Rialtas na hÉireann
Government of Ireland

Project Ireland 2040

BUILD 2022: Construction Sector Performance and Capacity

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Summary:

Regional Activity

1. In recent years, the share and number of planning permissions for apartments has increased in the Eastern and Midlands (incl. Dublin) and for the Southern region. Additionally, in Eastern & Midlands (excl. Dublin), Northern & Western, and Southern regions, the proportion of planning permissions for one-off houses has increased. There is a risk that this increasing share may work counter to overall National Planning Framework objectives, particularly compact growth. However, these years were atypical given the impacts of Covid-19 and it remains to be seen whether these trends will persist.
2. There were 30,724 commencements in 2021. Comparing the planning permissions to commencements highlights that planning permissions exceeded the commencements for all regions with the exception of Eastern and Midlands (excl. Dublin). While planning permissions provide an indication of the future pipeline of investment, it cannot be assumed that these permissions translate into completed dwellings. Approximately 35 percent of the commencements in 2021 are in Dublin, 25 percent in the Southern region, while the rest are in the Northern and Western region, and the Eastern and Midland region.
3. In the Northern & Western, and Southern regions, more new dwellings were completed in 2021 than in 2019. The opposite is true for the Eastern & Midlands and Dublin. However, it is noteworthy that Dublin had the highest (in comparison to other regions) number of new dwelling completions in 2021.
4. As for civil engineering (construction of roads etc.), the Southern Region has seen the highest number of planning permissions granted, followed by the Eastern & Midland, and Northern & Western regions.
5. Of the allocated €278 million RRDF fund, 40 percent is allocated in the Northern and Western region.
6. Of the allocated URDF funding of approximately €1.6 billion, approximately half is allocated to the Southern region.
7. While construction employment increased between Q4 2019 and Q4 2021, the share of construction employment decreased for regions such as Dublin, Mid-East, South-East, Mid-West, and Border.

Investment and Output

1. Trends in output show that activity in the construction sector was lower than pre-pandemic levels, with overall construction production volume decreasing by 15 percent between 2019 and 2021.
2. While new dwelling completions decreased by 3 percent, apartments increased by 50 percent (all between 2019 and 2021). Overall, in 2022 Q1, approximately 80% of all new dwellings were completed in urban areas with only 20% in rural areas.
3. In terms of the four Dublin LAs, there were 42,725 apartments and 5,307 houses, with full planning permission, yet to be commenced (as of Q4 2021). Of these units, 60 percent received planning permission through the strategic housing development process.
4. In 2022, approximate investment (public and private) in Building and Construction is forecasted to be €32 bn. The NDP has signaled the largest investment in the history of the State in 2022 at €12.2bn.

Costs

1. The Construction Tender Price Index, which is an inflation index for non-residential projects over €0.5 million, increased by 15 percent between H1 2020 and H2 2021.
2. Wholesale Price Index (WPI) for 'All materials' increased by circa. 25 percent between January 2021 and May 2022 (an increase of c. 7 percent between January 2022 and May 2022). Approximately a 40 percent increase is observed in rough timber between 2020 and 2021. Between January 2022 and May 2022, a 3 percent decrease in rough timber is observed, while a 30 percent increase is noted for structural steel. Between January 2022 and May 2022, approximately c. 30 percent increase in WPI and c. 20 percent increase in Consumer Price Index (CPI) was noted in electricity.
3. A 6 percent increase in average construction hourly earnings is noted between 2020 and 2022 (up to Q1 2022). The same percentage growth is observed across 'All economic sectors' for the same period.
4. Considering earnings data by construction subsector between 2020 and 2021, average hourly earnings for the 'construction of buildings' increased by approximately 15 percent, while civil engineering earnings decreased by approximately 5 percent.

Summary (Continued)

Employment and Enterprise

1. There were approximately 159,300 (full-time and part-time) construction sector employees in Q1 2022, representing 6 percent of total employment. Of the total employed in construction in Q1 2022, approximately 8 percent are females.
2. Approximately 45 percent of the 2021 construction workforce is over 45 years old, with another 45 percent in the 25 – 44 age group. Similar shares are seen for the employees in 'All sectors' category.
3. In 2021, 583 work permits were issued. Civil Engineers were issued the highest number of work permits, with approximately a quarter of work permits. It is noteworthy that IT and environmental professionals accounted for a negligible share of the work permits granted in both 2020 and 2021. Additionally, between these two years, plasterers, and bricklayers and masons work permits increased by over 200 percent.
4. Between 2017 and 2020, employment in 'construction of buildings' and civil engineering increased, while it decreased in specialised construction activities.
5. While financial lending demanded and provided to SMEs decreased by 15 percent between 2019 and 2021, as a result of Covid-19 uncertainty, it should be noted that this increased by 30 percent between 2020 and 2021. In Q1 2022, €67 million in new lending was demanded and provided.

Skills and Capacity

1. 12 percent (or 5,399 students) of all graduate new entrants were studying engineering, manufacturing and construction in 2020/2021.
2. In 2021, a record number of 4,870 construction apprenticeships was noted. Apprenticeships in wet trades (bricklaying, painting, decorating and plastering) increased, with the exception of the floor and wall tiling apprenticeship, which was discontinued in 2011. From SOLAS forecast of numbers in construction apprenticeships, it is evident that all will increase between 2022 and 2025, with the exception of electrical apprenticeship.
3. Upskilling is a critical priority. The Commercial Skills Academy, hosted by the Office of Government Procurement, organises focused training programmes for key spending Departments. Additionally, the Build Digital Project, led by TU Dublin and funded by the Government, will provide guidance and leadership on digital tools to address the skills and knowledge deficits that has restricted the sector from engaging in digital adoption. Tangible outputs include a searchable education and training inventory, the establishment of a training and research network, and standard accredited modules.
4. Additionally, the Modern Methods of Construction (MMC) action, led by CIF, outlined the skills required for the adoption of MMC. These skills and competencies include knowledge of construction materials, scheduling, planning and BIM/Data analysis. The MMC phase 2 and phase 3 reports highlight that training by those who are competent in both construction and manufacturing will be required.

Productivity

1. Using Eurostat data, the GVA per hours worked by persons engaged in the Irish construction sector was approximately €33 in 2020. This is higher than countries such as Spain, Italy and Portugal. However, it is lower than countries such as Denmark, Austria, Belgium, Germany, Netherlands, Finland and France. Due to data availability issues, it was not possible to measure productivity for 2021 and 2022.

Sustainability

1. 37 percent of Ireland's emissions are from the construction and built environment sector. 23 percent of these emissions are operational emissions (from heating, cooling, and lighting our buildings) with the remaining from embodied emissions. The Irish Green Building Council (IGBC) highlights that under the Government's National Plans, there will be an increase in embodied carbon emissions (activities in procuring, mining, harvesting raw materials etc.), effectively negating the savings in operational emissions (heating, cooling and lighting buildings).

Key points from cost commentaries

In order to gain first-hand insights into the issues related to costs faced in the construction and built environment sector, it was decided to engage with a number of stakeholders. This engagement culminated in discrete commentaries which are provided in the report. In terms of costs, six commentaries are provided from the following: the Department of Housing, Local Government and Heritage (DHLGH), CIF, SCSI, IBEC, Ronan Lyons, and the OGP.

A number of issues are discussed in the commentaries related to costs with some common themes arising. Among the issues are disrupted supply chains, constrained labour supply, tender price inflation, and the need for offsite manufacturing and MMC to modernise the industry.

The OGP provides context for the global pressure on construction material prices and supply. In addition, the opportunities and benefits associated with the adoption of MMC and BIM for the industry are also discussed. The OGP discusses the International Construction Management Standard (ICMS), a single methodology for reporting, grouping and classifying construction project lifecycle costs. They state that once ICMS is adopted, developed and implemented, it will enable carbon reporting throughout a construction project's lifecycle and aligns well with the structured data requirements that are part of the digital transformation of the sector.

Measures introduced by the OGP in January and May 2022 which seek to address the challenging inflationary environment are acknowledged and welcomed, but calls for further changes are made, including, inter alia; measures to burden share inflation pressures for both existing and future construction contracts, reform of the Public Works Contract to improve risk management and collaboration, and an agreed evidence base on the costs of residential construction and how they can be reduced.

The CIF note significant increases in construction material costs (such as steel, wood, and rolled steel) in 2021 and 2022. In addition, they point to a loss of construction sector workers that have returned to Eastern Europe, the increasing cost of wages (SEO with 2.8% annual increases awarded), additional supply chain compliance costs linked to Brexit, and energy costs (including the carbon levy). The CIF outlines its commitment to the opportunities which offsite manufacturing and MMC presents to increase efficiency, decrease costs, and increase cost certainty.

The SCSI Tender Price Index for H2 2021 records annual inflation of 13% (more than double pre-Covid-19 level), linked to pent-up demand post pandemic, labour shortages, the invasion of Ukraine, and supply chain disruptions (steel, base metals, and fuels in particular). Significant price increases present challenges for fixed price contracts. It recommends that existing public works contracts should include an equitable level of price variation to address material price inflation, similar to OGP measures under the Inflation Co-operation Framework announced in May 2022.

BEC notes contributing factors to inflation such as rising energy and transport costs, shortages of HGV drivers, and increasing labour costs. More positively, IBEC states that materials manufacturers do not foresee product availability from domestic sources as a constraint to the ambitious homebuilding and retrofitting programme in the medium term as Ireland has high quality resources such as stone, sand and gravel available. IBEC recommends faster processing of work permits for non-EU applicants to increase labour supply, and points to concerns around the supply of PVC and monomers derived from petroleum.

Ronan Lyons (Trinity College Dublin) finds house prices in 2020 were roughly 20% below their 2007 level, land costs 40% lower, while build costs after tax reliefs were between 70% and 90% higher in 2020 than 2007. Research suggests that absent other factors, net construction costs would need to fall by up to 40% or housing prices rise by one third for completions to increase from 20,000 per year to 30,000. An agreed evidence base is needed on what costs are now, why they differ to other locations, and how they can be reduced.

Key points from skills commentaries

Commentaries on the topic of skills and knowledge were gathered from key stakeholders. The key findings are as follows;

CIF stated that their members are reporting difficulties in sourcing civil engineers and people with skills in 'wet trades' (bricklayers, painters and decorators, and plasterers). CIF state that overall construction workers need to be supported to adapt from traditional activities and processes of a construction site to more manufacturing/production floor skills, with an emphasis on digitalisation. This will assist in implementing modern methods of construction in the sector.

DFHERIS stated that a record number of 4,870 apprenticeship was recorded in 2021. It is forecasted that this will decrease in 2022, before increasing between 2023 and 2025. Two recent initiatives have been highlighted to improve the attractiveness of apprenticeships. Firstly, an employer apprenticeship grant of €2,000 has been introduced and secondly the CAO system, from 2022, includes construction apprenticeship options. According to the Expert Group on Future Skills Needs, approximately 17,000 construction employees (from various areas of construction) will be required to achieve the national retrofitting target of 500,000 houses. Two centres of excellence are currently in place in WWETB and Mount Lucas, with another three centres in development in Cork, Limerick and Sligo. These centres will assist in providing the 17,000 workers needed.

Mary Flynn, a BIM Expert/Quantity Surveyor from Dublin City Council, calls for a sustained bespoke marketing campaign targeting many cohorts such as leaving cert students, females etc. into the construction sector. She highlights that there are traditional and non-traditional (related to digitilisation) careers in the construction sector currently. She believes the future is data driven where organisations with high levels of 'data literacy', use of smart workflows, and structured and standardised metadata mined from Building Information Modelling (BIM) become more common. She highlights that BIM awareness and its effect on generating productivity is in its infancy, there is a great need for an awareness campaign to clarify what the term means and it is important to highlight the success stories.

Emma Hayes, a BIM Expert, believes there are very few courses providing BIM training in Ireland. These should be available at undergraduate level such as structural engineering/ mechanical engineering etc. She believes this would assist the use of BIM in the construction industry; highlighting the use and importance of BIM to the sector, supporting to achieving BIM certification, improving digital skills for BIM software and upskilling project managers.

Roisin Murphy from TU Dublin states that there are insufficient workers in the area of 'wet trades' and surveying. This leads to sub-contracting and further sub-sub-contracting, which can risk quality and output. Construction Industry Register Ireland (CIRI) will assist in reducing this risk and also improve the attractiveness of construction as a career choice. This insufficient supply puts an upward pressure on wages, presenting a considerable challenge in securing value for money.

Engineers Ireland highlighted that there is a shortage of engineers in Ireland. There is a need to produce more engineers through the higher education institutions and also to invite women, who may have left the sector for many years, to return. Engineers Ireland are contributing to the revision of regulations for engineers and engineering technicians to include sustainability as a core competence by the end of 2022. Additionally, they have also partnered with Diatec to deliver a wider range of BIM training courses.

Key points on productivity

Clancy Construction

Clancy Construction are heavily involved in projects (ranging from €5m - €60m) in the residential, healthcare, commercial, industrial and heritage sectors in both the public and private arenas. According to them, one of the biggest barriers to improving productivity is the design time waste created by the lack of a collaborative approach between client, designers and the delivery team/contractor. The lack of early involvement of a competent contractor with the expertise in delivery of the type of project leads to significant wasted time, effort and money in the long run. Eliminating this waste requires a "people" change followed by a "process" change to enable smarter procurement.

Clancy Construction successfully introduced the Last Planner System (LPS) which is a recognised benchmark and is used to optimise project delivery through systematic collaboration and coordination of all project stakeholders. Embracing and upgrading the system further to maximise the benefits of off-site fabrication and lean planning is key. This process is proven to deliver projects quicker and to help mitigate risks on site. They are currently in the process of rolling out a comprehensive bespoke Lean Construction Training programme to increase productivity on construction sites by increasing speed of delivery and enabling maximum use of off-site fabricated elements. Additionally, they have also started their Building Information Modelling (BIM) journey. As a result, they have seen significant reductions in programme risk mitigation, increased on-site production with lower numbers on site, improved quality and safety, and overall a more sustainable delivery model as a main contractor. A culture of innovation and collaboration is key.

As a result of Modern Methods of Construction, BIM, lean process and digital technologies, they have seen output per employee as a productivity metric improve significantly over the past 3 years.

Build Digital Project

Build Digital Project, funded by DPER, with a grant of €2.5 million over 5 years, is one of 7 priority actions being implemented by the CSG Innovation and Digital Adoption Sub-Group. The Build Digital Project will transform the Irish construction and built environment sectors by enabling all stakeholders to develop, maintain, and continuously improve their capabilities through digital adoption to support delivery of Project Ireland 2040. A key tenet of the Build Digital Project is the adoption of a bottom-up approach where the Voice of the Customer is heard and acted upon. The project has embedded over 50 industry members from across the breadth and depth of the construction supply chain into its five pillars and as members of the industry Steering Group.

BIM/Information Management represents a set of processes, workflows, and standards, supported by a range of technologies, that enable trust, collaboration, and an integrated approach to management and delivery of the built environment. There are 5 pillars: digital leadership & cultural change, digital standards, digital education and training, digital procurement, and sustainability and Climate action.

Tangibles from the project include the Irish Build Digital Exchange Hub (IBDEH), which will be the two-way portal for ongoing and circular engagement between industry and the project, where exemplary practice, tools, and knowledge will be shared, appraised, improved, and disseminated. Productivity improves when all stakeholders within the construction supply chain communicate and collaborate to achieve shared goals; the IBDEH will be the enabler. The progress of the sector in digital adoption, and the positive impact on productivity and efficiency, will be monitored by annual survey, forming part of a continuous improvement loop that will ensure success.

Section 1: Overview

1.1 Policy Context

An efficient, productive and sustainable construction sector is essential to deliver the increased ambition set out in the National Development Plan 2021 – 2030. This Report seeks to contribute to the evidence base and inform both Government and the construction sector on the performance of the industry.

The last Build report was published in 2020 and it detailed a number of encouraging trends in the sector, such as the increasing spread of regional investment and the increasing share of planning permissions granted for apartments. Additionally, the report outlined that construction apprenticeships had increased in 2019. Ireland's total investment in the construction and building sector was 12.3 percent as a share of national income in 2018, which is well above the EU28 average of 10.8 percent.

Covid-19 had a major impact on the construction sector, effectively shutting down almost all output at the height of the crisis with the exception of a limited number of essential projects. As activity returns, it is timely to assess trends in the sector.

The National Development Plan 2021 – 2030 (NDP) was published by Department of Public Expenditure and Reform in October 2021. The annual expenditure ceilings are detailed, alongside a breakdown of the agreed allocations across each Department for the period 2021-2025. Overall, the revised NDP sets out the ten year capital ceilings to 2030. The NDP is approximately €165 billion compared to the €116 billion in the NDP 2018 - 2027. The increased level of investment is a positive signal for the construction sector.

1.2 Purpose and Structure of Build Report 2022

The purpose of this report is to give a comprehensive overview of the performance and prospects of the Irish construction sector, based on the available official statistics and data. Along with the Irish Construction sector, the report also includes international statistics as a comparator. This report will aid in the monitoring of trends across the sector, ranging from output and investment to employment and cost inflation, so that risks and performance issues can be identified and addressed where necessary.

This report, along with the broader work of the Construction Sector Group (CSG)[1] and the evidence based approach to public investment set out in the National Development Plan (NDP), will help to ensure that a more sustainable and innovative Irish construction sector develops over the coming period in order to deliver both public infrastructure and private investment in a timely and cost efficient manner for our society.

The chapters in the report are as follows; Regional Activity, Investment & Output, Costs, Employment & Enterprise, Skills & Knowledge, Productivity, Sustainability and Conclusion & Next Steps.

Additionally, qualitative analysis, in the form of case studies and construction sector commentaries which can be found in the cost, skills and productivity chapters. The information provided in these case studies was gathered from interviewing industry stakeholders and relevant Government Departments

[1] https://www.gov.ie/en/policy-information/cae030-construction-sector-group/

Section 2: Regional Activity

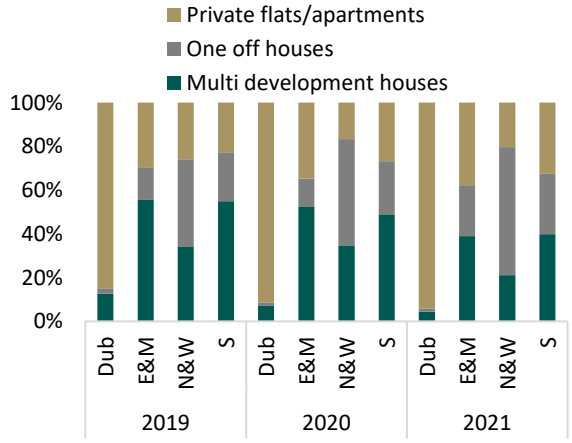
2.1 Overview

It is vital that investment supports long-term sustainable economic growth that benefits every region across Ireland. This section examines trends in construction activity across Ireland's regional areas.

2.2 Output

Figure 2.1 examines planning permissions (units) by region and type of dwelling. In Dublin, the proportion of apartments has increased over this period 2019 to 2021 (from 85 percent to 94 percent). As for the Eastern & Midlands (excl. Dublin), Northern & Western, and Southern regions, it is evident that the proportion of one-off housing permissions has increased, while the proportion of multi-development houses decreased between 2019 and 2021. In the Eastern and Midlands region, the proportion of one-off housing permissions increased from 15 percent to 23 percent (from 1285 to 1858 planning permissions) while the proportion of multi-development houses decreased from 56 percent to 39 percent over the same period. There is a risk that this increasing share may work counter to overall NPF objectives, particularly compact growth. These years were atypical given the impacts of Covid-19 and it remains to be seen whether these trends will persist.

