SCOTTISH FUTURES TRUST

Appendix B: Scotland's Infrastructure

Contents

1 Introduction and purpose

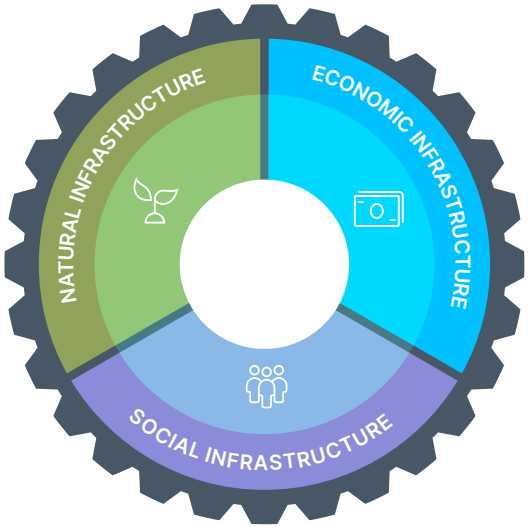
The sectoral summaries presented in this Appendix, provide a baseline assessment of Scotland's infrastructure, identifying key opportunities and challenges. This evidence-based approach provides the foundation for the Needs Assessment analysis, supporting key themes and recommendations.

It should be noted that the **sectoral summaries present a point-in-time assessment (up to end of September 2025)**, using public data sources with further evidence provided through Scottish Government portfolio and agency engagement carried out through Q2-3 2025.

Infrastructure definition and classification

Infrastructure is defined as "the physical and technical facilities, natural and other fundamental systems necessary for the economy to function and to enable, sustain and enhance societal living conditions".[1]

Figure 1: Infrastructure Classification



For the purposes of this Needs Assessment, infrastructure is classified as economic, social or natural.

Economic infrastructure encompasses physical and technical facilities supporting the economy, including:

- **Transport:** roads, railways, airports, seaports and active travel infrastructure.
- **Energy:** power generation and distribution networks, including renewable energy infrastructure.
- **Waste:** landfill sites, incineration facilities (including Energy from Waste plants), recycling and composting facilities, and various treatment and pre-treatment plants.
- **Water:** water supply and treatment facilities and wastewater management systems.
- **Telecommunications:** digital connectivity covering mobile and broadband networks.

Social infrastructure encompasses the services and facilities that support communities, wellbeing and health, including:

- **Housing:** including social, community and housing for vulnerable groups.
- **Education:** including schools, colleges, and universities.
- **Health:** hospitals (general and specialist), GP surgeries and health centres, specialist health facilities and care homes.
- **Emergency Services:** covering police, fire and rescue and ambulance services.
- **Defence:** covering Ministry of Defence (MoD) assets.
- **Justice:** including prison and courts.
- **Culture and recreation:** community and public leisure centres, public museums and art galleries, heritage assets, theatres and performance venues, parks and green spaces and other public sports and recreation facilities.

1 Scottish government A National Mission with Local Impact: Infrastructure Investment Plan for Scotland 2021-22 to 2025-26

Natural infrastructure is the network of natural ecosystems that provides essential services like flood management, climate regulation and biodiversity conservation. This covers:

- **Land:** agricultural, peatlands, woodlands and coastal areas.
- **Renewable resources:** including forestry, fishing, aquaculture, water and biodiversity.
- **Non-renewable resources**: oil and gas.

This natural capital provides the raw materials necessary for constructing and maintaining all other infrastructure. It also provides a range of provisioning, regulating and cultural services that are vital for the functioning and resilience of economic and social infrastructure.

Structure of this Appendix

For each sector the analysis has been structured as follows:

A summary that covers a high level review of the more detailed analysis that follows identifying: Responsibility, operating model, regulation, asset value, asset strategies, funding/investment, key policy and strategy, reflections on the last 20 years, key national developments, contribution to national outcomes and delivery plans.

More detailed analysis and commentary from which the summary has been developed as well as highlighting key challenges and opportunities that are framed under eight themes – funding and finance, service/system, supply/demand, net zero, climate resilience, socio-economic, data and technology, economic.

Economic Infrastructure

- 2 Transport
- 3 Energy
- 4 Waste
- 5 Water (including flood management)
- 6 Telecommunications

2 Transport

2.1 Sector summary

Responsibility

Scottish Government and its agency **Transport Scotland** are responsible for[1]:

- Developing and delivering policies (consistent with National Transport Strategy).
- Promoting active and sustainable travel and reducing car dependency.
- Supporting the key movement of goods and people.
- Improving travel experiences for all users.
- Overseeing the delivery of a safe and reliable rail services for passengers.
- Managing the Clyde and Hebrides and Northern Isles Ferry Service Contract and investment for vessel replacement and associated port and harbour infrastructure.
- Supporting sponsor bodies in their duties.
- Operating, maintaining, and improving Scotland's motorway and trunk road as well as bridge network.
- Administering subsidy, concessionary travel programmes and grants for bus services.
- Working with airports and airlines on sustainable aviation.
- Connecting rural Scotland and growing international connectivity.
- Collating and publishing Transport statistics, research and data.
- Working with the UK Government's Department for Transport to better understand the potential impact of policies in reserved areas or changes in UK legislation.

Operating model

Road: Transport Scotland is responsible for the Trunk Road Network through 4 regional operating and maintenance contracts. the remainder of the road network is the responsibility of local authorities.

Bus: The majority of bus services are operated on a commercial basis by private bus companies, although local authorities do also subsidise specific services that cannot be operated on a commercial basis.

Rail: ScotRail is now publicly owned and operates the vast majority of passenger train services and most railway stations throughout Scotland. Passenger services to the rest of the UK are operated by a number of different operators. Freight services are operated by a variety of companies. Network Rail (also publicly owned) owns, operates and maintains rail infrastructure and the larger stations.

Air: The main airports and operators flying to/from Scotland are privately owned. Scottish Government owns and funds Highlands and Islands Airports Ltd (HIAL) which operates 11 airports across the Highlands and Islands. The Scottish Government also owns Glasgow Prestwick Airport.

Ferry: Caledonian Maritime Assets Limited (CMAL) is a public body that owns the vessels, ports and harbours and leases them to operators (both public and privately owned) under Public Service Contracts for the majority of domestic services.

Canals: Managed by Scottish Canals (a public body) on behalf of the Scottish Government.

Regulation

Regulators for transport in Scotland include:

- **Scottish Road Works Commissioner:** oversees improvements to the planning, co-ordination and quality of road works in Scotland.
- **Office for Rail and Road (ORR)** ensures that Network Rail meets its safety responsibilities and determines the appropriate funding for the rail network.
- **Traffic Commissioners for Scotland** regulates operators of heavy goods vehicles (HGVs), buses and coaches.
- **The Civil Aviation Authority (CAA)** is responsible for aviation safety, airspace policy, airport regulation, and ensuring airlines are licensed.

Asset value

Transport Scotland's asset base is **£28.4 billion** (2023-24), the majority of which relates to the trunk road network (£27.4 billion).

The other most significant asset base is the rail network. Total value for the UK is £93.08 billion. The Scottish specific component of that is not separately accounted for, however the percentage of Network Rail assets located in Scotland is approximately 17%.

Asset strategies

- **Trunk Road:** Road Asset Management Plan (RAMP).
- **Network Rail Scotland:** Signalling Scotland's Future (2025).

Funding and ownership

Ownership and funding in Transport involves both the public and private sector, funded either by consumers in the form of user charges, or public sector budgets via taxation. This impacts on the governance and therefore levers available in addressing sectoral opportunities and mitigating for challenges, some of which we will touch upon in our review.

Table 1: Transport asset ownership and funding

ASSET CLASS	OWNERSHIP	FUNDING
Roads	Public – Scottish Government/Local Authority	Tax
Rail	Public – Scottish Government	Tax/Consumer/Regulated
Airports (major)	Private	Consumer/Regulated
Airports (lifeline)	Public – Scottish Government	Consumer/Tax
Ports and harbours	Private/Public (Local Authority)/Trusts	Consumer
Canals	Public – Scottish Government	Tax/Consumer

Scottish Government funding

£4 billion, representing **7%** of the total Scottish Government 2025/26 budget. This includes:

- £2.6 billion for public transport.
- £1 billion for trunk roads.
- £533 million for ferry services.
- £263 million for sustainable travel.

Key policy and strategy

- **National Transport Strategy 2** (NTS2), Transport Scotland.
- **Strategic Transport Projects Review 2** (STPR2), Transport Scotland.
- **Local Transport Strategies**, Local authorities.
- **Regional Transport Strategies**, Regional Transport Partnerships.
- **National Planning Framework 4** (NPF4), Scottish Government.

Policy priorities include: reducing inequalities; taking climate action; helping deliver inclusive growth; and improving health and wellbeing.

Reflection on last 20 years

Scotland's transport sector has seen significant changes, including increased rail patronage, a decline in bus patronage, and a growing emphasis on sustainable and active travel modes.

In 2022, surface transport was the highest emitting sector in Scotland, accounting for 23% of Scotland's emissions. Surface transport emissions have fallen by less than 1% from 1990 to 2022. The Covid-19 pandemic caused a 21% drop in emissions during 2020. While emissions have partially rebounded since then, they remain 7% below 2019 levels due to sustained shifts in travel patterns and working from home.

Key Scottish Government investments have included:

- New rail infrastructure (lines and stations) and electrification of central Scotland rail routes.
- Queensferry Crossing; M74 completion; M80 upgrade; and partial A9 and A96 dualling.
- New and upgraded active travel infrastructure.
- Upgraded ferry terminals and investment in new vessels.

- Introduction of Low Emission Zones (LEZ) into Scotland's four largest cities.
- Establishment of new air services from Scotland to new international destinations.
- Support for change in the bus market in favour of zero-emission technologies.

Key national developments

Key National Developments (NPF4) in the transport sector include:

- Urban Mass/Rapid Transit Networks (6).
- National Walking, Cycling and Wheeling Network (8).
- Aberdeen Harbour (14).
- High Speed Rail (18).

Contribution to national outcomes

Primary national outcomes include environment; communities; economy; international; and poverty.

Secondary national outcomes include: fair work and business; human rights; and children and young people.

Delivery plans

- The fourth NTS Delivery Plan 2024-25 (December 2024) sets out the range of actions that Scottish Government will take to the end of 2025 to support the delivery of a sustainable, safe, inclusive, and resilient transport system that meets the needs of individuals, businesses, visitors and is accessible to all.
- The long-term plans for investment in Scotland's transport network are set out in the second Strategic Transport Projects Review (STPR2).
- Scotland's Railway Delivery Plan 2024-2029 (March 2024).

2.2 Sector analysis

The ability to move people, goods and services around Scotland is a key component in supporting the economy, as well as helping us go about our daily lives.

The key elements of Scotland's transport system are:

- Roads
- Active Travel (walking, wheeling, cycling)
- Bus
- Rail (including heavy and light)
- Air
- Maritime

Roads

As a rural country, Scotland is heavily dependent on roads to move people and goods. Scotland has 10.4km of road per 1,000 people, compared to 6.0km in Great Britain. The total length of Scotland's road network is over 57,000km, the vast majority (80%) of which comprises minor roads (B and C roads). The remainder of the road network comprises non-trunk A roads (13%) and the trunk network (7%).[2]

In Scotland, the non-trunk road network is managed by the respective local authorities, whereas the trunk road is Transport Scotland's responsibility.

Trunk road

Transport Scotland is directly responsible for managing Scotland's trunk road and motorway network on behalf of Scottish Ministers. Scotland's trunk road network connects Scotland's major cities, towns, rural communities, airports and ports. It is Scottish Ministers' single biggest asset.

The network includes four key asset types:

- 3,752km of **carriageway**.
- 4,374 **structures**, such as bridges.
- 373,056 items and 28,968km of **ancillary assets**, such as lights and barriers.
- 18,244 items and 1,474km of **Traffic Scotland assets**.

Overall, the **trunk road network comprises assets worth over £27.4 billion**, and contributes £1.84 billion to the Scottish economy through the movement of goods and people.[3]

Overall, there was a decrease of 28% in the amount of trunk road that was newly constructed, reconstructed, strengthened or surface dressed in 2023-24 compared to the previous year. There has been little change in the length of motorway over the same period.[4]

Table 2: Total road length by council area (top 10)

COUNCIL AREA	TOTAL LENGTH (KM)	% OF ROAD NETWORK	TRUNK ROAD LENGTH (KM)	% OF TRUNK ROAD
Highland	7,747	13.5	961	25.7
Aberdeenshire	5,841	10.2	233	6.2
Dumfries and Galloway	4,542	8.0	352	9.4
Scottish Borders	3,160	5.5	167	4.5
Perth and Kinross	2,780	4.9	263	7.0
Fife	2,614	4.6	126	3.4
Argyll and Bute	2,582	4.5	296	7.9
South Lanarkshire	2,421	4.2	144	3.9
Glasgow, City of	1,957	3.4	108	2.9
Angus	1,877	3.3	55	1.5

Source: https://www.transport.gov.scot/media/4oolij2h/sts-chapter-04-road-network-reference-tables-accessible.xls

Figure 2: Scotland's trunk road network

Over a quarter of the total trunk road network, and about one-seventh of the total Scottish road network, is within the area of the Highland Council.

Road condition

In 2023-24, 20.4% of the motorway network, 15.6% of the dual carriageway and 14.1% of the single carriageway trunk road network required close monitoring of the state of the road surface.

The National Road Condition Indicator (RCI) showed that 29% of the local authority A road network may require some form of maintenance. For all road categories, the RCI increases to 34%.[5]

Travel behaviour (roads and traffic)

Transport and travel behaviour in Scotland was profoundly affected by the Covid-19 pandemic, with restrictions on travel in place for large parts of 2020 and some of 2021.

Prior to the pandemic, road traffic had been following a steadily increasing trend with total road traffic increasing by 10% in the 10 years leading up to 2019. Since the lifting of travel restrictions, there has been a recovery in the amount of road traffic. In 2023, 48 billion vehicle-km were travelled, which represents a 2% rise compared with 2022.[6]

The total volume of traffic on major roads (motorways and A roads) in 2023 was estimated to be 31.2 billion vehicle kilometres, comprising:

- 8.7 billion vehicle-km (18% of all traffic) on Motorways.
- 10.8 billion vehicle-km (22% of all traffic) on trunk A roads.
- 11.8 billion vehicle-km (24% of all traffic) on non-trunk A roads.

Therefore, 40% of the distance travelled on the road network is on trunk roads, which account for only 7% of the road network. The majority of A road traffic (68%) was in rural areas.

The total traffic on major roads was 3% higher than in 2022, with Motorway traffic increasing by 4%. Overall, traffic levels are around 11% higher than in 2013.[7]

In 2023, the volume of car traffic was 5% higher than in 2013. **Lights goods vehicle (LGV) traffic was 49% higher** and bus vehicle traffic was 25% lower. The significant growth in LGV traffic can be attributed to a range of factors including: regulatory and operational factors increasing the relative attractiveness of LGVs over HGVs; social and business changes, including growth of e-commerce and express delivery services; and changes to businesses' supply chain management with more frequent, smaller, 'Just in Time' deliveries.

Despite this, **cars account for approximately three quarters (73%) of the total volume of traffic on the roads**, light good vehicles for 20% and heavy goods vehicles for 5%. Pedal cycles fell by 5% in 2023 and only account for 1% of estimated traffic volume.

The seven local authorities with the highest traffic volumes (Glasgow, North Lanarkshire, Aberdeenshire, Edinburgh, Fife, Highland and South Lanarkshire) account for 46% of all traffic on Scotland's roads.

The Scottish Government's National Transport Strategy (NTS2) emphasises reducing travel by unsustainable modes by promoting walking, wheeling and cycling for shorter journeys. The goal was to reduce car-km by 20% by 2030, requiring a combination of people travelling less, switching to local destinations and reducing single-occupancy trips.

Scottish Government has since produced a renewed policy statement on achieving car use reduction in Scotland. The existing car use reduction target will be revised, informed by the advice of the Climate Change Committee and other relevant evidence, to develop a new, longer-term target which will support the 2045 net zero target.

Low Emission Zones

A Low Emission Zone (LEZ) is an area which sets an environmental limit on certain city roads, restricting access for the most polluting vehicles to improve air quality and public health. Scotland's LEZ's were introduced in May 2022 with Glasgow beginning enforcement in June 2024, Dundee in May 2024 and Aberdeen and Edinburgh in June 2024.[8]

Vehicles

74% of households had access to one or more cars or vans in 2023; 30% of households had access to two or more cars of vans.[9]

The number of new motor vehicle registrations in 2023 (204,911) was 14% more than 2022, however, it was 15% less than 2013. The trend in total vehicle registrations and new vehicle registrations suggests that, in recent years, people have been buying fewer new vehicles but retaining existing vehicles for longer.[10]

Of all new registered vehicles in 2023, 99,000 (48%) were petrol-propelled, and 41,000 (20%) were diesel-propelled. The remaining new vehicles registered in 2021 were mostly electric or hybrid-electric vehicles. Both these groups have seen steady increases in new registrations in recent years.

The Zero Emission Vehicle (ZEV) mandate in Scotland, part of a UK-wide scheme, requires a growing percentage of new car and van sales to be zero-emission, starting with 22% of new car sales in 2024 and increasing to 80% by 2030 and 100% by 2035.

Congestion and accidents

In 2023, based on the Scottish Household Survey, 12% of journeys made as the driver of a car were said to be delayed due to traffic congestion. Short delays were more common that longer ones, with weekday journeys most likely to suffer congestion delays.[11]

155 people were killed in road collisions in 2023, 16 less than the previous year. This was 11% less than the 2014-18 average, the time period used as the baseline for Scotland's Road Safety Framework to 2030.[12]

The cost of all road collisions (including damage only non-injury collisions) in 2023 was estimated at £1,189 million (2023 prices).[13]

Roads and freight

In 2023, it was estimated that:

- 118 million tonnes of goods were lifted within Scotland by UK HGVs and transported to destinations within Scotland.
- 16 million tonnes of goods from Scotland were delivered to destinations elsewhere in the UK.
- 20 million tonnes were brought to Scotland from elsewhere in the UK.

Most road freight journeys are 100km or less in length. 17% of tonnes lifted by road in Scotland in 2023 were carried a distance of no more than 25km. 29% travelled over 50km, but no more than 100km. The average journey distance, which is calculated by dividing the total tonne-km by the total tonnes lifted, was 116km.

In 2023, 19.7 million tonnes of goods entered Scotland on UK HGVs from the rest of the UK. 97% of these came from England. Around 7.3 million tonnes of goods entering came from the North West (38%).

In 2023, 'Products of agriculture, forestry and raw materials' was the largest single category of goods lifted in Scotland, which remained in Scotland, accounting for 36.5 million tonnes out of the total of 117.6 million tonnes.

In 2023, UK-registered HGVs carried an estimated 196,000 tonnes of goods from Scotland to countries outside the UK, and 81,000 tonnes from foreign countries into Scotland. Of goods leaving Scotland for abroad, carried by UK road hauliers, 58% went to France and 17% went to the Netherlands.

The volume of international road freight by UK HGVs travelling to and from Scotland is very small: less than 1 million tonnes in 2023.[14]

One of the major challenges that exists is to decarbonise the surface HGV sector. The UK Government has mandated that all new HGVs, including those 26 tonnes and under, will be zero-emission by 2035, with all new HGVs sold in the UK to be zero emission by 2040. Transport Scotland published a HGV Decarbonisation Pathway for Scotland in 2025 setting out a collaborative strategy to transition HGV's to zero emissions.

Active travel

Active travel is walking, wheeling or cycling for a purposeful journey. Wheeling includes using a wheelchair or mobility aid as an alternative to walking.

Active travel is fundamental to the interconnected priorities of Scotland's National Transport Strategy, and if it to be implemented successfully will require a shift in priority aligned to the transport hierarchy.

New and upgraded infrastructure that makes active and sustainable travel safer, easier and more convenient is essential to meet the 2030 vision that 'Scotland's communities are shaped around people, with walking or cycling the most popular choice for shorter everyday journeys'.[15]

National Cycle Network

The National Cycle Network (NCN) is developed by Sustrans, with the vision that the NCN is the backbone of Scotland's network of walking, cycling, and wheeling routes, spanning the whole of Scotland.

There are approximately 1,620 miles of National Cycle Network routes in Scotland. These include 695 miles of traffic-free routes, which use a mix of railway paths, canal towpaths, forest roads, shared-use paths, segregated cycle lanes and pre-determined rural footways.

With nearly half of Scotland's population living within 1km of the NCN, it provides an alternative to car travel which supports everyday trips and addresses the climate crisis.[16]

Figure 3: Scotland's Active Travel Network

Core paths

Every local authority and National Park Authority in Scotland is required to draw up a plan for a system of paths (core paths) sufficient for the purpose of giving the public reasonable access throughout their area. There are more than 21,000km of core paths in Scotland, including some on water for use by canoes, kayaks and other non-motorised craft.[17]

Bus

334 million passenger journeys were made by bus in Scotland in 2023-24. This is an increase of 13 per cent on 2022-23 but a 31% fall from a peak in 2007-08.[18]

Journeys under the National Concessionary Travel Scheme make up over half of this figure.

Passenger journeys fell by 11% for Scotland and 16% for Great Britain over the past five years, with vehicle-km also falling over the same period, by 16% and 15% respectively.

Service provision, as measured by the distance covered by local bus services (expressed as vehicle-km), was the same in 2023 asit was in 2022.

The number of buses in operators' fleets has decreased by 15% since 2017-18. There was a 13% decrease in the number of staff employed in the industry over the same period.[19]

There has been a substantial move in Scotland to reach Low Emission compliant standards, with an increasing emphasis on fleet electrification, supported by Scottish Government funding incentives.

Public bus services in Scotland are primarily run on a deregulated basis by private commercial operators, with some services supported through Public service contracts.

Rail

The declining trend in bus use contrasts with rail travel in Scotland. Although rail represents only a fifth of the number of passenger journeys made by bus, there were steady increases in passenger numbers over the years leading up to the Covid-19 pandemic.

Although passenger journeys on ScotRail services were significantly affected by the pandemic, they have been recovering and have now increased by 27% to 81 million in the 2023-24 financial year. This is still 16% less than 2019.

As of the end of 2022-23, Scotland had 2,708km of rail network (of which 887km is electrified) and 362 stations.

Total asset value for Network Rail across the UK is £93.08bn.[20] The Scottish specific valuation of that is not separately accounted for, however the percentage of Network Rail assets located in Scotland is approximately 17%.[21]

In 2023-24, Glasgow Central was the busiest national rail station in Scotland, with 25 million passenger journeys. Edinburgh Waverley was used by 21 million passengers, Glasgow Queen Street by 15 million, Paisley Gilmour Street by 3 million, Haymarket by 3 million, Partick by 3 million, Stirling by 2.4 million and Aberdeen by 2.3 million. Including those already listed, there were 58 stations for which half a million or more passenger journeys were recorded in the national ticketing system.

The number of passenger stations has increased from 340 in 2003-04 to 362 in 2022-23. The stations in Scotland, which have opened (or re-opened) since 1970, with the largest passenger volumes in 2023-24 include: Exhibition Centre (1,639,900), Argyle Street (1,270,900), Livingston North (995,000), Bathgate (898,200), Bridgeton (767,700), Edinburgh Park (522,400), Alloa (496,500) and Musselburgh (450,800). The newest stations in Scotland are included in Table 3, along with their opening date.

Table 3: Scotland's newest rail stations

STATION	OPENING DATE	PASSENGERS
Robroyston	Dec-19	245,300
Kintore	Oct-20	118,500
Reston	May-22	21,100
Inverness Airport	Feb-23	53,900
East Linton	Dec-23	21,600
Leven	Jun-24	N/A
Cameron Bridge	Jun-24	N/A

The local authorities which had the largest numbers of stations located in their areas in 2022-23 were Glasgow (61) and Highland (60). Since the completion of the Borders Railway Project in 2015, there are now 4 stations in Midlothian and 4 in the Scottish Borders council areas.

In 2023-24, 95% of ScotRail trains arrived within 10 minutes of the scheduled arrival time, 1.5% arrived 20 or more minutes late, and 1.8% were cancelled.

In 2023-24, 4 million tonnes of freight was lifted in Scotland by rail, 1% more than the previous year.[22]

Light rail: tram

The Edinburgh Tram opened in 2014 between Edinburgh Airport and York Place. The service is operated by Edinburgh Trams Ltd, a wholly owned subsidiary of Edinburgh Transport Holdings Ltd, in which the City of Edinburgh Council has a controlling interest.

When the Tram opened, there were 15 stops; this has increased to 23 in 2024, with the extension of the tram to Newhaven, which was completed in 2023 and added eight new stops along Leith Walk, The Shore, Ocean Terminal and Newhaven. Passenger journeys have increased from 4.1 million in 2015 to 10.1 million in 2024. Route length has increased from 14km in 2015 to 19km in 2024.[23]

There are proposals to extend the tram network further, including linking to the Granton Waterfront – a £1.3 billion transformation project in the north of the city.

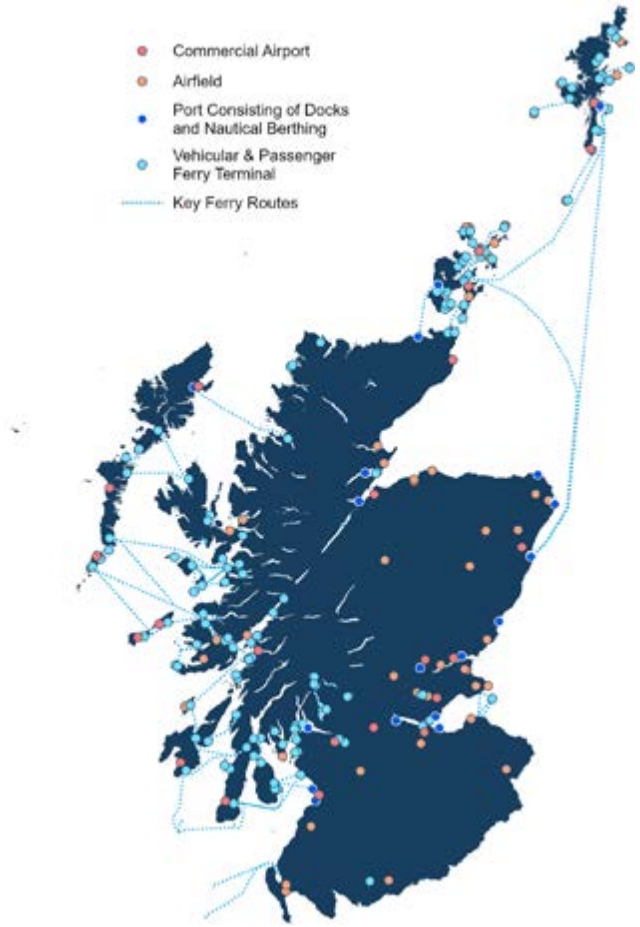
Light rail: subway

The Glasgow subway system is the third oldest in the world, opening in December 1896. The Subway runs every four minutes at peak times and takes 24 minutes to complete the 11km circuit of fifteen stations. It is run by Strathclyde Partnership for Transport (SPT) which is the largest of Scotland's seven regional transport partnerships.

From 2011 onwards, the Subway underwent a major modernisation programme delivering Smartcard ticketing and a complete refurbishment of the 15 stations, including the two city centre flagship stations, and the introduction of 17 new trains with new signalling and equipment to support maintenance of new trains, and a brand-new control centre.

The 15 stations of the Subway are distributed over the 11km circuit of the West End and City Centre, with eight stations to the North of the River Clyde and seven to the South. There are two lines: an Outer circle running clockwise and an Inner circle running anticlockwise, with all trains stopping at all stations no matter the direction.

Figure 4: Scotland's airports and ports



In 2024, there were 13.4 million journeys made on the Subway, up from 11.9 million in 2023, and also above pre-pandemic levels (13.1 million in 2019).

The Subway depot was also upgraded with an extension to the old stabling shed, new journeys were made on smart PAYG and more than 25,000 Smartcards were issued, taking the total to more than 350,000.[24]

Air

Airports provide economic and strategic value to Scotland, including lifeline services for isolated communities and allow time sensitive products to be traded internationally.

Edinburgh, Glasgow and Aberdeen airports are all under private ownership, while Highlands and Islands Airports Limited (HIAL), a company wholly owned by Scottish Government, manages the 11 regional airports including those in the Scottish Highlands, Northern Isles and Western Isles.

The Scottish Government acquired a 100% shareholding in Prestwick Aviation Holdings Limited, which owns Glasgow Prestwick Airport, in 2013, bringing it under public ownership. The Scottish Government has a long term goal of returning the airport to private ownership, with a current focus on cargo operations and spaceport development.

There were 26 million air passengers at Scottish airports in 2023, 21% more than in the previous year. Passenger numbers increased by 39% between 2010 and 2018, reaching a peak of 29.4 million before falling to 7 million in 2021 due to the pandemic and associated travel restrictions.[25]

The majority of passengers fly through Edinburgh, Glasgow and Aberdeen airports.

Air is one of the ways by which freight is transported in Scotland but it currently makes up only a small percentage of total freight (less than 1%). Air freight carried in 2023 decreased by 3,091 tonnes (6%) compared to the previous year.[26]

Air freight is normally only used for high value or time sensitive goods. However, as a result of changes brought about by the UK leaving the EU, as well as the development of drones, there might be a greater role for air freight in future. The increase in online shopping has also led to a greater demand for air freight to Scottish islands.

Maritime

Ferries

There were 8 million passengers carried on routes within Scotland in 2023, a rise of 5% compared to 2022 and 5% below peak numbers in 2007.[27]

Caledonian MacBrayne carried 5.1 million (63%) of these passengers and Western Ferries carried a further 16% on the Gourock-Dunoon route.

The busiest ferry route within Scotland in terms of passengers and vehicles carried is the service between Gourock and Dunoon, operated by Western Ferries, which carried 1.2 million passengers in 2023. There were 619,000 cars carried on this route and 29,000 commercial vehicles and buses in 2023.

Whilst the majority of passenger ferry services operate within Scotland, a service also operates between Cairnryan and Belfast in Northern Ireland.

Until its closure in 2018, the Rosyth to Zeebrugge freight route was the only ferry route between Scotland and Europe. There have been plans suggested by ferry operator DFDS to reintroduce a new direct ferry service linking Rosyth and Dunkirk in France.[28]

Ports

Ports are a key part of maritime infrastructure, providing the transport infrastructure between land and sea. They are critical in the effective movement of cargo and people.

Scottish ports provide hubs of regional and national economic activity as well as supporting important clusters of coastal employment.

Figures show that ports in Scotland handled 55 million tonnes of freight in 2023. Exports through major Scottish ports rose from 58 million tonnes in 1997 to 68 million tonnes in 2002 before steadily falling to 23 million tonnes in 2023. There has been a 27% fall in freight in the last ten years.[29]

Waterborne freight (both incoming and outgoing) passing through all ports decreased by 7% between 2022 and 2023 to 55 million tonnes. This was 23% less than in 2014, continuing a steady fall.[30]

In 2023, the eleven major ports, listed below, accounted for 94% of the total traffic through Scottish ports. Exports accounted for 44% of the total freight through major Scottish ports and domestic traffic accounted for 22%. Imports and incoming domestic freight were much lower, together accounting for 34% of the total freight through major Scottish ports.[31]

According to the British Ports Association, ports in Scotland employ 31,500 people, equivalent to 2.1% of total employment in the country The fishing industry in Scotland is also by far the largest in the UK. Landings at just three ports (Peterhead, Lerwick, and Fraserburgh) account for just over 50% of all landings by UK vessels.[32]

Scotland's coast is home to 11 major ports and more than 200 smaller ports and harbours, which have a range of public and private operators.

Scotland has a number of significant ports contributing to its economy and trade:

- **Forth:** (including Grangemouth, Leith, Dundee, Rosyth, Burntisland, Kirkcaldy and Methil): Grangemouth is Scotland's largest port handling 9 million tonnes of cargo each year through specialist container, liquid and general cargo terminals. This cargo flow represents as much as 30% of Scotland's gross domestic product (GDP), highlighting the port's essential role as an economic facilitator for Scotland.
- **Clydeport (Peel Ports Group, including Glasgow, Greenock, Hunterston and Ardrossan):** 10 million tonnes of freight traffic and second highest port for foreign traffic (8.1 million tonnes).
- **Cairnryan/Loch Ryan:** crucial gateway for freight and passenger traffic between Scotland and Northern Ireland, with around 400,000 freight units handled annually.
- **Sullom Voe (Shetland):** key hub for oil and gas activities.
- **Glensanda:** unique quarry port, operated by Aggregate Industries UK Ltd, specialising in shipping out granite aggregates from the largest granite quarry in Europe. In 2017, it handled 6 million tonnes of freight.
- **Aberdeen:** major commercial port serving the northeast of Scotland, known for its marine support for offshore energy.
- **Peterhead:** known as Europe's largest fishing port, also important for offshore oil and gas services.
- **Inverness:** located on the Cromarty Firth, it is part of a larger port area with potential for growth.
- **Oban:** a busy port on the west coast, serving as a key hub for ferry services.
- **Stornoway:** the primary port for the Outer Hebrides.
- **Troon:** a port on the west coast, known for its ferry services.

Bulk fuel (oil and fuel products) accounted for 31 million tonnes (59%) of the total traffic through major Scottish ports in 2023. The main types of traffic through the major ports in 2023 were crude oil (21 million tonnes), other dry bulk (7 million tonnes) and oil products (7 million tonnes).

In 2023, most exports were destined for the Netherlands (8.2 million tonnes), Poland (3.0 million tonnes), Germany (2.6 million tonnes) and Belgium (2.3 million tonnes) while most imports arrived from the USA (2.8 million tonnes) and the Norway (2.1 million tonnes).[33]

Green Freeports

Scottish Government has selected two Green Freeports, where port operators and business can benefit from a package of tax and customs incentives. These Green Freeports are:

- Forth Green Freeport.
- Inverness and Cromarty Firth Green Freeport.

Green Freeports are investment zones that will prioritise infrastructure projects focused on supporting a transition to net-zero and inclusive economic growth.

Canals

Scottish Canals are the public body who manage the canal network in Scotland on behalf of the Scottish Government.

Scottish Canals' primary responsibilities are:

- To maintain Scotland's 141 mile canal network, comprising Caledonian, Crinan, Forth & Clyde, Union and Monkland canals.
- To act as navigation authority for the canals and four locks in the Great Glen, which are linked to form the Caledonian Canal.

There are 21 water supply reservoirs, 88 locks in the Scottish canal system and a total of 235 bridges span the canal network.[34]

The canals are Scheduled Ancient Monuments and there are 22 Sites of Special Interest on or within 500m of a canal.

It is estimated that 22 million people visit Scotland's canals every year.[35] Whilst Scottish canals are primarily known for leisure boating and tourism, they also play a role in transporting cargo, particularly timber and materials, including for potential projects like the Coire Glas pumped hydro storage scheme. Ardrishaig Harbour on the Crinan Canal is a key asset for Scotland's timber trade, with exports averaging 100,000 tonnes per annum.[36]

Challenges and opportunities

Challenges

Funding and finance:

- Limited funding for competing demands.
- Cost and level of subsidy for public transport.
- Higher costs of accessibility on islands and in rural areas.
- Change in taxation regime as the system electrifies.

Service/system:

- Poor journey connections, reliability issues and lack of system integration e.g. enhancements required for timetable co-ordination and seamless connections.

Supply/demand:

- Limited evening and weekend public transport services.
- Reducing congestion in cities.
- Centralisation of public transport and limited provision in peripheral areas.
- Addressing differences in regional and local needs, particularly for rural and remote areas such as island communities and with changing demography.

Net Zero:

- High and persistent car dependency.
- Decarbonising the transport system to meet net zero targets.
- Decarbonising freight transport, especially Heavy Good Vehicles.

Climate resilience:

- Adapting the transport system to be resilient to the impacts of climate change.

Socio-economic:

- Reducing transport poverty i.e. the inability to access the transport required to meet daily needs and achieve a reasonable quality of life.
- Responding to changing demographics, including ageing population.
- Improving safety for vulnerable road users and for those on publictransport, particularly at night.
- Behaviour change to switch to active modes of transport.
- Addressing areas with limited or unreliable service provision which can lead to social isolation and reduced access to services, including education, healthcare and employment.
- Ensuring the transport system is accessible to all, including for those with health conditions

Opportunities

Data and technology:

- Adoption of new technologies, such as Ultra Low Emission Vehicles (ULEVs) to support net zero targets.
- Improvements in digital travel data and growth in mobility as a service (Maas) can shift to more sustainable travel behaviours and enhanced integrated ticketing.

Net Zero:

- Continued low carbon investment, including active travel development could reduce the operating cost of some transport.
- Behaviour and regulatory development such as ULEVs.

Service/system:

- Build on increasing rail use (trends in increasing passenger journeys on ScotRail services).
- Integrate transport and wider infrastructure policies and investments, including energy, to unlock greater benefits.
- Improve asset management across the transport network, including enhancing capability in capturing and managing data (including enhancement of digital tools), to support evidence-based and informed decision making, visualise performance and manage risk.
- Better integration of transport and spatial planning.
- Application of the Place Principle in prioritising transport investments can enhance outcomes for local communities.

Socio-economic:

- Interface with health: opportunity to enhance sustainable access to healthcare facilities for staff, patients and visitors.

Economic:

- New or enhanced international links and access to markets can enhance competitiveness and boost productivity.
- Low carbon and active transport investment can support sustainable tourism in Scotland.

Endnotes

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2 Transport Scotland (2024), Scottish Transport Statistics 2024: Chapter 4 – Road Lengths

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4 Transport Scotland (2024), Scottish Transport Statistics 2024: Chapter 5 – Road Traffic

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8 Low Emission Zones Scotland (2024), About Low Emission Zones

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14 Transport Scotland (2024), Scottish Transport Statistics 2024: Chapter 3 – Road Freight

15 Transport Scotland (2023), Active Travel: Walking, wheeling and cycling

16 Walk Wheel Cycle Trust (n.d.), The National Cycle Network in Scotland

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24 Strathclyde Partnership for Transport (2024), Annual accounts for the year ended 31 March 2024

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35 Scottish Canals (n.d.), Navigation resumes on the Caledonian Canal after historic winter works

36 Scottish Canals (n.d.), Ardrishaig Harbour

3 Energy

3.1 Sector summary

Responsibility

Certain aspects of energy policy have been reserved for the UK Parliament, while other elements are devolved to the Scottish Parliament. Since planning policy is devolved, the Scottish Government has the ability to shape the direction of energy generation in Scotland by approving or refusing new projects.

