



Public Bodies Climate Change Duties Reporting

Analysis Report 2022/23

Executive summary

This report presents summary findings based on high-level analysis of all Public Bodies' Climate Change Duties 2022/23 annual compliance reports.

→ See Annex on page 30 for legislative background to reporting

At the outset of reporting in 2015/16 the analysis covered all sections of the reports. This was subsequently limited to data provided on greenhouse gas emissions, emission reduction projects and renewable energy generation. With effect from 2022, the summary report has also included analysis of some of the information provided on adaptation. The report published in 2023 included analysis of new questions in the Targets section, introduced by the [2020 Amendment Order](#)¹.

As the majority of reports submitted by Integrated Joint Boards (IJBs) refer to the parent NHS Board and/or one or more local authority reports, they do not inform the analysis, unless specifically mentioned.

Some public bodies that are not required to report on a mandatory basis have taken steps to submit a voluntary report in the interests of transparency and accountability.

→ See Annex on page 30 for further information

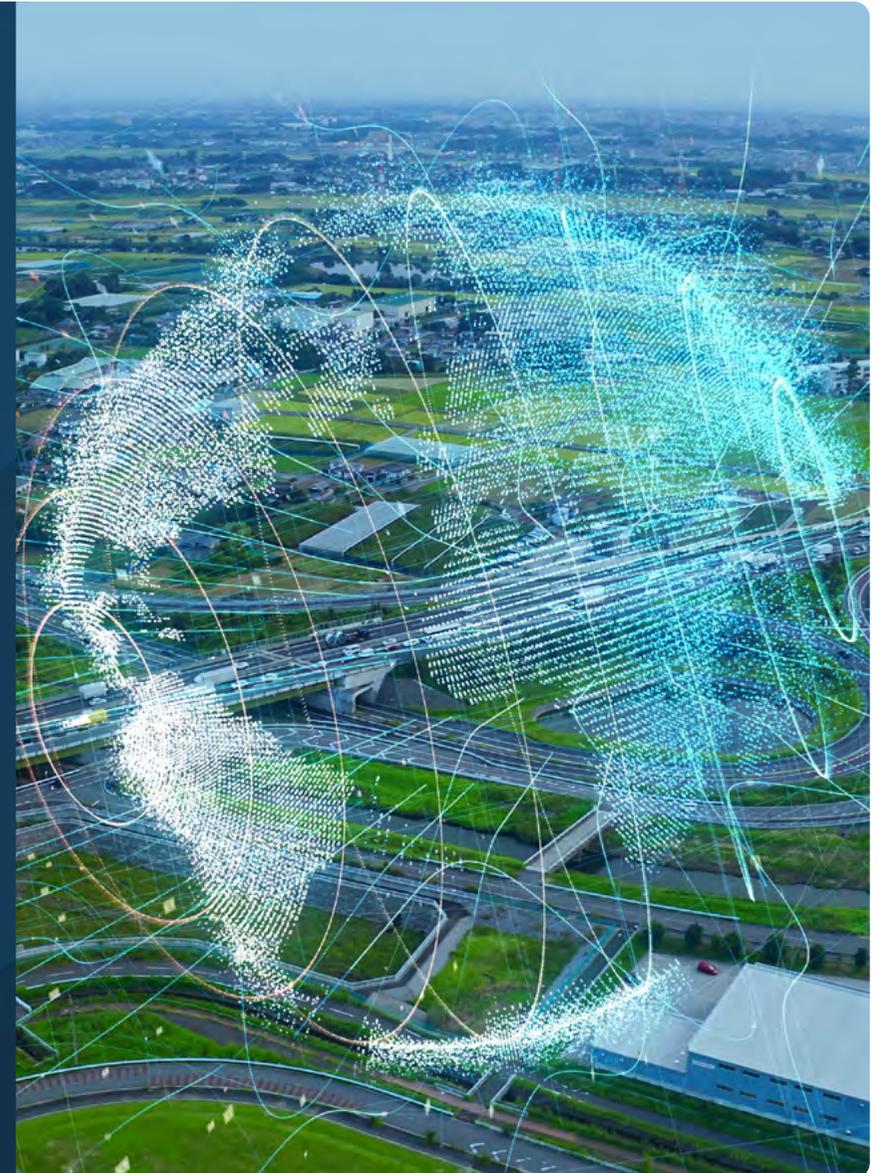
¹ The new questions introduced under the 2020 Amendment Order took effect from 1st April 2021 so applied for the 2021/22 reporting period and the summary analysis report follows the year after.