Figure 2.1: Planning Permissions granted for new dwellings (units), by type of dwelling and region



Source: CSO

In 2021, there were 42,991 planning permission granted (units). The table 2.1 below shows the regional breakdown.

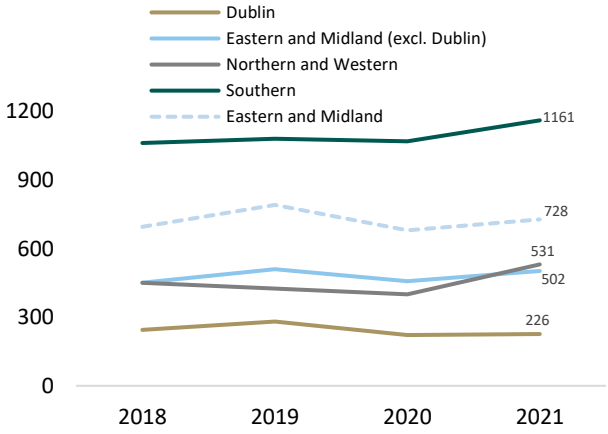
Table 2.1: 2021 Planning permission and commencements by region

	Planning permissions	Commencements
Dublin	20,101	10,936
Eastern and Midlands (excl. Dublin)	7,987	9,370
Northern and Western	3,923	3,061
Southern	10,980	7,357
Total	**42,991**	**30,724**

Source: CSO and DHLGH

In 2021, the Southern Region saw the highest number and share (approximately 50 percent) of civil engineering (Construction of highways, roads, water projects, etc.) planning permissions granted, followed by the Eastern & Midland, and Northern & Western Regions.

Figure 2.2: Number of Planning Permissions granted for Civil Engineering Projects by region

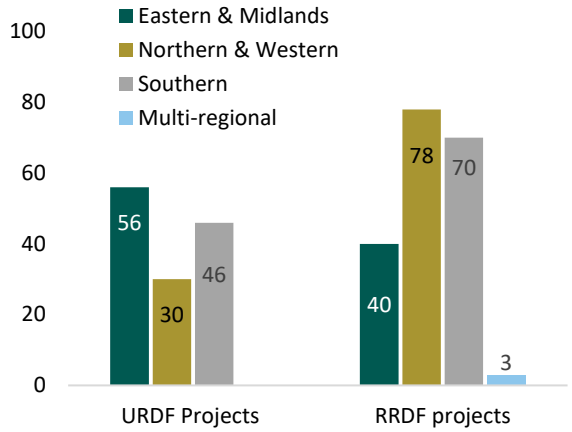


Source: CSO

As part of Project Ireland 2040, the Urban Regeneration Development Fund (URDF) and Rural Regeneration and Development Fund (RRDF) were established. The Urban Regeneration and Development Fund of €2 billion aims to rejuvenate significant but underused areas in Ireland's five cities and other large towns. The Rural Regeneration and Development Fund of €1 billion

will provide investment to support rural renewal for suitable projects in towns and villages with a population of less than 10,000, and outlying areas in the vicinity. In this regard, it is noteworthy that the Southern region has the second highest URDF projects and also RRDF projects.

Figure 2.3: Approved Projects by Region and Fund



Source: Department of Rural and Community Development and Department of Housing, Local Government and Heritage. Data relates to funding approved up to February 2022.

Tables 2.2 and 2.3 set out the largest projects by level of funding for each region under the Rural and Urban Regeneration Development Funds, respectively. As of February 2022, the total amount of RRDF expenditure that has been utilised is approximately €277.5 million. It is clear that the Northern & Western region has the highest amount and number of RRDF projects.

Table 2.2: Projects with RRDF funding awarded

Region	No of projects	Funding €m
Northern and Western	78	€118
Southern	70	€84
Eastern and Midlands	40	€60
Multi-regional	3	€16
Total	**191**	**€278**

Source: DRCD. The numbers are rounded. Data relates to funding approved up to February 2022.

The table 2.3 below shows the largest RRDF projects by region. The Northern and Western project namely Ballybofey - Stranorlar: The Seed Project has received €8.8 million in funding. As of February 2022, the project is at planning/procurement stage.

Table 2.3: Largest Approved Projects, project value, project progress and expected date of completion of RRDF projects by region

Region	Project	RRDF Funding in €m	Project Progress	Projected Completion Date
Eastern & Midland	Kinnegad Regeneration	€8	Planning/Procurement stage	Q2 2023
Northern & Western	Ballybofey - Stranorlar: The Seed Project	€9	Planning/Procurement stage	Q1 2024
Southern	Wexfordia - the New Ross Tourism Transformation	€6	Implementation stage	Q3 2024

Source: Dept. of Rural and Community Development. Numbers are rounded. Data relates to funding approved up to February 2022.

Currently, as seen in table 2.4, the total amount of URDF expenditure allocated is over €1.6 billion, of which the majority (€787 million or approximately 50 percent) is for the Southern Region.

Table 2.4: Projects from URDF

Region	Projects	Funding in €m
Southern	46	€787
Dublin	24	€510
Northern & Western	30	€211
Eastern & Midland	32	€117
Total	**132**	**€1,625**

Source: Department of Housing, Local Government and Heritage. Data relates to funding approved up to February 2022. The numbers are rounded.

The table 2.5 below shows the largest URDF projects by region. The Cork City Docklands has been allocated funding of approximately €353 million.

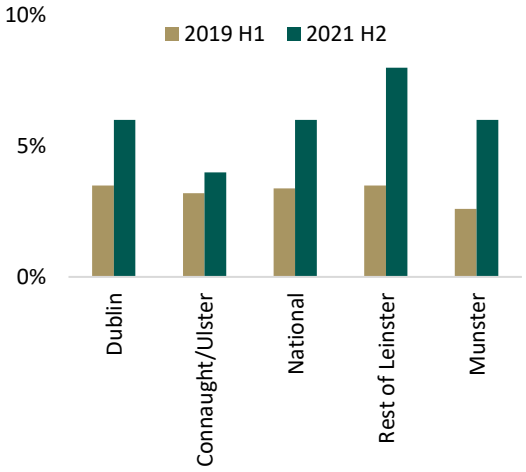
Table 2.5: Largest Approved URDF Projects by regions

Region	Project	URDF Funding in €m	Progress	Completion Date
Southern	Cork City Docklands	€353	Strategic Assessment Report	2027
Dublin	Clonburris	€177	Strategic Assessment Report	2027
Northern & Western	Galway City Council Transport Connectivity Project	€40	Strategic Assessment Report	2026
Eastern & Midland	Camlin Quarter Regeneration	€10	Strategic Assessment Report	2025

Source: Department of Housing, Local Government and Heritage. Data relates to funding approved up to February 2022. The numbers are rounded.

The Tender Price Index (TPI) depicts non-residential and mainly new build projects with values of over €0.5 million and covers all regions in Ireland. The TPI in H2 2021 stood at 6 percent nationally as shown in Figure 2.4. The highest inflation recorded in 2021 H2 was in the 'Rest of Leinster'. The SCSI note that exceptional material price increases coupled with labour shortages within the sector have contributed to this increase.

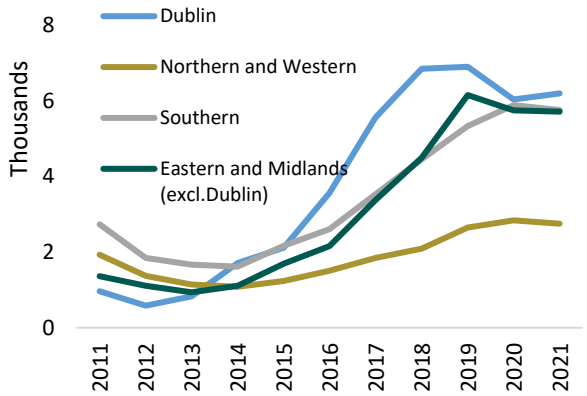
Figure 2.4: Tender price Index by years



Source: SCSI

Figure 2.5 looks at new dwelling completions by region. In the Northern & Western, and Southern region, more new dwellings were completed in 2021 than in 2019. The opposite is true for the Eastern & Midlands and Dublin regions.

Figure 2.5: New Dwelling Completions by Region

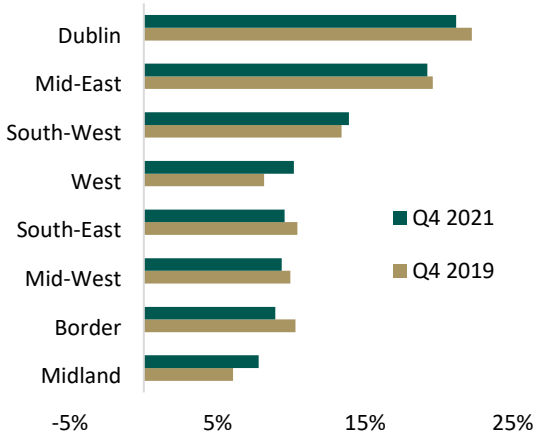


Source: CSO

2.3 Employment

Figure 2.6 below outlines that, in regions such as Dublin, Mid-East (Wicklow, Kildare, Meath), South-East (Waterford, Kilkenny, Carlow, Wexford), Mid-West (Clare, Tipperary, Limerick), and Border (Cavan, Donegal, Louth, Monaghan, Sligo, and Leitrim), the construction share of employment decreased between Q4 2019 and Q4 2021.

Figure 2.6: Construction Sector employment share by region in Q4 2019 and Q4 2021



Source: CSO

The figure 2.7 below displays construction sector employment as a percentage of total employment for Q4 2021. The Mid-East and Midlands (Longford, Westmeath, Offaly, and Laois) had the highest share of construction employment, while Dublin has the lowest.

Figure 2.7: Share of Construction Sector Employment in total Employment by Region

Source: CSO

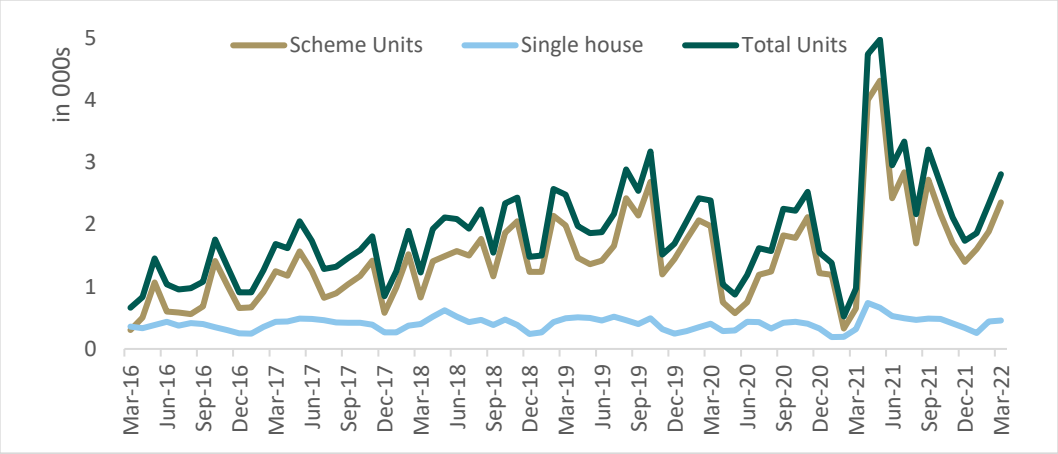
Box 1: Housing for All

Housing for All - launched in September 2021 – is the Government's plan to increase the supply of housing to an average of 33,000 units per annum up to 2030. The target 33,000 units is split across an average of 17,000 private, 10,000 social, 4,000 affordable purchase, and 2,000 cost rental homes. The plan is supported by over €4 billion in State funding per annum.

In 2021, 20,433 new dwellings were built (-0.5% y-on-y) reflecting the impact of COVID-19 and the associated public health restrictions on the construction sector and wider economy. There were exemptions for essential construction, which encompassed social housing. The latest Construction Status Report covering the period to Q4 2021 (published on 30 March 2022) shows that there were 5,202 new social housing units built in 2021. When acquisitions (1,270) and leased (2,711) units are included, the total number of new social housing units delivered in 2021 was 9,183.

As of Q4 2021 (latest data available), 8,749 social homes are onsite, with an additional 10,455 homes in the pipeline. In Q4 2021, 120 new construction schemes (2,050 homes) were added to the pipeline. The housing delivery target for 2022 is 24,600 homes of which 9,000 will be social homes, 4,100 affordable and cost rental, and the balance of 11,500 will be private rental and ownerships.

A Commencement Notice is a notification to a Building Control Authority (BCA) that a person intends to carry out either works or a Material Change of Use to which the Building Regulations apply. There were almost 35,000 commencement notices in the 12 months to March 2022 (an increase of 96.8% y-on-y), likely related to a backlog of commencements associated with the constructions sector lockdown in early 2021. In addition, almost 43,000 units were granted planning permission in 2021 (an increase of 1.5% y-on-y). The figure below shows commencement notices between March 2016 and March 2022.



Source: Department of Housing, Local Government and Heritage

2.4 Conclusion

In recent years, the share of planning permissions for apartments has increased in the Eastern & Midlands (incl. Dublin) region and Southern region. It is noteworthy that in the Eastern & Midlands, Northern & Western, and Southern regions, the proportion of planning permissions for one-off houses has increased. There is a risk that this increasing share may work counter to overall National Planning Framework objectives, particularly compact growth. However, these years were atypical given the impacts of Covid-19 and it remains to be seen whether these trends will persist.

Overall, across all the regions, there were 42,991 planning permission (units) granted in 2021, with Dublin granted twice the number of permissions (in units) as the Southern region.

There were 30,724 commencements in 2021. Comparing the planning permissions to commencements highlights that planning permissions exceeded the commencements for all regions with the exception of Eastern and Midlands (excl. Dublin). While planning permissions provide an indication of the future pipeline of investment, it cannot be assumed that these permissions translate into completed dwellings.

Additionally, in the Northern & Western and Southern regions, more new dwellings were completed in 2021 than in 2019. The opposite is true for the Eastern & Midlands and Dublin regions.

Planning permission for civil engineering projects were also analysed. Approximately 50 percent of all civil engineering projects (Construction of roads, water projects, etc.) planning permissions were for the Southern region.

The URDF and RRDF funds are important for the development of regional infrastructure. The Northern & Western region has the highest number of RRDF projects, whilst the Southern region has the highest number of URDF projects.

Inflation affects all aspects of the economy, and is crucial to capital investment as it can reduce the value of investment returns. In H2 2021, the Tender Price Index, which shows inflation of non-residential projects with a value of over €0.5 million, stood at 6 percent nationally. This was a result of increases in price of materials and also due to shortage of labour in the sector.

It is also important to examine on regional employment. The construction share of employment decreased between 2019 and 2021 for regions such as Dublin, Mid-East, South-East, Mid-West, and Border[2]. In contrast, the construction share of employment increased in regions such as South-West, West and Midlands. Construction employment as a share of total employment is between 4 percent and 8 percent, with 4 percent in Dublin and 8 percent in Mid-East and Midlands.

[2] Dublin, Mid-East (Wicklow, Kildare, Meath), South-East (Waterford, Kilkenny, Carlow, Wexford), Mid-West (Clare, Tipperary, Limerick), and Border (Cavan, Donegal, Louth, Monaghan, Sligo, and Leitrim)

Section 3: Investment and Output

3.1 Overview

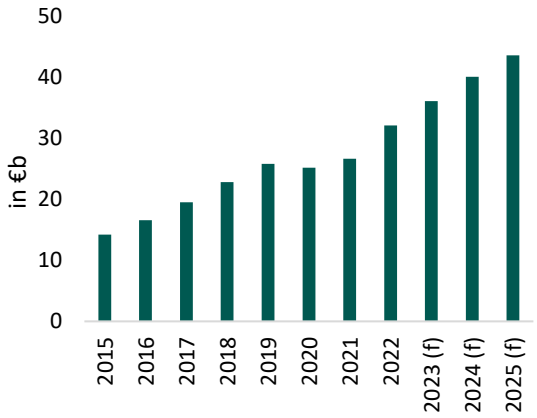
This section examines a broad range of elements in relation to construction sector investment and output in Ireland for both the private and public sector. The chapter outlines, particularly for the last decade, some vital trends in investment, construction and housing output. Finally, the chapter concludes with a list of vital projects now in place under Project Ireland 2040.

3.2 Trends in Investment

The official measure of total investment in the sector (including both private and public investment) is Gross Fixed Capital Formation (GFCF) in Building and Construction, which covers housing, commercial building, civil engineering and public infrastructure.

In 2022, approximate investment in Building and Construction is forecasted to be €32 billion. It is noteworthy that total investment in building and construction is forecasted to increase since 2020.

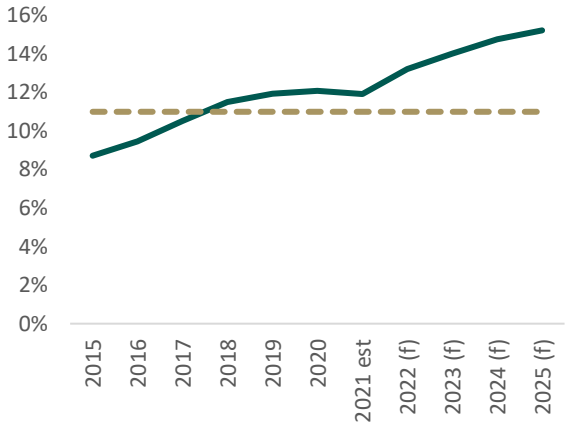
Figure 3.1: Total Investment in Building and Construction



Source: Department of Finance

The average share (as demonstrated by the golden line in figure 3.2) outlines the average total GFCF in Building and Construction as a share of GNI* between 2020 and 2025. It is evident that since 2017, the total share of GFCF in building and construction is above average.

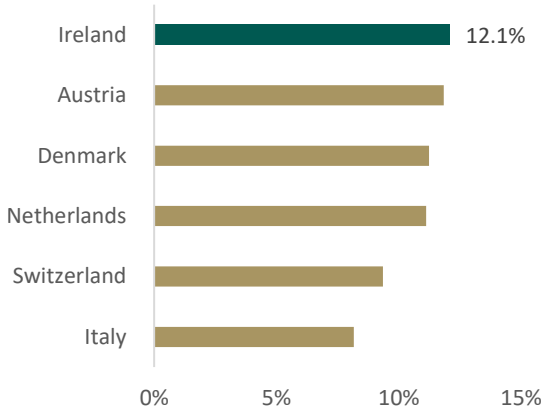
Figure 3.2: Total GFCF in Building and Construction as a share of GNI*



Source: D/Finance, including projections from D/Finance.

In 2020, GFCF in building and construction in Ireland stood at 12.1 percent of GNI*, higher than in Austria, Denmark, Netherlands, and Italy.

Figure 3.3: Comparison of GFCF in Building and Construction as a share of GDP/GNI* in 2020 across the EU

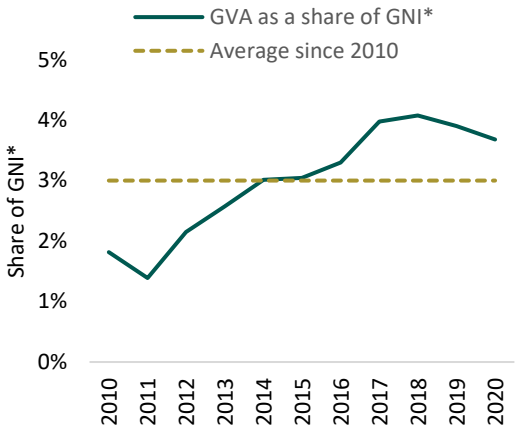


Source: Eurostat and CSO

3.3 Trends in Construction Output

Gross value added (GVA) in output can be understood as the combination of wages and profits. As a proportion of GNI*, the GVA by the construction sector was approximately 4% in 2020. It is important to note that the GVA is at current prices. Despite Covid-19, this was above the average (as shown by the broken gold line) in figure 3.4.

