

**Mapping Workforce Skills for
Construction of Loch na Cathrach
Pumped Storage Hydro Project, Loch Ness**
Final Report for
University of the Highlands and Islands
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Executive summary

Overview

- i. The Loch na Cathrach project (formerly the Red John scheme) is a consented pumped storage hydropower project on Loch Ness, being developed by Statkraft. The project is currently in pre-construction consultation and survey stages, with construction anticipated to commence in 2026, and to become fully operational at some point in 2030. Once complete, it will provide vital energy storage and generation, and requires a supply of energy-relevant skills to support the construction phase and subsequent operation and maintenance of the project.
- ii. Construction activity for the project is expected to last around five years. At the peak of construction activity, over 500 workers will be required on site, across a range of roles at varying skill levels. These construction roles will be supplemented by a non-construction workforce of up to 126 workers, across supervisory, management and administrative roles.
- iii. A synthesis of available evidence from previously undertaken research, desk-based analysis of skills supply provision and targeted consultation with key informants has highlighted some key skills challenges for the project:
 - Competition for Energy skills is considerable, and this is anticipated to increase as a pipeline of Renewable Energy developments is realised.
 - Relying on an overseas or out-of-area/region workforce to meet skills requirements on projects helps de-risk the workforce component of projects, but also inhibits the development of a local pool of labour, and can negatively impact how such employment opportunities are perceived by local workers.
 - There is an opportunity to attract and utilise skilled workers from oil and gas and other such industries to meet skills demand, though the relative attractiveness of renewables versus oil and gas in terms of pay and conditions may still be a challenge.
 - There can be limited availability of suitable training for specific Energy skills competencies, but these can be resolved through regular and proactive engagement between industry and education and training providers.
 - Key challenges and considerations for skills supply include courses in demand from employers, the cycle of work on developments, a critical mass of workers to train and upskill, and the phases of required roles.
 - Employer demand for experience is increasing, so there is a commensurate need to maximise the potential for work-based learning and training through experience.

Conclusions

- iv. The Loch na Cathrach project is a transformational opportunity to significantly increase the energy generation and storage capacity of the energy network in Scotland, and the UK. As a major construction project, it also offers significant employment opportunities in a range of skilled and other roles.
- v. Skills supply through UHI and from Highland-domiciled students is broadly increasing, and is sufficient to meet current industry demands. However, there is a considerable pipeline of

renewable energy developments and large-scale construction projects that will considerably drive up demand for these skills.

Priorities

- vi. Given the skills requirements of the project, there are a number of priorities to address:
- There is a need to develop a ready supply of more local skilled labour. This is both in terms of the immediate skills required for development and construction, and also longer-term operations and maintenance activity for the facility.
 - Consideration should be given by UHI and other training providers to the profile of skills required to deliver this and other projects, to assist in skills planning for both the construction phase and operational lifespan.
 - Developing an understanding of the extent to which the local workforce can be developed – such as potential through local skills content in contracting with Tier 1 contractors – would arguably be of equal if not more value in terms of securing benefits for the Highland economy through increasing employment, and is something that Statkraft are already exploring.
 - As part of skills planning activity, Statkraft should continue to engage with education and training providers, as well as with local and strategic stakeholders, to support the skills supply response and to maximise local labour market buy-in.
 - Collaboration with other developers and taking a ‘co-opetition’ approach to skills development and other areas of mutual benefit is increasingly important, and necessary for the successful development of the Loch na Cathrach project, and for other similar projects in the area.

1 Introduction

Overview

1.1 ekosgen were commissioned by the University of the Highlands and Islands (UHI) to review skills supply and demand relevant to the energy industry predominantly in the Highland Council area, and provide evidence to support the development of a new pumped storage hydropower project on Loch Ness. The consented Loch na Cathrach project (formerly the Red John scheme) is being progressed by Statkraft. Once complete, it will provide vital energy storage and generation, and requires a supply of energy-relevant skills to support the construction phase and subsequent operation and maintenance of the project.

Aim and approach

1.2 The objective of the research was to provide evidence to inform education and skills planning to ensure the workforce requirements for the project can be met by local provision as far as possible. This will allow Statkraft to be sure of accessing the skills it needs to deliver the project, and so that local people can benefit from the employment and training opportunities flowing from the construction of the Loch na Cathrach pumped storage hydro project.

1.3 The research undertaken by the ekosgen team comprised:

- Desk-based analysis of education provision data drawn from a number of sources, including Scottish Funding Council (SFC), Skills Development Scotland (SDS), Higher Education Statistics Agency (HESA), and UHI's own enrolment monitoring data. Chapters 4 and 5 provide a synthesis of SFC, SDS, and HESA data to offer a broad overview of skill supply and demands in the Highlands. UHI's own data is used in Chapter 6, and although is less extensive than the preceding chapters, this provides a more reliable and up to date review of skills provision in the Highlands.
- Consultation interviews with key informants in Statkraft and its supply chain to explore issues of skills supply and demand for the anticipated workforce.
- Synthesis of findings from previous research undertaken regarding the supply of and demand for Energy-related skills in the Highland Council area, across the Highlands and Islands region, and elsewhere in Scotland, to set out the key challenges to skills supply, and understanding on priority areas to address.

Report structure

1.4 The report takes the following structure:

- **Chapter 2** provides an overview of the proposed pumped hydro storage development and summarises the strategic context.
- **Chapter 3** details the baseline socio-economic conditions in the Highland Council area, covering key population and labour market trends in the area.
- **Chapter 4:** provides an overview of the economic context in the Highlands, including information on the business base and existing workforce in the area to contextualise skills demand.

- **Chapter 5:** presents data on education enrolments across all levels in the Highlands to provide an image of the skills available.
- **Chapter 6:** sets out analysis of UHI data to give an up-to-date overview of available skills.
- **Chapter 7:** reviews challenges affecting the skills pipeline in the Highlands.
- **Chapter 8:** presents a summary of anticipated skills requirements across construction and non construction roles for the Loch na Cathrach project.
- **Chapter 9:** sets out conclusions and provides consideration of some priority areas for improving skills supply in the future.

2 Project information

Introduction

- 2.1 This chapter provides an overview of the proposed development, and outlines its regional and national strategic context.

Company overview

- 2.2 Statkraft are a Norwegian renewable energy company and are the largest producer of renewable energy in Europe, as well as one of the top ten hydropower companies in the world. The company is headquartered in Oslo, operating in more than 20 countries, with over 6,000 employees, and in 2023, they produced 61.9TWh of energy.¹
- 2.3 In the UK, Statkraft have been operating since 2006, and now has a large number of locations including six onshore wind farms, two grid stability projects, and operates a hydropower plant in Wales. They also produce around 10GWh of energy in the UK per annum and have invested around £1.4 billion into renewable energy infrastructure in the UK.²

Project overview

- 2.4 The proposed development is a hydro pumped storage scheme called Loch na Cathrach which is close to and will use water from Loch Ness (see Figure 2.1) to provide long duration energy storage. The project will work by circulating water from Loch Ness, using underground pipelines, into a head pond sitting at a higher altitude. Here the water will sit until there is an increased demand for power, at which point this will be released back into Loch Ness providing a large supply of renewable energy using water turbines. This will provide a valuable resource to support Scotland's transition to renewable energy.
- 2.5 The project was originally started in 2015 by Intelligent Land Investments (ILI) Group, receiving consent from the Scottish Government in 2021, before being acquired by Statkraft in 2023, who are progressing the project to construction. Loch na Cathrach is positioned in an area of high renewable energy production. It will provide hundreds of new jobs during construction and will also provide a large number of high-quality jobs for the local area once in operation.³
- 2.6 The project is currently in consultation and survey stages, with construction hoping to commence in 2026, and to become fully operational in 2030. Statkraft are also exploring options to minimise and mitigate impacts, and increasing the benefits to the local community, including creating a park and ride for construction workers away from the site to reduce pressure on roads and transport systems. The project name was changed through consultation with locals and language organisations, to better reflect the area. More broadly, Statkraft already support UHI students through a £72,000 STEM scholarship programme that supports two students, for each year of their studies.⁴

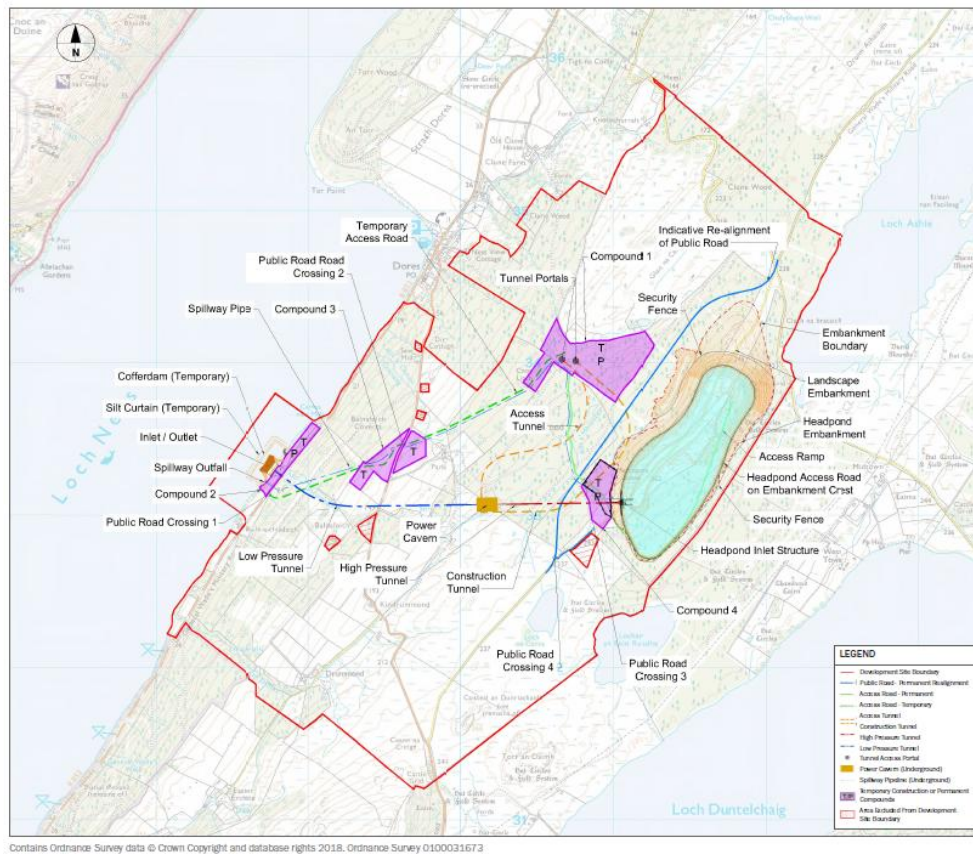
¹ <https://www.statkraft.com/about-statkraft/>

² <https://www.statkraft.co.uk/about-statkraft-uk/where-we-operate/Locations/>

³ <https://projects.statkraft.co.uk/loch-na-cathrach/>

⁴ <https://www.uhi.ac.uk/en/giving/scholarshipsandprizes/statkraft/>

Figure 2.1: Loch na Cathrach site



Contains Ordnance Survey data © Crown Copyright and database rights 2018. Ordnance Survey 0100031673

Source: Statkraft, 2023

Strategic context

Scotland's National Strategy for Economic Transformation

- 2.7 Scotland's National Strategy for Economic Transformation⁵ (NSET), published in 2022, sets out the Scottish Government's plan to improve socio-economic conditions in Scotland by 2032. The Strategy seeks to make Scotland a more 'successful' country, increasing the number of new businesses, and the capacity for upscaling of current businesses.
- 2.8 NSET will help to grow the country's availability of green skills by providing £200 million annually for sustainable energy investments such as creating a Green Jobs Skills hub which will identify and fill gaps in the green workforce. NSET supports the Scottish Government's goal of becoming a carbon net zero country by 2045.
- 2.9 Loch na Cathrach will support the objectives of net zero emissions by providing a reliable backup source of renewable energy, boosting Scotland's energy mix and energy supply, creating a more reliable energy production. Statkraft's provision of scholarships to UHI students undertaking STEM degrees also aligns with NSET's targets of increasing the supply of green skills.

⁵ <https://www.gov.scot/publications/scotlands-national-strategy-economic-transformation/documents/>

Climate Emergency Skills Action Plan

2.10 The Climate Emergency Skills Action Plan (CESAP)⁶, published in 2020, is SDS and the Scottish Government's plan to improve the availability of relevant skills to support with meeting net zero targets. The plan details some key short-term targets which will allow this, including:

- Supporting the green labour market to recover from the COVID-19 pandemic;
- Providing a strong workforce to capitalise on opportunities presented by net zero; and
- Supporting regional clean growth.

2.11 Loch na Cathrach will operate in a key renewable energy production region of the north of Scotland, and will bring a large number of STEM jobs to the area through construction, and eventually operation. The Scottish Highlands and Islands has historically struggled with younger people leaving the area to seek employment and education opportunities elsewhere. Therefore, providing increased high-quality renewable energy jobs will support with sustainable growth in the region.

Green Industrial Strategy

2.12 The Green Industrial Strategy, published in 2024, is the Scottish Government's strategy which identifies opportunities and challenges for the renewable energy industry. This aims to support the Scottish green energy sector to become globally competitive as the country transitions towards net zero. The Green Industrial Strategy presents five key objectives targeting the development of different renewable energy industries such as wind and hydrogen, and has various priorities relating to local development of skills, and employment opportunities. For example, this will ensure that educators are responsive to industry needs, support retraining and transferability opportunities into green jobs, and encourage renewable energy organisations to invest in local areas.

Draft Energy Strategy and Just Transition Plan

2.13 The Draft Energy Strategy and Just Transition Plan⁷, published in 2023, is the Scottish Government's plan to reach wider net zero goals, in a way which is equitable, and ensures no community in Scotland is negatively impacted by transitioning. This requires accessible and affordable renewable energy, and means of accessing it, so that it is the best option for everyone in Scotland. For example, rural communities can face more challenges in transitioning as their heating systems are often not suitable to retrofit. In response the strategy offers tailored funding packages to communities in Scotland to support with a just transition.

2.14 Ensuring that jobs are protected is another objective of the strategy, especially in regions where the oil and gas industry is a significant employer such as in the north of Scotland. Offering people the option to upskill or re-skill is important to ensure communities are not left behind. Therefore creating a large number of new jobs in the north of Scotland aligns the Loch na Cathrach project with the strategy.

⁶ <https://www.skillsdevelopmentscotland.co.uk/media/w0ulewun/climate-emergency-skills-action-plan-2020-2025.pdf>

⁷ <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/documents/>

Highlands and Islands Enterprise Strategy 2023-2028

- 2.15 The Highlands and Islands Enterprise Strategy 2023-2028⁸ published in 2023 by Highlands and Islands enterprise, outlines the regional approach to supporting the Scottish Government's net zero targets. Key objectives are to embed net zero principles in regional policy, promote fair and inclusive growth and regional transformational opportunities across the Highlands and Islands.
- 2.16 For example, this targets fair growth and transition for people living in rural communities, and improved opportunities through investment. The Loch na Cathrach project is avoiding negative impacts on communities such as through the provision of a park and ride to alleviate strain on the roads and transport system, while Statkraft are also providing opportunities through STEM scholarships for UHI students.

⁸ <https://www.hie.co.uk/media/kc5b4yl1/hie-strategy-2023-28-online.pdf>

3 Socio-economic context

Headline findings



- 12% of Highland's Data Zones* are in the most deprived 20% in Scotland
- The population of Highland has increased in recent years. However, it is forecast to decrease by 3% over the next 18 years, in contrast to Scotland's population overall. There are more nuanced population trends at lower-level geographies especially in rural data zones that have experienced some depopulation in recent years
- The dependency ratio for Highland is higher than Scotland as a whole (64% versus 56%) the share of working age population is lower than the national average and the dependency ratio is driven by a larger proportion of the population at retirement age
- The employment rate in Highland decreased significantly from 81% to 72% from 2018 to 2022, with little signs of recovery to pre-pandemic levels so far
- Economic activity, amongst the working age population, has decreased in Highland from 81% to 77% whereas in Scotland it remained steady (78%) over the period 2014 to 2023
- Median salary is slightly lower in Highland (c.£29k) than the national average salary (c.£30k)
- Highland has a higher rate of 16-19 year olds in employment than Scotland as a whole (24% compared to 18%), whereas Scotland has a higher rate in education (73% compared to 68%)

**Data Zones are small area geographies used in the production of official statistics in Scotland (Scottish Government)*

Introduction

- 3.1 This chapter sets out the socio-economic context of the Highland Council area. It draws on published data sources to establish a socio-economic baseline for the local authority area, including consideration of the current trends in the labour market, population, wage levels, and levels of deprivation.
- 3.2 The Highland Council area is analysed in this chapter and data is contextualised by national level analysis. Analysis is principally presented at local authority level; however, some analysis is presented at Travel to Work Area (TTWA).⁹

Socio-economic context

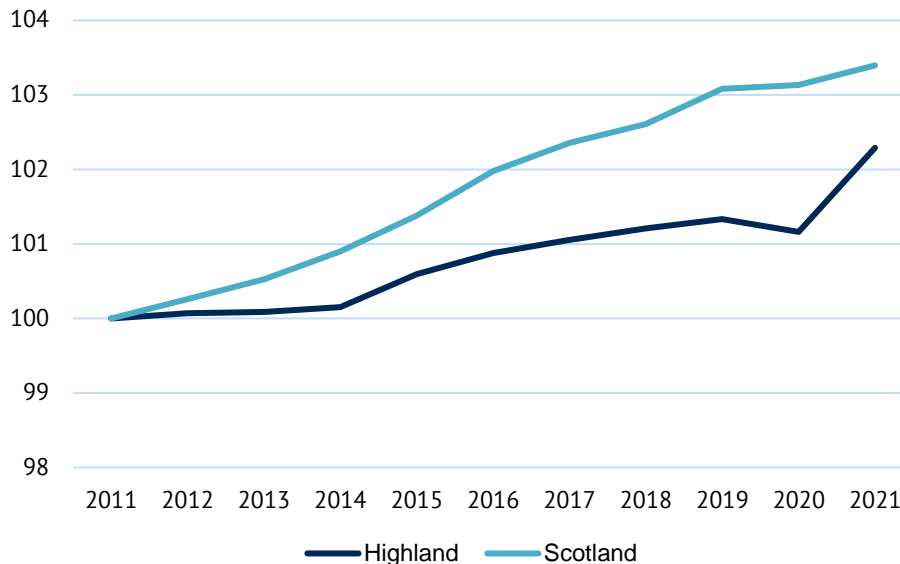
Population

- 3.3 The population in the Highland Council area has increased in recent years. Figure 3.1 shows the indexed population change in the Highland Council area and Scotland between 2011 and 2021 with 2011 as the base year. In contrast to national trends, population in the Highland Council area has grown at a significantly slower rate, albeit experiencing a comparatively large year-on-year increase between 2020 and 2021 (equating to a 1% change over the 12-month period).

⁹ Please note that the Annual Population Survey and the Scottish Government's statistics on Economic Activity, Benefits and Tax Credits do not drill down to electoral ward geographies therefore analysis has been completed solely for the relevant local authority geography.

3.4 The Highlands have experienced historic demographic challenges in terms of depopulation and areas within the Highland Council area may be more at risk of depopulation factors, in comparison to other local authorities, as evidenced by the COVID-19 pandemic¹⁰ – though the significant regional variability and unique circumstances that exist across the Highland Council area should not be overlooked. The Scottish Government anticipate that population growth in the Highland Council area will continue to fall below the national average by 2028.¹¹

Figure 3.1: Index population in Highland and Scotland (2011-2021)



Source: NRS Small Area Population Estimates

3.5 The average age of the population in the Highland Council area has been increasing for a number of years.¹² As shown in Table 3.1, the Highland Council area also has a lower share of working age population (61%) than the national average (64%). Consequently, the dependency ratios¹³ for the Highland Council area are higher than nationally. This may be driven by younger people leaving the Highland Council area in search of educational and employment opportunities.¹⁴ It may also be driven by older people retiring to the area.

