Administrative counties)			LOCAL ENGINES (8 Administrative counties)			INDUSTRIAL INNOVATOR (4 Administrative counties)			ENGINEERING POWERHOUSE (5 Administrative counties)			TECH HEAVYWEIGHT (4 Administrative counties)		
ENGINEERING ECONOMY	**139,000** Employment	**9,600** Businesses	**€48,600** Engineering wage	**79,000** Employment	**3,800** Businesses	**€48,600** Engineering wage	**78,000** Employment	**4,200** Businesses	**€53,200** Engineering wage	**183,000** Employment	**10,400** Businesses	**€61,400** Engineering wage	**246,000** Employment	**14,100** Businesses	**€70,000** Engineering wage
GROUP TRAITS	Smaller places where engineering makes up a lower share of the economy than in other groups. While less dominant, engineering still makes up a large share and value (measured by average wages in the sector) in thes places. The average engineering wage is higher compared to other sectors (though the gap is smaller than other places). R&D intensity is low and growing more slowly in this group of places.			A group of places where engineering plays a very significant role in the local economy, providing at least 29% of overall employment. The sector is less R&D intensive in these places, with less employment in tech. These are smaller (in population terms) places and employment per business is lower than the average. Wages in engineering are lower than other groups but the sector is still higher playing that the local average (though by less than other places).			A small group of places where engineering is a major part of the local economy and where this engineering is R&D intensive, driving innovation in smaller local economies. These are places where manufacturing makes up an important part of the engineering economy, with larger average engineering business (by employment).			The largest counties outside of Dublin, these are places with well established, high performing engineering economies. Volume and value are high and engineering makes up a high proportion of local employment, with a local significance above 32%. R&D intensity is above the national level on average and foreign-owned companies are a significant part of the local economy. Engineering is strong across each of the four broad sectors: tech, manufacturing, construction & utilities.			This group is a single area, the four administrative counties of Dublin, which collectively account for over a third of total engineering employment and of businesses. However, the scale of the economy in these places overall drives a lower local significance for engineering, which is also dominated by technology. In common with this, and wider economic trends in the area, employment is R&D intensive, and wages are high.		
CORE ENGINEERING INDICATORS	LS Vol Val LQ R&D			LS Vol Val LQ R&D			LS Vol Val LQ R&D			LS Vol Val LQ R&D			LS Vol Val LQ R&D		

Key:
Local significance (LS): percentage of total employment represented by the engineering economy.
Volume (Vol): total number of jobs from the engineering economy.
Value (Val): estimated average engineering wage.
Industry specialisation (LQ): the concentration of engineering business.
R&D: the proportion of engineering economy jobs in research and development related roles.

To identify engineering patterns in places using this set of indicators, a national average was calculated for each metric alongside the numerical range. These values were used as a baseline for assessing and categorising places, informing the development of a 'high to low' threshold for each indicator, displayed by colours as follows:
Red: Low performance relative to average.
Amber: Mid performance relative to average.
Green: High performance relative to average.

Low performance — High performance

Typology group characteristics

Table 8 presents, for each group, the average values across the typology indicators, giving an overview of the types of engineering economies seen in these places and how the sector appears to be performing.

TABLE 8
Typology groups' performance

	ENGINEERING ECONOMY					ENGINEERING PERFORMANCE			PLACE METRICS			
Typology Group	**Local Significance**	**Volume**	**Value**	**Industrial Significance**	**R&D %**	**Engineering employment growth**	**Average employees per engineering business**	**Value: earnings gap**	**Proportion at Third Level Education 2022 %**	**Mean annual earnings**	**Population density**	**Business Density**
Embedded Engineering	29.80%	13,000	€ 48,600	0.92	18.60%	3.80%	5.5	9.60%	36.10%	€ 44,300	51	608
Local Engine	32.70%	9,700	€ 48,600	1.02	17.10%	4.40%	7.1	8.30%	34.50%	€ 44,700	54	585
Industrial Innovator	33.40%	19,000	€ 53,200	0.99	21.70%	3.50%	9.1	10.50%	42.20%	€ 48,100	451	652
Engineering Powerhouse	34.00%	37,000	€ 61,400	1.08	21.50%	4.60%	7.3	16.90%	42.00%	€ 52,500	313	612
Tech Heavyweight	29.80%	62,000	€ 70,900	0.95	25.40%	4.00%	11.5	16.60%	50.20%	€ 60,800	2,241	820

To identify engineering patterns in places using this set of indicators, a national average was calculated for each metric alongside the numerical range. These values were used as a baseline for assessing and categorising places, informing the development of a 'high to low' threshold for each indicator, displayed by colours as follows:

- **Red:** Low performance relative to average.
- **Orange:** Mid performance relative to average.
- **Green:** High performance relative to average.

Mapping the engineering place typology

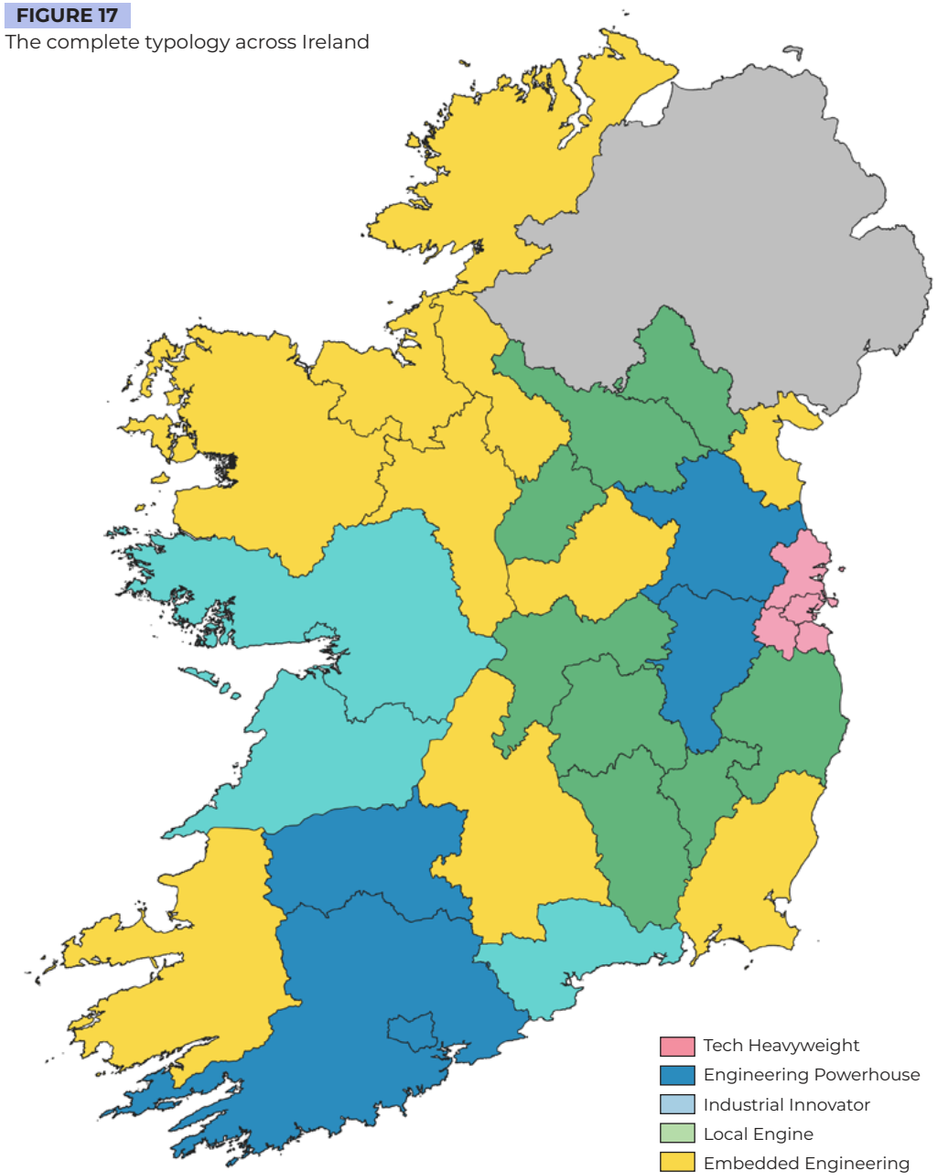
Individual authorities have been grouped together based on shared characteristics and trends rather than geographical proximity. However, naturally, some within each category share boundaries or regions, and there appear to be spatial patterns across groups.

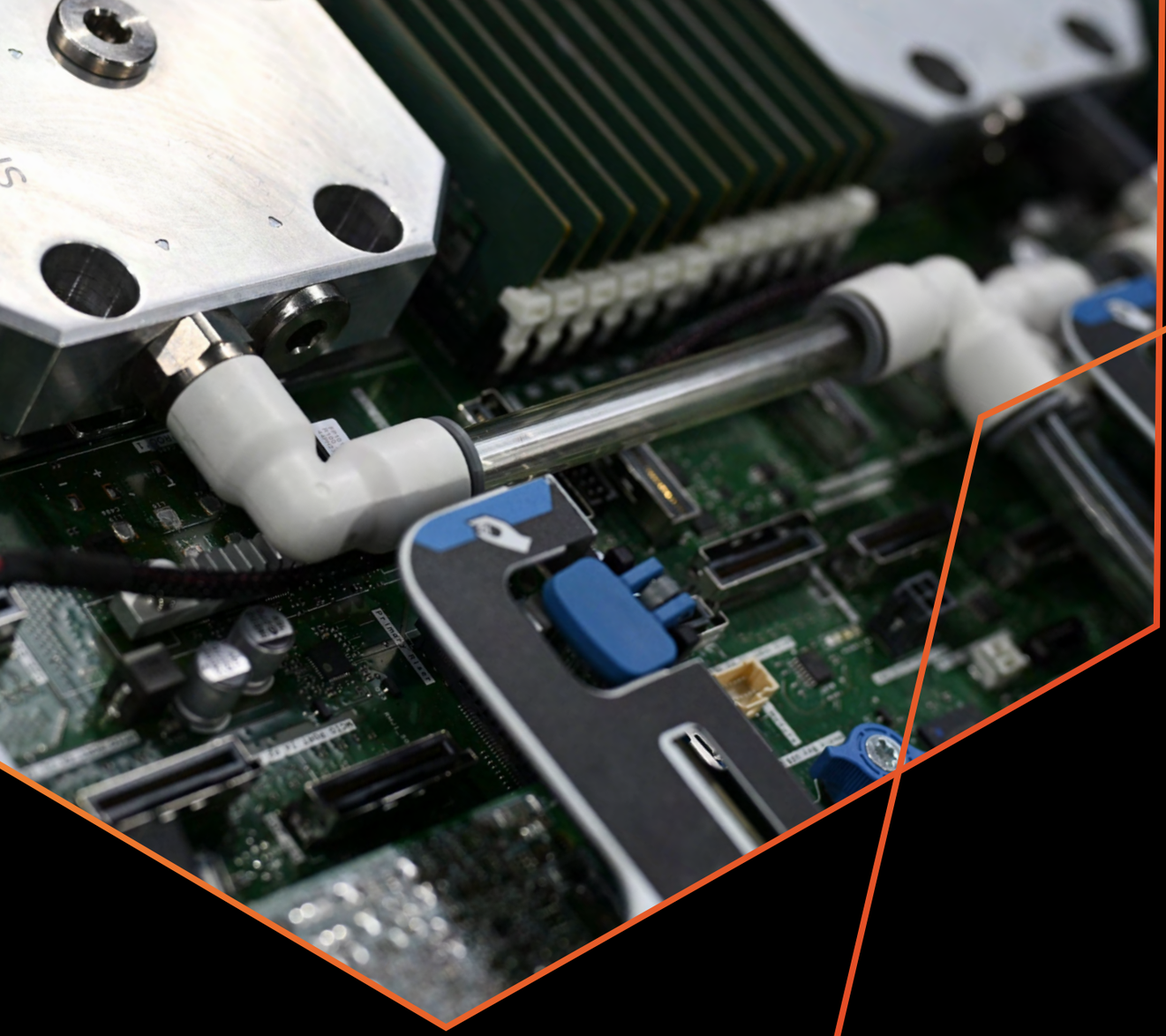
The map in Figure 17 shows the complete typology across Ireland. The distinctiveness of Dublin is evident, with the four administrative counties combining into an engineering area which is in a category of its own.

The groups marked out as higher in R&D activity levels (the Tech Heavyweight, Engineering Powerhouse and Industrial Innovators) are located across more densely populated parts of the country, Dublin and its surroundings, but also other cities including Cork, Galway, Limerick and Waterford. The Engineering Powerhouse, and particularly the Industrial Innovator grouping, highlight the pivotal role of smaller cities in Ireland in the national engineering and innovation system as hubs of R&D intensive activity. At the same time, it emphasises the importance of engineering as a driver of R&D across different places, with all the positive impacts this can bring for places.

The Border Counties, the North-West and the Midlands, along with rural counties such as Kerry and Tipperary, face greater economic development challenges and are classified within the Local Engines and Embedded Engineering groups. These areas typically have smaller and lower-value engineering economies, meaning the sector is less likely to drive wider activity compared with larger urban centres. Nonetheless, engineering remains an important part of their local economies. Encouragingly, Local Engine counties have seen strong growth in engineering employment, while Embedded Engineering areas such as Sligo and Roscommon, and Carlow (a Local Engine), have recorded notable increases in engineering R&D intensity.