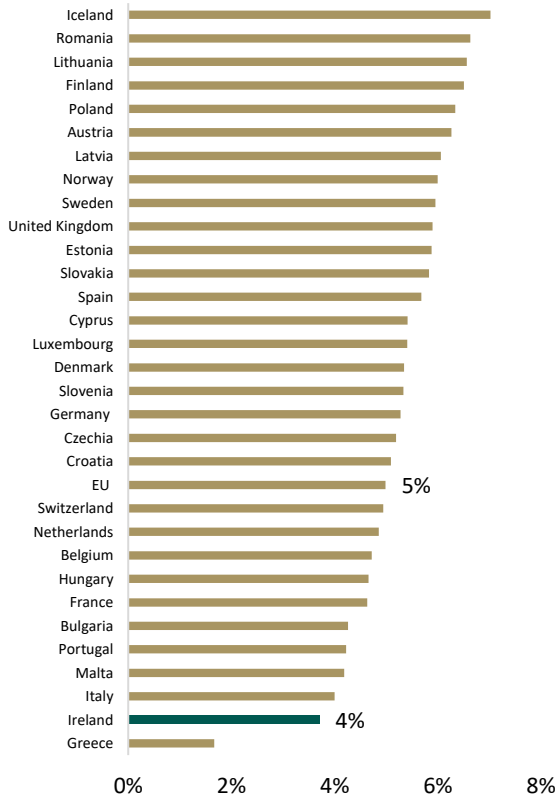
Figure 3.4: Gross Value Added from Construction in Ireland as a share of GNI*



Source: CSO

Figure 3.5 focuses on the GVA as a share of GDP/GNI* in 2020. Ireland's GVA from construction as a share of GNI* in 2020 is slightly lower than EU average of 5%.

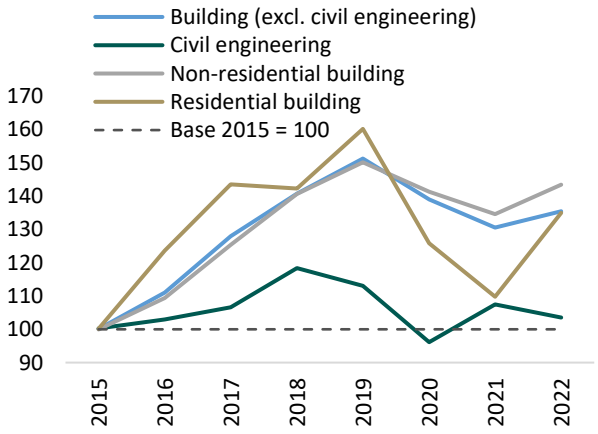
Figure 3.5: Comparison of GVA from Construction as a share of GDP/GNI* in 2020



Source: CSO and Eurostat. Note: 2020 GNI* figures are utilised for Ireland while 2019 GDP figures are utilised for United Kingdom.

Figure 3.6 shows the Volume of Output in Building and Construction. Firstly, activity in the construction sector remains lower than pre-pandemic levels with production volume in 2021 down 16 percent compared to 2019 and by 4 percent between 2020 and 2021. Secondly, the volume of output increased significantly every year from 2015 until 2020. Finally, the volume of residential building decreased by 16 percent between 2019 and 2021.

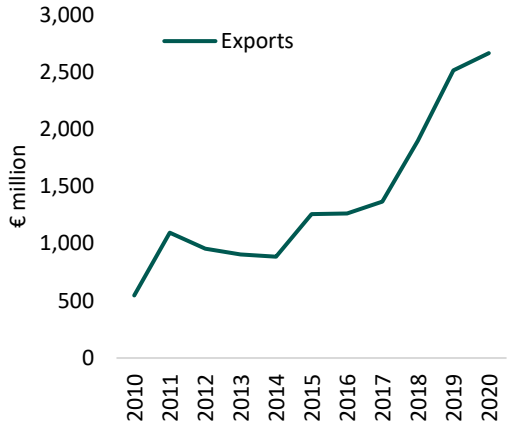
Figure 3.6: Volume of Output in Building and Construction (Base = 2015=100)



Source: CSO. Note 2022 only includes Q1 2022.

The Annual Business Survey of Economic Impact is a survey of the client companies of Enterprise Ireland, IDA Ireland and Údarás na Gaeltachta. As shown in Figure 3.7, exports by construction client companies stood at approximately €2.7 billion in 2020, an increase of 40 percent from 2018, despite Covid-19.

Figure 3.7: Exports by Construction Companies



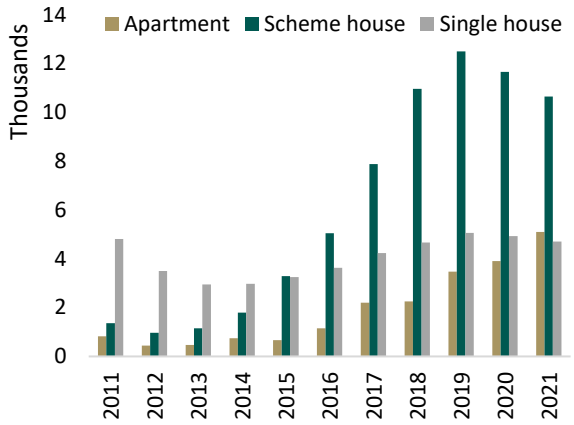
Source: Department of Enterprise, Trade and Employment

3.4 Trends in Housing Output

According to Housing for All, the aim is to build 33,000 dwellings per year over this decade. Between 2019 and 2021, the delivery of apartments has increased by 47 percent. However, between 2019 and 2021, overall new dwelling completions have decreased by 3%; this is a result of the number of scheme houses and single houses decreasing. In 2021, nearly 25 percent of all new dwelling completions were apartments. This is higher than the 2019 apartment share of 17 percent.

In terms of the total housing stock, Census 2016 found that 12 percent of all dwellings in the State were apartments. In comparison with other European countries, Ireland's average share of apartments is relatively low. Indeed, the National Planning Framework notes that across many European countries, 40 to 60 percent of households live in apartments.

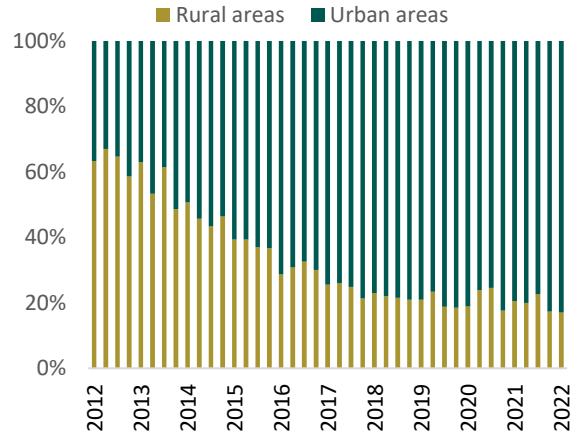
Figure 3.8: New Dwelling Completions by Type of Dwelling and Year



Source: CSO Statbank.

In the past decade, the proportion of new dwelling completions have changed in terms of location. In 2013, 44 percent of new houses were completed in urban areas, with 56 percent in rural areas, by 2017 the figures had changed to 76 percent in urban areas and 24 percent in rural areas; in Q1 2022, 83 percent of all new dwellings were completed in urban areas with only 17 percent in rural areas. The government had aimed to concentrate 50% of growth in the five urban cores of Dublin, Cork, Limerick, Galway and Waterford, while concentrating the other 50% outside of these regions. In recent years, it is evident from figure 3.9 that a large proportion of the completed dwellings are in urban areas. Concentrating growth in urban areas where people live closely together has a positive impact on the ability to easily access essential services such as supermarkets, workplaces and health and educational facilities, hence reducing the need to use cars and other less environmentally friendly means of transport for these journeys.

Figure 3.9: Share of New Dwelling Completions by Urban and Rural Area and Year



Source: CSO. For year 2022, only Q1 2022 data was available.

3.5 Anticipated Construction Pipeline

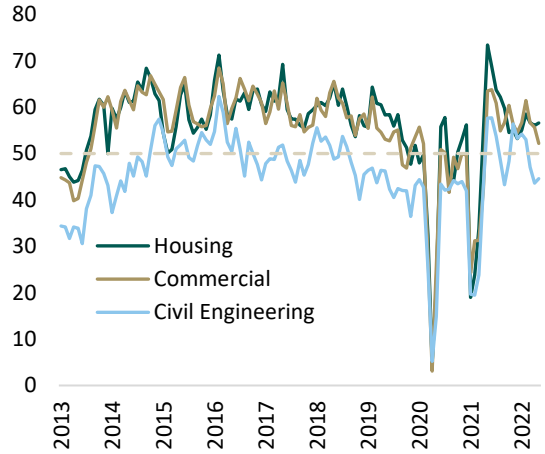
In this section, an overview is given of the anticipated construction pipeline by incorporating the latest data on confidence indices, planning permissions, and the major infrastructure pipeline planned under Project Ireland 2040, with a particular focus on 2022.

3.5.1 Trends in Confidence and Planning Permissions

The Ulster Bank Construction Purchasing Managers Index survey select companies which provide an advance indication of sentiment in the private sector. However, it should be noted that it is a measure of sentiment rather than actual output. A reading of >50 indicates expansion (<50 indicates contraction).

The housing index rose to 73.4 in May 2021 and is currently at 56.6 in May 2022. Civil engineering includes construction of roads & railways, motorways, bridges and tunnels. This index is approximately at 44. As for commercial, the sentiment is slightly positive at 52 in May 2022.

Figure 3.10: Ulster Bank Construction Purchasing Managers Index

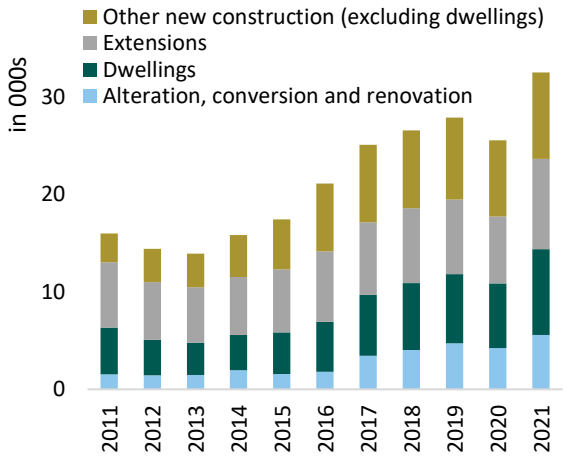


Source: Ulster Bank

The purpose of the CSO Planning Permissions Statistics is to provide a short-term indicator on anticipated levels of construction sector activity.

In 2021, there were 32,499 planning permissions granted. An increase of 30 percent in planning permissions was observed between 2020 and 2021.

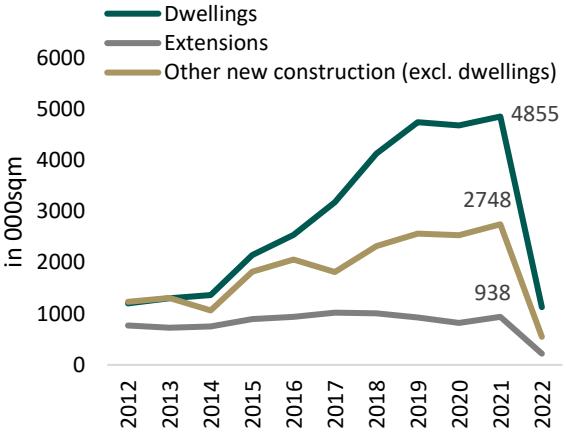
Figure 3.11: Number of planning permission by types of construction



Source: CSO Statbank.

Between 2019 and 2021, a 4 percent decrease in the total number of residential planning permissions by floor space was noted. In the recent years, the number of planning permission by floor space share has remained the same.

Figure 3.12: Total Floor Area for which Planning Permission Granted by types of Construction

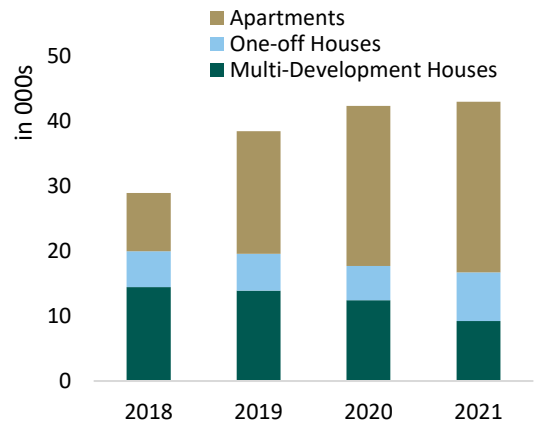


Source: CSO. 2022 only includes Q1 2022.

In 2021, 42,991 dwelling units were granted permission. In 2021, 32,499 planning permissions granted amounts to 42,991 dwelling units. In 2021, approximately 60 percent of planning permissions were granted for apartments, while 17 percent were granted for one-off houses, with the rest for multi-development houses. Conversely, this was 31 percent for apartments, 19 percent for one-off houses and 50 percent for multi-development houses in 2018. Overall, it is clear that planning permissions (units) for apartments has increased from 8,975 in 2018 to 26,272 in 2021. Over the same period, the number of multi-development houses has decreased from 14,483 to 9,220.

In terms of the four Dublin Local Authorities, it is observed that there were 42,725 apartments and 5,307 houses within Tier 1 (with full planning permission that can implemented immediately) yet to be commenced (as of Q4 2021). Of these 48,032 units, 60 percent (29,579) received planning permission through the strategic housing development process.

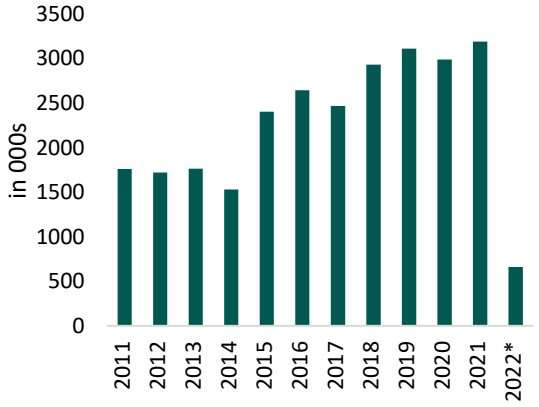
Figure 3.13: Number of Planning Permissions (units) granted for New Houses and Apartments



Source: CSO

The types of non-residential construction that require planning permissions are categorised as Commercial Buildings, Buildings for agriculture, Industrial Buildings, Government, Health and Education, Other Buildings for Social Use, and Civil Engineering. As shown in Figure 3.14, demand for non-residential construction planning permissions has returned to pre-Covid-19 levels. Between 2019 and 2021, a 4 percent decrease in the total number of non-residential planning permission by floor space was noted. In 2021, non-residential planning permissions were granted for 3,191,000 metres squared of floor space.

Figure 3.14: Non-residential Planning Permissions by Floor Space



Source: CSO. 2022* includes Q1 2022 only.

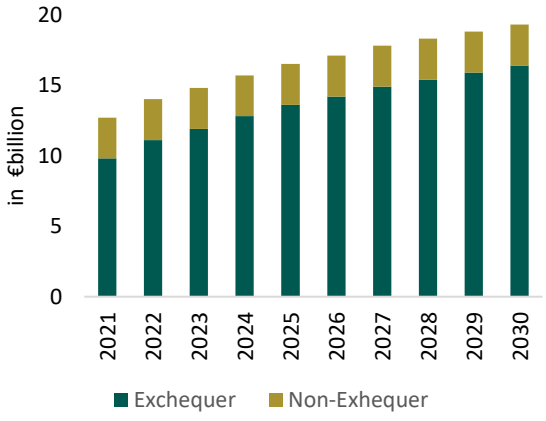
3.5.2 Public Investment Priorities

Project Ireland 2040 – the National Development Plan (NDP) and the National Planning Framework (NPF) – remains the strategic vision for Ireland's public capital infrastructure priorities strictly aligned with the National Strategic Outcomes (NSOs) for Ireland's new spatial strategy contained in the NPF.

The plan is ensuring a shift to greater integration of regional investment plans, stronger co-ordination of sectoral strategies and more rigorous selection and appraisal of projects to secure value-for-money.

The Government is committed to continued investment in infrastructure to support, in line with the NPF vision, balanced regional development. To support the vision outlined in the Project Ireland 2040 and NPF, the total capital expenditure, as announced in NDP 2021 – 2030, is €165 billion. This is a 42 percent increase from the NDP 2018 – 2027. This includes €2.9 billion annual non-exchequer investment.

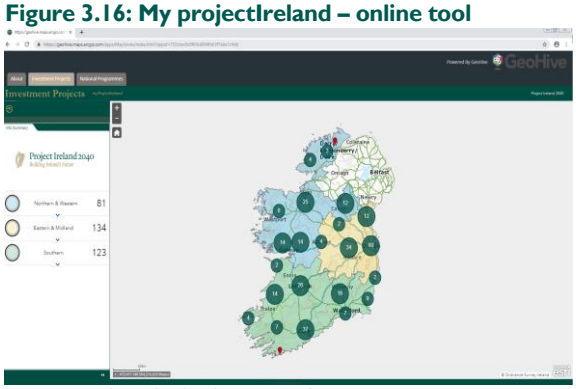
Figure 3.15: Ireland's Public Capital Investment under the NDP 2021 – 2030



Source: National Development Plan 2021 – 2030

MyProjectIreland interactive map includes over 1,100 projects. Additionally, updated Investment Projects and Programmes Tracker includes 270 projects and 140 programmes. This tracker and map was last updated in Q2 2022.

Figure 3.16: My projectIreland – online tool



Source: gov.ie/2040 (Updated in May 2022)

3.6 Conclusion

In 2022, approximate investment in Building and Construction is forecasted to be €32 billion. It is forecasted that investment in construction will increase between 2020 and 2025.

In 2020, GFCF in building and construction in Ireland stood at 12.1 percent of GNI*, higher than in Austria, Denmark, Netherlands, and Italy.

As a proportion of GNI*, the Gross Value Added (GVA) by the construction sector was approximately 4% in 2020. This is slightly lower than the EU average of 5%.

Trends in output show that activity in the construction sector remains lower than pre-pandemic levels, with overall production volume decreasing by 16 percent between 2019 and 2021. However, exports by construction client companies stood at approximately €2.7 billion in 2020, an increase of 40 per cent from 2018, despite Covid-19.

Trends in housing output show that new dwelling completions have increased by 3 percent, with apartments increasing by 50 percent (all between 2019 and 2021). Overall, in Q1 2022, 83 percent of all new dwellings were completed in urban areas, with only 17 percent in rural areas. The Government had aimed to concentrate 50% of growth in the five urban cores of Dublin, Cork, Limerick, Galway and Waterford, while concentrating the other 50% outside of these regions. In 2021, 42,991 dwelling units were granted permission. Since 2014, the share of apartments to houses has grown incrementally every year. In 2021, approximately 40 percent of the units that were granted planning permission were houses, while the rest were apartments.