Table 3.1: Population by age in the Highland Council area and Scotland, in 2021

Age	Highland	Highland %	Scotland %
0-15	38,130	16%	17%
16-64	144,706	61%	64%
65+	55,224	23%	20%
All ages	238,060	100%	100%

Source: NRS Small Area Population Estimates

3.6 Figure 3.2 illustrates the projected population growth for the Highland Council area over the period 2024 to 2042. Whilst the national population is expected to grow slowly before stagnating

¹⁰ <https://www.gov.scot/publications/convention-of-the-highlands-and-islands-meeting-papers-october-2020-2/>

¹¹ <https://www.gov.scot/publications/supporting-enabling-sustainable-communities-action-plan-address-depopulation/documents/>

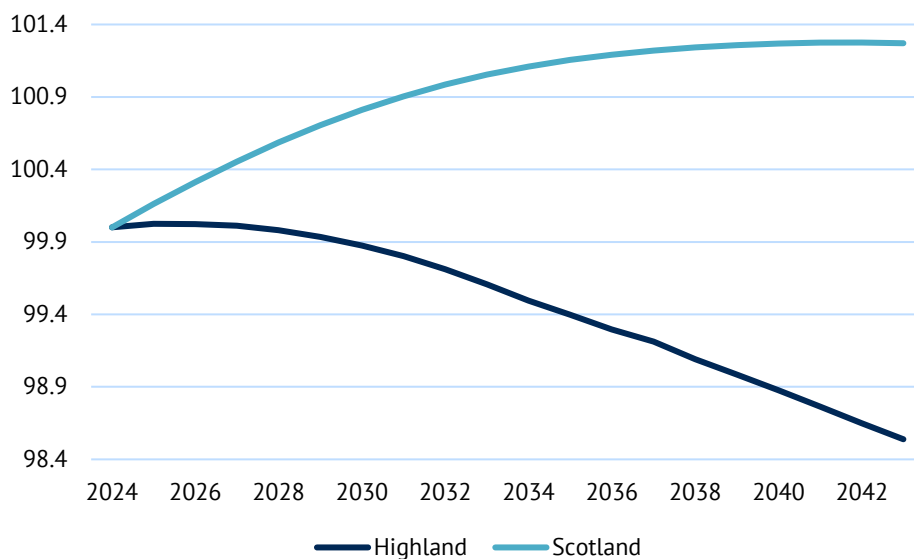
¹² <https://www.hie.co.uk/research-and-reports/our-reports/2019/november/21/highlands-and-islands-area-profiles-2019/>

¹³ Dependency ratios calculate the ratio of the number of dependants (people aged 0-16 and 65+) to the number of working age people.

¹⁴ <https://www.hie.co.uk/media/3007/youngpluspeopleplusandplustheplushighlandsplusandplusislandsplus-plusmaximisingplusopportunitiesplus-plusreport.pdf>

over this period, the Highland Council area is forecast to decrease by around 1.5%. However, it is worth noting that these forecast trends appear to contrast with the historical trends to date as discussed in relation to Figure 3.1.

Figure 3.2: Index population projections in Highland and Scotland (2024-2042)

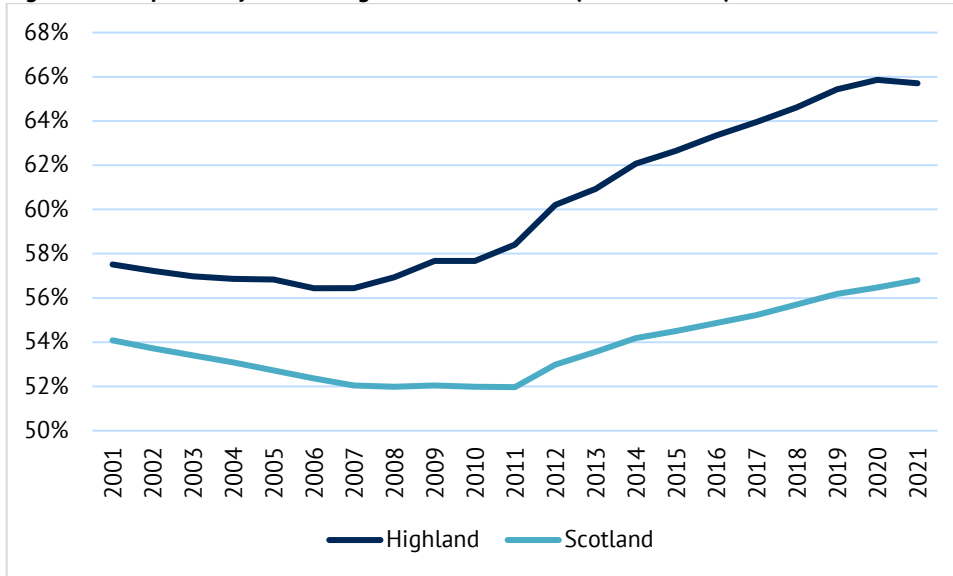


Source: NRS Sub-National Population Projections

- 3.7 Over the period 2018 to 2028, Highland’s population aged 75 and over is forecast to increase by 34%.¹⁵ This is the seventh highest percentage change for all local authority areas in Scotland. Over the same period, Scotland’s population in this age group is forecast to increase by 25%. This highlights an ageing population and potentially indicates that more young people are forecast to leave the Highland Council area whilst older people are staying, or moving into the area.
- 3.8 Figure 3.3 shows the dependency ratio in Scotland and the Highland Council area from 2001 to 2021. This represents the population of children (aged 0 to 15) and older people (aged 65 and over) expressed as a percentage of people aged 16 to 64. A ratio of 53% would mean that for every 1,000 people of working age there would be 530 of non-working age. Highland’s dependency ratio is higher over the period than Scotland, with both geographies experiencing an increase in the dependency ratio between 2001 and 2021. This indicates a higher burden for the economically active population, particularly in the Highlands, as there are more economically inactive people to provide services for.

¹⁵ <https://www.nrscotland.gov.uk/files/statistics/population-projections/sub-national-pp-18/pop-proj-principal-2018-report.pdf>

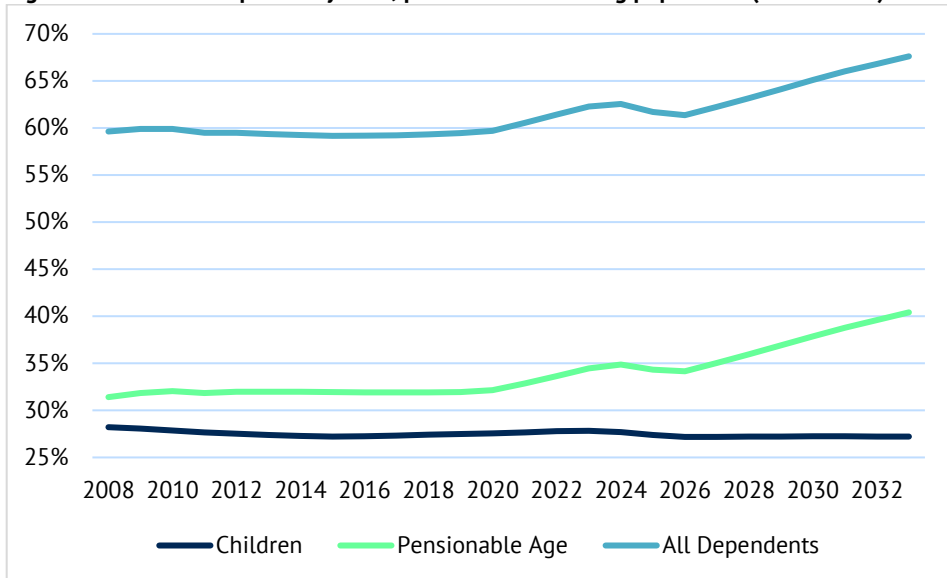
Figure 3.3: Dependency ratio in Highland and Scotland (2001 to 2021)



Source: NRS Dependency Ratio

3.9 Figure 3.4 shows the dependency ratio per thousand working population (excluding working age people who are economically inactive, or unemployed) between 2008 and 2032 in Scotland. The total proportion of dependents is projected to increase significantly between 2024 and 2032, however, the proportion of children is not expected to increase. This highlights Scotland’s ageing population and may exacerbate the burden placed on the economically active population in Scotland.

Figure 3.4: Scottish Dependency ratio, per thousand working population (2008-2033)



Source: NRS Dependency ratio

3.10 The dependency ratio in the Highland Council area was 64% in 2018 compared to 56% for Scotland and the gap is expected to increase in the future, with the ratio forecast to be 72% in the Highland Council area and 60% for Scotland.

3.11 Table 3.2 presents total net migration in the Highland Council area and Scotland. Total net migration shows the difference between in and out migration for the rest of the UK, within

Scotland and internationally. There has been a significant increase in net migration, over the period 2011 to 2020, in the Highland Council area particularly, but also nationally. The significant increase in total net migration in 2020-21 may be as a result of factors relating to the COVID-19 pandemic and resulting socio-economic consequences, which – amongst other things – saw people move from cities to more rural areas to capitalise on quality of life benefits, whilst taking advantage of more flexible working arrangements.¹⁶

Table 3.2: Total net migration in Highland and Scotland (2011-2021)

	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Highland	120	90	240	1,120	1,200	810	970	980	390	3,390
Scotland	12,700	10,000	17,600	28,000	31,700	23,900	20,900	30,200	16,900	27,800

Source: NRS Migration

- 3.12 There is some variation in total net migration from 16-to-64 year-olds in the Highlands. There was negative total net migration in the Highland Council area in 2012-13 as shown by Table 3.3. Total net migration across all ages was positive in the Highland Council area, during the period 2011 to 2021, with only one outlier 'negative' year, in 2012-13 (-30).

Table 3.3: Working age (16-64) total net migration flows in Highland and Scotland

	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Highland	187	-30	172	819	1,016	856	777	747	291	2,807
Scotland	11,462	8,267	14,470	23,858	26,475	19,788	17,048	24,399	13,928	21,236

Source: NRS Migration

Deprivation

- 3.13 The Highland Council area has a high degree of deprivation with approximately 12% of the Highland Council area data zones being in the most deprived 20% in the country (decile one and two). This is partly due to Highland scoring very low on the geographical domain because of the remoteness of areas means lack of access to services and employment. The most deprived areas also score particularly low on the employment domain (such as deprived areas of Alness and Invergordon) whilst housing is also a low scoring domain more widely in the Highland Council area.
- 3.14 A breakdown of the percentage of data zones in the Highland Council area by deprivation decile is shown in Table 3.4.

Table 3.4: Percentage of Highland data zones by SIMD decile (2020)

Decile	1	2	3	4	5	6	8	9	10
Highland	5%	7%	8%	13%	20%	23%	15%	5%	4%

Source: Scottish Index of Multiple Deprivation 2020

¹⁶ <https://www.hie.co.uk/media/9646/the-impact-of-covid-19-on-the-highlands-and-islands.pdf>

Population skill levels

- 3.15 Compared with Scotland as a whole, the Highland Council area has the same proportion of the population qualified at RQF4+, and a greater share qualified at RQF3+, as shown by Table 3.5.¹⁷ However, the working age population (16-64) of the Highland Council area (8%) are more likely to have no qualifications than Scotland (5%). This may reflect the type of industries that are more prevalent in the Highland Council area than Scotland and the qualification requirements of these industries whereby 'on the job' learning may be more common; such as agriculture, forestry & fishing and accommodation & food services.

Table 3.5: Population (aged 16-64) qualification levels in Highland and Scotland (2022)

	Highland	Scotland
RQF4+	48%	48%
RQF3+	72%	70%
RQF2+	87%	92%
RQF1+	87%	93%
Other qualifications (RQF)	5%	2%
No qualifications (RQF)	8%	5%

Source: NOMIS Annual Population Survey

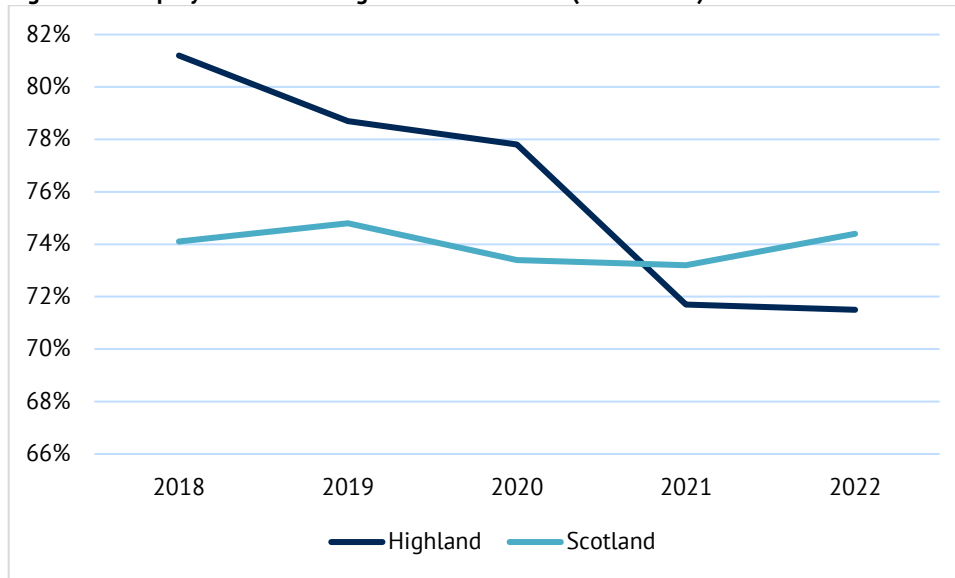
Labour market participation

- 3.16 Figure 3.5 illustrates the employment rate in the Highland Council area and Scotland during the period 2018 to 2022. The employment rate in the Highlands has been decreasing since 2018 from approximately 81% to just under 72% in 2022. This has brought it below the national average.
- 3.17 The COVID-19 pandemic may have adversely affected employment in Scotland. However, this appears to have been more noticeable in the Highland Council area with employment falling by around six percentage points from 2020 to 2021. Prior to this, the employment rate in the Highland Council area was significantly higher than the national average with this falling to two percentage points below the Scottish average in the most recent year. The reliance on Tourism and Hospitality in the Highlands may be a factor here. Statistical and anecdotal evidence indicates that this sector in particular has faced recent challenges linked to the pandemic, however in more recent years, Visit Scotland data indicates that tourism employment and GVA are exceeding pre-pandemic levels.¹⁸

¹⁷ RQF4 equates to SCQF7 and RQF1 equates to SCQF4. For further details please see: <https://www.sqa.org.uk/sqa/64561.html>. It is worth noting that some data such as APS may be less reliable at the sub-national level due to the sampling approach taken to compile such datasets, which results in a degree of variability in the data.

¹⁸ <https://tourismobservatory.scot/data/insights/tourism-businesses-in-scotland/?backid=1496>

Figure 3.5: Employment rate in Highland and Scotland (2018-2022)



Source: NOMIS Annual Population Survey

3.18 The economic activity rate in 2023 was slightly lower in the Highland Council area (77%) than the national average (78%). However, at 94%, the economic activity rate in the Highland Council area amongst older people (aged 50+) was significantly higher than the economic activity rate amongst older people in Scotland (81%) in 2023; as shown by Table 3.6. Although economic activity is lower in the Highland Council area than the national average, there is a participation rate (percentage participating in education, training or employment) of approximately 95% amongst 16-19-year-olds, in 2023, which puts it above the Scottish average.¹⁹ It should also be noted that the largest difference in economic activity between the Highland Council area and Scotland, is amongst young people (aged 16-24) where just over half (52%) of this group in the Highland Council area are economically active, compared to 62% in Scotland.

Table 3.6: Economic activity rate by age group and local authority (2023)

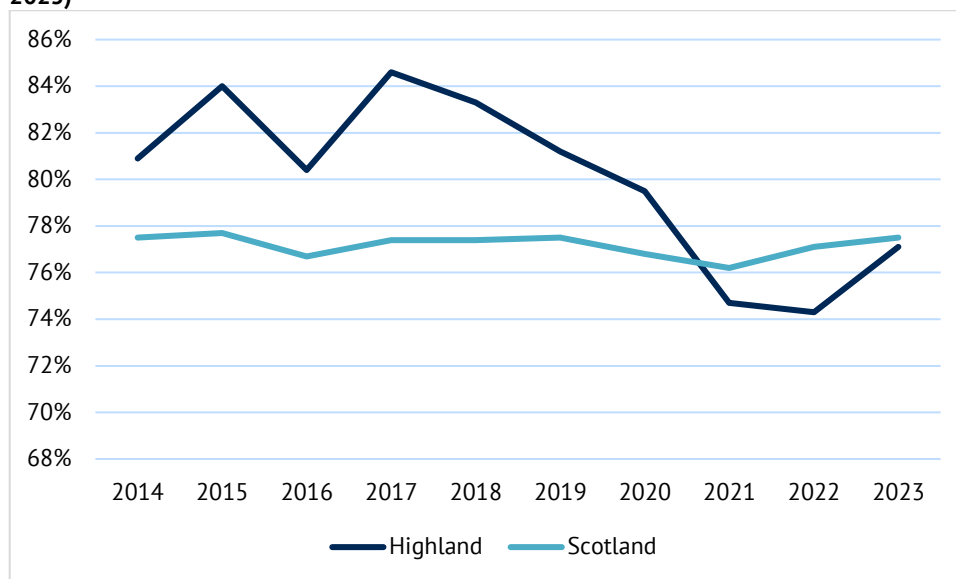
	Highland	Scotland
Economic activity rate - aged 16-24	52%	62%
Economic activity rate - aged 25-49	83%	86%
Economic activity rate - aged 50-64	79%	72%
Economic activity rate - aged 65+	15%	9%
Economic activity rate - aged 16-64	77%	78%

Source: NOMIS Annual Population Survey

3.19 Economic activity has decreased somewhat significantly in the Highland Council area from 2014 to 2023, decreasing from 81% to 77%. Meanwhile Scotland's economic activity has remained relatively stable over the period, remaining broadly around 78%. The Highland Council area, in particular, experienced a significant decrease in 2020 and 2021 likely due to prominent industries (such as Hospitality and Tourism) being adversely impacted by COVID-19 lockdown restrictions.

¹⁹ <https://www.skillsdevelopmentscotland.co.uk/media/b0xj43cd/annual-participation-measure-2023-report.pdf>

Figure 3.6: Economic activity amongst working age population (16-64) in Highland and Scotland (2014-2023)



Source: NOMIS Annual Population Survey

3.20 In 2023, the Highland Council area had a slightly larger (+ one percentage point) retired population than the national average shown by Table 3.7. The Highland Council area also has a much larger percentage of people who want a job (+ seven percentage points) than the national average.

Table 3.7: Economic inactivity by type in Highland and Scotland (2023)

	Highland	Scotland
Student	13%	25%
Looking after family/home	9%	17%
Temporary sick	*	3%
Long-term sick	40%	32%
Discouraged	*	0%
Retired	15%	14%
Other²⁰	22%	9%
Want a job	24%	17%
Do not want a job	77%	84%

Source: NOMIS Annual Population Survey

* Estimate and confidence interval not available since the group sample size is zero or disclosive (0-2)

Wages

3.21 Median annual wage for all employee jobs is lower in the Highland Council area than the national average as Table 3.8 highlights.²¹ This indicates a higher proportion of employment in lower-skilled, lower-paid roles in the Highland Council area compared to Scotland. In the

²⁰ Other reasons include people who (i) are waiting the results of a job application, (ii) have not yet started looking for work, (iii) do not need or want employment, (iv) have given an uncategorised reason for being economically inactive, or (v) have not given a reason for being economically inactive:
<https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/economicinactivity/datasets/economicinactivitybyreasonseasonallyadjustednac01sa>

²¹ Note that the 2023 dataset used in this analysis is a provisional dataset.

Highland Council area, the gap with the national average is c.£800, with the Highland Council area’s median weekly wage for full-time employees in 2023 as £574.