The Scottish Government's **Draft Energy Strategy and Just Transition Plan (2023)** sets a vision for the future of Scotland's energy system, aiming to transition to a low-carbon and sustainable system. This includes supporting renewable energy, promoting energy efficiency, and developing a local energy sector.

Operating model

Both private and public sector organisations are involved in Scotland's energy sector. The private sector is a major player in renewable energy deployment, while public funding plays a crucial role in early-stage research and development of emerging technologies.

Key roles in the energy sector include:

- **Generation:** this includes electricity generation infrastructure and operators, with a strong focus on renewable energy, particularly onshore and offshore wind. For offshore renewables **Crown Estate Scotland** has a key role, being responsible for the rights to leasing for offshore renewable energy and gas, as well as carbon dioxide storage.

  The majority of the UK's oil production and around half of its gas production comes from fields based in the continental shelf around Scotland.
- **Transmission:** the electricity transmission system in Scotland is managed by SP Transmission and SSEN Transmission (subsidiaries of Scottish Power and SSE plc respectively), who are responsible for transporting electricity across the country via high-voltage lines. The Transmission Operator (TO) network in Scotland includes overhead lines, underground (and subsea) cables and substations.

  The TOs works with **National Grid Electricity Transmission** to manage the overall UK electricity transmission grid, ensuring reliable and efficient electricity supply.

  For gas, **National Gas** is the transmission owner of the Gas National Transmission Network (NTS) – the 7,600km long high pressure gas network that transfers gas from offshore pipelines, LNG terminals and storage facilities (including gas injected from the North Sea at St Fergus in North East Scotland).
- **Distribution:** the **Distribution Network Operator (DNO)** manages the movement of local electricity and enables a more flexible and sustainable energy system. In Scotland, Scottish and Southern Electricity Networks (SSEN) manage the north and SP Energy Networks manages the central and southern areas.

  The **Gas Distribution Network (GDN)** operator for Scotland is Scotia Gas Networks (SGN), who manage the local gas infrastructure and are responsible for delivering gas to homes and businesses.
- **System Operator:** **The National Energy System Operator (NESO)** is a publicly owned body which ensures the system is balanced and supply meets demand, but doesn't own any infrastructure. NESO is also responsible for planning the future of the energy system in Great Britain.
- **Energy suppliers:** buy electricity and gas from the wholesale market and sell to homes and businesses.

Regulation

The Scottish Government is responsible for consenting large onshore and offshore electricity generation projects (over 50MW), while the UK Parliament retains legislative powers related to electricity generation, transmission and supply.

Local planning authorities handle applications for smaller onshore projects.

The **Office of Gas and Electricity Markets (Ofgem)** regulates the monopoly companies which run the gas and electricity networks. It takes decisions on price controls and enforcement, acting in the interests of consumers and helping the industries to achieve environmental improvements.

Asset value

Network: for the UK as a whole, the combined value of all the gas and electricity networks is estimated at £64 billion (2018).

Generation:

- The asset value of Scotland's renewables was estimated at £5.3 billion in 2018.
- The total asset value of Scotland's offshore wind was £288.6 million as of 31 March 2022.

Transmission:

- As at March 2024, SSEN Transmission had a Regulatory Asset Value (RAV) of just under £5.8 billion.
- As at March 2023, SP Energy Networks' RAV was £3.1 billion.

Asset strategies

Transmission:

- SSEN Transmission[1]
- SP Energy Networks[2]

Funding and investment

Ownership and funding in the Energy sector involves principally the private sector, funded by consumers in the form of user charges, although there are additional support mechanisms that are funded through public sector budgets via taxation. This impacts on the governance and therefore levers available in addressing sectoral opportunities and mitigating for challenges, some of which we will touch upon in our review.

Table 4: Energy asset ownership and funding

ASSET CLASS	OWNERSHIP	FUNDING
Electricity		
Generation	Private	Consumer (regulated)
Transmission and distribution	Private	Consumer (regulated)
Storage	Private	Consumer (emerging regulated)
Gas		
Extraction	Private	Consumer (regulated)
Storage and distribution	Private	Consumer (regulated)
Oil (and derivatives)		
Extraction	Private	Consumer
Storage and distribution	Private	Consumer
Heat	Public – local authority/ private	Consumer

- In December 2025, OFGEM approved £5.4bn of electricity grid investment by SPEN and SSEN over the next 5 years.
- In the UK energy sector, RAB (Regulated Asset Base) and CfD (Contracts for Difference) are key financing models. CfD guarantees a fixed price (strike price) for low-carbon generators (like offshore wind) after they start producing, while the newer RAB model for nuclear (like Sizewell C) shares construction risk, allowing consumers to pay a small levy from the start to lower investor costs and attract capital, ensuring long-term, stable funding for large, upfront infrastructure. CfDs pay generators the difference between the market price and their strike price, whereas RAB provides a regulated revenue stream during construction and operation, lowering

investment risk for big projects. The total value of CfD subsidies to date is in excess of £10 billion.

- In the June 2025 Spending Review, the UK Government confirmed **£8.3 billion in funding for GB Energy-Nuclear** and **GB Energy** in Aberdeen. This is alongside an increased commitment to the Acorn Carbon Capture, Usage and Storage project (St Fergus, Aberdeenshire), which will receive development funding of £200 million.
- **Emerging Energy Technologies Fund (EETF):** £180 million fund to support the development of the hydrogen sector and carbon capture and storage (CCS). The EETF provides capital support over five years from 2022-2026 to accelerate low carbon infrastructure projects.
- **Scottish Industrial Energy Transformation Fund (SIETF):** in September 2020, the SIETF made £34 million available for capital projects that could demonstrate significant reductions in greenhouse gas emissions through energy efficiency, switching fuel to a lower-carbon source or capturing carbon.
- £500 million through the **Scottish National Investment Bank** and enterprise agencies for investment in ports, manufacturing and assembly work to support major supply chain opportunities for offshore renewables.
- £4m **GB Energy** funding scheme to target clean energy projects in Scottish communities. Part of the Community Energy Generation Growth Fund which targets community-led renewable energy projects, allowing communities to generate their own energy and potentially reinvest profits.
- There are also various grants and funding opportunities to help homeowners and businesses improve energy efficiency, switch to cleaner heating systems, and support renewable energy projects. The Home Energy Scotland Grant and Loan scheme, for example, offers funding for energy efficiency measures and clean heating systems, with grants and interest-free loans available.

Key policy and strategy

- Draft Energy Strategy and Just Transition Plan (Scottish Government, January 2023).
- Powering up Britain: The Net Zero Growth Plan (HM Government, March 2023).
- Powering Up Britain: Energy Security Plan (HM Government, March 2023).

Reflection on last 20 years

Scotland's energy sector has undergone a significant transformation, marked by a substantial decline in coal-fired electricity generation and a rapid increase in renewable energy capacity and production.

The proportion and quantity of electricity generated from renewable sources in Scotland has increased significantly over the past 20 years. In 2024, 38.4TWh of electricity was generated from renewable sources in Scotland – the highest annual generation total. The majority of the renewable energy growth has come from wind, with most renewable electricity generated from onshore wind (58.7% in 2024).

Key national developments

Key National Developments (NPF4) in the energy sector include:

- Energy innovation development on the islands (1).
- Pumped hydro storage (Scotland wide) (2).
- Strategic Renewable Electricity Generation and Transmission Infrastructure (3).

Contribution to national outcomes

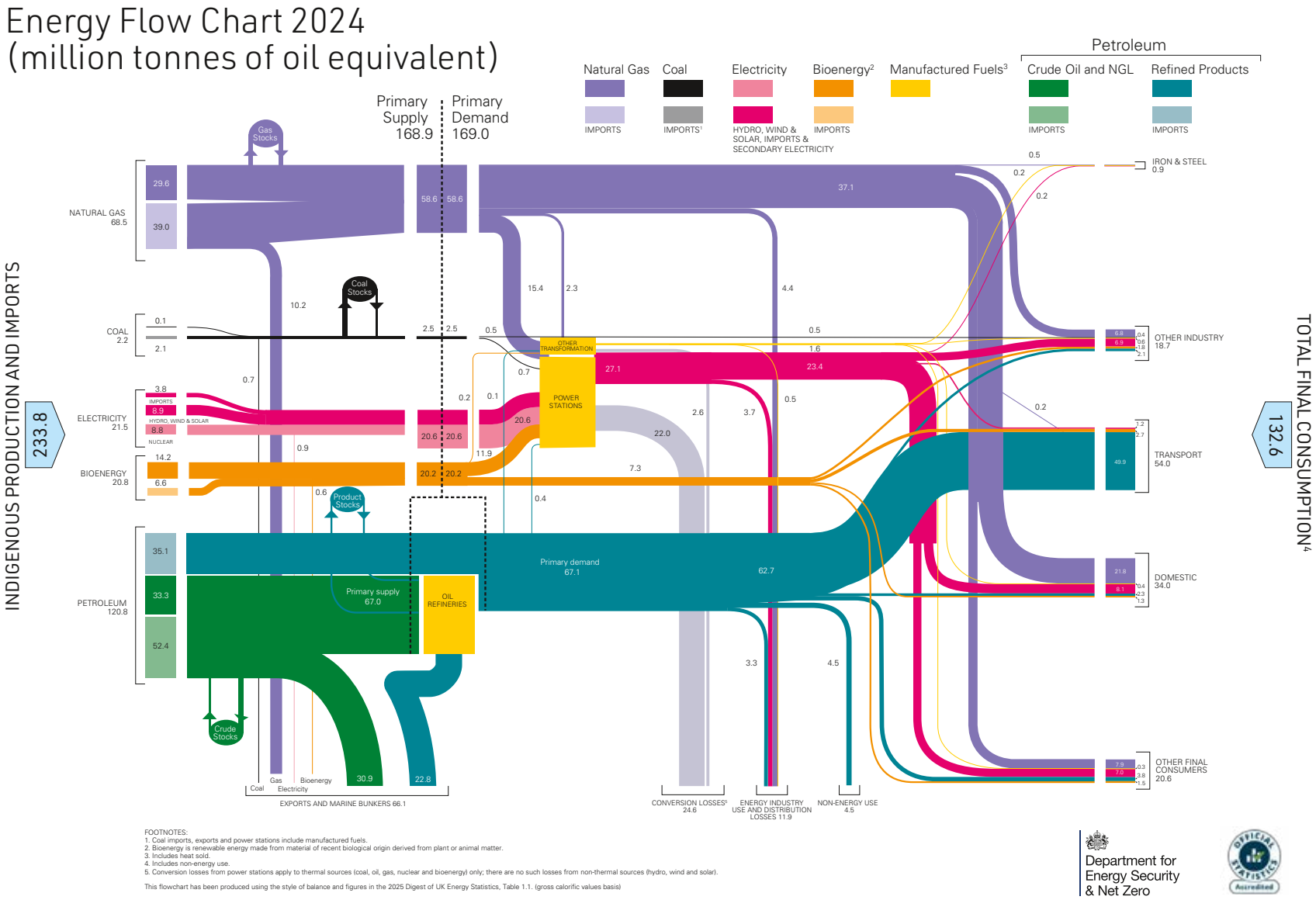
- Economy
- Environment
- Communities
- Poverty
- International

Delivery plans

- Transmission Acceleration Action Plan (November 2023).
- Hydrogen Action Plan (December 2022).
- UKG Clean Power 2030 Action Plan (2040).

3.2 Sector analysis

Scotland's energy system is a complex mix of infrastructure at all scales and under a wide range of ownership structures. It includes the infrastructure used in the extraction, transformation, transmission and distribution and storage of energy around the country. It also links closely to several other major infrastructure groups including transport and housing. This is illustrated in the chart below.



FOOTNOTES:
1. Coal imports, exports and power stations include manufactured fuels.
2. Bioenergy is renewable energy made from material of recent biological origin derived from plant or animal matter.
3. Includes heat sold.
4. Includes non-energy use.
5. Conversion losses from power stations apply to thermal sources (coal, oil, gas, nuclear and bioenergy) only; there are no such losses from non-thermal sources (hydro, wind and solar).

This flowchart has been produced using the style of balance and figures in the 2025 Digest of UK Energy Statistics, Table 1.1. (gross calorific values basis)

Department for Energy Security & Net Zero

As a sector, it is undergoing significant transformation towards a low-carbon future, including significant investment in renewable energy, supporting industrial decarbonisation and improving energy efficiency in homes and businesses.

The key groups of energy infrastructure in Scotland are:

- **Generation:** including both renewable (primarily wind, hydro and solar) and non-renewable (including oil, gas and nuclear) sources. Energy from waste is covered in Section 4.

  Oil and gas infrastructure is associated with extraction from the North Sea, including offshore infrastructure such as oil rigs and pipelines to transport oil and gas to onshore sites, and the infrastructure associated with developing, maintaining and finally decommissioning oil and gas fields.

- **Transmission and distribution:** this includes both electricity and gas transmission networks. These networks are used to transport energy from source to demand within Scotland and to facilitate the import and export of electricity and gas with the rest of the UK. These cover both **transmission** (bulk national transportation of energy) and **distribution** (delivery of energy to end users and connection of smaller, more local sources to the wider system).
- **Storage:** Scotland is investing heavily in energy storage infrastructure to support its transition to a low-carbon energy system and ensure a stable and reliable electricity grid. The primary focus is on developing Battery Energy Storage Systems (BESS) and pumped hydro storage.

  The above categories are likely to be extended to include **Hydrogen production** and **Carbon Capture Utilisation and Storage (CCUS)** infrastructure.

  Heat networks are closely linked to generation, with many possible technologies that can provide the input to a heat network.

- **Heat infrastructure:** includes both the production of heat and the delivery of the heat to end use. It includes a growing number of district and community heating schemes (heat networks) as well as the infrastructure used in the production of heat.

  Finally, a critical aspect of the transition to net zero is the more efficient use of our energy.

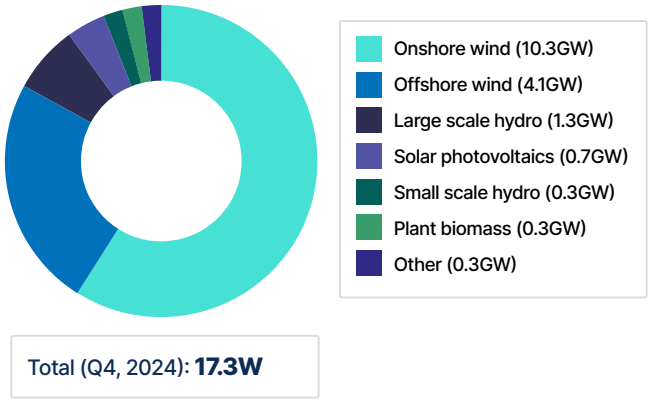
- **Energy efficiency:** has been designated as a national infrastructure priority in Scotland and covers end use appliances which represent the final demand for energy, along with building insulation in the domestic and non-domestic sectors.

Generation (electricity)

The electricity system is changing radically. Scotland's last coal power stations at Cockenzie and Longannet have closed in recent years, while renewable generating capacity has increased, now exceeding 17GW in 2024 (Q4 2024) – leading to a huge reduction in the carbon intensity of Scotland's electricity supply. This represents a 12.9% increase in renewables compared to 15.4GW at the end of 2023.

In 2023, 70% of all electricity generated in Scotland was from renewable sources, while 91% was generated from low carbon sources (including nuclear and pumped storage).[3]

Figure 5: Operational renewable capacity 2024 (Source: Scottish Energy Statistics Hub)



Fossil fuels

Peterhead gas fired power station is the last major fossil fuel generator in Scotland, providing up to 1.18GW of generation capacity.

Nuclear

Scotland has two EDF-owned nuclear stations: Torness which is still generating electricity, and Hunterston B, which is currently being decommissioned. The Unit B2 (Reactor 4) of the Hunterston Nuclear Power Plant in North Ayrshire was permanently shut down in 2022 after generating electricity for 46 years. Hunterston B1 (Reactor 3) shut down in 2021. When operational, the two reactors at Hunterston B provided enough base-load electricity to power 1.8 million homes.[4]

There are three Nuclear Decommissioning Authority-owned civil nuclear sites that are at advanced stages of decommissioning – Dounreay, Chapelcross and Hunterston A.

Renewables

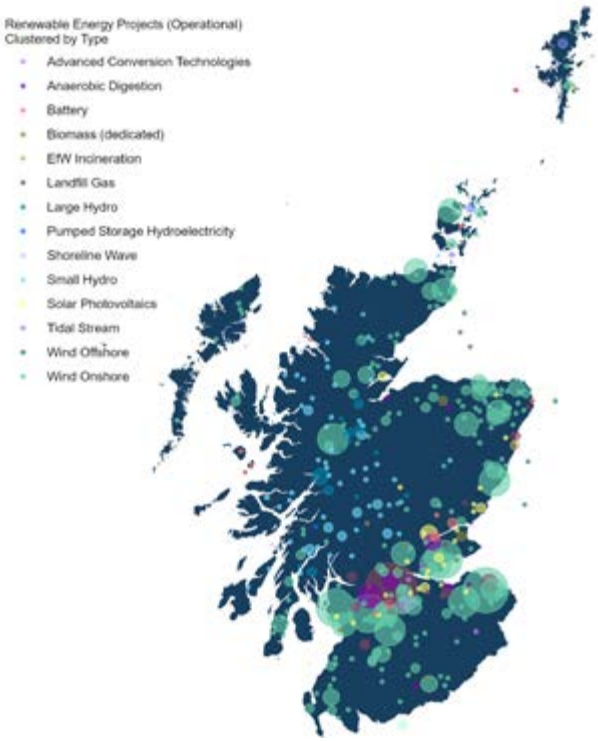
Figure 6 shows total renewable annual electricity generation in Scotland in Q4 2024, with a total cumulative installed capacity of 17.4GW. Over the preceding 12 months, renewable electricity capacity rose 12.9%, largely due to increases in onshore and offshore wind capacity.[5]

Wind (onshore)

Data shows 332 operational onshore wind sites across Scotland. The largest is the Viking Wind Farm (Shetland).[6] Completed in September 2024, it has 103 turbines and an installation capacity of 443MW. The other two largest wind farms – with an installed capacity of over 300MW – are Clyde Wind Farm and Whitelee, which are both located in Strathclyde and have capacities of 350MW and 322MW respectively.[7,8]

There were 27 onshore wind farms under construction, with the largest, in terms of planned installed capacity, being South Kyle Wind Farm (Strathclyde) at 240MW.[9] There were 99 schemes with planning permission granted and 135 with planning permission submitted. Of those with permission granted, the largest planned installed capacity is Sanquhar 2 Community Wind Farm (Dumfries & Galloway). Of those with planning permission submitted, the largest planned installed capacity is Scoop Hill Wind Farm with 525MW (Dumfries & Galloway) followed by Teviot Wind Farm (Borders) at 350MW.

Figure 6: Operational renewable energy projects



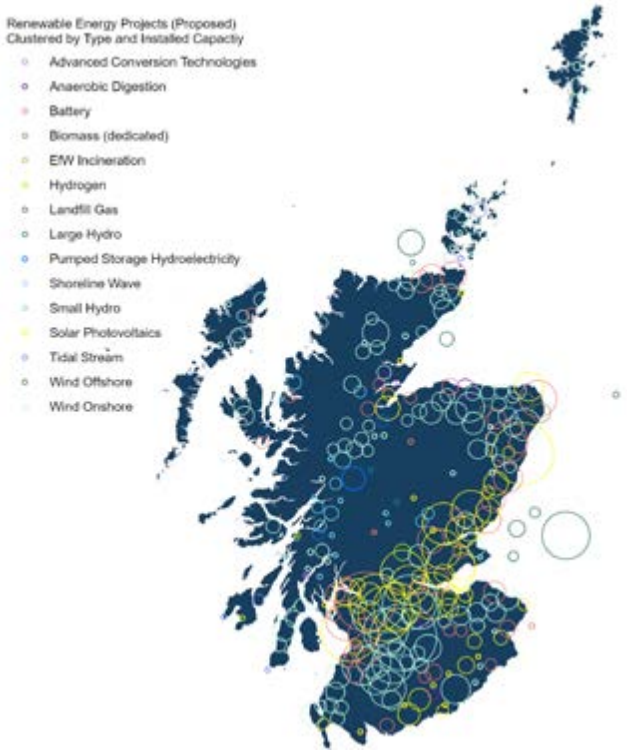
Wind (offshore)

Data shows 10 operational offshore wind farms[3].

Seagreen, situated 27km off the Angus coast in the North Sea's Firth of Forth, is Scotland's largest wind farm as well as the world's deepest fixed-bottom offshore wind farm, with its deepest foundation installed at a record 58.7m below sea level.[10]

Seagreen is operated from a dedicated onshore operations and maintenance Base at Montrose Port.

Figure 7: Proposed renewable energy projects



The 1,075MW project has the capacity to generate enough renewable electricity to power almost 1.6 million homes annually, equivalent to two-thirds of all Scottish homes. Seagreen also has the capability to displace over 2 million tonnes of carbon dioxide from electricity generated by fossil fuels every year – making a significant contribution to Scotland's net-zero target.[11]

Seagreen is followed by Moray East with an installed capacity of 950MW. The wind farm is located in the outer Moray Firth and is operated from Fraserburgh Harbour.[12]

There are 3 schemes under construction, with the largest being Moray West with a planned installed capacity of 882MW.[13] There are 6 schemes with planning permission granted, awaiting construction. The largest is Inch Cape with a planned capacity of 1,080MW and set to be constructed 15km off the Angus coast.[14]

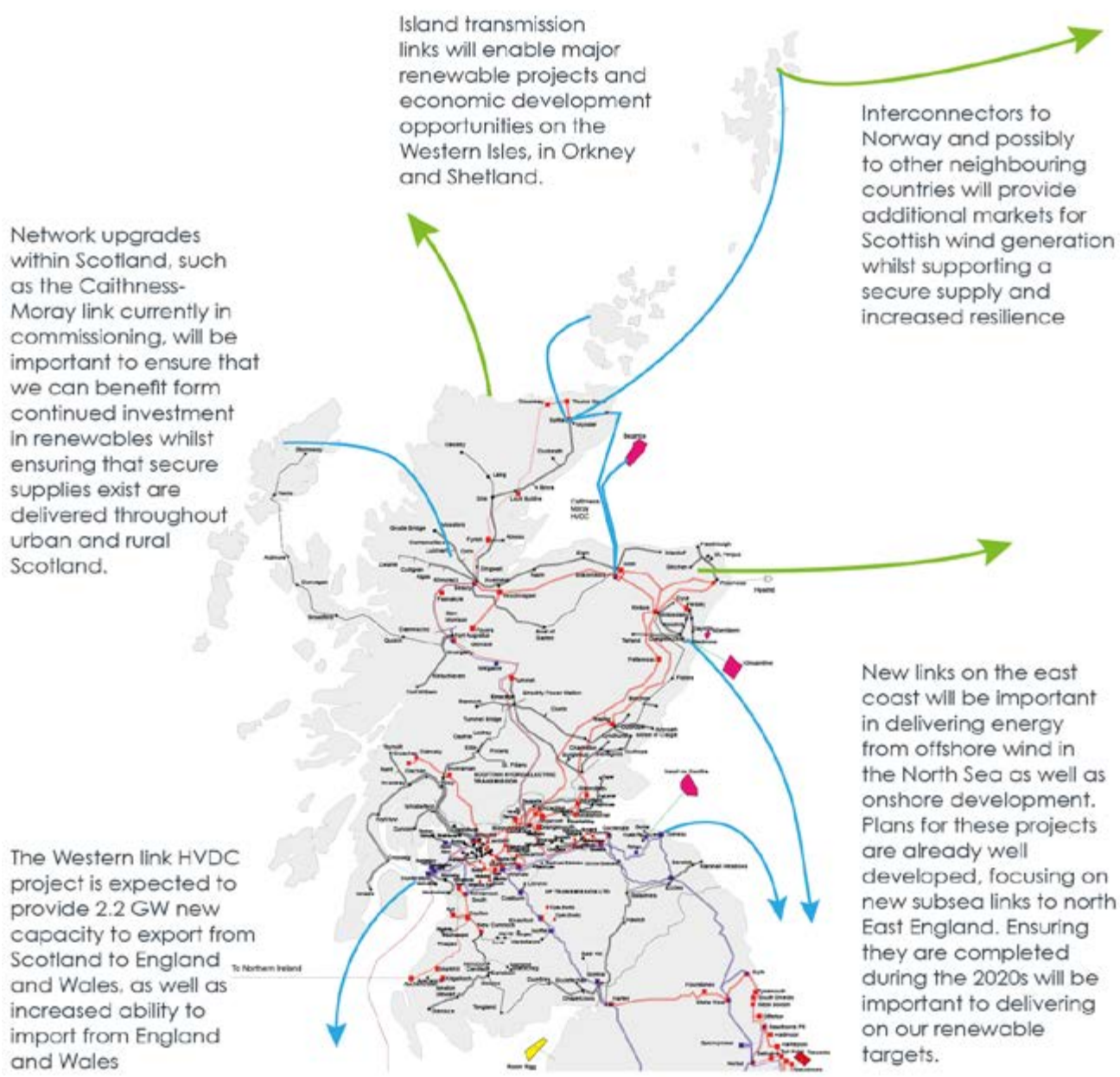
Two further large schemes have been consented but are Pre FID, namely Berwick Bank Offshore Wind Farm (4,100MW)[15], followed and West of Orkney Wind Farm (2,000MW).[16]

Shoreline/wave/tidal

There are 5 tidal stream operational projects. The largest tidal stream project is Inner Sound Phase 1A (MeyGen) which is located in the Pentland Firth, Orkney, and has an installed capacity of 6MW.[17]

There are four planning permissions submitted (4 tidal, 1 shoreline), with the largest scheme being Brims Tidal Array (200MW, Cantick Head, Orkney).[18] There are 5 tidal schemes with planning permission granted, with the largest being Phase 2 of MeyGen (59MW).[19]

Figure 8: Scotland's electricity transmission network (new transmission links)



Pumped hydro

There are currently two operational pumped storage hydroelectricity sites in Scotland – Cruachan (Loch Awe, 440MW)[20] and Foyers (Loch Ness, 300MW).[21] Cruachan Power Station, also known as the 'Hollow Mountain', resides deep inside Ben Cruachan mountain in Argyll and Bute. As well as having enough capacity to power more than 500,000 homes for about 15 hours, the power station is also a tourist attraction with a visitor centre and cafe.

No pumped storage schemes are in construction, however, three planning applications have been submitted: Earba Pumped Storage Hydro (Highland, 1800MW)[22], Balliemeanoch Pumped Hydro Project (1,500MW, Argyll & Bute)[23] and Loch Ness and Loch Kemp – Pumped Hydro Scheme (600MW, Highland).[24] Five projects have planning permission granted. The largest of these is Coire Glas (1,300MW, Highland).[25] Two of these applications relate to expansion and upgrade of the Cruachan Power Station.

Large hydro

There are 19 large hydro schemes in Scotland, not including the two referenced above. The largest of these is the Glendo Hydro Scheme(Highland) which has a capacity of 100MW.[26] The 19 large hydro schemes have a combined capacity of almost 423MW. There are currently no planning permissions granted or submitted.

Small hydro

There are 67 small hydro schemes with a combined capacity of 134MW. There are 8 small hydro schemes under construction, totalling 8.4MW of capacity. There are 10 small hydro schemes with planning permission granted, awaiting construction, with a total capacity of 10.5MW. Finally, there are a further four with planning permission submitted.[27]

Solar PV

There are 39 operational solar photovoltaic arrays, with the largest being Errol Estate with a capacity of 13MW.[28] There are 17 projects under construction, with the largest being Bilbo Soar Farm (Aberdeenshire, 36.6MW).[29] There are 45 projects with planning permission submitted, with the largest being Tealing Solar Energy Park – Phase 2 (110MW, Tayside).[30] There are 222 projects with planning permission granted, with a combined total capacity of 1,150MW.

Bioenergy and waste

There are 14 anaerobic digestion plants, with the largest being the Glasgow Renewable Energy and Recycling Centre (5MW).[31] There are 2 plants under construction and planning permission granted for a further 10 projects.

There are 16 operational biomass energy plants, the largest being the Markinch Biomass CHP Plant (65MW).[32] There are 2 projects with planning permission submitted and 13 with planning granted, awaiting construction.

There are 5 operational energy-from-waste (EfW) projects, with the largest being Dunbar at 25.6MW.[33] There are a further 5 under construction and planning permission granted for a further three.

Transmission and distribution (electricity)

In 2019, it was estimated that there was 71,000 miles of electricity cable in Scotland and 98,000 transformers, with £1.0 billion spent on running and investing in the electricity network each year.[34]

Electricity system operator

The National Electricity System Operator (NESO) is responsible for the day-to-day security of the electricity system across Britain, adjusting which power stations are operating and ensuring sufficient back up.

NESO is also responsible for planning the future of the energy system including recommending which major network investment projects should go ahead.[35]

Electricity transmission network

The onshore transmission network in Scotland is owned by SSEN Transmission and SP Transmission, divided into 7 boundaries.[36]

SSEN Transmission (75%-owned subsidiary of SSE plc) is responsible for the electricity transmission network in the north of Scotland. They maintain and invest in the high voltage 132kV, 220kV, 275kV and 400kV electricity transmission network.[37]

The network consists of underground and subsea cables, overhead lines on wooden towers or steel and in excess of 100 grid supply points in the network.

SP Transmission plc is a wholly owned subsidiary of SP Energy Networks, responsible for the transmission of electricity in central and southern Scotland. The transmission network consists of over 4,500km of overhead lines and over 600km of underground cables, with 150 substations and in excess of 100 grid supply points.

Electricity distribution networks

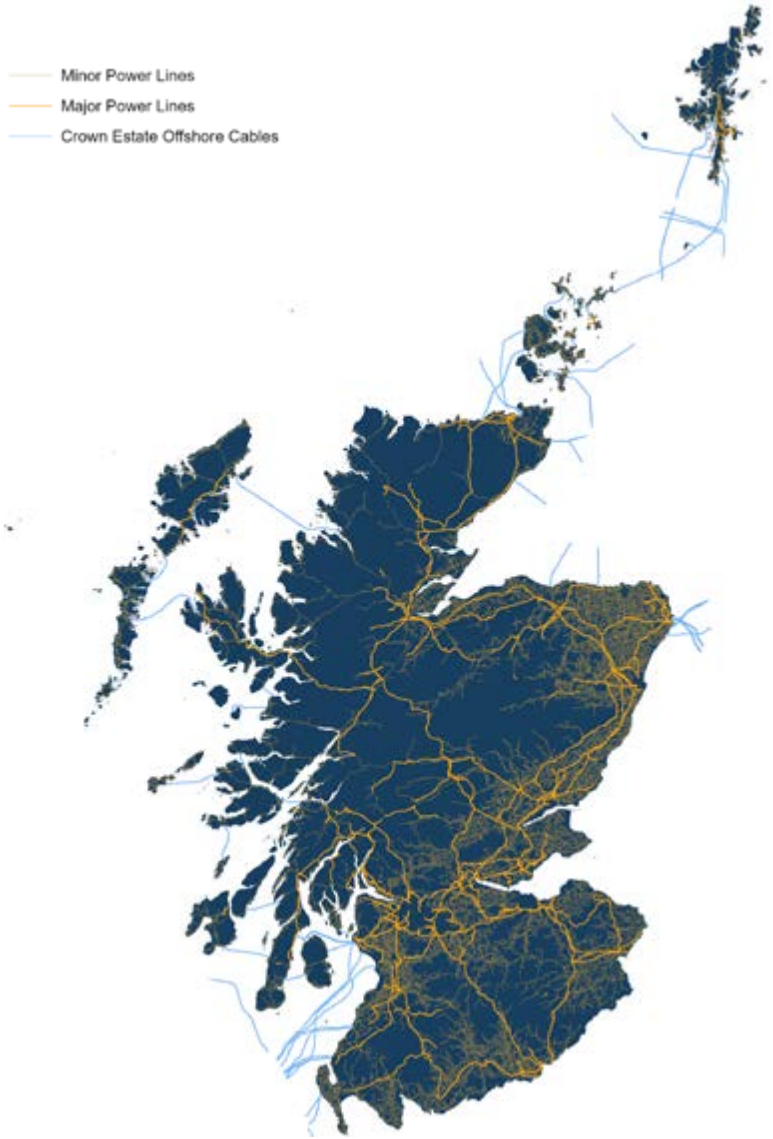
This is the low voltage networks that bring electricity to homes and businesses. They are owned by a Distribution Network Owner (DNO) – SSE Energy Networks and SP Energy Networks. The shift to renewables means that electricity supplies within Scotland have become more variable, increasing the importance of the transmission network linking Scotland with England and Wales.

Two major projects are in the process of increasing the capacity of the Scottish transmission network. The Western HVDC Link, which connects Hunterston to Deeside in North Wales via an undersea cable, will add around 2,200MW of new capacity to the transmission network – allowing more electricity generation in Scotland to connect and meet demand across the UK.[38]

The Caithness-Moray HVDC link is a 1,200MW undersea connection between Spittal in northern Caithness and Blackhillock in Morayshire, which was commissioned in January 2019. This link increases the capacity available to transport renewable electricity generated in northern Scotland, including Orkney and Shetland, into the wider transmission network.

Scotland's electricity transmission and distribution network has a strategic role to play, along with new transmission links, to enable Scotland is able to make the most of opportunities for renewable generation and ensure security and reliability of electricity supply. This includes adapting the network to the shift away from large centralised thermal power plants to smaller scale, more highly distributed sources of generation, largely from renewable sources.

Figure 9: Scotland's electricity transmission network



Oil and gas infrastructure

Oil and gas exploration has been a major activity in Scottish offshore waters since the late 1960s. In 2018, it was estimated there were 112 active platforms and over 14,800km of pipeline.[39]

Production of oil and gas across the UK Continental Shelf (UKCS) increased steadily since 2014, following several years of substantial investment in the development of new and existing fields. Between 2011-2018, 42 new fields started production.

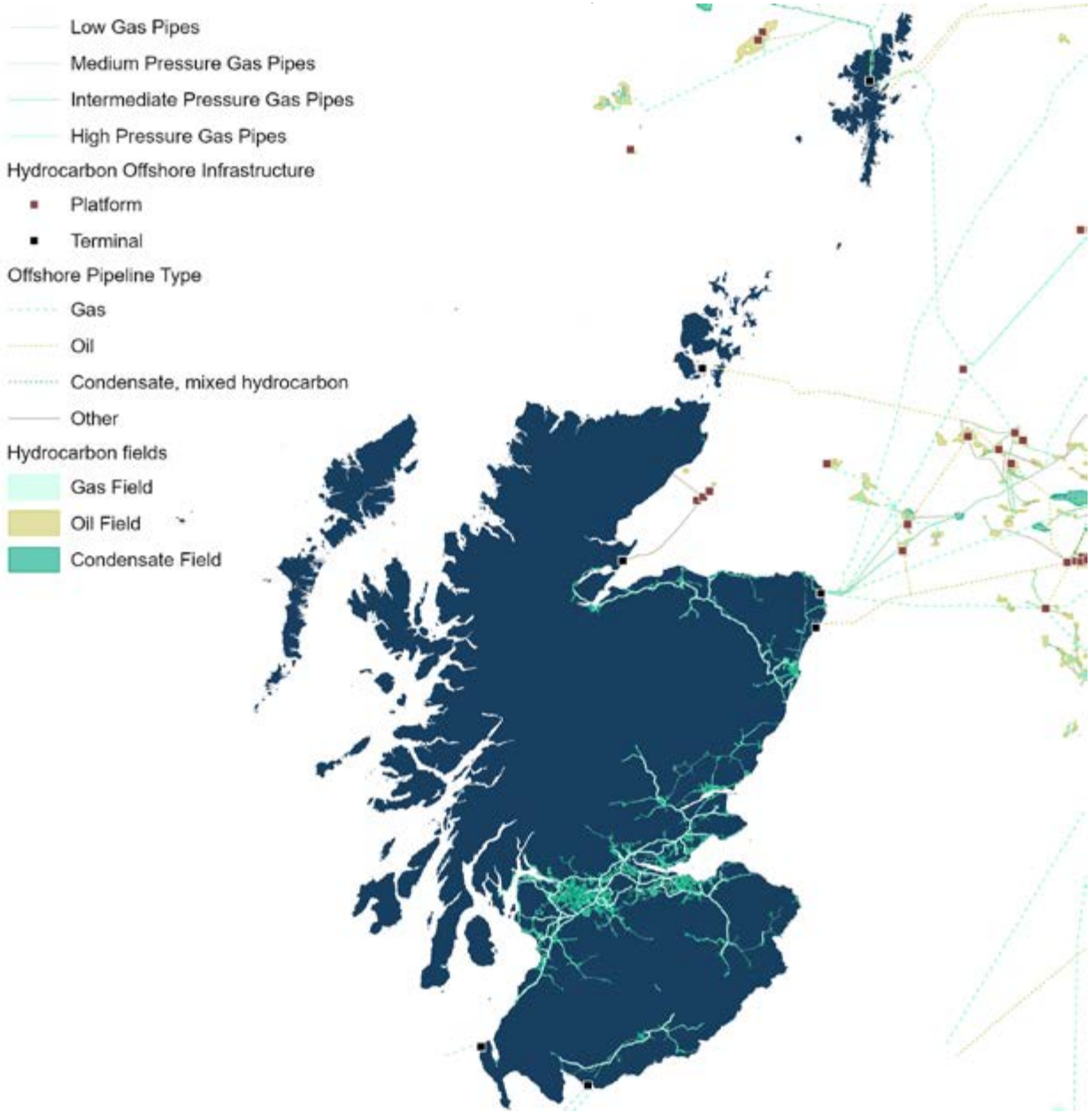
Most oil and gas fields in the Scottish sector of the UKCS are located in the North Sea, with the exceptions being Lybster field located in the Moray Firth and some activity to the west of Shetland.