Section 4: Costs

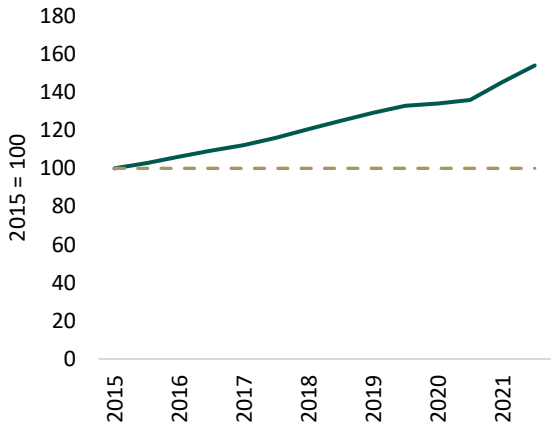
4.1 Overview

This section examines the overall trends in residential and non-residential construction costs. In addition, it considers material and wage price inflation, and revision to procurement processes. Furthermore, a number of commentaries are provided which explore some key issues related to cost, such as disrupted supply chains, constrained labour supply, tender price inflation, and the need for offsite manufacturing and MMC to modernise the industry.

4.2 Trends in Non-Residential Construction Costs

The Construction Tender Price Index[3] increased by 15 percent between H1 2020 and H2 2021. For context, the Construction Tender Price Index increased by 10 percent between H1 2018 and H2 2019.

Figure 4.1: Construction Tender Price (non-residential projects) Index (2015=100)

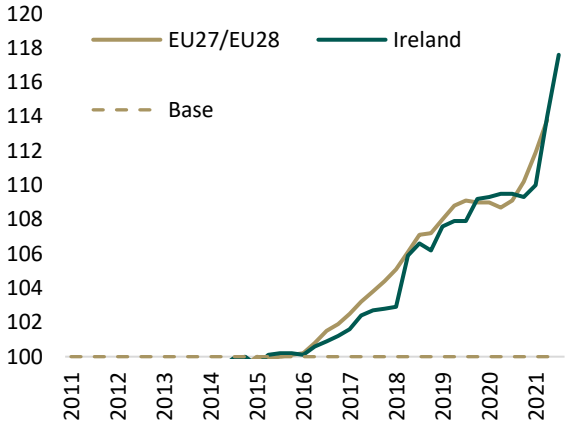


Source: SCSI. The author has utilised 2015 as the base year.

4.3 Trends in Residential Construction Costs

The Construction Cost Index in Figure 4.2 shows the development of costs (labour, materials and plant overheads) incurred by the contractor to carry out the construction process. This measure does not include costs (VAT, site cost, Professional Fees, or selling Price) to the client. Specifically, between Q1 2021 and Q3 2021 (latest available), a 7 percent increase is noted in the Construction Cost Index (2015 = 100). Overall, since 2015, a significant (approximately 18 per cent) increase is noted in the Construction Cost Index. Additionally, since 2015, the EU28/ EU27 average has been above Ireland's, thereby indicating that the costs faced by Irish home builders has grown at a slightly slower rate than the EU average and also has merged with the EU construction cost index.

Figure 4.2: Construction Cost Index (2015=100), Residential Buildings



Source: Eurostat. Note: Since 2019 Q2, EU27 is used rather than EU 28.

[3] The Construction Tender Price Index - inflation index for construction. Based on tender returns for non-residential projects, predominately new build projects with values in excess of €0.5 million across all regions. The Index is therefore a measure of average price increases across differing project types and locations. Additionally, it measures the movement in prices agreed between clients and contractors, normally when the tender is accepted.

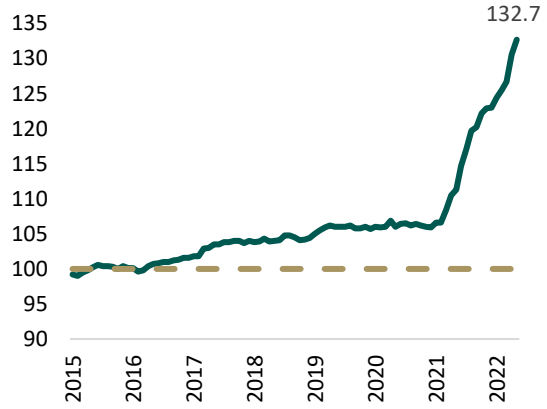
4.4 Trends in Cost of Materials

The price of materials is one element of the increase in residential and non-residential costs.

The Wholesale Price Index (WPI) for Building and Construction Materials provides a general indication of price trends in the sector. It is important to note that WPI is exclusive of VAT. Figure 4.3 below illustrates that the WPI has increased significantly for materials in 2021. Between January 2022 and May 2022, a 7 percent increase is noted in WPI for 'Materials'.

The current significant material inflation seen in 2021 and 2022 is attributable to the interplay between COVID-19, Brexit, supply chain disruptions, unprecedented weather conditions, and increased demand both nationally and internationally, and the conflict between Russia and Ukraine.

Figure 4.3: Monthly Wholesale Price Index for Building and Construction Materials (2015=100)



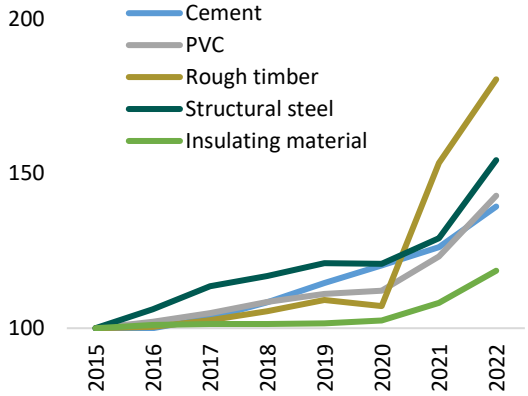
Source: CSO. 2022 includes January to May 2022.

Figure 4.4 below shows the WPI of materials such as Cement, Steel, insulating material, PVC, and rough timber. It is evident that rough timber experienced the largest price increase of 43 percent increase between 2020 and 2021. However, between January 2022 and May 2022, a 3 percent decrease in WPI of rough timber is noted.

In relation to timber, the Department of Agriculture, Food and the Marine stated that 80 percent of forestry licence applications are being screened for a comprehensive ecological assessment. In addition, the number of appeals increased from 21 in 2017 to a peak of 582 in 2020. This combination of events led to a backlog of licence applications. In total, 4,050 forestry licences were issued in 2021, which is an increase of 56 percent on the number issued in 2020. Currently, an ambitious forest licencing plan for 5,250 licences in 2022 has been set. This represents an overall increase in licensing of 30%. It provides for a 100% increase in output for afforestation licences. In addition, the overall number of licences in respect of private felling, roads, and afforestation will be increased year on year by 48%. In terms of felling, in 2021, 2,877 tree felling licences were issued for approx. 8.5 million cubic metres. As regards 2022, Coillte which supplies 75% of Irish timber is almost fully licensed for the year.

As for structural steel, a 7 percent increase is noted between 2020 and 2021, and another 30 percent increase is recorded between January 2022 and May 2022.

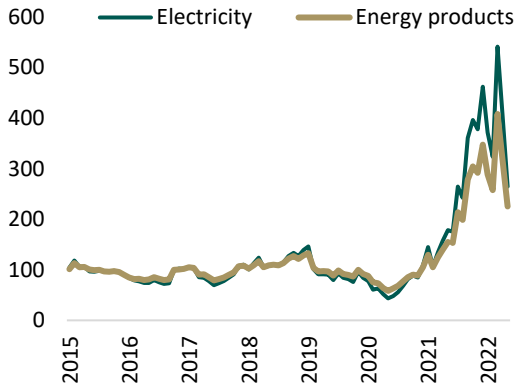
Figure 4.4: Changes in Wholesale Price Index (2015 = 100)



Source: CSO. 2022 includes the average of January 2022 to May 2022.

Between January 2022 and May 2022, a 30 percent increase is noted in electricity, and a 20 percent price increase is noted in energy products (fuels purchased by manufacturing industry).

Figure 4.5: Monthly changes in Wholesale Price Index of Electricity and Energy Products (2015 = 100)



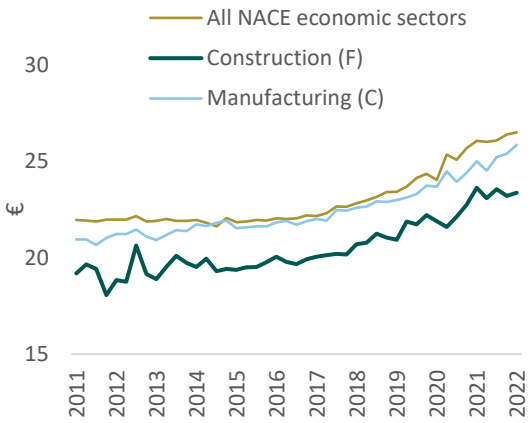
Source: CSO. 2022 includes January to May 2022.

It is important to note that electricity consumer price index was also calculated. It is noted that the price of electricity increased by approximately 20 percent between January and May 2022.

4.5 Trends in the Cost of Labour

Average Hourly Earnings for the construction sector were €21.6 in 2019, €22.1 in 2020, €23.4 in 2021 and 23.4 in 2022. Therefore, a 6 percent increase in average construction hourly earnings is noted between 2020 and 2022 (includes only Q1). The same percentage growth is observed across 'All NACE economic sectors'. For context, between 2016 and 2018, a 5 percent increase was noted in hourly construction earnings.

Figure 4.6: Quarterly changes in Average Hourly Earnings in Construction

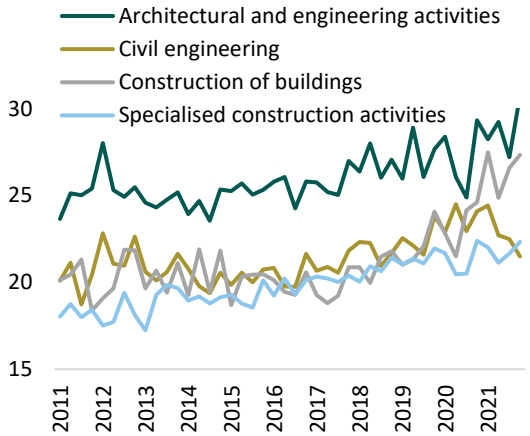


Source: CSO. Seasonally adjusted data

Analysis was also carried out for the apprenticeship hourly wage. It was noted that the average hourly wages for apprenticeship in construction was €13 in 2018 and 2019.

Figure 4.7 details the earnings data by subsector. Between 2020 and 2021, average hourly earnings for the construction of buildings[4] increased by approximately 14 percent, compared to specialised construction activities which increased[5] by 2 percent. For the same period, civil engineering decreased by approximately 4 percent.

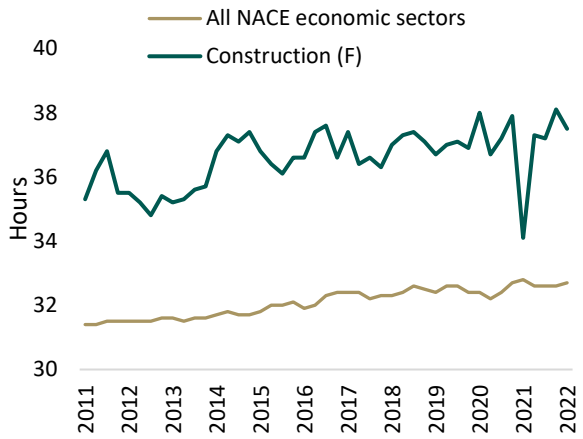
Figure 4.7: Average Hourly Earnings for Construction Subsectors



Source: CSO

In Q4 2021, average paid hours reached 38.6, highest average weekly paid hours for construction employees when looking at the data between 2011 and 2021. The average weekly paid hours reduced slightly in Q1 2022.

Figure 4.8: Average Weekly Paid Hours for All Construction Employees (Seasonally Adjusted)



Source: CSO

[4] Construction of Building includes development of building projects, and construction of residential and non-residential buildings.

[5] Specialised construction activities includes demolition, site preparation, installation of utilities, insulation work etc. Activities mostly carried under subcontracts.

4.6 Procurement overview

In January 2022, the OGP introduced measures to address inflation for new contracts/tenders. These measures included the introduction of an indexed price adjustment mechanism for the tendered price in the Instruction to Tenderers for certain forms of the public works contract. Secondly, a reduction of the fixed price period to 24 months from the date of the award of the contract, and finally contractors can seek an adjustment to their price once the contract has been awarded should the price of a particular material when purchased increase by more than 15% on its price at the time the contract was awarded. In addition, provision for the public body to seek a reduction in the price where the price of a particular material reduces by more than 15 percent from the date the contract has been awarded has also been introduced.

The OGP in May 2022 introduced a new set of measures for projects operating live contracts under a public works contract. These measures were introduced as contractors faced further significant increases in material and energy prices as a result of the Russian invasion of Ukraine. Additional inflation costs will be apportioned between the parties, with, subject to budgetary constraints, the State bearing up to 70 percent of the additional inflationary related costs. The full details of the measures can be found on the Capital Works Management Framework website.

Reporting on construction costs in a manner which classifies, defines, measures, records, analyses, presents and compares construction project life cycle costs in a structured and logical format is vital as the information can be utilised for many purposes beyond the project level. The International Construction Management Standard (ICMS) is a single methodology for reporting, grouping and classifying construction project costs. It also incorporates Life Cycle Costs in line with international standards, enabling practitioners to classify costs across the whole project life cycle. This eliminates inconsistencies when accounting, comparing and predicting project finances. In its most recent third edition, published in 2021, ICMS encompasses Life Cycle Analysis and provides a common reporting framework accounting for the interrelationship between construction costs and carbon emissions. The OGP, as part of the review of the Capital Works Management Framework currently underway, is incorporating ICMS into the cost reporting templates. Once adopted, developed and implemented it will enable carbon reporting throughout a construction project's lifecycle and aligns well with the structured data requirements that are part of the digital transformation of the sector.

4.7 Research

The SCSI, in January 2021, produced a report titled 'The real costs of new apartment delivery'. The report examines development costs and viability of privately developed apartments in Dublin, but its findings are also relevant to other urban locations across Ireland (while the costings and sales prices may differ). It outlines that the cost of a 'category two' suburban medium-rise (build-to-sell 2 bedroom) apartment is €2,098 - €2,785 per m2 (ex. VAT, including siteworks and parking). The viability or unviability of these suburban medium-rise apartments 18 months ago are as follows based on sales prices less total development cost (i.e. development margin) followed by a viability test against average market risk premiums (15%): For low spec units, the development margin was €49,000 with a viability hurdle of €47,000, which was deemed viable by €2,000; For high spec units, the development margin was negative (-€7,000) before taking account of the viability requirement of €61,000, which made the viability gap for these units €68,000. Furthermore, it is noteworthy that there are viability gaps identified under both low and high spec for build-to-sell two-bedroom apartments (in 5- to 15-storey buildings) in urban areas. The SCSI notes the above analysis predates a significant period of construction cost inflation in 2021 and the first half of 2022.

Additionally, as highlighted in the Housing for All document, there are approximately 70,000 to 80,000 residential units with planning permissions that have not commenced construction. In order to address issues relating to un-commenced apartments and associated viability gaps, Department of Housing, Local Government and Heritage (DHLGH) has introduced the Croí Cónaithe (Cities) scheme. This is a fund which will be made available for suitable apartment developments (for sale to owner occupiers), where a demonstrated viability gap is identified. The fund will require open book accounting in order to ensure that the funding feeds through in reduced cost to home-buyers.

Under the Construction Sector Group (CSG) Subgroup, DHLGH has commissioned a study to illustrate how smart residential design could deliver housing, planning, social and environmental policy objectives in a cost-efficient manner with a view to reducing cost. Additionally, the cost study will review, by way of international benchmarking, how Ireland's residential construction costs compare to other European countries. It will also identify and test areas for potential cost savings (including at the early design stage) on a range of case study projects, representative of construction projects

currently being delivered in Ireland. The study will account for a suburban housing scheme, a suburban medium rise apartment scheme, an urban medium rise apartment scheme, and an urban student accommodation scheme. A CSG Innovation Sub Group Steering Committee, composed of stakeholders from the Sub Group, Government and industry, has been formed and will provide oversight and direction to the study. The final report will be published in Q4 2022 and it will provide a baseline for similar future construction cost studies.

The Stability Programme Update 2022 outlines that the annual inflation rate was 5.9 percent in Q1 2022 and is likely to peak in Q2 2022 (at 6.75 per cent). Very high levels of uncertainty warrant the modelling of an additional, more severe, scenario – for instance, one in which inter alia European Union sanctions are extended to cover Russian energy products. The SPU also attempts to quantify the impact of an escalation of sanctions, for instance if Russian fossil fuels were immediately removed from the European Union's energy mix. This simulation is calibrated on the assumption that energy prices returned to levels that prevailed in the immediate aftermath of the invasion, and remain considerably above the central scenario assumptions throughout this year and next. This would add around 2 percentage points to inflation (and the annual inflation rate could reach around 9 percent in the third quarter of 2022). The fallout from price increases of this magnitude would tip many European economies into recession and, in the face of weaker external demand and the transfer of domestic income abroad (via even higher energy prices), the impact would be to reduce demand in Ireland.

The box below outlines cost commentaries from relevant stakeholders, which examine a selection of issues related to construction costs.

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

Global events have had an impact on supply chains and also availability of labour, resulting in a rise in the tender prices within the construction sector. Tender prices for social housing projects have generally risen across 2021 and 2022, and indicate a level of volatility in this area of the market, with lower numbers of tender returns, increased numbers of tender withdrawals, and the level of tender costs varying significantly from project to project. New measures were introduced by the OGP in January 2022 to address the impact that recent price increases in construction materials are having on public works tenders. While the reduction of the fixed price period (to 24 months) will only impact a limited number of social housing projects, the residual measures (addressing the period between tender submission and award and permitting cost recovery within the fixed price period for material price changes over 15%) will reduce the level of inflation risk that contractors will have to bear. It is hoped that going forward this will result in an improvement in tender results in the social housing sector.

CONSTRUCTION INDUSTRY FEDERATION

Prices of materials such as steel, wood, rolled steel, plywood, and dry lining increased at significant rates, with some on a monthly basis. The return to Eastern Europe of some construction workers increased labour costs (particularly for those on "piece work" rates). The Sectoral Employment Order, for those on hourly rates, was also changed by recommendation of the Labour Court awarding annual increases of 2.8% in November 2021. Additionally, costs have increased significantly particularly around supply chain compliance due to Brexit. The price of energy, which has increased significantly, is a major driver as it is required to make cement and steel. Carbon credits have increased from €30 per tonne to €90 per tonne; the carbon levy increase of over 20% is also a key driver of cost increases. As a result of these challenges, contractors have no control over these costs and many believe they are currently subsiding public projects from their own balance sheets. Additionally, the greater use of Offsite manufacturing and MMC offers an opportunity to maximise efficiency and minimise waste in the construction process. This potentially allows the project funder to lock anticipated costs in at the point of the project cycle when they are fully designed and procured. This can serve to insulate projects against future inflation during the course of the works programme, materials procured and with manufacturing already underway, costs are committed, providing cost certainty.

The CIF recommends measures to be introduced to fairly manage inflation for both existing and future construction projects. Additionally they state that there is a need to strengthen the clause 4 management in the public works contract to enforce closer collaboration and problem solving and the avoidance of disputes. Finally, it is recommended to allow for an Extension of Time and Cost relief for specific unforeseeable matters and for the formulas and indices to reflect construction commodities such as fuel and labour. The Public Works Contract needs to be reformed to bring it in line with international norms like the NEC that better manages costs, risk and collaborative behaviour on construction projects. This will help deliver better value to the state and the taxpayer over the lifetime of Project 2040, the NDP and Housing for All.