The 2022/23 reporting period spanned 1st January 2022 to 31st August 2023, due to sub-sectors adopting different corporate accounting years (i.e. calendar, financial or academic).

Reports were received from all 188 listed bodies, representing 100% compliance for the public sector.

Reported emissions have increased in total primarily due to some bodies expanding their reporting boundary to include more Scope 3 emission sources rather than an absolute increase. In particular, emissions from procurement activity and commuting which were rarely reported before 2020/21.

Scope 1 and Scope 2 reported emissions have decreased 2% and 10% respectively since 2021/22. Scope 2 emissions have declined by 63% since 2015/16 due mainly to the carbon intensity of the UK electricity grid supply reducing by more than half and consumption dropping by almost 14%. Scope 1 emissions overall have remained fairly stable over the same period, declining by less than 2%.



Executive summary continued

Figure 1: Headline figures

**188/100%**

Reports received

**52,460 tCO₂e**

Project emissions savings

**496,657 FTEs**

Total staff

**2,786,823 tCO₂e**

Total reported emissions

Scope 1 ↓ 2%
Scope 2 ↓ 10%
Scope 3 ↑ 21%

Emission changes

**362 GWh**

Renewable energy generated

Figure 2: Percentage of total bodies by sector

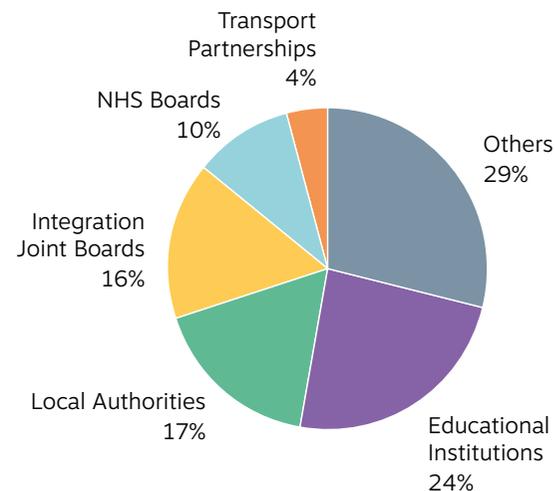


Table 1: Number of reports by sector

Sector	Number
Others	54
Educational Institutions	45
Local Authorities	32
Integration Joint Boards	30
NHS Boards	20
Transport Partnerships	7
Total	188

Executive summary continued

1

Direct emissions (Scope 1) are from the heating of buildings and fueling of fleet vehicles, including vans, lorries and boats. Other Scope 1 sources include emissions from the use of refrigerants, air-conditioning systems, medical gases and process gases, the latter two being more sector specific.

Scope 1 reported emissions fell by 2%. The main factor is a 6% drop in emissions from natural gas used for heating corresponding with a 5% drop in consumption. This is the largest reduction in gas consumption since 2017/18 and is principally due to 2022/23 being the warmest year since 2015/16 when reporting began. Reported fleet emissions increased 5%, due in part to operational activity continuing to recover to pre-pandemic levels but increasing electrification of public sector fleet is helping to soften this rebound to some extent.