There is extensive infrastructure associated with these developments, both on the sea bed and on land. This includes platforms, pipelines and terminals. There is currently no natural gas storage activity in Scottish waters.

In 2021, Scotland (including Scottish adjacent waters) produced an estimated 65.1 million tonnes of oil equivalent (Mtoe) of crude oil and natural gas liquids (NGLs), equivalent to 757TWh.[40] This is approximately 35% of its peak in 1999, and a decrease of 16.1% from 2020.

Long-term production is in decline and is expected to continue for 20 years. Older, mature fields are reaching the end of their economic life and will require decommissioning.

Figure 10: Oil and gas infrastructure



Carbon Capture Utilisation and Storage (CCUS)

Carbon capture encompasses the methods and technologies required to capture carbon dioxide from large emitters, thereby preventing it from entering the atmosphere.

Carbon Capture and Storage (CCS) is when carbon dioxide is captured and transported to be stored safely and permanently in deep underground geological formations. Carbon Capture and Utilisation (CCU) is when captured carbon dioxide (normally biogenic) is used as a feedstock in chemicals, fuels or materials production, giving the carbon dioxide economic value whilst playing a role in sustainable manufacturing and forming part of the circular economy.

The North Sea's CO_2 storage potential through existing oil and gas infrastructure provides a unique opportunity for CCUS projects. There is also a unique opportunity to repurpose the existing network of oil and gas pipelines which link Scotland's industrial clusters in North-East and Central Scotland for the transportation of carbon dioxide to storage sites.

Negative Emissions Technologies (NETs) are an emerging field of technologies that may be underpinned by CCS, such as Bioenergy with CCS (BECCS) or Direct Air CCS (DACCS). The aim of NETs is to permanently remove carbon dioxide from the atmosphere. The Scottish Government published a detailed feasibility study in November 2023 to explore the opportunities of developing NETs in Scotland.[41]

The Scottish Government supports the development of Carbon Capture, Utilisation and Storage (CCUS) which can play a central role in the decarbonisation strategies of key sectors such as heat, industry and power.

Key to the success of CCUS will be the Scottish Cluster, a group of emitter projects which will be linked by pipeline to the Acorn Transport and Storage project, located at St Fergus. Carbon dioxide which has been captured at these emitters projects will be transported by pipeline to Acorn, and then onwards to be injected and stored permanently under the North Sea in depleted oil and gas wells. The Acorn Transport and Storage project has an ambition to store up to 5 million tonnes of carbon dioxide per year by early 2030's.

Hydrogen production

Green hydrogen is made by splitting water into hydrogen and oxygen using renewable energy, and can be used for fuel for transportation, commercial and industrial heat or stored to generate electricity.

Scotland is committed to becoming a world-leading hydrogen nation and major exporter. This is set out in Scottish Government's Hydrogen Policy Statement.[42] The ambition is 5GW of clean hydrogen production by 2030 and 25GW by 2045.

Scotland's large renewable energy resource makes it a promising hub for large-scale hydrogen projects and these hubs could become a key way of balancing a renewables dominant electricity system as well as the focus for efuel production such as methanol and ammonia.

Heat infrastructure

More than half of Scotland's energy consumption is used for heating. To meet the Scottish Government's commitment of decarbonising heat by 2045, it is essential to change how we heat our buildings, moving away from individual gas boilers.[43]

Heat networks supply heat to homes and buildings from a central source, avoiding the need for individual gas boilers. The can be fuelled by both gas and low/zero carbon sources.

Currently, just under 2% of Scotland's heat is supplied from heat networks.[44]

Scotland's heat network targets are set out in the Heat Networks (Scotland) Act 2021.[45] This requires that the following amounts of thermal energy are supplied through heat networks:

- 2.6 terawatt hours of output by 2027.
- 6 terawatt hours of output by 2030.
- 7 terawatt hours of output by 2035.

These figures equate to approximately 3%, 8% and 9% of current non-electrical heat consumption respectively.

Local Heat and Energy Efficiency Strategies (LHEES) are at the heart of a place-based, locally-led and tailored approach to the heat transition. These

local strategies underpin an area-based approach to heat network and energy efficiency planning and delivery.

Energy efficiency

The vast majority of household energy consumption is for heat purposes (87%), with approximately three quarters (76%) of all energy consumption from space heating.

The Climate Change Plan (2025) sets ambitions in the residential sector for energy and emissions intensity to fall by 30% from 2015 levels. Energy intensity is the average energy use per household in Scotland.[46]

From 2005 to 2020, energy intensity fell by 24.8% to 17.4MWh. This is despite a 10.3% increase in the number of households and is driven by a 17.1% decrease in energy consumption – from 2015 to 2020, energy intensity increased by 0.5%, due to a 2.3% increase in domestic energy consumption.

The Climate Change Plan (2025) also sets ambitions in both the industrial and services sectors to improve energy productivity by 30%, through a combination of fuel diversification, energy efficiency improvements and heat recovery. Energy productivity is calculated as sectoral GVA divided by energy consumption in each sector.

Industrial energy productivity in Scotland stands at £0.67 million GVA per GWh in 2022, up 6.3% compared to the baseline in 2015.

Scottish Government plans to introduce regulations to reduce greenhouse gas emissions from heat in non-domestic buildings.

Energy Performance Certificates

An EPC provides information about how energy efficient a building is, and how the efficiency could be improved. Buildings are rated on a scale from A to G, with A being the most efficient.

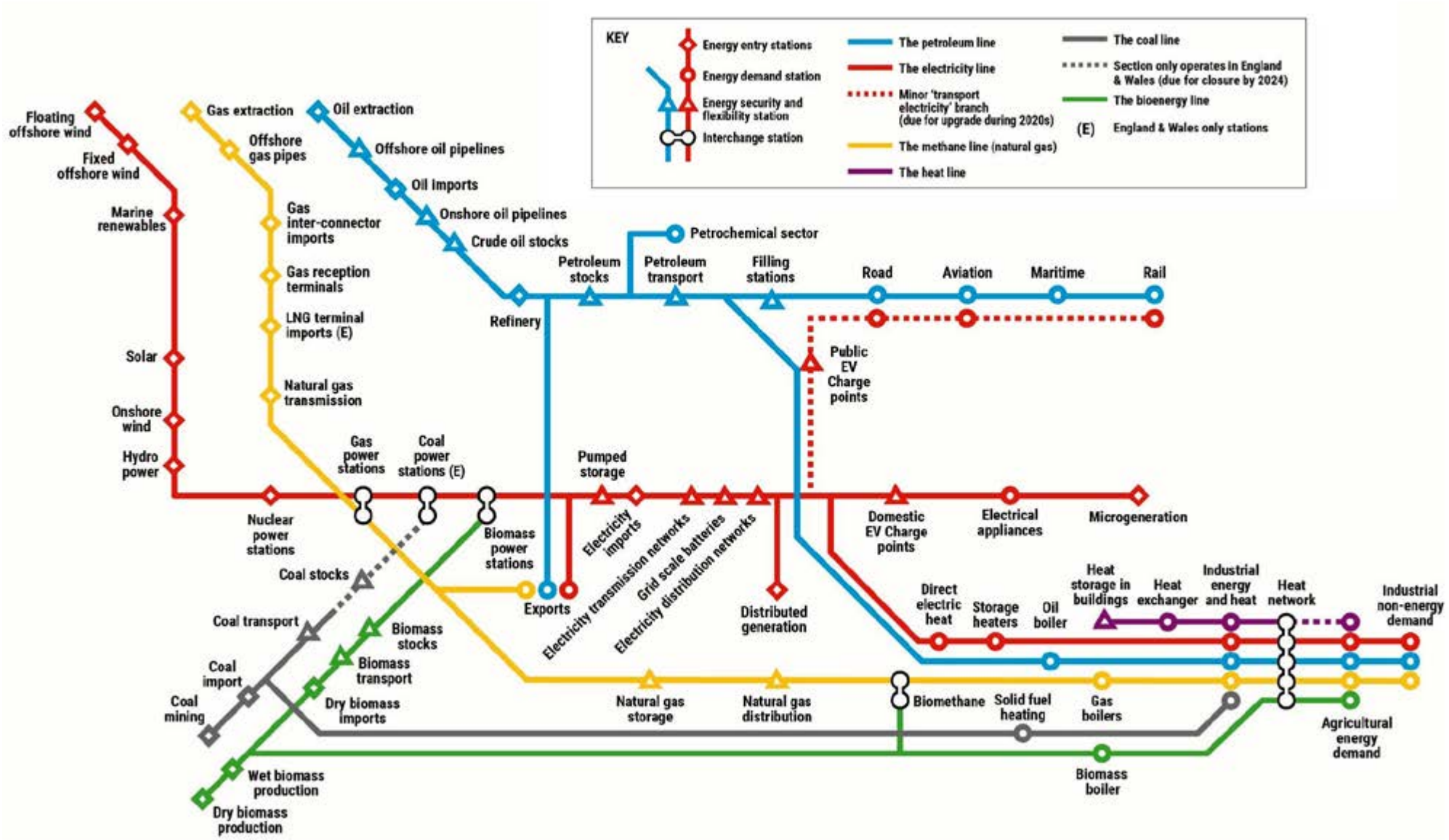
In 2019, 62% of homes were owner occupied, of which only 42% were rated as Energy Performance Certificate (EPC) band C or better.[47] Scottish Government's 'Heat in Buildings Strategy', sets out initial proposals to improve the energy efficiency of privately owned homes across Scotland. This Strategy also set out our proposals that would prohibit all buildings from using direct emissions heating systems by 2045.

Scottish Government introduced the Energy Efficiency Standard for Social Housing (EESSH) in 2014. As a result, homes in the social rented sector are now some of the most energy efficient in Scotland, with 85% already achieving EPC D or above.

Homes in the private rented sector are more likely to be in the lowest bands for energy efficiency when compared with other areas in the domestic sector.There are approximately 230,000 non-domestic buildings in Scotland, and these vary widely in terms of construction, size, and use. All non-domestic buildings are required to produce an Energy Performance Certificate (EPC) on sale or rental to a new tenant. Since 2016 regulations have required non-domestic buildings over 1,000sq m to produce an Energy Action Plan at the point of sale or rental.

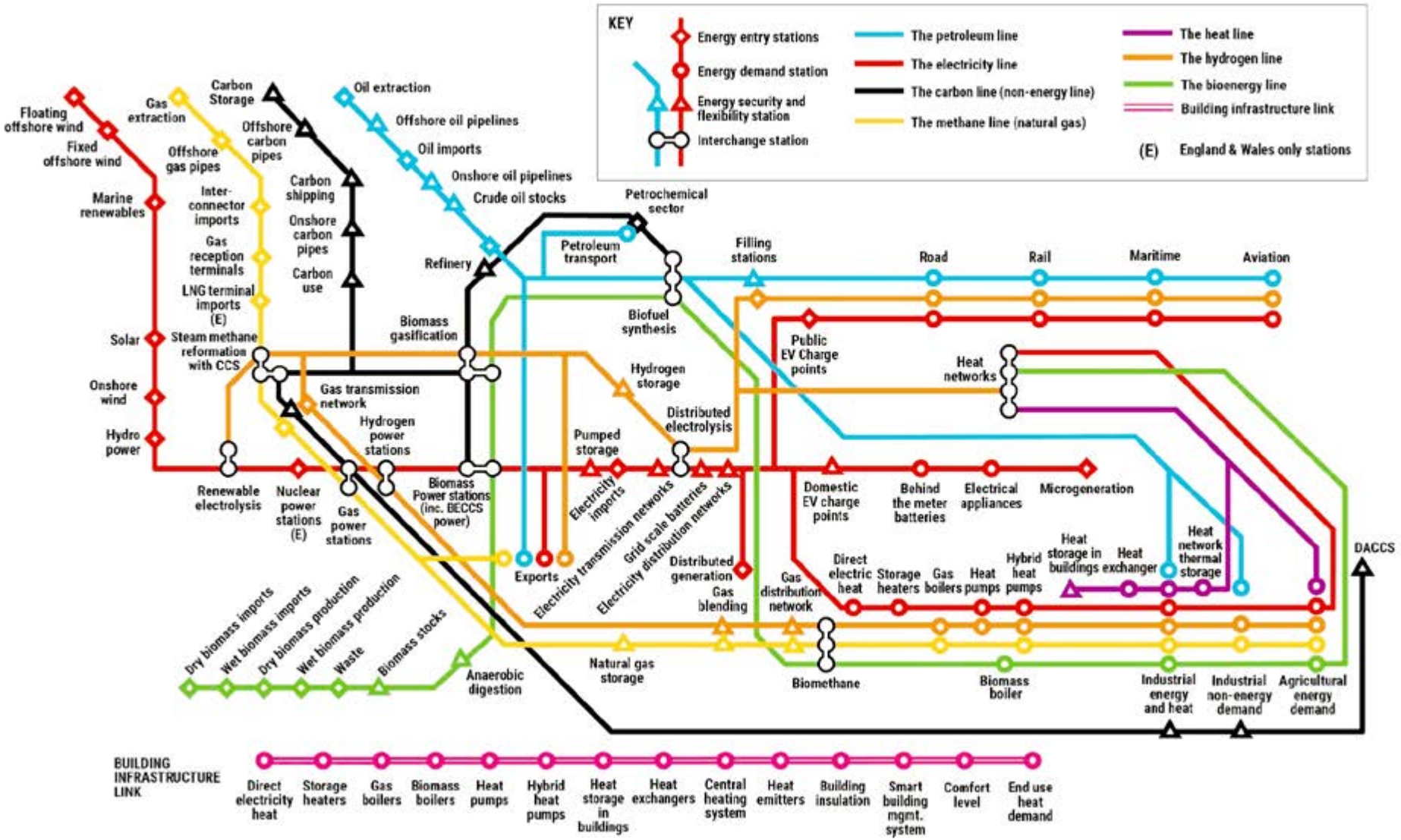
The changes anticipated in the energy sector system are complex. Figure 11 and 12 on the next pages illustrate this complexity, with Figure 11 showing the current system and Figure 12 the anticipated changes to the system in the future.

Figure 11: Scotland's energy map in the 2020s



Source: Scottish Government

Figure 12: Scotland's energy map in the 2030s



Source: Scottish Government

Challenges and opportunities

Challenges

Service/system:

- There may be competing demands for land use between energy production, food production and other development (e.g. housing).
- There are pricing barriers to the growth of low-carbon electricity generation, due to the spark gap or spark spread, referring to the ratio of the price of electricity to the price of gas.
- There are challenges to be overcome in order to decarbonise Scotland's heat including financial, economic, technical, supply chain, and regulatory barriers.

Funding and Financing:

- The scale and pace of investment required particularly in electricity to meet Net Zero ambitions.

Supply/demand:

- The existing grid infrastructure is not sufficient to handle the increased generation from renewable sources, requiring significant upgrades and expansion.

Legislation and regulation:

- The planning and consenting processes for renewable energy projects can be complex and subject to delay, hindering development.

Workforce:

- Balancing the workforce transferability between an existing oil and gas workforce skill base as the energy system as a whole transition to greater reliance on renewable sources.

Socio-economic:

- There is a need to galvanise public support in order to change behaviours
- Some communities may oppose large-scale renewable energy projects, particularly those that impact sensitive areas.
- Disruption in homes as a result of energy efficiency measures and heat source change.

Opportunities

Net Zero:

- Energy transition as a key building block towards net zero.

Socio-economic:

- The energy transition is projected to create thousands of new jobs in low-carbon industries, particularly in renewable energy and related supply chains, energy efficiency and heat decarbonisation.

Economic:

- Scotland's reputation as a leader in renewable energy and its strong infrastructure make it an attractive location for international investment in the energy sector.
- Continued growth of renewable energy generation, particularly offshore wind.
- Development of Hydrogen, CCUS, using North Sea oil and gas infrastructure.

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4 Waste

4.1 Sector summary

Responsibility

The responsibility for waste infrastructure is shared between different entities in Scotland. The Scottish Government sets national waste policy, and the Scottish Environment Protection Agency (SEPA) regulates waste management facilities and ensures compliance with regulations. Local authorities are primarily responsible for collecting and disposing of household and some commercial waste.

Operating model

- **Scottish Government:** sets waste policy, aiming to make Scotland a zero-waste society with a circular economy.
- **Zero Waste Scotland:** Scotland's circular economy public body, working with government, business, and communities to rewire the economy from our current "take, make, waste" model to one that makes the most of the materials we have.
- **Local authorities:** collect and dispose of household waste and some commercial waste. They also manage a network of Household Waste Recycling Centres (HWRCs).
- **Business:** businesses have a 'duty of care' to deal with business waste from construction, demolition, industry, agriculture and any commercial activity, through a registered waste carrier or waste transfer station.
- **Waste management companies:** ensure responsible disposal, recycling and reuse of waste materials.
- **SEPA:** see regulation.

Regulation

SEPA regulate and monitor waste management activities, including licensing waste facilities, administering producer responsibility schemes and enforcing environmental regulations. They also respond to pollution incidents and illegal waste activities.

Tax

Scottish Landfill Tax (SLfT) is a devolved tax on the disposal of waste to landfill, paid by site operators. The aim of the tax is to reduce the amount of waste sent to landfill.

Asset value

There is currently no publicly available monetary estimate of the value of Scotland's waste infrastructure assets, however, they hold significant value due to their contribution to a circular economy, resource management and environmental sustainability.

Asset strategies

Local authorities develop and implement waste management strategies, guided by national strategy and the **Circular Economy and Waste Route Map to 2030**.

New tools are being developed to collect and report information about waste, including a **UK-wide Digital Waste Tracking System**. Digital waste tracking is planned to be introduced from April 2026.

Key policy and strategy

- Scotland's Circular Economy and Waste Route Map to 2030 (December 2024).
- The Waste (Scotland) Regulations 2012.
- The Single Use Carrier Bags Charge (Scotland) Regulations 2014.

Reflection on last 20 years

There has been a long-term downward trend in the volume of waste landfilled in Scotland, with a reduction of 5.06 million tonnes (71.7%) from 2005. The current volume of waste landfilled in Scotland is the lowest annual amount since then.

Key investments include:

- **Recycling Improvement Fund (RIF):** launched by Scottish Government in 2021 to provide grants to local authorities for improving recycling infrastructure and services.
- **Circular Economy Investment Fund:** Zero Waste Scotland is investing £18 million as grant funding to small and medium sized enterprises to create a more circular economy.
- **Energy recovery from waste facilities:** such as the South Clyde Energy Centre.

Key national developments

Key National Developments (NPF4) in the waste sector include:

- Circular Economy Material Management Facilities (4).

Contribution to national outcomes

Waste reduction and management directly contribute to the Scottish National Outcomes, particularly in the areas of environment, economy and health.

Delivery plans

Scotland's Circular Economy and Waste Route Map to 2030 sets out an ambitious plan to deliver actions that the government, in collaboration with others, must take to accelerate progress towards a circular economy between now and 2030. The Route Map includes priority actions around: reducing waste and increasing reuse; modernising recycling; decarbonising disposal; and strengthening the circular economy. Some of these priority actions are to develop further and more specific plans and strategies.

4.2 Sector analysis

Scottish Government aims to make Scotland a zero-waste society with a circular economy.[1] This means minimising the population's demand on primary resources and maximising the reuse, recycling and recovery of resources, rather than treating them as waste.

Scotland produced around 11.5 million tonnes (Mt) of waste in 2018 from households (HH, 2.4Mt), Commercial and Industrial sources (C&I, 3.2Mt) and Construction and Demolition activities (C&D, 5.8Mt).

Waste generated in Scotland has reduced by 4.2% since 2011. While there has been a general reduction in household waste (7% between 2011 and 2018) and C&I waste (22% between 2011 and 2018), the amount of C&D waste generated fluctuates year on year.[2]

The majority of waste generated in Scotland is recycled. In 2018, 60.7% of waste from all sources was recycled.

Waste management

SEPA has developed the Scottish Waste Sites and Capacity Tool[3] which provides details about:

- **Landfill sites and capacity:** includes the numbers and types of landfill sites in Scotland, the amount of waste landfilled at each site in a given year, the remaining capacity for each site and, where available, the annual capacity of the site. There is an interactive map showing the location of the landfills. The tool also contains information about historical closed landfills.
- **Waste sites and capacity:** includes the numbers and types of all licensed/permitted waste management facilities in Scotland. It shows the amount of waste each site handles in a given year (as inputs, treatment onsite and output tonnages) and, where available, the annual capacity of the site. There is an interactive map showing the location of the sites.
- **Site return information:** displays a summary of waste managed by individual waste facilities on a quarterly/annual basis.

Every year SEPA provides an estimate of the national shortfall in waste management infrastructure capacity required to meet the targets set out in **Making Things Last: a circular economy strategy for Scotland**.[4] These estimates are intended to help authorities collectively plan for the waste management infrastructure. The capacity shortfall is allocated to groups of local authorities or strategic development plan areas across Scotland.

Household waste

Scottish Environment Protection Agency (SEPA) statistics (29 October 2024) show that Scotland's generated household waste has dropped to a record low.[5]

The total amount of household waste generated in Scotland in 2023 decreased by 26,000 tonnes (1.1%) from 2022. This is the lowest amount of household waste generated since the start of the current time series in 2011:

- Overall, the household recycling rate was 43.5%, up slightly compared to 2022.
- The amount of Scottish household waste landfilled decreased by 30.2% from 2022.
- Household waste diverted from landfill but not recycled increased by 21.6% from 2022.
- The carbon impact of household waste is now under 1 tonne carbon dioxide equivalent (CO_2e) per person for the first time since reporting began in 2011.

Landfill

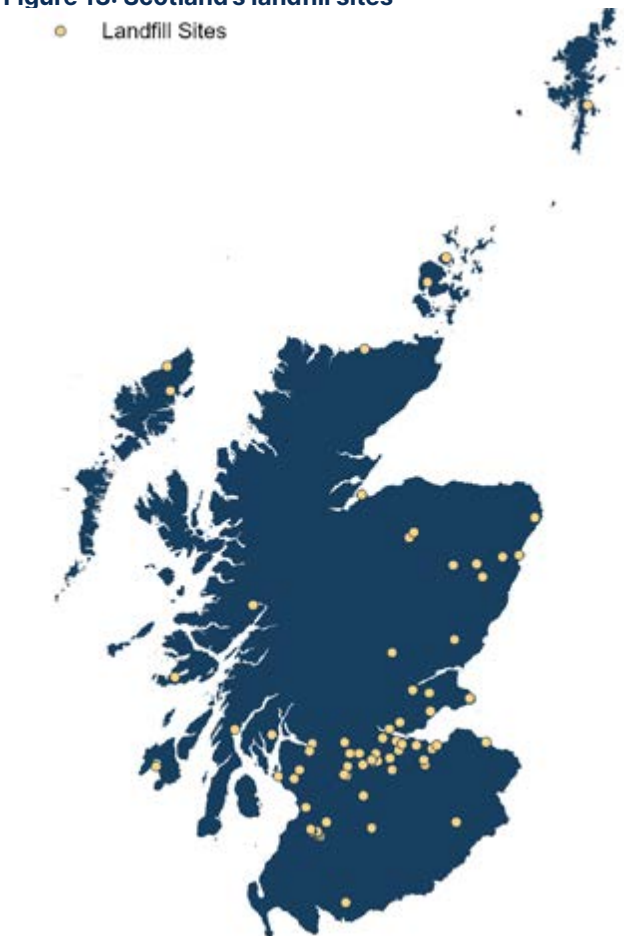
The total amount of waste going to landfill in Scotland has halved over the past decade (2.3 million tonnes or 23% of all waste managed was sent to landfill in 2022) and over 62% of waste was recycled in 2022.[6]

Measures such as the Scottish Landfill Tax, diverting waste from landfill to incineration, and improving recycling rates have reduced the amount of waste sent to landfill.

The total quantity of waste landfilled in Scotland in 2023 – at the 41 permitted landfill sites – was 2.0 million tonnes, a decrease of 14.8% from 2022.[7] This continues a long-term trend, with a reduction of 5.1 million tonnes since 2005, and is the lowest annual amount on record.

However, the landfill sector is facing significant business challenges, predominantly reducing waste inputs by increasing waste reuse and recycling and through the biodegradable municipal waste ban.[8] The sector also has a poor compliance record resulting from legacy issues, as well as the difficulties in solving some chronic problems such as odour.

Figure 13: Scotland's landfill sites



The total quantity of waste incinerated in Scotland in 2023 was 1.62 million tonnes, an increase of 15.4% from 2022.[9] Household and similar wastes represented 33.8% of the total waste incinerated in Scotland.

Over one third of waste incinerated was in facilities that applied for and were accredited with the R1 energy efficiency criteria for incinerated by recovery, meaning wastes used principally as a fuel to generate energy.

Circular economy

The Scottish Government's Circular Economy Act, which received Royal Assent in August 2024, establishes the legislative framework to support Scotland's transition to a zero waste and circular economy, significantly increase reuse and recycling rates, and modernise and improve waste and recycling services.[10]

Scotland's circular economy and waste route map to 2030 proposes policy initiatives with specific focus on delivering a system-wide circular economy across Scotland, accelerating sustainable use of resources and reducing emissions associated with waste and resources.

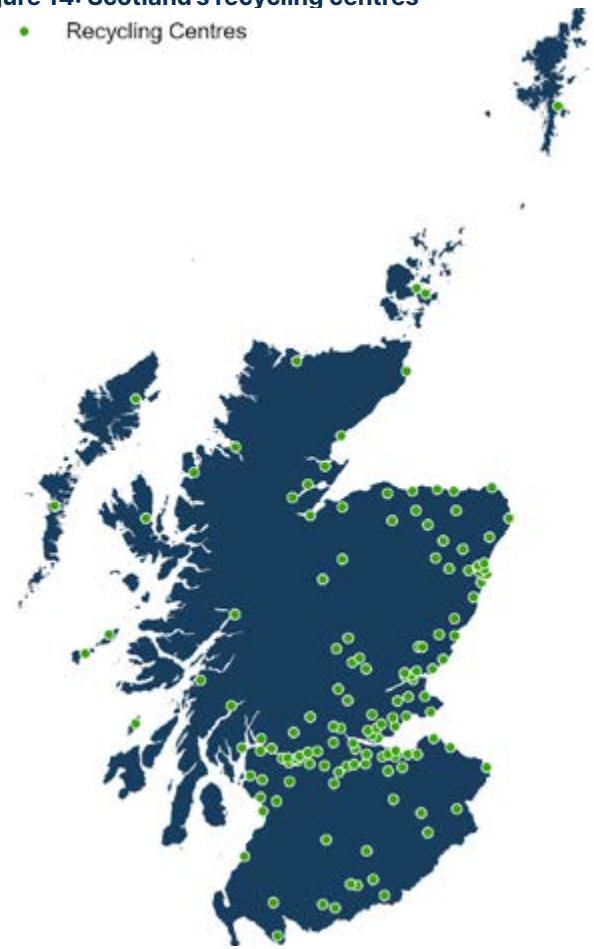
Energy from waste

Residual waste – waste which cannot be reused, recycled or recovered – forms the lowest aspect of the waste hierarchy and is normally destined for landfill.[11]

However, new technologies are being developed to allow the incineration of residual waste to produce electricity and heat by energy from waste (EfW) operations. In 2018, there were fourteen operational EfW plants in Scotland.[12] Of these, six were permitted to take municipal waste and the remaining eight processed commercial and industrial waste.

The South Clyde Energy Centre is being built with state-of-the-art technology.[13] The plant generates energy by using non-recyclable waste as fuel.

Figure 14: Scotland's recycling centres



The combustion process and flue gas cleaning technology is designed to remove harmful emissions to the highest internationally accepted standards. The potential to add carbon capture technology in the future would allow carbon dioxide to be captured and stored or turned into new materials, reducing greenhouse gas emissions to close to zero.

Challenges and opportunities

Challenges

Legislation and regulation:

- Environmental compliance issues in the landfill sector.

Net Zero:

- Reducing emissions from waste, including those associated with landfill gas and energy from waste.

Socio-economic:

- Public opposition to energy from waste sites in urban settings.
- Behaviour change and reducing landfill waste.
- Unsustainable consumption patterns in Scotland are a significant challenge, according to Zero Waste Scotland.

Opportunities

Data and technology:

- Development of new technologies and processes, particularly in energy from waste and the circular economy.

Net Zero:

- Energy from waste can contribute to Scotland's renewable heat and electricity targets where reuse or recycling is not feasible.

Service/system:

- Building a skilled workforce, adopting digital tracking and data systems, and supporting circular-business models and new recycling technologies.

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5 Water (including flood management)

5.1 Sector summary

Responsibility

The Scottish Government is responsible for making national policy on water sector planning, flood prevention and flood warning.

Scotland's public water and sewerage services are provided by Scottish Water, a public company accountable to Scottish Ministers and Scottish Parliament.

The Scottish Environment Protection Agency (SEPA) oversees the broader water environment, including:

- Water environment regulations (enforcing the EU Water Framework Directive).
- River Basin Management Plans (RBMPs) to protect and improve water quality.
- Water scarcity monitoring, including reporting on water resources (including flood warning).

Flood risk management: is a shared responsibility between multiple authorities including Scottish Water, SEPA, and local authorities who collaborate to manage and mitigate flood risk, also working with landowners and communities.

Water quality: SEPA and Scottish Water work together to ensure water quality meets standards.

Operating model

- **Scottish Parliament:** holds Scottish Water and Ministers to account
- **Scottish Government:**
  - Sets the objectives for Scottish Water and appoints the Chair and non-executive members.
  - Responsible for the drainage of the motorway and major trunk roads through its agency Transport Scotland.
- **Scottish Water:** Scottish Water is a public company responsible for providing public drinking water and managing sewerage services. Scottish Water develops Water Resource Plans (WRPs) to manage water supply and demand.
- **Private owners:** private owners are responsible for private water supplies in Scotland and are regulated by local authorities.
- **SEPA:** is responsible for environmental protection and improvement.
- **Local authorities** are responsible for:
  - The drainage of local roads and public highways.
  - Dealing with tidal and river flooding caused by extreme rainfall.
  - Providing flood defence and maintaining watercourses.
  - Protecting public health by ensuring compliance with drinking water regulation, particularly regarding private supply.

Regulation

SEPA is Scotland's principal environmental regulator.

The **Water Industry Commission for Scotland (WICS)** is the economic regulator of Scottish Water. WICS was formed on 1 July 2005 under the Water Services etc. (Scotland) Act 2005 with statutory duties covering:

- **Customer interest:** promoting the interests of Scottish Water's customers.
- **Setting charges:** ensuring customer charges reflect the lowest reasonable overall cost.
- **Performance:** commenting on Scottish Water's reporting of its performance, challenging for more efficient and sustainable operations.

The **Drinking Water Quality Regulator** (DWQR) for Scotland exists to ensure that drinking water in Scotland is safe to drink, pleasant and has the trust of consumers.

Consumer Scotland: represents the interests of consumers within Scotland's water industry.

Asset value

Scottish Water's gross inventory valuation was reported as £119 billion in the AR24 report. Infrastructure assets dominate the valuation (86.7%), with wastewater infrastructure representing the single largest asset category.

According to the Hydro Nation report[1], the water sector, including Scottish Water, contributes significantly to the Scottish economy, generating an estimated £3.7 billion in turnover.

Asset strategies

Scottish Water's asset strategy focuses on long-term sustainability, resilience and affordability of water and wastewater services, whilst also addressing challenges like climate change and population growth.

Key policy and strategy

- Our Sustainable Future Together: Long-term strategy, Scottish Water, 2020, and updated in 2025.
- Climate Change Adaptation Plan 2024, Scottish Water.
- National Flood Resistance Strategy, 2024.
- National Flood Risk Assessment 2025, SEPA.

Reflection on last 20 years

Climate change is affecting Scotland's water resources with increasing frequency and intensity of droughts and intense rainfall. Adapting to the impacts of climate change is becoming increasingly urgent and unless urgent action is taken to adapt, the costs and impacts of will increase.

Scottish Government undertook a consultation (July 2024) which showed wide agreement that the water industry in Scotland provides three services: water, wastewater and drainage, and that suitable infrastructure is required to support the delivery of each of these services. With the increasing likelihood of drought and water scarcity, consultation respondents agreed that Scotland needs to plan its water resources to ensure future resilience.

Scotland's households also need to become more water efficient and reduce current consumption levels of 180 litre per person per day to levels seen elsewhere in Europe. Reducing consumption is the preferential solution to building new infrastructure, such as reservoirs and water treatment works, which would be far more expensive.

Scottish Water's investment programme is one of the largest infrastructure programmes in Scotland. In 2023/24, Scottish Water invested £1.02 billion with key investments covering:

- **Wastewater:** the largest investment in this area was in Perth, where a series of new waste water projects (totalling £108 million) will provide new sewer networks and treatment capacity for an additional 40,000 people as the city expands.
- **Improving urban waters:** £500 million programme to enhance sewer networks and address challenges like storm overflows.
- **Climate change adaptation:** investments aimed at addressing the impacts of climate change on water resources and infrastructure.

Key national developments

Key National Developments (NPF4) in the water sector include:

- Pumped hydro storage (energy project but relies on water resources and management)(2).
- Urban Sustainable, Blue Green Surface Water Management Solutions (5).

Contribution to national outcomes

- Environment
- Communities
- Economy

Delivery plans

Scottish Water 2021-27 investment programme: delivering £6 billion of maintenance and improvements to Scotland's water and waste water infrastructure, contributing to the three ambitions set out in the Strategic Plan:

- Service excellence.
- Going beyond net zero emissions.
- Delivering great value and financial sustainability.

Scottish Water is in the process of developing its SR27 Business Plan, which will be published in 2026 and will give details on the level of spend for 2027-2033.

Scottish Government and CoSLA have agreed that a minimum of £42 million per year capital grant will be available in the 10 years from 2016-2026 for flood protection schemes. In recent years the flood protection scheme delivery programme has provided protection for communities at a rate of between 400 and 800 properties per year. £570 million will be invested in flood resilience in the period 2016-2026. Since 2016, 16 flood protection schemes have been completed, 4 are under construction and a further 11 are in the early stages of development.

5.2 Sector analysis

Scotland's water environment is one of the country's greatest natural assets, supporting our health, wellbeing, nature and the sustainable growth of the economy.

Our water environment provides us with goods and services that are important to human wellbeing[2], including:

- **Provisioning services:** the products obtained from water e.g. drinking water, fish and shellfish from commercial fishing, water for irrigation for the production of food; water for whisky production; electricity generation through hydropower; and production of hydrogen.
- **Regulating services:** the benefits related to the role that water has in nature, for example, climate regulation, flood regulation, water purification, and supporting biodiversity.
- **Cultural services:** the non-material benefits that people obtain from ecosystems, for example, recreational and aesthetic value.

As Scotland's urban population continues to grow, the need for resilient water infrastructure is more vital than ever. This is coupled with the challenge of climate change, with more extreme weather events and more dramatic fluctuations in weather patterns.

Water resources

Scotland's water resources are also covered under Section 15, Natural Infrastructure.

Scotland's freshwaters are essential for the health and prosperity of the country as well as vital for industry. In Scotland, there are more than 125,000km of rivers and streams, with an estimated 30,000 freshwater lochs, mostly concentrated in the Western Isles and Sutherland in the North West of Scotland.[3]

The largest 8 lochs cover an area of approximately over 3,000 sq km, five times the area of the 17,600 smallest lochs combined.

Loch Lomond has the largest surface area (71 sq km), and Loch Ness holds the most water – more than all the English and Welsh lakes combined – with approximately 7,450 million cubic m.

Conditions range from soft, relatively acidic waters with low levels of nutrients, to hard more alkaline waters with higher nutrient concentrations.[4] The former tend to be found in the north-west and in upland areas. Lochs with higher levels of nutrients are often found in lowland areas to the south and east, associated with more fertile catchments.

Pollution with nutrients is the most common threat to Scotland's lochs. This can result in a turbid water body with no submerged plants and persistent algal blooms. When water bodies are in this condition, they have little recreational or conservation value. Freshwater non-native species also threaten the ecology of Scottish lochs.

Surface water

Surface water includes rivers, waterways, lochs, and reservoirs (see Figure 15) as well as coastal waters.

Scotland has an abundant supply of high-quality surface water resources, which are essential for drinking water, agriculture and industry.

Figure 15: Scotland's Surface Water Resources

Groundwater

The volume of groundwater is greater than the water found in Scotland's rivers and lochs (surface water) but is hidden from sight beneath our feet[5].

It is also a key water source for drinking, agriculture, industry (including the bottled water and whisky sectors), and recreation (including golf course irrigation), and therefore plays an important role

in Scotland's economy. Groundwater is also vital to the health of Scotland's environment, supporting surface water ecosystems, helping to dilute and assimilate contaminants, and mitigating flooding.[5]

Groundwater management in Scotland is delivered primarily through the River Basin Management framework.

Water quality

Both groundwater and surface water are monitored regularly to assess their condition and quality. In 2023, SEPA reported 85% (346) bodies of groundwaters in Scotland were in overall good condition and the remaining 15% were classed as poor.[6]

For Scotland's surface water bodies, 52% (1,688) were in 'good' overall condition; 14% (444) fell into the 'high' category, 21% (694) were classed as 'moderate', 11% (366) as 'poor' and only 2% (57) reported as being in bad condition.

Scottish Water has a Surface Water Policy[7] to manage and protect surface water resources and reduce the risk of environmental pollution and flooding due to surface water entering the wastewater system.