The SCSI Tender Price Index for H2 2021 shows that national annual inflation was at 13 per cent, more than double the pre-Covid-19 level (H2 2018 to H2 2019). The significant increases in tender price inflation are the result of pent-up demand, following the easing of Covid-19 restrictions and supply chain issues that occurred because of Covid. The SCSI found the main reasons for material price inflation for 2021 were high price volatility across a range of building materials – particularly insulation, cement, plasterboard metals and fuel – and labour shortages coupled with the extremely high demand for projects across all tiers. While the initial expectation in January 2022 was towards price and market stabilisation, the invasion of Ukraine has significantly impacted that expectation. Certain materials, previously sourced from the region – particularly steel and base metals – and fuels have seen a dramatic price increase. This highlights the uncertainty for the viability of project pipelines and the high risk for those with contracts to deliver projects at fixed prices. Additionally, the Sectoral Employment Order came into effect on 1 February 2022, which sets the statutory minimum pay rates and other conditions (sick pay and pension entitlements) for construction workers. Risk management has become a primary focus for companies to ensure that construction competitions awarded are structured adequately to protect against inflation pressures within the market. Some contracting firms no longer accept previous contract risks due to material inflation and are either delaying jobs or selecting jobs where the client is taking on the risk, which is particularly apparent in the private sector. From a public sector perspective, the government needs to ensure that existing projects have an equitable level of price variation to react to the frequent increases in material prices facing the market. The sector welcomed recent changes to new contracts when inflation was an issue because of Covid. The SCSI is calling on similar support to counter the impact of inflation due to high energy costs.

As with many other sectors throughout Europe, there has been increased cost of shipping containers and challenges around the number of heavy good vehicle drivers seen predominantly after re-opening of the economy nationally and internationally. As with construction skills, a quicker processing of work permits would be a significant help in attracting more drivers from outside the EU. Massive increases in energy costs have had a major impact on materials such as cement and concrete. Electricity costs for manufacturers have more than doubled in 2021, and there is no indication that this will reduce in the short-term. In addition to reduced free allocations, the cost of carbon credits has tripled over the past 12 months for those companies in the Emissions Trading Scheme. Transport fuel costs have increased by over 40% in the year to March impacting on delivery costs for material manufacturers. Additionally, labour costs continue to increase to match inflation, contributing to operating costs for manufacturers. Finally, materials manufacturers do not foresee product availability from domestic sources as a constraint to Government's ambitious homebuilding and retrofitting programme in the medium term as Ireland has high quality resources such as stone, sand and gravel available. However, there has been a significant impact on both the cost and availability of several building materials due to the invasion of Ukraine and sanctions, including structural steel, aluminium, wood fibre and nickel, with potential concerns around PVC and monomers derived from petroleum.

Ronan Lyons, Assistant Professor of Economics, Trinity College Dublin

In a recent paper titled 'Housing prices, macro-prudential rules and the elasticity of housing supply: Evidence from Ireland', we find strong evidence across all our specifications that housing prices, the cost of construction and, with some exceptions, the cost of land affect new housing supply, in line with the predictions of economic theory. We find consistent evidence that supply responds positively to prices and negatively to both construction costs and site costs, with the estimated responsiveness to prices no lower in recent periods than in earlier ones. The low level of new housing supply in Ireland during the 2010s is not anomalous, but rather explained well by the fundamentals included in the long-run equation, in particular the dramatic rise in construction costs. While housing prices in 2020 were roughly 20% below their 2007 level and land costs 40% lower, build costs after tax reliefs were between 70% and 90% higher in 2020 than 2007.

Land-use restrictions or other policy barriers limiting supply have grown in importance over time and are more relevant in Dublin than elsewhere. These barriers are reflected in higher costs, whether related to construction or sites, rather than in addition to those costs. We do not find any evidence that looser credit conditions are associated directly with higher housing supply, if anything the opposite; any effect is likely to be captured instead through the housing price channel. As part of the Housing for All strategy, Ireland has targeted an increase in construction of more than 50% between 2020 and 2030. Our results imply that, absent other factors, net construction costs would need to fall by up to 40% or housing prices rise by one third for completions to increase from 20,000 per year (their level at the start of the 2020s) to 30,000. It is clear that of these two options, lower costs rather than higher prices is the socially preferred solution to facilitating an increase in completions. However, to do that, an agreed evidence base is needed on what costs are now, why they differ to other locations, and how they can be reduced.

Oifig um Sholáthar Rialtais
Office of Government Procurement

As economies emerged from the pandemic, increased expenditure on infrastructure globally has heightened demand for construction materials. The invasion of Ukraine has increased energy prices and further disrupted supply chains.

Modern Methods of Construction combined with Building Information Modelling has the potential to deliver better quality and consistency, a better and safer workplace, more stable employment conditions, greater diversity in the workforce, export potential and more efficient use of raw materials and time.

4.8 Key points, Projections, and Conclusions

The Construction Tender Price Index, which is an inflation index for non-residential projects over €0.5 million, increased by 15 percent between H1 2020 and H2 2021 (SCSI Data). Secondly, since 2015, an 18 percent increase is noted in the Construction Cost Index[6], with a 7 percent increase noted between Q1 2021 and Q3 2021 alone. However, since 2015, EU27/ EU28 average is above Ireland, thereby indicating that costs faced by Irish home builders have grown at a slightly slower rate than the EU average.

Between January 2022 and May 2022, an approximate 7 percent increase is noted in Wholesale Price Index for 'Materials'. It is evident that rough timber experienced the largest price increase (43 percent increase between 2020 and 2021). It is important to note that, between January 2022 and May 2022, a 3 percent decrease was noted for rough timber, while a 30 percent increase was noted in structural steel.

Between January 2022 and May 2022, a 30 percent price increase is noted in electricity, while a 20 percent price increase is noted in energy products (fuels purchased by manufacturing industry). Additionally, for the same time period, a similar increase was noted in electricity prices, according to the consumer price index.

Considering labour costs, average hourly earnings for the construction sector were €21.60 in 2019, €22.1 in 2020, €23.4 in 2021 and the same, €23.4, in 2022. Therefore, a 6 percent increase in average hourly earnings was recorded between 2020 and 2022 (includes only Q1). This increase was the same as the increase in the overall hourly wage across all sectors. For context, between 2016 and 2018, a 5 percent increase was noted in hourly construction earnings.

[6] Construction Cost index shows the development of costs (labour, materials and plant overheads) incurred by the contractor to carry out the construction process.

Section 5: Employment and Enterprise

5.1 Overview

This section examines trends in construction sector employment and enterprise. The level and composition of construction sector employment is analysed by considering the split by subsector, by Irish and non-Irish workers, by self-employment, employment, and employment by gender. The profile of construction sector enterprise is examined based on the available data.

5.2 Trends in Employment

The public health measures saw the introduction of the Pandemic Unemployment Payment (PUP) to support those who lost their jobs due to Covid-19. Table 5.1 shows the number of construction sector employees on PUP and the Employment Wage Subsidy Scheme (EWSS). Overall, we see a decreasing trend in the number of people availing of PUP and EWSS from the construction sector between Q1 2021 and Q1 2022.

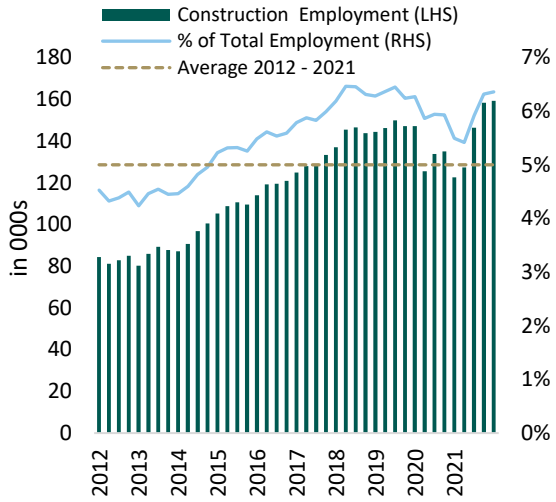
Table 5.1: Pandemic Unemployment Payments and EWSS, as of end Q1 2021 and Q1 2022

	Q1 2021	Q1 2022
Construction employees on PUP	32,868	2,801
Construction Employees on EWSS	31,173	8,812
Total	64,041	11,613

Source: Department of Social Protection Vote in DPER. It is noteworthy that both these schemes have ended in Q2 2022.

There were approximately 159,300 (full-time and part-time, and not seasonally adjusted) construction sector employees in Q1 2022. The graph (figure 5.1) also shows the share of construction employment. In Q1 2022, the share of construction employment was just over 6 percent. This share is similar to pre-Covid-19 share of construction employment. This is just below the EU27 share of construction employment (according to 2020 Eurostat data) of 7 percent.

Figure 5.1: Employment in the Construction Sector



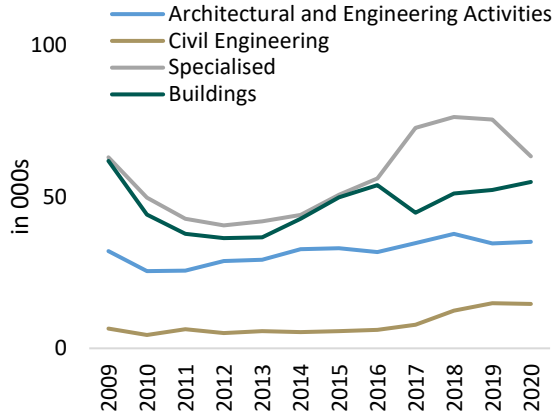
Source: CSO. Not seasonally adjusted as some other data in this chapter was not available seasonally adjusted. Therefore, for comparison, non-seasonal data has been utilised.

Of the four sub-categories of construction detailed in Figure 5.2, there has been a gradual upward trend since 2012, with the exception of construction of buildings which experienced a significant decline between 2016 and 2017.

In 2017, there was a significant divergence between the numbers employed in 'Buildings' and those employed in 'Specialised construction activities' (the construction of parts of buildings and civil engineering works or preparation). These activities are usually specialised in one aspect common to different structures, requiring specialised skills.

However, despite Covid-19, it is important to note that employment in construction of buildings increased from 44,800 in 2017 to 54,900 in 2020. On the other hand, specialised construction activities declined significantly between 2017 and 2020 (from approximately 72,800 to 63,400).

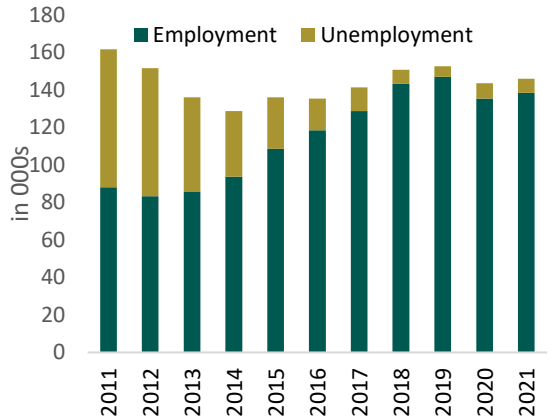
Figure 5.2: Employment by Construction Subsector



Source: Eurostat

In 2021, approximately 7,500 construction workers were unemployed. This was approximately 8,200 in 2020.

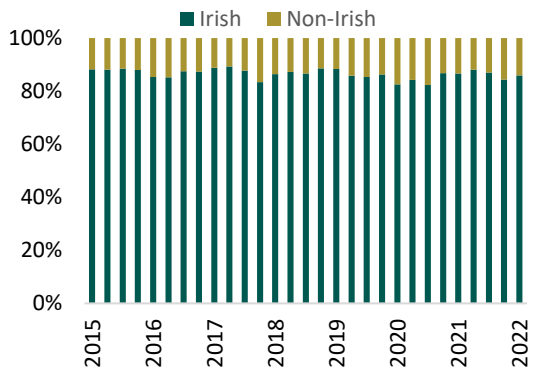
Figure 5.3: Construction Sector Employment and Unemployment



Source: CSO

Between Q1 2021 and Q1 2022, the share of Non-Irish construction employees has increased from 13 to 14 percent i.e. from 16,500 to 22,500.

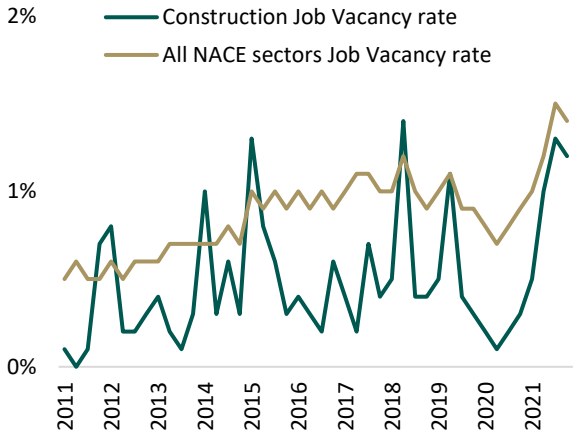
Figure 5.4: Share of Construction Sector Employment by Nationality



Source: CSO

The vacancy rate is calculated as the number of job vacancies divided by total sector employment plus total vacancies. The number of unemployed decreased by 700 between 2020 and 2021, while the job vacancy rate increased from an average of 0.2 percent to 1 percent. This shows that the number of job vacancies has increased between 2020 and 2021 and the number of unemployed workers with construction skills is reducing.

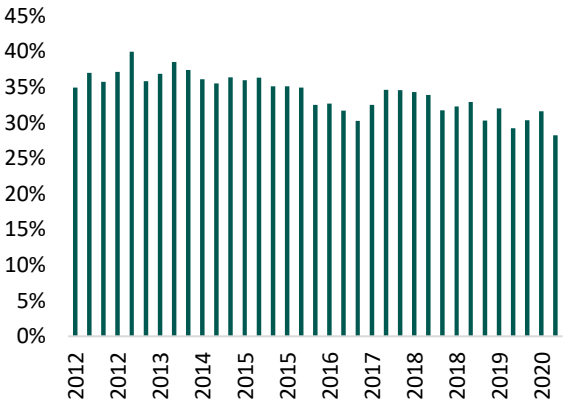
Figure 5.5: Job Vacancy Rates



Source: CSO

Figure 5.6 focuses on construction sector self-employment as a share of total construction employment. In recent years, self-employment accounts for circa. 30% of total construction employment.

Figure 5.6: Construction Self-Employment as Share of Total Construction Employment



Source: CSO

Table 5.2 below shows the age profile of those employed in the construction sector for 2006, 2011, 2016 and 2021. It is evident that this proportion has fallen by roughly 10 percent for those aged 25 – 44 years, while it has increased by 6 percent for those aged 45 and over. Approximately 44% of the current workforce is in the 45+ age category.

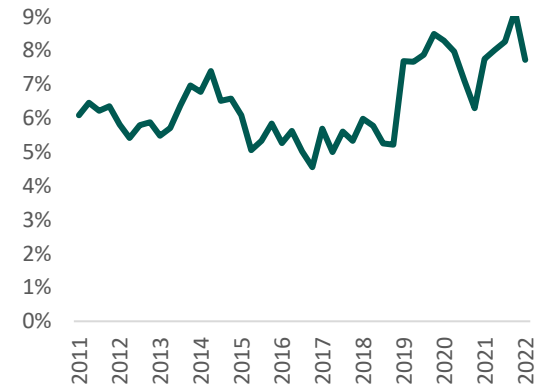
Table 5.2 Age Profile of those Employed in the Construction Sector (in percentage)

Type	2006 (in %)	2011 (in %)	2016 (in %)	2021 (in %)
15 - 24 years	21	8	6	11
25 - 44 years	54	58	56	45
45 years and over	25	35	38	44

Source CSO

Female employment in the construction sector stood at 12,300 as of Q1 2022. This equates to 8 percent share of total employment in construction. For context, there were 14,500 female construction workers, accounting for 9 percent of the construction workforce in Q4 2021. It is noteworthy that the 9 percent was the highest share seen (data analysed between 1998 and 2022).

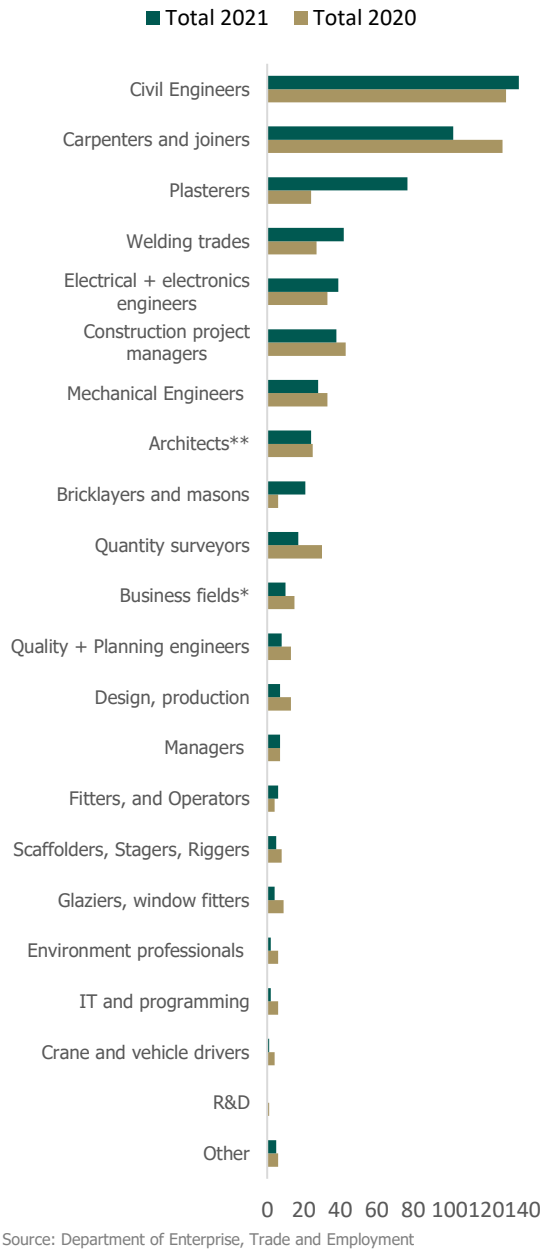
Figure 5.7: Share of Female Employment in the Construction Sector



Source: CSO

Overall, 583 work permits were issued in 2021, with civil engineers receiving a quarter of those work permits. A 5 percent increase in work permits was observed for civil engineers between 2020 and 2021. An increasing trend can also be seen for employment permits for both Plasterers and Bricklayers & Masonry, where they increased by more than 200 per cent over the same period. Given the increasing focus on the environment and digitalisation for the sustained growth of the construction industry, it is important to analyse IT and programming and environmental professional roles. In 2021, only two IT and two environmental professional work permits were granted. Additionally, in both cases this is less than the employment permits by these aforementioned construction subsectors that were provided in 2020.

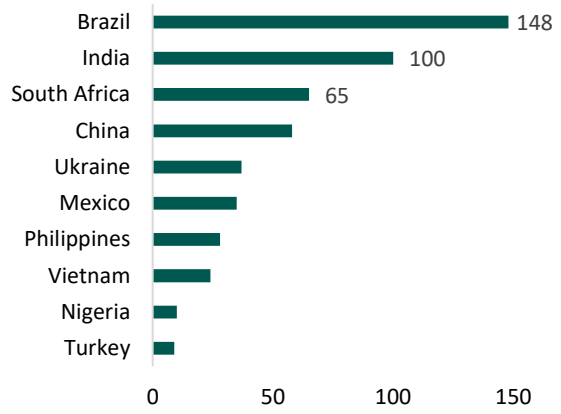
Figure 5.8: 2020 and 2021 Employment Permits Granted by Construction subsector



Source: Department of Enterprise, Trade and Employment

Figure 5.9 shows the 2021 work permits granted by nationality. It is evident that citizens from Brazil, India and South Africa were the top three nationalities to be granted work permits. Out of 138 civil engineers who were granted a construction related work permit in Ireland, approximately 100 of them were from South Africa, India and Brazil.