Table 3.8: Median gross pay for full-time employees 2023

	Highland	Scotland
Weekly wage	£574	£588
Annual wage	£29,049	£29,842

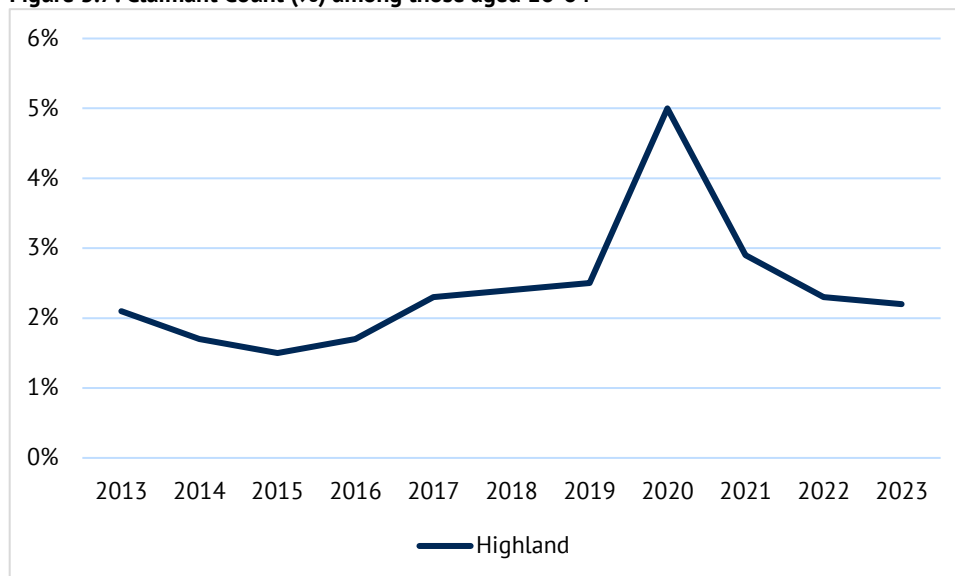
Source: ONS Annual Survey of Hours and Earnings

Claimant count

3.22 Figure 3.7 shows the proportion of working age people claiming benefits across the Highland Council area , with the proportion remaining relatively consistent over the ten-year period. Following a large spike in the claimant rate during 2020 (from 3% to 5%) the percentage of claimants has been decreasing and is now largely similar to pre-COVID levels at around 2% of working age population. In 2023, the Highland Council area had the 13th lowest claimant count percentage out of Scotland’s 32 local authorities which is positive.²²

3.23 There was a significant increase in the Universal Credit claimant rate across Scotland from 2019 to 2020, rising to around 5% in the Highland Council area, likely due to the COVID-19 pandemic.²³

Figure 3.7: Claimant Count (%) among those aged 16-64



Source: Claimant Count from Department for Work and Pensions

Travel

3.24 Table 3.9 shows the distance travelled to work by local authority area in 2022. People living in the Highland Council area are more likely to travel short distances to work of under one kilometre (31%) and one to two kilometres (21%) than people in Scotland as a whole.

²² <https://www.ons.gov.uk/visualisations/labourmarketlocal/S12000017/#claimant-count>

²³ <https://stat-xplore.dwp.gov.uk/webapi/metadata/dashboards/uch/index.html>

Table 3.9: Distance travelled to work by local authority

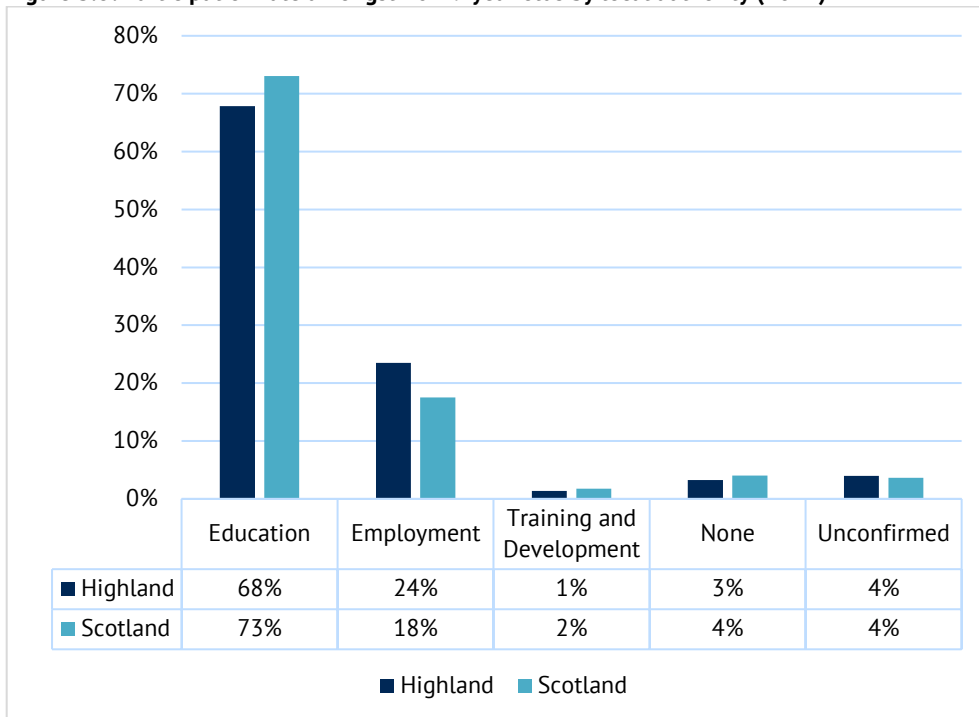
	Under 1km	1-2km	2-3km	3-5km	5-10km	10-15km	15-20km	20-40km	40km+
Highland	31%	21%	5%	8%	9%	9%	6%	9%	4%
Scotland	24%	16%	9%	12%	15%	8%	5%	8%	4%

Source: Scottish Household Survey

Participation rate

3.25 Scotland had a higher rate of 16-19 year olds in education than the Highlands (73% and 68% respectively) whereas the Highland Council area had a higher rate of 16-19 year olds in employment than Scotland (24% and 18% respectively) in 2022 as shown by Figure 3.8.

Figure 3.8: Participation rate amongst 16-19 year olds by local authority (2022)



Source: Participation Measure, Skills Development Scotland

4 Current and emerging demand for skills

Headline findings



- A decrease in the number of energy-related businesses in the Highland TTWA and an increase in employment in energy-related jobs suggests some consolidation in the sector with fewer but larger employers.
- In 2023, average median weekly pay for people working in Energy was £905 in Scotland, compared to £703 for employees in all sectors. However, pay in the Energy sector has risen less steeply than in all sectors in recent years.
- Employment in Energy is forecast to decrease in Highland in line with national forecasts. However, forecasts do not account for anticipated growth driven by ScotWind, new pumped storage hydro schemes, proposals for new onshore wind developments and similar opportunities.
- GVA in 2024 in Highland is forecast to be £550m accounting for 7% of Scotland's total forecast GVA for the year.
- Net business registrations in Highland and Scotland were positive in 2018 and 2019 and were negative 2020 and 2021.
- Scottish Oil and Gas employment decreased from 2015 to 2021 from 109,200 to 82,400.
- There was a 17% increase in the number of Low Carbon and Renewable Energy Economy (LCREE) businesses from 2014 to 2021.
- There has been a 12% increase in total unique job postings across Highland over the period in the energy and manufacturing industries.
- Scotland has seen a 7% increase in R&D spending from 2020 to 2021 from £2,927m to £3,121m.

Introduction

- 4.1 This chapter presents an analysis of the current and emerging skills demand in the Highland Council area. It focuses on the Energy sector including time-series analysis of the business base, employment, pay, and forecast GVA. It also provides detail on Low Carbon and Renewable Energy Economy employment.
- 4.2 The findings establish a baseline for the existing availability of a skilled workforce and provides context for the analysis of anticipated supply in Chapter 5.

Energy sector

Energy business base

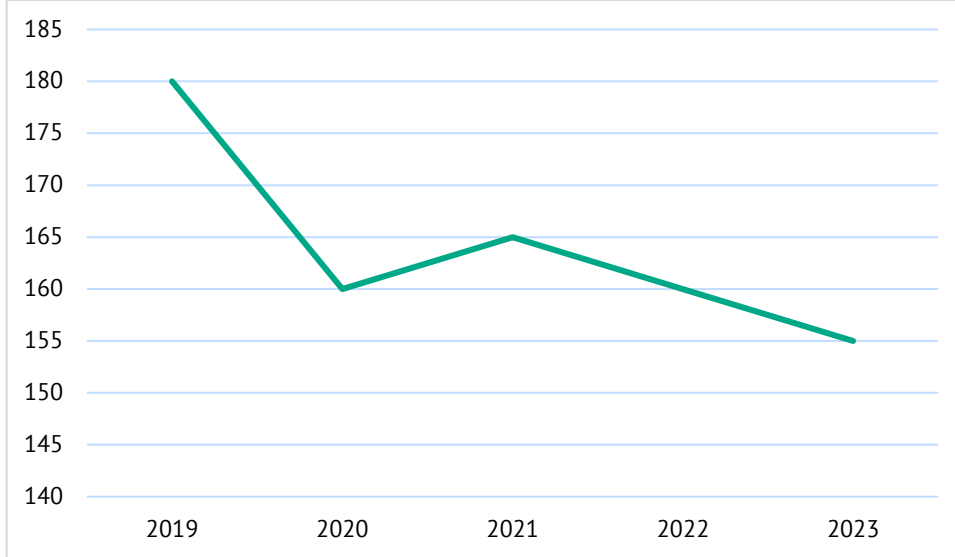
- 4.3 Figure 4.1 shows that the number of energy-related businesses in the Highland Council travel to work area (TTWA) has decreased from 180 in 2019 to 155 in 2023.²⁴ It fell between 2019 and 2020, then increased slightly in 2021 before declining in the two years from 2021 to 2023.²⁵

²⁴ The Highland TTWA is made up of the Alness and Invergordon, Aviemore and Grantown-on-Spey, and Inverness TTWAs (2011), as defined by the Office for National Statistics (ONS).

²⁵ UK Business Counts figures are rounded to avoid disclosure therefore it is fair to assume the energy-related business base in the HIGHLAND TTWA may not have fluctuated significantly from 2020 to 2023.

Combined with the index of employment in Figure 4.3, there appears to have been some consolidation in the sector, with fewer but larger employers. Energy-related businesses in the Highland Council TTWA made-up a small proportion, 5%, of Scotland's 3,820 energy-related businesses in 2023.

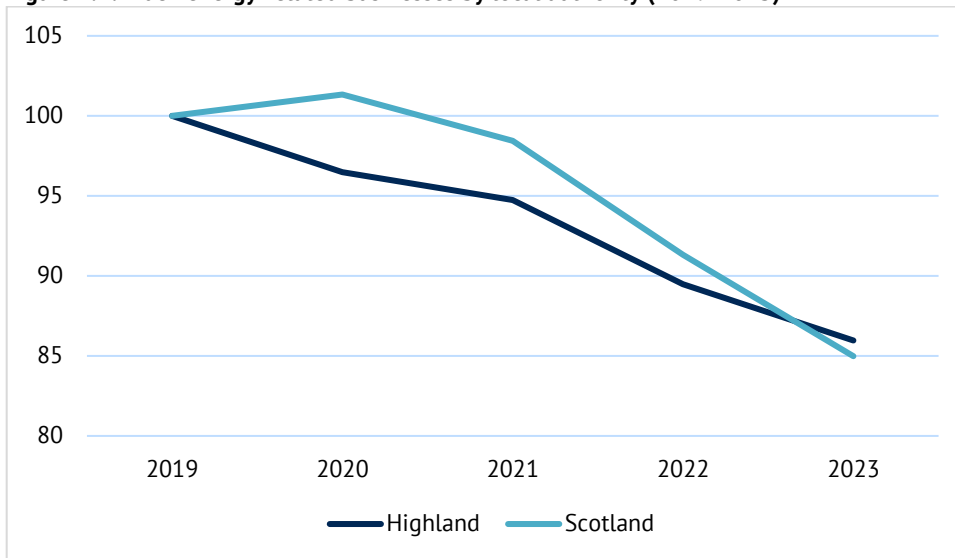
Figure 4.1: Number of energy-related businesses in the Highland Council TTWA (2019-2023)



Source: UK Business Count – local units, 2023

4.4 Figure 4.2 shows an index of the number of energy-related businesses across the Highland Council area and Scotland. It indicates a decrease over the period 2019 to 2023 in both geographies.

Figure 4.2: Index energy-related businesses by local authority (2019-2023)



Source: NOMIS UK Business Count – local units, 2023

4.5 The highest proportion of energy-related businesses in the Highland Council area and Scotland, during the period 2019-2023, were businesses conducting engineering related scientific and technical consulting activities (47% in the Highland Council area, and 56% in Scotland) followed by businesses providing electricity, gas, steam and air conditioning supply (29% in the Highland Council area, and 24% in Scotland).

- 4.6 Micro businesses account for the majority of energy-related businesses in the Highland Council area and Scotland.²⁶ Table 4.1 shows that there are very few medium and large businesses (zero in table due to rounding) in the Highland Council area and only 165 in Scotland.²⁷ This indicates the importance of fostering a supportive business environment for micro and small businesses in the energy industry.

Table 4.1: Energy-related businesses by size in the Highland Council area and Scotland (2023)

	Micro		Small		Medium		Large		Total
	N	%	N	%	N	%	N	%	N
Highland	220	90%	15	6%	0	0%	0	0%	245
Scotland	3,325	87%	325	9%	115	3%	50	1%	3,820

Source: NOMIS UK Business Count

Business registrations

- 4.7 Net business registrations in the Highland Council area and Scotland fell sharply in 2020, likely due to the pandemic. The Highland Council area experienced a steeper relative decline in net business registrations, than Scotland as a whole, which may have resulted from a reliance on industries that were particularly vulnerable to lockdown restrictions such as hospitality, tourism, and retail. Table 4.2 shows that net business registrations in the Highland Council area and Scotland decreased significantly between 2019 and 2020 before increasing again in 2021, however, registrations remained net negative for both the Highland Council area and Scotland in 2021.

Table 4.2: Net business registrations

	2018	2019	2020	2021
Scotland	2,250	2,370	-1,360	-795
Highland	35	50	-40	-5

Source: Scottish Government Business Demography – Births and Deaths

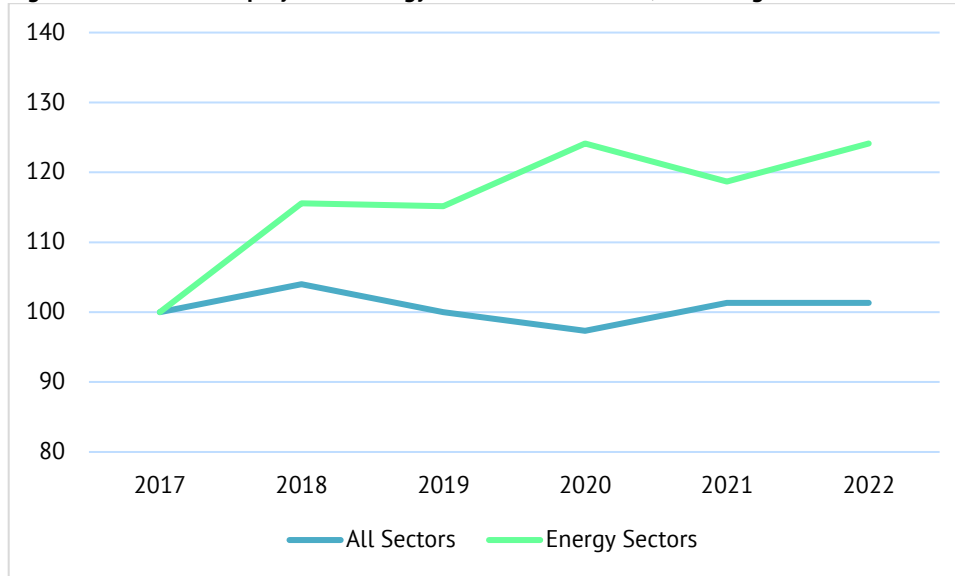
Employment

- 4.8 This section presents analysis of the existing energy-related employment across the Highland Council area setting out the scale and significance of the energy-relevant workforce and how it compares to Scotland.
- 4.9 As set out in Figure 4.3, employment in energy-related businesses in the Highland Council TTWA increased by 24% over the period 2017 to 2022. The number of employees in the sector and related subsectors rose from 1,285 in 2017 to 1,595 in 2022. By comparison, the level of employees across all sectors in the Highland Council TTWA remained almost constant with a 1% increase of the base year value. This represents an increase from 75,000 employees to 76,000. As highlighted, the data indicates that there are fewer businesses but that overall, they are employing more people.

²⁶ In terms of employees: Micro (0-9), Small (10-49), Medium (50 to 249), and Large (250+).

²⁷ All figures are rounded to avoid disclosure. Values may be rounded down to zero and so all zeros are not necessarily true zeros. Totals across tables may differ by minor amounts due to the disclosure methods used. Furthermore, figures may differ by small amounts from those published in ONS outputs due to the application of a different rounding methodology.

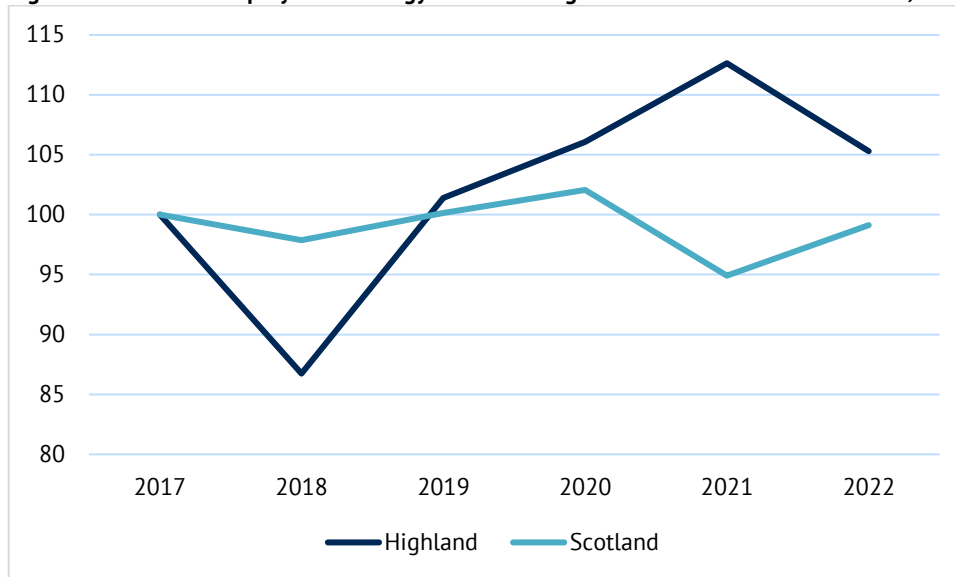
Figure 4.3: Index of employees in energy sector and all sectors, in the Highland Council TTWA, (2017-2022)



Source: Business Register and Employment Survey

4.10 Figure 4.4 shows that the number of energy-related employees in the Highland Council area grew at a greater rate than in Scotland as a whole, with a slight increase of 5% on the base year value in 2017, up to 2022. Over the same period the number of employees in the sector in Scotland remained relatively constant.

Figure 4.4: Index of employees in energy sector the Highland Council area and Scotland, 2017-2022



Source: Source: Business Register and Employment Survey

4.11 Table 4.3 exhibits a breakdown of employment by industry in the Highlands. The Health industry is the largest employer in the Highland Council area (16%), whilst the second largest employer is Accommodation and Food Services (12%), followed by Agriculture, forestry & fishing (11%).

Table 4.3: Employment by broad industrial group in the Highland Council area (2022)

Industry	Highland	Highland %
1 : Agriculture, forestry & fishing (A)	14,000	11%
2 : Mining, quarrying & utilities (B,D and E)	3,500	3%
3 : Manufacturing (C)	6,000	5%
4 : Construction (F)	9,000	7%
5 : Motor trades (Part G)	2,500	2%
6 : Wholesale (Part G)	2,500	2%
7 : Retail (Part G)	12,000	9%
8 : Transport & storage (inc. postal) (H)	5,000	4%
9 : Accommodation & food services (I)	15,000	12%
10 : Information & communication (J)	2,500	2%
11 : Financial & insurance (K)	900	1%
12 : Property (L)	1,500	1%
13 : Professional, scientific & technical (M)	6,000	5%
14 : Business administration & support services (N)	6,000	5%
15 : Public administration & defence (O)	6,000	5%
16 : Education (P)	9,000	7%
17 : Health (Q)	20,000	16%
18 : Arts, entertainment, recreation & other services (R,S,T and U)	6,000	5%
Total	127,400	100%

Source: NOMIS Business Register and Employment Survey 2022

- 4.12 Employment type, in all industries, in the Highland Council area largely follows the national trend.²⁸ Table 4.4 shows some variation between the Highland Council area and Scotland.²⁹ Noticeably, there are a greater proportion of self-employed people in the Highland Council area (15%) than in Scotland as a whole (10%).