FIGURE 17
The complete typology across Ireland





CHAPTER 04

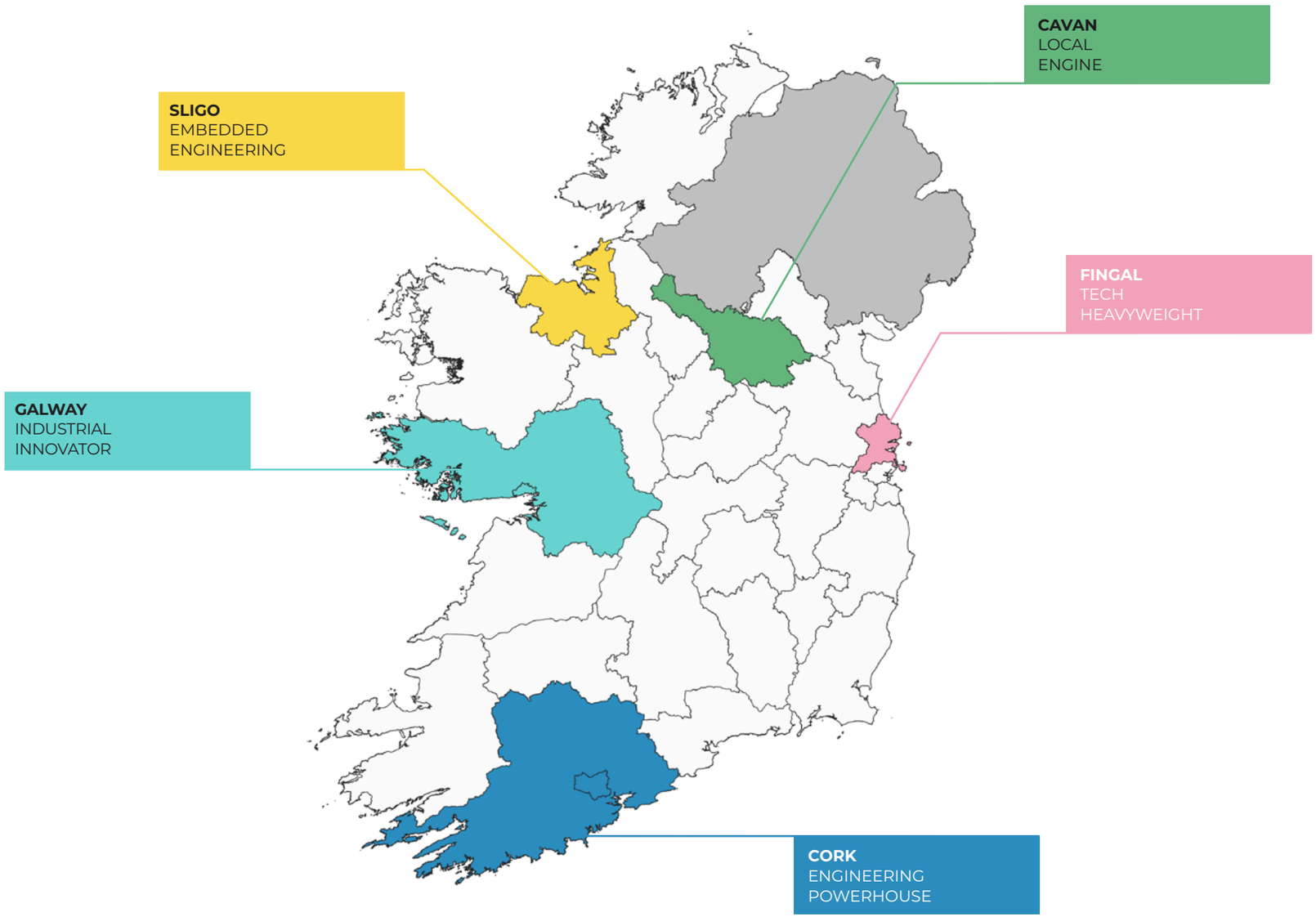
Engineering Places

Across sectors and places, engineering plays a major role in Ireland's economy. Place snapshots help illustrate the range and level of nuance across the typology.

Engineering Places

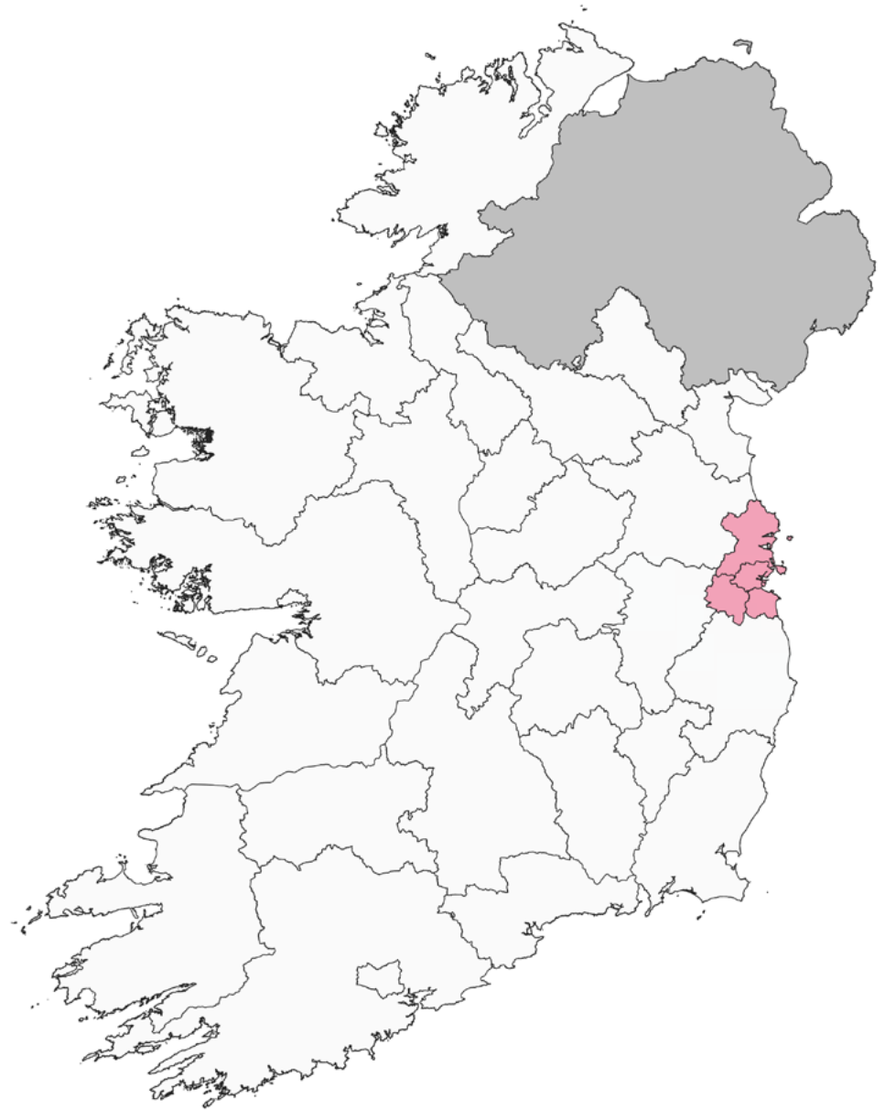
The following pages take the five typology categories individually, describing each in more detail, along with a summary place case study, exploring how engineering has developed and how it is part of local economies across the country.

FIGURE 18
Engineering places case studies



Tech Heavyweight

4 ADMINISTRATIVE COUNTIES



The Tech Heavyweight category is unique as a group as it is both a collection of four distinct places and a unified economic area, with the four Dublin authorities[11] falling into the same categorisation. While one of the smallest groups in a number of places, it is the largest in terms of the size of its engineering footprint, accounting for 34% of engineering economy employment (only slightly lower than its share of total employment in Ireland, which was 36% in 2022).

These places are characterised by the large scale and high value of the activity taking place. While the volume of engineering activity is large, at 246,000 engineering economy occupations across Dublin County, it is a smaller share of the overall local economy than that seen in other parts of the country at 29.6%.

Engineering employment in Dublin is heavily concentrated in technology industries, with a much lower share in manufacturing. These places are also characterised by high R&D intensity 24%–28%, with high shares of employment across roles focused on research, develop and evaluate activities, and the business base is larger on average, than the other groups, averaging 3,500 engineering businesses.

[11] Dublin City Centre, Fingal, Dún Laoghaire–Rathdown and South Dublin.

What distinguishes Tech Heavyweights from other categories?

The defining characteristics of **Tech Heavyweights** are their large scale, high value, and strong R&D intensity.

Unlike **Engineering Powerhouses** (the other high-volume category) engineering accounts for a smaller share of overall activity in **Tech Heavyweights**, which is a key point of distinction.

Spotlight on Fingal

Engineering economy:	**43,900** **Employment**	**2,500** **Businesses**	**€70,900** **Average Earnings**

Fingal represents a significant, high-value engineering footprint, despite a slightly lower local significance than average. The county has one of the highest R&D intensities in Ireland at 24.3%, and a 13% higher employment concentration in technology industries than in Ireland. Engineering is also growing at a faster rate than most other counties.

Fingal has become a major centre of engineering and technology within the Greater Dublin Area. Often overshadowed by Dublin City, it has followed a distinct growth path shaped by strong infrastructure, good transport links and a focus on enterprise. Over recent decades, Fingal has shifted from being largely agricultural to a high-value, export-oriented and technology-rich economy, supported by investment in education, enterprise zones, connectivity, and foreign direct investment.

National and regional strategies identify Fingal as a key area for future growth, with development focused on Swords, Blanchardstown and the Airport Economic Zone. Its strengths in ICT, advanced manufacturing, aerospace, and smart infrastructure are widely recognised, and the county's local plan (2023–2028) places engineering-related sectors at the heart of future expansion. Priorities include growing enterprise and clusters, strengthening skills and training, and improving transport and digital infrastructure, alongside a focus on sustainability and decarbonisation.

Today, Fingal's engineering economy employs over 25,000 people across ICT, biopharma, aerospace and advanced manufacturing. Major employers include MSD Biotech, Bristol-Myers Squibb, IBM, PayPal, Synopsys, Symantec, Ryanair, Aer Lingus and Dublin Airport. Alongside these multinationals, many local SMEs specialise in automation, robotics, precision engineering and smart infrastructure, often working with global firms on prototyping, tailored solutions and supply chains. Together, these firms help sustain high household incomes and a thriving regional economy. These strengths, combined with Fingal's innovation capacity, reinforce its role as a leading technology hub in Ireland.

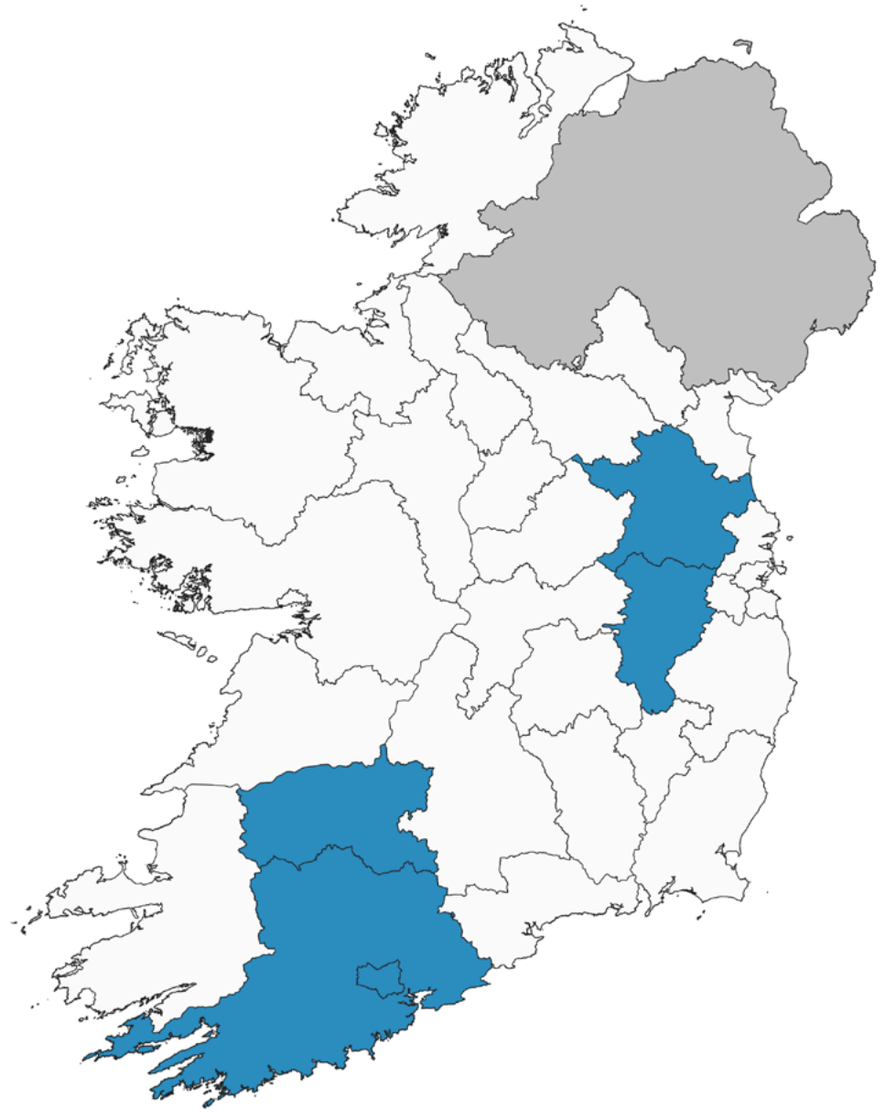
ENGINEERING ECONOMY KEY INDICATORS FOR FINGAL

Engineering Economy Indicators	**Volume** Fingal: 44k Avg: 23k	**Value** Fingal: 71k Avg: 54k	**Local Significance** Fingal: 30% Avg: 31%[12]	**Industry specialisation** Fingal: 0.95 Avg: 0.97	**R&D Intensity** Fingal: 24% Avg: 20%

[12] The average score reflects the average of all the administrative counties in Ireland, not the Ireland total. This gives a clearer indication of how Fingal compares to other places.