Figure 5.9: 2021 Employment Permits Granted by Nationality, Top 10



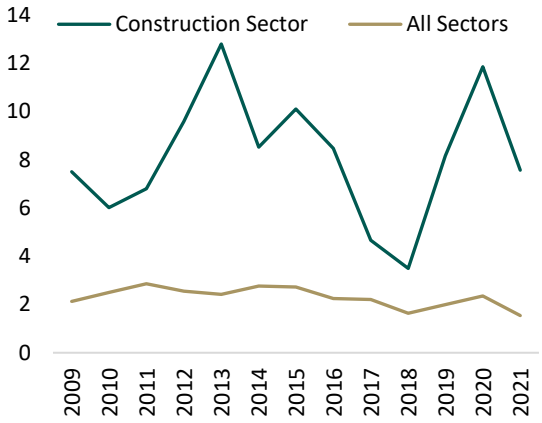
Source: Department of Enterprise, Trade and Employment

In Q4 2021, amendments were made to the employment permits regulation. Construction occupations such as electricians, masons, roofers, roof tilers, plumbers, heating & ventilating engineers, carpenters & joiners, floorers, wall tilers, painters, decorators and construction and building trades supervisors are permitted to apply for work permits to work in Ireland.

5.3 Workplace Safety

Workplace fatalities per 100,000 increased significantly in 2020 and fell in 2021. It is important to note however that the construction sector has had the highest number of fatalities by sector after agriculture, consistently since 2012. There were 16 construction fatalities in 2020 and 10 in 2021.

Figure 5.10: Workplace Fatalities per 100,000 Workers

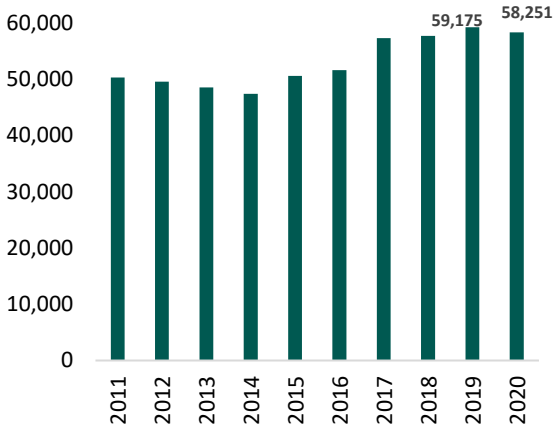


Source: Health and Safety Authority

5.4 Trends in Enterprise

In 2020, there were 58,251 active construction enterprises (latest year available). This is a decrease of 2 percent or 924 active construction firms from 2019.

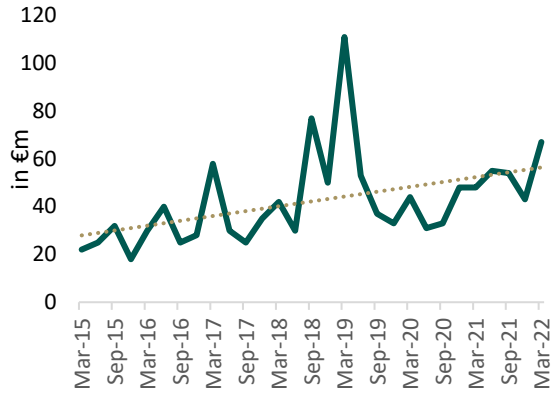
Figure 5.11: Number of Construction Enterprises



Source: Eurostat. According to the CSO, an enterprise is considered to be active in a certain period if it generates turnover, employs staff, or makes investments in that period.

Figure 5.12 outlines the four-quarter rolling average of new lending to construction sector SMEs. In March 2022, a total of c. €67 million in new lending occurred. While, between 2019 and 2020, new lending had decreased by a third, new lending has increased by approximately 30 percent between 2020 and 2021.

Figure 5.12: Quarterly New Lending to Irish Construction Sector SMEs



Source: Central Bank of Ireland, SME Credit Series, Table A.14.1.

5.5 Conclusion

There were approximately 159,300 (full-time and part-time) construction sector employees in Q1 2022. In Q4 2021, the share of construction employment was at 6 percent. In recent years, self-employment is roughly 25% of total construction employment. Female employment in the construction sector stood at 12,300 as of Q1 2022. This represents an 8 percent share of total construction employment. Approximately 45 percent of the 2021 construction workforce is over 45 years old, while a similar share is in the 25 – 44 age group. These shares are similar to employees in 'All sectors' category.

Despite Covid-19, it is important to note that employment in construction of buildings increased from 44,800 in 2017 to 54,900 in 2020. On the other hand, specialised construction activities declined significantly between 2019 and 2020.

The number of unemployed construction sector workers decreased by 700 (from 8,200 to 7,500) between 2020 and 2021, while the job vacancy rate increased from an average of 0.2 percent to 1 percent. This shows that the number of construction job vacancies has increased between 2020 and 2021, and the number of unemployed workers with construction skills is reducing.

In 2021, 583 work permits were issued. It is evident that citizens from Brazil, India, and South Africa were granted the most number of work permits. Civil Engineers were issued the highest number of work permits, with approximately a quarter of work permits given in 2021. A 5 percent increase was observed for civil engineers between 2020 and 2021. Finally, given the increasing focus on the environment and digitalisation for the sustained growth of the construction industry, it is important to analyse IT and programming and environmental professionals' roles. In 2021, only two IT and two environmental professional work permits were granted.

As for enterprise, in 2020, there were 58,251 active construction enterprises. This is a decrease of 2 percent or 924 active construction firms from 2019. Additionally, finance is extremely important for construction firms.

In March 2022, a total of c. €67 million in new lending occurred. Additionally, new lending increased by approximately 30 percent between 2020 and 2021.

Section 6: Skills and Knowledge

6.1 Overview

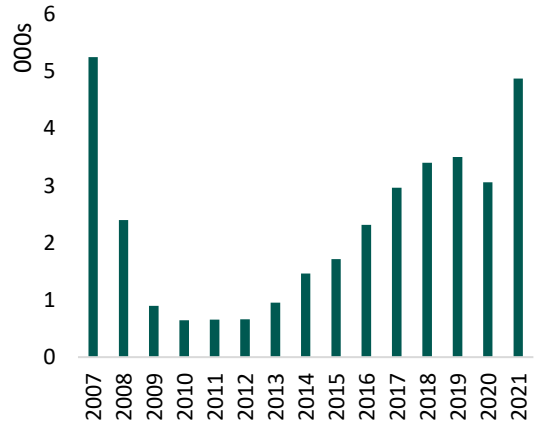
This section gives a brief analysis of trends in skills and training for the construction sector with a particular focus on participation in apprenticeships and education in engineering, manufacturing, and construction. The chapter also provides an overview of the challenges, targets, projections, and opportunities for upskilling in the construction sector.

6.2 Trends in Skills

It is crucial that the construction sector has the necessary pipeline of skills in order to produce the high quality output, which is required as investment continues to increase in the construction sector. The necessary skills for this sector are generally produced through the apprenticeship system for the construction trades, and through higher education for the construction professions.

In 2021, there was a total of 4,870 new construction apprentice registrations. This represented an increase of 40 percent on 2019 apprenticeship registrations and 60 per cent on 2020. Additionally, this was the highest level of new construction apprentice registrations since 2007.

Figure 6.1: Number of New Construction Apprentice Registrations



Source: SOLAS

Table 6.1 below shows the apprentice registrations by construction apprenticeship offered. Firstly, a substantial increase was observed for all construction apprenticeships with the exception of Construction plant fitting7. Secondly, in terms of construction wet trades, which includes floor and wall tiling, bricklaying, painting, decorating and plastering. It is evident that apprenticeships in these areas increased from 2014 to 2018, and again from 2018 to 2021. However, there were zero new floor and wall tiling apprenticeships from 2011 onwards. Thirdly, since 2012, apprenticeships such as cabinet making and wood machinists were discontinued. Fourthly, new apprenticeships in stonecutting & stonemasonry, and geodriller were introduced in both 2019 and 2020, respectively.

Table 6.1: New Apprenticeship registrations by construction Apprenticeships in various years

	2014	2018	2021
Bricklaying	20	81	148
Carpentry and joinery	185	591	847
Construction plant fitting	55	71	81
Electrical	845	1841	2748
Geodriller			7
Painting and decorating	10	30	43
Plastering	10	29	38
Plumbing	320	653	875
Stonecutting and Stonemasonry			9
Wood manufacturing and finishing	25	95	155
Total	1,470	3,391	4,870

Source: SOLAS

[7] Construction Plant Fitters service and maintain all the heavy equipment and machinery used on construction plants and vehicles.

SOLAS forecasted apprenticeships in construction trades, building services, industry related trades & commercial and motor related trades from 2022 to 2025. These forecasts shown in the table 6.2 below. Between 2021 and 2022, the number of apprenticeships are expected to decrease (with the exception of plastering and construction plant fitters). It is seen that apprenticeship numbers will increase for all between 2021 and 2025, with the exception of Electrical and metal fabrication apprenticeships.

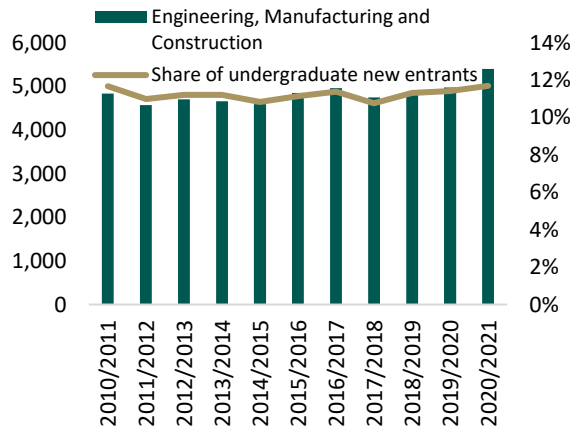
Table 6.2: Forecast by Construction Apprenticeships

Registered apprentices	2021 (a)	2022 (f)	2023 (f)	2024 (f)	2025 (f)
Industrial insulation	22	25	25	25	25
Plastering	38	45	55	65	70
Painting and decorating	43	40	43	50	60
Construction plant fitters	81	86	90	90	90
Pipefitting	98	80	90	100	110
Bricklayers	148	120	135	160	190
Wood manufacture, finishing	155	140	155	165	170
Metal fabrication	340	230	240	255	270
Carpentry and joinery	847	800	950	1,050	1,100
Plumbing	875	800	850	900	950
Electrical	2,748	2,250	2,300	2,400	2,550

Source: SOLAS. a is actual and f is forecasted. There were more categories/ apprenticeships provided by SOLAS. However, for the purpose of this paper, only the above apprenticeship and forecasts were chosen to be displayed.

There were 5,399 undergraduate new entrants in engineering, manufacturing and construction in 2020/2021, representing approximately 12 percent of all undergraduate new entrants. Engineering, Manufacturing and Construction increased by approximately 12 percent in the last two academic years.

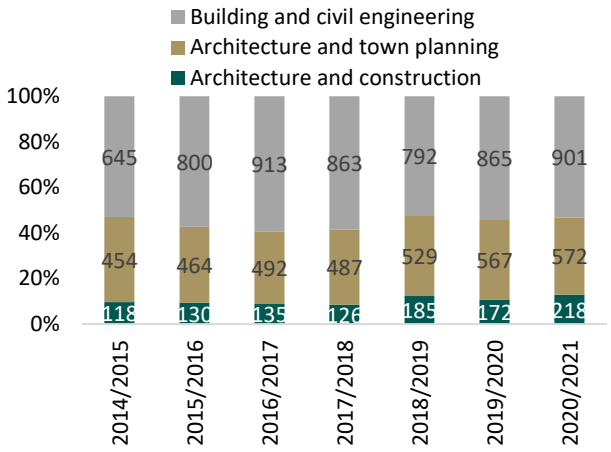
Figure 6.2: Annual Undergraduate New Entrants in Engineering, Manufacturing and Construction



Source: HEA.

Figure 6.3 focuses on new entrants to courses specifically related to building and construction. In total, undergraduate new entrants have risen in Architecture & Town Planning, and Building & Civil Engineering between 2017/2018 and 2020/2021. For Architecture & Construction courses, the academic year 2020/2021 saw the largest number of students enrol (901) in recent years.

Figure 6.3: Trends in undergraduate new entrants in Architecture and Civil Engineering



Source: HEA

6.3 Targets, Projections and Opportunities

Targets – National Development Plan, Climate Action Plan and Housing for All

There are many targets outlined in the various plans announced by the Government. The NDP outlines an investment of €165 billion for this decade. It is forecasted that the NDP will sustain approximately 80,000 direct and indirect construction jobs.[8]. The Housing for All plan outlines that approximately 33,000 homes per year have to be built by 2030. Additionally, the retrofitting challenge, under the Climate Action Plan, notes that the cumulative number of residential buildings retrofitted to B2 BER will be approximately 500,000 by 2030. Furthermore, there is a commitment to install circa 600,000 renewable energy heat pumps in residential buildings.

Projections, Challenges and Opportunities

The Expert Group on Future Skills Needs (EGFSN) and the National Skills Council report titled 'Labour Demand Estimates for Ireland's National Housing targets, 2021 – 2030', published in September 2021, outlines a number of key findings. The report states that an additional 27,500 workers over five years are required to deliver the 33,000 homes per year, targeted under Housing for All. Total demand is estimated to peak at just over 80,000 workers towards the end of the decade.

Occupations were classified according to whether they were 'Core' or 'Niche' skills. Core skills account for 50 percent of the total labour demand, and include Carpenters, Electricians, Plumbers and Construction workers. 'Niche' skills represent smaller, more specialised occupations and account for a further 7 percent of total labour demand, including floorers/wall tilers, construction supervisors, roofers and window fitters. Some of the occupations are as follows:

Table 6.3: Total demand by construction occupation to 2025

Occupation (A)	Total demand for next 5 years (B)	Total demand for every year (B divided by 5)
Carpenters & Joiners	2,500	500
Electricians	1,900	380
Elementary Construction occupations	1,800	360
Plumbers	1,300	260
Painters & Decorators	1,100	220
Bricklayers & Masons	700	140
Production Managers	690	138
Plasterers	680	136
Architects & Planners	670	134
Construction Operatives	650	130
Civil Engineers	602	120

Source: Expert Group on Future Skills Needs (EGFSN) and National Skills Council report titled 'Labour Demand Estimates for Ireland's National Housing targets, 2021 – 2030'. Published in 2021.

The 'Skills for Zero Carbon - The Demand for Renewable Energy, Residential Retrofit and Electric Vehicle Deployment Skills to 2030' report states that firstly, a shortage in craft occupations associated with retrofitting is likely by the middle of the decade and stresses the importance of building up capacity and supply of these occupations. Craft apprenticeships includes Carpenters & Joiners, Bricklayers & Stonelayers, Electricians, Stonecutting & Stonemasonry, and Industrial Insulation. Secondly, for professional engineering occupations associated with renewable energy, there is a shortage of skilled people with relevant experience, rather than necessarily a shortfall in the overall number of engineers entering the profession. This points to upskilling requirements in emerging and niche engineering occupations. These occupations include wind turbine technicians, solar technicians, remotely operated underwater vehicle operatives etc.

Overall, labour demand of over 17,000 full-time workers are required to support the planned level of retrofits by 2030, with most of this labour to be in place by 2023. In total, 30 recommendations are provided in the 'Skills for Zero Carbon' report. Some of these include assessing the benefits of developing a register of workers who have upskilled in retrofitting, in order to underpin consumer confidence and demand for residential retrofit, exploring the full integration of retrofit occupations within relevant apprenticeship programmes and encouraging the urgent upskilling of existing plumbers in the installation and servicing of heat pumps.

[8] Direct employment defines the workers on the construction site. Indirect construction employment defines the construction jobs sustained through the supply chain. Includes self-employed and employed.

6.4 Upskilling

Commercial Skills Academy

The Commercial Skills Academy, established in 2019 by the Office of Government Procurement (OGP), aims to enhance the commercial delivery capabilities of key spending Departments and public sector bodies through a focussed training programme. Additionally, it provides training for public service managers to gain an understanding of key issues, commercial skills, and best practice approaches for effective project delivery throughout the entire lifecycle of the project.

Build Digital Project

In November 2021, a consortium led by TU Dublin were awarded €2.5 million in grant funding to deliver the Build Digital Project.

The education pillar of the Build Digital Project will provide guidance and leadership on the necessary digital tools, to address the skills and knowledge deficits that have restricted the sector from engaging in digital adoption.

Developing digitalisation for a Circular Economy (DiCE) toolkit for the industry, to enable adoption of international best practice in relation to addressing the Irish Construction Sector's requirements in respect of sustainability, climate change, and the circular economy is a critical element of this project. Other tangible deliverables includes a searchable education and training inventory, the establishment and launching of a training and research network and standard accredited modules aligned with Build Digital and BIM project outcomes.

Modern Methods of Construction

The CIF, in January 2022, published a report on Modern Methods of Construction. Furthermore, another report titled 'Modern Methods of Construction: Defining MMC Business' was published by the CIF, and Skillnet. Both the report notes that a lack of properly trained and educated personnel throughout the supply chain is one of the main barriers to implementation of MMC. There is a need to upskill existing workers to cover site management, integration, on-site placement and assembly. The key future requirements in order to support MMC are identified as MMC understanding, construction materials knowledge, collaboration skills, quality assurance and control, planning and scheduling, and BIM/Data analysis. The report highlights that training by those who are competent in both construction and manufacturing will be required. A proposed MMC training pathway is also outlined in the aforementioned report, which proposes MMC modules to be integrated from transition year, and NFQ Level 5 until 9. Other solutions include creating a broader MMC manufacturing technician apprenticeship course, or expanding existing construction apprenticeships to include MMC.

National Apprenticeship Alliance

The National Apprenticeship Alliance (NAA), a 23-member alliance, was launched in March 2022. The NAA will have an advisory role in relation to the development of the apprenticeship system, and will oversee and sanction the development of new apprenticeships over the coming years. The members will be particularly responsible for the implementation of the Craft Apprenticeship Migration Plan, and ensure all apprenticeships are delivered under the single apprenticeship system. NAA will also be responsible for recommending apprenticeship proposals for development, and approving formal occupational profiles in the development of new apprenticeships. The newly established National Apprenticeship Office (NAO) will be responsible for all aspects of the management, oversight and development of the single apprenticeship system. The NAA will report to the NAO.

The section below provides information on gathered from Government Departments, members of the Construction Industry, and other experts. The commentaries were compiled following discussions with the Construction Sector Innovation and Digital Adoption Subgroup.

CIF are working with, through CIF education, training and skills committee, people currently on social welfare (with a potential for construction), diaspora, and new entrants (school leavers). Recently, opened discussion with SOLAS to develop initiatives for TY students to support access to the construction sector. Offsite construction requires higher levels of skills and flexibility in the installation workforce than that of traditional methods. Members are reporting difficulties in sourcing "wet trades" – brick and Stonelaying, Painting and decorating, plastering. Finally, civil engineering contractors report difficulties in recruiting civil engineers.

A big challenge with the industry is the boom/bust cycle and there is a need for the industry to be internationally transient and for employees to consider lateral skills transfer when their particular specialist sector goes into a downward cycle. Finally, CIF note that the EGFSN analysis takes a straight line projection based on the scale of the industry at a point and that anticipated at a future date. The extrapolation of current employment versus projected future requirements is based on the continued delivery of future projects using the exact same traditional labour sets and skills profiles. This does not account for the impact of MMC on existing traditional training nor does it set out the quantum for MMC trained employees. These MMC skills are in the area of sustainability, regulator knowledge, building regulations, product design & manufacturing, MMC leadership/management skills, change management skills, and early engagement skills.