Table 4.4: Employment in all industries by type (2022)

	Highland	Scotland
Full-time employment – aged 16-64	75%	75%
Part-time employment – aged 16-64	25%	25%
Employees – aged 16-64	85%	89%
Self-employed – aged 16-64	15%	10%
Non-permanent employment	-	-

Source: NOMIS Annual Population Survey 2022

Pay levels

- 4.13 Energy is a relatively highly paid sector in Scotland but has risen less steeply than in the economy as a whole.³⁰ In 2023, average weekly pay for people working in Energy was £905

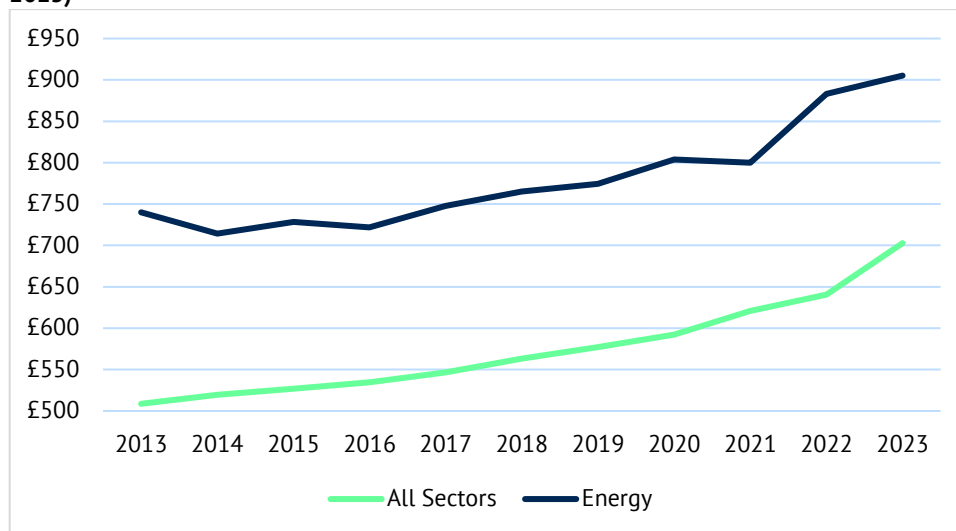
²⁸ The Annual Population Survey does not analyse employment type by industry therefore analysis has been completed for all industries.

²⁹ Figures are missing for non-permanent employment.

³⁰ As defined by the Scottish Government, the Energy (including Renewables) growth sector comprises: Mining of coal and lignite (SIC 05); Extraction of crude petroleum and natural gas (SIC 06); Mining support service activities (SIC 09); Manufacturing of coke and refined petroleum products (SIC 19); Manufacture of other organic based chemicals (SIC 20.14); Electricity, gas, steam and air conditioning supply (SIC 35); Water collection, treatment and supply (SIC 36); Treatment and disposal of hazardous waste (SIC 38.22); Engineering related scientific and technical consulting activities (SIC 71.12/2); and Environmental consulting activities (SIC 74.90/1).

compared to £703 for employees in all sectors.³¹ Figure 4.5 shows that average pay in Energy increased by 22% over the period 2013 to 2023 whereas the corresponding rise for all sectors was higher (at 38%). Attracting and retaining higher value jobs, such as Energy, benefits local and regional economies.

Figure 4.5: Median weekly gross pay for full-time employees in Scotland: all sectors and Energy (2013-2023)



Source: Scottish Government Growth Sector Statistics 2023³²

Sector forecasts

4.14 This section presents employment forecasts for energy sectors, using data from Oxford Economics forecasts produced for SDS. Oxford Economics forecasts and projections are provided on a ‘policy neutral’ basis. Unconfirmed, aspirational or policies at the planning or development stage are not included. The forecasts are built primarily around economic relationships, but make use of local knowledge and published material on local development to augment modelling, as well as forecast population and demographic change in Scotland, amongst a number of other macro-economic factors. Policy considerations around pivoting to ‘green-energy’ will not appear in employment forecasts until policy-driven investments are confirmed. As such, Green Freeport developments are likely not to be included in forecast data until business cases are signed off and investment has commenced.

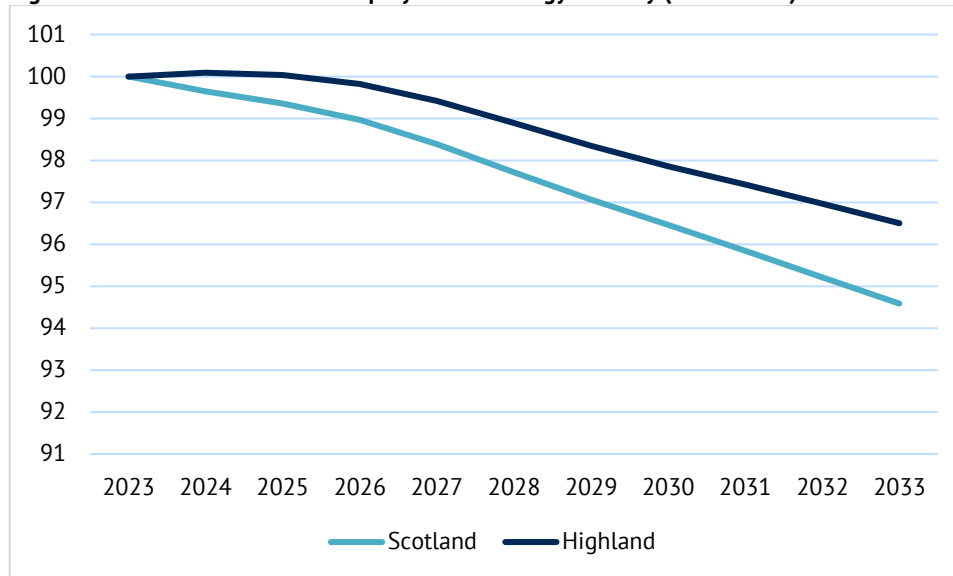
Employment

4.15 Oxford Economics forecasts estimate that total employment in the Energy industry in the Highland Council area and Scotland is forecast to decrease by 3.5% and 5.5% respectively between 2023 to 2033, as shown in Figure 4.6.

³¹ Note that this is a different data set from the salary analysis conducted for all employee jobs in the previous chapter.

³² See data source for notes including that 2023 data is provisional.

Figure 4.6: Forecast index total employment in energy industry (2023-2033)³³



Source: Oxford Economics 2024

- 4.16 Change in employment in the energy sector is typically captured by two measures: expansion demand and replacement demand. Expansion demand is defined as the number of new jobs as a result of growth in the sector. Replacement demand is the number of people who will have to be recruited to replace people who have left the sector for example, through retirement.
- 4.17 Table 4.5 shows that there will be negative expansion demand in the Highlands and Scotland from 2024 to 2033 in the energy industry. This may result from a decrease in Oil and Gas operations.

Table 4.5: Forecast labour demand in energy industry by type and local authority (2024-2033)

	Expansion (2024-33)	Replacement (2024-33)	Total Requirement (2024-33)
Highland	-149	2,015	1,866
Scotland	-5,167	18,409	13,242

Source: Oxford Economics 2024

- 4.18 It should be noted, however, that Oxford Economics forecasts and projections are provided on a ‘policy neutral’ basis. As such, employment that may result from currently unconfirmed ScotWind leasing rounds, from proposed pumped storage hydropower developments, or from potential new onshore wind developments, will not be included in the forecasts.³⁴

GVA

- 4.19 Gross Value Added (GVA) from the Energy industry in the Highlands is forecast to be £550m in 2024, which accounts for 7% of Scotland’s total GVA of £7,825m (Table 4.6).

³³ The data provided by Oxford Economics did not include SIC codes of more than two digits. Therefore, the Scottish Government’s Growth Sector definition for Energy could not be used as outlined in Appendix 1. Consequently, Oxford Economics’ definition of Energy as a key sector has been used for this analysis.

³⁴ See for example: <https://www.climatexchange.org.uk/wp-content/uploads/2024/05/CXC-Skills-requirements-in-Scotlands-onshore-industry-May-2024.pdf>

4.20 GVA is forecast to increase in the Highland Council area and Scotland from 2024 to 2033 by 11%, and 6% respectively. This indicates that the Highland Council area is set to perform better than Scotland across the period in terms of relative value creation.

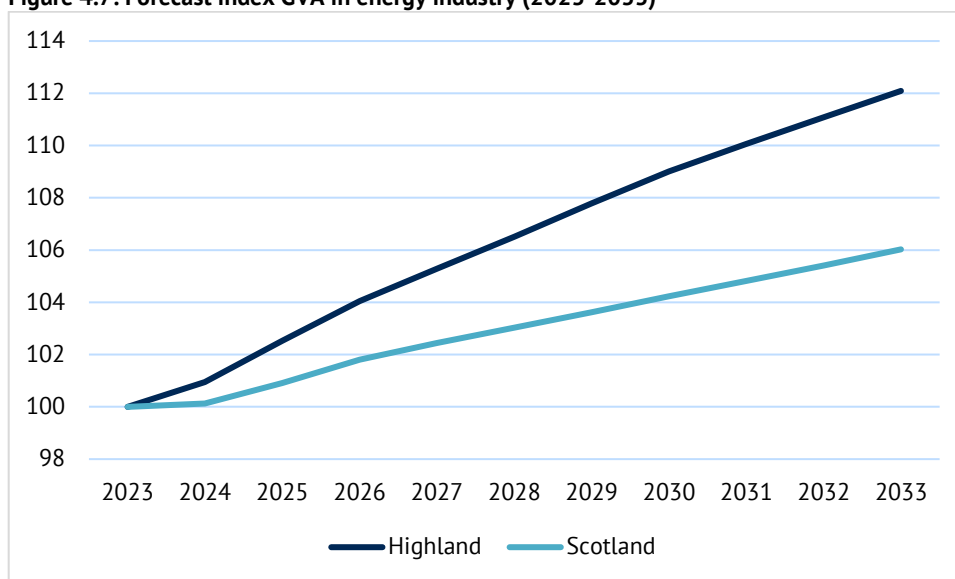
Table 4.6: Forecast GVA in Energy industry – in £m, constant 2019 prices (2023-2033)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Highland	£545	£550	£559	£567	£574	£580	£587	£594	£600	£605	£611
Scotland	£7,815	£7,825	£7,887	£7,956	£8,005	£8,051	£8,098	£8,146	£8,191	£8,238	£8,286

Source: Oxford Economics 2024

4.21 GVA for the Energy sector is forecast to grow significantly between 2023 and 2033. Figure 4.7 shows that GVA is forecast to increase by 12% of the base year (2023) in the Highland Council area over the period. This is higher than the forecast of 6% for Scotland as a whole.

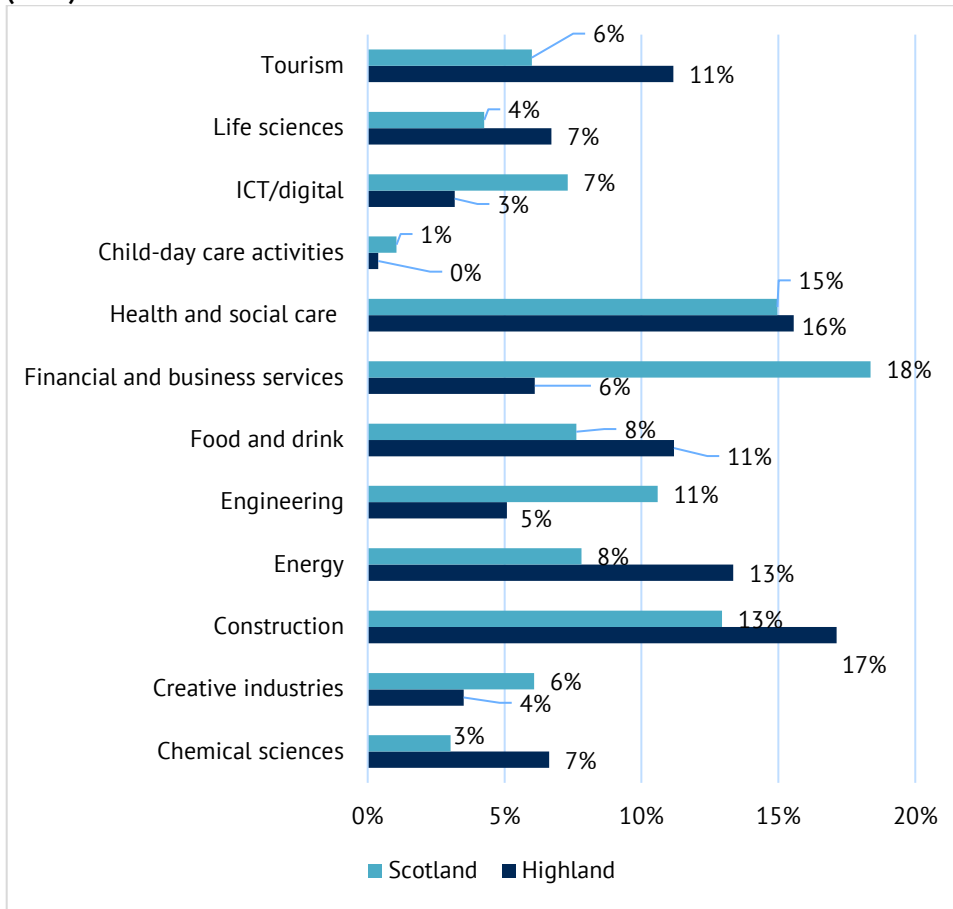
Figure 4.7: Forecast index GVA in energy industry (2023-2033)



Source: Oxford Economics 2024

4.22 The Highland Council area’s forecast GVA is balanced across Construction (17%), Health and Social Care (16%), and Energy (13%) primarily as shown by Figure 4.8.

Figure 4.8: Forecast GVA (as % share of total GVA) by industry in the Highland Council area and Scotland (2033)



Source: Oxford Economics 2024

Low Carbon and Renewable Energy Economy

- 4.23 The Office of National Statistics' UK Environmental Accounts data provides an overview of the business base and employment in the Low Carbon and Renewable Energy Economy (LCREE) for the years 2014 to 2022. It presents information at Scotland level only.³⁵
- 4.24 Table 4.7 highlights the change in the number of businesses across various LCREE groups in Scotland between 2014 and 2022 and overall, there was a 17% increase. There has been an increase in the number of businesses involved in low carbon heat and low carbon electricity (100% and 67% respectively). However, the number of businesses involved in low carbon services and energy efficient products declined by 50% and 11% respectively.

³⁵ Estimate figures are used in this analysis. Upper Carbon Index and Lower Carbon Index figures are also included in the source data.

Table 4.7: LCREE businesses in Scotland, by group, 2014-2022

LCREE Group	2014	2022	% change 2014 - 22
Low carbon electricity	4,500	7,500	67%
Low carbon heat	500	1,000	100%
Energy from waste and biomass	1,000	~	~
Energy efficient products	4,500	4,000	-11%
Low carbon services	2,000	1,000	-50%
Low emission vehicles and infrastructure	~	1,000	~
Total	11,500	13,500	17%

Source: ONS UK Environmental Accounts Data, 2022

- 4.25 Table 4.8 shows that employment levels across LCREE overall increased by 11% between 2014-2022 from 23,200 to 25,700. This was driven by increases in low emission vehicles and infrastructure (267%), low carbon heat (80%), and low carbon electricity (59%).

Table 4.8: LCREE employment in Scotland, by group, 2014-2022

LCREE Group	2014	2022	% change 2014 - 22
Low carbon electricity	6,800	10,800	59%
Low carbon heat	1,000	1,800	80%
Energy from waste and biomass	1,700	1,200	-29%
Energy efficient products	12,100	9,600	-21%
Low carbon services	1,200	1,100	-8%
Low emission vehicles and infrastructure	300	1,100	267%
Total	23,200	25,700	11%

Source: ONS UK Environmental Accounts Data, 2022

- 4.26 Table 4.9 shows that between 2014 and 2022, total turnover of all LCREE groups in Scotland increased by 122%. This is a rise from £5,853,000 in 2014 to £12,992,000 in 2022. The key driver was low carbon electricity which increased by 231%. It is interesting to note that turnover for energy efficient products fell in the period, as did employment (Table 4.8).

Table 4.9: LCREE turnover in Scotland, by group, 2014-2022

LCREE Group	2014	2022	% change 2014 - 22
Low carbon electricity	£3,025,500	£10,009,000	231%
Low carbon heat	£171,500	£419,500	145%
Energy from waste and biomass	£369,500	£447,500	21%
Energy efficient products	£2,143,000	£1,870,500	-13%
Low carbon services	c	£94,000	*
Low emission vehicles and infrastructure	c	£152,000	*
Total	£5,853,000	£12,992,000	122%

Source: ONS UK Environmental Accounts Data, 2022

5 Current and emerging supply of skills

Headline findings



- The profile of students on Energy-relevant courses is different to the total student body at college level, with double the proportion of those studying full time, and just over a third the number of those in distance or flexible learning, when compared to the entire student body



- A greater proportion of college students enrolled on Energy-relevant courses are slightly older than the overall college student cohort (71% versus 45%). However, there are fewer students aged 25+ enrolled on Energy-relevant college courses (22% versus 37%)



- The proportion of Highland domiciled, and total Scottish university students on energy relevant courses has increased since 2016 (+4% and +31+ respectively) while UHI-enrolled university students on Energy-relevant frameworks has fallen by a quarter over the same period



- Almost half of university-level UHI students on Energy-relevant courses are over the age of 25 (49%) compared to less than a third (31%) of those at Scotland level, with Highland-domiciled students closely aligned to the national average



- UHI university graduates on Energy-relevant courses are more likely to be in full time or part time further study, such as a postgraduate degree than Highland-domiciled and Scottish students, who instead are 15% more likely to be in full time employment

Introduction

- 5.1 This chapter offers an overview of the education and training supply in the Highland Council area which is relevant to the energy industry. This considers subjects on offer at college and university level, as well as through foundation, graduate, and modern apprenticeships. This chapter considers data from the SFC, SDS, and HESA.
- 5.2 Modern Apprenticeship starts and college enrolments in energy-related subjects have increased in the three-year period between 2020-2023. Moreover, there has been an increased diversification of college enrolments in terms of age, with more over 20-year-olds now enrolling in energy-relevant courses, and more female enrolments.

Apprenticeship family

Foundation and Graduate Apprenticeships

Foundation apprenticeships

- 5.3 Foundation apprenticeships (FAs) are one or two-year programmes, aimed at providing work-based learning to pupils in the senior phase of secondary school in Scotland (S5 and S6). The FA allows students to work with local employers, offering Higher level learning, and a nationally recognised qualification. This aims to improve the range of skills young people have and increases their employability.

- 5.4 FAs have been running since 2016, and are now nearing the end of their sixth cohort of students, who will graduate in 2024. They have seen increased popularity over the last eight years, boosted by increased flexibility in 2018, when the one-year FA format was introduced. This increased flexibility in FA provision, and the existing framework which allows for delivery around school learning and other commitments, means the FAs are a popular further education avenue for many young people.
- 5.5 Table 5.1 highlights the number of FA starts in energy-relevant frameworks in the Highland Council area between 2019 and 2022 based on trainee address. Civil Engineering and IT: Software Development are the two most popular FA frameworks in 2021-22, both having half of total energy-relevant framework starts from the Highland Council area. Energy-relevant frameworks also comprised over 20% of total frameworks available.

Table 5.1: Foundational Apprenticeship starts in energy-relevant frameworks based on trainee address (2019-2022)

Framework	2019-20	2020-21	2021-22
Civil Engineering	*	4	5
Engineering	-	4	-
IT: Software Development	*	*	5
Total	0	8	10
Total (all sectors)	57	63	47

Skills Development Scotland 2024

** Disclosure control is applied to values less than five (marked with an *) or where such numbers can be identified by differencing*

Graduate Apprenticeships

- 5.6 Graduate apprenticeships (GAs) provide in work education up to Masters level for new and existing employees. Introduced in 2018, GAs have seen increasing popularity due to providing well-structured upskilling opportunities, but also due to the high level of engagement from employers who are increasingly seeing GAs as a successful way of bringing younger staff into their workforce.
- 5.7 Table 5.2 illustrates the number of GA starts in energy-relevant frameworks in the Highland Council area between 2019 and 2022 based on trainee address. The number of GA starts here has also fallen by almost a quarter (24%) between 2019 and 2022.