Scottish Water

Scottish Water is trusted to care for the water on which Scotland depends.[8] Scottish Water is responsible for providing water and waste water services to household customers and wholesale Licensed Providers. It delivers the investment priorities of Scottish Ministers within the funding allowed by the Water Industry Commission for Scotland (WICS) – the economic regulator.[9]

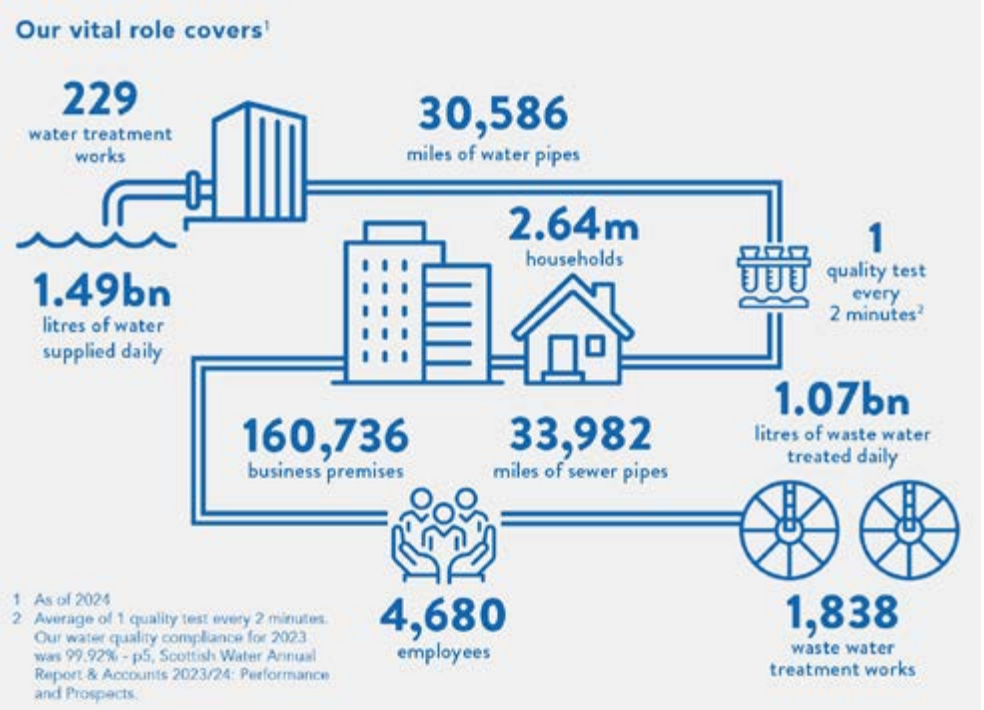
Every day, Scottish Water delivers:

- 1.49 billion litres of clear fresh drinking water.
- Removes 1.07 billion litres of waste water which is treated, recovering and returning resources safely to the environment.[10]

To do this, Scottish Water abstracts from 417 different water resources across the country, ranging from very large reservoirs to very small river intakes, and reports on the raw water available in storage.[11]

Supporting these operations, Scottish Water manage £120 billion of assets.[12] Infrastructure (Figure 16) comprises 229 water treatment works, with over 48,000km of water pipes, delivering 1.49 billion litres of water per day to customers.[13]

Figure 16: Scottish water infrastructure



Scottish Water run an investment programme which delivers the investment objectives set out by Scottish Ministers for a set regulatory period (currently 2021-2027) with regular Capital Investment Programme.[14] Overviews of ongoing projects and initiatives are published regularly during this period. The funding is allocated by WICS through the Strategic Review of Charges.

The 2021-2027 investment programme is planned to deliver over £6 billion of maintenance and improvements to Scotland's water and wastewater infrastructure.[15] Scottish Water has indicated that its focus is on improving the resilience of water supplies and mitigating the impacts of climate change on the system.

Scottish Water has highlighted that leakages from the water supply system is a key operational issue due to the changing climate and extreme weather impacts on infrastructure.[16] It reported an increase in the amount of water lost from the system in 2024 (462 M/ld) compared to 2023 (454 Ml/d), the first annual increase since 2007 when recording began. Scottish Water have committed to reducing leakage using technology to monitor the network.

Waste water management

Scottish Water own 1,838 wastewater treatment works which treat 1.07 billion litres of water daily, though a network of some 54,000km of sewer pipes. There are approximately 3,600 combined sewer overflows (CSOs) within the sewer network in Scotland (equivalent to one every 15km). These are intended to spill during heavy rainfall to prevent sewer flooding.

The majority of the existing sewer network is combined sewers, which means that they transport both foul water and rainwater. Modern standards and best practice are to separate the systems, with the combined sewer system representing a significant challenge for supporting growth and development.

Scotland currently has 96% wastewater compliance rates. In 2023/24, 196 Environmental Pollution Incidents (EPIs) were recorded; ten fewer than the previous year.[17] There was an increase in more serious Category 1 and 2 EPIs, with three more than the previous year. The cause of these incidents was associated with the wastewater network.

Scottish water investment

The objectives set by the Ministers for the 2021-2027 investment period outlines the following challenges:[18]

- **Climate change:** respond to the climate crisis and make substantive progress towards the climate change targets and the impact it has on the quality of service provided, as well as improving compliance with environmental licenses and limit the number of plastics reaching the water environment through the sewer network.
- **Demographic changes and resource availability:** identify and provide new strategic capacity to meet the increased demand due to all new housing developments and requirements of commercial and industrial development across Scotland.
- **Asset management:** in addition to providing a strategy to inform the long-term asset replacement needs, ensuring asset maintenance is fully integrated in the investment programme.
- **Statutory obligations:** meeting standards to comply with relevant statutory requirements.

Water and energy

Hydropower

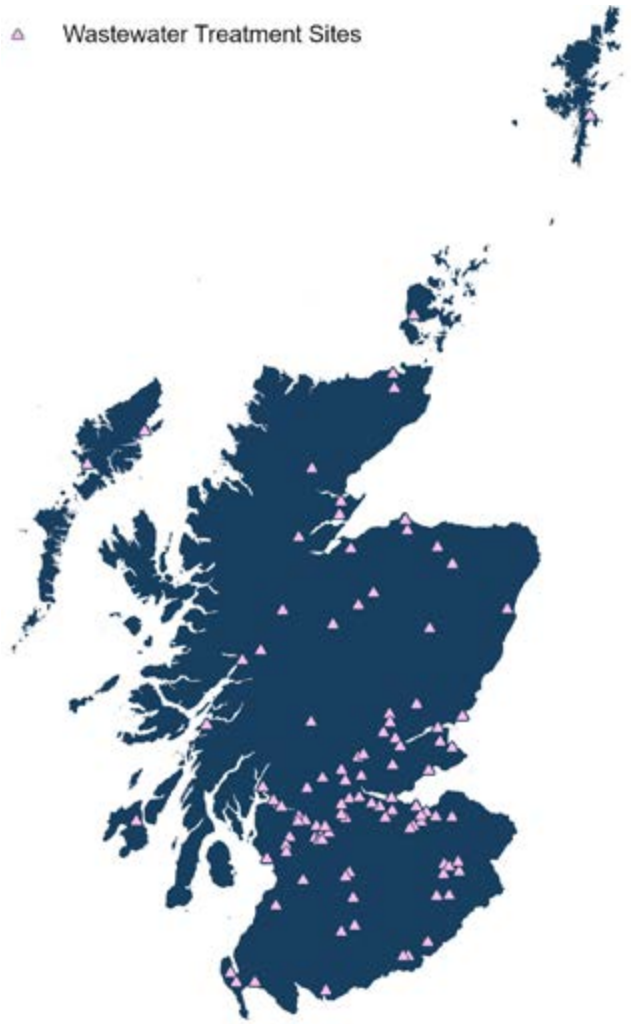
Scotland has the UK's highest mountains and largest inland lochs. Combined with a high rainfall, this makes production of hydroelectricity viable in Scotland.[19]

Hydropower is energy that comes from the force of moving water. Hydro plants use the force of falling water to make electricity. The water can be stored in a dam to allow for generation year-round, or a turbine can be installed on the entrance to a treatment works or storage tank.

Hydroelectric generation in Scotland started early in the 20th century – kickstarted by the need for power to drive aluminium smelting plants at Kinlochleven and Lochaber in the Highlands. This led to the construction of the Laggan dam and hydroelectric system in 1934.

Scotland now has 85% of the UK's hydroelectric energy resource. Much of it developed in the 1950s by the North of Scotland HydroElectric Board. The Board played a large part in bringing 'power from the glens' into Scottish homes.

Figure 17: Wastewater treatment sites



By 1965, 54 main power stations and 78 dams had been built, providing a total generating capacity of over 1,000MW.

As set out in Section 3 (Energy) hydroelectric schemes are still being built in Scotland. This includes the Coire Glas pumped storage scheme which received planning consent from Scottish Government

in 2020 and represents the first large-scale hydro scheme to be developed in the UK for 40 years.

Scottish Water takes advantage of the fact that it is moving water around the country and has installed hydro turbines wherever possible on these flows.[20] It has been actively installing hydro schemes since 2010, with turbines at more than 28 of its assets across Scotland.

Hydro schemes are used to offset energy consumption at treatment works, with any surplus energy generated exported to the national grid.

Scottish Water currently has 5.5MW of installed hydropower capacity, with the aim is to install a further 2.2MW of hydro capacity in the coming years.

The cost per kW of hydropower is the lowest of all renewable technologies (over the full lifetime of each scheme). Benefits of hydropower include that schemes have an 80-year life span and are well suited for remote rural areas, providing energy and income opportunities.

Scottish Water operate the country's only treated water hydro-electricity site located in a major town or city. The Firrhill site in Oxgangs, Edinburgh, not only supplies drinking water to parts of Edinburgh, but also generates electricity as a by-product. Harnessing modern technology, the site now generates enough electricity to be self-sufficient and feeds around 60,000 kWh to the National Grid. It supplies dozens of homes, a large care home and a secondary school with electricity.[21]

Hydrogen and water

Hydrogen has the potential to be an important part of the energy mix in the future.[22] The Scottish Government has pledged to achieve 5GW of hydrogen capacity by 2030 and 25GW by 2045. But hydrogen production relies on one critical resource – water .[23]

Hydrogen needs to be extracted from either water (using low-carbon electricity) or by reforming fossil-fuel hydrocarbons in the presence of steam]. For hydrogen to be a low-carbon fuel, the electricity for electrolysis needs to be low-carbon, and carbon capture and storage (CCS) needs to be part of reforming fossil fuels.

Primary water is largely required for hydrogen production, and its use is expected to rise 5-fold by 2050.[24] Secondary water is required in all forms of energy generation; growing and using biomass; and carbon capture processes.[25] Although secondary water is returned to the environment, the quantities required are five to ten times greater than primary water and, most importantly, the power generators and CCS plant cannot run without it.

Scottish Water's commercial subsidiary, Scottish Water Horizons, is developing proposed new water infrastructure on behalf of ScottishPower and Storegga as part of the Cromarty Hydrogen Water Connection.[26] This would see over 20km of water pipe installed to serve a proposed hydrogen production plant near Edderton.

The pipe would run from an existing 'raw' water storage tank near Newmore Water Treatment Works, north of Invergordon, to the proposed plant east of the Beinn Tharsuinn wind farm, joining the B9176 Struie Road at Ardross and following it north to the wind farm access road. Three pumping stations would also be installed as part of the project, at various stages along the route.

Climate Change Adaptation

The Climate Change Adaptation Plan published by Scottish Water (2024) outlines the efforts it will take to make services and infrastructure more resilient to extreme weather.[27]

Over the past decade, Scottish Water has responded to the changing climate, by assessing risks and building resilience into its operations and investment plans.

Scottish Water assets were not designed to cope with the more extreme weather conditions being experienced on a regular basis. They are also ageing and will deteriorate more quickly with climate change.

The Climate Change Adaptation Plan outlines several key issues facing Scottish Water, including:

- **Drought:** Scotland's current, water supply deficit during drought could increase four-fold from 60 to 240 million litres a day with more sustained low rainfall periods anticipated.
- **Deteriorating water quality:** By 2050, an estimated 200 water sources are at greater risk of seeing increased manganese – a naturally occurring element which can discolour water and result in algal blooms.
- **Customer flooding and environmental pollution:** 4,800 properties could be at risk of sewer flooding by 2050, compared to 2500 currently.
- **Waste water and environmental quality:** risk of a 20% rise in overflow discharges.

The report shows that adapting the water assets that serve Scotland to be resilient to more challenging climate futures will need new investment of £2 billion to £5 billion over the next 25 years.

Flood management

The Flood Risk Management (Scotland) Act 2009 introduced a more sustainable and modern approach to flood risk management that is better suited to current needs and can accommodate the impacts of climate change. SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. It has a statutory duty to produce Scotland's Flood Risk Management Strategies. It works closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted. SEPA also has a responsibility to identify where in Scotland there is the potential for natural flood management techniques to be introduced. Natural flood management uses the natural features of the land to store and slow down the flow of water.

Flood Risk Management Strategies coordinate efforts to tackle flooding in Scotland. They set the national direction of future flood risk management, helping to target investment and coordinate actions across public bodies. The strategies explain what causes flooding in high risk areas as well as the impacts when flooding does occur. This information is used as a basis for better decision-making across flood risk management organisations.

A strategy is available for each of the 14 Local Plan Districts in Scotland. They are approved by Scottish Government and published by SEPA as Scotland's strategic flood risk management authority. The Plans were developed in collaboration across all 32 local authorities, Scottish Water and other organisations with a responsibility or interest in managing flooding.

Local Flood Risk Management Plans are the responsibility of Local Authorities, have been developed in parallel and provide additional local detail on the funding and delivery timetable for actions. Local Flood Risk Management Plans and Flood Risk Management Strategies are to be updated every six years.

Scottish Water assesses the risk of flooding from surface water and combined sewers that results from higher than usual rainfall. Once risks are identified, Scottish Water works with local authorities and SEPA to look for ways to reduce those risks through its capital investment programme.

Scottish Government published its National Flood Resilience Strategy in December 2024 and SEPA updates is National Flood Risk Assessment in December 2025.

Scottish Government and CoSLA have agreed that a minimum of £42 million per year capital grant will be available in the 10 years from 2016-2026 for flood protection schemes, with 80% of the total available allocated to large scale projects prioritised in the Flood Risk Management Strategies and the remaining 20% allocated to local authorities to contribute to other elements contained in these strategies.

In recent years the flood protection scheme delivery programme has provided protection for communities at a rate of between 400 and 800 properties per year. £570 million will be invested in flood resilience in the period 2016- 2026. Since 2016, 16 flood protection schemes have been completed, 4 are under construction and a further 11 are in the early stages of development.

Challenges and opportunities

Challenges

Funding and finance:

- The funding needed to deliver sustainable services over the next 25 years would require around £50 billion to be invested in water and wastewater services. Adapting the water assets that serve Scotland to be resilient to more challenging climate futures will need new investment of £2 billion to £5 billion over the next 25 years.
- Asset maintenance: repair costs continue to rise – in 2024, compared with the same six-month period in the previous year, repair costs rose by 15%, up from £139 million to £161 million.
- Cost of flood management and resilience measures currently forecast to be in excess of £1bn.

Ageing or changing asset needs:

- Ageing assets and the investment required to replace those nearing end of life and increase vulnerability to high risk events.
- Scale of maintenance challenge, as noted above.
- Prevalence of combined sewer that will require greater investment with increased flood risks.

Service/system:

- The need to reduce leakage from the system.
- Risk of failures given the combined impact of ageing assets and climate change (with more storm and drought events).

Supply/demand:

- Increasing energy related demand for water including potential hydrogen production and data centres.
- Population growth and keeping up with new developments and housing delivery.

Climate resilience:

- Increasing rainfall intensity and more frequent extreme events (including [periodic low rainfall//drought) will raise river and surface-water flood risk across Scotland, particularly in the west and upland catchments.
- Rising sea levels and storm surges threaten long, varied coastlines, estuaries and island communities, increasing the scale and cost of coastal defence and relocation decisions.

Opportunities

Data and technology:

- Technology advancement may improve cost effectiveness, reducing leakages and inefficiencies in the system. More active, real-time monitoring could help with maintenance planning and asset replacement.

Innovation:

- Opportunity for Nature based Solutions (NbS) to be implemented for a more resilient water system that also enhances the natural environment.

Socio-economic:

- Evidence that behaviour change campaigns can work, particularly where the impact on the environment can be seen.
- Reduction or better management of usage through volume related metering or charging.

Economic:

- Expansion of hydropower can drive economic growth and contribute to meeting net zero targets.

Endnotes

1 Scottish Government (2023), Hydro Nation: annual report 2022

2 Scottish Government (2025), Water

3 Scotland's environment (2023), Scotland's freshwater

4 NatureScot (2023), Freshwater lochs

5 National Environment Research Council (2015), Scotland's aquifers and groundwater bodies

6 SEPA (2022), State of Scotland's Water Environment: Summary Report 2022

7 Scottish Water (n.d.), Surface Water Policy

8 Scottish Water (n.d.), Our Vital Role

9 Scottish Water (n.d.), The Water Industry in Scotland

10 See 8 above

11 Scottish Water (n.d.), Scotland's Water Resource Levels

12 Scottish Water (n.d.), Long Term Strategy

13 Scottish Water (2024), Annual Report and Accounts: Performance and Prospects

14 Scottish Water (n.d), Investment Programme

15 Ibid

16 Scottish Water (2024), Adapting Scotland's Water and Waste Water Services to Climate Change

17 Scottish Water (2024), Water Industry Commission for Scotland (WICS) Annual Return 2023/24 Overview

18 Scottish Government (2020), Water Industry: The Scottish Water (Objectives: 2021 to 2027)

19 Institute of Civil Engineers (ICE), Hydroelectric power Scotland

20 Scottish Water (n.d.), Hydropower

21 Ibid

22 Scottish Government (2022), Hydrogen Action Plan

23 Renewable UK (2024), Water use for UK hydrogen energy systems

24 Ibid

25 Primary water refers to the water that is directly used and consumed in a process, while secondary water refers to water that is used for cooling or other purposes and then returned to the environment, often in larger quantities.

26 Scottish Water (n.d.), Cromarty Hydrogen Water Connection

27 See 16 above

6 Telecommunications

6.1 Sector summary

Responsibility

Telecommunications infrastructure in Scotland encompasses the networks and physical components that enable digital communication, including both fixed and mobile internet access. This infrastructure is crucial for business, social interaction, and access to essential services like healthcare and education. The Scottish Government is actively working to enhance and expand digital connectivity across the nation, with significant investment in both broadband and mobile programmes and projects.

Operating model

- **UK Government:** responsibility for telecommunications policy and legislation is primarily reserved to the UK Government under the Scotland Act 1998. The Department for Science, Innovation and Technology (DSIT) has responsibility for telecommunications legislation.
- **Scottish Government:** the Scottish Government has specific programmes and projects which they directly fund and deliver to improve coverage in Scotland including rural parts. In addition, Scottish Government leads on delivery of some UK programmes such as Project Gigabit.
- **Private telecommunications companies:** the primary responsibility for deploying broadband and 5G infrastructure, including the necessary cables and connectivity, lies with these companies, However, government plays a crucial role in facilitating this rollout through policy, regulation and investment in complementary infrastructure. There are also infrastructure and equipment suppliers who support the physical build-out of telecommunication networks.
- **Local authorities:** Councils work closely with the Scottish and UK Government to deliver initiatives like Project Gigabit and the R100 programme, which aim to extend gigabit-capable broadband to underserved communities. A local authority's digital connectivity team is often the designated single point of contact (SPOC) on such programmes and projects. Local authorities also help identify coverage gaps and prioritise areas for investment, ensuring that rollout plans are aligned with local need.
- **Local authorities and property owners:** grant permission to provide access to land and assets for the installation of 5G equipment.
- **Internet Service Providers:** these are the companies that provide broadband services to domestic and business users.
- **Mobile Network Operators:** these are the companies that provide 4/5G mobile and data services across Scotland.
- **Digital Office:** Leaders of digital transformation and delivery across Scottish Local Government. The Digital Office works with local authorities across Scotland, providing the leadership, guidance, resources and expertise needed to navigate the complexities of the ever-changing digital landscape.
- **Scottish Cyber Coordination Centre (SC3):** is the focal point for Scotland's cyber security and resilience, providing services to help protect against cyber incidents while promoting adherence to appropriate standards and best practices across critical functions and infrastructure.

Regulation

Ofcom is the statutory regulator of all domestic communication services. This includes digital communications services, like the provision of fixed and mobile broadband services.

Key policy and strategy

- Scotland's Programme for Government, Scottish Government (2025).
- Scotland's National Strategy for Economic Transformation (NSET), Scottish Government (2022).
- National Islands Plan (2019).
- UK Digital Strategy, DCMS, October 2022.
- A Changing Nation: How Scotland will Thrive in a Digital World, Digital Scotland, Scottish Government, 2021.
- 5G: strategy for Scotland, Scottish Government, 2019.
- Connected Nations: Scotland Report 2024, Ofcom (2024).
- Green Data Centres Vision and Action Plan, Scottish Government (2021).
- Scottish AI Playbook, AI Alliance.

Funding

Digital Scotland Superfast Broadband (DSSB) was a major public investment programme aimed at extending high-speed broadband to areas of Scotland that were not covered by commercial rollout. The programme was jointly funding by Scottish Government, UK Government, European Regional Development Fund (ERDF), Local Authorities and BT Group (Openreach). This programme laid the groundwork for follow-on programmes like R100 and Project Gigabit.

The R100 programme is funded primarily by the Scottish Government (£591 million) with investment from the UK Government (£52 million) and BT (£53 million) who appointed Openreach to deliver the network.

Project Gigabit is funded primarily by the UK Government, with additional local authority contributions and private sector investment (Openreach, GoFibre, CityFibre). The project complements the R100 programme which is led by Scottish Government.

The Scottish 4G Infill Programme (S4GI) is an initiative aimed at improving mobile connectivity in Scotland's rural and remote communities. It was launched in 2018 and is a £28.75 million programme funded by Scottish and UK Government and the ERDF.

Reflection on last 20 years

Scotland's digital economy has undergone significant transformation, with advancements in digital infrastructure and a transition from a standalone tech sector to a broader digital economy where digital technology, connectivity and skills impact all businesses and individuals.

Broadband provision only began to be available at the turn of the century and there has been significant additional investment over that period – both public and private – with significant progress in expanding superfast broadband coverage. The rollout of full fibre has accelerated in the last 5 years, again with additional government support (including R100 and Project Gigabit) to enhance coverage in harder to reach or non-commercial areas.

Mobile coverage has seen a similar pattern of progression, with investment in 3G technology early in the 21st Century, followed by 4G and latterly 5G rollouts. Programmes such as S4GI are addressing areas where commercial mobile coverage is not viable, helping to deliver 4G services through partnerships with mobile network operators. This includes building masts in these "notspots", with over 50 new mobile masts having been built or in progress. There is focus on community benefit, including improved access to emergency services, education and economic opportunities.

Advances in digital technologies have enabled more flexible and remote working.

Cybersecurity threats are, however, a growing concern, with a significant percentage of businesses reporting cyber-attacks in recent years.

Uses of artificial intelligence (AI) are growing across a range of industries in Scotland, with potentially transformative applications. In particular, AI has many potential benefits for healthcare. For example, in successfully discovering early stage-cancer, or in accelerating radiography processes in healthcare.

AI algorithms are also analysing extensive health databases to spot trends and patterns. For example, further developing diagnostic capabilities for illnesses such as liver fibrosis, which is common in Scotland.

AI is also supporting energy performance. At RWE's Robin Rigg in Dumfries and Galloway, AI predicted when maintenance is needed.

AI also supports energy efficiency improvements in Scottish homes, supporting property surveys utilising thermal imaging. The combination of technology (advanced cameras) and AI can identify heat loss ten times faster than existing methods.

When combined with advanced technologies (sensors and Internet of Things devices), AI can deliver potential energy and operational cost savings.

Key Scottish and UK Government investments have included:

- Digital Scotland Superfast Broadband (DSSB), a major public investment programme (£463 million) launched in 2013 to extend superfast broadband to areas of Scotland that were not covered by commercial rollout. DSSB helped Scotland reach over 95% superfast broadband coverage by 2020. It has now been superseded by R100 and Project Gigabit.
- Reaching 100% (R100) programme which is investing £600 million in digital infrastructure across Scotland (with R100 contracts expected to continue to deliver gigabit-capable connections until 2028).
- Project Gigabit is the UK Government's programme to deliver gigabit-capable broadband to hard-to-reach communities across the country. It is one of the largest digital infrastructure projects at £5 billion investment, aiming to ensure that 99% of premises have access to lightning-fast internet by 2032.
- Scottish 4G Infill Programme (S4GI) complements other initiatives like R100 and Project Gigabit, which focus on broadband rather than mobile. The £28.75 million programme aims to eliminate mobile "notspots", support economic development and enable emergency services and residents to stay connected in isolated regions.
- Scotland 5G Centre (S5GC) is the national innovation hub accelerating the deployment and adoption of 5G technology across Scotland.

Key national developments

- Digital fibre network (12).

Contribution to national outcomes

Cross-cutting: supporting all 11 National Outcomes.

Delivery plans

- Digital Economy Skills Action Plan 2023-2028, Skills Development Scotland.
- Digital Office Action Plan 2024-2026.

6.2 Sectoral analysis

The Scottish Government published a Digital Strategy for Scotland in 2021, which sets out how Scotland will thrive in a digital world.[1] The Covid-19 pandemic served to reinforce the importance of broadband and mobile networks as a key component of Scotland's critical national and international infrastructure.

The Strategy outlined the plan to respond to the digital age by embracing key opportunities such as implementing technology in a secure, efficient way, digitising public services and promoting digital participation as part of the culture and way people work.

A Changing Nation – progress report (2021 – 2024)[2] was published to provide an update on the delivery of the commitments set out in the Digital Strategy for Scotland, covering digital connectivity, digital skills, digital inclusion, digital ethics, and supporting business to transition to digital services, as well as reform of digital government services.

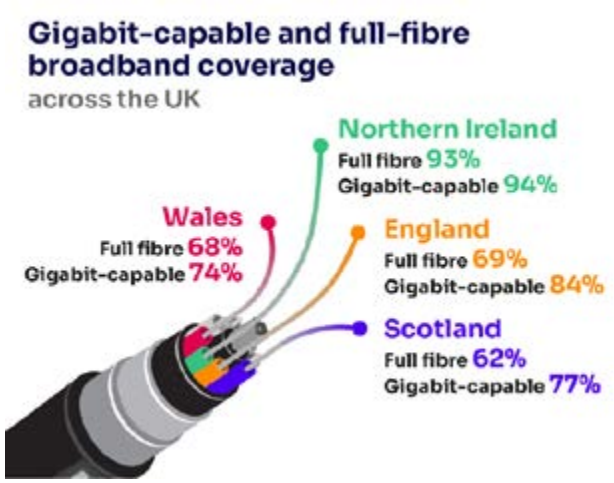
The progress report describes the series of actions outlined in the 2021 Strategy to achieve Scotland's ambitions in the digital world, and assessed progress against each of these.

Broadband infrastructure

The Digital Scotland Superfast Broadband (DSSB) programme[3] was launched in 2013 to extend superfast broadband to areas of Scotland that were not covered by commercial rollout. The programme has extended access to more than 950,000 premises and helped Scotland reach over 95% superfast coverage by 2020. This has transformed access to broadband in rural areas.

An Ofcom analysis of provider data published in the Connected Nations Scotland report (2024)[4] states that Scotland is the least connected of the UK's four nations as shown in Figure 18. Full-fibre networks are available at 62% of residential premises in Scotland, but this figure drops to 42% when looking at rural Scotland.

Figure 18: Digital coverage (source: Ofcom analysis of provider data, July 2024)



In terms of full-fibre network coverage, rural connectivity in Scotland increased 9 percentage points (equivalent to 265,000 premises) from September 2023 to July 2024.

Over three-quarters of Scottish households have gigabit capable coverage, showing an increase of 5 percentage points (166,000 premises), meaning 77% of premises can access gigabit-capable services. The coverage differs between urban and rural areas with 85% coverage in urban areas and 43% in rural areas.

The Scottish Government is committed to delivering gigabit-capable connections until 2028 through the Reaching 100% (R100) programme and have invested over £600 million into digital infrastructure across Scotland.

Mobile data infrastructure

The total amount of data usage in Scotland is the lowest in the UK, using on average 35GB less than in urban areas in the rest of the UK and even more pronounced in rural Scotland where usage is 156GB less on average. This difference in data usage can be attributed to the greater reliance on older technology offering lower download speeds.

Infralink, Scotland's 4G and 5G rollout initiative, aims to breakdown previous barriers to the rollout of 4G and 5G infrastructure and accelerate the deployment, led by Scottish Futures Trust and funded by The Scotland 5G Centre.[5] The strategy works in hand with the Shared Rural Network (SRN) which has received £1 billion to erect 124 mobile masts to improve coverage in rural Scotland and reduce 'notspots' (places without mobile phone service).

5G coverage

5G has the potential to take connectivity to the next level and achieve the Scottish Government's aspiration to be a leading 5G nation. It has the ability to enhance connectivity in the fields of transport, artificial intelligence (AI), robotics and remote monitoring, supporting the transition to a zero-carbon economy.

The 5G: Strategy for Scotland[6] estimates 5G will add £17 billion to the economy by 2035, create 160,000 new jobs, increase productivity by £1,600 per worker and play a part in creating 3,100 new businesses. The 5G: Strategy sets out the steps to embrace the possibilities of 5G.

There are approximately 23,100 5G sites operational across the UK, a 24% (+18,500) increase since 2023; 4% (924) of these sites are located in Scotland.

Ofcom measures the availability of 5G through a confidence range covering High Confidence (signal strength of -110 dBm to at least an 80% confidence level) and Very High Confidence (signal strength of -100 dBm to a ~95% confidence level), which represents the likelihood of on the ground coverage for consumers.[7]

Ofcom reported an increase in the deployment of 5G across Scotland in 2024, with coverage outside of premises from at least one mobile network operator (MNO) at 91%, up from 88% in 2023 for the high confidence measure (up from 80% in 2023 to 85% for a Very High Confidence measure).

The range of 5G coverage outside of premises (outdoor) in Scotland by individual MNOs, based on the High Confidence Level, is between 54%-76%, showing a 6-15% increase from 2023.

Table 5: Range of 5G coverage (High Confidence Level) outside of premises in Scotland and across the UK in 2024

COUNTRY	RANGE
Scotland	54%-76%
England	65%-81%
Wales	16%-80%
Northern Ireland	36%-90%
UK	61-79%

4G coverage

In Scotland, individual operator 4G premise coverage ranges from 77% to 80% and most MNOs have made significant improvements in their coverage in 2024 compared to 2023. Table 6 outlines the MNOs geographical coverage across Scotland and rural Scotland.[8]

Table 6: 4G geographic coverage in Scotland by MNO

PROVIDER	ALL OF SCOTLAND		RURAL SCOTLAND	
	2023	2024	2023	2024
BT/EE	76%	79%	76%	78%
Three	59%	77%	58%	76%
Virgin media O2	66%	79%	66%	78%
Vodafone	69%	80%	69%	80%

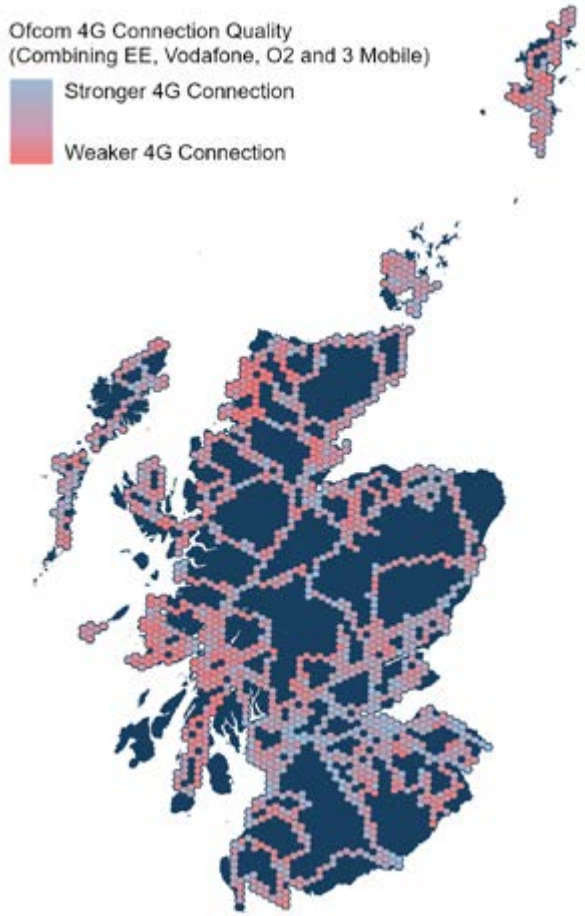
There has been 5% growth in the levels of 4G geographic coverage, by at least one MNO, in rural Scotland, the largest increase of any rural or urban area in the UK.

The 4G geographic coverage across Scotland from all four MNOs has increased by 17 percentage points, from 48% in 2023 to 65% in 2024, the largest percentage improvement across the UK (but lower than the UK average of 80%).

The Scottish 4G infill programme, in collaboration with the UK Government, aims to maximise the impacts of the £1bn Shared Rural Network (SRN) investment in Scotland to reach 91% geographic coverage by at least one mobile network operator.

The Scottish Government also plan to simplify the planning process to make it easier for telecoms operators to deploy infrastructure that meets community needs.

Figure 19: 4G coverage



Data infrastructure

The Scottish Government published the Green datacentres and digital connectivity: vision and action plan for Scotland (2021)[9] to support Scotland's digital ambitions and economic recovery from the Covid-19 pandemic.

Scotland generates significant energy form renewable sources, so has the potential to be a leader in green data centres. As of 2025 there are nine data centres located in Scotland, operated by Pulsant, Iomart, Brightsolid, DataVita and Royal Bank of Scotland.

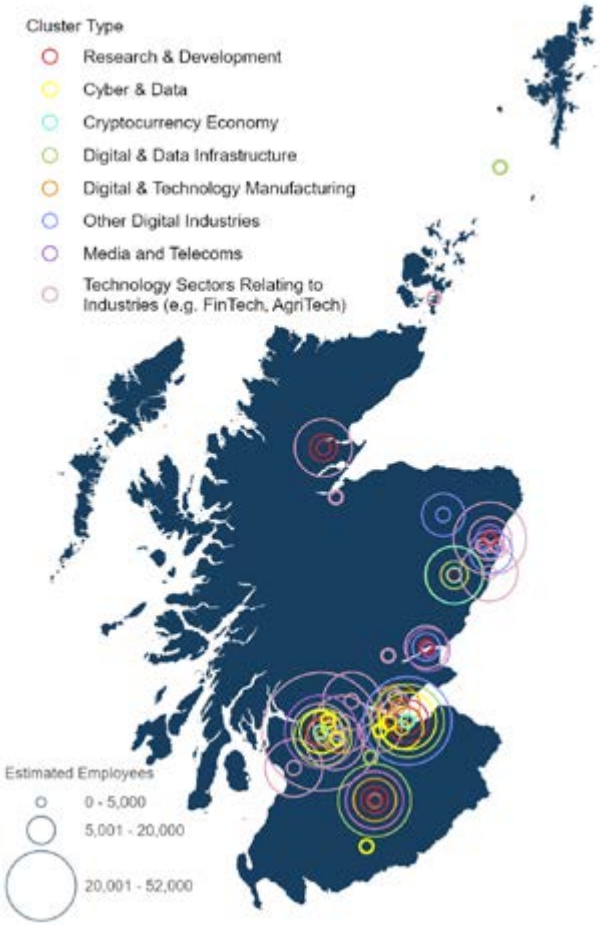
Digital technology industries

Scotland's digital technology industry is a vibrant and growing sector, with over 11,200 companies engaged in activities ranging from software development to telecommunications, and a thriving tech ecosystem contributing significantly to the Scottish economy.[10]

According to Scottish Development International, digital technology is Scotland's fastest-growing sector for inward investment, with centres of excellence for collaboration across cyber security, data, fintech, games, global business services, software and technology, space, and waste and wastewater technology.

Cyber Resilient Scotland: Strategic Framework[11] highlights that the data security industry is growing in Scotland and is on the way to becoming a major tech hub. The number of cyber security companies increased from 50 to 330 between 2017 and 2021.

Figure 20: Scotland's digital clusters



Challenges and opportunities

Challenges

Funding/finance:

- Securing sustainable public and private investment models, subsidy design and risk sharing to address market failure in remote and low density communities.

Service/system:

- Protecting networks from cyber attack, managing supplier risk, ensuring secure equipment sourcing and maintaining resilient architectures for critical services.
- Balancing competition with efficient network sharing, wholesale access, and co investment to avoid duplication and reduce costs, while protecting market dynamics.
- Adapting infrastructure to more frequent flooding, storms and coastal erosion, and ensuring redundancy (including diverse routing and international submarine cable resilience) for continuity.
- With planned the switch off by 2027 of the UK PSTN (Public Switched Telephone Network) - the traditional network of copper wires and switching centres that carries landline phone calls, digital Internet Protocol (IP) networks will need to be sufficiently available to ensure appropriate levels of coverage.

Supply/demand:

- Accelerating the deployment and adaption of 5G (and then 6G) in Scotland, with the unique challenges of Scotland's topography and complex engineering on programmes such as R100.

Net Zero:

- Reducing the carbon footprint of masts, data centres and transport; integrating renewable power and improving energy efficiency.

Socio-economic:

- Ensuring digital inclusion and digital skills across all ages.
- Rural connectivity still behind urban areas, however, programmes in place to address this challenge.

Opportunities

Data and technology:

- The telecoms network provides significant opportunities to support public sector reform objectives, using data and technology.

Innovation:

- Scotland is already home to several digital innovation hubs particularly in the larger cities such as Glasgow and Edinburgh. Recent trialling of Low Earth Orbit satellite technology on Scotrail services is a god example of this.

Service/system:

- Scotland has a strong renewable energy supply which could position Scotland as a leading location for green data centres.

Socio-economic:

- Digital technology can improve public services, including healthcare e.g. digital services as part of social care reform.
- Digital technology can help enable independent living and healthy ageing through the provision of digital services in the homes, such as telecare and smart sensors.
- There is significant potential to enhance public services be leveraging digital technologies and AI.
- 5G has the potential to help sustain remote and rural areas, avoiding depopulation by providing connectivity through digital technology.

Economic:

- Digital technology innovation can support economic growth through new and expanding digital industries, building on existing clusters for example the potential increase in Data Centres driven by AI adoption.