Overall, workers need to be supported to adapt from traditional activities and processes of a construction site to more manufacturing/production floor skills, with an emphasis on digitalisation. Off-site construction requires higher levels of skill and flexibility in the installation workforce than that of traditional methods. In addition to the traditional skills associated with building services installations, the workers will need to cope with the changes in the production process. The manufacturing environment reduces variability in work activities and processes and increases the requirement for accuracy. Workers would need to adapt from the variety, movement and safety requirements of a busy construction site to the repetitive nature of a manufacturing environment, coupled with reduced downtime and increased productivity on the production floor.

Emma Hayes, BIM Expert

I am involved in the MSc in applied Building Information Modelling and Management in TU Dublin. About 70-75% of these graduates have roles in the architectural discipline with about 20% coming from main contractors or M & E consultancy or sub-contracting. I believe there is a gap in the industry for junior BIM technicians or coordinators as there are very few undergraduate courses providing BIM training. An 8 week module is delivered with a recommended project experience. I must say that the 3 day Revit course will teach the basics and is easy to learn. I think there needs to be BIM modules (e.g. BIM Process and software skill training) at undergraduate level such as structural engineering/ mechanical engineering etc. Also, I think there is a gap in information originators such as Revit technicians; I am only aware of one Level 6 course in CDETB Finglas Training Centre. I also think there is a need to upskill trades in the use of BIM e.g. model viewing, using models for communication, and marking up and commenting on the models. I have also experienced a lack of understanding of what BIM is and the benefits it can bring to the industry, in particular for the SME contractors and consultants. Other recommendations to assist SMEs with BIM is by providing support to SMEs to achieve BIM certification, and improve digital skills for BIM software. Additionally, there is a need to train and upskill project managers to have appropriate skills – the more informed, the more effective the process. Overall, new emerging roles will attract new and diverse talent and address the skills shortages.

An Roinn Breisoideachais agus Ardoideachais, Taighde, Nuálaíochta agus Eolaíochta
Department of Further and Higher Education, Research, Innovation and Science

A record number of construction apprenticeships of 4,870 noted in 2021. Additionally, to achieve growth in public service apprenticeship registrations, a working group is developing a plan on public service recruitment. This will be brought to Government in the summer, based on surveying organisations in relation to apprenticeship skills needs in the public sector. The Apprenticeship Employer Grant, has been introduced this year and will see eligible employers receive €2,000 per eligible apprentice that they employ, across the consortia-led apprenticeship programmes. This means that for the first time, all programmes will receive funding as standard towards the cost of apprenticeships. The number of apprentices being registered each year is determined by employer and employment demand in the sector. Due to previously low applications to floor and wall tiling apprenticeship, registrations for this have been closed since 2012. Instead, there is a module for floor and wall tiling included in the plastering apprenticeship. Furthermore, the CAO system in 2022 for the first time includes information on apprenticeships, increasing awareness of the opportunities available through this employment and training option.

The National Recovery and Resilience Plan has committed €29m to NZEB & Retrofit upskilling and reskilling programmes, and €10m to Green Skills Modules. Under the Plan, 4,550 retrofit and NZEB standard places and 60,000 green skills places are to be provided by the end of 2022. Two centres of excellence are currently in place in WWETB and Mount Lucas, with another three centres in development in Cork, Limerick and Sligo. These centres will assist in providing the 17,000 workers needed. Under the Housing for All Plan Industry Capability Working Group, there is an International Recruitment sub-group which looks specifically at targeting workers outside of Ireland and attracting them to work in Ireland's construction sector. The work includes increasing staffing in the work permits section of the Department of Enterprise, Trade and Employment ensuring faster processing times for workers. There is also increased resourcing in the Department of Social Protection to assign PPS numbers to non-Irish citizens.

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Mary Flynn, BIM expert / Quantity Surveyor

There appears to be a great lack of awareness amongst the population in general of exciting careers and emerging new specialist roles within the construction sector beyond the traditional architect and engineer roles. In light of this, there should be a sustained bespoke marketing campaign specifically targeting Leaving Cert and transition year students well in advance of the CAO completion to break the traditional culture of male stereotype roles and attract females into the construction sector. This necessitates an awareness campaign sharing and showcasing success stories of women already within construction.

There is a growing body of BIM modelling skills within the AEC (Architecture, Engineering & Construction) industry thanks mainly to the large number of BIM post graduate and undergraduate courses being rolled out by the HEI's (Higher Education Institutions) in the design disciplines of Architectural, Structural, Mechanical and Electrical. Additionally, new roles in data science & data analytics are gaining traction, becoming increasingly important within the construction industry. Currently a small number of tier one innovative firms are capitalising on data harvesting and monetizing the outputs and insights for commercial purposes very successfully. This exercise can only be executed by a firm operating BIM as "bau" (business as usual) with a high level of BIM maturity and structured data repositories. The future is "data driven" organisations with high levels of "data literacy" using smart workflows and structured, standardised metadata mined from BIM & other emerging technologies (drones, lidar, Iot's AR) from within the AEC industry for the public good through data lakes and warehouses. Data mining will produce productivity, streamline operations, create new added value workstreams, increase sustainability, enable real time informed decision-making & so much more. As for the adoption of MMC (Modern Methods of Construction), legacy and culture issues are at the heart. MMC is still in its infancy, there is a great need for an awareness campaign to clarify what the term means as well as highlighting success stories that demonstrate how alternative emerging materials can be used for their sustainability, practicality, speed and cost attributes in line with the climate action plan deliverables.

Roisin Murphy, Senior Lecturer, TU Dublin

In spite of an increasing number of apprenticeship registrations, there remains insufficient skilled workers to meet future requirements across construction trades, most notable in "wet trades". Wet trades are critical in the structure, thermal efficiency, aesthetic and fire safety of our built environment, therefore the shortage of qualified tradespeople in these areas is particularly concerning. Recent research undertaken on behalf of the CIF, determined that there were five times more wet tradespeople sub-contracted than directly employed, and while subcontracting labour is commonplace, the prevalence of sub-sub-contracting may increase risk and diminish quality of output. Placing CIRI on a statutory footing to monitor qualifications, quality and standards enhances professionalism of those registered, and with that, the attractiveness of construction as a career choice. The shortage of construction skills extends beyond trades as demonstrated by recent SCSI research, whereby 65% of Quantity Surveyors and Building Surveyors confirmed an insufficient number of surveying graduates to meet future demand, increasing to 81% for experienced staff. The resultant upward pressure on wages and construction tender prices presents a considerable challenge in securing value for money in the role-out of the NDP and Climate Action Plan.

Building and construction accounts for 39% of carbon emissions (operational and embodied) globally and surveyors play a pivotal role at every stage of the building life cycle. Skills relating to sustainable materials, carbon measurement, life cycle analysis and costing are essential to a whole life cycle approach to the design, construction, operation and ultimately decommissioning of our built assets. Modern Methods of Construction (MMC) form part of the solution to improve productivity and sustainability, but upskilling in innovative technologies are required to maximise potential in this regard. The recently launched Build Digital Project aims to transform the construction and built environment sector by driving digital adoption to improve productivity, and innovation in the delivery of PI2040. Education and training (core pillar of Build Digital Project) will provide a suite of upskilling opportunities to advance digital knowledge, skills and competence across the sector. Inter-disciplinary, collaborative action is required to realise the ambitions of Build Digital Project and with that, comes an opportunity for stakeholders to actively work together to encourage a diverse range of new applicants and promote career opportunities across the sector.

Currently there is a shortage of engineers, which can be met through a combination of producing more engineers from our Higher Education Institutions, sourcing talent from overseas, and bringing people back into the engineering sector, particularly women, who may have left the sector for several years and require upskilling and support. Of course, such upskilling and CPD support is a requirement for all engineers. As part of our work on engineering apprenticeships, EI has engaged with the DFHERIS and SOLAS. This included discussion on national policy, legislation, industry needs and accreditation.

Additionally, EI as the awarding body for the professional title of Chartered Engineer, is also responsible for ensuring that overseas engineering talent, seeking to hold that title, meet the required standards. Just as the new academic criteria are being adjusted to reflect the importance of sustainability in all aspects of engineering, so too are the professional competencies expected of a Chartered Engineer. We will revise the regulations for the Chartered Engineer, Associate Engineer and Engineering Technician titles to include sustainability as a core competence. We are aiming to revise the professional title regulations by year end, pending approval by Engineers Ireland's Board and Council. Furthermore, we are committed to develop a multi-module CPD programme to provide essential environmental upskilling for engineers, drawing on best-practice case studies from trainers across industry, academia and state agencies. Examples include webinars on MMC, attracting over 300 participants. Finally, EI has partnered with Diatec to deliver a wide range of Autodesk and BIM training courses. These courses include Civil 3D Essentials, BIM 360 Build Fundamentals, BIM 360 Design Collaboration, and Introduction to BIM Management. We are also collaborating with Skillnet Ireland on events like the two-part webinar on BIM collaboration.

6.5 Conclusion and Next Steps

Skills are attributes and competencies used by individuals to perform tasks and activities. Upskilling is essential in the construction industry as it improves performance, accuracy, and quality. There are benefits for the workers too, namely an increase in confidence, enhancing skillsets, and improved job satisfaction.

Construction upskilling is essential to deliver the ambitions set out in the NDP and the Climate Action Plan. As a result of the NDP investment of €165 billion, DPER has estimated that 80,000 direct and indirect jobs will be sustained. Additionally, total labour demand is estimated to rise from circa 40,000 full-time equivalents in 2020 to 67,500 by 2025, before peaking at just over 80,000 from 2028 in order to achieve the Housing for All targets. Furthermore, it is indicated that labour demand of over 17,000 full-time workers are required to support the planned level of retrofits by 2030, with most of this labour to be in place by 2023.

These aforementioned targets are coupled with opportunities such as the Build Digital Project of €2.5 million and Modern Methods of Construction (MMC). Both Build Digital project and MMC reports outline the need to gain and upskill digital skills, with training to be provided by those who have competent education and professional experience in both construction and manufacturing. The phase 2 MMC report makes a number of recommendations, including the need for advanced education and training facilities to deliver human capital to meet the current and future needs of MMC. As for the Build Digital Project, digital education and training is one of the five key pillars. This pillar will include a comprehensive suite of upskilling courses, and will establish and launch accredited modules (including programmes at 3rd level) aligned with Build Digital and BIM Project outcomes.

According to current statistics, there were 5,399 undergraduate new entrants in engineering, manufacturing and construction in 2020/2021, representing approximately 12 percent of all undergraduate new entrants in 2020/2021. It is noteworthy that engineering, manufacturing, and construction increased by approximately 12 percent in the last two academic years. Additionally, it is clear that the number of overall undergraduate new entrants are rising in architecture and civil engineering between 2017/2018 (863 students) and 2020/2021 (901 students), an increase of 5 percent. However, while the number of civil engineering and architects are rising due to undergraduates and work permits, our case study interviews identified that demand for these core skills are higher than the supply.

As for apprenticeships, a substantial increase (between the years 2014, 2018 and 2021) was observed in all construction apprenticeships, with the exception of Construction Plant fitting. Overall, a record number of 4,870 construction apprenticeships was noted in 2021. In order to increase the efficiency and effectiveness of these apprenticeships, the Department of Further and Higher Education, Research, Innovation and Science (DFHERIS) launched the National Apprenticeship Alliance (NAA) in March 2022. The NAA will have an advisory role in relation to the development of the single apprenticeship system, and will oversee and sanction the development of new apprenticeships. Forecasting of apprenticeships shows that apprenticeships will reduce in 2022 in comparison to 2021, with the exception of plastering. Additionally, apprenticeship numbers are generally higher, with the exception of electrical apprenticeships, in 2023, 2024, and 2025 when compared to 2021 and 2022.

Finally, from the interviews with the industry, and academics, it is clear that promotion of construction careers is a priority, particularly promoting construction careers for women and young school leavers, as well as the promotion of other linked careers to construction such as data analytics. A coordinated approach from the DFHERIS, SOLAS, the Higher Education Authority, and industry bodies has been outlined as a major step to securing the construction skills pipeline required. The case studies also outlined that there is a shortage of Engineers, including BIM Engineers and a lack of skilled project managers.

Section 7: Productivity

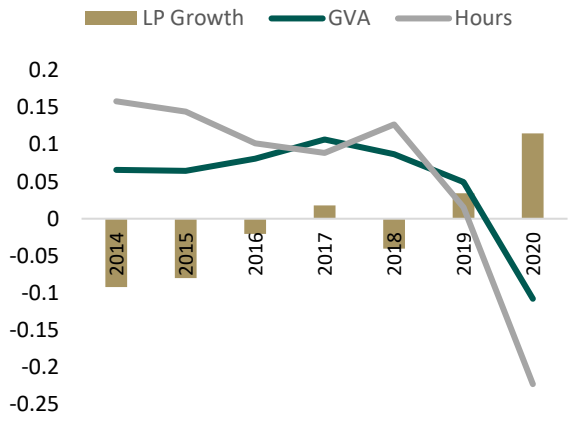
7.1 Overview

This section analyses trends in productivity in the construction sector. Initiatives to increase productivity in the sector are also outlined.

7.2 Trends in Productivity

Labour productivity is an important indicator when looking at the Irish economy, as it measures output per hour worked for a particular sector. Labour productivity can be measured by dividing Gross Value Added (GVA) by hours worked. In the graph below, labour productivity in the sector increased by 11.5% in 2020, following decreases between 2014 and 2016. The strong result for labour productivity in 2020 was due to a lower fall in GVA growth (-11%) compared to hours worked growth (-22%), resulting in increased labour productivity. It must be noted that in 2020 the Construction sector was impacted by Covid-19 lockdowns with employees supported by the Employment Wage Subsidy Scheme during these intermittent closures.

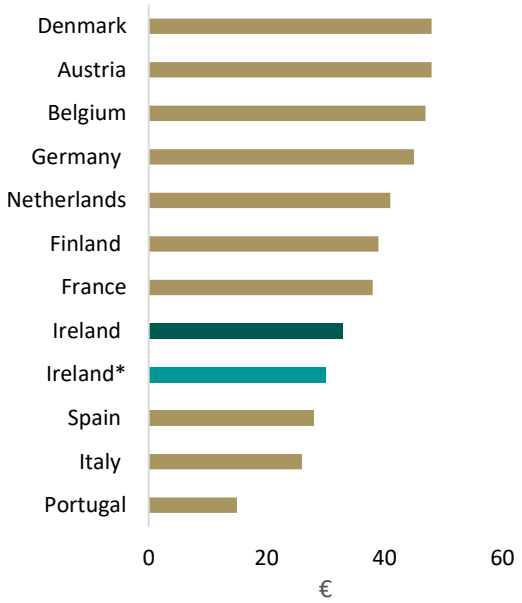
Figure 7.1: Labour productivity, Gross Value added and Hours worked by years



Source: CSO

Figure 7.2 below compares the productivity of the Irish construction sector to those across Europe in 2020. The GVA per hours worked by persons engaged in the Irish construction sector was approximately €33 in 2020. This is higher than countries such as Spain, Italy and Portugal. However, it is lower than countries such as Denmark, Austria, Belgium, Germany, Netherlands, Finland and France.

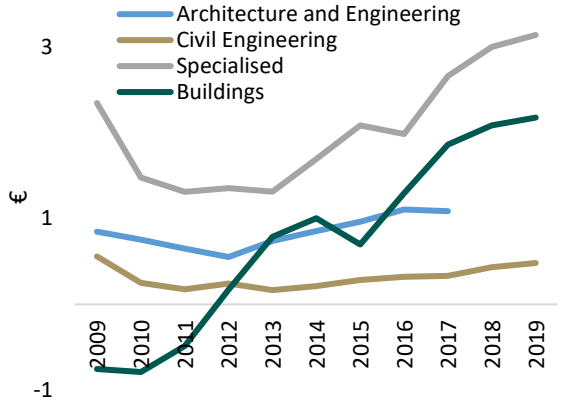
Figure 7.2: International Comparison of GVA per hour worked by persons engaged in Construction (2020)



Source: Eurostat (EU KLEMS) and CSO (Productivity in Ireland 2020). See footnote below.[9]

GVA per paid hour worked for the four subsectors is displayed in Figure 7.3. The general upward trend across sub-sectors since 2010 is particularly pronounced in the 'Buildings' and 'Specialised' buildings subsector.

Figure 7.3: Valued Added per Paid Hour, Construction subsectors



Source: Eurostat

[9] 'Ireland*' (€29.8) utilises CSO data, whereas the 'Ireland' (€33) uses Eurostat data. The difference between the two figures is as a result of differences in methodology for GVA and hours worked. CSO utilises GVA per hour worked with effect of inflation removed, while Eurostat uses GVA per hour worked with inflation included. As for hours worked, the CSO uses actual hours worked (from the Labour Force Survey) in comparison to Eurostat which uses normal hours from EHECS.

7.3 Initiatives to Increase Productivity in the Construction Sector

Construction Industry Register Ireland

The Construction Industry Register Ireland (CIRI) is an online register, supported by Government, of competent builders, contractors, specialist sub-contractors and tradespersons who undertake construction works. CIRI was established in 2014 and currently, CIRI is voluntary, but legislation is being drafted which will put CIRI on a statutory footing. The purpose of the Regulation of Providers of Building Works and Building Control (Amendment) Bill 2022 is to provide for a mandatory statutory register of builders, contractors and specialist sub-contractors, and subject to a limited number of exceptions, a builder will only be permitted to carry out building works in respect of which he or she is registered.

The establishment of CIRI as a mandatory statutory register is seen as an essential consumer protection measure which will give consumers who engage a registered builder the assurance that they are dealing with a competent and compliant operator. It will also provide a forum for the investigation of complaints against registered members and the imposition of proportionate sanctions. Approximately 800 building and contracting entities are currently included on the register. When the register operates on a statutory footing, it is expected that initially at least 5,000 entities will be required to register. As of June 2022, the CIRI bill is currently at committee stage in the Seanad.

Research and Development

Enterprise Ireland Innovation Vouchers were developed to build links between small firms in Ireland and the country's knowledge providers including universities, colleges, institutes of technology and research institutes. Innovation vouchers in units of €5000 are available to help firms to explore a business opportunity or problem with a registered knowledge provider. This initiative is open to all SME limited companies registered in Ireland. Applications are not restricted to clients of Enterprise Ireland. Innovation vouchers can be utilised for innovations in areas such as new product or process development, new service delivery, tailored training in innovation management and innovation audit.

Since the programmes started, there have been low numbers of innovation vouchers awarded to the built environment sector. An independent evaluation determined that during 2014-2016, only 5% of the firms that participated were from the construction industry. From 2015-2020, only 200 vouchers were won by the sector.

The Association of Consulting Engineers of Ireland report titled 'Action 2 – Explore Construction Innovation Funding' states that encouraging the uptake of innovation vouchers by other types of firms in the Irish construction and built environment sector would be an easy 'win' to assist in introducing firms to the benefits of R&D and innovation for their business. There is a standard application process attached to a relevant call, as well as a 50-50 co-funded fast track process where applications can be submitted any time.

The section below provides case studies from Clancy Construction and Build Digital Project. The case studies focus on various initiatives which have or will increase productivity in the construction sector.

Clancy Construction are heavily involved in projects (ranging from €5m - €60m) in the residential, healthcare, commercial, industrial and heritage sectors in both the public and private arenas. We see ourselves as the leaders in finding solutions to address this through upskilling, innovation, process improvement, and digital adoption (in that order!). Over the last decade, we have invested in our people, providing leadership, coaching and training for our senior management team since 2017.