Table 5.2: Graduate Apprenticeship starts in energy-relevant frameworks based on trainee address (2019-2022)

Framework	2019-20	2020-21	2021-22
Business Management	*	*	5
Civil Engineering Level 10	*	11	5
Civil Engineering Level 8	*	-	-
Construction and the Built Environment	11	9	5
Cyber Security Level 10	8	-	6
Cyber Security Level 11	-	*	*
Data Science	-	-	*
Engineering: Design and Manufacture	*	*	*
Engineering: Instrumentation, Measurement and Control	*	-	*
IT: Management for Business	*	*	-
IT: Software Development	*	*	-
Total	38	37	29

Skills Development Scotland 2024

Modern Apprenticeships

Total Starts

- 5.8 Modern Apprenticeship (MA) data is available from 2020-21 to 2022-23, covering starts based on the trainee's postcode. Table 5.3 shows the uptake in Modern Apprenticeships in the Highland Council area. There has been a significant increase in the number of starts (52%) in the three years between 2020 and 2023.

Table 5.3: Modern Apprenticeship starts in energy-relevant frameworks and all frameworks, the Highland Council area 2020-21 to 2022-23

Year	No.	All Frameworks
2020-21	284	1,454
2021-22	386	1,663
2022-23	432	1,741
% change 2020-2023	52%	20%

Skills Development Scotland, 2024

Starts by framework

- 5.9 Table 5.4 shows the number of MA starts in energy-relevant frameworks in the Highland Council area between 2020 and 2023. Construction: Building has remained the most popular framework over the three years, followed by Electrical Installation. Aquaculture has seen the sharpest increase from <5 starts in 2020-21, to 43 in 2022-23. Conversely, Automotive has seen the sharpest decrease having no starts in the current year, down from 40 in 2021-22.

Table 5.4: Modern Apprenticeship starts in energy-relevant frameworks based on trainee address (2020-2023)

Framework	2020-21	2021-22	2022-23
Construction: Building	56	83	91
Electrical Installation	14	46	55
Engineering	26	28	49
Aquaculture	*	-	43
Construction: Technical	28	40	37
IT and Telecommunications	9	28	34
Construction: Civil Engineering	20	33	30
Digital Applications	*	15	26
Plumbing and Heating	14	20	21
Construction: Professional Apprenticeship	6	7	20
Freight Logistics	29	16	16
Construction: Technical Apprenticeship	20	19	5
Construction: Specialist	9	11	5
Information Security Technical Apprenticeship	8	-	*
Industrial Applications	5	-	*
Water Industry	5	*	*
Automotive	21	40	-
Domestic Plumbing and Heating	14	-	-
Total	284	386	432

Skills Development Scotland, 2024

** Disclosure control is applied to values less than five (marked with an *) or where such numbers can be identified by differencing*

MA Starts by local authority area

5.10 Table 5.5 illustrates the fluctuation in MA starts for energy-relevant frameworks in the Highland Council area.

Table 5.5: Modern Apprenticeship starts on relevant frameworks by area, the Highland Council area, 2020-21 to 2022-23

MA Starts	2020-21	2021-22	2022-23	% change, 2020-21 to 2022-23
Highland	498	567	604	21.3%

Skills Development Scotland, 2024

College campuses

5.11 Table 5.6 shows the four UHI College campuses which are located across the Highland Council area, as well as Moray, which is in close proximity to the development site. It should be noted that West Highland College and North Highland College have recently merged with UHI partners

in the Outer Hebrides to form UHI North, West and Hebrides, therefore North, and West Highland Colleges are now part of one institution spread across 19 campuses.³⁶

Table 5.6: Colleges in scope for analysis

Colleges
UHI Inverness
North Highland College
West Highland College
UHI Moray

Further Education provision in subjects of relevance to Loch na Cathrach

5.12 Table 5.7 illustrates the total number of enrolments in energy-relevant courses in the Highland Council area and Scotland over a three-year period between 2019 and 2022. The total number of enrolments on energy-relevant subjects has increased by roughly 7% over the period. The proportion of national energy-relevant enrolments that this comprises has increased by a very modest amount (0.1%). The Highland Council area experienced a slight decrease in energy-relevant enrolments during 2020-21, whereas the number increased nationally, however, the portion of this which comprised of the total Further Education enrolments in the Highland Council area increased in 2021-22. In 2021-22, energy-relevant enrolments accounted for approximately one-in-four Further Education enrolments at Highland college campuses.

Table 5.7: College enrolments on Energy-relevant courses, 2019-2020 to 2021-2022³⁷

	2019-20	2020-21	2021-22
Highland – Energy-relevant enrolments	3,090	3,080	3,300
Scotland – Energy-relevant enrolments	87,355	91,690	90,425
Highland share of Scotland Energy-relevant enrolments	3.5%	3.4%	3.6%
Highland: Energy-relevant enrolments share of total Highland enrolments	23.3%	27.7%	24.2%

Source: SFC 2024

Provision by Highland sub-region

5.13 Table 5.8 shows the number of students studying energy-relevant subjects at each college campus in the Highland Council area, and the proportion which this comprises of the total student body at each college campus. The range of subjects which can be studied at each college campus is a factor here; for example, UHI Inverness has significantly more variety in the courses available, offering more energy-relevant frameworks.³⁸ West Highland College, based in Fort William, for example, only offers two construction courses, and the highest level which can be studied, in these courses, is SCQF Level 5.

5.14 UHI Inverness has the largest number of Further Education students studying energy-relevant subjects with 1,725 enrolments, which comprises over a third (39%) of the entire student body. Just over a quarter (26%) of UHI Moray students are studying energy-relevant Further Education subjects. Conversely, fewer than one in ten (8%) West Highland College students are studying

³⁶ <https://www.cdn.ac.uk/colleges/highlands-and-islands/uhi-north-west-hebrides/>

³⁷ Numbers are all rounded to the nearest 5 to protect anonymity, where number is greater than zero and less than 5, the number is rounded to 5

³⁸ <https://siuk-europe.s3.amazonaws.com/assets/prospectus/undergraduate/highlands-and-islands-undergraduate-2019.pdf>

energy-relevant subjects. There is a smaller proportion of Further Education students in the Highland Council area who are studying energy-relevant subjects than the Scottish average (with only 24% of the student body, compared to 28% in Scotland).

Table 5.8: Further Education enrolments in Energy-relevant subjects by institution, 2019-2020 to 2021-2022

Institution	2019-20	2020-21	2021-22	% share of all enrolments (2021-22)
UHI Inverness	1,470	1,470	1,725	38.5%
UHI Moray	875	970	1,010	25.5%
North Highland College	550	450	320	16.6%
West Highland College	195	190	245	7.5%
Highland total	3,090	3,080	3,300	24.2%
Scotland total	87,355	91,690	90,425	28.1%

Source: SFC 2024

- 5.15 In the period between 2019 and 2022, three of the Highland Council area's college campuses saw an increase in the proportion of their energy-relevant Further Education enrolments compared to the national total, with only North Highland College seeing a decrease, as highlighted in Table 5.9. UHI Inverness contributes the largest number to the Scottish total in real terms (1,725), and also saw the largest increase in proportion. Overall, the total Highland share of energy-relevant enrolments to the Scottish total increased over this period by 0.1 percentage point.

Table 5.9: Share of national Energy-relevant Further Education enrolments by institution and Scotland, 2019-2020 to 2021-2022

Institution	Share of Energy-relevant enrolments in Scotland		Percentage point change in number of enrolments, 2019-2022
	2019-20	2021-22	
UHI Inverness	1.7%	1.9%	0.2%
UHI Moray	1.0%	1.1%	0.1%
North Highland College	0.6%	0.4%	-0.2%
West Highland College	0.2%	0.3%	0.1%
Highland total	3.5%	3.6%	0.1%
Scotland total	100.0%	100.0%	0.0%

Source: SFC 2024

Full time / part time split

- 5.16 Table 5.10 shows the split of Further Education students in the Highland Council area who study part-time, full-time, who study flexibly or by distance learning, or who study by some other means, such as through work-based learning (WBL). As shown, just under a quarter of total students study full-time (22%), with the majority studying part-time (58%). However, the proportion of full-time students who study energy-relevant subjects is much higher: 44% study relevant subjects full-time, and 45% study part-time.
- 5.17 There are also substantially fewer Further Education students of energy-relevant subjects who study flexibly or at a distance (six percentage points), than for the total student body (16 percentage points), with slightly more (one percentage point) who participate in WBL or an

alternative type of study. This suggests that traditional learning formats are more prevalent for energy-relevant subjects at Further Education level.

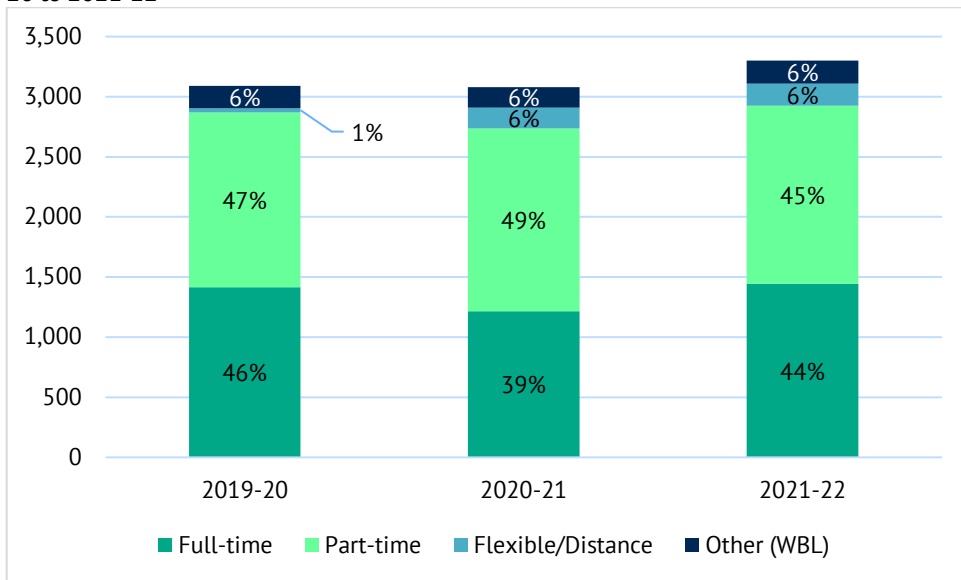
Table 5.10: Further Education enrolments in Energy-relevant subjects by mode of attendance, Highland Council area, 2019-20

Mode	No. Energy-relevant (Highland)			% of Energy-relevant, 2021-22 (Highland)	% of total enrolments 2021-22 (Highland)
	2019-20	2020-21	2021-22		
Part-time	1,455	1,520	1,480	44.9%	57.8%
Full-time	1,415	1,215	1,445	43.8%	22.1%
Flexible/Distance	35	175	185	5.6%	15.5%
Other (WBL)	185	170	190	5.7%	4.6%
Total (Highland)	3,090	3,080	3,300	100%	100%

Source: SFC 2024

5.18 Figure 5.1 offers a breakdown of Further Education enrolments for energy-relevant subjects, and their study method, over the three-year period between 2019 and 2022. In absolute terms, the numbers of enrolments on full-time and part-time energy-relevant courses has increased, however the proportions by which each comprise of total enrolments have fallen by two percentage points in both instances. Conversely, flexible, or distance learning has seen an increase of five percentage points in the three-year period, with the UHI offering a small group of engineering courses through online learning.

Figure 5.1: Further Education enrolments in Energy-relevant subjects by mode, Highland Council area, 2019-20 to 2021-22



Source: SFC 2024

Enrolments by subject

5.19 Table 5.11 shows the number of Further Education enrolments in the Highland Council area by superclass, the proportion which this comprises of total enrolments for energy-relevant subjects, and any change in the three-year period between 2019 and 2022. Construction and Property is the most popular energy-relevant subject with almost half of the enrolments (47%), rising in

popularity by almost a third (31%) since 2019. Engineering is the next most popular subject with around a third of total energy-relevant enrolments (34%) remaining stable since 2019.

- 5.20 Transport Services and Environment Protection, Energy, Cleansing, Security are two of the less popular superclasses, comprising just over 2% together, and have also seen the greatest decreases in enrolments over the period. For example, Transport Services has seen enrolment decrease by over a quarter (27%), with enrolments in Environment Protection, Energy, Cleansing, Security decreasing by three quarters. The overall number of enrolments into energy-relevant courses in the Highland Council area, has increased by seven percentage points between 2019 and 2022.

Table 5.11: Further Education enrolments in Energy-relevant subjects by superclass, Highland Council area, 2021-22

Superclass	No.	%	% change, 2019-20 to 2021-22
Construction and Property (Built Environment)	1,560	47.2%	31.6%
Engineering	1,130	34.3%	0.0%
Sciences and Mathematics	300	9.1%	-10.4%
Politics, Economics, Law, Social Sciences	240	7.3%	-2.0%
Transport Services	55	1.7%	-26.7%
Environment Protection, Energy, Cleansing, Security	15	0.4%	-75.0%
Services to Industry	0	0%	0%
Oil, Mining, Plastics, Chemicals	0	0%	0%
Total (Highland)	3,300	100%	6.8%

Source: SFC 2024

Profile of learners

- 5.21 Table 5.12 offers a breakdown of Further Education enrolments into energy-relevant subjects, and total enrolments in the Highland Council area by age. As illustrated, there is a much higher portion of those aged 16-24 in energy-relevant subjects. This cohort comprises 71% of energy-relevant enrolments, compared to less than half (45%) of total enrolments across Highland colleges. Enrolments by students under 16 and aged 25 and over are much less common in energy-relevant subjects, making up only 30% of enrolments, compared to 55% of enrolments in the total student body.

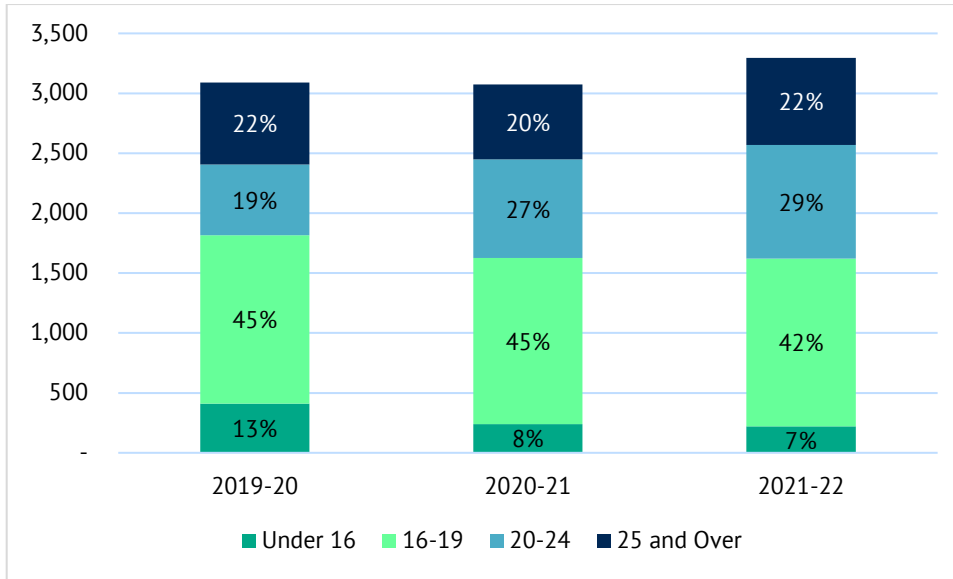
Table 5.12: Further Education enrolments in Energy-relevant subjects by age, Highland Council area, 2021-22

Age group	No. Energy-relevant enrolments (Highland)	% Energy-relevant enrolments (Highland)	% total enrolments (Highland)
Under 16	220	6.7%	17%
16-19	1,400	42.5%	30.3%
20-24	950	28.8%	15.1%
25 and Over	725	22%	37.6%
Total (Highland)	3,300	100%	100%

Source: SFC 2024

5.22 The age profile of energy-relevant enrolments at Further Education level has increased over the three-year period between 2019 and 2022, as shown in Figure 5.2. In the academic year 2019-20 the majority of enrolments (58%) were aged 19 or younger. However, the slight majority in the academic year 2021-22 (51%) were aged 20, an increase of ten percentage points on 2019-20. The age group 20-24 has seen the largest increase, with enrolments growing by 62% in the three years, now comprising almost a third (29%) of total enrolments to energy-relevant courses. This might indicate an increase in the number of people reskilling to energy-relevant professions instead of going into college straight from school.

Figure 5.2: Further Education enrolments in Energy-relevant subjects by age, Highland, 2019-2020 to 2021-2022



Source: SFC 2024

5.23 Males are typically more highly represented on energy-relevant Further Education courses in the Highland Council area. Overall, males comprised 84% of energy-relevant enrolments in 2021-22, compared to 51% of total enrolments when considering all courses, as Table 5.13 shows.

Table 5.13: Further Education enrolments in Energy-relevant subjects by gender, Highland Council area, 2021-22

Gender	No. Energy-relevant enrolments (Highland)	% Energy-relevant enrolments (Highland)	% total enrolments (Highland)
Male	2,770	84%	50.5%
Female	515	15.6%	48.7%
Other	5	0.2%	0.5%
Prefer not to say	5	0.2%	0.3%
Total (Highland)	3,300	100%	100%

Source: SFC 2024

5.24 Table 5.14 provides a breakdown of Further Education enrolments on energy-relevant subjects by ethnicity. White students are more highly represented in energy-relevant subjects compared to the overall student body, with 92% of students enrolled on energy-relevant courses compared to 89% of the wider student body. This is also a higher proportion than national level. For Scotland as a whole, white students comprised 83% of those enrolled in energy-relevant subjects.

Table 5.14: Further Education enrolments in Energy-relevant subjects by ethnicity, Highland Council area, 2021-22

Ethnicity	No. Energy-relevant enrolments (Highland)	% Energy-relevant enrolments (Highland)	% total enrolments (Highland)	% Energy-relevant enrolments (Scotland)
White	3,025	91.7%	89.2%	83.3%
Indian	5	0.2%	0.2%	0.7%
Pakistani	0	0%	0.1%	0.7%
Bangladeshi	5	0.2%	0.1%	0%
Chinese	5	0%	0.2%	0.1%
Black,* Scottish or Black British	10	0.3%	0.3%	0.9%
Arab, Arab Scottish or Arab British	5	0.2%	0.2%	0.3%
Other	25	0.8%	1.2%	1%
Information refused/not known	220	6.6%	8.5%	12.5%
Total (Highland)	3,300	100%	100%	100%

Source: SFC 2024

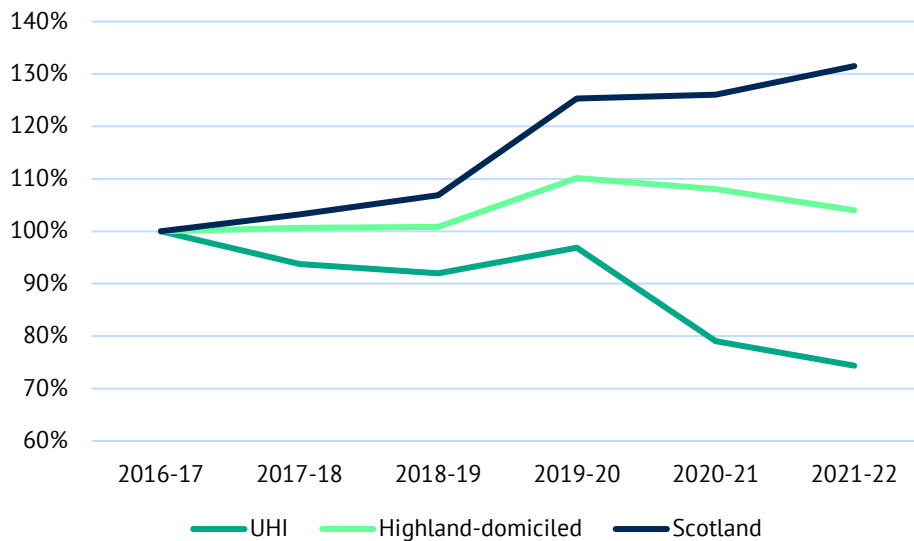
*Including Black African and Black Caribbean

Higher Education

Overall university provision

5.25 Figure 5.3 shows the percentage of Full Person Equivalent (FPEs) in Higher Education subjects with the potential to have benefits for the energy sector, and how this has changed since 2016-17. The number of students in 2016-17 is taken as a baseline and each following year is proportionate to that. The number of FPEs in energy-relevant subjects in Scotland has increased year upon year since 2016-17, and is now a third higher than the baseline. Proportionately, the number of Highland domiciled students has not risen nearly as much, with an increase of around 10% in 2019-20, falling to 4% in the most recent year. Conversely, the total FPE for UHI has decreased by over a quarter in the same period. UHI FPE decreasing while Highland domiciled FPE increase indicates fewer potential Higher Education students opting to study energy-relevant subjects at UHI, and instead going to universities elsewhere in Scotland or the UK.