Engineering Powerhouse

5 ADMINISTRATIVE COUNTIES



The Engineering Powerhouse category covers counties with well established, high performing engineering economies. Outside of Dublin, these are the largest in volume and have the next highest level of value and R&D intensity. They fall into two pockets, with Kildare and Meath closely tied to the Tech Heavyweights of Dublin, while Cork and Limerick show similar engineering economy features.

These are strong engineering economies, where the engineering footprint accounts for a high proportion of local employment. Each of these places has a local significance exceeding 32% (and 34% on average). They are strong across the four broad industrial areas: tech, manufacturing, construction, and utilities and have had an average growth rate of 4.6% each year from 2016 to 2022, the most of any typology group, with the Ireland average at 3.7%.

Alongside their supply chains and labour market linkages to Dublin, Kildare and Meath maintain distinct and important engineering economies in their own right. Kildare has been (and remains) a major hub of high-tech manufacturing and semiconductor innovation, and has developed complementary strengths around this, including microelectronics, precision automation and cleanroom construction. Building on the county's rural–industrial roots, Meath has a strong AgriTech sector along with a network of SMEs in agricultural engineering and machinery innovation.

In the South and South-West, engineering is central to Cork's large and diversified industrial base with strengths spanning biopharma, MedTech, ICT, and advanced manufacturing. In Limerick, with its proximity to the Shannon Free Zone, firms are active across precision engineering, MedTech, digital technology, and aerospace.

What distinguishes an Engineering Powerhouse from other categories?

Places in this group are engineering economies with high local significance in a way that the Dublin **Tech Heavyweight** area, where engineering is large in volume but lower in local significance, is not.

They are larger and higher in value than the **Industrial Innovators** group.

These places have more balanced strengths across domains of engineering than **Industrial Innovators** (where manufacturing is the main strength) and the **Tech Heavyweight** area, where tech is the dominant strength.

Spotlight on Cork

Engineering economy:	**96,800** **Employment**	**5,500** **Businesses**	**€62,500** **Average Earnings**

Cork has the highest local significance in Ireland, as over 36% of total employment is in the engineering footprint in both the city and county. It also has the most significant industrial specialisation, with a 19% higher concentration of engineering businesses than the national average. The county also ranks among the highest in engineering size, value and R&D intensity, reinforcing its position as an Engineering Powerhouse. Strengths are seen across all engineering industries, with particularly high proportion of employment in manufacturing and technology.

Cork City and County are prime examples of how engineering can drive economic development. As Ireland's 'second city,' Cork has evolved from an industrial and maritime hub into a centre for advanced manufacturing, life sciences, electronics, and renewable energy. This transformation is supported by a globally connected engineering ecosystem.

Engineering plays a strategic role in Cork's economic planning. Under Project Ireland 2040 and the NPF Review, Cork is designated as a key counterbalance to Dublin, attracting major public investments. These include upgrades to Cork Airport and Port of Cork, strategic road connectivity projects such as the M28 and M20, and urban mobility initiatives such as Cork Light Rail and BusConnects. These projects require expertise in civil, systems, marine, and environmental engineering, reinforcing Cork's status as an Engineering Powerhouse.

Cork's engineering sector is bolstered by major employers such as Apple, Pfizer, Stryker, and Boston Scientific, which contribute to a diverse and high-value economic base. The presence of these multinational companies drives local economic impacts, including high-value SME employment and entrepreneurship.

Education and talent development are crucial to Cork's engineering-led growth. Institutions such as Munster Technological University and University College Cork collaborate with local employers to ensure that graduate skills meet industry demands. Research centres such as the Tyndall National Institute and the MaREI Centre further embed innovation within the regional economy. Tyndall alone has secured over €40 million in EU research funding, underscoring Cork's international profile.

Cork's engineering sector aligns with national sustainability and digital transformation goals, positioning the city and county as leaders in Ireland's green and digital transitions. Despite challenges such as skills shortages and talent retention, Cork continues to shape a resilient and future-ready regional economy.

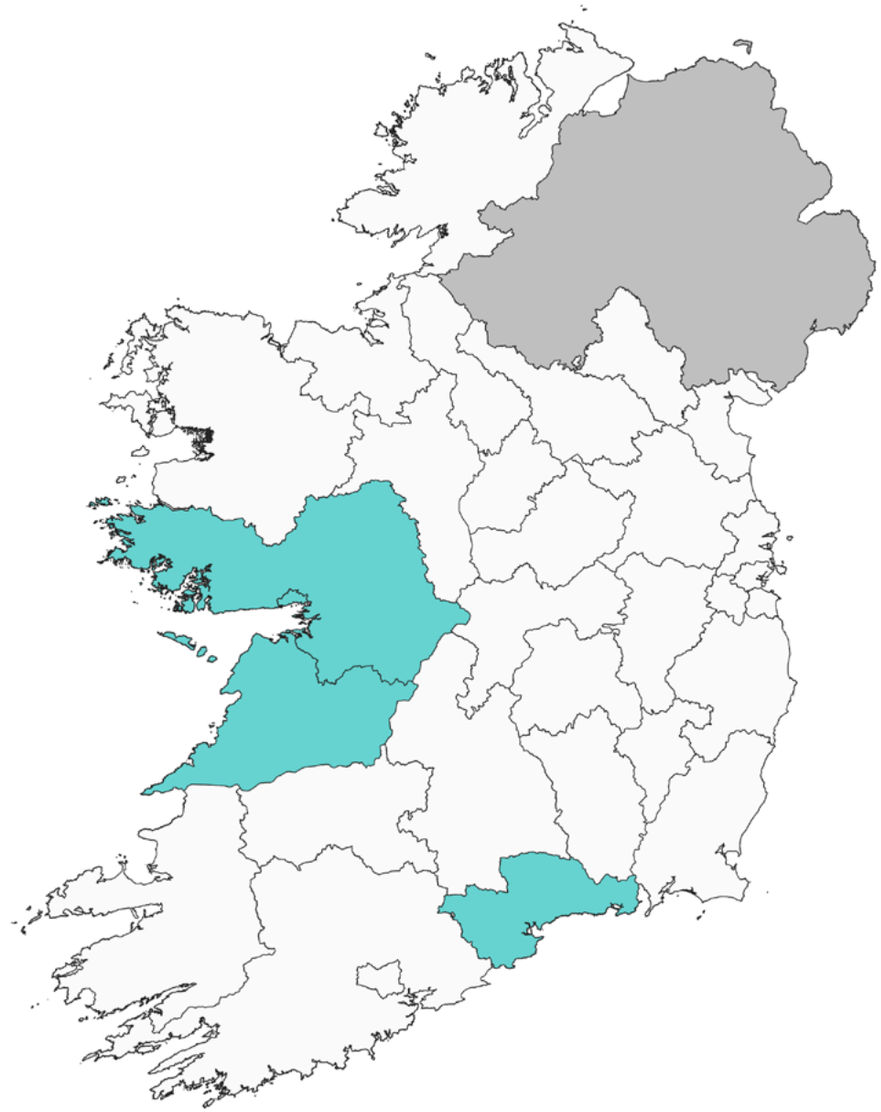
ENGINEERING ECONOMY KEY INDICATORS FOR CORK

Engineering Economy Indicators	**Volume** Cork: 48k Avg: 23k	**Value** Cork: 62k Avg: 54k	**Local Significance** Cork: 36% Avg: 31%[13]	**Industry specialisation** Cork: 1.19 Avg: 0.97	**R&D Intensity** Cork: 23% Avg: 20%

[13] The average score reflects the average of all the administrative counties in Ireland, not the Ireland total. This gives a clearer indication of how Cork compares to other places.

Industrial Innovator

4 ADMINISTRATIVE COUNTIES



The Industrial Innovators are a small group of four administrative counties across Galway (City and County[14]) and Clare in the West and Waterford on the East coast. These are places where there is a high share of local economic activity in engineering, and where engineering is more R&D intensive than the average.

Compared to the two previous groups these are smaller places where there are strong levels of R&D activity in the engineering sectors. Looking at the size of the engineering footprint in these places puts this group in the centre of the pack, higher than Embedded Engineering and Local Engines and below the other two groups, and the same is true for value. Manufacturing makes up an important part of the engineering economy, this is the group with the highest share of employment in manufacturing at 35%, with the Ireland total at 26%, and businesses are larger on average.

A particular interest for this group is the role of engineering as a driver of innovation and therefore value and productivity in smaller local economies. In Galway, engineering innovation includes a major MedTech cluster, where global leaders such as Medtronic and Boston Scientific, long established in the city, collaborate with the University of Galway on research and product development. In Clare, the engineering sector is closely tied to aviation and aerospace, with strengths (particularly in the Shannon Free Zone) in precision manufacturing, automation and sensor technologies. Waterford, meanwhile, is emerging as a strong regional centre and a leader in areas such as plastics engineering and toolmaking, sectors which are important locally and as part of wider national supply chains.

[14] One reason for Galway City falling into this group instead of, for example, the Powerhouse group, may be due to the administrative boundary of the city council, which may divide some of the areas of high activity outside the city centre across two jurisdictions.

What distinguishes an Industrial Innovator from other categories?

These places have a higher level of R&D intensity in their engineering economies than the **Local Engines** and **Embedded Engineering** groups.

These are smaller places compared to the **Engineering Powerhouse** group, with clear strengths in Manufacturing, where the **Engineering Powerhouse** group are strong across the four broad areas in Engineering.

Spotlight on Galway

Engineering economy:	**42,400** **Employment**	**2,100** **Businesses**	**€53,100** **Average Earnings**

Engineering in Galway accounts for over 33% of total employment, but a slightly lower value compared to those places within the Engineering Powerhouse or Tech Heavyweight groups. The concentration of employment in manufacturing is nearly 40% higher than the national average, and average business size and R&D intensity also exceed the national average.

Engineering has significantly contributed to Galway's economic development, becoming a core driver of the regional economy. The region has a substantial engineering footprint, with high-value manufacturing, research and design activities spread across various industrial hubs, supporting thousands of jobs.

Galway is internationally recognised as a MedTech powerhouse, hosting some of the world's largest medical device manufacturers including, Boston Scientific and Medtronic alongside high-growth indigenous firms. The Parkmore MedTech Hub is a thriving cluster of MedTech companies with a strong emphasis on innovation and collaboration with the University of Galway. The region also supports strong clusters in automotive vision systems, climate and refrigeration technologies, marine engineering, and a growing digital and ICT base with embedded engineering functions. This industrial strength is bolstered by significant research infrastructure, a robust talent pipeline and a diverse mix of companies ranging from multinationals to startups.

Strategic projects such as the €34 million ARC HealthTech Hub at the University of Galway and the proposed €3 billion semiconductor site at Oranmore highlight the sector's potential for both consolidation and diversification. These projects are expected to enhance Galway's engineering economy further.

Galway City and County Councils have framed engineering-intensive sectors as central to their economic vision, focusing on employment growth in strategic zones, infrastructure upgrades, and support for innovation and commercialisation. The region's engineering economy is anchored by large multinational employers and complemented by high-growth indigenous firms, creating a dynamic and diverse industry ecosystem.

Education providers such as the University of Galway and Atlantic Technological University support the engineering sector through world-class research centres, industry-focused curriculums, and commercialisation supports. They function as both talent suppliers and innovation partners, linking education, research and enterprise development.

Overall, Galway's engineering sector is well-positioned for growth, with opportunities in MedTech, semiconductors, automotive vision, marine engineering, and climate technologies. However, challenges such as infrastructure demands and the need for serviced land and utility capacity must be addressed to ensure sustainable development.