One of the biggest barriers to improving productivity is the design time waste created by the lack of a collaborative approach between client, designers and the delivery team/contractor. The lack of early involvement of a competent contractor with the expertise in delivery of the type of project leads to significant wasted time, effort and money in the long run. Often, we see designs almost fully developed only to realise the budget can't reach, followed by a re-design and re-tender, followed by a "value engineering" exercise to make further cuts which ends up giving the client a sub-standard product. To get to this point several contractors and their supply chain have spent a lot of time and money pricing various options and only one of them gets the project. Then the contractor could make further changes to make the project viable and buildable once they have engaged with their supply-chain specialists; this all before a final scope is arrived at. The point behind this example being that eliminating this waste requires a "people" change followed by a "process" change to enable smarter procurement.

We successfully introduced the Last Planner System (LPS) on a few pilot projects. LPS is a recognised benchmark and is used to optimise project delivery through systematic collaboration and coordination of all project stakeholders. It is critical for us to embrace and upgrade it further to maximise the benefits of off-site fabrication and lean planning. This process is proven to deliver projects quicker and to help mitigate risks on site. We are currently in the process of rolling out a comprehensive bespoke Lean Construction Training programme to increase productivity on our construction sites by increasing speed of delivery and enabling maximum use of off-site fabricated elements. Key elements include a) Set up of a process to select, manage and monitor continuous improvement projects b) Upskilling of Sponsors for Project Sponsorship and coaching role c) Upskilling of Project teams to Yellow and Green Belt level with the delivery of improvement projects to improve productivity, and d) Execution of Productivity projects.

We commenced our BIM Journey in 2012 with a collaboration with a leading Institute of Technology on a live project. We have appointed a BIM manager to develop and adapt our BIM capabilities to suit our and clients' needs. Without careful 3-D design coordination between different off-site fabricated building elements such as Light Gauge Steel, bathroom pods, structural steel, curtain walling and plant room assemblies, the benefits of manufacturing off-site would be negligible. For this reason, BIM is a critical element and enabler of improving productivity by embracing the ever-increasing off-site options on a project. We were using the following pre-Covid-19; 3D software for BIM, tablets on all sites, project management software, snagging apps, QR codes for quality control, robotic surveying equipment, drones, 3D scanning, Virtual Reality, and virtual meeting platforms like Zoom. In terms of MMC utilisation, we have used many forms including precast concrete, Light Gauge Steel, bathroom pods, mechanical assemblies, pre-packaged plant, reinforced steel and many more depending on the project. We have seen significant reductions in programme risk mitigation, increased on-site production with lower numbers on site, improved quality and safety, and overall a more sustainable delivery model as a main contractor. A culture of innovation and collaboration is key!

As a result of MMC, BIM, lean process and digital technologies, we have seen output per employee as a productivity metric improve significantly over the past 3 years. What is our advice for improving productivity? Create a strong culture based on strong core values to build commitment; Invest in Lean principles training; Develop simple LPS standard and train staff; Embrace technology to suit your processes; and use new innovative solutions to reduce onsite resources and improve delivery.

The Build Digital Project, funded by DPER, is a grant of €2.5 million over 5 years, and is one of 7 priority actions being implemented by the CSG Innovation and Digital Adoption Sub-Group. The Build Digital Project will transform the Irish construction and built environment sectors by enabling all stakeholders to develop, maintain, and continuously improve their capabilities through digital adoption to support delivery of Project Ireland 2040. A key tenet of the Build Digital Project is the adoption of a bottom-up approach where the Voice of the Customer is heard and acted upon. The project has embedded over 50 industry members from across the breadth and depth of the construction supply chain into its five pillars and as members of the industry Steering Group.

BIM/Information Management represents a set of processes, workflows, and standards, supported by a range of technologies, that enable trust, collaboration, and an integrated approach to management and delivery of the built environment. The Digital Leadership & Cultural Change pillar's role will be to drive the culture change required to realise digital transformation in support of innovative, effective, and sustainable evolution in mindset and practice within the sector. This pillar will enable parallel positive impacts for organisations across productivity, energy performance, sustainability, decarbonisation, the circular economy, procurement, standards adoption, and BIM adoption. Enabled by interoperable file formats and open BIM, when clients clearly define their required outcomes (e.g. specific sustainability targets or certifications), when designers model using circular economy principles to achieve targets, and when contractors and subcontractors are enabled to innovate to deliver assets that perform as required, productivity will increase as waste is minimised and information flows in the right way and at the right time.

The Digital Standards pillar will champion the benefits of a common language, rules, guidelines, and workflows within an Irish Information Management (Digital Construction) Framework, enabling efficient communication and a reduction in cost, rework, and disputes, all contributors to improvement in productivity.

A key deliverable for the Build Digital Project are the living labs, whose purpose is to identify, monitor, and publish on test projects of different scales, types, and locations, in collaboration with public and private sector clients. These projects will provide opportunities to trial and monitor different approaches to delivering a step-change in digital innovation and digital supply chains.

The Irish Build Digital Exchange Hub (IBDEH) will be the two-way portal for ongoing and circular engagement between industry and the project, where exemplary practice, tools, and knowledge will be shared, appraised, improved, and disseminated. Productivity improves when all stakeholders within the construction supply chain communicate and collaborate to achieve shared goals; the IBDEH will be the enabler. The progress of the sector in digital adoption, and the positive impact on productivity and efficiency, will be monitored by annual survey, forming part of a continuous improvement loop that will ensure success.

7.4 Conclusion and Next Steps

Key findings from this section are that labour hours growth has decreased significantly between 2013 and 2018, while GVA growth has remained constant. This implies higher productivity or higher labour productivity growth.

The GVA per hours worked by persons engaged in the Irish construction sector was approximately €33 in 2020. This is higher than countries such as Spain, Italy and Portugal. However, it is lower than countries such as Denmark, Austria, Belgium, Germany, Netherlands, Finland and France. Due to data availability issues, it was not possible to measure productivity for 2021 and 2022.

R&D is necessary to increase productivity. 200 Enterprise Ireland innovation vouchers were won by the construction sector between 2015 and 2020. Additionally, the Construction Industry Register Ireland (CIRI) is an online register of competent builders, contractors, specialist sub-contractors and tradespersons who undertake construction works. The CIRI bill is currently at committee stage in the Seanad.

Section 8: Sustainability

This section examines key trends in sustainability within the construction sector.

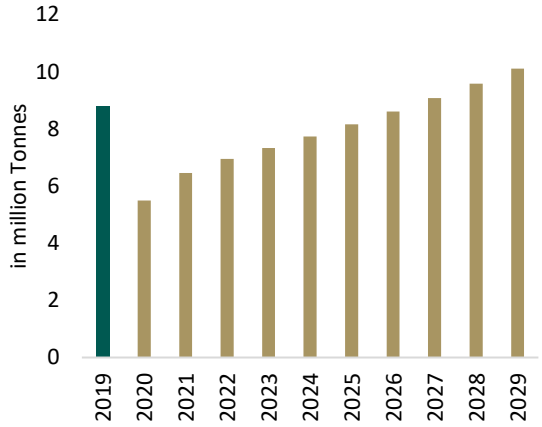
In terms of sustainability the construction sector face multiple challenges to meet the targets of reducing emissions by 51% in the Built Environment by 2030, whilst delivering the ambitious goals of Housing for All and the National Development Plan.

8.1 Trends in construction sustainability

Figure 8.1 summarises the total Construction and Demolition Waste (CDW) for 2019 and the projections for 2020 to 2029. Given the increasing ambition of the National Development Plan, the high growth scenario for CDW projections was chosen for the purpose of this chart. Between 2012 and 2018, the CDW almost doubled from 3.14 million tonnes to 6.22 million tonnes.

From the chart, it is clear that, despite a high growth scenario, the CDW projections are lower until 2027. The report notes that the reduced CDW in 2020 and 2021 is due to Covid-19. A linear correlation in projections is assumed between economic growth and construction output factors.

Figure 8.1: Construction and Demolition Waste Projections 2019-2029

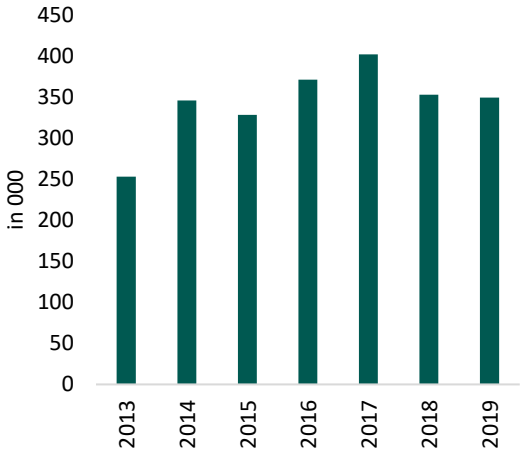


Source: Construction & Demolition Waste Soil and Stone Recovery/ Disposal Capacity – Update report 2020. 2019 data is unpublished but recorded. 2020 to 2029 is projected.

Total greenhouse gas emissions from the construction sector increased significantly from 2013 to 2017. In contrast, greenhouse gases reduced from 2017 to 2018 with a further reduction in 2019. Total construction emissions in Ireland stood at approximately 349,000 tonnes in 2019.

These figures do not take into account the emissions from production of cement or other intermediate products which generate high levels of emissions.

Figure 8.2: Construction Sector Greenhouse Gas Emissions in 000 tonnes in Ireland



Source: CSO. Note that greenhouses includes Co2, N20, CH4, HFC, PFC, and SF6.

8.2 Projections and Next Steps

The Irish Green Building Council report titled 'Net Zero Whole Life Carbon (LC) Roadmap for the Built Environment in Ireland' (published in Q1 2022) states that 37 percent of Ireland's emissions are from the construction and built environment sector. 23 percent of the emissions are operational emissions (from heating, cooling, and lighting our buildings) with the remaining from embodied emissions10. The IGBC report further states that the national retrofit scheme and energy efficiency improvements in new build (NZEB standard), alongside a decarbonising grid, will drive operational emissions down in the next decade, however, new construction outlined in the national development and housing plans will lead to a significant increase in embodied

10 Emissions associated with all the activities of procuring, mining, harvesting raw materials, transforming these materials into construction products, transporting them to site and incorporating them into a building, and subsequently maintaining, replacing and removing and disposing at the end of their life.

carbon, effectively negating the savings in operational emissions. The report outlines a number of recommendations such as that the embodied and operation carbon impact of all proposed construction must be measured, reduce demand for new construction by prioritising reuse and support greater use of reused and recycled materials.

The Sustainability & Climate Action Consultation Group have been set up under Action 2[11]: Explore and Mobilise Construction Innovation Funding. The group consist of representatives from RIAI, Engineers Ireland, ACEI, SCSI, CIF, BMF, NSAI and the Irish Green Building Council. The purpose of the Sustainability & Climate Action Consultation Group has been to assist with the identification of three suitable projects per year responding to the National Development Plan, Housing for All and the Climate Action Plan and in assisting with the identification of barriers to innovation.

A report published in November 2021 identifies barriers to undertaking innovation, some includes lack of leadership from public sector, current planning system, and legislation and building regulations do not currently advocate for innovation nor create a level playing field for novel and sustainable solutions, funding, fragmented and cyclical nature of the industry. Following this report, the Sustainability & Climate Action Consultation Group has searched for, and reached out to, potential research/innovation partners for these proposals and encourage them to apply for funding under suitable streams.

One of the key elements identified to reduce the embodied carbon of the construction sector is the need for locally produced and low carbon materials, increased re-use of existing building stock and reducing the amount of materials used through waste prevention, modern methods of construction and the circular economy.

The Sustainability and Climate Action Consultative Committee together with DECC are working on a Construction Sector Circular Economy Roadmap Report to set out guidance on best practice for the reduction of waste from construction and demolition projects through the adoption of Circular Economy principles alongside the use of BIM and MMC.

The Climate Action Plan 2021 – 2030 outlines ambition in the areas of sustainable construction, specifically decreasing embodied carbon in construction materials. Overall, core key performance indicator includes a 10 percent decrease in embodied carbon in construction materials and further measures includes a 10 percent to 60 percent in embodied carbon in construction materials. Practical actions include the use of low-carbon cement blends, or cross laminated timber as alternative construction materials, uptake of carbon-neutral heating, increasing use of wood, extensive retrofitting programme, and prioritisation of brownfield and compact development.

11 This is one of the actions of the Construction Sector innovation and Digital Adoption Subgroup.

Section 9: Conclusions and Next Steps

9.1 Overview

This section outlines the key points from Build report 2022. It also highlights the next Steps i.e. policy responses, initiatives and actions.

9.2 Key Points from Report

This report, through its analysis of the available datasets and information gathered from stakeholders in the construction and built environment, has outlined a number of key findings and challenges which the construction sector is currently experiencing.

Firstly, in terms of regional development, the share of planning permissions for apartments has increased in Eastern & Midlands (incl. Dublin) region and Southern region. Additionally, in the Eastern & Midlands (excl. Dublin), Northern & Western, and Southern Regions, the proportion of planning permissions for one-off houses has increased. There is a risk that this increasing share may work counter to overall National Planning Framework objectives, particularly compact growth. However, these years were atypical given the impacts of Covid-19 and it remains to be seen whether these trends will persist.

There were 30,724 commencements in 2021. Comparing the planning permissions to commencements highlights that planning permissions exceeded the commencements for all regions with the exception of Eastern and Midlands (excl. Dublin). While planning permissions provide an indication of the future pipeline of investment, it cannot be assumed that these permissions translate into completed dwellings.

The NDP 2021 – 2030 has signaled an ambitious investment of €165 billion. Analysis shows that this investment will support approximately 80,000 direct and indirect construction jobs. It is also highlighted that approximately €104 billion of this will be linked to the construction and Built environment sector. Sustainable employment in the construction sector is vital to delivering the NDP. In Q1 2022, there were approximately 159,300 (full-time and part-time) construction sector employees, representing 6 percent of total employment in Ireland. Female employment in the construction sector represents 8 percent of the total employment in construction for the aforementioned time period. Looking at employment from a regional perspective, we observed that the construction share of employment decreased between 2019 and end-2021 for regions such as Dublin, Mid-East, South-East, Mid-West, and Border. In contrast, the share of regions such as the South-West, West and Midlands increased. As for the share of construction employment to total employment, Mid-East and Midlands has the highest share, while Dublin has the lowest.

It is observed that approximately half of the 2021 construction workforce is over 45 years old. Securing the skills pipeline for the construction industry and work permits are an important element. There were 5,399 undergraduate new entrants in engineering, manufacturing and construction (including architecture) in 2020/2021, representing approximately 12 percent of all undergraduate new entrants in 2020/2021. As for apprenticeships, a record number of 4,870 apprenticeships were seen in 2021, with further increases forecasted for 2023, 2024 and 2025.

The skills commentaries from Industry and DFHERIS highlight that many initiatives are being advanced to increase the skills pipeline, namely competitions at secondary school level, increasing apprenticeships, promoting the Irish construction industry abroad and launching campaigns to bring back Irish construction workers from abroad. Additionally, in anticipation of the changes in the construction sector, the benefits of BIM and Modern Methods of Construction and the skills associated with these are highlighted.

Inflation affects all aspects of the economy, and inflation is crucial to capital investment as inflation can reduce the value of investment returns. The Tender Price Index[12], in H2 2021, which shows inflation of non-residential projects with a value of over €0.5 million, stood at 6 percent nationally. Wholesale Price Index of 'materials' has increased by 11 percent between 2021 and Q2 2022 (includes May). Materials such as timber, structural steel and energy have increased significantly, as a result of pent-up demand following covid-19 and the conflict between Russia and Ukraine. Between January 2022 and May 2022, we note a 30 percent increase

12 TPI shows inflation of non-residential projects with a value of over €0.5 million

in structural steel while a decrease of 3 percent in rough timber is observed.

As with materials price inflation, average hourly earnings have increased by 6 percent between 2020 and 2022 (includes Q1 2022). The Stability Programme Update outlines that the annual inflation rate was 5.9 percent in Q1 2022 and is likely to peak in the second quarter of 2022 (at 6.75 per cent), before reducing to approximately 3.5 percent in 2023. While there is a data lag, cost commentaries provided an opportunity to obtain a present view of issues in the construction sector. These can be found in the gold boxes in the cost chapter.

Trends in output shows that activity in the construction sector remains lower than pre-pandemic levels with the overall construction production volume having decreased by 15 percent between 2019 and 2021. Secondly, exports by construction client companies stood at approximately €2.7 billion in 2020, an increase of 40 per cent from 2018, despite Covid-19.

While the new dwelling completions decreased by three percent, apartment completions increased by nearly 50 percent (all between 2019 and 2021). Overall, in Q1 2022, approximately 80% of all new dwellings were completed in urban areas while roughly 20% in rural areas. The government had aimed to concentrate 50% of growth in the five urban cores of Dublin, Cork, Limerick, Galway and Waterford, while concentrating the other 50% outside of these regions.

In terms of the four Dublin Local Authorities, it is observed that there were 42,725 apartments and 5,307 houses within Tier 1 (with full planning permission that can implemented immediately) yet to be commenced (as of Q4 2021). Of these 48,032 units, 60 percent (29,579) received planning permission through the strategic housing development process.

Finally, in the midst of a climate crisis, the report focuses on the element of sustainability. There is an upward trend forecasted for construction and demolition waste (CDW) from 2021 to 2029. Additionally, a report by the Irish Green Building Council has noted that overall GHG emissions are predicted to follow a downward trend but embodied emissions[13] are forecasted to increase. The Sustainability Group, led by RIAI (under the Construction Sector Subgroup) are working with the Department of Environment, Climate and Communications on a Construction Sector Circular Economy Roadmap Report. This report will outline guidance on best practice for the reduction of waste from construction and demolition projects through the adoption of Circular Economy principles.

9.3 Next Steps

Upskilling is now more necessary than ever given the increasing targets and ambitions identified under the NDP, Housing for All and the Climate Action Plan. The apprenticeship model is essential to the delivery of a skilled workforce capable of meeting the built infrastructure requirements of the State. In order to increase the efficiency and effectiveness of apprenticeships, the DFHERIS launched the National Apprenticeship Alliance (NAA) in March 2022. The NAA will have an advisory role in relation to the development of the single apprenticeship system, and will oversee the development of new apprenticeships.

The Construction Sector Innovation and Digital Adoption Subgroup is working on seven priority actions, including the building of the Construction Technology Centre, establishing Modern Methods of Construction and increasing digital adoption in the construction industry through the Build Digital project. Build Digital Project was launched in Q4 2021 and it will run until Q4 2026. This project aims to embed Building Information Management and Modelling in the construction industry, including with SMEs, clients, and suppliers. The overall aim of the project is to promote innovation and digital adoption and enhance productivity.

A cross cutting action of the Construction Sector subgroup is the delivery of 'Housing for All'. As part of this subgroup, DHLGH will conduct a study to illustrate how smart residential design could deliver housing, planning, social and environmental policy objectives in a cost-efficient manner with a view to reducing cost, with a particular focus on higher density development. Additionally, the cost study, which is expected to be published in Q4 2022, will compare Ireland's residential construction to European countries.

Overall, it is clear that there are many challenges and opportunities in the construction sector. Challenges include increasing materials and wages inflation, and the increasing age of the construction workforce. The opportunities include the large capital investment from the Government, necessitating an expansion of the construction workforce. While there are many challenges, there are also multiple initiatives being undertaken by both the industry and the Government to improve outcomes and delivery within the construction and built environment sector.

13 Emissions associated with all the activities of procuring, mining, harvesting raw materials, transforming these materials into construction products, transporting them to site and incorporating them into a building, and subsequently maintaining, replacing and removing and disposing.

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