Endnotes

1 Scottish Government (2021), A Changing Nation: How Scotland will Thrive in a Digital World

2 Scottish Government (2024), A Changing Nation: how Scotland will thrive in a digital world. Progress report 2021-2024

3 Scottish Government (2025), Digital Connectivity

4 Ofcom (2024), Connected Nations Scotland Report 2024

5 Scottish Government (2021), New scheme to increase connectivity unveiled

6 Scottish Government (2019), Forging Our Digital Future with 5G: A Strategy for Scotland

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9 Scottish Government (2021), Green datacentres and digital connectivity: vision and action plan for Scotland

10 Scottish Development International (n.d.), Digital and technology industries in Scotland

11 Scottish Government (2021), The Strategic Framework for a Cyber Resilient Scotland

Social Infrastructure

- 7 Housing
- 8 Health
- 9 Education
- 10 Emergency services
- 11 Defence
- 12 Justice
- 13 Culture and recreation
- 14 Central Estate

7 Housing

7.1 Sector summary

Responsibility

The Scottish Government sets overall housing policy, including affordable housing, building standards, and homelessness support.

Operating model

The housing market in Scotland comprises the following:

Local authorities: responsible for the provision of social housing and the broader strategic planning of housing across all tenures. Local authorities are responsible for assessing local housing needs and tackling homelessness. They may own or manage social housing stock.

House builders: primarily involved in the construction of new homes, for private sale, private rent and affordable homes through planning obligations.

Housing associations/Registered Social Landlords (RSLs): not-for-profit organisations that provide affordable housing for rent or low-cost home ownership.

Registers of Scotland: manages land and property registers.

Regulation

The **Scottish Housing Regulator (SHR)** is a non-ministerial department responsible for regulating social housing in Scotland. The SHR is an independent regulator of Registered Social Landlords and local authority housing services in Scotland, established on 1 April 2011 under the Housing (Scotland) Act 2010.

SHR's statutory objective[1] is to safeguard and promote the interests of:

- Around 600,000 tenants who live in homes provided by social landlords.
- Over 120,000 owners who received services from social landlords.
- Around 40,000 people and their families who experience homelessness and seek help from local authorities.
- Around 335 Gypsy/Traveller families who can use official sites provided by social landlords.

Scotland's building standards, under the **Building (Scotland) Act 2003**, require warrants, verifiers' checks and completion certificates, enforcing Technical Handbook rules on safety, sustainability and accessibility.

Asset value

The total value of **new build properties** in Scotland in 2024-25 was **£3.2 billion**.[2]

Asset strategies

The Scottish Government's **'Housing to 2040'** sets out a vision for housing in Scotland to 2040 and a route map to get there.

Local Housing Strategies (LHS) (mandated by the Housing (Scotland) Act 2001) are developed by local authorities to address local housing need.

Individual Housing Associations and RSLs produce Asset Management Strategies.

Funding

The **Affordable Housing Supply Programme (AHSP)** comprises a range of funding mechanisms to enable affordable housing providers to deliver homes for social rent, mid-market rent, and low cost home ownership in communities across Scotland to support local authorities' Local Housing Strategies. A total of £767.75 million is available in 2025-2026.[3]

The **Housing Infrastructure Fund (HIF)** enables funding for housing developments that have stalled or cannot proceed due to excessive cost or nature of the infrastructure works to be delivered.

Launched in 2016, it has invested nearly £50 million in loans and grants across urban and rural areas to fund infrastructure that unlocks the delivery of homes.[4]

The **Rural and Islands Housing Funds** aim to increase the supply of affordable housing of all tenures in rural Scotland.

In April 2024, the Scottish Government created a **Housing Investment Taskforce**[5] to identify actions to unlock existing and new commitments to investment in housing. Initiatives include:

- Supporting the delivery of mid-market rent (MMR)
- Charitable bonds
- National Housing Trust Initiative (NHT)

Scottish Government are also investing £2 million in 2025-26 through the **Scottish Empty Homes Partnership** to support local authorities to reduce the numbers of privately owned long-term empty homes.[6]

Key policy and strategy

- **Housing to 2040**, The Scottish Government (2021)
- **National Planning Framework 4** (NPF4), The Scottish Government, prioritising:
  - Quality homes
  - Rural homes
  - Affordable homes
  - Long-term planning
  - Sustainable locations
  - Infrastructure first approach

National developments

There is not a specific housing-focused national development, but many include housing delivery:

- Urban mass/rapid transit networks (6)
- Edinburgh Waterfront (9)
- Dundee Waterfront (10)
- Clyde Mission (13)
- Aberdeen Harbour (14)

Contribution to national outcomes

Scottish housing contributes to national outcomes including:

- **Poverty:** affordable housing helps to tackle poverty and inequality.
- **Economy and environment:** how we live in, heat and build our homes impacts on the environment.
- **Human rights, communities and health:** safe and warm homes and good neighbourhoods improve physical and mental health and wellbeing and build strong communities.
- **Children and education:** high-quality homes and neighbourhoods improve children's wellbeing and development.
- **Economy, fair work and business and education:** housing creates and support jobs and drives inclusive economic growth and social benefits.

Delivery plans

- **Housing to 2040**, The Scottish Government (2021) – Route Map.
- **Rural and Island Housing: Action Plan** (2023).
- **Local Housing Strategies**.

7.2 Sector analysis

A safe and affordable home is a fundamental human need and a crucial part of the infrastructure required for an inclusive society. High-quality, affordable, and energy-efficient housing is essential for achieving Scotland's goals of eradicating child poverty and homelessness, ending fuel poverty, addressing climate change, and promoting inclusive economic growth.

However, achieving these goals is complex and depends on various factors, including acute shortages of social housing, vacant properties and second homes, rural housing challenges, commercial viability and availability of land and rising housing costs.

Housing to 2040[7] is Scotland's first long-term national housing strategy, outlining a vision for housing and the path to achieving it. The vision is for:

- A well-functioning housing system.
- High quality, sustainable homes.
- Sustainable communities.
- Homes that meet people's needs.

A key focus of the strategy is the delivery of 100,000 affordable homes by 2031/32 and ensuring a continued supply of affordable homes in the future. The strategy also emphasises a place-based approach, ensuring that housing and communities work together to support health and well-being.

Households and dwellings in Scotland

Trends in households

In 2024, there were an estimated **2.55 million households** in Scotland. This was 301,100 (13%) higher than in 2004.[8]

There was a 0.7% (over 17,000 households) increase in households between 2023 and 2024, in line with the general upward trend in the growth rate in number of households since 2012.

Over the last twenty years, the number of households increased in every council area. The largest percentage increases were in Midlothian (29%), East Lothian (29%) and Orkney Islands (25%). The smallest percentage increases were in Inverclyde (2%), Dundee City (6%) and West Dunbartonshire (6%).[9]

People increasingly live in smaller households or alone. Therefore, the number of households has increased at a faster rate than it would due to an increase in the population alone. In terms of trends, the east and north of Scotland saw bigger increases in household numbers compared with the west and south.

Household size

Average household size in Scotland has generally decreased in recent decades, falling from 2.27 people per household in 2001 to 2.19 in 2011 and then to 2.12 in 2022.

The changes in household size and type over time are partly due to changes in the way we live, but also reflect the general ageing of Scotland's population. Older people are more likely to live alone or in smaller households. In addition, a growing proportion of older people are living in their own homes rather than in care homes or other communal establishments.[10]

Dwellings

Dwellings are defined as the place where a group of people (i.e. a household) live together. In 2024, there were **2.74 million dwellings in Scotland**, of which 4.1% were unoccupied (3.3% were vacant and 0.8% were second homes).[11]

Vacant properties (3.3% of total dwellings) are either those that are long-term (six months or more) empty (1.6% of all dwellings), or unoccupied exemptions (1.7% of all dwellings), such as new homes yet to be occupied and dwellings undergoing repair or awaiting demolition.

Overall, the percentage of unoccupied dwellings in Scotland has remained fairly stable in recent years, around 4%. However, the number of vacant dwellings has been increasing, mainly due to an increase in long term empty properties.

Empty and second homes are concentrated in different parts of the country, with remote rural areas having the highest percentage of vacant dwellings and second homes.

- **Vacant:** The council areas with the highest proportion of dwellings that were vacant in 2024 were Na h-Eileanan Siar (8%), Aberdeen City (6%), Orkney Islands (6%) and Shetland Islands (6%).
- **Second homes:** The areas with the highest proportion of dwellings that were **second homes** were mainly rural and island areas, including Argyll and Bute (6%), Na h-Eileanan Siar (6%), Orkney Islands (4%) and Highland (3%). Highland, Argyll and Bute and Fife together accounted for 8,400 second homes, more than a third (39%) of the total for Scotland.

Distribution in terms of value, type and density

Council Tax Bands give an estimate of the relative value of property, with the least expensive falling into Band A and the most expensive in Band H.

Data from the Scottish Assessors' Association[12] shows that 58% of dwellings fall into the three lowest Council Tax Bands (A-C), whereas around 14% fall into the highest bands (F-H).

The local authority area with the highest proportion of properties in bands F-H is East Renfrewshire (36% of all dwellings) and the lowest is Western Isles, Eilean Siar (2%).

Housing stock

Scotland's housing stock is diverse and varies across the country, comprising:

- Old (pre-1919) detached houses (4%) and tenement flats (7%).
- More modern post-1982 detached houses (11%) and tenements (8%; 182,000).
- Post-war terraced houses (14%, built between 1945 and 1982).
- Semi-detached houses, common across all age bands and accounting for around 20% of the stock alone.[13]

These six broad categories account for 64% of the overall housing stock. However, there is variability within these groups. Among pre-1919 tenement flats, for example, there is a wide range of sizes, layouts, and areas of exposure, which affects their energy efficiency and the living conditions experienced by the household.

The type of dwelling varies by rural and urban area. Half of all rural dwellings are detached, and 23% are semi-detached. Only 11% of rural dwellings are flats.

The most common dwelling type in urban areas is the tenement flat, accounting for around 28% of urban housing. Around 59% of urban stock are detached, semi-detached and terraced houses.

Rural dwellings are also, on average, 32% larger than urban dwellings based on internal floor area.

After a major expansion of private housing landlords between 2000 and 2019 (increasing it's market share from 5% to 15% of total housing stock) there has been recent structural shifts with smaller landlords stepping away and large institutional investors moving in via Built to Rent and Purpose-Built Student Accommodation.

Access to gas grid

Around 11% of dwellings in Scotland are estimated to be outside the coverage of the gas grid. 97% of urban dwellings are within the coverage of the gas grid, whereas 55% of those in rural areas are not.

Housing emergency

In recent years, there has been rising concern over the lack of available housing and housing affordability in Scotland. This is placing pressure on local authority areas, with some no longer able to meet their basic housing obligations.

The Scottish Parliament declared a national "housing emergency" in May 2024 and 13 of Scotland's 32 councils declared local housing emergencies, beginning with Argyll and Bute Council in June 2023, followed by Edinburgh City, Glasgow City, Fife and West Dunbartonshire.[14]

There is no standard definition for what constitutes a housing emergency. Each Council area has its own reasons for declaration, but common themes include: pressures on homelessness service; high levels of people in temporary accommodation; and, a lack of affordable homes compared to high waiting lists.

The declarations are intended to focus attention, at both the local and national level, to the significant housing and homelessness pressures local authorities are facing.

Housing land supply

NPF4 (2023)[15], the national spatial strategy for Scotland, introduced Policy 16 which includes the Annual Housing Audit to monitor the delivery of housing land allocated in Local Development Plans (LDP) to meet the Local Housing Land Requirement (LHLR). Local authorities in Scotland are required to conduct an annual survey of the housing land supply to determine completions and update forecasts of the housing land supply to inform land releases within the LDP and ongoing development management decisions.

House building

For all sector new home completions, the rate of house building has fluctuated over the last 20 years due to a number of factors.

Figure 21: All sector new housebuilding starts and completions, 2004-2024 (Source: Housing Statistics for Scotland Quarterly Update)

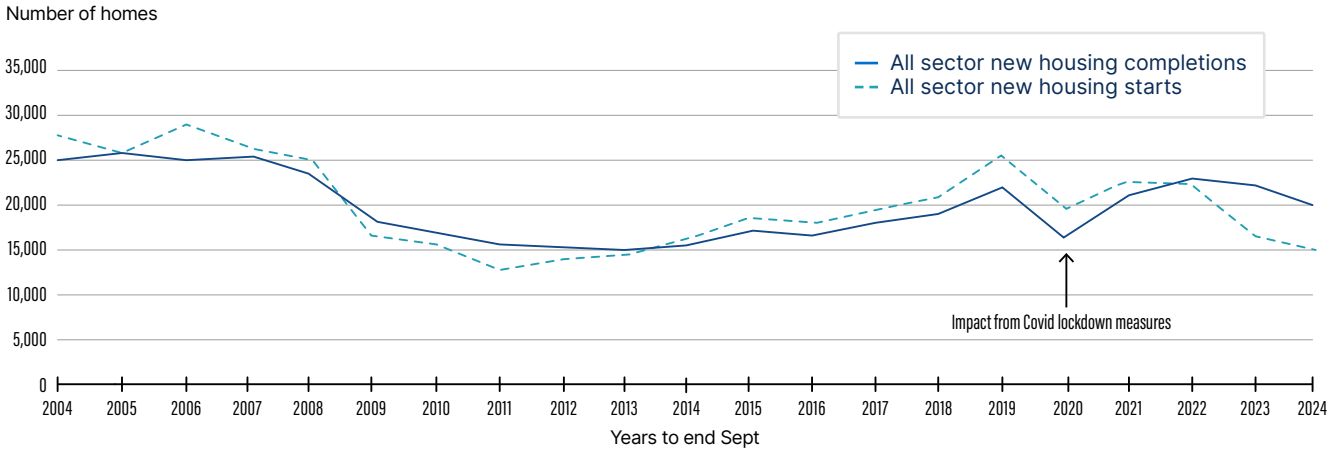


Figure 21 shows the annual number of 'all sector' starts and completions from September 2004-2024. At the start of the economic downturn in 2007/08, the annual number of new home completions was between 24,000-25,000. After this period, the volume of housebuilding (starts and completions) decreased yearly until 2012.[16]

In 2013, approximately 15,000 new homes were started and completed. From this point on, housebuilding generally increased and peaked at the end of 2019, almost matching the pre-economic downturn numbers for housebuilding starts. The impact of Covid-19 restrictions in 2020 caused starts and completions to drop to around 16,000.[17]

In the year to September 2024, a total of approximately 20,000 homes were completed and 15,000 new builds started. This followed a decrease in starts and completions of 10% and 12% respectively between 2023 and 2024.[18]

The highest number of starts were for the City of Edinburgh (11%), Aberdeenshire (9%), Fife (9%) and West Lothian (8%). Completions were highest for Glasgow City (10%), City of Edinburgh (9%) and Fife (7%).[19]

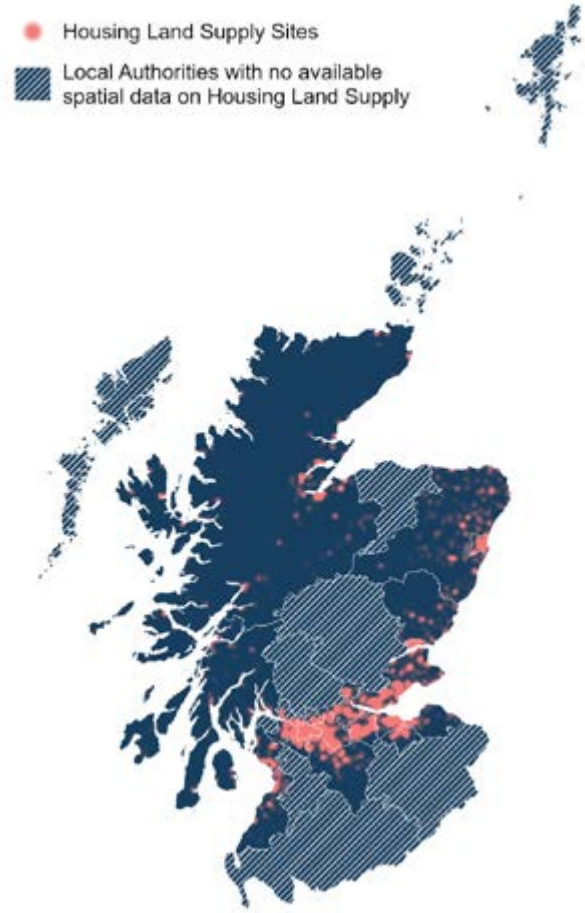
Social housing

Local authority housing numbers declined from the 1980s but began stabilising in the 2010s. The drops in local authority housing stock since the 1980s can be explained by three main factors: tenants buying homes under Right to Buy, stock transfers to Registered Social Landlords (RSLs), and a decrease in new local authority builds.[20]

Total social sector stock has been increasing steadily since 2018. The total social sector housing stock increased by 6,102, reaching 633,030 dwellings as of 31st March 2024, compared with 626,928 dwellings in the previous year. There were 325,477 local authority dwellings and 307,553 housing association dwellings as of 31st March 2024.

The demand for social housing is ever present; according to the Scottish Federation of Housing Association (SFHA) almost 250,000 people are waiting for social housing.[21] A snapshot of the local authority housing list on 31st March 2024 shows 177,264 applications – a 1.2% increase compared to 2023.[22]

Figure 22: Housing Land Supply Sites
(note: the absence of spatial data does mean the absence of Housing Land Supply)



Of the 177,264 applications on local authority or common housing register lists, 42,000 (23.7%) were recorded as being on transfer lists and 135,300 (76.3%) on waiting lists for entry into social housing.

Social housing in Scotland is primarily owned and managed by Councils and Housing Associations, also known as Registered Social Landlords (RSLs).

Approximately 565,000 households are provided by social housing landlords. The Scottish Housing Regulator oversees registered social landlords and councils' landlord and homelessness services.[23] Its purpose is to protect the interests of tenants and other service users and ensure the continued provision of high-quality social housing.

The regulator collects information and reports on the performance of social housing landlords against the Scottish Housing Charter, which sets the standards and outcomes landlords should aim to achieve for their tenants. According to Scottish Census data[24], Glasgow City and West Dunbartonshire has the largest proportion of social rented households at 35% and 34% respectively. The number of social rented households tend to be in larger cities and urban regions.

The local authorities with the lowest number of social rented households tend to be in rural areas. In the Perth and Kinross Council area, 16% of all households were social rented and the lowest numbers were recorded in East Renfrewshire (11%).

As of March 2024, there were 325,477 local authority housing stock units, a 1% (+2,331 units) increase from the previous year. There were 11,751 housing stock units vacant, remaining similar to the reported total in 2023, increasing slightly by 0.9% (+107 units).

In total, 3.6% of all local authority housing stock was reported as vacant, including units to be demolished or unfit for letting.

Table 7 shows the local authority housing stock by use and vacancy rate as of March 2024.

The peak total vacant stock rate was 4% in 2001, halving to 2% in 2017. Since then, there has been an increase in the vacancy rate, reaching 3.6% in 2022 before levelling off in 2024.

The normal use housing stock vacancy rate has also increased form 0.8% in 2017 to 1.9% in 2024.

The total vacancy rate in 2024 was highest in Renfrewshire (10.2%). Aberdeen City reported the highest vacancy rate for normal use stock (9%) increasing 2% from 2020.

To alleviate pressures on housing, many local authorities have implemented a 'Buy Back' scheme in which they will purchase properties which are either ex-council owned, empty, and/or in demand for social housing in that area. This has been successful in many council areas, and it can be more cost-effective to purchase these properties and bring them up to standards rather than to build new homes from scratch.

Table 7: Local authority housing stock by use and number of vacant units (2024)

	HOUSING STOCK	VACANT STOCK	% OF VACANT STOCK IN MARCH 2024
Awaiting demolition	1,645	1,636	1%
Low demand area	16,193	452	5%
Used for temporary accommodation	7,671	783	2%
Part of a modernisation programme	3,397	3,239	1%
Normal letting stock	296,350	5,640	91%
Total Stock	**325,477**	**11,751**	**100%**

Homelessness

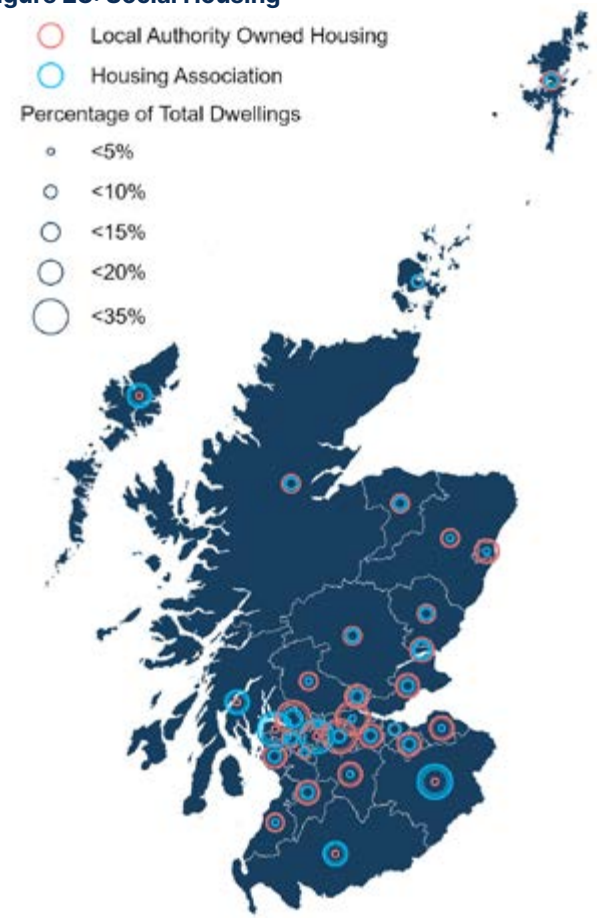
There were 40,685 homeless applications in 2023-24; an increase of 1,377 (4%) compared to 2022-23, and the highest level since 2011-12.[25]

There were 16,330 households in temporary accommodation at 31 March 2024, compared to 29,408 at March 2023, representing the highest in the time series. The number of children in temporary accommodation is also at the highest in the time series, up 5% between 2023-24.

Housing quality

The Scottish House Condition Survey (2023)[26] looks at the physical condition of Scotland's homes as well as the experience of householders.

Figure 23: Social Housing



It was reported that around 45% of the total housing stock was in some state of disrepair, with:

- 16% of all dwellings having urgent to critical elements of disrepair and 2% having extensive disrepair.
- 18% of dwellings having disrepair to non-critical elements.
- 3% of dwellings requiring some urgent repair to non-critical elements.
- 1% having extensive disrepair to non-critical elements.

The levels of dwellings that had disrepair to critical elements has decreased from 2022 and are at the lowest rate since 2012 (49% of dwellings in this condition), following the trend of improvements to the quality of the Scottish housing stock.

Looking at the prevalence of damp in the housing stock, 90% of properties were reported as being free from damp or condensation and 90% were free from mould, remaining similar to the levels reported in 2022.

The Scottish Housing Tolerable Standard (SHTS) is the basic level of repair a property must meet for it to be fit for inhabitants. The level of compliance with the SHTS is around 98%, with 2% of dwellings falling below the Standard, prescribed by the Housing (Scotland) Act 1987.

Energy performance

Energy Performance Certificates (EPC) provide energy efficiency and environmental impact rating for buildings based on standardised energy usage.[27] In 2023, 56% of Scottish homes were rated as EPC B and C or better with the mean Energy Efficiency Rating (EER) of 68.9 points, up from 59.9 points in 2010. The median EER has also improved for half of all Scottish dwellings, rising from 62 points in 2010 to 71 points in 2023, jumping from EPC Band D to B and C or above.

The Standard Assessment Procedure (SAP) for the energy rating of dwellings is the methodology currently used by the government to estimate the energy performance of homes. Based on the modelled energy use required to meet the Standard Assessment Procedure (SAP) standard heating regime, the average Scottish home was estimated to produce 6.3 tonnes of carbon dioxide (CO_2) per year. This is more than double the average carbon emissions per household reported by the Department for Energy Security and Net Zero (2.9 tonnes per year) in 2022, based on actual energy use.

Fuel poverty

In 2023, 861,0000 households (34% of all households) were estimated to be in fuel poverty, of which 491,000 (19.4% of all households) were in extreme fuel poverty.[28] This is higher than the 2022 estimates of 31% and 18.5% respectively. For both fuel poor and extreme fuel poor households, the lowest rates of fuel poverty are associated with higher energy efficiency standards.[29]

32% of households living in dwellings rated EPC Band C or better were fuel poor, compared to 48% living in dwellings in Bands F or G.

Challenges and opportunities

Challenges

Funding and finance:

- Lack of private investment in housing in rural and island areas.
- Risk appetite in the public sector to use innovative delivery/ funding mechanisms.
- Cost of construction.
- Maintenance/ cost of housing repairs.

Supply/demand:

- Housing supply challenges: housing affordability, funding (different public and private sector challenges), and sufficient delivery of affordable housing.
- Local authorities declaring housing emergencies due to housing pressures.
- High numbers of vacant properties – both a challenge and opportunity.

Service/system:

- Delivery of housing, especially length of time from planning to delivery (164,000 sites have planning permission, which in total are estimated to represent more than 164,000 unbuilt homes across Scotland).

Net Zero:

- Requirement for retrofit to meet net zero, however significant financial barriers.

Climate resilience:

- Flooding – and the ability/ funds to invest in resilience; risk of development without remedial long-term action.

Socio-economic:

- Increasing fuel poverty.
- High rates of child poverty and homelessness.
- Impact on health and productivity of poor housing – SHCS data.

Legislation and regulation:

- Housing Bill and market uncertainty while exemptions are confirmed through secondary legislation.

Workforce:

- Availability of contractors and skills, particularly in rural areas.

Opportunities

Data and technology:

- Digital technologies can enhance social housing management, with predictive analytics enabling proactive maintenance, reducing costs, and enhancing tenant satisfaction. Implementing comprehensive asset management systems provides real-time data on property conditions, facilitating timely interventions and efficient resource allocation.

Innovation:

- Innovative procurement and delivery models.
- Using methods such as off-site construction to reduce the cost of construction.

Service/system:

- Making best use of existing homes and support for home ownership.
- Re-using vacant/under-used assets.
- Legacy investment in housing from major infrastructure investments e.g. energy across Highlands & Islands and South of Scotland – Enabling the delivery of more high-quality affordable homes.

Socio-economic:

- Supporting community-led development.
- Supporting place resilience, especially in remote and rural places.

Economic:

- Strategic housing sites – major development opportunities to support national economic growth.

Housing

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2 Registers of Scotland (2025), Property Market Report 2024-25

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29 Housemark (2024), Tackling Scotland's housing challenges: insights from the Housemark Scotland leadership forum

8 Health

8.1 Sector summary

Responsibility

The Scottish Parliament and Scottish Government hold responsibility for health and social care services. The Scottish Government is also responsible for public health initiatives and promoting overall wellbeing.

A number of areas are still reserved to Westminster, including the regulation of medicines and health professionals.

NHS Scotland is responsible for delivering frontline services and improving population health.

Operating model

- **Scottish Government and parliament:** sets laws and policy governing NHS Scotland.
- **Digital health and care division:** this Scottish Government Division works collaboratively with a range of public, private, third and independent sector partners to deliver digital solutions to ensure that the health and care needs of the people of Scotland are met, and that they benefit fully from innovation and digital and data developments.
- **NHS Scotland:** NHS Scotland includes 14 regional NHS Boards (territorial boards) that directly manage health services and protect the health of their populations.

  NHS Scotland provides health services, including public health, primary care, secondary care and tertiary care.
- **Special NHS Boards:** These 7 Boards provide specialist and national support to the regional boards.
- **Public Health Scotland (PHS):** is a public health body jointly sponsored by the Scottish Government and the Convention of Scottish Local Authorities (COSLA) on behalf of local government. PHS leads and supports Scotland to respond to its health challenges and make a difference to the lives of people in Scottish communities.
- **NHS Education for Scotland (NES):** Responsible for education and training of the healthcare workforce.
- **Health and social care partnerships:** 31 integration authorities which are responsible for adult social care, adult primary health care and unscheduled adult hospital care. Some are also responsible for children's services, homelessness and criminal justice work.
- **Local authorities:** have the statutory responsibility for social care.
- **Scottish Ambulance Service:** provides emergency ambulance services and patient transport – covered in more detail under Section 10 (Emergency services).

Regulation

The Scottish Parliament is responsible for legislating on healthcare matters, including the regulation of new healthcare professional groups and any relevant legislation concerning healthcare services.

NHS Scotland is not regulated by a single body, with the roles of regulation, inspection, complaints and enforcement divided between several bodies, including:

- **NHS Assure:** NHS Assure provides a guidance service related to the design, build and maintenance of acute healthcare built environments. This will ensure they are free from avoidable risk and infection. The service will also produce the standards by which compliance within the healthcare built environment is measured so that assurance can be provided.
- **Healthcare Improvement Scotland:** focuses on improving healthcare quality and safety, assessing and inspecting services, and providing guidance to NHS Scotland.
- **The Care Inspectorate:** This body is the national regulator for care services in Scotland, inspecting and regulating various types of care settings like care homes, childcare services, and more.
- **Scottish Public Services Ombudsman:** handles complaints about public services in Scotland, including the NHS.

Various other professional regulatory bodies, such as the General Medical Council (GMC) and General Dental Council (GDC) also play a role in regulating individual healthcare professionals.

Asset value

NHS Scotland owns physical assets that are worth over £7 billion (2017)[1], the majority of which comprise estate (land and buildings) but also owned vehicles, medical equipment and information management and technology assets.

Asset strategies

Scottish Government have proposed that all NHS Boards develop a Programme Initial Agreement (PIA) setting out a deliverable and whole-system service and infrastructure change plan for the next 20-30 years.[2] This will show the interlinked investment priorities of each Board. Once agreed this would enable business cases to be developed more dynamically and credibly against agreed capital planning assumptions.

Boards such as NHS Fife have developed a Whole System Property and Asset Management Strategy to provide the strategic intent for the Whole System Agreement.[3]

Key policy and strategy

- Scotland's Population Health Framework[4]
- Health and Social Care Service Renewal Framework (June 2025)[5]
- Healthcare Quality Strategy for Scotland, The Scottish Government, 2010[6]
- 2020 Vision and Strategic Narrative[7]
- NHS Scotland: national access policy (2023)[8]
- Scotland's Digital Health Care Strategy[9]

Funding

Healthcare is the Scottish Government's largest area of spending, with the 2024-25 budget allocating £19.1 billion, representing 40% of the total Scottish budget and £1.025bn of capital investment.[10]

Reflection on last 20 years

The NHS in Scotland has undergone significant change, including dismantling the internal market that was created during the 1990s.

The focus in the last 20 years has been to move towards:

- Integrating health and social care.
- Shifting the balance of care towards the community (reducing demand on hospitals).
- Improving service quality and patient experience.

NHS Scotland has taken steps to reduce demand on hospitals, aiming to eliminate unnecessary outpatient appointments and hospital admissions for older people. Although the number of patients treated in hospital is lower, the average length of stay in hospital has risen since the start of the pandemic.

Key investments have included:

- Increasing health spending per person in real terms.
- Investment in NHS Scotland workforce numbers.
- Capital investment including:
  - New hospitals:
    - Dumfries and Galloway Royal Infirmary – opened at the end of 2017.[11]
    - Royal Hospital for Sick Children and Department of Clinical Neurosciences (Edinburgh) – opened to patients in early 2018.[12]

Key national developments

- Urban mass/rapid transit network (for access to physical healthcare facilities) (6).
- National walking, cycling and wheeling network (access to physical healthcare facilities along with contribution to health outcomes) (8).
- Digital fibre network (connectivity to health services) (12).

Contribution to national outcomes

- Health
- Human Rights
- Poverty
- Education
- Children and Young People
- Communities

Delivery plans

- NHS Recovery Plan (2021)[13]
- Care in the Digital Age: Delivery Plan 2023-24[14]

Sector analysis

NHS Scotland is the publicly funded healthcare system in Scotland. It operates 14 territorial NHS Boards across Scotland, 7 special non-geographic health boards and NHS Health Scotland.

NHS Scotland's infrastructure is large and complex, with a wide range of physical assets, the vast majority comprising land and buildings.

In aggregate terms, NHS Scotland, and its component Boards, own physical assets with a gross value of some £7.2 billion[1], comprising the physical estate, vehicles, medical equipment and information management and technology systems.

In addition, NHS Scotland and the Boards also operate other assets, for example PPP/PFI hospitals and health centres and leased vehicles; the gross value of these assets is estimated to be around £1.4 billion.

Figure 25 shows a map of Scotland's healthcare infrastructure.

NHS Scotland property

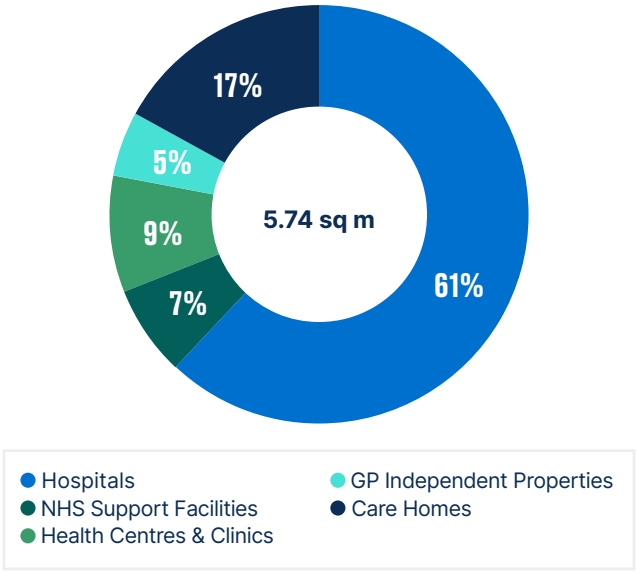
NHS Scotland's estate comprises approximately 4.7 million sq m.[15] Buildings built in the 1960s and 1970s account for a quarter of NHS Scotland's infrastructure and would cost an estimated £8.5 billion to replace. Many are at the end of their economic life and will need increasing investment to safeguard these assets. However, these is insufficient budget to replace all ageing assets, with a need to make better use of existing assets, extend their life beyond 60 years and reduce reliance on NHS buildings.

Property infrastructure supporting Scotland's health and care services consists of a range of NHS, local authority and privately owned accommodation. Figure 24 shows the distribution (by floor area) of these main property types.

The replacement value of NHS accommodation is estimated at over £30 billion[16]. In addition, there is a network of independent optometrists, dentists, pharmacies, private hospitals and voluntary sector organisations, which all combine in support of population health, care and wellbeing.

The size of the NHS estate in Scotland is almost the size of the city of Stirling. It has been estimated that just over half (52%) of the total NHS Scotland estate is greenspace, almost twice the size of Loch Lomond Nature Reserve.

Figure 24: Distribution of Scotland' s Health and Care Infrastructure (by floor space)



Health and social care service frameworks

A key focus of NHS Scotland is ensuring people receive the right care in the right place, recognising that acute hospitals are not always best option.

Figure 25: Scotland's Hospitals and Health Care facilities

On 27 January 2025, the First Minister described plans to renew Scotland's health service, with the first component being an Operational Improvement Plan, to be followed by publication of a population health framework and a health and social care service renewal framework[17].

- **The Population Health Framework (June 2025)**[18] sets out Scottish Government's and COSLA's long-term collective approach to improving Scotland's health and reducing health inequalities for the next decade. It represents a shift in culture, from treating illness to prevention and a whole system approach to improving health.
- The **Health and Social Care Service Renewal Framework (June 2025)**[19] provides a high-level guide for change, to ensure the sustainability, efficiency, quality, and accessibility of health and social care services in Scotland.
- In November 2025, Scottish Government issued guidance to regional boards encouraging them to organise themselves in to two collaborative sub-national structures – Scotland East and Scotland West. Through these they should co-operate with each other in planning and delivery of the Population Health Framework, the Health and Social Care Service Renewal Framework, as well as wider ambitions related to public sector reform[20].

Health and digital

Scotland envisions a future where digital technologies are seamlessly integrated into health and social care, enhancing accessibility, efficiency, and the overall well-being of its citizens.

The Digital Health and Care Strategy (2021)[21] sets out how to improve the care and wellbeing of people in Scotland by making best use of digital technologies in the design and delivery of services, in a way, place and time that works best for them.

Key Areas of focus include:

- **Citizen empowerment:** Giving individuals greater control over their health information and providing access to digital tools for self-management.
- **Service transformation:** Ensuring digital foundations for health and care services, enabling staff to effectively record, access, and share information, and improving care delivery.
- **Data-driven insights:** Providing access to secure data for planning, research, and innovation to improve efficiency and develop new approaches.

Challenges and opportunities

Challenges

Funding and finance:

- Capital budget constraints impact on ensuring hospitals, clinics and GP premises investment is at a level to meet modern clinical, infection control and accessibility standards.

Net Zero:

- Buildings and critical infrastructure must be adapted for flooding, storms and heat, while decarbonising energy use (heat, power, transport) to meet Scotland's net zero commitments and ensure operational resilience.

Service/system:

- Protecting critical systems and patient data from cyber attack, ensuring rapid recovery and securing supply chains for digital equipment are essential to maintain service continuity.
- A wide scale roll out and integration of electronic health records, remote monitoring, telehealth and shared care records requires resilient networks, standardised data formats and investment in systems that talk to each other.

Supply/demand:

- Increasing demand for services through a range of factors including ageing population.

Workforce:

- Concerns about the sustainability of the workforce and its ability to meet the growing demands on the NHS and its estate.

Socio-economic:

- Scotland faces enduring health inequalities and a stall in life expectancy improvements.
- Ensuring equitable access across sparsely populated and island communities requires tailored infrastructure.

Ageing or changing asset needs:

- Many hospitals/healthcare buildings are at end of their economic life.
- Deferred maintenance increases costs and clinical risk.

Opportunities

Data and technology:

- Digital technology to transform health and social care delivery.
- National digital platform through which relevant real-time data and information from health and care records can be shared in a secure and safe way.

Service/system:

- Further integrating health and social care.
- Using investment in healthcare infrastructure to catalyse a shift in the balance of care towards the community.