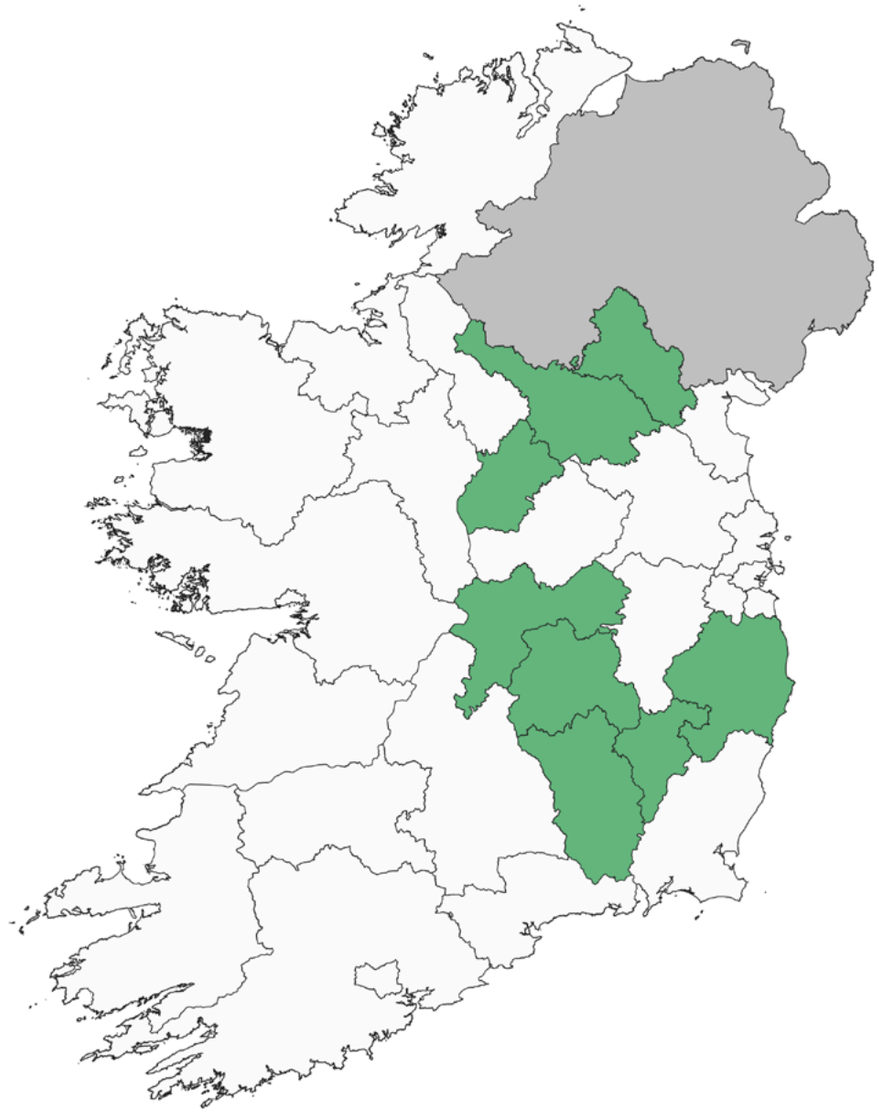
ENGINEERING ECONOMY KEY INDICATORS FOR GALWAY

Engineering Economy Indicators	**Volume** Galway: 21k Avg: 23k	**Value** Galway: 53k Avg: 54k	**Local Significance** Galway: 34% Avg: 31%[15]	**Industry specialisation** Galway: 0.89 Avg: 0.97	**R&D Intensity** Galway: 22% Avg: 20%

[13] The average score reflects the average of all the administrative counties in Ireland, not the Ireland total. This gives a clearer indication of how Galway compares to other places.

Local Engine

8 ADMINISTRATIVE COUNTIES



The Local Engines are a group of places across the Border and Midlands regions which are predominantly characterised by the high local significance of engineering. These are places where engineering plays a large role in the local economy, accounting for at least 29% of overall employment. They have seen strong growth rates in employment between 2016 and 2022, averaging 4.1% each year, with both Carlow and Longford exceeding the average growth rate at 5.5% each. However, because of Local Engines often being smaller in size with an average volume of 9,700, growth rates are from a smaller base.

Outside of the high local significance, they are similar in many ways to the Embedded Engineering group, with lower value and low R&D intensity of engineering and a small share of employment in tech compared to nationally. These counties have a high share of employment in manufacturing, though the lower R&D intensity may suggest that this is less high-value manufacturing on average than other groups, particularly the Industrial Innovators.

What distinguishes Local Engines from other categories?

The **Local Engines** are smaller in size and less R&D intensive than the **Engineering Powerhouse** and **Industrial Innovato**r group.

The principal difference to the **Embedded Engineering** group is the higher level of Local Significance (LQ). These are places where engineering plays a larger role in the local economy.

Spotlight on Cavan

Engineering economy:	**10,400** **Employment**	**565** **Businesses**	**€45,400** **Average Earnings**

Though smaller in total size, engineering accounts for a large part of Cavan's economy, with 34.2% of total employment in the engineering footprint and the second highest local significance after Cork. Cavan has the highest concentration of workers in both construction and utilities in Ireland, as well as a high concentration of workers employed in manufacturing. However, Cavan has a low share of employment in technology industries, and R&D intensity is low.

Engineering is becoming a key driver in Cavan's economic strategy, traditionally known for agriculture and border trade. Located between Dublin and Belfast, Cavan benefits from access to both domestic and cross-border markets. Key planning documents such as the Local Economic and Community Plan (LECP) 2023–2029 and the Climate Change Adaptation Strategy highlight the county's intent to integrate engineering into economic, community and environmental planning.

Engineering is central to Cavan's strategy for economic resilience and low-carbon development. The LECP prioritises enterprise innovation, job creation and sustainable construction, all requiring engineering capabilities. Cavan County Council supports this through industrial zoning in Ballyjamesduff, Bailieborough and Cootehill, and infrastructure projects such as the IDA's Advance Building Solution in Cavan Town.

Cavan hosts a range of companies relying on engineering skills, including Lakeland Dairies, Kyte Powertech, McAree Engineering, PQE Technology, Obelisk Communications, Ultra Clean Holdings, and EMCA Controls. These companies contribute to regional supply chains and demand skilled engineering professionals.

Cavan's engineering talent pipeline is supported by local and regional education and training institutions like Cavan Institute and Monaghan Institute, offering courses and apprenticeships in engineering-related fields. Access to higher education in engineering is available through nearby institutions such as Technological University of the Shannon (TUS) and Atlantic Technological University (ATU), Sligo.

Engineering is also crucial for achieving Cavan's climate and sustainability goals, with employers such as Saint-Gobain and Lakeland Dairies applying engineering solutions in areas like net-zero construction and energy recovery and Kingspan, a leader in net-zero and circular economy solutions with a Global Innovation Centre in Kingscourt. Training providers are incorporating sustainability into engineering programmes.

Overall, Cavan is developing its engineering sector through coordinated planning, investment in education and enterprise support, positioning the county for growth in Ireland's low-carbon and innovation-focused economy.

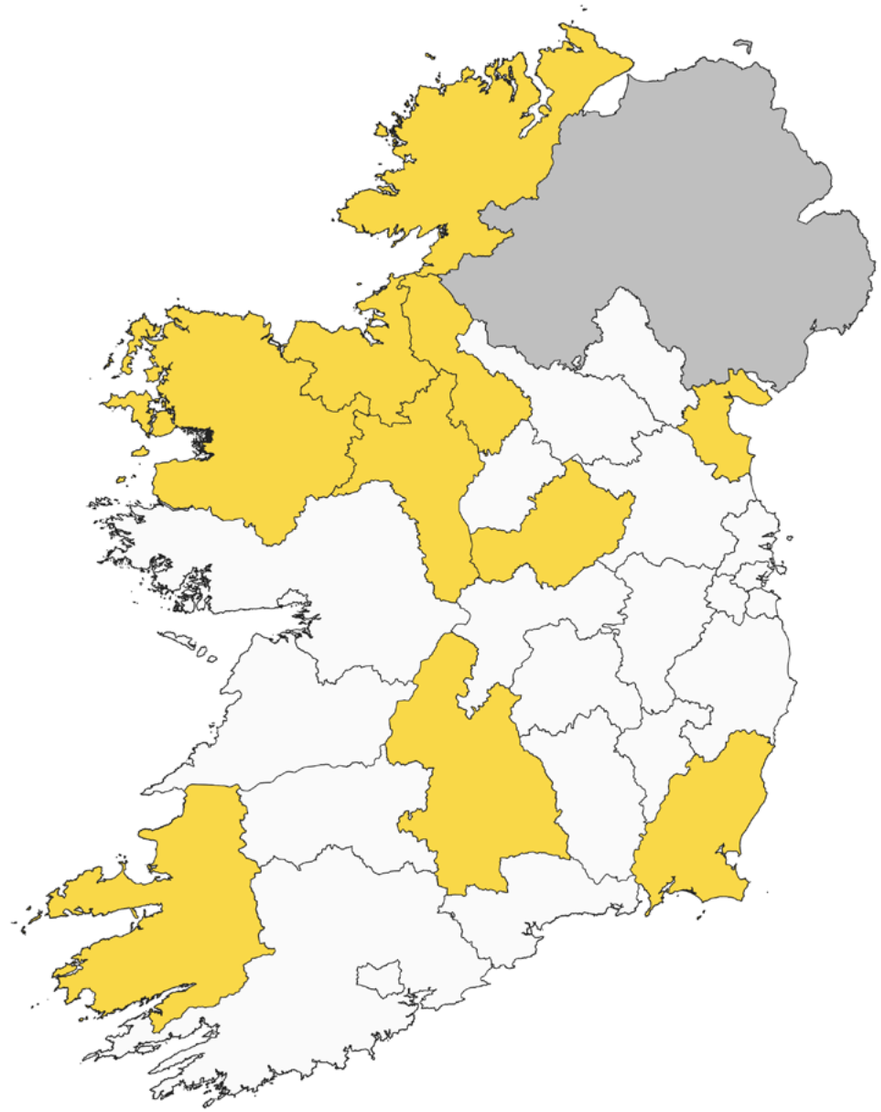
ENGINEERING ECONOMY KEY INDICATORS FOR CAVAN

Engineering Economy Indicators	**Volume** Cavan: 10k Avg: 23k	**Value** Cavan: 45k Avg: 54k	**Local Significance** Cavan: 34% Avg: 31%[16]	**Industry specialisation** Cavan: 0.95 Avg: 0.97	**R&D Intensity** Cavan: 15% Avg: 20%

[16] The average score reflects the average of all the administrative counties in Ireland, not the Ireland total. This gives a clearer indication of how Cavan compares to other places.

Embedded Engineering

10 ADMINISTRATIVE COUNTIES



The places in Embedded Engineering make up just under a third of the administrative counties, mainly across the North-West and the Midlands. Based on their engineering characteristics, they are the least distinctive compared to the other typology groups, not outperforming national averages on any of the core engineering metrics.

These are smaller places by population, more rural, with lower population density and the lowest wages. Consistent with their smaller size, this group has some of the smallest engineering footprints, measured by volume, with an average of 13,300 workers employed in the engineering footprint. While engineering is still an important sector, it makes up a lower share of the economy than in other groups. Value is low compared to other places, averaging €48,600, and the engineering wage premium, or the difference between average wages and estimated engineering wages in this group of places, is smaller than in other groups (though still positive).

What Distinguishes Embedded Engineering from other categories?

In these places, while engineering is a significant part of the local economy, it is not distinctive in terms of size, value, R&D, or specialism, unlike other groups.

These places are smaller than **Engineering Powerhouses** and **Tech Heavyweights**, and have lower local significance and enterprise LQ scores than **Industrial Innovators** and **Local Engines**. Engineering strengths also vary between construction, manufacturing and utilities.

Spotlight on Sligo

Engineering economy:	**9,200** **Employment**	**480** **Businesses**	**€49,800** **Average Earnings**

Though currently a small footprint which does not stand out on core indicators, Sligo shows strong growth prospects in engineering. There is also strong growth in local significance, particularly driven by large increases in R&D intensive activities and technology at 6% and 9% year on year, respectively, from 2016 to 2022.

County Sligo has transformed into a modern, innovation-led economy by aligning education, enterprise and planning policy. Traditionally known for its natural beauty and cultural heritage, Sligo is now recognised as a hub for engineering, manufacturing and applied research. This transformation is anchored by multinational employers, a proactive local authority, and the presence of Atlantic Technological University (ATU). Engineering is not just a sector but a foundational pillar for inclusive regional growth.

As one of Ireland's designated Regional Growth Centres, Sligo plays a critical role in providing employment and services across the North-West. The county's economic base is diverse, with strengths in pharmaceuticals, MedTech, agri-food, and creative industries. Major infrastructure improvements are underway to reinforce Sligo's role and drive sustainable economic growth.

Engineering is central to Sligo's Local Economic and Community Plan (LECP) 2023–2030, which integrates engineering under the Sustainable Economy pillar. The plan envisions engineering as key to supporting specialisation in MedTech, advanced manufacturing and energy efficiency. It prioritises expanding enterprise infrastructure, building local supply chains and investing in future-facing skills.

Sligo's major employers in the engineering sector include global firms such as Abbott and AbbVie, which focus on high-value manufacturing in medical devices and biologics. Other key employers include LotusWorks, GSK, Phillips-Medisize, and B. Braun, contributing to the region's reputation in diagnostics and precision engineering.

ENGINEERING ECONOMY KEY INDICATORS FOR SLIGO

Engineering Economy Indicators	**Volume** Sligo: 9k Avg: 23k	**Value** Sligo: 50k Avg: 54k	**Local Significance** Sligo: 28% Avg: 31%[17]	**Industry specialisation** Sligo: 0.92 Avg: 0.97	**R&D Intensity** Sligo: 21% Avg: 20%

[17] The average score reflects the average of all the administrative counties in Ireland, not the Ireland total. This gives a clearer indication of how Sligo compares to other places.

CHAPTER 05

Conclusion

This framework for analysing current engineering performance, characteristics and challenges brings new insights, helping to identify where engineering activity is concentrated, how different areas contribute to the national picture and where there may be opportunities to strengthen local capacity. The analysis overwhelmingly shows that engineering plays a far greater role in Ireland's economy than previously captured by narrower definitions.