Figure 5.3: Higher Education FPEs in Energy-relevant subjects, 2016-17 to 2021-22



Source: HESA 2024

5.26 Table 5.15 highlights the total of UHI, Highland domiciled, and Scotland FPE in energy-relevant Higher Education subjects since 2015-16.

Table 5.15: Higher Education FPEs in Energy-relevant subjects, 2015-16 to 2021-22

	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
UHI	2,405	2,555	2,395	2,350	2,475	2,020	1,900
Highland-domiciled	2,255	2,365	2,380	2,385	2,605	2,555	2,460
Scotland	79,830	81,865	84,485	87,485	102,615	103,170	107,655

Source: HESA 2024

Provision by subject

5.27 Table 5.16 offers a breakdown of all FPE enrolled in energy-relevant Higher Education subjects at UHI, and who are Highland domiciled. According to official statistics, the vast majority of students at UHI studying energy-relevant subjects appear to be studying one of five energy-relevant subjects despite the university offering nine; the data do not appear to show any students studying Geographical and Environmental Studies, Physical Sciences, or Mathematics Sciences, and only a small number (5) studying Law. However, there are Geography and Physical Sciences courses offered at UHI³⁹, and as highlighted in the footnote to Table 5.16, the HESA data may reflect how such courses have been coded for HESA purposes.

5.28 Energy and Technology is the most popular Higher Education subject for both UHI FPE and Highland domiciled FPE. At UHI the other most popular subjects are Social Sciences (26%), and Computing (24%) with around a quarter of total UHI FPE each. Highland domiciled students are studying a broader range of subjects than UHI students. For example, Physical Sciences, Law, and Mathematical Sciences comprise roughly a fifth (18%) of Highland domiciled FPEs, where there only a small number of FPEs at UHI for Law, and none for the other subjects. This reflects the nature of UHI, and other universities in terms of potential specialisms, and corresponding subject offerings.

³⁹ <https://www.uhi.ac.uk/en/prospectus/>

Table 5.16: Higher Education FPEs in Energy-relevant subjects by subject, UHI and Highland-domiciled, 2021-22

Subject ⁴⁰	UHI			Highland Domiciled		
	No.	% total	% Scotland	No.	% total	% Scotland
Engineering & technology	570	30%	3%	685	28%	3%
Social sciences	495	26%	3%	370	15%	2%
Computing	460	24%	3%	385	16%	2%
Architecture, building & planning	160	8%	2%	220	9%	3%
Geographical & environmental studies ⁴¹	0	0%	0%	0	0%	0%
Psychology	215	11%	2%	360	15%	3%
Physical sciences	0	0%	0%	120	5%	1%
Law	5	0%	0%	215	9%	2%
Mathematical sciences	0	0%	0%	100	4%	2%
Total	1,900	100%	2%	2,460	100%	2%

Source: HESA 2024. Data for 'UHI' is all FPEs studying at UHI in energy-relevant subjects regardless of student domicile; data for 'Highland Domiciled' is all FPEs within the Highland Council area regardless of institution of study.

Full-time/part-time split

5.29 Table 5.17 highlights the full-time/part-time split of Higher Education students at the UHI, and in wider Scotland. As shown, there is a significantly higher (83%) proportion of full-time students in the total Scottish student population than at the UHI (60%), where there is a more even split amongst full-time and part-time students. This may be due to the fact that the UHI offers the vast majority of its courses to be taken full-time or part-time.

Table 5.17: Higher Education FPEs in Energy-relevant subjects by mode, UHI and Scotland, 2021-22

Mode	UHI		Scotland	
	No.	%	No.	%
Full Time	1,140	60%	89,175	83%
Part Time	760	40%	18,480	17%
Total	1,900	100%	107,655	100%

Source: HESA 2024

Provision by level

5.30 Regarding the Higher Education level of study of students in energy-relevant subjects at the UHI and in Scotland, the majority of FPEs at UHI are in other undergraduate courses (56%) compared to only a very small proportion of those in Scotland in general (3%). In contrast, almost double the proportion of Scottish students are studying their first degree than those at the UHI (66% and 35% respectively). The UHI offers a very broad range of study types including flexible study, which may result in a larger portion of students leaving before their honours year or taking a break in studying for example.

⁴⁰ Data analysed at HECoS Common Aggregation Hierarchy (CAH) Level 2

⁴¹ The zero figures here may be influenced by how such courses are coded for HESA data purposes, and may be recorded under other categories, e.g. Social or Physical Sciences

- 5.31 There are also a greater proportion of Scottish students studying postgraduate degrees (31%) compared to those at the UHI (9%). This may be due to the UHI offering a smaller range of postgraduate study than other universities in Scotland. As the institution operates as a university which also provides college level courses, there may be more of a focus on further education and undergraduate courses instead of postgraduate education. Although potentially supporting more routes into education for a broader range of people in this way, the potential lack of provision of postgraduate education may be another factor causing fewer Highland domiciled, and fewer students in general, to study at the UHI.

Table 5.18: Higher Education FPEs in Energy-relevant subjects by level, UHI and Scotland, 2021-22

Level	UHI		Scotland	
	No.	%	No.	%
First degree	670	35%	70,695	66%
Further education	0	0%	245	0%
Other undergraduate	1,060	56%	3,500	3%
Postgraduate (taught)	170	9%	27,060	25%
Postgraduate (research)	0	0%	6,160	6%
Total	1,900	100%	107,655	100%

Source: HESA 2024

Provision by institution

- 5.32 Table 5.19 gives a breakdown of FPE enrolments in energy-relevant subjects at Higher Education level across all Scottish universities for Highland domiciled, and Scotland domiciled students. The UHI has the highest level of enrolment for Highland domiciled students (27%), likely due to its location and ease of access to Highland domiciled residents. Similarly, the Open University is the second most popular institution amongst Highland domiciled students, likely as this is much more accessible financially, and in terms of study type, than other universities in the country.
- 5.33 For the total Scottish student population, the University of Edinburgh and the University of Glasgow had the highest shares of FPEs in energy-relevant subjects (17% and 15% respectively) likely due to these being by far the largest universities in Scotland. Almost one in ten highland domiciled students (9%) are studying at the University of Strathclyde, due to this university having a large enrolment also.

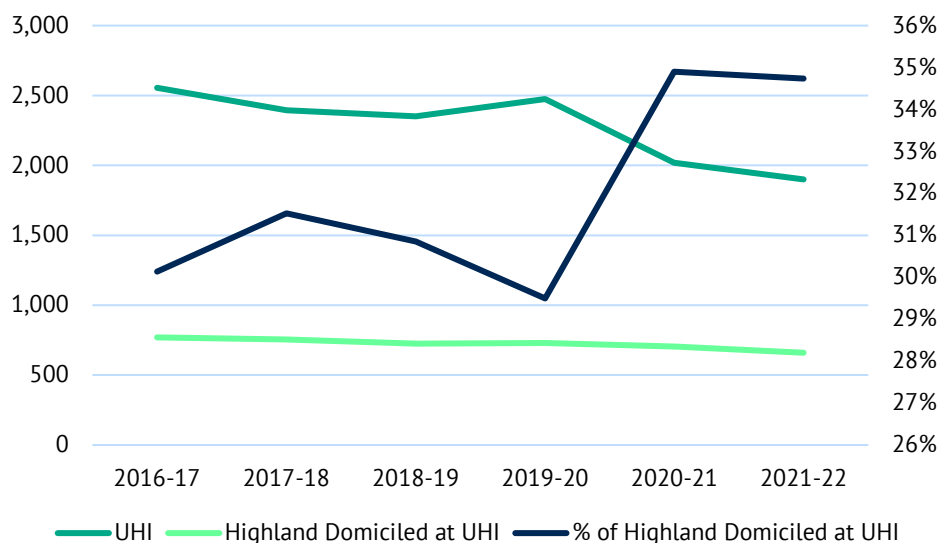
Table 5.19: Higher Education FPEs in Energy-relevant subjects by institution, Highland-domiciled and Scotland, 2021-22

Institution	Highland Domiciled		Scotland	
	No.	%	No.	%
University of Aberdeen	160	6%	6,040	6%
University of Abertay Dundee	60	2%	2,175	2%
University of Dundee	50	2%	4,370	4%
Edinburgh Napier University	145	6%	5,420	5%
University of Edinburgh	140	6%	18,715	17%
Glasgow Caledonian University	60	2%	6,045	6%
Glasgow School of Art	5	0%	635	1%
University of Glasgow	155	6%	15,940	15%
Heriot-Watt University	150	6%	6,500	6%
University of Highlands and Islands	660	27%	1,900	2%
Open University in Scotland	405	16%	8,905	8%
Queen Margaret University, Edinburgh	15	1%	510	0%
Robert Gordon University	125	5%	3,640	3%
Scottish Agricultural College	0	0%	0	0%
University of St Andrews	45	2%	5,165	5%
University of Stirling	55	2%	4,345	4%
University of Strathclyde	210	9%	13,045	12%
University of West of Scotland	20	1%	4,300	4%
Total	2,460	100%	107,655	100%

Source: HESA 2024

- 5.34 Highland-domiciled Higher Education students are more likely to be enrolled at the UHI than other Scottish students. While the proportion of Highland domiciled UHI students had decreased steadily between 2017-18 and 2019-20, a recent increase, has seen these students comprise over a third of the UHI student body for the previous two years of analysis, as shown in Figure 5.4. The total number of FPEs enrolled at UHI has decreased by over a fifth since 2016-17 (-21 percentage points) meanwhile, Highland domiciled UHI enrolments have also decreased to a lesser extent (-14 percentage points) over the same period. Due to this, the proportion of Highland domiciled students at the UHI has increased by five percentage points.

Figure 5.4: UHI and Highland Domiciled FPEs in Energy-relevant Higher Education subjects, 2016-17 to 2021-22



Source: HESA 2024

Profile of learners

5.35 UHI enrolments at Higher Education level are on average older than the national average, with almost half (49%) of students being over 25 years old, compared to only 31% of those in Scotland as a whole, as illustrated in Table 5.20. Highland domiciled students are generally closer to the national average, with slightly more Highland domiciled enrolments aged 16-20 comprising 39% of the student body compared to 35% in Scotland, Highland domiciled enrolments over 30 comprising 23% compared to 17% in Scotland. As discussed UHI has a larger proportion of part time students, and those studying other undergraduate degrees, both of which could potentially appeal more to older students who are working part, or full time through the duration of the course. Therefore, this may explain the older average age of students at the UHI.

Table 5.20: Higher Education FPEs in Energy-relevant subjects by age, UHI, Highland-domiciled, and Scotland, 2021-22

Age group	UHI		Highland Domiciled		Scotland	
	No.	%	No.	%	No.	%
15 and under	0	0%	0	0%	45	0%
16-20	580	30%	965	39%	38,065	35%
21-24	375	20%	660	27%	35,930	33%
25-29	275	14%	255	10%	15,185	14%
30 and over	675	35%	575	23%	18,430	17%
Total	1,900	100%	2,460	100%	107,655	100%

Source: HESA 2024

5.36 Table 5.21 breaks down the total FPE enrolments for energy-relevant subjects at Higher Education level at the UHI, in Scotland, and of Highland domiciled students in terms of gender. As illustrated, there is a slightly larger number of male students compared to female students at the national level (54% to 46%). In Highland domiciled students, this gap is larger with 56% male students compared to 43% female, and this is larger still at UHI with 57% male students compared to 42% female. Most energy-relevant subjects sit within the STEM framework of

subjects which have historically been dominated by male students,⁴² likely explaining the overrepresentation of male students at all levels.

Table 5.21: Higher Education FPEs in Energy-relevant subjects by gender, UHI, Highland-domiciled, and Scotland, 2021-22

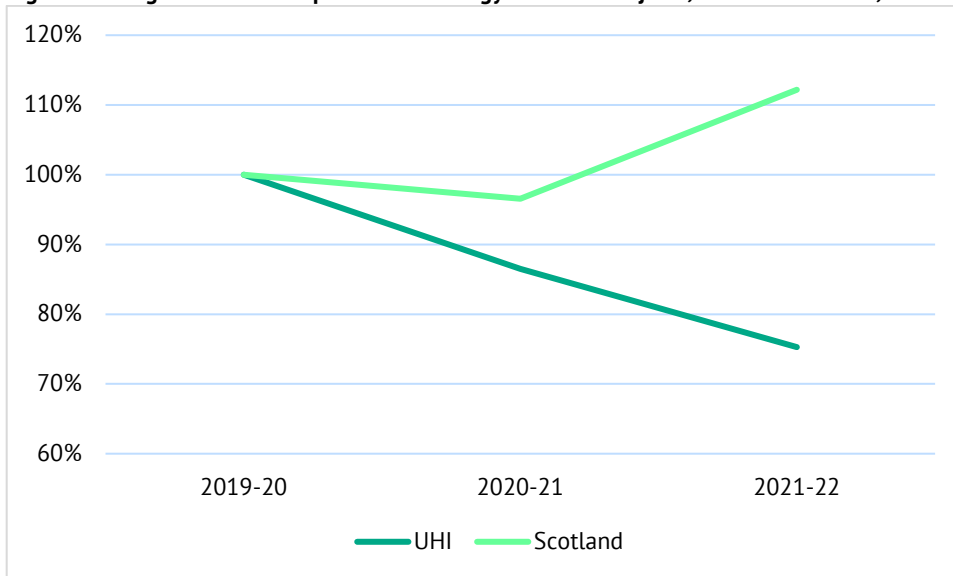
Gender	UHI		Highland Domiciled		Scotland	
	No.	%	No.	%	No.	%
Female	810	42%	1,060	43%	48,990	46%
Male	1,085	57%	1,385	56%	58,275	54%
Other	10	1%	10	0%	390	0%
Total	1,900	100%	2,460	100%	107,655	100%

Source: HESA 2024

Graduate profile

5.37 Figure 5.5 illustrates the change in Higher Education qualifiers in energy-relevant subjects between 2019-20 and 2021-22 for Scotland and the UHI, with the total in 2019-20 taken as 100%, and each subsequent year proportionate to this. Scottish qualifiers have increased (+12%) in the most recent year of analysis despite a small decrease in 2020-21, while UHI qualifiers have decreased both years and are now a quarter lower than 2019-20 levels. The 2020-21 decrease is likely an impact of COVID-19, however, in the following year Scottish qualifiers have bounced back from this, whereas UHI qualifiers have continued to decline. As discussed, it is likely that UHI have been offering a smaller prospectus following the pandemic, therefore, it is possible that more students are opting for different universities as these are offering a greater range of subjects.

Figure 5.5: Higher Education qualifiers in Energy-relevant subjects, UHI and Scotland, 2019-20 to 2021-22



Source: HESA 2024

5.38 Table 5.22 shows Higher Education qualifiers in energy-relevant subjects for UHI and Scotland by level. Again, the vast majority of UHI qualifiers (68%) are other undergraduate whereas almost

⁴² <https://www.gov.scot/policies/science-and-research/women-stem/>

half of Scottish qualifiers (46%) are first degrees. There are also significantly more postgraduate qualifiers in the Scottish cohort (41%) than at UHI (4%).

Table 5.22: Higher Education qualifiers in Energy-relevant subjects by level, UHI and Scotland, 2021-22

	UHI		Scotland	
	No.	%	No.	%
First degree	180	27%	17,515	46%
Other undergraduate	460	68%	3,745	10%
Postgraduate (taught)	30	4%	15,590	41%
Postgraduate (research)	0	0%	1,430	4%
Total	670	100%	38,275	100%

Source: HESA 2024

- 5.39 On average, UHI Higher Education qualifiers are older than Highland domiciled and Scottish qualifiers, with almost half (46%) aged over 25, compared to a third (34%) of Highland domiciled and a third of Scottish qualifiers (36%). However, UHI qualifiers also have the largest percentage of those aged 16-20 (30%).

Table 5.23: Higher Education qualifiers in Energy-relevant subjects by age, UHI, Highland-domiciled, and Scotland, 2021-22

Age group	UHI		Highland domiciled		Scotland	
	No.	%	No.	%	No.	%
15 and under	0	0%	0	0%	25	0%
16-20	205	30%	145	20%	4,220	11%
21-24	160	24%	345	47%	20,455	53%
25-29	95	14%	100	14%	6,835	18%
30 and over	210	32%	150	20%	6,735	18%
Total	670	100%	740	100%	38,275	100%

Source: HESA 2024

- 5.40 As illustrated in Table 5.24, at the Scottish level, there are a slightly greater share of male Scottish Higher Education qualifiers (52%) than female (48%) in energy-relevant subjects, equating to a difference of 4 percentage points. This differential is more pronounced for Highland domiciled qualifiers (8 percentage points) and even more pronounced for UHI qualifiers (24 percentage points of difference between male and female qualifiers).

Table 5.24: Higher Education qualifiers in Energy-relevant subjects by gender, UHI, Highland-domiciled, and Scotland, 2021-22

Gender	UHI		Highland Domiciled		Scotland	
	No.	%	No.	%	No.	%
Female	255	38%	340	46%	18,220	48%
Male	415	62%	400	54%	19,770	52%
Other	5	0%	0	0%	285	1%
Total	670	100%	740	100%	38,275	100%

Source: HESA 2024

Graduate destinations

5.41 Table 5.25 details the destinations of all Highland domiciled Higher Education graduates, those from the UHI, and the Scottish total. The number of students unemployed or other such as travel or retirement is consistent across all three cohorts, with slightly greater share of the Scottish total (2 percentage points greater) unemployed compared to those from UHI, or Highland domiciled students. The proportion of Higher Education graduates in full time employment is similar across Highland domiciled (62%) and total Scotland graduates (63%), however, the percentage is lower for UHI graduates (47%). Conversely, UHI graduates are more likely to be in either full time or part time further study of some kind (30%) than Highland domiciled (22%) and total Scotland students (19%).

Table 5.25: Destination of Higher Education graduates in Energy-relevant subjects, UHI and Scotland, 2020-21

Destination	UHI		Highland Domiciled		Scotland	
	No.	%	No.	%	No.	%
Full-time employment	180	47%	240	62%	8,060	63%
Employment and further study	75	20%	60	16%	1,290	10%
Full-time further study	35	10%	25	6%	1,175	9%
Part-time employment	50	13%	30	8%	955	7%
Other including travel, caring for someone or retired	20	5%	20	5%	540	4%
Unemployment	15	3%	10	3%	620	5%
Unemployed and due to start further study	0	0%	0	0%	0	0%
Part-time further study	0	0%	0	0%	55	<1%
Unemployed and due to start work	0	0%	0	0%	0	0%
Unknown pattern of employment	0	0%	0	0%	55	<1%
Unknown pattern of further study	0	0%	0	0%	5	<1%
Voluntary or unpaid work	0	0%	0	0%	120	1%
Total	380	100%	385	100%	12,875	100%

Source: HESA 2024

5.42 The most common sector destination for both Highland domiciled and Scotland Higher Education graduates is Professional, scientific, and technical activities (16% and 17% respectively, which contrasts with 7% for UHI graduates). Manufacturing (9%) and Human health and social work (7%) were the next most common destinations for Highland domiciled, while Information and communication (8%) and Education (7%) the next most common with Scotland graduates. There is not a prominent destination sector for UHI graduates; the most popular destinations were Wholesale and retail (9%) and Manufacturing (9%), followed by Education. At 7%, Public administration was on par with the share going into Professional, scientific and technical activities.