Endnotes

1 Scottish Government (2018), NHS Scotland assets and facilities 2017: annual report

2 Scottish Government (2024), NHS Scotland: Whole System Infrastructure Planning

3 NHS Fife (2023), Whole system property and asset management

4 Scottish Government (2025), Scotland's Population Health Framework

5 Scottish Government (2025), Health and Social Care Service Renewal Framework

6 Scottish Government (2010), Healthcare quality strategy for NHS Scotland

7 Scottish Government (2014), Healthcare quality and efficiency support team: annual report 2013

8 Scottish Government (2013), NHS Scotland: national access policy

9 Scottish Government (2021), Scotland's Digital Health Care Strategy

10 The Scottish Parliament (2024), NHS in Scotland 2024: Finance and performance PAC to HSCS Committee 3 April 2025

11 The Scottish Government (2017), Half a billion pounds of NHS facilities to go live

12 Ibid

13 Scottish Government (2021), NHS Recovery Plan 2021-2026

14 Scottish Government (2023), Care in the Digital Age: Delivery Plan 2023-24

15 Scottish Government (2020), Annual State of NHS Scotland Assets and Facilities, 2020 Performance Report

16 Ibid

17 Scottish Government (2025), NHS Scotland Operational Improvement Plan

18 See 4 above

19 See 5 above

20 Scottish Government (2025), Implementation of sub-national planning: co-operation and planning directions 2025

21 See 9 above

9 Education

9.1 Sector summary

Responsibility

The Scottish Government is responsible for the education system in Scotland, with Education Scotland acting as its executive agency.

Operating model

- **Scottish Government:** sets national education policy, provides funding and oversees curriculum and qualifications.
- **Education Scotland:** a Scottish Government executive agency charged with supporting quality and improvement in Scottish education and thereby securing the delivery of better learning experiences and outcomes for Scottish learners of all ages.
- **Local authorities:** act as Education Authorities and have the statutory role of delivering education. Local authorities are primarily responsible for building and maintaining schools.
- **COSLA (Convention of Scottish Local Authorities)** plays a key role in shaping and implementing education reforms in Scotland. COSLA is actively involved in the development of plans for the replacement of the SQA (Scottish Qualifications Authority) and the creation of a new independent inspectorate and a new national education body.
- **Scottish Funding Council (SFC):** The SFC is a non-departmental public body responsible for funding Scotland's Further and Higher education institutions.
- **Universities:** Scotland's universities are operated by 19 autonomous higher education institutions. These institutions are represented by the representative body **Universities Scotland**.
- **Colleges:** Scotland's colleges are organised into 13 regions, with regional bodies coordinating college activities. **Colleges Scotland** acts as a collective voice for the college sector.
- **The Scottish Council of Independent Schools (SCIS)** is an educational charity representing and promoting the interests of **70 independent schools** across the country.

Regulation

- The **Scottish Funding Council (SFC)** is the primary regulator of higher education institutions.
- The **General Teaching Council for Scotland** is the independent regulator for teachers in Scotland.

Funding

The Scottish Government plays a role in supporting local authorities through funding programmes like the **Learning Estate Investment Programme (LEIP)**. The £2 billion LEIP is a joint programme with COSLA.

LEIP also impacts how local authorities fund new school construction, requiring them to fund the construction or refurbishment, with Scottish Government revenue support over 25 years provided set outcomes are achieved (eg maintain buildings in Condition A/B, meeting in-use energy targets).

Scotland's colleges are primarily funded by Scottish Government through the Scottish Funding Council grants, supplemented by tuition, apprenticeships, commercial income, training contracts and capital grants.

Scottish universities are funded mainly by the Scottish Government via the Scottish Funding Council, with student tuition (domestic fees government funded; UK/international fees paid), competitive research grants, commercial income, philanthropy and capital grants or borrowing.

Asset value

Schools: The overall value of Scotland's school estate in gross terms is estimated to be **£20 billion** based on current replacement costs.

Colleges: Between 2011-2021, the Scottish Government has invested £863 million in the college estate.

Universities: Between 2011-2021, the Scottish Government has invested £179 million in the University estate. The value of the estate as of 2019 was estimated at just over **£5 billion**.

Key policy and strategy

- **College Infrastructure Strategy: The approach to delivering Scotland's College Infrastructure Plan**, Scottish Funding Council (2022).
- **Education (Scotland) Bill:** This Bill establishes a new body called Qualifications Scotland and also creates a new office His Majesty's Chief Inspector of Education in Scotland. The Bill was introduced on 4 June 2024 and is at Stage 3 to decide if it should be an Act.
- **Delivering excellence and equity in Scottish education: a delivery plan for Scotland**, Scottish Government (2016).
- **Enhancing learning and teaching through the use of digital technology**. Scottish Government (2016).
- **Scotland's International Education Strategy**, Scottish Government (2024): sets out a framework to cement Scotland's reputation as a world leader in education, research and knowledge exchange, working with universities and colleges to attract students and staff from outside the UK.
- **Scotland's Learning Estate Strategy: Connecting People, Places and Learning**, Scottish Government and COSLA (2019).

Reflection on last 20 years

Since 2007, the Scottish Government and local authorities across Scotland have collectively invested around £5 billion improving Scotland's Learning Estate.

The LEIP follows on from the successful £1.8 billion Scotland's Schools for the Future Programme, which delivered 117 new or refurbished learning facilities across Scotland from 2009 to 2021.[1]

Scottish Government has allocated £800 million since 2007 to allow for the construction of new campuses and buildings, and £330 million in Non-Profit Distributing revenue funded investment.

Key national developments

No education-specific national development, but some will encompass or facilitate enhanced educational provision.

- Digital Fibre Network (12).

Contribution to national outcomes

- Education
- Communities
- Children and young people
- Health
- Poverty

Delivery plans

- **College Infrastructure Strategy (CIS) Delivery Plan (2023):** supports the development of an Infrastructure Investment Plan for the college sector.

9.2 Sector analysis

Scotland's learning estate comprises a mix of large, multi-campus assets through to smaller assets across Scotland. The learning estate is a key part of Scotland's infrastructure and plays a critical role in the success of the communities and economy it serves.

The public sector learning estate includes early years facilities, primary schools, secondary schools and colleges. Schools dedicated to supporting children and young people with Additional Support Needs are also part of this sector. The estate also provides resources such as libraries, swimming pools and recreational areas to communities.

The current education system in Scotland is designed to provide early learning and childcare for 2–5-year-olds, primary/secondary education for those aged 5-18 and further and higher education through a network of colleges and universities. As of 2024, there are **1,978 publicly funded primary schools, 360 secondary schools and 107 special schools** in Scotland catering to 702,428 pupils.[2]

Early learning infrastructure

All children aged three and four are entitled to free part-time early learning and childcare. The Scottish Government provided up to 1,140 hours of funded Early Learning and Childcare (ELC) a year, equating to around 30 hours a week in term time and 22 hours a week all year round.

There are currently 2,575 centres providing funded ELC not including child minders. This is a decrease from 2,582 in 2023 and a continued decrease form 2,630 in 2021; the lowest total number of centres since 2018 (2,544). There were 90,321 children currently registered in ELC in September 2024, a decrease of 2% since the previous year. Total registrations dropped considerably in 2020 before increasing in 2021 and 2022 but are expected to decrease again (according to the Records of Scotland[3]). The current number of children registered for ELC places represents 94% of 3–4-year-olds and 13% of 2-year-olds in Scotland.

According to the Scottish Household Survey[4], about 82% of households with pre-school aged children use some form of childcare. In 2022, the most common form of childcare used were local authority nursery and private nursery, with around 39% using local authority nursery.

School education

In Scotland, local authorities are responsible for the delivery of primary and secondary education and provide education for most school-aged pupils, with the remaining provided by the small independent sector. There are approximately **2,500 local authority schools in Scotland** with about 91 independent schools across the country ranging in size and scale (with 71 being members of the Scottish Council of Independent Schools, SCIS).

Scotland's School Estate Statistics (2024)[5] report on the condition, suitability and capacity of all local authority schools. The overall value of Scotland's school estate in gross terms is estimated to be **£20 billion** based on current replacement costs.

The estates vary in age, with some new schools recently built to some over 50 years old. Around 1,139 schools have been built or substantially refurbished since 2007-08, equating to around 44% of the entire estate. It should be noted, only builds and refurbishments with a cost of over £500,000 or more for primary schools and £1 million or more for secondary and special schools are included.

Table 8 shows the number of new builds or refurbishment projects completed in the last five years.

Table 8: Schools built or substantially refurbished (2019-2024)

	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
Primary School	23	32	48	38	27
Secondary School	6	7	4	6	11
Special School	1	2	1	2	3
Total	30	41	53	46	41

Source: Scotland's School Estate Statistics (2024)

As a result of school building and refurbishment, the proportion of schools in good or satisfactory condition has increased 29 percentage points from 62.7% in April 2007 to 91.7% in April 2024.

Colleges

There are **24 colleges operating in 13 regions across Scotland**, delivering around 68 million hours of learning to approximately 218,000 students.

These colleges deliver around 13% of all further education in Scotland and the sector enables almost 9,000 students to progress into university every year. Data for 2023-24 suggests there is about 62.6 million learning hours provided by Scottish colleges.[6]

Colleges also work in partnership with schools and employers to offer students the skills required in industry.

The Scottish Funding Council (SFC) published the College Infrastructure Strategy (2022)[7] which details the strategy for future investments in Scotland's college estate and other college infrastructure. Scottish Government has allocated £800 million since 2007 to allow for the construction of new campuses and buildings, and £330 million in Non-Profit Distributing revenue funded investment.

Universities

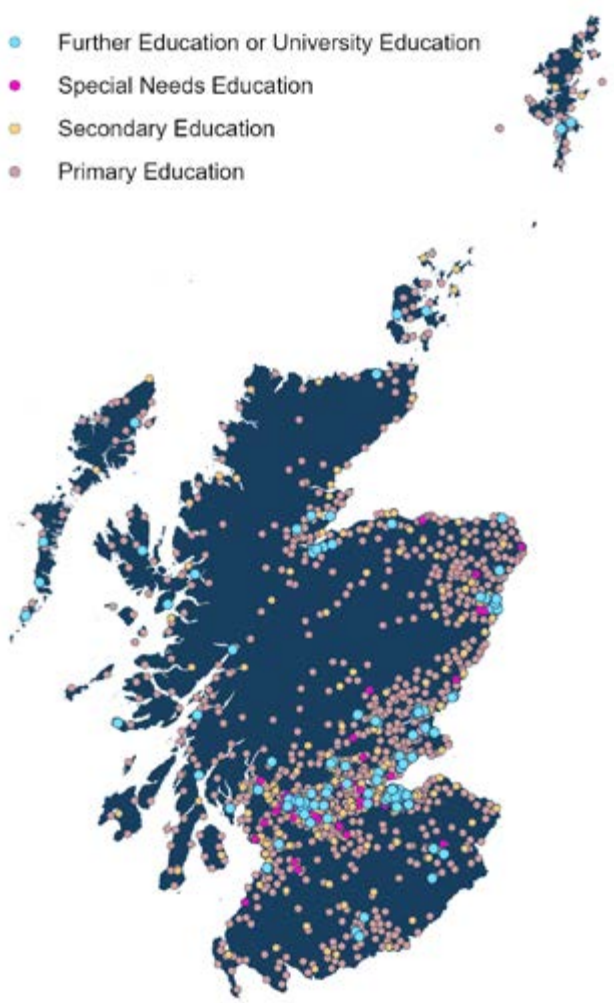
Scotland has **19 higher education institutions**, 15 of those being universities. All Scottish universities are public universities and are partially funded by the Scottish Government through the SFC.

Data from the Higher Education Students Statistics (2023-24)[8] reported 184,735 students were enrolled in Scottish universities, with some 65,000 international students. These figures represent a 1.6% increase in total student enrolment and a 37.1% increase in international student enrolment compared to 2020-2021.

Universities Scotland[9] states the presence of international students in Scotland has contributed between £4-6 billion to the economy since 2019, as well as supporting thousands of jobs and businesses.

The University estate is large and diverse, with some 1,856 buildings throughout Scotland in 146 locations with 24% constructed between 1840-1959 and 6% before 1840. The value of the estate as of 2019 was just over **£5 billion**, with Edinburgh having a third (£1.7 billion) of the total value.[10] The age profile of the estate comes with increasing maintenance requirements and the need to create facilities to compete in the current market.

Figure 26: Education infrastructure



Challenges and opportunities

Challenges

Funding and finance:

- Funding pressures. For example, the financial challenges facing colleges have increased, with real-terms resource funding for the sector having reduced by 17 per cent since 2021-22.
- Maintenance funding to keep the learning estate in appropriate condition.

Net Zero:

- The investment required to achieve public sector net zero targets.

Service/system:

- Performance, including performance relative to international comparators.
- Localised population growth in some urban areas and declining rolls in others will create pressure to expand or rationalise places, requiring flexible planning and timely capital investment.

Socio-economic:

- Performance, including the attainment gap between students from different socio-economic backgrounds.
- Demographic shifts leading to drops in demand and also concurrently increasing demand in different areas.

Opportunities

Data and technology:

- Leveraging technology. Scotland has strong digital infrastructure, providing opportunities to harness technology in education.

Innovation:

- Scotland has a history of innovation, with opportunities to leverage for performance improvements.

Service/system:

- The education reform programme has been informed by a series of independent reviews which were published between 2021 and 2023. These reports detail ways in which Scotland can build on the strengths of the current system, for the betterment of children and young people, adult learners and practitioners.
- National needs-based skills planning process.
- Increased all year round asset utilisation.
- Increased inclusion for those with additional support needs.

Endnotes

1 Scottish Government (2020), Schools Upgrade

2 Scottish Government (2024), Summary statistics for Schools in Scotland 2024

3 Ibid

4 Scottish Government (2023), Scottish Household Survey 2022: Key Findings

5 Scottish Government (2024), School estate statistics 2024

6 Scottish Funding Council (2025), College Statistics 2023-24

7 Scottish Funding Council (2022), College Infrastructure Strategy: The approach to delivering Scotland's College Infrastructure Plan

8 Higher Education Statistics Agency (HESA) (2025), HE student enrolments by permanent address 2019/20-2023/24

9 Universities Scotland (2024), International students critically important for International students critically important for Scottish jobs, growth and global ambitions

10 Audit Scotland (2019), Finances of Scottish universities

10 Emergency Services

10.1 Sector summary

Responsibility

The Scottish Government sets the **Vision for Justice in Scotland** which includes the aim that the police, fire and other emergency services work in partnership to reduce harm and increase safety.

The primary responsibility for police services lies with **Police Scotland**, a single national service.

The **Scottish Fire and Rescue Service (SFRS)** is responsible for protecting the safety and wellbeing of people in Scotland by preventing, protecting and responding to emergencies.

The **Scottish Ambulance Service** is responsible for providing emergency and non-emergency healthcare services across Scotland. This includes responding to 999 calls, providing patient transport, and supporting national emergencies.

Operating model

Police Scotland: Police Scotland is responsible for policing across the whole of Scotland. Its purpose is to improve the safety and wellbeing of people, places and communities across Scotland. Police Scotland is the second largest force in the UK with 23,000 officers and staff. There are 13 local policing divisions, supported by national specialist divisions[1].

Scottish Fire and Rescue Services (SFRS): works in partnership with communities and with others in the public, private and third sectors, on prevention, protection and response, to improve the safety and wellbeing of people throughout Scotland. The SFRS is the 4th largest fire service in the world[2] with:

- 74 wholetime stations.
- 282 on call stations.
- 301 property assets for training (including 5 centres).
- 710 heavy fleet.
- 7,700 employees.

Other emergency service infrastructure in Scotland includes:

- **HM Coastguard:** coordinates all maritime search and rescue (SAR) operations in the UK through a network of coastguard stations (116 around Scotland's mainland and islands)[3]. It is a section of the Maritime and Coastguard Agency (MCA) which is an executive agency of the Department for Transport (DfT). The **Royal Lifeboat Institution (RNLI)** charity provides lifeboat services and coordinates rescues at sea, often working with HM Coastguard.
- **Scotland's Charity Air Ambulance (SCAA):** works in partnership with the **Scottish Ambulance Service**. SCAA plays a crucial role in responding to life-threatening accidents and medical emergencies across Scotland, operating from two helicopter air ambulances and two rapid response vehicles from bases in Perth and Aberdeen[4].
- **Scotland's Mountain Rescue:** Scottish Mountain Rescue represents 26 volunteer Mountain Rescue Teams – including two Search and Rescue Dog Associations (SARDA), Scottish Cave Rescue Organisation and the Search And Rescue Aerial Association – Scotland (SARAA – Scotland) with over 850 volunteers[5]. Scotland's Mountain Rescue also includes an additional three Police teams and one RAF team.

Regulation

- The **Scottish Policing Authority (SPA)** was established at the same time as Police Scotland and is responsible for maintaining policing, promoting policing principles and the continuous improvement of policing in Scotland.
- **Crown Office and Procurator Fiscal (COPFS)** – see Section 12 – Justice.

Funding

Police Scotland: The Scottish Government has provided a financial allocation of £1.6 billion to the Scottish Police Authority for policing in 2025-26. This is made up of £1,480.6 million revenue funding, £20.3 million reform funding and £70 million capital funding.

SFRS: The Scottish Government has provided a financial allocation of £412.2 million for 2025-26, up 4.78% since 2024-25. The Service is facing a capital backlog, estimated at £818 million, of which £496 million is to develop the operational estate up to modern station design standards.

Scottish Ambulance Service: The Scottish Government has provided a financial allocation of £437.2 million in 2025-26. The service has been facing financial challenges, including overtime cost pressures, and is seeking to deliver significant efficiency savings[6].

Asset value

Police Scotland: In terms of the Police Scotland estate, the area footprint is 490,000 sq m, with only the Metropolitan Policy Authority in the UK having a larger estate. The estate has a book value of £478 million, with Police Scotland owning 80% of the properties. The remainder are on leases, with one PFI property[7].

More than 200 operational buildings are more than 40 years old, with 66% of Police Scotland buildings constructed before 1980.

SFRS: has an asset portfolio worth around £0.5 billion comprising a range of assets, land and buildings, vehicles and operational equipment, which are critical to the effective delivery of services to communities across Scotland.

Scottish Ambulance Service: at 31 March 2024, Scottish Ambulance Service assets were valued at approximately £130 million (net book value). The highest valued asset was unsurprisingly 'transport equipment' (£61 million), followed by buildings (£20 million) and plant and machinery (£10 million). Assets under construction were valued at £27 million.[8]

Asset strategies

- Estate Strategy 2019: A changing estate to better serve our communities, Police Scotland and SPA[9]
- Strategic Asset Management Plan: Property 2023-28, Scottish Fire and Rescue Service, July 2023[10]

Key policy and strategy

- Joint Strategy for Policing 2023: Policing for a safe, protected and resilient Scotland[11]
- SFRS Draft Strategy 2025-2028[12]
- Scottish Ambulance Service – Our 2030 Strategy[13]

Reflection on last 20 years

Police Scotland: the organisation (created in 2013) inherited a very large and ageing estate, much of which was not fit for purpose, with high maintenance costs, environmental inefficiencies, and locations that no longer meet the requirements of local communities. In December 2023, proposals to close several police stations across the country were announced as part of the Estate Strategy.

The current Strategy[14] seeks to move towards police stations co-located with partners, where possible, to ensure services are delivered in the most efficient and effective way. There are currently more than 60 co-locations with partners, supporting more sustainable and modern workspaces, achieving financial savings and providing more integrated and effective public services with better outcomes.

The Strategy highlights that in recent years Police Scotland has been responding to rising and increasingly complex community and individual needs. This includes responsibilities that go beyond preventing and responding to crime and disorder, adapting to how society continues to evolve. The changing nature of needs includes responding to the growing challenges of cyber and digital crime and the impact of vulnerability, mental ill-health and substance misuse.

SFRS: the draft Strategy[15] outlines how Scotland is changing and the need to adapt, with the service responding to a wider range of incidents than ever before. This includes fewer house fires but more flooding and wildfire incidents.

Some stations are in areas where heavy industry – such as coal mines or shipyards – formerly existed but is no longer present. Like Police Scotland, the estate is ageing, and some stations are no longer fit for purpose or require significant investment to make them safer and more sustainable.

SFRS has in 2025 undertaken a 12-week public consultation on its Service Delivery Review which looks at ways to reshape and modernise the organisation. Service delivery and asset recommendations will be considered by the SFRS Board during 2026.[16]

Scottish Ambulance Service: Demand for the service has significantly increased over the years, with a 55% rise in the last decade. This increase is partly due to a growing and ageing population, but is also as a result of changes to healthcare provision, including increased referrals from GPs and other healthcare professionals. The service is also handling more complex cases and experiencing longer handover delays at hospitals.

Significant investments

- Scottish Crime Campus opened in 2014 (£75 million investment).
- Special operations training and logistics facility at National Risk and Resilience Department base in Newbridge Edinburgh (£1.5 million).
- SFRS's West of Scotland Asset Resource Centre in Cambuslang opened in 2023 (£12 million).

Key national developments

None specifically relate to Police and SFRS.

Contribution to national outcomes

- Communities
- Children and Young People
- Education
- Human Rights

Delivery plans

- Annual Police Plan 2025-26[12]
- SFRS Three-Year Delivery Plan 2024/25 – 2026/27[13]

10.2 Sector analysis

Police

Police Scotland occupy the second largest police estate in the UK and have a wide geographical coverage with presence in all 32 local authorities. Police Scotland inherited a complex and ageing estate in 2013; despite improvements over the years, much of the estate is at the end of its useful economic life and is no longer suitable for the delivery of the revised model of policing.

According to the Scottish Police Authority (SPA)[17], there is a backlog of maintenance, with a bill of almost £245 million to just address the structural make-up of the buildings, with future capital required to make them fit for the future.

As of December 2018, the estate comprised of 605 individual assets, as follows:

- 344 operational properties (police stations and administrative offices).
- 113 residential properties.
- 143 Telecommunication masts.

Scottish Police own 80% of the entire estate with the remainder under some form of lease with a single PFI property operating as the police training facility. The operational estate is valued at £478 million with a footprint of around 490,000 sq m[18].

In terms of the estate age, 66% of the estate pre-dates 1980, with 33% pre-dating 1950 and a small number pre-dating 1900. As a result of the ageing estate, more than 30% of buildings are in poor condition and have become expensive to occupy and maintain.

Fire and Rescue

The Scottish Fire and Rescue service (SFRS) was also formed in 2013 by merging the 8 regional fire services into one single national organisation creating the largest fire brigade in the UK.

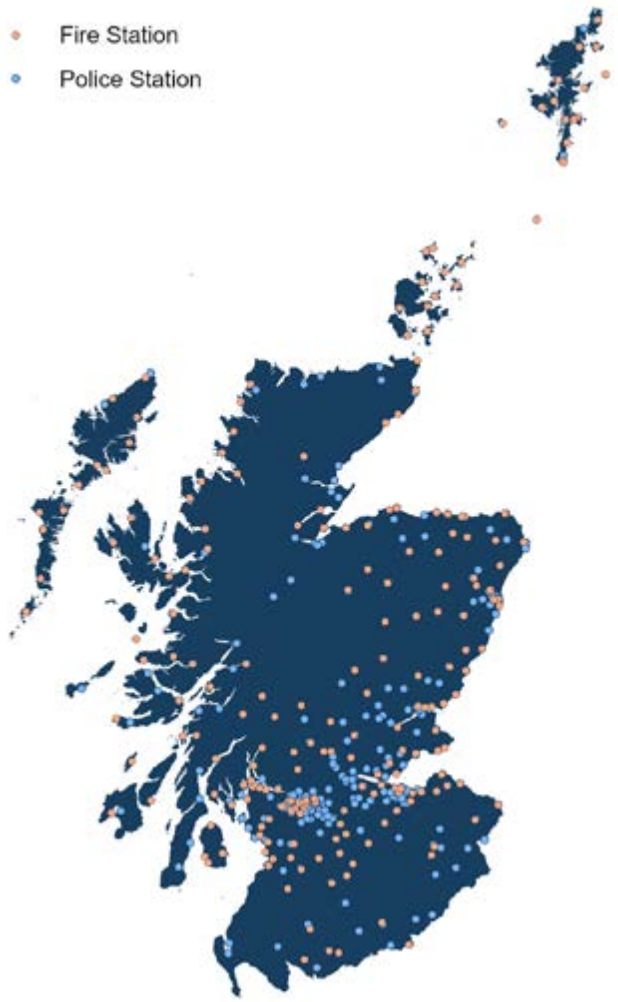
The SFRS estate contains 356[19] fire stations made up of:

- 74 wholetime fire stations (continually staffed 24/7).
- 250 retained duty fire stations.
- 42 volunteer fire stations.

In 2022, it was estimated that SFRS had responsibility for some 1,100 built assets, owned or leased, over 422 sites.

SFRS has approximately 1,620 fleet vehicles and a large asset base of specialist rescue equipment. SFRS assets are worth £0.5 billion in total. However, over 60% of the buildings are over 30 years old; 45% of the operational property estate is currently in poor or bad condition and 75% is deemed unsuitable. The fire stations vary significantly in terms of provisions. Of the 356 fire stations, 220 were assessed as poor or bad with regards suitability[20]. There are several fire stations without locker facilities, adequate toilets and sufficient showering facilities. Audit Scotland described the backlog in capital spend as "insurmountable", with the SFRS assets requiring a minimum investment of £60 million per year to be operational[21].

Figure 27: Fire, police and ambulance stations



Since the establishment of Police Scotland and the Scottish Fire and Rescue Service in 2013, Police Scotland's Estate Strategy has actively pursued the co-location of assets with various partners. To date, over 60 co-locations have been successfully implemented with partners such as local authorities, the Scottish Ambulance Service, and the Crown Office and Procurator Fiscal Service.

Scottish Ambulance Service

The Scottish Ambulance Service is a frontline service of the NHS in Scotland with over 5,700 members of staff. It is responsible for a range of services, from accident and emergency response, to delivering primary care, providing patient transport, dispatching rapid air ambulance and ScotSTAR (Scottish Specialist Transport and Retrievals Service) support for critical patients, to being a Category 1 responder for national emergencies[7].

The Scottish Ambulance Service has at least 135 ambulance stations and service locations across Scotland. It also has a number of other facilities, including air ambulance bases, co-locations with other emergency services, and specialist bases like the Emergency Medical Dispatch Centre and the Scottish Trauma Network.

The air ambulance service operates two helicopters (based in Glasgow and Inverness) and two fixed-wing aircraft (based in Aberdeen and Glasgow).

The Scottish Ambulance Service is also through its role in supporting anticipatory and preventative health care and providing a vital social and economic role in communities.

The service has carried out a national review of demand and capacity. The service is committed to increasing its ambulance provision and to accelerate recruitment. The service has introduced 10 new locations, nine of which are co-locations with the SFRS alongside an additional 52 ambulances[18].

Challenges and opportunities

Challenges

Funding and finance:

- Budget constraints and difficult resource allocation choices that could impact service delivery.

Service/system:

- Lack of systems integration, resulting in inefficiency and duplication of effort.

Climate resilience:

- Evolving nature of incidents that the fire service is responding to, involving less house fires and more climate-related events (e.g. wildfires and flooding.

Supply/demand:

- Increased demand related to vulnerability, mental health and substance misuse issues.
- Police: rising crime (assaults on officers) and the evolving nature of crime (for Police Scotland). While Scotland has comparatively low crime rates, there is a need to address emerging crime types and adapt to the changing landscape of crime (e.g. cybercrime).

Ageing or changing asset needs:

- Ageing estate and workspace modernisation.

Opportunities

Data and technology:

- Leveraging technology, especially digital technology in face of increasing cyber crime.
- Investing in data science, AI and analytics could enhance crime prevention and design targeted interventions, which can contribute to operational efficiency in reducing crime.

Service/system:

- Collaboration and co-locating with partners to improve resilience and achieve operational efficiencies. This can also support in addressing complex issues like vulnerability and substance misuse which draws on a range of services.
- Achieving efficiency savings through co-location with key partners including other emergency services and communities.

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11 Defence

11.1 Sector summary

Responsibility

Defence is a reserved UK Government function delivered by the Ministry of Defence (MoD) and its commands and agencies.

In Scotland, MoD owns and operates key bases and ranges. The Scottish Government's role is chiefly through planning, environmental regulation, and local economic development.

Due to its geographic location, Scotland plays a key role in UK and NATO activities in the North Atlantic and High North (Arctic) regions[1].

Operating model

As mentioned above, the MoD oversees all military operations, infrastructure and personnel across the UK, including Scotland.

The Defence Infrastructure Organisation (DIO) manages military estates, facilities and construction projects in Scotland.

The Defence Equipment and Support (DE&S) handle procurement and maintenance of military requirement, including contracts with Scottish defence industry partners.

Scotland has an important role to play in the UK's deterrence and homeland defence, with strategic operational assets including:

- **His Majesty's Naval Base Clyde, HMNB (Faslane and Royal Naval Armaments Depot, RNAD Coulport):** home to the UK's entire submarine fleet, including the continuous at-sea nuclear deterrent (CASD). Coulport stores and loads Trident warheads. Continued multi-year investment is preparing for Dreadnought class submarine entry in the 2030s.[2]
- **RAF Lossiemouth (Moray):** one of two UK Quick Reaction Alert stations, hosting four Typhoon squadrons and the UK's Poseidon (P-8A) maritime patrol fleet, with facilities upgraded (including a £132 million Poseidon complex) and further capability growth expected with E-7 Wedgetail.[3]
- **British Army barracks:** including Fort George near Inverness; Glencorse Barracks in Penicuik, Midlothian; Redford Barracks, Edinburgh (scheduled for closure but still operational for training and support); and Kinloss Barracks (a former RAF base) near Forres.
- **Training and firing ranges:** including Cape Wrath – the only naval gunfire support range; Benbecula range located in the Outer Hebrides and supporting multiple launch rocket system (MLRS) system and Galloway Forest Park, which hosts NATO exercises and military training operations.
- **Industrial bases:** complex warship build and integration at BAE Systems (Glasgow) and Babcock (Rosyth) across Type 26 and Type 31 programmes, plus surveillance radars and countermeasure systems at Leonardo Edinburgh.[4]

Regulation

Safety and procurement oversight is split across specialist regulators:

- **Military Aviation Authority (MAA):** regulates all defence aviation activity.[5]
- **Defence Nuclear Safety Regulator (DNSR):** internal MoD regulator for defence nuclear safety; Office for Nuclear Regulation (ONR) enforces applicable civil nuclear legislation on or around defence sites.[6]
- **SEPA:** environmental regulation in Scotland[7]
- **Single Source Regulations Office (SSRO):** regulates non-competitive (single source) defence contracts under the Defence Reform Act 2014 and SSCR 2014.[8]

Asset value

MoD's UK-wide estate (900 sites, 96,000 buildings) was valued at £33.4bn (31 Mar 2024).[9] In addition, the MoD is a significant land owner in Scotland, with 64,800 hectares of land in 2025, 19% of the MoD total land holdings.[10]

Funding

The MoD spends over £2 billion per year with the Scottish defence sector, supporting 12,000 jobs.[11]

MoD spending has risen to over £55 billion (2.3% of the UK's GDP), and plans have been announced to increase this to 2.5% of GDP by 2027.[12]

Wider Aerospace, Defence, Security and Space sectors added £3.7 billion GVA (2024) in Scotland[13], signalling strong post-pandemic growth.

Key policy and strategy

- **Defence Nuclear Enterprise Command Paper 2024:** force readiness, NATO posture, nuclear enterprise modernisation.[14]
- **Strategic Defence Review 2025:** outlines the planned investment trajectory, including details on increasing defence spending to 2.5% of national GDP by 2027.[15]
- **Defence Industrial Strategy 2025:** "Make defence an engine for growth"[16]
- National Shipbuilding Strategy (Refresh 2022).[17]

Reflection on last 20 years

Over the past two decades, Scotland's defence footprint has been consolidated and modernised, with CASD anchored at HMNB Clyde and significant estate upgrades to prepare for the Dreadnought-class submarines (the UK's next generation of nuclear-powered ballistic missile submarines (SSBNs)).

RAF Lossiemouth has transitioned into a 24/7 Quick Reaction Alert (QRA) and maritime patrol hub, underpinned by major infrastructure investment and the introduction of P-8A Poseidon (a maritime patrol and reconnaissance aircraft) and E-7 Wedgetail (Airborne Early Warning and Control aircraft) capability.

Concurrent naval build programmes (Type 26 frigate (global combat ship on the Clyde, and Type 31 (general purpose warship at Rosyth) have revived long-term industrial pipelines, while procurement and estate reforms (SSCR 2014, DEO) have reshaped how capability and infrastructure are delivered.

Over the same period, UK and NATO posture has shifted further toward the North Atlantic/High North, increasing allied activity through Scottish bases and ranges.[18]

Significant investments

Scotland has seen an increase in defence investment recently, reflecting its strategic importance to UK national security. Significant investment include:

- £250 million Defence Growth Deal: of which Scotland will receive a share to support job creation, innovation and collaboration between government, business and research institutions.
- Investment in Type 26 and Type 31 frigate construction at BAE Systems (Clyde, Glasgow) and Babcock (Rosyth).
- RAF Lossiemouth Expansion to enhance the UK's airborne surveillance and anti-submarine capabilities.
- Strategic infrastructure projects, including HMNB Clyde and RNAD Coulport.

Key national developments

Defence is UK-reserved and not part of NPF4 National Developments.

Contribution to national outcomes

- Economy
- International
- Communities
- Environment

Delivery plans

MoD portfolios and plans that drive delivery in Scotland include:

- **DEO** delivery pipeline (estate modernisation).
- **Naval Shipbuilding** programme plans (Type 26/31, export variants).
- **Lossiemouth** basing/mission capability plans (Poseidon, QRA, Wedgetail).
- **Defence Industrial Strategy (2025):** growth deals, SME access, innovation funding.

11.2 Sector analysis

Scotland's defence footprint supports the UK's strategic deterrent, homeland air policing and NATO commitments in the North Atlantic and the High North (Arctic and sub-Arctic regions).

A network of maritime, air, and radar assets enables persistent surveillance, quick-reaction air defence, and support for protecting subsea infrastructure. These functions are delivered alongside a defence-industrial base concentrated in shipbuilding, aerospace and advanced electronics.[19]

Strategic role

Scotland provides the UK's principal northern operating area for defence, with HMNB Clyde delivering the CASD and concentrating the Royal Navy's submarine fleet[20], and RAF Lossiemouth providing one of two 24/7 Quick Reaction Alert hubs for Typhoon aircraft and the UK base for nine P-8A Poseidon maritime patrol aircraft. From this northern operating area, the UK conducts air policing of the northern approaches, long-range maritime patrol in the North Atlantic and the High North, and contributes to NATO collective defence activities. The planned introduction of E-7 Wedgetail airborne early warning aircraft at RAF Lossiemouth is intended to expand wide-area air and maritime surveillance coverage when fully operational.[21]

Military bases and infrastructure

Scotland contains a network of military bases that enable UK and NATO operations across the High North and the wider North Atlantic. Its proximity to the Greenland-Iceland-UK (GIUK) Gap is a primary factor in this role, providing direct access to maritime and air corridors used for surveillance, anti-submarine warfare, and the protection of subsea infrastructure.[22]

HMNB Clyde, comprising Faslane and RNAD Coulport, supports Vanguard-class SSBNs that deliver the Continuous At-Sea Deterrent (CASD) and Astute-class SSNs. The base houses the United Kingdom's nuclear deterrent. Ongoing estate investment is planned to accommodate the Dreadnought-class successor and to maintain a single, integrated operating base for the Submarine Service. RAF Lossiemouth provides surveillance and quick-reaction alert capabilities for air defence.[23]

Defence operations

Routine activity from Scottish bases includes Anti-Submarine Warfare (ASW) and broader undersea surveillance in the North Atlantic through Poseidon sorties integrated with Royal Navy units and allied forces, Quick Reaction Alert interceptions over the northern approaches[24], and regular participation in multinational naval and air exercises staged from the Clyde and Lossiemouth bases[25, 26]. In addition, UK measures to strengthen subsea infrastructure security, including dedicated survey and surveillance capabilities, complement the ASW and radar posture supported from Scotland.[27]

Defence industry and workforce

The defence-industrial base in Scotland is concentrated in naval shipbuilding and advanced electronics. BAE Systems' Glasgow yards at Govan and Scotstoun are building the eight-ship Type 26 City-class programme[28], while Babcock's Rosyth yard is delivering the five-ship Type 31 programme based on the Arrowhead-140 design[29]; both designs have been selected for export, supporting order pipelines and skills retention.

In aerospace and sensors, Leonardo UK's Edinburgh site develops radar and electro-optical systems used across air and maritime platforms[30]; Thales in Glasgow provides submarine periscopes and optronic masts and wider electro-optics[31]; and Raytheon UK maintains defence electronics facilities in Livingston and Glenrothes.[32]

A cluster of Scottish small and medium-sized enterprises in autonomy and subsea robotics contributes software, mission systems and services to Royal Navy and allied programmes.[33, 34] These activities support sustained employment and supply-chain development throughout Scotland.

Figure 28: Military locations

Defence procurement and economic impact

Annual MoD spending with industry in Scotland is around £2.1 billion, supporting an estimated 12,000 supply-chain jobs.[35] Major programmes such as Type 26 and Type 31 shipbuilding, P-8A infrastructure and E-7 support at RAF Lossiemouth, and modernisation at HMNB Clyde generate long-term regional economic impacts through sustained capital investment.[36]

Policy measures to widen SME participation and align with regional growth initiatives seek to broaden access to defence supply chains and raise productivity and innovation, with particular focus on areas hosting major bases and yards.[37]

Challenges and opportunities

Challenges

Funding and finance:

- Balancing multi-year nuclear enterprise, air basing and shipbuilding works within constrained delivery budgets and inflationary pressures.
- Affordability pressures for personnel (housing/amenities near bases) and for SMEs facing working-capital and compliance costs on defence contracts.

Ageing or changing asset needs:

- Ageing assets and maintenance backlogs in parts of the estate can constrain readiness.

Net Zero:

- Decarbonising a mission-critical estate (power, heat, fuels) while sustaining operational resilience.
- Transitioning vehicle/plant fleets and improving energy efficiency across dispersed sites.

Climate resilience:

- Hardening coastal and island infrastructure against extreme weather and sea-level impacts; ensuring ranges and radars maintain availability during climate-related disruptions.

Workforce:

- Skills shortages in high-end trades (welders, systems engineers), security-vetting lead times, and attracting talent to remote locations.