Conclusion

Ireland's economic future will be shaped by its ability to respond to global challenges and invest ambitiously in the infrastructure needed to support growth. The National Development Plan sets out a transformative €275.4 billion investment over the next decade, focused on large-scale, strategic projects across critical areas such as energy, water and transport. Delivering this will require strong engineering capacity.

Engineering plays a vital role in enabling innovation, supporting high-growth sectors such as AI and semiconductors, and strengthening local economies across the country. As highlighted in the National Planning Framework, a resilient, high-value economy depends on places that attract talent, foster enterprise and support skilled industries.

This study, built on trusted publicly available sources, highlights the value of a structured data-driven approach to understanding the role of engineering across economies. By closely following the methodology of the 2023 EEP UK study, the work provides a framework for analysing current engineering performance, characteristics and challenges – It brings new insights into where and how engineering is happening across Ireland. This report, place profiles and the underpinning data (available in the accompanying dashboard) is intended to inform policy, investment and local decision-making. The approach helps identify where engineering activity is concentrated, how different areas contribute to the national picture and where there may be opportunities to strengthen local capacity.

The analysis shows that engineering plays a far greater role in Ireland's economy than previously captured by narrower definitions.

SCALE AND REACH:

- The engineering economy accounted for 31% of total employment in 2022, with over 725,000 people working in engineering-related industries and occupations.
- Engineering expertise permeates all sectors of Ireland's economy, with an estimated 40% of people employed in engineering occupations working in companies that are non-engineering sectors.
- While there is variation across Ireland in how much employment engineering accounts for, it is a large part of the employment base everywhere.

DRIVING INNOVATION AND VALUE CREATION:

- Engineering in Ireland is a highly R&D intensive sector, with over one-fifth of those employed in the engineering economy in a role focused on R&D, three times more than across the entire economy.
- Robust growth has been observed in R&D intensive activities between 2016 and 2022.

SUSTAINED GROWTH:

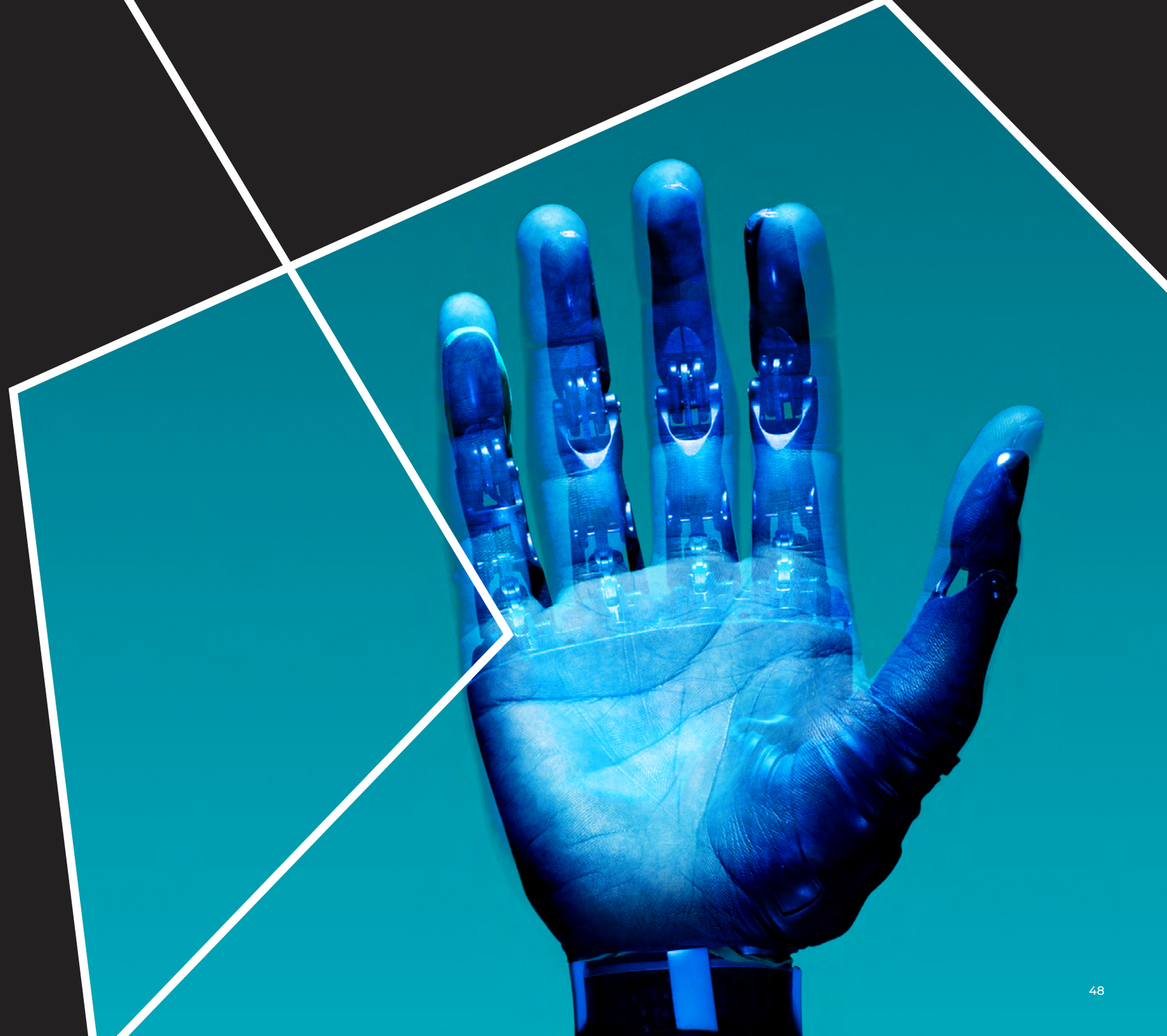
- From 2011 to 2022, engineering employment grew by 44%, compared to a 29% increase in total employment, adding more than 200,000 jobs and increasing engineering's share of total employment.

REGIONAL DIVERSITY:

- Engineering plays a distinct role and exhibits different features in every county across Ireland, reflecting variations in scale, specialisation and local significance. EEP Ireland presents a new engineering typology to capture and explain these differences.

Looking ahead, the study provides a foundation for continued development. As data availability and quality improve, there is potential to enhance and expand the typology, enabling a deeper understanding of how engineering in places changes over time. Repeating the study in future will help track progress, assess the impact of policy interventions and ensure that the engineering economy continues to contribute effectively to Ireland's regional and national priorities. Furthermore, alignment with the UK's methodological framework presents an opportunity to explore an all-island view of Engineering Economy and Place in the future.

Annex



Annex A: Methodology

THE UK'S ENGINEERING FOOTPRINT AS A STARTING POINT FOR EEP IRELAND.
The engineering footprint aimed to create a shared definition of engineering by classifying which jobs and industries are considered 'engineering' using standard occupation codes (SOC) and standard industrial codes (SIC). The resulting footprint serves as the basis for indicating the sector's contribution to the UK economy, its impacts and the need for skills. Through a review of SOCs, 60 'Core' engineering occupations were identified, in which all jobs in that occupation are considered engineering roles. A further 37 'Related' occupations were identified to reflect jobs and roles that involve engineering, but also draw upon non-engineering skill sets. All industries (SICs) were also reviewed to determine whether they should be included in the footprint.

EEP UK used all these SIC and SOC codes to define the engineering footprint. Six SOC codes[18] were added to the definition, while one code was removed to capture activities aligned with the Deliver and Research occupational categories

Both Ireland and the UK draw their classification of industries and occupations from international standard classifications such as the EU's NACE industry codes. This makes carrying the definition over from the UK to Ireland easier. However, as Ireland is a much smaller country with a greater risk of disclosure within the most granular definitions, sectors and occupations have been grouped into 149 'Detailed Industrial Groups' (DIGs) and 329 'Detailed Occupational Groups' (DOGs), made up of multiple 4-digit SICs and 4-digit SOCs. Figure 1 illustrates an example of how UK SIC and SOC engineering definitions were mapped with Ireland's DIGs and DOGs.

Only one detailed occupational group was split between engineering SOCs and non-engineering SOCs; therefore, a decision was made as to whether it should be considered an engineering occupation or not. These were aggregated into 15 detailed industrial groups covering both engineering and non-engineering industries in the UK classification. One example is shown in Figure 1 showing the decision made about the DIG "Construction of buildings".

In total, 101 DOGs out of 360 were identified as engineering occupations. Meanwhile, 53 out of 146 detailed industrial groups were identified as engineering industries.

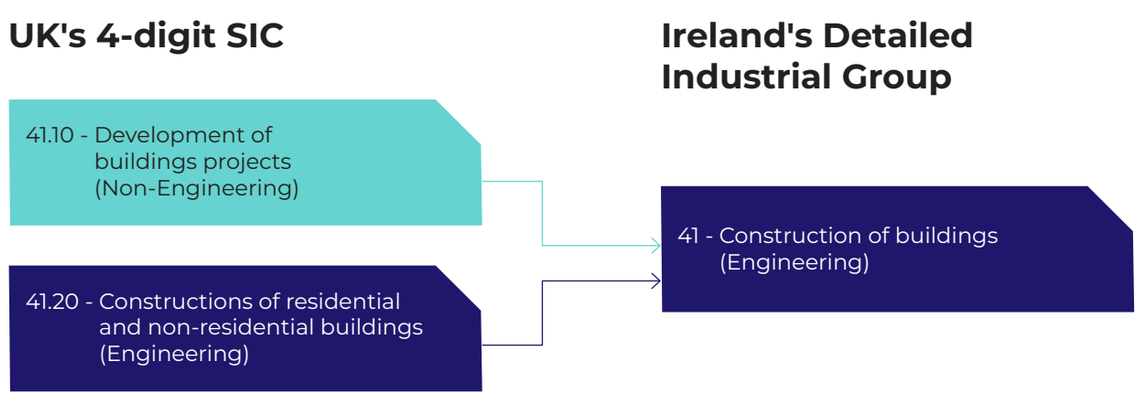
The engineering footprint definition is a broad one, covering a lot of engineering activities that

[18] The occupations added into the engineering definition were: 8113: Textile process operatives; 8127: Printing machine assistants; 9120: Elementary construction occupations; 9132: Industrial cleaning process occupations; 9139: Packers, bottlers, canners and fillers; 9139: Elementary process plant occupations n.e.c. The occupation that was removed from the definition was 2150: Research and development managers

TABLE 1
Engineering businesses and engineers – EEP UK definition

Engineering businesses	Engineers
Businesses in a set of sectors are defined as engineering.	Engineers are those employed in occupations defined as engineering.
This constitutes 295 SIC codes, all of which form the Engineering Footprint definition.	This constitutes 102 SOC codes, most of which derive from 'Core' and 'Relative' occupations in the engineering footprint, plus the addition of six SOCs and the removal of one more.
All employees in these businesses – regardless of their job title – are included in the total engineering economy employment figures.	All in these engineer-specific occupations, regardless of the activity of the business they work in, are included in the total engineering economy employment figures.

FIGURE 1
Defining engineering – detailed industrial groups



may not be typically considered as 'engineering sectors' or 'engineers'. This is intentional, as this definition highlights that engineering is essential to a large part of economies and is present in a range of activities. The definition aims to include all aspects of design, building and the use of machines and infrastructure.

CATEGORISATION OF ENGINEERING ACTIVITIES

Working within the confines of the occupational classification system, EEP UK created groups of occupations that reflect different types of activity in the engineering economy by analysing keywords and descriptions of all SOC codes. For the first time, this provides insight into the balance of employment in R&D and 'deploy and deliver'-focused roles, and on jobs in the engineering economy for non-engineers.

In describing these categories, it is essential to emphasise that the activities do not necessarily follow a linear sequence, nor do they generally happen in isolation. Quite often, testing and evaluation lead to further research, or deployment that can flow back into development and design. While occupations are mapped to categories, sectors span the entire spectrum. With this in mind, the spectrum has been considered in a more interconnected way to better reflect real-world development processes.

Engineering occupations include develop, evaluate, deploy, and deliver categories. On the other hand, research, support, and other occupational categories do not form the engineering footprint definition.

The UK's occupational definitions were mapped onto Ireland's DIGs. In three cases, a single Irish group included jobs that fell into different UK categories. Where this happened, a decision was taken on which category best reflected the group within the engineering economy.