Table 5.26: Destination of Higher Education graduates in Energy-relevant subjects by industry, UHI, Highland-domiciled, and Scotland, 2021-22

Industry	UHI		Highland Domiciled		Scotland	
	No.	%	No.	%	No.	%
Wholesale and retail trade; repair of motor vehicles and motorcycles	35	9%	20	6%	565	4%
Construction	20	5%	25	6%	405	3%
Human health and social work activities	25	6%	30	7%	825	6%
Accommodation and food service activities	20	5%	20	5%	365	3%
Public administration and defence; compulsory social security	25	7%	20	6%	805	6%
Manufacturing	35	9%	35	9%	755	6%
Professional, scientific and technical activities	25	7%	60	16%	2,130	17%
Water supply, sewerage, waste management and remediation activities	10	2%	15	4%	55	0%
Arts, entertainment and recreation	5	1%	5	2%	140	1%
Mining and quarrying	0	0%	5	1%	185	1%
Transport and storage	5	2%	5	1%	105	1%
Education	30	8%	20	5%	855	7%
Electricity, gas, steam and air conditioning supply	15	4%	10	3%	150	1%
Information and communication	10	3%	15	4%	995	8%
Activities of extraterritorial organisations and bodies	0	0%	0	0%	30	0%
Activities of households as employers; undifferentiated goods- and services-producing activities of	0	0%	0	0%	5	0%
Administrative and support service activities	5	1%	0	0%	240	2%
Agriculture, forestry and fishing	0	0%	5	1%	15	0%
Financial and insurance activities	5	2%	5	1%	620	5%
Other service activities	0	0%	0	0%	115	1%
Real estate activities	0	0%	5	1%	100	1%
Not applicable	85	22%	65	17%	2,740	21%
Not known	20	5%	15	4%	675	5%
Total	380	100%	385	100%	12,875	100%

Source: HESA 2024

5.43 Table 5.27 illustrates the destination occupations of UHI, Highland domiciled, and Scottish Higher Education graduates. As shown, Highland domiciled (39%) and Scottish graduates (44%) are more likely to be in Professional occupations than UHI graduates (22%). Conversely, UHI graduates are slightly more likely to be in skilled trades and non-professional roles such as sales and customer service.

Table 5.27: Destination of Higher Education graduates in Energy-relevant subjects by occupation, UHI, Highland-domiciled, and Scotland, 2021-22

Occupation	UHI		Highland Domiciled		Scotland	
	No.	%	No.	%	No.	%
Associate professional and technical occupations	60	16%	60	16%	1,815	14%
Professional occupations	85	22%	150	39%	5,640	44%
Skilled trades occupations	40	10%	25	7%	165	1%
Sales and customer service occupations	20	6%	10	3%	380	3%
Caring, leisure and other service occupations	20	6%	10	3%	350	3%
Elementary occupations	25	6%	15	4%	385	3%
Administrative and secretarial occupations	10	3%	10	3%	525	4%
Managers, directors and senior officials	15	4%	15	4%	345	3%
Process, plant and machine operatives	10	3%	5	2%	70	1%
Not known/Not applicable	95	25%	70	19%	3,195	25%
Total	380	100%	385	100%	12,875	100%

Source: HESA 2024

6 UHI skills provision

Headline findings



- There is an increase in enrolments of Energy-relevant courses at all but the most advanced levels. However, there has been a significant decrease in enrolments onto SCQF level 9-11 energy relevant courses in particular
- Enrolment in Energy-relevant subjects at all Apprenticeship levels has increased since 2020, with Foundation Apprenticeships seeing the largest increase
- There has been a modest increase in enrolments in Energy-relevant Further Education courses, with Construction and Engineering related subjects remaining the most popular
- Computing and Engineering & Technology remain the most popular higher education courses over the period despite a real terms decrease in both (40 and 45 respectively)

Introduction

6.1 This chapter details statistics related to the uptake of energy-relevant subjects at the University of the Highlands and Islands. This is broken down the same as the previous chapter, into an overview of the apprenticeship family, and uptake in energy-related apprenticeship frameworks, before covering further education, and then higher education, all at UHI. The previous chapter offered a snapshot of the topic using data from Skills Development Scotland, and the Scottish Funding Council, to provide a brief overview. This chapter uses data from UHI which offers further detail to the previous chapter for example, giving an institutional breakdown of enrolment in energy-relevant subjects and courses, broken down by level, and is more up to date in a number of areas. This will also provide greater context alongside the previous chapter in terms of skills supply intelligence.

Apprenticeship family

Foundation and Graduate Apprenticeships

Foundation Apprenticeships

6.2 Table 6.1 shows Foundation Apprenticeship enrolments in energy-relevant subjects in the Highland Council area. There has been a significant increase in enrolments since 2020/21 increasing by 293%, with multiple courses with no enrolments in 2020/21 seeing large uptake in 2023/24 such as Construction which had the largest number of energy-relevant enrolments (99).

Table 6.1: Foundation Apprenticeship enrolments in the Highland Council area (student postcode) by subject, 2020-2024

Course Name	2020/ 21	2021/ 22	2022/ 23	2023/ 24
Automotive Engineering	0	0	13	19
Civil Engineering	14	9	15	14
Construction	0	16	44	99
Construction Skills	0	0	9	19
Engineering	18	13	7	6
Information Communication and Technology & Digital	2	0	0	0
IT: Hardware/System Support	1	0	0	0
IT: Software Development	5	2	0	0
Total	40	40	88	157

UHI: Enrolment data

Graduate Apprenticeships

- 6.3 Table 6.2 highlights Graduate Apprenticeship Enrolments in energy-relevant subjects in the Highland Council area from 2020-2024. These have also seen a rise over the four-year period, similar to that seen in FA enrolments, with enrolment into Civil Engineering more than doubling over the period, and recent uptake in Construction and the Built Environment.

Table 6.2: Graduate Apprenticeship enrolments in the Highland Council area (student postcode) by subject, 2020-2024

Course Name	2020/2 1	2021/2 2	2022/2 3	2023/2 4
Civil Engineering	13	13	18	29
Construction and the Built Environment BSCH (Graduate Apprenticeship)	0	0	0	12
Grand Total	13	13	18	41

UHI: Enrolment data

Modern Apprenticeships

Total starts

- 6.4 Total enrolments in energy-relevant courses for Modern Apprenticeships between 2020 and 2024 have varied significantly less than those for FAs and GAs, with the total for 2024, seeing a 22% increase on the 2020 figure, following a decrease in the 2022/23 figure, as shown in Table 6.3. Construction Contracting Operations courses have seen an increase in uptake over the four-year period, while Engineering Maintenance courses remain some of the most popular Modern Apprenticeship courses.

Table 6.3: Modern Apprenticeship enrolments in the Highland Council area (student postcode) by subject, 2020-2024

Course Name	2020/21	2021/22	2022/23	2023/24
Aquaculture Management	0	1	0	0
Civil Engineering	0	5	1	0
Construction Contracting Operations: General	0	7	2	23
Construction Contracting Operations: Estimating	5	3	2	6
Construction Contracting Operations: Site Tech Support	20	18	1	12
Engineering Core Skills	1	0	6	0
Engineering Practice	0	0	1	0
Engineering Systems HE	9	6	0	0
Engineering Systems FE	0	1	0	0
Engineering Maintenance (Electrical)	11	10	5	8
Engineering Maintenance (Mechanical)	25	29	16	19
Engineering Maintenance (Multi-skilled)	8	33	23	20
Engineering Manufacture (CNC Machining)	1	4	0	1
Electrical Installation	5	2	10	15
Grand Total	85	119	67	104

UHI: Enrolment data

Modern Apprenticeship starts by institution

6.5 Table 6.4 illustrates Modern Apprenticeship enrolments in the Highland Council area by institution. UHI Inverness accounts for the majority of energy-relevant enrolments across every year, likely due to the institution being by far the largest of the UHI partners in terms of student body⁴³ until the creation of UHI North, West and Hebrides in 2023.⁴⁴

Table 6.4: Modern Apprenticeship enrolments by institution, 2020-2024

Course Name	2020/21	2021/22	2022/23	2023/24
UHI Inverness	75	111	50	89
North Highland College	10	6	17	15
Total	85	117	67	104

UHI: Enrolment data

Further Education provision

Further Education provision in subjects of relevance to the Loch na Cathrach project

6.6 Table 6.5 sets out Further Education enrolments in energy-relevant subjects in the Highlands between 2020 and 2024. Total enrolments have grown over the four-year period, with the 2023/24 figure seeing a 27% increase on the 2020/21 figure, however while the number of full-time enrolments comprised just over a quarter (26%) of total enrolments in the 2020/21 academic year, in the most recent figure, the two enrolment types are equal with full-time enrolments more than doubling in the period.

⁴³ <https://www.inverness.uhi.ac.uk/about-us/foi/class-1-about-uhi-inverness/>

⁴⁴ <https://www.nwh.uhi.ac.uk/en/news/uhi-north-west-and-hebrides-celebrates-launch-as-scotlands-newest-college.html>

Table 6.5: Further Education enrolments in energy-relevant college courses in the Highland Council area (student postcode) by enrolment type

	2020/21	2021/22	2022/23	2023/24
Full Time	239	395	383	591
Part Time	692	721	701	594
Total	931	1,116	1,084	1,185

UHI: Enrolment data

- 6.7 Table 6.6 shows Further Education enrolments in energy-relevant subjects across the Highland Council area by institution. This has stayed relatively stable over the four-year period, with UHI Inverness maintaining the majority of students across all years.

Table 6.6: Further Education enrolments in energy-relevant courses by institution, 2020-2024

	2020/21	2021/22	2022/23	2023/24
UHI Inverness	1,207	1,461	1,135	1,228
North Highland College	377	233	326	376
West Highland College	149	208	283	194
Total	1,733	1,902	1,744	1,798

UHI: Enrolment data

- 6.8 Table 6.7 illustrates Further Education enrolments in energy-relevant subjects by institution, shown as a portion of the total enrolments in that year. UHI Inverness has the largest proportion of students on energy-relevant courses with around a third of the total enrolments, followed by North Highland College who have around one fifth of students studying energy-relevant courses every year.

Table 6.7: Further Education enrolments in energy-relevant courses by institution, as proportion of total enrolments

Academic Partner	2020/21		2021/22		2022/23		2023/24	
	Energy-relevant	% of total	Energy-relevant	% of total	Energy-relevant	% of total	Energy-relevant	% of total
UHI Inverness	1,207	34%	1,461	32%	1,135	29%	1,228	34%
NHC	377	19%	233	12%	326	18%	376	19%
WHC	149	6%	208	6%	283	11%	194	9%
Total	1,733	22%	1902	19%	1,744	21%	1,798	23%

UHI: Enrolment data

- 6.9 Construction is the most popular energy-relevant course for Further Education students in the Highland Council area with 555 (31%) students, as illustrated by Table 6.8. Engineering/Technology (general) is the next most popular course, with 12% of the total enrolments, and Electrical Engineering and Building Maintenance/Services are also popular, with 9% each.

Table 6.8: Further Education enrolments in energy-relevant courses by superclass

Superclass Name	2020/21	2021/22	2022/23	2023/24
FE: Building Design/Architecture	10	2	18	23
FE: Building Maintenance/Services	145	189	139	158
FE: Building/Construction Operations	159	90	136	131
FE: Built Environment (general)	21	7	15	6
FE: Chemistry	1	3	1	3
FE: Civil Engineering	50	55	47	60
FE: Construction	487	625	454	555
FE: Construction Management	0	8	21	26
FE: Distribution	0	0	4	4
FE: Electrical Engineering	267	282	149	163
FE: Electrical/Electronic Servicing	0	26	69	41
FE: Engineering/Technology (general)	176	156	157	214
FE: Environmental Health/Safety	7	0	0	0
FE: Environmental Protection/Conservation	32	6	113	0
FE: Land and Sea Surveying/Cartography	21	11	0	0
FE: Life Sciences	4	3	1	0
FE: Marine Transport	5	56	46	51
FE: Mathematics	90	84	92	113
FE: Mechanical Engineering	150	111	92	83
FE: Metals Working/Finishing	11	50	6	21
FE: Physics	5	0	8	17
FE: Pollution/Pollution Control	0	0	16	10
FE: Science	61	97	118	84
FE: Tools/Machining	31	41	42	35
Total	1,733	1,902	1,744	1,798

UHI: Enrolment data

Higher Education provision

Overall Higher Education provision

6.10 Table 6.9 shows Higher Education enrolment in energy-relevant courses for students from Highland postcodes, broken down by subject. Engineering and Technology has remained the most popular subject across the four years seeing a slight increase in its proportion of the total body of students taking energy-relevant subjects, despite a decrease in the number of students taking the subject. Biological and Sport Sciences, Business and Management, and General and Others in Sciences are the only subjects to experience an increase in the number of actual students taking the subjects, whereas Agriculture, Food and Related Studies, Subjects Allied to Medicine, and Computing have all experienced significant decreases in uptake.

Table 6.9: Higher Education enrolment in energy-relevant subjects in the Highland Council area (student postcode) by HECoS Group, 2020-2024

HECoS Group	2020/21	2021/22	2022/23	2023/24
Agriculture, Food and Related Studies	150	167	113	102
Biological And Sport Sciences	130	111	117	136
Business And Management	0	0	0	18
Communications And Media	33	28	25	22
Computing	218	187	138	173
Engineering And Technology	354	319	274	314
General And Others in Sciences	47	28	39	72
Geographical And Environmental Studies	61	55	52	47
Physical Sciences	43	36	33	32
Psychology	88	89	85	85
Subjects Allied to Medicine	158	135	130	97
Grand Total	1,282	1,155	1,006	1,098

UHI: Enrolment data. HECoS = Higher Education Classification of Subjects

- 6.11 Table 6.10 details the number of enrolments on energy-relevant subjects by institution between 2020 and 2024. All three academic partners have seen an increase in the proportion of students taking energy-relevant subjects, however, only North Highland College has seen an increase in the number of actual students (3.7%), also seeing the largest increase in the proportion of these to the entire student population (5 percentage points, up from 60% in 2020/21 to 65% in 2023/24).

Table 6.10: Energy-relevant Higher Education enrolments by institution, 2020-2024

Academic Partner	2020/21		2021/22		2022/23		2023/24	
	Energy-relevant	% of total enrolments	Energy-relevant	% of total	Energy-relevant	% of total enrolment	Energy-relevant	% of total enrolments
Inverness	874	33%	784	34%	759	33%	800	36%
NHC	429	60%	474	64%	428	64%	445	65%
WHC	35	10%	45	13%	30	10%	31	11%
Grand Total	1,338	35%	1,303	37%	1,217	36%	1,276	39%

UHI: Enrolment data

- 6.12 Table 6.11 offers a breakdown of the SCQF level of Highland domiciled UHI students studying energy-relevant subjects for the years 2020 to 2024. There has been a drop in students studying energy-relevant subjects at all levels, with the steepest of these being at higher levels, with SCQF 11 students decreasing 34% and SCQF 10 students decreasing by 42%. SCQF level 7-9 students have seen much less variation, decreasing by only 9% in total. This indicates less Highland domiciled students studying energy-relevant subjects at higher levels, potentially due to students opting to study these at universities and colleges elsewhere, after studying energy-relevant subjects in earlier levels at the UHI.

Table 6.11: SCQF level of Higher Education enrolments in the Highland Council area (student postcode) by SCQF level, 2020-2024

SCQF Level	2020/21	2021/22	2022/23	2023/24
7	652	537	425	588
8	254	262	294	243
9	159	151	114	133
10	95	80	75	55
11	122	125	98	80
Grand Total	1,282	1,155	1,006	1,099

UHI: Enrolment data

7 Skills supply and availability challenges

Headline findings



- Competition for Energy skills in Highland is considerable, and this is anticipated to increase as a pipeline of Renewable Energy developments is realised



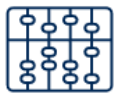
- Relying on overseas labour to meet skills requirements on projects helps to de-risk the workforce component of projects, but it also serves to inhibit the development of a local pool of labour, and negatively impacts how such employment opportunities are perceived by local workers



- There is an opportunity to attract and utilise skilled workers from oil and gas and other more 'traditional' industries, which will help to meet skills demand
- There can be limited availability of suitable training for specific competencies within the Energy sector, but these can be resolved through regular and proactive engagement between industry and education and training providers



- Key considerations for skills supply include particular courses in demand, the cycle of work on developments, a critical mass of workers to train and up-skill, and the short-term or seasonal nature of roles



- The potential for work-based learning and live accreditation should be maximised, to seize the opportunity for learning and training through experience, and to satisfy employer demand for industry experience

- Education and training facilities should be sufficiently flexible to meet constantly changing industry need

- There should be cognisance of the impact that a range of external factors such as housing/accommodation, attractiveness of the region, sector perceptions, and the trend of out-migration from the region (particularly amongst young people) have on skills supply and the ability to meet labour demand

Introduction

- 7.1 The Loch na Cathrach project is being developed at a time when there are a number of challenges and constraints around the supply of skills of relevance to the energy sector. This chapter draws on available evidence from other aligned research and synthesises the findings from this to summarise the key skills supply challenges.

Challenges and constraints

Competition for skills

- 7.2 The competition for skilled energy workers in the area is considerable. There is already a degree of competition for energy-relevant skills amongst employers working in renewable energy, and there will be increasing demand for skilled workers to fill new jobs as pipeline developments

come forward.⁴⁵ Some of these developments are already under way, with others forming part of a significant pipeline across the Highlands and Islands.

- 7.3 Thus, there is competition within and between different renewable energy industries (e.g. offshore wind, hydropower, green hydrogen, etc.) but also with legacy carbon-intensive industries (oil and gas) and other non-energy sectors. Industry intelligence gained from research interviews suggests that because of the area's low population density, if even a comparatively small number (say, three or four) large-scale projects commence at the same time, this can soak up a lot of the available talent.
- 7.4 Available intelligence and anecdotal evidence gathered through previous research indicates that this competition for labour can result in a degree of rotation between employers or employment agencies by those on short-term contracts. Understandably, this arises largely from employees acting to ensure their own continued employment. However, it introduces a degree of uncertainty for developers around the reliability of the workforce for the duration of a contract.
- 7.5 There is also an industry reliance on recruiting overseas labour in the region. This helps companies in ensuring an adequate workforce, or supplementing the existing domestic workforce, particularly for short-term construction projects. Consequently, developers and contractors are able to de-risk the workforce component of any given development or investment. However, anecdotal evidence suggests that this may contribute to a perception amongst local contractors or workers that such jobs (i.e. in development, construction and installation (DCI)) won't be available locally, or are offered/given to overseas workers in the first instance). Recent developments in the skills supply pipeline – such as moves by UHI to improve their offering, the Nigg Skills Academy and the PowerHouse, and most recently Aurora Energy Service's Renewable Energy Training Centre – indicate that more is being done to address the provision of relevant local skills and reduce the reliance on overseas workers.
- 7.6 However, it is worth noting that the Highlands and Islands (and indeed Scotland, and the rest of the UK) cannot compete with lower overseas workforce costs for certain activities e.g. component or hardware manufacturing. This impacts on the types of activities and enterprises that are likely to locate in the region, and so the opportunity or need for specific skills.

Education and training challenges

- 7.7 Alongside challenges relating to the availability of and competition for required skills, there are also a number of challenges with regard to education and training provision, and how this impacts on the skills supply pipeline.
- 7.8 Previous research⁴⁶ has highlighted challenges around the (limited) availability of training and qualifications for specific competencies, equipment and processes related to renewable energy generation technologies. This has typically been highlighted with regard to Wind Energy (and

⁴⁵ See for example: Skills Development Scotland (2023) Mapping green investments across Scotland – CESAP Pathfinder Work package 1: Action 1.2; at: <https://www.skillsdevelopmentscotland.co.uk/media/vadouyfi/wp1-investment-precis.pdf>. Additional research for Highlands and Islands Enterprise to identify the scale of potential development across a range of Regional Transformational Opportunities including renewable energy, is currently being undertaken by ekosgen.

⁴⁶ See for example: ekosgen, for Skills Development Scotland (2022) Inner Moray Firth Energy Skills, Final Report

Offshore Wind in particular), but there is some evidence to suggest that this applies to other Renewable Energy fields also.⁴⁷

- 7.9 The particular courses in demand, the cycle of work on developments and a critical mass of workers to train and up-skill are also key considerations. Similarly, there is a need to ensure that course content and format is aligned to industry need and standards. This requires a regularly updated picture of employer and industry need, facilitated through the right level of industry engagement, collaboration, co-operation, etc. with education and training providers to identify need, plan provision, and showcase career opportunities.
- 7.10 In some instances, the short-term or seasonal nature of roles (e.g. construction, installation, and time-bound maintenance) means that meeting demand for skills can be challenging. Intermittent employment is not an attractive career option, especially in dispersed or remote locations, and so there are challenges around stimulating sufficient interest in courses or apprenticeship frameworks that provide the required skills to make them viable.
- 7.11 There is a risk for education and training providers in trying to respond to such demand for skills related to renewable energy development. There is no certainty of projects going ahead and construction commencing until the final investment decision (FID) has been reached. Thus, providers cannot speculatively develop courses without incurring a significant element of risk. Whilst there are a number of large renewable energy schemes progressing in the Highlands and Islands, very few have reached FID, and so at this point the wider pipeline has no absolute certainty of progressing to construction and installation.
- 7.12 Previous skills research has also highlighted that contractors typically demand job applicants are able to demonstrate industry experience. This effectively locks newly qualified workers out of the labour market. As such, there is a need for education and training providers to incorporate 'live' work and project experience into course delivery, so that those enrolled in college, university or on apprenticeships can maximise their exposure to work, and consequently demonstrate the required experience upon leaving education.
- 7.13 Finally, there is a need to consider the suitability and flexibility of education and training facilities to meet dynamic and changing industry need. What may be suitable and adequate currently in terms of training space may not be even in the short-term future – so careful consideration should be given to how best to future-proof training facilities and space.