Socio-economic:

- Ensuring community benefits and supply-chain inclusion across regions.
- Housing, transport access and services around Faslane/Coulport, Lossiemouth, Rosyth and the Clyde. Integrating with local planning to manage growth and mitigate localised impacts.

Opportunities

Data and technology:

- Adoption of next-generation sensors, autonomy, AI-enabled anti-submarine warfare (ASW) and directed-energy systems; digital shipbuilding and predictive maintenance to lift availability and lower through-life costs.
- Data fusion across undersea, air and space sensors; digital twins for ships and basing; cyber-secure data environments to accelerate design, test and certification.

Service/system:

- Deepening Navy-RAF integration for Greenland-Iceland-United Kingdom Gap (GIUK)/High North.
- Leveraging multinational basing and exercise programmes.
- Strengthening estate asset management and condition data to target spend.
- Joint planning on housing, transport and amenities around bases; using local growth deals (e.g., Moray) to align training, innovation campuses and supply-chain space.

Skills:

- Expansion of apprenticeships and graduate pathways aligned to the Type 26/31 pipeline and base upgrades.

Economic:

- Multi-year naval programmes and mission-system support sustaining high-productivity jobs; export variants (frigates, sensors) and inward investment crowding-in private capital.
- Targeted SME development and export support to grow regional clusters.

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12 Justice

12.1 Sector summary

Responsibility

Scotland legal system incorporates its court system, prosecution service, prison and criminal justice work services.

The 1998 Scotland Act devolved a range of power from Westminster to the Scottish Parliament, which included legislative powers to administer the Scottish legal system. Legislative powers over some areas, including terrorism and legal safeguards for human rights, remain reserved to the UK.

Operating model

Many public, private and voluntary bodies and individuals are involved in delivering Scotland's criminal justice system. They range from large, national bodies, such as the Scottish Prison Service and the Scottish Court Service, through to groups of professional individuals, such as the judiciary and private criminal defence solicitors, to individual members of the public who may contribute as members of a jury.[1]

Key organisations

Scottish Parliament: responsible for scrutinising the policy and legislative proposals of the Scottish Government.

Scottish Government: the Justice Directorate of the Scottish Government ensures the operation of Scotland's justice system, including criminal, civil and family law, and administrative justice.

Crown Office and Procurator Fiscal (COPFS): is the department of the Scottish Government civil service which has responsibility for:

- The prosecution of crime.
- The investigation of sudden or suspicious deaths.
- The investigation of complaints against the police involved allegations of criminal conduct.

Office of the Public Guardian (Scotland): maintains a public register of powers of attorney registered.

Scottish Courts and Tribunals Service (SCTS): The Scottish Court System is administered by the SCTS. Scotland has a three-tier criminal court system. There are, in order of precedence, the High Court of the Judiciary (the High Court), the sheriff courts and justice of the peace courts. The UK Supreme Court can also become involved in some criminal cases in its role as the ultimate court of appeal in relation to 'devolution issues'.

Scottish Prison Service (SPS): an Executive Agency of the Scottish Government ensures the secure custody of individuals sentenced by the courts, alongside rehabilitation efforts and contributing to a safer Scotland. SPS is responsible for managing prisons, delivering custodial services, and facilitating rehabilitation programmes.

Community Justice Scotland: is a non-departmental public body (NDPB), funded by Scottish Government but independent and evidence driven. The aim of the organisation is to drive progress in the field of community justice to create better outcomes for those who have broken the law, their families and victims of crime.

Regulation

The Scottish justice system has several inspectorates that play a crucial role in ensuring accountability and public confidence. These include HM Inspectorate of Prosecution in Scotland (IPS), HM Inspectorate of Prisons for Scotland (HMIPS), and Audit Scotland, which also has a role in scrutinising the justice system.[2]

Funding

The Scottish Government has committed to investing **£4.2 billion** across the justice system in 2025-26. This represents a budget increase with an additional £194 million resource funding to support frontline justice services including police, fire, prisons, courts and tribunals, and legal aid, focussing on preventing crime, reducing reoffending and creating safer communities with fewer victims of crime.[3]

The budget aims to address the significant pressures across the justice system, with a focus on strengthening and reforming vital front-line services, with the aim of ensuring responsive, resilient, and financially sustainable justice services.

Asset value

SCTS: SCTS' estate comprises 71 buildings, made up of courts, vulnerable witness suites, tribunals and offices. The estate is mainly valued by the Depreciated Replacement Cost (DRC) method of valuation. Due to the specialist nature of court buildings, open market valuations (OMV) are not suitable. The total holding value of the SCTS estate on 31 March 2014 was £375 million.[4]

SPS: The Scottish Prison Service (SPS) estate comprises 17 operational establishments, including 15 prisons and two Community Custody Units, with a total floor area exceeding 361,000 sq m.[5]

Asset strategies

- COPFS Strategic Plan 2023-27[6]
- Scottish Courts and Tribunals Service Corporate Plan 2023-26[7]
- SCTS Estates Strategy[8]
- Scottish Prison Service Corporate Plan 2023-28[9]

Key policy and strategy

- **The Vision for Justice in Scotland**, The Scottish Government (2022).[10]

Reflection on last 20 years

Over the last 20 years, the Scottish justice system has seen significant changes, including a notable shift towards community-based sentences and a greater emphasis on victim support and rehabilitation (in an effort to reduce instances of reoffending).

Whilst overall convictions have decreased, those sentenced to custody receive longer sentences, particularly for more serious crimes.

There is also a greater focus on early intervention and diversion from prosecution for young people, aiming to prevent them from entering the formal justice system.

Significant investments

Between 2023-2028, the SPS will complete a number of major capital projects designed to alleviate pressure on some of the older buildings in its estate, including construction of HMP and YOU Stirling, HMP Highland and HMP Glasgow.

In the last 10 years, the Scottish Courts and Tribunals Service (SCTS) has undertaken significant investment in its estate, modernising and upgrading facilities to support a modern justice system. This includes new co-located justice facilities in locations like Livingston, and significant upgrades to existing courts, such as the civil annexe in Aberdeen. Additionally, the SCTS has focused on digital infrastructure, expanding online services and enabling remote testimony to improve efficiency and access to justice.

Key national developments

None specifically relate to justice.

Contribution to national outcomes

Primary

- Communities
- Human Rights

Secondary

- Children and young people
- Economy
- International
- Poverty
- Education
- Fair Work and Business
- Health
- Environment

Delivery plans

The Vision for Justice – three-year delivery plan 2023/24-2-25/26[11]

12.2 Sector analysis

Scottish Prison Service (SPS)

Scotland's prison estate contains 17 prisons employing approximately 5,000 staff.[12]

The operational budget for the SPS in 2024/25 was £481 million and covers the cost of staff, service delivery contacts, buildings and energy, prisoner food, organisational administration and the provision of the Scottish Custody Court and Prisoner Escort Service[13].

The age of the estate varies, similar to the other estates in Scotland; most of the estates are modern facilities less than 25 years old, with only a handful constructed over 100 years ago.

However, some parts of the prison estate are in poor condition and HMP's maintenance backlog has doubled from £0.9 billion in 2020 to £1.8 billion in 2024, with 23,000 occupied prison places (1/4 of the total places) failing to meet fire safety standards.

The SPS Corporate Plan (2023)[14] stated that the capital budget for 2024/25 was £167 million and included a capital programme to progress the replacement for HMP Inverness (HMP Highland), and the replacement for HMP Barlinnie (HMP Glasgow).

Crown Office and Procurator Fiscal Service (COPFS)

The COPFS estate comprises 46 properties in Scotland; 8 are owned by COPFS, 10 are leased, 2 are held under Memorandum of Terms of Occupation (MOTO) agreements and 26 are co-located within Sheriff/High Court buildings, a reduction of 5 properties since 2016.

The estate is mostly office accommodation of various types and configurations to support the effective operation of the service.

COPFS has developed an estates transformation strategy for the period 2020 to 2023[15] which prioritises buildings being in the right place, right size, right configuration, right condition and right price.

Scottish Courts and Tribunal Service (SCTS)

The SCTS estate comprises 71 buildings such as courts, vulnerable witness suits and offices covering 51 geographical locations across Scotland, 187,245 sq m in total size. The SCTS estate also lease 15 buildings 12,670 sq m in size. Of these 71 buildings, the ten largest courts account for over 63% of the estate and 80% of the estate expenditure. In addition, there are a further 70 tribunal venues across Scotland for hearings. The estimated total value of the SCTS estate is around £375 million.

The SCTS Estates Strategy[3] outlines the condition of the estate. Approximately 44% of the estate pre-dates 1960 with 86% being historic, listed and pre-1900. This entails a significant responsibility for preserving Scotland's historic building heritage, including Parliament Hall. Although 46% of the estate dates from 1981 to 2000, this group still includes listed buildings such as Glasgow Sheriff Court, constructed in 1986, the second largest building in the estate.

The condition of the existing estate is ranked form A-D where A-is 'as new', B is sound and operationally safe, C is Operational, but major repair or replacement needed in the short to medium term and D-inoperable or serious risk of major failure or breakdown. 2% are categorised as A, 52% as B, 46% as C and <1% categorised as D.

SCTS, similar to the COPFS estate strategy, prioritises ensuring that properties are strategically located to support efficient service delivery, are appropriately sized to meet operational needs, and offer sufficient functionality and flexibility.

Challenges and opportunities

Challenges

Service/system:

- Although the number of convictions has reduced, the length taken from the date of an offence to verdict can be lengthy, particularly in higher courts.
- While there is a digital strategy for justice, achieving a fully digital, user-focussed system will take time.
- Overcrowding impacts the ability to deliver rehabilitative support and NHS services.
- Workloads of staff and case backlogs (from the Covid-19 pandemic) in the COPFS and the SCTS hindering the effective administration of justice.
- Increased case volumes leading to delays in bringing cases to trial and resolving disputes.

Supply/demand:

- Many prisons in Scotland are operating at full capacity, creating a critical risk to the safe and effective operations of the estate.
- The profile of the prison population is ageing impacting on facility requirements.

Socio-economic:

- Delays in processing cases can erode public confidence in the justice system.
- Drug use within prisons is a significant problem- both supply into prisons (drug smuggling) and usage among inmates.
- The complexity of cases is high and the legal framework surrounding individuals with mental health issues is particularly complex and difficult to navigate.

Ageing or changing asset needs:

- Some of Scotland's prisons are also ageing and may not be fit for purpose, creating challenges maintaining safety and security.
- Need to modernise technology to improve efficiency and accessibility.

Opportunities

Data and technology:

- Enhancing use of digital technology, including technology to improve case management, and enhance public access to information.

Service/system:

- Optimise the use of the Home Detention Curfew to mitigate overcrowding.
- Improving access to justice through exploring alternative business structures in the legal services market to improve customer choice and access to legal support.
- Greater focus on prevention and early intervention to address the root causes of offending behaviour.

Socio-economic:

- The Scottish Government is committed to providing substantial funding for enhanced victim support services, including for survivors of gender-based violence.
- Addressing inequalities in access to justice for marginalised groups, particularly in rural areas and detention facilities.

Asset development:

- Capital investment in new prisons to relieve current constraints. Also, exploration of the feasibility of adding temporary accommodation.
- Estate consolidation, modernisation and co-location of justice facilities.

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13 Culture and Recreation

13.1 Sector summary

Responsibility

The Scottish Government holds primary responsibility for cultural policy. The Scottish Parliament also plays a role in shaping cultural policy through legislation and oversight of the Scottish Government's actions.

Operating model

The Scottish Government provides funding to various cultural organisations and initiatives, including Creative Scotland, Historic Environment Scotland, and the National Performing Companies.

- **Historic Environment Scotland:** the lead public body set up to investigate, care for and promote Scotland's historic environment.
- **Creative Scotland:** a non-departmental body that provides funding and support for the arts and cultural sector in Scotland.
- **National Performing Companies:** the Scottish Government funds and supports five National Performing Companies: National Theatre of Scotland, Royal Scottish National Orchestra, Scottish Ballet, Scottish Chamber Orchestra, and Scottish Opera.
- **Museums Galleries Scotland:** the national development body for the Scottish museums sector, supporting 460 museums and galleries across Scotland.
- **Other cultural organisations:** for example, the Scottish Library and Information Service also play a role in promoting and preserving Scottish culture.
- **Local Authorities:** Scottish local authorities have a statutory duty under the Local Government and Planning (Scotland) Act 1982 to ensure adequate provision of facilities for the inhabitants of their area for recreational, sporting, cultural, and social activities.

Recreation is managed through a combination of national policies, local initiatives and various organisations covering the Scottish Government, NatureScot, Forestry and Land Scotland and local authorities (see Section 13 Natural Capital).

Land managers must manage land in Scotland responsibly with regard to access.

Scottish Countryside Rangers' Association: Rangers have a role in helping people understand, engage with and safeguard the natural and historic environment.

Asset value

Key cultural assets and attributes include:

- **Historic environment:** castles, historic buildings and archaeological sites. The historic environment generates £6 billion annually with heritage tourism contributing £2.1 billion.
- **Intangible heritage:** traditions and cultural practices passed through generations.
- There is also value in culture through creative industries, language (Gaelic and Scots) and sports. The creative industries in Scotland are a significant part of the Scottish economy contributing over £5 billion annually.

Recreation is closely tied to culture. Scotland's landscapes provide many opportunities for hiking, cycling, golf and water sports, which in combination with Scotland's cultural experiences, support Scotland's hospitality sector – a vital part of the economy.

Asset strategies

- Historic Environment Scotland, Asset management Plan, 2018
- NatureScot National Nature Reserve Management Plans
- Forestry and Land Scotland: Land Management Plans[1]

Key policy and strategy

- A Culture Strategy for Scotland (February 2020)
- Connecting people and places – a policy statement on rangering in Scotland, NatureScot (2021)

Reflection on last 20 years

The impact of the Covid-19 pandemic on the cultural sector, particularly on venues and audiences has been substantial. Cultural organisations are facing increased costs and supply chain issues, which are likely to negatively impact rural and peripheral areas.

Key investments have included:

- £27 million transformation of Perth City Hall into Perth Museum.
- New concert venue – the Dunard Centre, Edinburgh.
- £80 million V&A Museum of Design in Dundee.
- £16.8 million extension to the Scottish National Gallery in Edinburgh.
- £10 million refurbishment of the National Library of Scotland.
- £35 million refurbishment of Kelvin Hall in Glasgow.

Contribution to national outcomes

- Culture
- Communities
- Education
- Health
- Economy
- International

Delivery plans

- Our Past, Our Future Delivery Framework 2023-38 Historic Environment Scotland

13.2 Sector analysis

Culture is central to building a sense of community and fostering a diverse, inclusive and prosperous place to live, work and learn. It is key in creating social cohesion fostering active citizenship and building a strong collective identity.

The Scottish Government published 'Building a New Scotland: culture in an independent Scotland' (2024)[2] outlining the importance of culture as a key economic sector. It defines the culture sector as *'individuals or organisations that derive income form work associated with culture, creative activities and heritage or the arts;'* from cultural facilities to shared history language and traditions.

The culture sector is an important part of Scotland's economy, creating jobs, and supporting other sectors, contributing to overall economic growth.[3] The arts, culture and creative sectors employ over 155,000 people in 2022 and contributed £4.4 billion gross value added (GVA) to Scotland's economy in 2020.[4] As of March 2022, there were almost 14,000 registered enterprises operating in the creative industries growth sector, representing 7.6% of all registered businesses in Scotland according to industry statistics (Directorate S. C., Industry statistics, 2025).

Historic environment

Scotland's Historic Environment Audit (2024) (SHEA)[5] assesses Scotland's historic environment and assets. These include listed buildings, World Heritage Sites, battlefields and monuments.

There are some 55,932 total protected heritage sites in Scotland supporting over 81,000 full time jobs, contributing £6 billion to the economy. Of the £6 billion generated, £2.1 billion is attributed to heritage tourism and £3.9 billion is attributed to repair and maintenance of pre-1919 buildings with industry suppliers.

Scotland ranked 10th out of 60 nations for its historic buildings and monuments in the Nation Brands Index, with an estimated 16 million visitors coming to Scotland to interact with the historic environment.

Listed buildings

In Scotland, buildings are classified as listed by Historic Environment Scotland (HES), a public government body. Listed buildings contribute to Scotland's distinctive character, demonstrate aspects of Scotland's social and economic past and have served a range of uses throughout multiple periods in history. Most of Scotland's historic environment assets are listed buildings, with some 46,762 across the country.

Traditional buildings make up about 33% of Scotland's retail space, 24% of office spaces and 41% of spaces used by the public sector. About 18% of Scotland's dwellings pre-date 1919.

Much of Scotland's building stock with historic significance needs repair or upgrades to meet net-zero standards. Approximately 71% of pre-1919 housing stock needs critical repair, with owners reported to spend £1.3 billion each year on repairs and maintenance. It is estimated that an additional £6.6 billion is needed to convert these buildings to low carbon heating.

The Buildings at Risk Register (BARR)[6] is a tool used to track the number of listed buildings and buildings in Conservation Areas that are vacant or in a state of disrepair. Since recording began (1990), there has been a total of 2,225 buildings saved and 658 have been demolished; currently 2,214 buildings are recorded on the BARR in Scotland.

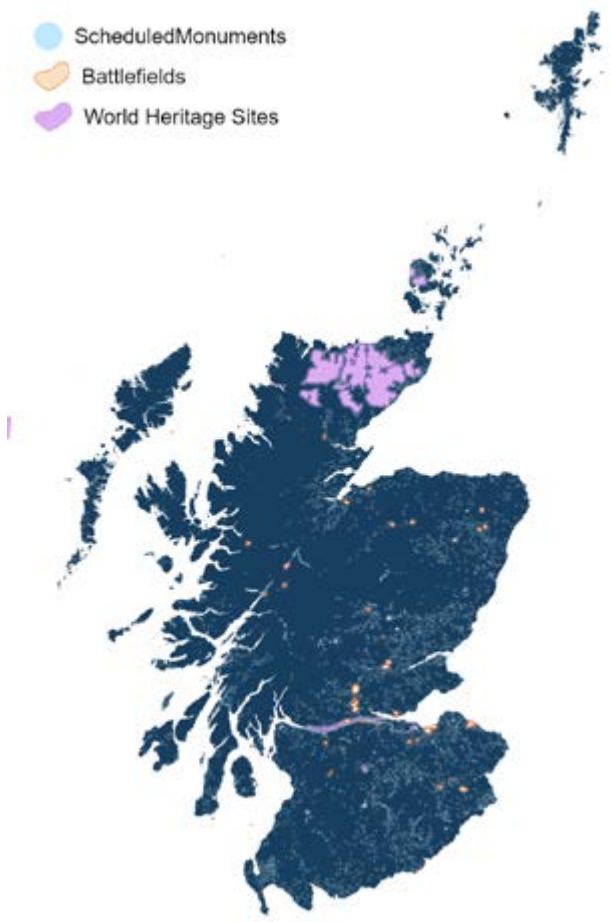
Monuments

Scotland's Scheduled Monuments[7] are maintained by Historic Environment Scotland (HES). HES is the lead public body set up to investigate, care for and promote Scotland's historic environment, including over 8,160 scheduled moments and 300 properties of national importance.

The aim of scheduling is to preserve sites and monuments for as long as possible. The sites and monuments vary in type from prehistoric burial mounds to Roman Forts, ruined castles, and more recent monuments dating to the Second World War.

Data from Key Scottish Environment Statistics 2016 (Government, Key Scottish Environment Statistics – Scheduled Monuments: 1991-2013)[8] show the total number of scheduled monuments has increased by 74% between 1991 and 2016 and the area they account for has increased by 129% over the same period.

Figure 29: Scotland's historic environment



In 2016, there were 8,167 designated scheduled monuments in Scotland, covering an area of 18,285 hectares (ha). There are also 7 historic Marine Protected Areas (MPAs), covering 87 ha, that have been designated to protect marine historic assets such as historic shipwrecks.

Scheduled monuments are spread across Scotland, but numbers vary across local authorities. The local authority area with the largest number was reported to be in the Highland Council, with some 1,238 monuments covering an area of approximately 2,200 hectares in total.

Battlefields

Scotland's Battlefields are part of the historic environment and date back 10,000 years, forming part of Scotland's strong national identity and culture. The inventory of historic battlefields began in 2010 and there are now 40 nationally important battlefields in Scotland. The inventory identifies sites where an important battle took place, soldiers who fought and died and where activities took place[9].

Conservation areas

The Guide to Conservation Areas in Scotland[10], describes conservation areas as 'areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance'.

There are over 600 conservation areas, mostly designated in the 1970s; some have since been redesignated, merged or had their boundaries changed. Some of the conservation areas cover historic land, battlefields, public parks, designed landscapes and railways.

Designation as a conservation area does not place a ban upon all new development within its boundaries. However, new development will normally only be granted planning permission if it can be demonstrated that it will not harm the character or appearance of the area.

World Heritage Sites

World Heritage Sites (WHS) are landmarks or areas recognised by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for their outstanding significance. There are currently 7 WHS in the Scotland[11], listed as follows:

- The Antonine Wall
- Heart of Neolithic Orkney
- New Lanark
- The Old and New Towns of Edinburgh
- St Kilda
- The Forth Bridge
- The Flow Country

The Department for Culture, Media and Sport (DCMS) is responsible for the UK's general compliance with UNESCO World Heritage Convention. For sites located in Scotland, the Scottish Ministers work with DCMS to ensure compliance with the Convention and identify potential WHS. The local authorities the sites fall under are also involved in site management plans along with other partners such as Historic Environment Scotland, NatureScot and more.

Local authorities

Scottish local authorities have a statutory duty under the Local Government and Planning (Scotland) Act 1982 to ensure adequate provision of facilities for the inhabitants of their area for recreational, sporting, cultural, and social activities.

Their core functions include managing and funding essential community assets such as:

- Libraries, museums, and galleries.
- Sports and leisure facilities (including swimming pools, sports pitches, and community parks).
- Theatres, concert halls, and other arts venues.

Councils deliver these services directly or increasingly through Arm's Length External Organisations (ALEOs) and community partnerships. The aim is to enhance quality of life, promote public health and wellbeing, foster social cohesion, and support the local economy, though service levels are ultimately decided locally based on discretionary budgets.

Total Local Authority capital expenditure on Culture and leisure services in 2023/24 was £209 million[12].

Museums and galleries

There are roughly 450 museums and galleries supported in Scotland, including those accredited by Museums Galleries Scotland (MGS)[13]. MGS is the National Development Body for Scotland's museum sector, supporting museums and galleries through strategic investment, advice, workforce development and advocacy.

Museums and galleries across Scotland very by type, size and focus – including national, independent, local authority, university and military museums. They are united in their purpose to safeguard Scotland's history and support learning, enjoyment, creativity and wellbeing.

Museums and galleries are vibrant threads in the fabric of Scottish society. They connect the people of Scotland to their communities, their environment, and their place in the world. As key pieces of cultural infrastructure, they contribute to a range of important national outcomes, for example: improving health and wellbeing, education, climate awareness, building cohesive communities and supporting fair work and skills development.

Recent budgetary pressures have created debate on how Scotland's culture, heritage and creative industries add value to the economy. In 2023, MGS commissioned an economic impact study[14] which found that:

- From 2019-2020, there were 8 million visits to Scotland's museums and galleries.
- Gross spending impacts of these visits (both on-site at museums and off-site elsewhere in the economy) amounted to an estimated £900 million.
- In 2019-20, 28% were visits from local people, 38% were national visitors (i.e., from elsewhere in Scotland/UK), and 34% were international visitors.

Many of Scotland's museums and galleries rely on volunteers. It is harder to quantify the range of benefits that volunteers provide, but it is a significant contribution to the economy:

- The scale of volunteering in Scotland's museums and galleries (based on 2022 rates and 7.5hr working day) is estimated to be more than 54,100 days per year and, as a minimum, this is valued at between £3.9 million and £4.4 million per annum.

Museums and galleries not only house collections and run exhibitions, but they also procure goods and services for day to day activities, run cafés, shops and events, hire equipment and manage maintenance of their buildings and grounds. The economic impact assessment estimates that £81.2 million of income (supporting almost 3,690 FTE jobs within the sector, its supply chain and through induced spending impacts) is generated within the museum sector and through its supply chains. Overall, it is estimated that for every £1 of core funding provided to museums, more than double the economic output is generated, at £2.67.

Libraries

Libraries are an important part of Scotland's social and educational history; the public library system began with the passing of the Public Libraries (Scotland) Act in 1853[15]. Scotland's library estate dates back to the late 19th century, with a significant period of construction in the late Victorian period up until the end of the First World War.

There are about 490 public libraries in Scotland, with some 350 purpose-built. There are also 49 mobile libraries that offer 24/7 digital services. Scotland's public libraries see over 40 million visitors per year, with 1 in 2 using the libraries regularly[16].

Libraries require funding to provide essential services as providers of digital utilities, community hubs and safe spaces for the most vulnerable of society. The Public Librarian Survey[17] reported that 1 in 3 librarians felt their whole service was at risk of reduction or losses and 66% agreed their communities face digital poverty. Scotland's libraries are one of the few remaining public spaces where people can remain without payment and be able to access information, combat digital poverty, socialise and learn new skills.

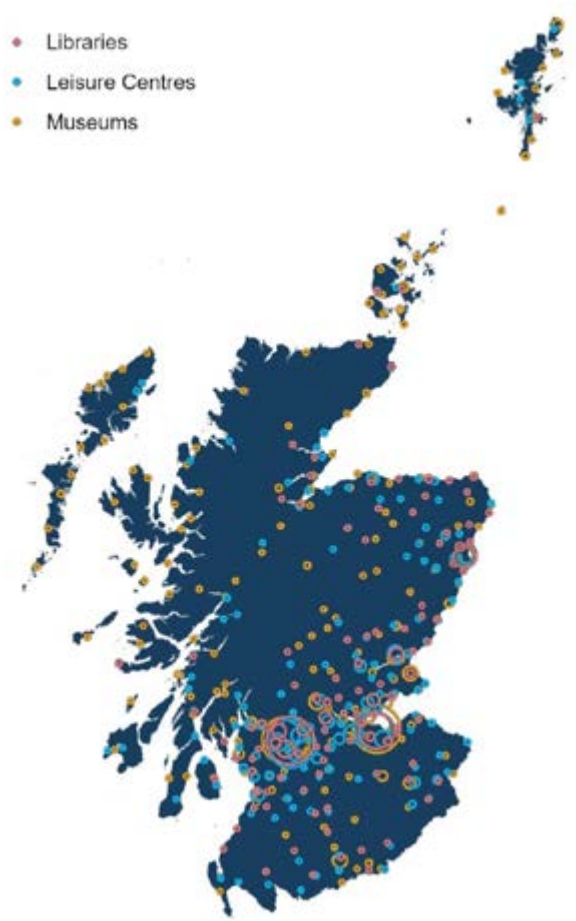
Parks and greenspace

Scotland's greenspace supports a vibrant recreational culture, deeply intertwined with its natural landscapes, featuring national parks, country parks, local nature reserves, and a strong emphasis on outdoor access.

National parks

Scotland has two national parks: Loch Lomond and The Trossachs National Park and the Cairngorms National Park.

Figure 30: Recreation assets



National nature reserves

As referenced in Section 15 (Natural Capital), Scotland has numerous national nature reserves, including Glencoe and Glen Affric, which are managed to protect wildlife and unique landscapes.

Regional parks

Covering landscapes of regional significance, this designation was created to enable the coordinated management of recreation and other land uses such as farming and forestry[18].

Scotland has three regional parks:

- Clyde Muirshiel Regional Park
- Lomond Hills Regional Park
- Pentland Hills Regional Park

Geoparks

Scotland is an ancient land, formed over many millennia, with geoparks providing the best insights into how unique landscapes have developed over billions of years.[19] There are three recognised geoparks in Scotland:

- North West Highlands Geopark
- Geopark Shetland
- Lochaber Geopark

Biospheres

These special places demonstrate a balanced and harmonious relationship between people and nature in a world-class natural environment. At present, there are six UNESCO Biospheres in UK, with two in Scotland:

- Galloway and Southern Ayrshire Biosphere
- Wester Ross Biosphere

Forest parks

Forestry and Land Scotland[20] manages several forest parks, such as Glenmore, Queen Elizabeth, Tay, and Tweed Valley, offering diverse outdoor activities.

Country parks

There are 40 country parks in Scotland, often located at the edge of cities and towns. Most are equipped with good visitor facilities, including cafés, playgrounds, car parking, toilets and sometimes ranger services, events, and activities.

Local authorities set up and manage most country parks, though the National Trust for Scotland manages Brodick and Culzean. Some private landowners also use the country park name[21].

Gardens

There are approximately 400 gardens to visit in Scotland, including 8 botanic gardens, created for the collection of plant species, as well as conservation and preservation.

Urban greenspace

In Scotland, council parks and green spaces are managed by local authorities and play a vital role in community well-being, with organisations like Greenspace Scotland promoting their development and access.

Greenspace is a vital piece of local infrastructure, providing benefits for physical and mental wellbeing, creating space for biodiversity and nature in communities and often acting as key social spaces for communities to meet, relax and play.

The importance of greenspace is widely recognised in Scotland's policy landscape – from health to regeneration, early years to planning, and biodiversity to climate change.

The total area of greenspace in urban Scotland is 159,274 hectares; excluding private gardens the total is 119,299 hectares[22].

Urban Scotland is more green than grey – greenspace covers 54% of the urban land area. There is the equivalent of 36 hectares of greenspace per 1,000 people or 27 hectares per 1,000 people if private gardens are excluded, equivalent to a tennis court size of greenspace per person.

As part of the National Performance Framework, an indicator records the proportion of adults who live within a 5-minute walk of their local green or blue space. In 2019, 65% of adults lived within a 5-minute walk of their nearest green or blue space. However, the indicator also shows that people living in the most deprived areas are less likely to live within a 5-minute walk of their nearest greenspace.

Recreation

Also, covered under Section 15 (Natural Capital), Scotland has a large number of recreational assets which provide access to the natural environment.

National Walking and Cycling Network

Collectively, Scotland's National Walking and Cycling Network (NWCN) is made up of about 6,400km of strategic long-distance paths and trails across Scotland. This extensive network includes Scotland's Great Trails. Sustrans are responsible for the network of signed paths and routes designated for walking, wheeling and cycling.

Walkers and cyclists made over 145 million trips on the NWCN, contributing approximately £1.9 billion to the local economy and supporting around 27,500 jobs in 2019.[23] The network was also attributed to reducing 19.5 million car journeys in 2019, saving 7.1 million kg of $C0_2$.

There are approximately 1,620 (2,600km) miles of National Cycling Network (NCN) routes in Scotland.[24] These include 695 miles (1,100km) of traffic free routes, including railway paths, forest roads, segregated cycle lanes, canal towpaths, shared-use paths and re-determined rural footways. Approximately 44% of Scotland's population live within 1km of the NCN, encouraging people to cycle for their everyday journeys.

Core paths

Scotland has an extensive network of core paths; made up of paths, waterways and other means of crossing land. The routes are designated by local authorities in Scotland under the Land Reform (Scotland) Act 2003. There is currently more than 21,000km of core paths in Scotland, including a network of some 11,000 miles (18,000km) of recorded rights of way[25].

Scotland's Great Trails

Scotland's Great Trails are managed trails that are clearly waymarked, run largely off-road and offer a choice of welcoming visitor services. Ranging in length from 24-210 miles (40-340km), many are suitable for short breaks as well as end-to-end expeditions. Collectively, the 29 different routes offer over 1,900 miles (3,000km) of trails with opportunities to explore the best of Scotland's nature and landscapes, and to experience Scotland's history and culture.

Scotland's marine leisure

Scotland's marine leisure sector, encompassing activities like sailing, boating, diving, and watersports, is a vital part of the Scottish economy, contributing to tourism and creating jobs, particularly in coastal and island communities.

There are 482 natural harbours, anchorages and marinas in Scotland. Marine tourism and recreation contributed £598 million in GVA to the Scottish economy and employed 33,100 people in 2019. Marine and coastal tourism is an important growth sector for Scotland, accounting for around 13% of the total GVA of all tourism[26].

Snowsports

Scotland's snowsports infrastructure includes five mountain centres (Cairngorm, Nevis Range, Glenshee, Glencoe, and The Lecht) and 14 artificial slopes, with Snowsport Scotland playing a crucial role in developing the sector[27].

Mountain biking

Scotland has world-class trails, including the "7stanes" network in the south and the Nevis Range near Fort William. There are numerous other trail centres and natural trails across the country, including in the Cairngorms National Park and the Tweed Valley[28].

Challenges and opportunities

Challenges

Funding and finance:

- A Review of Culture and Sport and Leisure-Services in Scotland found local government investment in culture, sport and leisure services across Scotland has decreased by 20% in real terms between 2010/11 and 2022/23.[29]
- Financial pressures and long-term budget constraints.
- Closure of culture and leisure services throughout Scotland due to budget cuts.

Service/system:

- Operational challenges on leisure and cultural services such as staffing, managing facilities and adapting to changing public needs.
- Damaged confidence in the culture sector as it continues to face significant budget cuts.

Socio-economic:

- Reduced income generation facilitated by the ongoing cost of living crisis in Scotland.

Opportunities

Data and technology:

- Investment in digital technologies across culture and leisure services, building upon the current learning and improving access to services.

Socio-economic:

- Inclusion of a diverse range of cultures to reflect a changing Scotland in the 21st century.

Asset development:

- New World Heritage Site in Scotland.
- Extending the National Walking and Cycling Network from 6,400km to 8,000km.

Economic:

- Increased investment into Scotland's culture and leisure sectors, supporting wellbeing and growth opportunities including tourism.

Endnotes

1 Forestry and Land Scotland (n.d.), Active Plans

2 Scottish Government (2024), Building a New Scotland: Culture in an independent Scotland

3 Ibid

4 Ibid

5 Historic Environment Scotland (2024), Scotland's Historic Environment Audit 2024

6 Historic Environment Scotland (2025), Buildings at Risk Register for Scotland

7 Historic Environment Scotland (n.d.), Scheduled Monuments

8 Scottish Government (2016), Key Scottish Environment Statistics 2016

9 Historic Environment Scotland (n.d.), What is the Inventory of Historic Battlefields?

10 Scottish Government (2005), Guide to conservation areas in Scotland

11 Historic Environment Scotland (n.d.), World Heritage Sites in Scotland

12 Audit Scotland (2025), Local government performance: Spotlight on culture and leisure service

13 Museums Galleries Scotland (n.d.), Museums Galleries Scotland

14 Museums Galleries Scotland (2023), Economic Impact of Scotland's Museums and Galleries – Summary Report

15 Historic Environment Scotland (2021), Scotland's Public Libraries

16 The Scottish Library and Information Council (SLiC) (2021), Forward: Scotland's Public Library Strategy

17 The Chartered Institute of Public Finance and Accountancy (CIPFA) (2024), Public Library Users Survey

18 NatureScot (n.d.), Regional parks

19 Visit Scotland (n.d), Scotland's Best National Parks and Natural Heritage Sites

20 Forestry and Land Scotland (n.d,), Our Forest Parks

21 NatureScot (2023), Find a Country Park

22 NatureScot (2022), Landscape Indicator

23 NatureScot (2021), £1.9 billion boost from walking and cycling

24 Walk Wheel Cycle Trust (n.d.), The National Cycle Network in Scotland

25 Ramblers (n.d.), Paths in Scotland

26 Scottish Government (2020), Marine Scotland – Scotland's Marine Economy

27 Scottish Government (2022), The Economic, Cultural and Social Impact of the Scottish Snowsports Sector

28 Visit Scotland (n.d.), Mountain Biking in Scotland

29 29. EKOS (2024), Review of Culture and Leisure Services in Scotland

14 Central Estate

14.1 Sector summary

The Central Estate provides predominantly administrative/office buildings occupied by Scottish Government and it's public bodies.

The office estate consists of approximately 370 buildings with a total floorspace of c. 570,000 sq m. Whilst predominantly concentrated in the main Scottish cities there are also a network of smaller office buildings in towns and more rural locations across the entire country.

Around 50% of the estate is owned with the other 50% a mixture of buildings held on a lease or Memorandum of Terms of Occupation (MOTO) which is an intergovernmental organisation agreement.

Annual operating costs are estimated at c. £72 million, which includes rent costs of approximately £24 million with the other costs including business rates, service charge, facilities management and utilities.

Operating model

The Central Office Estate is subject to the Scottish Public Finance Manual (SPFM) and is split into two main elements:

- Scottish Government core properties.
- Public body properties subject to the SPFM.

Where Scottish Government or a public body is looking to make changes to their office estate, particularly regarding leasehold and property acquisitions they are subject to Scottish Government Property Controls.[1] Depending on the potential value and complexity of the transaction this may require relevant Ministerial Consent.

Asset strategies

Scottish Government's Central Estate Strategy, published in March 2020[2] set out the overarching objectives, principles and measures of success to ensure Scottish Government public bodies have the right property and services in the right locations to provide a sustainable and well-managed estate.

Since this strategy was published, and as reflected in the Infrastructure Investment Plan 2021-22 to 2025-26 and the supporting Guide to Property Asset Strategy in the Scottish Public Sector[3], the requirements on the public sector office estate have significantly changed. In particular, Covid-19 and the move to greater hybrid working has increased the need for more flexible and connected spaces whilst also reducing the overall size of the estate.

The Smarter Workplaces Programme which ran from 2014 – 2018, had started a process to increase collaboration and co-location to make workplaces more flexible, improve the user experience and ensure best value with a focus on Scottish Government core and public bodies subject to the SPFM. This allowed for a reduction in the overall size of the central estate together with delivering annual recurring revenue savings of over £28 million.

The Scottish Government established the Single Scottish Estate (SSE) Programme in autumn 2023, which is aimed at transforming how public sector property is managed across Scotland. The SSE Programme will build on existing good practice and previous activities (such as the Smarter Workplaces Programme) to provide a framework for a more efficient approach to Public Sector Property Management (PSPM). This is intended to optimise the public sector estate, to provide more sustainable, compliant and interoperable facilities that will support improved public sector service delivery. To date the SSE programme has delivered over £40 million of savings[4].

New Deal with Local Government, Verity House Agreement[5] published in 2023, supported the need to consider wider public sector property opportunities including from the local authority estate. This is with the intention to work together to consider potential co-location opportunities to maximise the efficiency of public sector properties.