Annex B: Spotlight on Earnings

SPOTLIGHT ON EARNINGS

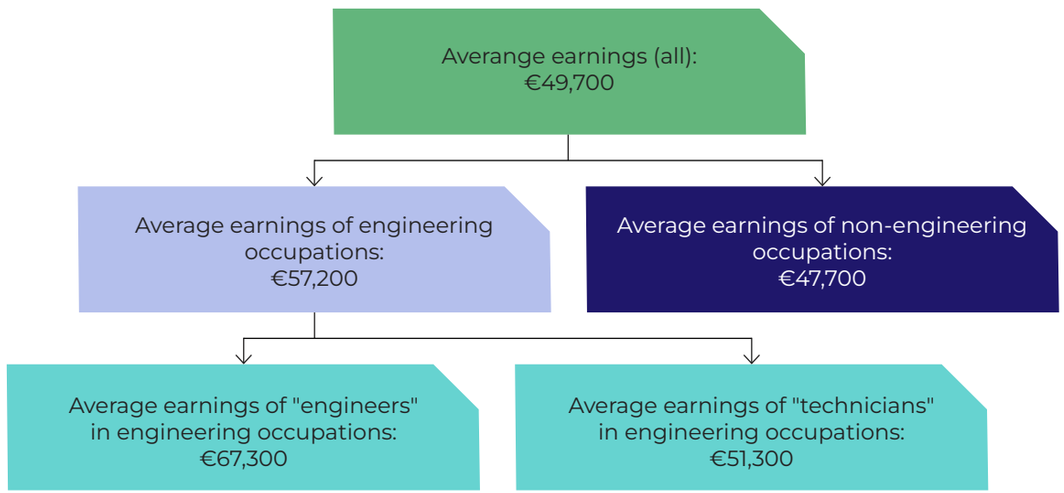
Overall averages across such a large and diverse sector mask a wide range of earnings across different parts of the engineering economy and roles within it, including salaries which are considerably higher than this average. This spotlight provides a clearer understanding of the earnings of workers in engineering occupations and engineers themselves. These figures are derived from occupation wage data[19] and are not directly comparable to engineering value estimates, which are based on industry wage data.

While average earnings by DOG are unavailable in 2022, the CSO provided median earnings by DOG in 2016. Therefore, average earnings in each DOG has been estimated by modelling change in earnings since 2016, basing this on changes to broad occupation groups.[20]

Figure 2 shows that the mean earnings of workers in Ireland is €49,700. When split between engineering occupations and non-engineering occupations in the footprint, the earnings of workers engaged in engineering activities are approximately 20% higher (€57,200 vs €47,700). As engineering occupations cover a broad range of occupations, this figure has been broken down further to illustrate the variation within the full set of engineering occupations. Occupations containing the word 'engineers' earn even more,[22] with an average salary of €67,300, which is more than 35% higher than the average salary of an Irish

FIGURE 2

Breakdown of earnings across Ireland[21]



[19] This data uses salaries based on the average salary of all jobs in each standard occupational categorisation. This therefore is a slightly different method used to understand the salaries of individual job titles, often found by survey methodologies.
[20] While wages by the most detailed occupation subgroups were released only in 2016, broader occupation category wages are released regularly
[21] Average earnings of "engineers" refer to DOGs that contain the word 'engineer' in the title only, such as "civil engineers", while average earnings of "technicians" are occupations which include the word 'technician' in the title, such as "vehicle technicians, mechanics and electricians".
[22] This was done by taking all occupations containing the word 'engineers,' and is intended only to be illustrative. Not all engineering occupations are reflected by either of these two terms, so they do not reflect the full range of engineering occupations accounted for in the average.

worker. In contrast, to reflect other engineering occupations across the spectrum, occupations containing the term 'technicians' earn less than the average engineering occupation, but still significantly more (€3,600) than the average non-engineering occupation. The full range of earnings in engineering occupations includes from "Information technology and telecommunications directors" at €155,600 to "Industrial cleaning process occupations", who earn €25,300 a year on average.

Figure 3 explores the average earnings of occupations in the engineering spectrum. Lighter blue bars represent engineering occupations. R&D occupations earn the most out of the occupational categories, on average earning €75,900, demonstrating the value of research and development. This is driven by the high earnings of "develop" occupations, with all three occupational categories in R&D making up the top three (as shown in Figure 8). In contrast, occupations in the practical application of engineering, such as deploy and deliver earn less than the average engineering occupation.

Figure 4 shows the breakdown of earnings of all occupations in each broad industry group. Technology stands out as the highest paid engineering industry with an average earning of €60,200. Average earnings in technology are significantly more than in other engineering industries, all of which fall slightly below the total engineering industries' average, ranging from €52,200 to €55,400. The four broad industry groups have higher average earnings than non-engineering industries in Ireland.

FIGURE 3
Average earnings by occupational category

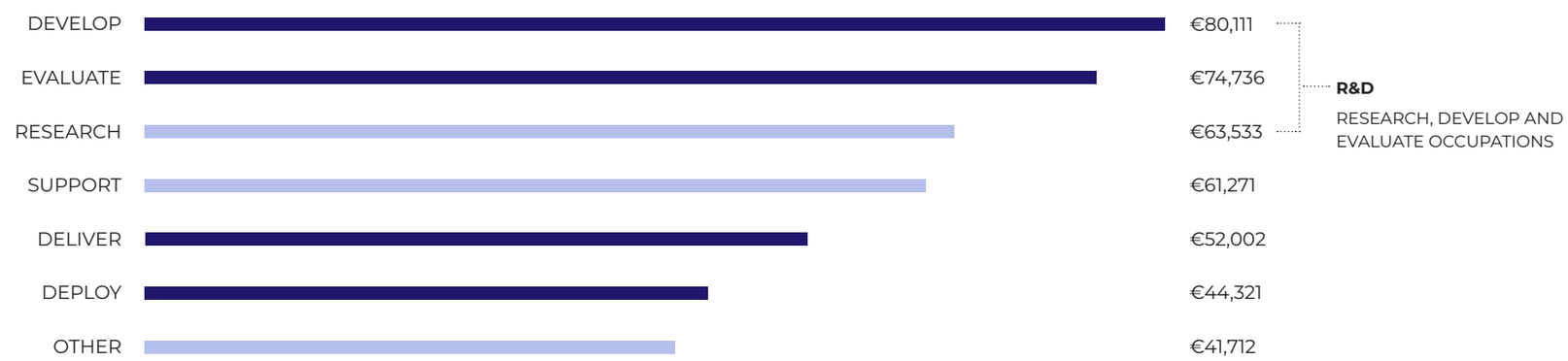
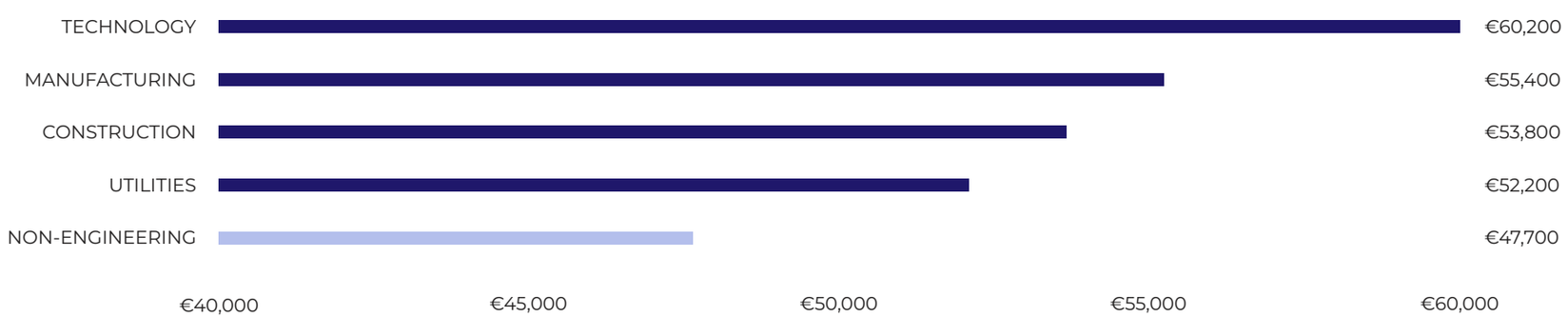


FIGURE 4
Average earnings of all occupations by engineering industry



Annex C: Engineering place profiles

FINGAL – TECH HEAVYWEIGHT

Overview

Fingal has emerged as a leading centre for engineering and advanced technology within the Greater Dublin Area. Over the past two decades, the county has transformed from a predominantly agricultural region into a thriving economy defined by high-value sectors, including ICT, biopharma, aviation, logistics, and smart infrastructure. This transformation is being strategically guided by Fingal County Council through major policy frameworks such as the Local Economic and Community Plan (LECP) 2023–2028 and the Future Fingal strategic vision. Together, these plans shape the county's approach to inclusive, sustainable and innovation-driven growth.

Strategic Planning and Economic Zones

Fingal's economic development strategy is rooted in a spatial and sectoral approach to growth. The Local Economic and Community Plan (LECP) outlines specific Strategic Economic Development Objectives (SEDOs), including clustering, infrastructure development and digital transition. Complementing this, the Future Fingal vision sets out a long-term framework to promote balanced regional development, economic resilience and sustainable prosperity across the county. The LECP outlines 12 Strategic Economic Development Objectives (SEDOs), which provide a clear framework for Fingal's continued growth. Future Fingal expands on this by integrating land use planning with economic forecasting and climate resilience, allowing Fingal to take a more proactive stance on long-term development. The vision ensures alignment with national policies while being grounded in local priorities. Each of the county's growth zones has been selected for its infrastructural readiness, access to talent and strategic importance to regional balance.

Fingal's key economic hubs include the Dublin Enterprise Zone (DEZ) in Blanchardstown, the Airport Economic Corridor and the newly emerging Stephenstown Economic Development Zone. The DEZ is a major cluster of foreign direct investment, hosting multinationals such as IBM, PayPal, Symantec, and MSD Biotech. It contributes more than €14 billion annually to the Irish economy and supports over 34,000 jobs in technology and engineering-led sectors.

The Airport Economic Corridor, centred around Dublin Airport – which is entirely located in Fingal – functions as a vital logistics and aviation hub. It supports firms involved in aircraft maintenance, logistics technologies, fleet operations, and aerospace engineering, with companies such as Ryanair and Aer Lingus anchoring the ecosystem.

The Stephenstown Economic Development Zone is a new strategic site in North Fingal, near Balbriggan, intended to support growth in clean-tech, advanced manufacturing and logistics-focused SMEs. This zone reflects the Future Fingal emphasis on spatial equity and will serve as a critical node in balancing economic activity across the county.

Engineering Clusters and Talent

Fingal's engineering and technology landscape is defined by its sectoral diversity and integration between foreign multinationals and local SMEs. The region employs over 25,000 people in high-skill engineering roles across ICT, automation, aerospace, and life sciences. The presence of global companies has created a strong ecosystem of supplier firms and specialist engineering service providers. In addition, Fingal is actively working with employers to shape micro-credentials and modular learning that can address emerging skill gaps. Companies involved in digital manufacturing, smart infrastructure and green construction are particularly engaged in developing future workforce pathways. Fingal's approach is holistic, recognising that a modern engineering economy must support continuous professional development alongside foundational education.

Major employers include MSD Biotech in Swords, which has invested €1 billion into biopharma production; Bristol-Myers Squibb, which supports advanced process engineering; and IBM and Synopsys in Blanchardstown, which contribute to Ireland's leadership in data infrastructure and embedded software.

Technological University Dublin's (TU Dublin) Blanchardstown campus is a key player in developing the regional engineering talent pool. Its programmes in mechanical, automation and software engineering are closely aligned with employer needs. Collaboration between TU Dublin, local training centres such as Baldoyle, and enterprise zones ensures Fingal can respond to evolving labour market demands.

The Future Fingal: Fingal Skills Strategy 2024–2029 builds on the legacy of the 2016–2020 plan – the first local skills strategy in Ireland – and expands its focus to include automation, aviation and clean technologies. It prioritises digital skills, upskilling pathways for mid-career workers and expanded apprenticeship options in collaboration with industry.

Engineering and the Green Economy

Fingal is at the forefront of engineering for sustainability, with growing clusters in clean technology, low-carbon transport, energy optimisation, and waste-to-energy systems. These are aligned with both the LECP's green transition priorities and the Future Fingal Economic Strategy (2024)'s climate resilience goals. The Smart Balbriggan initiative is a key example of innovation in public infrastructure, supporting digitally enabled, energy-efficient

urban development. Clean-tech SMEs in Fingal are also increasingly participating in EU-funded research initiatives focused on circular economy models and decarbonisation technologies. These collaborations enhance Fingal's reputation as a living lab for green innovation. The integration of digital and environmental technologies is also visible in pilot projects related to electric vehicle infrastructure, adaptive traffic systems and energy monitoring platforms for businesses and public buildings.

Engineering firms in Fingal are increasingly integrating sustainable practices into their operations – from smart grid technology to emissions optimisation in aviation. This shift reflects Fingal's broader ambition to become a national leader in green economic growth, blending environmental responsibility with high-tech innovation.

Challenges and Strategic Outlook

Despite its strengths, Fingal faces key challenges such as infrastructure pressure due to rapid population and employment growth, skills shortages in mid-career tech roles and the need to maintain planning certainty and zoning flexibility. There is also a need for targeted support for indigenous SMEs operating in the engineering value chain.

However, Fingal's unique advantages – including land availability, global connectivity through Dublin Airport, strong education–industry links, and an expanding base of innovative firms – create significant strategic opportunities. Future growth will depend on deepening R&D collaboration, enhancing infrastructure and ensuring continued alignment between policy, skills and enterprise.

Conclusion

Fingal's role as an engineering and tech heavyweight is grounded in a combination of strategic location, concentrated industry presence and coherent long-term planning. Its economic zones – including the Dublin Enterprise Zone, Airport Economic Corridor, and Stephenstown – provide scalable infrastructure for advanced industry. The region supports diverse engineering sectors, from ICT and biopharma to aviation and clean-tech, anchored by global firms and supply chain SMEs. A young, skilled population is supported by education and training infrastructure aligned through the Future Fingal: Fingal Skills Strategy 2024–2029. Crucially, Fingal's planning frameworks, including the LECP and Future Fingal Economic Strategy, create institutional certainty and spatial coordination, while initiatives such as URBACT ECOCORE signal capacity to deliver sustainable, innovation-led growth. Together, these factors form an integrated ecosystem that sustains engineering-driven economic performance.