External factors

- 7.14 There are a range of factors external to skills supply and education and training, which impact on the availability of skills. The principal challenges include the following:
- **Accommodation:** Housing is an acknowledged challenge in the Highlands and Islands. There are well documented issues for local residents in communities across the region struggling to find suitable and affordable accommodation, to continue living and working in their local area. It is also cited as a particular challenge for firms in attracting workers to the region to take up employment. Short-term demand for worker accommodation places even more acute pressure on local housing markets. Often, the solution is temporary accommodation – workers' 'camps' comprised of Portakabins, Bunkabins, etc. However, there is some evidence

⁴⁷ See for example: ekosgen, for Scottish Enterprise (2023) Tay Cities Clean Growth Skills Report

of recent developments and construction projects exploring other solutions e.g. renovating or redeveloping unused hotels, or pursuing agreements with housing associations to construct new social housing, take occupation of the new stock during the construction period, and then hand dwellings back to the housing associations upon completion of the project.

- **Regional attractiveness:** Whilst quality of life is an important positive attractor for the Highlands, other factors such as availability and proximity or access to services, facilities, social and cultural offers, etc. can detract from the area's attractiveness to prospective workers. This serves to discourage prospective workers from moving to the region, or is a factor in workers that do come to the region not staying long-term.
- **Sector perceptions:** There is evidence of increasing attractiveness of renewables over legacy industries such as oil and gas, and so there is potential to attract and utilise existing skills capacity from oil and gas, and more 'traditional' energy and other industries. However, renewables still cannot compete yet with the pay and remuneration on offer in oil and gas and its supply chain. There is therefore a need to identify ways of encouraging more workers to enter or make transition to the renewables sector, which maximise its environmental credentials. This may include early engagement with secondary or even primary school pupils, with a view to stimulating a longer-term interest in such careers.
- **Out-migration:** There is a continuing challenge of attracting people to (or encouraging to stay in) the Highlands and Islands to work. The quality of life that the region can offer is a competitive advantage held over many other areas. However, access to services and facilities (as discussed above with regard to regional attractiveness) often does not compare favourably to other parts of Scotland, and is often a factor in young people leaving the region to pursue education and employment opportunities.

8 Future project skills requirements

Introduction

- 8.1 This chapter sets out the anticipated skills requirements on the Loch na Cathrach project. It takes into consideration the likely construction and non-construction workforce requirements across the full construction delivery period.

Anticipated skills needs

- 8.2 Peak **construction** workforce requirement on the Loch na Cathrach site is anticipated to be a maximum of c.500 workers, during the five-year delivery timescale. The anticipated construction skills needs for the Loch na Cathrach project include:
- **Civil engineering** skills, to support the construction and engineering required to build the pumped storage hydro scheme, including the head pond, power cavern and inlet/outlet structure;
 - **Tunnel engineering** skills for excavating and constructing the facility's low- and high-pressure tunnels, as well as tunnels required for construction; and
 - **General labour** across the site, including (heavy) plant operations.
- 8.3 Table 8.1 highlights the total daily workforce which will be required at each year of construction by headcount across the anticipated work areas for the project, and the level of skill breakdown of this workforce. Year one of development and construction will require the least workforce with 127, whereas the largest workforce will be required in years three and four of construction, both requiring over 500 workers.
- 8.4 The most common employment type across all years of construction is Skilled workers, comprising almost half (45%) of the total employment, followed by Lower-Skilled workers with just over a third (35%) of the total employment.

Table 8.1: Total daily construction workforce each year of construction

Year	Y1	Y2	Y3	Y4	Y5	% of total workforce
Access Roads	20	20				2%
Utility Diversions	15	15				2%
Temporary Structures at Compounds	20	20	20			3%
Permanent Structures at Compounds		30	40	40		6%
Access – Tunnels		30	30	30		5%
Waterways – Tunnels	30	60	60	60	30	13%
Material Processing	12	22	22	22	12	5%
Headpond Works	30	60	60	60	30	13%
Landscape Embankment		10	10	10	10	2%
Inlet/outlet works		35	35	35		6%
Spillway		40	40	40	20	8%
Powerhouse and Transformer Caverns		40	40	40	20	8%
Mechanical and Electrical			60	60	60	10%
Powerhouse – other electrical-mechanical related works			20	30	20	4%
Grid Connection				10	10	1%
Penstock			25	25	25	4%
Grid Connection to Knocknagaels Substation					10	1%
Support Teams (Batchplant, Workshop, etc)	20	40	40	40	20	9%
Total	147	422	502	502	267	100%
<i>High-Skilled</i>	8	22	26	26	14	5%
<i>Skilled</i>	67	190	226	226	121	45%
<i>Semi-skilled</i>	23	64	76	76	41	15%
<i>Lower-skilled (General Labourer)</i>	52	148	176	176	94	35%

Statkraft: Workforce projections

8.5 A list of example construction roles by broad skill level is set out in Table 8.2.

Table 8.2: Skill level role examples

Lower-skilled	Semi-skilled	Skilled	High-Skilled
<ul style="list-style-type: none"> • Flagman • Helper • Cleaner • Equipment/materials organisers • Roles required to build and maintain temporary structures 	<ul style="list-style-type: none"> • Bricklayer • Signalworker • Gateperson 	<ul style="list-style-type: none"> • Heavy equipment operator • Carpenter • Electrician • Pipefitter • Plumber • Roofer • Welder • Reinforcement fixer • Painter • Joiner • Driver • Scaffolder • Mechanic 	<ul style="list-style-type: none"> • Foreman • Gang Leader • Camp Boss

Statkraft: Workforce projections

- 8.6 A further 126 **non-construction** staff will be required in supervisory, management and administrative roles across the project. This includes roles such as project director, health, safety and wellbeing supervisor, document controller, quality control/assurance manager, and accountant. This workforce and skills requirement will be across Statkraft, and their contractors and sub-contractors. At this stage, the Statkraft component is likely to be modest, with around 30-40 people directly employed by Statkraft themselves.
- 8.7 There is an acknowledged desire on the part of Statkraft to maximise the local employment content on the project as far as possible. There is recognition that, given the anticipated delivery timescales, Statkraft are not going to be able to significantly change the local labour market in advance of the project commencing (e.g. positively influencing the provision of training and availability of required skills), nor avoid use of outside or overseas workers. In addition, the delay in the publication of the UK Government's response to the long duration electricity storage (LDES) consultation has served to further compress timescales, which negatively impacts on Statkraft's ability to recruit locally. However, there is an appetite to influence as far as possible the recruitment and employment approach on the project by their main Tier 1 contractor, and others too where this is feasible.

9 Conclusions and future priorities

Introduction

- 9.1 The preceding chapters have set out and synthesised the evidence from a number of skills and other research reports of relevance to the Loch na Cathrach project, and to renewable energy developments more generally. This chapter presents a number of conclusions arising from the findings of this report, and details a number of key priorities going forward for skills development for the project.

Conclusions

- 9.2 The Loch na Cathrach project is a transformational opportunity to significantly increase the energy generation and storage capacity of the energy network in Scotland, and the UK. As a construction project, it also offers significant employment opportunities in a range of skilled and other roles. There will also be a number of roles to be filled during the operational lifespan of the facility once complete.
- 9.3 The supply of skills through UHI, and through Highland-domiciled students, is broadly increasing in relevant subjects, which is positive for the project. That said, qualifiers at Higher Education level and at higher SCQF levels is decreasing.
- 9.4 The Loch na Cathrach project is not being developed in isolation: that is, there are a considerable number of other pumped storage hydro and other renewable projects currently in development, and at varying stages of construction readiness. This means that there is acute – and increasing – competition for the skills required by the Loch na Cathrach project. Thus, it can be assumed that whilst the supply of skills from UHI and through Highland-domiciled students may be sufficient to meet current skills demands, the supply will likely be insufficient as the Loch na Cathrach project – and other, similar projects with significant construction skills requirements – commences development.
- 9.5 Well-documented skills supply and availability challenges in the region, and in the renewable energy sector, mean that recruiting and developing a local workforce for the project will be considerably challenging. Given the current landscape of a raft of renewable energy and other large-scale construction projects that are currently under development, this will not be a challenge unique to the Loch na Cathrach project, but common across a number of other pumped storage hydro schemes in the Great Glen and more widely across the Highland Council area, and indeed the Highlands and Islands region.
- 9.6 Given the skills requirements of the project in light of these challenges, there are a number of priorities to address the emerging skills needs to deliver the Loch na Cathrach pumped hydro scheme.

Future priorities to meet skills needs

Skills planning

- 9.7 Given that employers already recruit from outwith the region to import skills required for the delivery of renewable energy projects, there is a need to develop a ready supply of more local skilled labour. This is both in terms of the immediate skills required for development and construction (and which will be of benefit to other, similar schemes in the region in future, of which there is a considerable and growing pipeline well into the 2030s), and also longer-term operations and maintenance (O&M) activity for the facility, though for the latter the skills requirement is considerably smaller.
- 9.8 Consideration should be given by UHI – and other training providers as appropriate – to the profile of skills required to deliver projects. This includes the current anticipated workforce profile, and any changes between now and commencement of the development. It is worth noting that there has not been significant large-scale hydro development in the region in decades. However, there is still significant capability in the region to deliver an engineering project of this nature, with a skills latency amongst the region’s workforce that understands large-scale engineering projects, and this will go some way to satisfying the skills requirements of the Loch na Cathrach project. However, there needs to be full understanding of workforce profile – i.e. not just focusing on civil or tunnel engineering, or the general workforce requirement, but also required skills and roles across project management and control, commercial/financial functions, stakeholder management and engagement, etc. throughout the DCI phase of the project, and then subsequently the roles required for O&M once the facility is live.
- 9.9 This will help in skills planning for both the DCI phase of the Loch na Cathrach project, and also its operational lifespan. Current timelines to Final Investment Decision (FID) mean that education and training providers will still be able to provide skills to meet the project’s construction needs, as well as forward plan for operational skills requirement provision.
- 9.10 As part of their own skills planning, Statkraft are working to identify the extent to which local skills content can be specified in main contracts. Statkraft have an appetite to mirror the approach to contract value spend that is present in ScotWind leasing, for example, with skills content. Such an approach would arguably be of equal if not more value in terms of securing benefits for the Highland economy through increasing employment, and capturing induced impacts from increased employee spend within the area.

Supplier and stakeholder engagement

- 9.11 Local stakeholder engagement is essential to maximise supplier buy-in. Statkraft have already become involved with business membership organisations across the Highlands to help achieve this. Engagement with local and strategic stakeholders is also important in maximising local labour market buy-in. This is as much to demonstrate a willingness to operate in an open and transparent way, and work with local communities and businesses – thus building social licence – as it is to showcase forthcoming employment opportunities. Statkraft are exploring opportunities to help get potential suppliers contract-ready once the project reaches FID and proceeds to construction, including on the required skills element of the work.

- 9.12 Additionally, Statkraft are working with their main contractors to enhance recruitment and workforce development. This is needed to maximise the extent to which Tier 1 contractors can shoulder the burden of recruitment and workforce development. Skills supply, recruitment and development of the workforce should be the responsibility of as many parties as possible on any given development, to maximise the extent to which a local workforce can be secured.

Collaboration with other developers

- 9.13 Overcoming competition for skills, and constraints on volume of available labour and skills is increasingly important, particularly given the potential pipeline of developments across the Highlands and Islands. Should all forthcoming developments in the region come to fruition, then it is likely that competition for skills will become an acute challenge. This is of course dependent on the timing and phasing of the project pipeline, and could in fact lead to enhanced long-term employment and career prospects for those with skills in demand.
- 9.14 Statkraft should thus identify opportunities to collaborate more with competitors and other Energy industry players to develop the pool of available labour and skills. This means taking a 'co-opetition' approach in areas where mutual benefit is necessary for the wider good of development projects.

Engagement with education and training providers

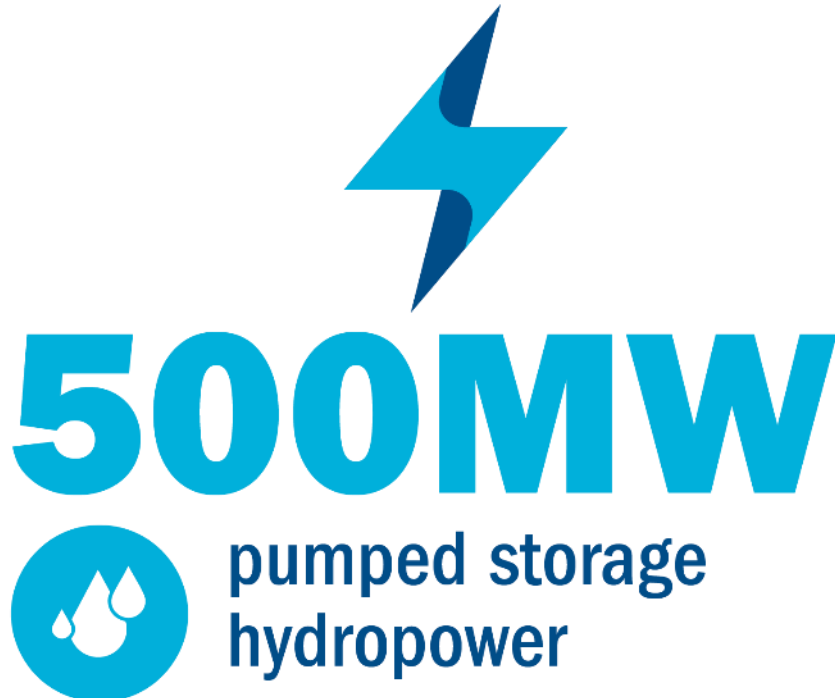
- 9.15 Active and ongoing engagement by developers with education and training providers is essential to enabling providers respond to current and emerging demand, and ensure an adequate supply of skills. Statkraft are already doing considerable proactive and advance engagement with education and training providers. It is worth noting that this is not so much for own workforce requirements (which is anticipated to be no more than 30-40 FTEs during the project's delivery), but for their Tier 1 contractors and supply chain. This is helping the skills supply system to be more responsive, and also helps to de-risk the skills element of the project.
- 9.16 Statkraft have existing relationships with UHI, and also the University of Strathclyde outwith the region. The relationship with UHI is viewed by Statkraft as very positive – UHI are seen as responsive and proactive, and this has helped to generate strong mutual understanding of what UHI are able to provide, and also what Statkraft will need in terms of skills provision. Such relationships are essential for allowing providers to understand and anticipate skills demand, and tailor or develop courses accordingly.
- 9.17 Other providers and strategic actors identified as being important to maintain relationships with include:
- Civil Engineering Contractors Association (CECA) Scotland Academy, to develop essential skills in construction and engineering (CECA have already piloted a scheme in partnership with UHI);
 - Scottish School of Forestry (part of UHI Inverness) because of the forestry works and compensatory planting that will be needed on a large scale as a result of the Loch na Cathrach development; and
 - Energy Skills Partnership (ESP), to contribute to and increase influence in shaping Energy skills provision at a strategic level.

Strategic influencing

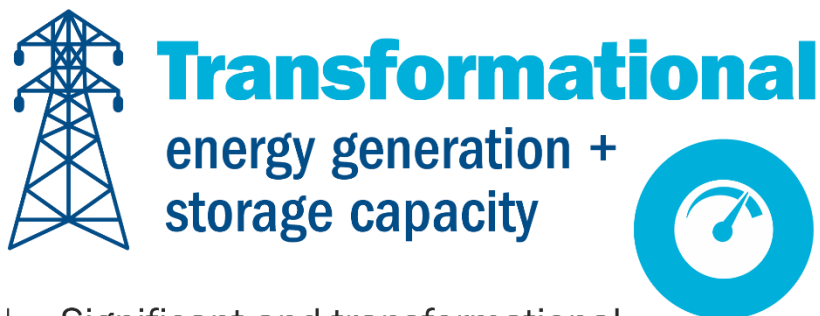
- 9.18 Finally, consideration should be given to ways in which Statkraft and partners can engage with the Scottish and UK Governments and other strategic actors – including Highlands and Islands Enterprise, Highlands and Islands Regional Economic Partnership, and the Convention of the Highlands and Islands (CoHI) – to influence the provision of funding and other support to the development of skills required by this and other similar projects. This may also include exploring opportunities to support skilled non-renewables workers transition into the sector.

A.1. Appendix 1: Infographic stickers

The project



Loch na Cathrach is a c.500MW pumped storage hydropower project on Loch Ness, due to start construction in 2026.



Significant and transformational opportunity to increase the energy generation and storage capacity of the energy network.



500+

workers on site

At the peak of construction, over 500 workers will be on site.



100+

management and administrative roles

More than 100 office-based management and administrative roles will support construction activity.

Challenges and barriers



Skills competition
significant and growing

Significant and growing competition for skills to build energy projects in the Highlands and throughout Scotland.



Energy-related
enrolments insufficient
to meet future need

Enrolments in energy-related subjects have increased but are insufficient to meet future need.



Skills competition will become acute

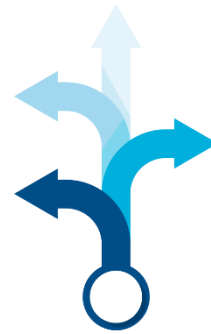
Competition for skills will become more acute as the pipeline of renewable energy developments is realised.



High paid oil and gas workers hard to attract

Oil and gas is a high paying sector which can make it hard to attract these workers into other sectors.

Challenges must be **addressed in skills response**



Persistent structural challenges – housing, sector attractiveness, access to services and amenities, and out-migration – must be acknowledged and addressed in any skills response.

Opportunities and solution



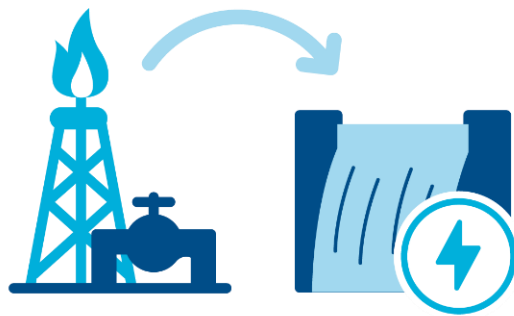
Renewable-energy
**employment
insufficient
to meet future need**

Existing employment and GVA forecasts do not fully account for the pipeline of renewable energy developments across pumped storage hydro, offshore wind, onshore wind and other generation and storage technologies.

Local skilled labour supply required



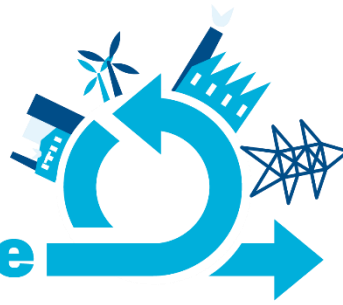
A need to develop a local skilled labour supply for immediate construction needs and for longer-term operation of the facility.



Opportunity to pivot and repurpose skills

Opportunity to pivot and repurpose skills in oil and gas and other more 'traditional' industries.

Skills provision must be **industry-led and responsive**



Skills provision must be clearly signposted and led through close collaboration with education and training providers.



Opportunity to pursue **co-opetition approach to skills**

Opportunity to pursue a 'co-opetition' approach to skills development to maximise mutual benefit.



Work-based learning will be key

Maximising the potential for work-based learning and training through experience as a key part of the solution.

Target skilled local workforce through contracting process



Opportunity for Statkraft to target a skilled local workforce and consider local skills content through contracting process with Tier 1 supply chain.