Change to the office estate occurs within a wider landscape of reform and is aligned to wider work on Scottish Public Sector Reform and programmes such as the National Digital Strategy[6] and Digital Scotland Service Standard[7] which will all have an impact on the way the office estate is used.

Amongst the recommendations of Investing in Scotland's infrastructure[8], a briefing paper by the Auditor General, published in September 2023, was to consider how the public estate can support the transformation of services as well as reducing the size of the estate and making it more efficient.

Challenges and opportunities

Challenges

Funding and finance:

- Budget constraints impacting on the ability to invest and provide fit for purpose and attractive workspaces that support staff attraction/retention and wellbeing.

Service/system:

- Complex governance structures can inhibit and delay co-location opportunities.
- Differing operational requirements and standards providing barriers to co-location and sharing of facilities e.g. differing security standards.
- Lack of supporting culture change to support more flexible and hybrid working practices.

Supply/demand:

- Reducing demand for office estate, but a need to repurpose what is retained to reflect hybrid working e.g. increased spaces for collaboration.

Ageing or changing asset needs:

- Ageing estate and workspace modernisation.

Opportunities

Data and technology:

- Property data supporting improved visibility of opportunities for co-location in particular locations.
- Technology allowing staff to be more flexible regarding where they work.

Service/system:

- Improved public service delivery through co-location of key partners.
- Sharing good practice that supports a more streamlined approach to co-location.
- Achieving efficiency savings through co-location.

Endnotes

1 Scottish Government (2025), Property controls: guidance for public bodies

2 Scottish Government (2020), Central Estate Strategy

3 Scottish Futures Trust (2022), A Guide to Property Asset Strategy in the Scottish Public Sector

4 Scottish Government (2025), Single Scottish Estate (SSE) Programme: reflections and progress report

5 Scottish Government (2023), New Deal with Local Government – Verity House Agreement

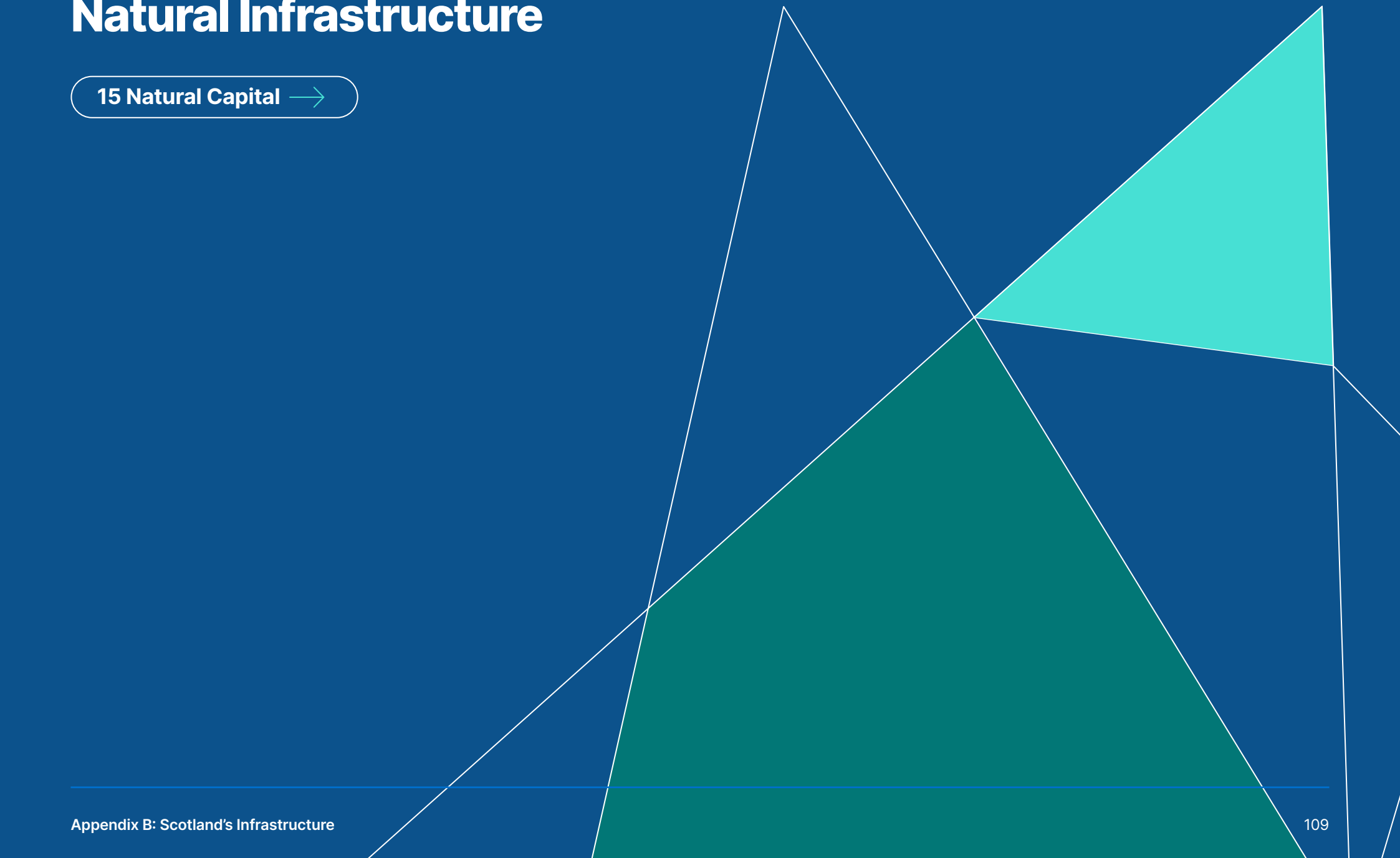
6 Scottish Government (2025), Digital strategy for Scotland: sustainable digital public services - delivery plan 2025-2028

7 Scottish Government (2025), Digital Scotland Service Standard – Service Manual

8 Audit Scotland (2023), Investing in Scotland's infrastructure: A briefing paper

Natural Infrastructure

15 Natural Capital →



15 Natural Capital

15.1 Sector summary

Responsibility

Responsibility for Scotland's natural capital rests primarily with Scottish Government and its agencies, including NatureScot and the Scottish Environment Protection Agency (SEPA).

Operating model

- **NatureScot:** is the lead public body responsible for advising Scottish Ministers on all matters relating to natural heritage.
- **Scottish Environment Protection Agency (SEPA):** SEPA is a non-departmental body that ensures that the environment and human health are protected, so that Scotland's natural resources and services are used as sustainably as possible and contribute to sustainable economic growth.
- **Marine Scotland:** is responsible for managing marine habitats, including conservation, planning and enforcement.
- **Forestry and Land Scotland (FLS):** is the primary agency responsible for managing the National Forest Estate (NFE).
- **Conservation charities** such as Scottish Wildlife Trust, RSPB Scotland and National Trust for Scotland focus on various aspects of conservation, including working to protect and restore healthy ecosystems.
- **Scottish Water (covered in Section 5 – Water Sector):** is increasingly adopting blue-green infrastructure into its operations, which means using nature based solutions (NbS) to manage rainwater, reduce flooding and also used within treatment processes.
- **Landowners:** private landowners, rural estates and organisations such as Crown Estate Scotland are responsible for land management and the good stewardship of the land in line with sustainable development principles.
- **Local authorities:** have a role in environmental protection and sustainability, including being responsible for ensuring air quality meets national standards and a statutory duty to contribute to Scotland's net zero target by 2045. Nature Networks, which are designed to connect and enhance wildlife, habitats and ecosystems, are increasingly being incorporated into Local Development Plans (LDPs).

Regulation

SEPA regulates activities that could harm the environment, with the aim of protecting and improving it. This includes managing resources sustainably and ensuring compliance with environmental legislation.

Scottish Forestry is the Scottish Government agency responsible for forestry policy support and regulations.

Asset value

The Scottish Natural Capital Accounts values Scotland's natural assets at **£254.7 billion in 2022**.[1]

Asset strategies

- **Forest:** Land Management Plans, Forestry and Land Scotland[2]
- **Peatland:**
  - Scotland's National Peatland Plan: Working for our future, Scottish Natural Heritage (2015)
  - Peatland ACTION – Peatland Restoration and Management Guide, NatureScot
- **Water:** see Section 5
- **Land:** individual farmers/landowners are responsible for land management plans, although may be guided or incentivised by the:
  - **Agri-Environment Climate Scheme (AECS)** helping to promote land management practices which protect and enhance Scotland's natural heritage.
  - **Scottish Upland Sheep Support Scheme** which aims to keep sheep on rough grazing land.
  - **Forestry Grant Scheme**, supporting the management or creation of woodland and forests.

Key policy and strategy

- Natural Environment (Scotland) Bill.
- Green Industrial Strategy, The Scottish Government, 2024.
- Investing in Nature: A plan to support investment in biodiversity and climate adaptation in Scotland, The Scottish Government, 2025.
- Scotland's Forestry Strategy, 2019-2029.
- Scottish Biodiversity Strategy to 2045: this includes the '30×30' target of protecting at least 30% of Scotland's land and sea for nature by 2045.
- National Planning Framework 4 (NPF4).
- Water-Resilient Places Framework (2021) and Flood Resilience Strategy (2024).
- The Green Infrastructure Strategic Intervention (GISI), NatureScot (2016-2023).
- Natural Capital Market Framework, The Scottish Government (2024).

Funding

- **Scottish Government Nature Restoration Fund (NRF):** has awarded over £55 million since its launch in 2021, including more than 240 projects through the competitive fund run by NatureScot.
- **The Facility for Investment Ready Nature in Scotland (FIRNS):** the Scottish Government and NatureScot, working in partnership with the National Lottery Heritage Fund (and support from the Green Finance Institute) provides grants to support the development of investment-ready projects that help to restore and improve the natural environment.
- **Scottish Rural Development Programme:** the Scottish Government delivers the **Scottish Rural Development Programme (SRDP)** in partnership with other public bodies, including NatureScot.

The two key schemes within SRDP to manage for biodiversity and climate change are:

- **Agri-Environment Climate Scheme (AECS):** promotes land management that protects and enhances Scotland's natural heritage, improves water quality, manages flood risk and helps mitigate and adapt to climate change. AECS has also supported access projects. The scheme guidance was updated in 2025.
- **Forestry Grant Scheme (FGS):** supports the sustainable management of existing woodlands and the creation of new woodlands. FGS also offers funding for access projects in woodland.
- **Scottish Marine Environmental Enhancement Fund:** the fund is managed by NatureScot, the Scottish Government's Marine Directorate and Crown Estate Scotland. Since inception it has distributed £3.8 million to approximately 54 marine enhancement projects across Scotland.
- **Peatland ACTION fund:** a Scottish Government Fund that supports on-the-ground peatland restoration activities.
- **Various other funding:**
  - National Lottery Heritage and Community Funds
  - Crown Estates Environment Grants
  - Scottish Landfill Community Fund
  - Energy Community Funds (e.g., The ScottishPower Foundation, SSE Renewables Hydro Community Fund, Sustainable Development Fund and SSEN Transmission Community Benefit Funds)

Reflection on last 20 years

Over the short-term (2019-2022), natural capital has been "maintained" according to the Natural Capital Asset Index (this does not include an assessment of marine ecosystems).

Evidence suggests that natural capital was in decline from 1950 to 1990 and that efforts to recover natural capital in Scotland still have a way to go to return to historic levels.

Key investments and initiatives have included:

- Scottish Government **Nature Restoration Fund** (NRF), NatureScot: £65 million over five years to support the delivery of projects that restore Scotland's wildlife and habitats on land and at sea.
- **Peatland ACTION programme:** in 2020, the Scottish Government committed £250 million over 10 years to restore 250,000 hectares of degraded peatlands.
- **Agriculture Transformation Fund (ATF)**.
- **Vacant and Derelict Land Investment Programme**.
- **Agri-environment Climate Scheme** (AECS).
- **Scottish Marine Environment Enhancement Fund** (SMEEF).
- **Water Environment Fund** (WEF).
- **Forestry Grant Scheme** (FGS).
- The **Facility for Investment Ready Nature in Scotland Fund** (FIRNS) is a collaborative initiative led by the Scottish Government, NatureScot and the National Lottery Heritage Fund.

Key national developments

Key National Developments (NPF4) in the natural infrastructure sector include:

- Circular Economy Material Management Facilities (4).
- Urban Sustainable, Blue and Green Surface Water Management Solutions (5).
- Central Scotland Green Network (7).

Contribution to national outcomes

- Economy
- Environment
- Health
- Education
- Communities

The health of natural ecosystems also underpins other National Outcomes including: children & young people; culture; fair work & business; human rights; international; and poverty.

Delivery plans

- **Biodiversity:** Delivery plan 2024 to 2030, the Scottish Government (2024)

15.2 Sector analysis

Natural capital is defined in Scotland's National Strategy for Economic Transformation (NSET)[3] as "the renewable and non-renewable stocks of natural assets, including geology, soil, air, water and plants and animals that combine to yield a flow of benefits to people".

Society is part of nature, not separate from it. We rely on it to provide us with food, water and shelter (provisioning services), regulate our climate, disease and maintain nutrient cycles and oxygen production (regulating services) and enhance our health and wellbeing, providing us with recreational, aesthetic and cultural enrichment (cultural services).

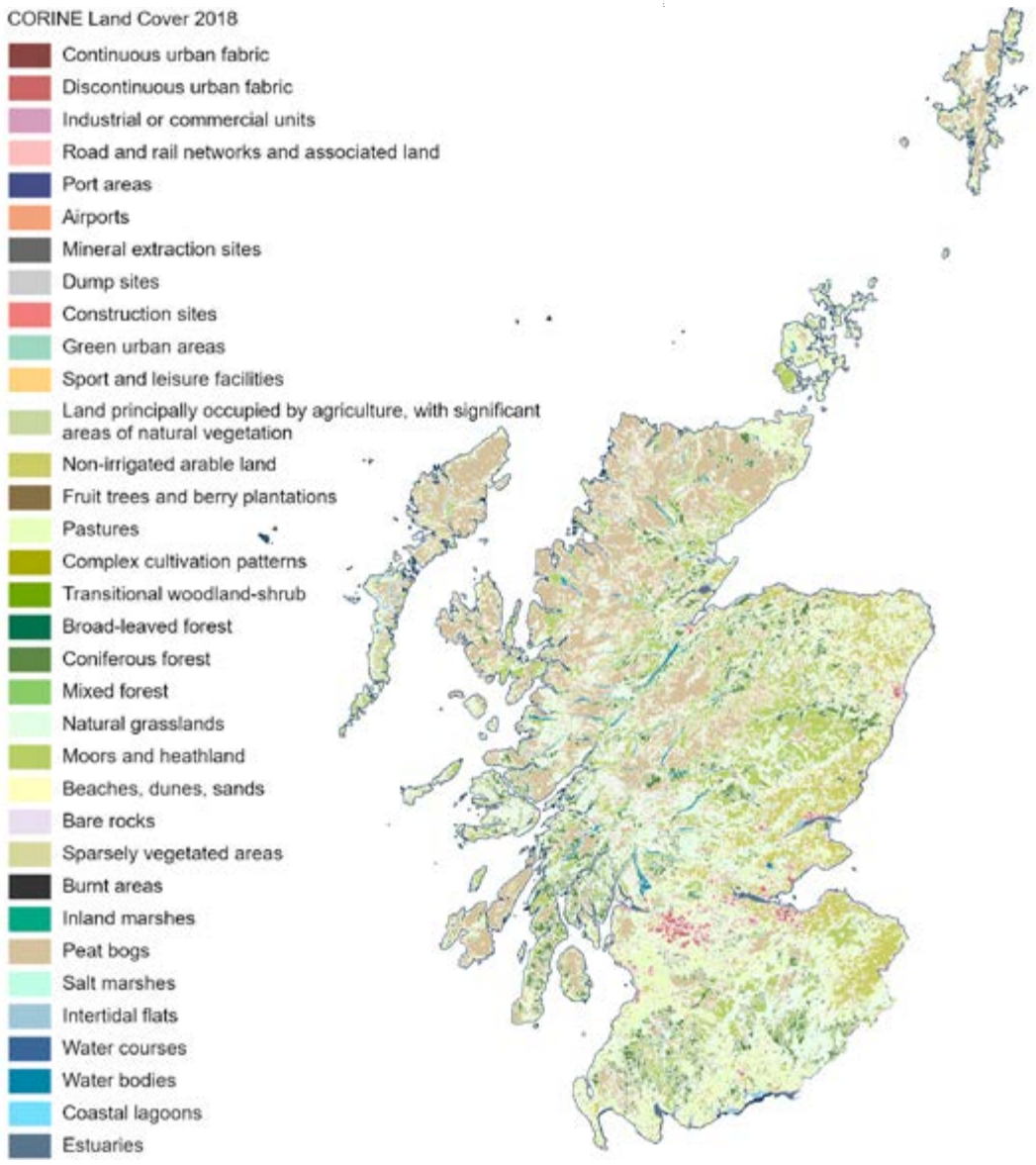
Our economy is reliant on nature. The industries in Scotland most reliant on natural capital, excluding non-renewable resource sectors, include:

- Agriculture, fishing and aquaculture.
- Forestry and wood products.
- Water and sewage.
- Sprits/wine and beer/malt sectors.
- Electricity.

These industries supported over 14% of Scotland's total output, equating to at least around £40 billion of total economic output, and at minimum supporting around 260,000 jobs[4].

Other critical Scottish industries also rely on natural capital through ecosystem services that are not reflected in market statistics. For example, the tourism industry relies on cultural services, with the direct economic impact of nature-based tourism in Scotland estimated at £1.4 billion per

Figure 31: Scotland's land use (CORINE Land Cover, 2018)



year (associated with 39.000 full time equivalent jobs and visitor spending of more than £4 billion per year, in 2010 prices).[5]

Land

The total land area of Scotland, including islands, is around 78,000km^2. It is estimated that Scotland has over 900 islands, with 118 being inhabited.

In total, Scotland accounts for around 32% of all land area in the UK. The main habitat types in Scotland's land cover are mountains, moorland, and heath (26%), and enclosed farmland (25%).

Between 1990 and 2021, mountains, moorland, and heath experienced the largest change in coverage, with 633,108 hectares transitioning mainly to semi-natural grassland, freshwater, wetlands, floodplains, and woodlands.

Urban areas saw the highest relative increase (46%), while woodlands expanded the most in area terms, growing by 418,998 hectares (42%).

Enclosed farmland, which covered 27% of Scotland's land in 1990, decreased by 141,382 hectares to 25% by 2021, with 99,397 hectares of farmland converting to woodland[6].

Mountains, heaths and bogs

Scotland's mountains, moors, hills and heaths cover more than 50% of Scotland's land area, extending from near sea level in the north and west to the highest mountain tops. Scotland's uplands support a wide range of habitats, due to their varied geology, which gives rise to many rock and soil types.

Scotland is the European stronghold for upland heath, covering up to 31% of Scotland's land area[7]. The ways in which Scotland's uplands have been managed over centuries also contributes to the range of habitats seen today. Some habitats, such as montane heath, look more or less as they would if Scotland were uninhabited. Others are the result of deliberate management. For example, Scotland's heather moorland is maintained mostly by management such as grazing and burning.

Forests and woodlands

Scotland has over 1.4 million hectares of forests and woodlands, covering 17.6% of the country. This figure has increased from 5% coverage 100 years ago.

Scotland has the most forest and woodland coverage in the UK. One third (470,000 hectares) is owned by Scottish Ministers as part of the National Forest Estate (NFE), and over 1 million hectares is privately or community owned[8].

The Programme for Government 2021 to 2022[9] announced an increased woodland creation target of 18,000 hectares per year by 2024/25, together with £150 million of funding support through forest grants (£100 million), increased state nursery production (£20 million) and expansion of Scotland's national forests (£30 million).

The NFE, including its open grounds, contribute to Scotland's economic, environmental and social outcomes, such as adding £1 million GVA per day, supporting 11,000 full time jobs, powering 500,000 homes through renewable sources, hosting nine starter farms and welcoming 10 million visitors annually[10].

Soils and peatland

Soil is a crucial carbon reservoir and the foundation for most plant life, supporting both human and wildlife ecosystems. Scotland is home to a variety of soils, with organic peat soil being one of the most significant types.

Peat soils cover more than 20% of Scotland and store around 1,600 million tonnes of carbon. However, it is estimated that over 80% of Scotland's peatlands are in poor condition[11].

Peatlands in good condition form peat, absorbing CO_2 from the atmosphere and store carbon in the soil. Unfortunately, the evidence is that degraded peatlands can emit more CO_2 than they absorb, thereby contributing to climate change. Peatland is therefore one of Scotland's biggest assets in action against climate change.

Peatland restoration is essential to ensure Scotland reaches net-zero. Peatland is also important for ensuring clean drinking water, as much of Scotland's water is filtered through peatland before reaching our taps. Peatland habitats are also critical for biodiversity, supporting many important species, including ground nesting birds, amphibians and reptiles.

Farmland and croftland

In 2024, around 66% of Scotland's land mass was used for agricultural production[12]. According to UK Natural Accounts 2024, enclosed farmland represented 2 million hectares. The total area of land used for growing crops or rearing livestock has grown by 10% between 2014 and 2022 to 5.66 million hectares[13].

While much of Scotland's agricultural land is used for rough grazing, particularly in hilly or mountainous areas, the eastern regions, especially coastal areas, are more suitable for growing food crops for human consumption.

Lochs, rivers and wetlands

Scotland's lochs, rivers and wetlands support many important habitats and species, and wetland vegetation also helps to maintain water quality. Clean water is a vital resource (see Section 5, Water), not just for people but also for sustaining biodiversity.

Freshwater, wetlands and floodplains cover over 887,000 hectares, representing 11% of all habitat extent[14].

Scotland has more than 30,000 freshwater lochs, ranging from small lochans to large, nationally significant lochs like Loch Ness and Loch Lomond. Water conditions vary from soft, relatively acidic waters with low levels of nutrients, to hard, more alkaline waters with higher nutrient concentrations[15].

Scotland has an abundance of 'running waters' supporting aquatic and riverside habitats and species, alongside Scotland's wetlands. Wetland areas support biodiversity, help provide clean water, moderate floods and maintain river flows as well as storing large amounts of carbon.

Coasts and seas

The area of Scotland's seas is estimated to be over 462,300 sq km using the definition of the "Scottish Zone" (in the Scotland Act 1998) which is from the coastline to the Exclusive Economic Zone (EEZ) limit – generally about 200 nautical miles. Scotland's seas are significantly larger than its land area, by nearly six times.

Scotland EEZ accounts for 63% of the overall UK EEZ.

At about 18,000km long, Scotland's coastline would stretch from Scotland to Australia in straight line distance. Coastal habitats include sand dunes, cliff habitats, saltmarsh and saline lagoon.

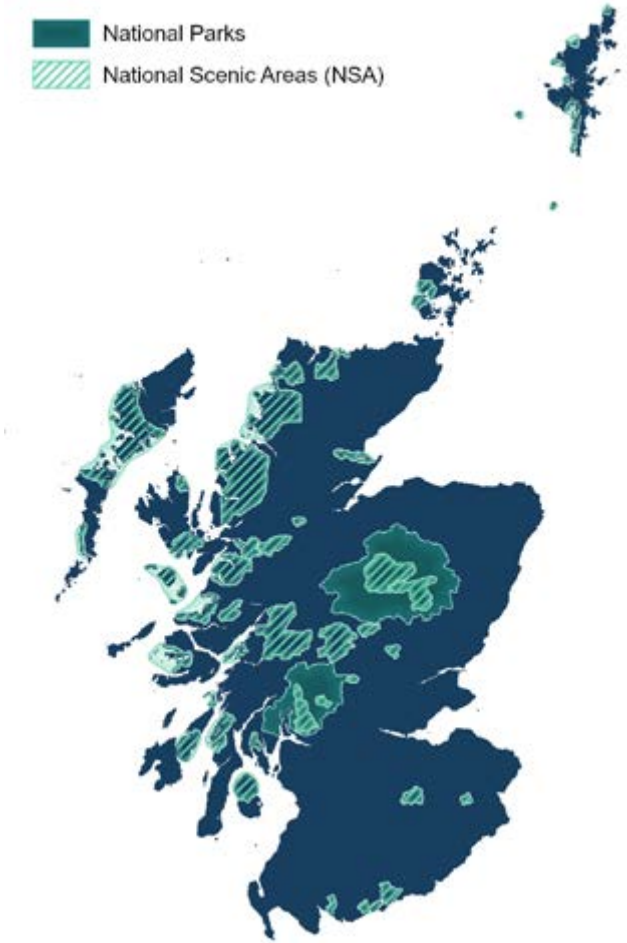
Machair (a Gaelic word meaning fertile, low-lying grassy plain) refers to a unique habitat that is one of the rarest in Europe – only occurring on the exposed west-facing shores of Scotland and Ireland. The Machair habitat is very similar to a fixed sand dune but is distinguished by its flat (or gently undulating) landscape, and variety of vegetation types. Machair is formed from lime-rich shell sand washed up thousands of years ago by the sea, and eroded from dunes by powerful winds, spreading the sand well inland. Light cattle-grazing, hay cutting and low intensity rotational crop farming (free of artificial fertilisers or pesticides) has shaped the landscape.

Scotland's seas (up to 12 nautical miles from the coast) cover an area greater than the Scottish mainland and islands added together. Scotland's inshore and offshore waters combined make up 13% of all European seas and contain 8,000 species or more.

Figure 32: Scotland's Marine Protected Areas

Around 37% of the seas around Scotland are Marine Protected Areas (MPAs). There are more than 240 MPAs, which are designed to protect Scotland's seas, marine life and habitats from damage caused by human activity. MPAs can be designated for nature conservation, research and demonstration or to protect heritage areas and historic sites such as shipwrecks.

Figure 33: Scotland's National Parks and National Scenic Areas (NSA)



National parks

There are currently 15 national parks across the UK, with two in Scotland: Loch Lomond and the Trossachs (established 2002) and Cairngorms (established 2003 and extended 2010).

National Parks serve as models of sustainable development. They do this by:

- Working to protect and enhance their natural and cultural heritage.
- Promoting responsible access to nature.
- Supporting local economies and communities.
- Managing millions of visitors annually.

Figure 33 shows the boundaries of Scotland's two existing national parks, alongside Scotland's National Scenic Areas (NSA).

National Scenic Areas (NSA)

Legislation defines an NSA as an area "of outstanding scenic value in a national context". They are broadly equivalent to 'Areas of Outstanding Natural Beauty (AONB)' found in England, Wales and Northern Ireland. Scotland's NSA are valuable natural capital assets supporting the tourism and visitor economy.

Scotland's NSAs include mountain ranges, such as Skye's Cuillins, Glencoe and Ben Nevis, and the dramatic island landscapes of the Hebrides. Much of the North Coast 500 (NC500) tourist route is covered by NSAs.

National Nature Reserves

Scotland has 43 National Nature Reserves (NNRs) covering just under 2% of Scotland's land area.

National Nature Reserves (NNRs) are areas of land set aside for nature. As in other countries, the accolade is given to Scotland's best wildlife sites, to promote their conservation and enjoyment.

Most reserves contain nationally or internationally important habitats and species, so the wildlife is managed very carefully. Visitor facilities are designed and managed to ensure that people can enjoy NNRs without harming or disturbing the wildlife that lives there.

Figure 34: Scotland's National Nature Reserves

Sites of Special Scientific Interest (SSSIs)

In Scotland, there are 1,422 Sites of Special Scientific Interest (SSSIs). These sites are designated to protect the best examples of Scotland's flora, fauna, geology, and geomorphology. They cover approximately 1,011,000 hectares, which is about 12.6% of Scotland's land area[16].

Special Areas of Conservation (SACs)

Special Areas of Conservation (SACs) are designated to protect specific habitats and species, as outlined in the European Habitats Directive. These examples are chosen to represent the best examples of these habitats and species, with 243 SACs designated within Scotland, including those that extend into offshore waters. Three SACs straddle the border with England.

Special Protection Areas (SPAs)

Scotland has 162 designated Special Protection Areas (SPAs) which are areas designated to protect important bird habitats. They include both terrestrial and marine areas, with some encompassing inshore and offshore waters

Natural capital asset value

Natural capital is crucial for Scotland's sustainable development; in 2024, the Scottish Government published the Natural Capital Market Framework[17] providing estimates on the quality and value of services being supplied by Scotland's natural capital.

The natural capital asset value for Scotland in 2022 was an **£142.2 billion** when oil of gas is excluded. This measures the stock of ecosystem services and takes into consideration future supply.[18] The total value represents almost 14% of the UK natural capital asset value.

The largest contributions to Scotland's asset value include: Oil and gas (42%), recreation (health benefits) (21%) recreation and tourism (14%), water provisioning (9%), and agricultural biomass (10%).

It has been found the areas in Scotland with the highest shares of key habitats are the Highlands & Islands, Tay Cities and South of Scotland Regional Economic Partnerships (REP). These REPs provided ecosystem services with the estimated value of £2.1 billion in output in 2019 for all economic sectors in Scotland[19].

Non-renewables

Scotland makes up the majority of the UK's oil and gas asset value and oil and gas represent the highest contribution to Scotland's natural capital value. However, Scotland's natural capital accounting tends to adopt a renewables-based definition of natural capital, excluding sectors reliant on non-renewable resources. These are resources that will not regenerate after exploitation within any useful time period.

Industries supported by non-renewable sectors include mining and mining support, coal and lignite, oil and gas extraction and metal ores.

Ecosystem service valuation

The Natural Capital Accounts (NCAs) take a range of ecosystem services and attempt to value, in monetary terms, the benefits they bring to society, including:

- **Provisioning services** – material outputs such as fish, timber, fossil fuels.
- **Regulating services** – that help to maintain the quality of the environment, such as greenhouse gas regulation, air pollution removal and noise mitigation.
- **Cultural services** – such as recreation, tourism and aesthetics.

The net annual value of natural capital in Scotland was **£38.7 billion in 2022**, or £5.9 billion when oil and gas is excluded[20].

Scotland's annual value of natural capital increased from £14.8 billion in 2021 to £38.7 billion in 2022. Variation in Scotland's annual value is largely explained by fluctuating oil and gas prices.

Provisioning services

Provisioning services fall under the ecosystem services provided by nature. These services are products extracted, harvested or derived from nature such as food, raw materials, water and energy.

Provisioning services accounted for 94% of Scotland's annual value in 2022, predominantly oil and gas (£32.8 billion), followed by renewable electricity (£1.2 billion), and water (£1.0 billion).

NatureScot data shows there has been an overall positive trend since 2000 (+4.6%) in provisioning services, with a +1.4% increase recorded between 2019 and 2022. There was a large percentage drop starting in 2006 before bottoming in 2010 (-2% from baseline) before increasing again.

The provision of renewable electricity has almost doubled from 17,575 gigawatt hours in 2016 to 33,332 gigawatt hours in 2022. Oil and gas provisioning fell from 75 to 65 million tonnes of oil equivalent but its annual value, in monetary terms, increased around 6-fold from £5.4 billion to £32.8 billion.

Regulating and maintenance services

The regulation and maintenance of ecosystem services are vital in sustaining the health and stability of ecosystem services in Scotland.

Regulating ecosystem services had a net annual value of £0.1 billion in 2022. Air pollution removal had the highest annual value of the regulating services, worth £0.1 billion in avoided health impacts.

The levels of regulation and maintenance have remained stable since 2019 (+0.3%) and show an overall increase of 2.5% since 2000.

Cultural services

Cultural ecosystem services had an annual value of £2.3 billion in 2022. This included health benefits from recreation (£0.9 billion) and outdoor recreation and tourism (£0.9 billion).

Cultural Services have been stable in both the short and long term, showing a +1.9% change since 2000 and -0.4% change from 2019. This ecosystem service has the most even distribution of habitats and quality indicators, with grassland and woodland habitats having the largest influence due to the expanding area they cover.

Scotland's Natural Capital Asset Index

The Natural Capital Asset Index (NCAI) assesses the quality and conditions of natural capital in Scotland, whilst the Natural Capital Accounts value in monetary terms the ecosystem services provided by the natural capital and also the natural capital assets as a stock.

Scotland's Natural Capital Asset Index, 2025 (NCAI)[21] is made up of a range of databases that make up and characterise the various Scottish habitats. The index focuses on the ways habitats contribute to the wellbeing and quality life of those who live in Scotland.

Biodiversity underpins Scotland's natural capital, as the ability of nature to provide benefits now and in the future is reliant on the diversity of life, genes, species and ecosystems.

The NCAI uses ecosystem services to assess how nature contributes to the wellbeing of Scottish citizens. Habitat extent, ecosystem service potential, the demand for different ecosystem services and measurements of habitat quality are all used in the assessment.

According to the NCAI, agriculture and cultivated habitats have increased gradually since 2009. There has been about a 3-point increase in the relative availability to provide benefits to people in that time frame; this increase is likely due to increased habitat extent and the reduced use of fertilisers.

Mires, bogs and fens, coastal, inland surface waters, woodland, grassland and heathlands have remained relatively stable since 2019; showing less than 2% change since 2019.

The woodland habitats in Scotland appear to show the largest percentage point improvement since 2000 (baseline year). This increase can be attributed to the increase in woodland area, with broadleaf woodland area increasing by 60 percentage points compared to the 2000 baseline. It should be noted the condition of the woodlands has decreased by 27 percentage points during the same period, representing the relatively poor condition of Scottish woodland.

Natural Flood Management (NFM)

Coastal

Scotland has £20 billion[22] of buildings and infrastructure within 50m of the shoreline. Three-quarters of these assets are protected by natural defences such as sand dunes, with the remaining protected by man-made defences such as sea walls. Rising sea levels, increased coastal erosion and erosion-enhanced flooding will progressively impact soft coastlines.

SEPA's 2018 National Flood Risk Assessment[23] estimates that with climate change the number of properties at risk from coastal flooding is expected to increase to over 54,000 properties by 2080s.

Evidence from the Dynamic Coast[24] project helps identify and anticipate coastal changes to better adapt to sea level rises of up to 1.2m forecast by the end of the century.

Findings from the Dynamic Coast project show that:

- If recent erosion rates were to continue on natural erodible shores, by 2050, at least 269 residential and non-residential buildings, 3.4km of railway, and 44.6km of road (as well as significant sections of clean water network and areas of runways, cultural and natural heritage sites) are expected to be affected by coastal erosion.
- If erosion rates increase in the future, as expected with climate change, Dynamic Coast and SEPA's National Flood Risk Assessment[25] are likely to underestimate the extent of assets at risk from future coastal erosion and associated coastal flooding.
- Large numbers of assets are sited close to erodible coasts (including 16,000 residential properties, 497km of roads and 58km of railway lines).

Nature based Solutions (NbS) have a key role to play in increasing the resilience of the shoreline to improve flood and erosion protection. This includes improving the volume, altitude and health of natural buffers, helping to absorb wave and tidal energy. Sand dunes, for example, can be restored to improve the stability of the dune and increase its ability to dissipate wave energy and protect land areas. Dissipation of wave and tidal energy can also be improved by replacing sediment eroded from beaches or restoring intertidal habitats such as saltmarsh and mudflats.

Catchment

Natural capital also plays a vital role in NFM across Scotland's catchments. Catchments are defined as areas of land where rainfall and surface water naturally drain into a common water body – either a river, loch or into coastal areas. Catchments are essential for management of water resources, flood risk and the wider environment. Catchments include major river catchments, coastal and island catchments and urban catchments.

Scotland's Flood Risk Management Act (2009) and the EU Floods Directive encourage integrated catchment scale approaches. Agencies like SEPA and NatureScot actively promote NFM as part of Scotland's sustainable flood strategy.

Furthermore, projects such as Eddleston Water demonstrate how NFM can protect communities while also enhancing place by reconnecting people with the landscape and water.

Blue-Green Infrastructure

Blue-Green Infrastructure (BGI) is embedded in Scotland's spatial planning system (NPF4), with the requirement that all new developments incorporate sustainable drainage systems (SuDS) and NbS.

BGI can support water, climate resilience and urban design by integrating natural landscapes (green) with water systems (blue) and is important in creating water-resilient places. BGI thinking and design promotes collaboration across planning, transport, housing and the environment.

Green infrastructure includes parks, green roofs, raingardens, woodlands and wetlands, while blue infrastructure includes rivers, ponds, canals, and SuDS. Hybrid spaces combine both, like bioswales, urban wetlands and floodable parks.

Challenges and opportunities

Challenges

Funding and finance:

- Challenging to make the case for investment in BGI and NbS as main benefits are often claimed by communities rather than being a direct financial return on investment.
- Nature recovery requires long-term, patient investment – returns are not immediate.
- Challenges navigating natural capital markets – information and risk
- Embedding the value of natural capital and ecosystem services into investment decisions.

Service/system:

- Increase in stock of natural capital does not always translate to enhanced quality of the natural environment (planting trees needs the 'right tree in the right place').
- Achieving sustainable tourism growth e.g. impact of NC500 on communities and the environment.
- Land ownership (small number of large private landowners) and incentives for investment in nature.

Legislation and regulation:

- Currently no statutory duties on authorities to manage or plan for the improvement of rainwater drainage within the public realm.

Climate resilience:

- Potential collapse of biodiversity and increasing impact of climate change.

Opportunities

Data and technology:

- Create mapping of national rainwater drainage management network to increase understanding of existing functional infrastructure.
- Improved monitoring of the state of Scotland's natural capital (through the NCAI, for example).

Innovation:

- Enhanced use of Nature based Solutions to improve resilience to the impacts of climate change.

Service/system:

- BGI thinking and design promotes collaboration across planning, transport, housing and the environment.

Asset development:

- Increased investment in green and blue infrastructure to integrate nature into built environments (e.g. green roofs, street trees, raingardens) to create more liveable and climate-resilient places.

Socio-economic:

- Land reform and empowering communities to engage with and benefit from land use decisions.
- Involving communities in the stewardship of natural capital fosters a sense of ownership and responsibility and this participatory approach encourages a long-term approach to the environment.
- Access to nature supports physical activity and investment in nature can improve health and social interaction which can ultimately contribute to reduced health costs and increased economic activity.

Economic:

- Emergence of nature markets and potential to leverage private investment through use of technology to manage and measure.

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