Employers and Industry Ecosystem

Fingal's role as an engineering and tech heavyweight is grounded in a combination of strategic location, concentrated industry presence and coherent long-term planning.

CORK – ENGINEERING POWERHOUSE

Overview

Cork City and County stand as Ireland's leading example of how a regional economy can integrate engineering, research and enterprise to drive innovation-led growth at scale. Long established as an industrial and maritime hub, Cork today is a dynamic centre for advanced manufacturing, life sciences, electronics, and renewable energy, underpinned by a globally connected engineering ecosystem.

Designated as Ireland's 'second city' in national planning policy, Cork plays a critical role in balancing regional development, supporting employment, innovation, and infrastructure delivery across the South-West. Its economic base is diverse and high value, blending multinational investment in biopharma and ICT with indigenous precision engineering, marine services and a growing renewable energy sector. Major public investments in transport, offshore energy infrastructure and higher education continue to reinforce Cork's role as a counterweight to Dublin and an anchor of sustainable economic growth in Ireland.

Engineering and Strategic Economic Planning

Under Project Ireland 2040 and the recently adopted NPF Review, Cork is reaffirmed as Ireland's 'second city' and a key counterbalance to Dublin, anchoring an all-of-government approach to balanced regional growth. This designation underpins major public investments and policy commitments to strengthen Cork's role as a hub for advanced manufacturing, life sciences, offshore renewable energy, and strategic transport development.

The Revised NDP includes multiple Strategic International Transport Projects with significant engineering implications for Cork, including:

- upgrades to Cork Airport and Port of Cork, supporting trade, tourism and offshore renewable energy development
- M28 Cork to Ringaskiddy and M20 Cork to Limerick, enhancing strategic road connectivity
- Cork Light Rail (Cork Luas) and BusConnects, transforming urban mobility
- Cork Commuter Rail Programme and Great Island Connectivity Project, expanding regional rail and bridge infrastructure.

These projects demand large-scale civil, systems, marine, and environmental engineering expertise, underscoring why Cork is an Engineering Powerhouse – delivering nationally significant infrastructure with global standards of design and delivery excellence.

This ecosystem ensures continuous demand for engineering talent, supported by supply chains, specialist services, and global R&D functions embedded locally.

Cork's engineering-led FDI growth delivers significant local economic impacts. Beyond direct employment in multinationals, indigenous engineering firms provide critical supply chain services – from automation systems to precision component manufacturing – sustaining high-value SME employment. Engineering roles in Cork are among the highest paid outside Dublin, underpinning regional prosperity and talent retention. The presence of global firms also drives entrepreneurship, with multiple engineering startups and consultancies tracing their origins to MNC supply chains and management spinouts.

Education and Talent Development

Cork's education and training system is a cornerstone of its engineering-led growth.

Munster Technological University (MTU):

- delivers technician-level and apprenticeship training with Cork ETB, addressing skills shortages in automation, mechatronics and process control
- operates the Rubicon Centre, fostering engineering startups and research commercialisation
- offers programmes spanning mechanical, electronic, software, and automation engineering, directly aligned with regional industry needs

University College Cork (UCC):

- ***h***ome to the Environmental Research Institute (ERI), a multidisciplinary hub for engineering solutions in sustainability, water, waste management, and circular economy.
- leads the MaREI Centre, Ireland's national marine and renewable energy research centre, advancing offshore wind, hydrogen systems, energy integration, and climate adaptation
- hosts the Tyndall National Institute, employing over 600 researchers and positioning Cork as Ireland's semiconductor and nanoelectronics research capital, with a central role in EU Chips Act pilot lines and Horizon Europe collaborations

Both universities collaborate extensively with local employers to ensure graduate skills match sectoral demand, with research centres generating spinouts and technology transfers that embed innovation within the regional economy.

Cork's research and innovation ecosystem amplifies this impact. Tyndall National Institute alone generates over €40m annually in economic returns through EU-funded projects, spinouts and industry collaborations. IMERC at Ringaskiddy and Cork Innovates provide marine and smart systems innovation hubs linking academia, enterprise and government. Multinationals partner directly with UCC and MTU on engineering R&D, embedding innovation capacity within the regional economy and ensuring talent pipelines align with advanced sectoral needs.

Employers and Industry Ecosystem

Cork's transformation into an Engineering Powerhouse is evident in its major employers and sectoral clusters:

Apple

Employs over
6,000
people in Cork, with engineers across logistics, systems, quality, and AI, alongside a planned expansion for
1,300
additional staff.

Pfizer

Employs approximately
1,500
people at its Ringaskiddy site, a key biopharma engineering and manufacturing facility within a national workforce of
~5,000.

stryker

Employs
~5,050
across Cork and Limerick in MedTech R&D, manufacturing engineering, and advanced materials.

Boston Scientific

Has over
1,400
staff in Cork engaged in MedTech device manufacturing, process engineering, and global supply operations.

Janssen — Pharmaceutical Companies of Johnson & Johnson

Employs over
700
at Ringaskiddy, with a
€150m
expansion underway in biologics manufacturing engineering.

MERCK

Employs
~800
at Carrigtwohill across pharmaceutical and membrane manufacturing.

GE HealthCare

Employs
~750
in biomedical engineering and diagnostics.

abbvie

Employs over
~500–600
in Cork within a national workforce of
~2,600,
focused on pharmaceutical engineering and operations.

AMD
Qualcomm
logitech

Maintain significant ICT and electronics engineering teams, with AMD recently expanding AI semiconductor R&D roles.

Johnson Controls

Headquartered in Cork, employs over
400
engineers in building systems, energy efficiency and smart infrastructure technologies.

EPS GROUP
trend TECHNOLOGIES

Exemplify indigenous precision and contract engineering strengths, specialising in mechanical design, automation and component manufacturing.

bam
BUILDERS SISK CONTRACTORS Established 1859

Lead civil and construction engineering for Cork's major public infrastructure projects under CMATS and NPF.

Engineering and the Green & Digital Economies

Cork's engineering sector is deeply aligned with national sustainability and digital transformation goals. The offshore wind and hydrogen strategies, underpinned by the Climate Action Plan 2024 and OREDP II, position Cork Harbour as a linchpin in Ireland's decarbonisation, demanding marine, civil, electrical, and environmental engineering expertise for turbine assembly, port upgrades and grid integration.

In parallel, semiconductor and AI R&D expansion – led by Tyndall, AMD, Apple, and others – supports Ireland's ambitions to lead in advanced electronics and smart systems, with engineering talent central to future competitiveness.

The county and city also prioritise sustainable construction, energy-efficient buildings, and smart mobility under Cork Metropolitan Area Transport Strategy (CMATS), further integrating engineering into climate and economic resilience policy delivery.

Conclusion

While challenges remain – including mid-career skills shortages, digital integration demands and talent retention pressures – the city and county are poised to maintain their leadership role in Ireland's green and digital transitions. With the Revised NDP identifying major transport and energy infrastructure upgrades, and with engineering at its core, Cork continues to shape a resilient, inclusive and future-ready regional economy that leverages both its industrial heritage and its world-class human capital.

GALWAY – INDUSTRIAL INNOVATOR

Overview

Galway has one of the most significant engineering footprints in Ireland, with a concentration of high-value manufacturing, research and design that extends from its city centre to industrial hubs in Parkmore, Ballybrit, Mervue, Oranmore, Tuam, and Athenry. It supports thousands of engineering-related roles, making it a core driver of the regional economy.

The region is internationally recognised as a MedTech powerhouse, home to some of the world's largest medical device manufacturers as well as high-growth indigenous firms. Alongside MedTech, Galway supports strong clusters in automotive vision systems, climate and refrigeration technologies, marine engineering, and a growing digital and ICT base with embedded engineering functions.

This industrial strength is supported by nationally significant research infrastructure, an established talent pipeline and an increasingly diverse base of companies ranging from multinationals to start-ups. With upcoming strategic projects, including the €34 million ARC HealthTech Hub at the University of Galway and proposals for a €3 billion semiconductor megasite at Oranmore, Galway's engineering economy is positioned for both consolidation and diversification.

Engineering and Strategic Economic Planning

Both Galway City and County Councils frame engineering-intensive sectors as central to their economic vision. Their development strategies aim to:

- concentrate employment growth in strategic zones such as Parkmore, Ballybrit, Mervue, Oranmore, Tuam, and Athenry
- align infrastructure upgrades – transport, utilities, broadband – with enterprise and cluster growth
- support innovation and commercialisation through targeted investment in research facilities, incubation space and industry–education partnerships
- promote sustainable, compact urban growth to ensure that employment centres remain accessible and well-served.

The ARC HealthTech Hub reflects this focus, providing a dedicated platform to accelerate medical technology research into commercial products – leveraging Galway's MedTech strength and integrating skills in AI, advanced manufacturing and clinical validation.

Meanwhile, the proposed semiconductor megasite near Oranmore, which remains at the development stage, if delivered, would extend Galway's industrial base into advanced microelectronics, complementing existing engineering skills while creating entirely new supply chain opportunities. The site's scale, at about 1,000 acres, would require major infrastructure commitments but could place Galway on the global semiconductor map.

In addition, both Galway City and County Councils work in close collaboration with IDA Ireland. This includes ensuring that zoned lands for economic development are fully serviced with the necessary infrastructure and partnering with the IDA in attracting high-value international clients to the Galway region, complementing local enterprise and innovation strategies.

There are important development areas in both the public and private sectors including:

ICT & Digital Engineering:

- SAP, HPE, CISCO, IBM, AVAYA, Fidelity Investments, Genesys, Wayfair – Galway operations with engineering functions in software, analytics and systems
- Arm – R&D site in Galway focused on semiconductor and hardware systems design.

Marine & Environmental Engineering:

- Marine Institute (Oranmore) – National ocean science centre with engineering in marine sensors, platforms and monitoring systems
- ÉireComposites (Indreabhán) – Composites for aerospace, marine and renewable energy.

Innovation & Research Infrastructure:

- University of Galway – Hosts CÚRAM, Lambe Institute, BioInnovate, BioExel, INSIGHT, The Ryan Institute and ARC HealthTech Hub
- Atlantic Technological University (ATU) – Applied engineering programmes, prototyping labs and incubation via iHub
- PorterShed & Platform94 – Startup and scaleup spaces with engineering-focused venture support.

Education and Talent Development

Education providers in Galway are central to the region's engineering capacity.

The University of Galway (UG) supports the engineering economy through world-class research centres, industry-focused curricula and commercialisation supports. Programmes such as BioInnovate and BioExel help translate research into viable MedTech ventures, while CÚRAM and the Lambe Institute work directly with global manufacturers and healthcare providers on device development, clinical trials and regulatory pathways. Academic–industry collaboration is embedded, with co-designed modules, joint R&D projects, and student placements feeding directly into local engineering employers.

Atlantic Technological University (ATU) delivers applied engineering programmes in mechanical, electronic, civil, and renewable energy disciplines, alongside computing and design. Its iHub incubation space and research collaborations help start-ups and SMEs access prototyping facilities, testing and technical expertise. ATU's teaching model emphasises practical, work-based learning and industry engagement, ensuring graduates are equipped for immediate contribution to the engineering workforce.

Together, the two institutions function as both talent suppliers and innovation partners, linking education, research and enterprise development in a way that continually reinforces Galway's engineering strengths.

Engineering and the Green Economy

Engineering is central to Galway's sustainability agenda. The Galway Wind Park in Cloosh Valley generates enough renewable electricity to power most of the county's homes. County-level renewable energy strategies identify wind, solar and bioenergy potential, while the city pursues smart transport, energy-efficient retrofitting and low-carbon infrastructure.

Marine research at Oranmore and the Ryan Institute in UG positions Galway as a testbed for ocean monitoring, renewable energy devices and marine climate services. These activities create pathways for a climate-tech engineering sector rooted in both land-based and maritime innovation.

Opportunities and Constraints

Opportunities:

- established MedTech cluster with deep supply chains
- expansion into semiconductors through the Oranmore megasite proposal
- ARC HealthTech Hub as a platform for R&D commercialisation
- growth potential in information technology, automotive vision, marine engineering and climate technologies
- education–industry linkages that produce a skilled engineering workforce.

Constraints:

- congestion and limited public transport access to eastern industrial zones
- need for serviced land and utility capacity to meet large-scale project demands.
- limited scaleup and innovation space for growing firms
- high infrastructure investment requirements for semiconductor and other advanced manufacturing sites.

Conclusion

Galway's engineering sector is both broad and deep, anchored by MedTech but extending into diverse technology and manufacturing areas. With globally significant employers, a rich research base and new strategic projects such as the ARC HealthTech Hub and the semiconductor megasite, the region is well placed to expand its industrial profile. The challenge will be ensuring that infrastructure, land supply, housing and skills keep pace with demand, enabling Galway to remain a competitive, sustainable and innovative engineering hub.

Employers and Industry Ecosystem

Galway's engineering economy is anchored by large multinational employers with substantial design, R&D and manufacturing operations, complemented by high-growth indigenous firms and a diverse mix of adjacent engineering sectors.

Boston Scientific

Approx.
3,700
employees in Galway (part of 6,400 nationally). Specialises in product design, R&D and large-scale manufacturing of cardiovascular and urology devices. A €100 million investment is supporting an additional
~300 jobs.

Medtronic

Over
2,000
staff in Galway engaged in high-volume manufacturing, process engineering, R&D, and regulatory affairs for global markets.

MERIT MEDICAL

About
1,000
employees manufacturing diagnostic and interventional devices, with engineering functions spanning process improvement to tooling design.

Aerogen

Currently employs
~600
people globally, the majority in Galway. A
€300
million expansion will add 725 new jobs across Galway and Shannon over the next decade, focused on respiratory device R&D and manufacturing.

TE connectivity
CREGANNA MEDICAL

Specialist in catheter delivery systems, with engineering roles in design, precision manufacturing and prototyping.

Integer®

Manufacturer of minimally invasive components; recently expanded its Parkmore East facility.

BECKMAN COULTER

Diagnostics and laboratory instrumentation engineering and production.

dexcom

Dexcom's new facility represents a transformative investment, set to become a major regional employer. It is the first major client locating on IDA-owned lands in Athenry, strengthening the strategic role of the Galway–Athenry economic corridor in future development.

Adjacent Engineering & Advanced Manufacturing include:

Valeo

Global R&D and manufacturing centre for automotive vision and driver assistance systems, with expertise in optics, embedded software, electronics, and mechanical engineering.

THERMO KING

Engineering and production of transport refrigeration systems.

PennEngineering®

Fastener manufacturing and advanced materials engineering;
€14
million expansion under way.

marel

Engineering of food processing equipment, with mechanical, automation and process engineers.

CAVAN – LOCAL ENGINE

Overview

Cavan, traditionally associated with agriculture and border trade, is increasingly focused on engineering and advanced manufacturing as core components of its economic strategy. Located between Dublin and Belfast, Cavan benefits from access to both domestic and cross-border markets.

Key planning and policy documents including the Local Economic and Community Plan (LECP) 2023–2029, the Climate Change Adaptation Strategy, the Corporate Plan, and the Outdoor Recreation Plan 2025–2030 demonstrate the county's intent to integrate engineering into economic, community and environmental planning. These plans are aligned with national frameworks such as Project Ireland 2040 and the National Development Plan (NDP) 2021–2030. Cavan is recognised in these frameworks as part of the North-Eastern Functional Area within the Northern and Western Region.

Engineering and Strategic Economic Planning

Engineering is a core part of Cavan's strategy for economic resilience and low-carbon development. The LECP highlights priorities including enterprise innovation, job creation and sustainable construction – all areas that require engineering capabilities.

Cavan County Council has supported this through industrial zoning in Ballyjamesduff, Bailieborough and Cootehill. Infrastructure projects such as the IDA's Advance Building Solution in Cavan Town support investment in engineering-led industries.

At the regional level, the Northern and Western Regional Assembly's Smart Specialisation Strategy identifies opportunities for precision engineering, environmental technology and sustainable food systems. Enterprise Ireland has identified Cavan as a priority location for engineering-related SMEs.

The Cavan County Development Plan 2022–2028 is aligned with Project Ireland 2040 and the Regional Spatial and Economic Strategy (RSES). Cavan's location within the Dublin–Belfast corridor positions it for future infrastructure and investment support under the NDP.

Education and Talent Development

Cavan's engineering talent pipeline is supported by a strong network of local and regional education and training institutions:

- Cavan Institute, under the governance of Cavan and Monaghan Education and Training Board (CMETB), provides a wide range of engineering-related courses. These include Engineering Technology (Level 5) and Renewable & Engineering Technology (Level 6). Course modules cover electronics, control systems, CNC programming, workshop practices, and mechanical processes. The Institute prepares students for both entry-level roles and progression to higher education.
- CMETB offers structured apprenticeships and traineeships in engineering-related fields, including the OEM Engineering Apprenticeship and Phase 2 Electrical Apprenticeship. These programmes blend practical work experience with technical classroom instruction and are developed in partnership with local industry.
- Monaghan Institute, also operated by CMETB, delivers several of these traineeships and apprenticeships that are accessible to learners from Cavan. Programmes include Renewable Construction Technologies and Engineering Technology Traineeships, with strong employer engagement.
- Access to higher education in engineering disciplines is available through nearby institutions including Technological University of the Shannon (TUS), Atlantic Technological University (ATU) Sligo and Dundalk Institute of Technology (DkIT).

This integrated education and training ecosystem ensures that learners in Cavan can build relevant skills for engineering roles across a range of sectors.

Engineering and the Green Economy

Engineering is important to achieving Cavan's climate and sustainability goals. The LECP and Climate Strategy highlight areas such as retrofitting, renewable energy systems and resource efficiency.

Employers such as Kingspan (in Kingscourt), Lakeland Dairies, and Kyte Powertech are applying engineering solutions in areas such as net-zero construction, energy recovery and electrical infrastructure. Kingspan's Global Innovation Centre represents a flagship investment in sustainable construction research. The centre focuses on advanced insulation technologies, energy-efficient building systems and circular economy solutions, reinforcing Cavan's role in engineering-led climate innovation.

Training providers are incorporating sustainability into engineering programmes. The application of circular economy principles is growing among local firms.

Conclusion

Cavan is developing its engineering sector through coordinated planning, investment in education and enterprise support. With alignment to national strategies and the presence of key employers and infrastructure, the county is positioned to grow its role in Ireland's low-carbon and innovation-focused economy.

Employers and Industry Ecosystem

Cavan hosts a range of companies that rely on engineering skills. These include both multinational firms and indigenous SMEs.

Lakeland Dairies

Headquartered in Killeshandra, employs over

1,200

people. Engineering supports process automation, packaging and energy management.

kyte POWERTECH

In Cavan Town manufactures electrical transformers and employs over

470

staff. The company has made recent investments in equipment and facilities.

UCT

Established an Advanced Technology Cleaning Centre in 2022, serving semiconductor clients and creating over

100

technical jobs.

emca

RAPTOR Engineering Solutions Ltd

Provide automation and water systems engineering.

Obelisk.

Operates in telecom and infrastructure engineering.

SAINT-GOBAIN

BOXMORE PLASTICS LTD

Are long-standing IDA-supported manufacturers.

McAREE ENGINEERING

pqe

SETINC SuperWheel

Represent smaller engineering-led firms in areas such as fabrication and mobility solutions.

These companies contribute to regional supply chains and the demand for skilled engineering professionals.

Cavan is also home to engineering consultancies such as Alan Traynor Consulting Engineers Ltd, which provides structural and civil engineering services across Ireland. These firms contribute to national infrastructure delivery and offer professional career pathways for local engineers.

SLIGO – EMBEDDED ENGINEERING

Overview

County Sligo has emerged as a compelling example of how a rural region can strategically align education, enterprise and planning policy to build a modern, innovation-led economy. Long known for its natural beauty and cultural heritage, Sligo is now gaining recognition as a hub for engineering, manufacturing and applied research. Anchored by a strong base of multinational employers, a proactive local authority, and the presence of Atlantic Technological University (ATU), Sligo is positioning engineering not merely as a sector, but as a foundational pillar for inclusive regional growth.

As one of Ireland's designated Regional Growth Centres, Sligo plays a critical role in providing employment and services across a broad hinterland in the North-West. The county's economic base is increasingly diverse, blending strengths in pharmaceuticals, MedTech, agri-food, and creative industries, while responding to the emerging opportunities of the green and digital economies. Major road upgrades and active travel improvements are underway to reinforce Sligo's role as a Regional Growth Centre and drive sustainable economic growth across the wider North-West region.

Engineering and Strategic Economic Planning

Engineering holds a central place in Sligo's Local Economic and Community Plan (LECP) 2023–2030, which sets out a clear strategy for sustainable development under six key pillars. Engineering is integrated under the Sustainable Economy pillar, recognised as a high-growth, key strategic sector. Engineering features in the LECP's economic profile and sectoral priorities.

The LECP envisions engineering as key to supporting smart specialisation in areas such as MedTech, advanced manufacturing and energy efficiency. It prioritises expanding enterprise infrastructure to support these industries. The LECP also recognises the importance of building local supply chains, supporting cluster development and investing in future-facing skills that reflect industry needs. What distinguishes Sligo's approach is the deliberate integration of engineering into broader economic, social and environmental planning – a model that aligns policy with place-based potential.

Employers and Industry Ecosystem

Sligo's transformation into an engineering-led economy is evident in the profile of its major employers. The pharmaceutical and MedTech sectors are led by global firms such as Abbott and AbbVie, whose two facilities in Sligo focus on high-value manufacturing in medical devices and biologics. The scale of their operations– and their continued investment in the county – has created hundreds of jobs in process engineering, automation and technical operations.

Engineering expertise is also central to firms such as LotusWorks, a Sligo-headquartered technical services provider that supports multinationals in pharma, MedTech and semiconductors across the globe. Other employers include GSK and Phillips-Medisize and an R&D presence by B. Braun, contributing to the region's growing reputation in diagnostics and precision engineering. Meanwhile, Avenue Mould provides tooling solutions for advanced manufacturing, and Arrotek Medical delivers end-to-end product design for MedTech clients.

Beyond pharmaceuticals and manufacturing, the county's economy also benefits from a strong agri-food sector led by Aurivo Co-operative, a growing digital and tech base and robust public sector employment in health and local government. Together, these firms form an ecosystem where engineering talent is in continuous demand, and where new graduates can build careers without leaving the region.

Education and Talent Development

Sligo's education and training infrastructure is one of its greatest assets. The creation of Atlantic Technological University (ATU), which brings together the former IT Sligo, GMIT and LYIT, has significantly strengthened the county's higher education offer. ATU Sligo serves as a regional engine for skills development, research and enterprise support. Its Faculty of Engineering and Design delivers a wide range of undergraduate and postgraduate programmes in mechanical, civil, biomedical, and renewable energy engineering, with a strong emphasis on work-based learning and industry alignment.

The university also supports applied research through a network of specialised centres:

- PEM (Precision Engineering and Manufacturing Centre): focuses on advanced manufacturing, materials processing, and the development of high-precision production systems
- CERIS (Centre for Environmental Research Innovation and Sustainability): leads research on water, waste, energy, and circular economy solutions for environmental challenges
- CRISP (Centre for Research in Social Professions): supports research on professional practice in health, education and social care, often intersecting with technology and innovation
- MISHE (Mathematical Modelling and

Intelligent Systems for Health and Environment): applies data modelling, AI and machine learning to environmental and health system challenges
- HEAL (Health and Biomedical Research Centre): supports interdisciplinary research on diagnostics, therapeutics and biomedical innovation.

These centres ensure that ATU is not only training future engineers but also generating knowledge that directly supports Sligo's priority sectors.

ATU also plays a leadership role in the North-West Tertiary Education Cluster, enabling cross-border collaboration on training for emerging technologies such as electric vehicles. Meanwhile, St. Angela's College, a campus of ATU, adds strength in health sciences and home economics education. The Mayo, Sligo and Leitrim Education and Training Board complements this with further education and apprenticeships, including through its flagship Retrofitting Centre of Excellence in Collooney. Together, these institutions form a comprehensive education and training ecosystem aligned with regional needs.

The AIM Centre in Sligo is a state-of-the-art engineering and advanced manufacturing hub providing local businesses with access to robotics, automation and digitalisation expertise to drive innovation and productivity. Sligo County Council played a key role as co-founder and funder, partnering with ATU Sligo and Leitrim County Council to establish the Centre as a strategic asset for regional economic development.

Engineering and the Green Economy

Sligo's engineering sector is also increasingly aligned with the county's sustainability goals. The LECP identifies green innovation as a critical area of opportunity, particularly in retrofitting, renewable energy and sustainable construction. Engineering expertise is central to delivering on these goals – whether through the development of energy-efficient building methods, the deployment of smart grid technologies or the scaling of renewable infrastructure.

The research centres at ATU Sligo – particularly CERIS, PEM and MISHE – play key roles in developing solutions to environmental challenges. Training programmes in retrofitting and sustainable energy ensure that the local workforce is equipped for the transition to a low-carbon economy. The county has also begun exploring the potential of developing a local gas network that could eventually transition to green hydrogen, further illustrating the strategic integration of engineering into environmental planning.

Conclusion

Sligo's experience offers a compelling case study in engineering-led regional development. Through deliberate investment in education, targeted support for key sectors and integrated planning, the county is building a resilient, knowledge-based economy that leverages both its human capital and natural assets.

While challenges remain – including underperformance in indigenous exports, high commercial vacancy and a historically low rate of employment growth – the direction of travel is clear. With engineering at its core, Sligo is positioning itself as a national exemplar for how smaller regions can compete on the basis of skills, innovation and place-based collaboration. Its story underscores the importance of aligning strategy, institutions and community in pursuit of sustainable economic transformation.

Employers and Industry Ecosystem

Sligo's transformation into an engineering-led economy is evident in the profile of its major employers.

Abbott
lotusworks® powered by experience
Philips Medisize a molex company
abbvie
GSK
B|BRAUN
Avenue A Nolato Company
Aurivo
ARROTEK

Royal Academy of Engineering

Royal Academy of Engineering
The Royal Academy of Engineering creates and leads a community of outstanding experts and innovators to engineer better lives. As a charity and a Fellowship, we deliver public benefit from excellence in engineering and technology and convene leading business people, entrepreneurs, innovators and academics from every part of the profession. As a National Academy, we provide leadership for engineering and technology, and independent, expert advice to policymakers in the UK and beyond.

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