2

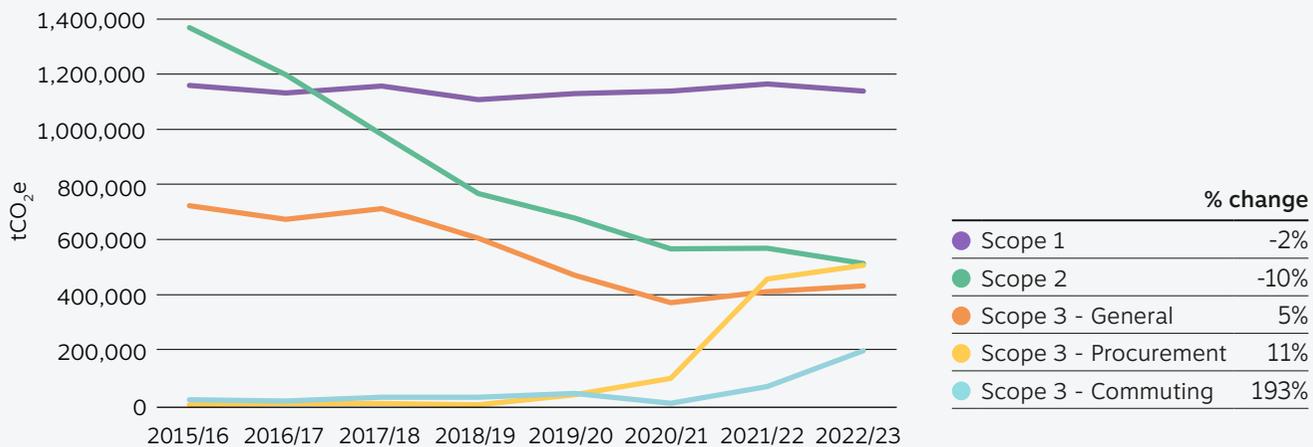
Indirect emissions (Scope 2) from UK grid electricity consumption and the direct purchase of heat and steam reduced by almost 10% from 2021/22. Much of this reduction is due to further decarbonisation of the grid. Electricity grid consumption remained stable which masks an underlying but indeterminate balance between improved efficiency and more on-site renewable generation versus growing demand e.g. for electric vehicles. The UK grid factor for 2023 is 7% higher than the 2022 factor due to more gas being burned and lower renewable power generation. This means that, without substantive reductions in consumption – which may be driven to some extent by increased energy costs – Scope 2 emissions are expected to show an increase for 2023/24.

3

Other indirect emissions (Scope 3) increased 21% compared to 2021/22. Almost half of this increase is due to student commuting and between term travel being reported by more of the Education Sector. This means that reported commuting emissions now account for c. 7% of total reported emissions. Overall they remain significantly under-reported, however, accounting for only 21% of total public sector FTEs. Actual commuting emissions, therefore, are effectively much higher than total reported fleet emissions (albeit these may also be under-reported to some extent) and may well outstrip currently reported Scope 1 and Scope 2 sources. The steep rise of 348% in reported procurement emissions witnessed in 2021/22, due to an increase in the number of bodies reporting procurement emissions, tailed off markedly to an 11% increase for 2022/23, although the number of bodies reporting some level of procurement emissions increased from 17 to 56. This is due to only a few bodies being responsible for the bulk of reported procurement emissions to date.

Business travel emissions have increased 40% reflecting a rebound in travel activity akin to pre-pandemic levels, although emissions are still significantly less than first reported in 2015/16. Other factors contributing to the increase include the Education sector reporting more air miles and significant increases in the UK emission factors for flights as a result of lower passenger occupancy.

Figure 3: Reported emissions (tCO₂e) by scopes since 2015/16 and percentage changes since 2022/23



Executive summary continued

Emission reduction projects

After dropping by over 50% in 2021/22, emission savings from planned projects increased by 36% in 2022/23. Electricity and gas projects accounted for c.55% of total savings but the biggest change was a large rebound in savings from waste projects (422%) mainly due to more landfill diversion of waste. Savings of c.60% accrued from new biomass plants and decarbonisation of fleet vehicles. Project savings are still 35% lower than 2020/21 due to a range of factors influencing project delivery, including ongoing impacts from the pandemic and UK withdrawal from the European Union, plus increased energy costs. There is also an element of some of the larger one-off savings having been achieved e.g. for material or infrastructure changes, such as adoption of LED street lighting and installation of building energy management systems.

Renewable energy generation

There is no net change in total renewable energy generation of 363 GWh reported in 2021/22. There was a 3 GWh gain for renewable electricity and equivalent loss for renewable heat. Total generation equates to emissions savings of c.74,000 tCO₂e, split 30:70 between electricity and heat, and roughly 3% of total reported emissions. This suggests potential scope for much greater adoption of renewable energy generation, where financially and environmentally feasible, across the public sector estate. 68% of savings were from renewable heat generation and 32% from renewable electricity which is comparable with 2021/22.

Emission reduction targets

Many bodies have made strong public commitments to contributing towards Scotland’s policy on becoming a net zero nation by 2045. However, reporting of targets and progress is still lagging and may be indicative of a range of issues, from sector leadership and governance needs through to accountability and quality control of reports within individual bodies, although there has been a noticeable improvement in the quality of information provided.

The number of bodies per sector with one or more targets aligned to national targets is very similar to last year, with the exception of the target for net zero Scope 1 emissions by 2045. An increase from 18 to 109 bodies is due to including bodies that have set the target as part of a broader suite of scopes e.g. Scope 1 and Scope 2, or all emissions etc.

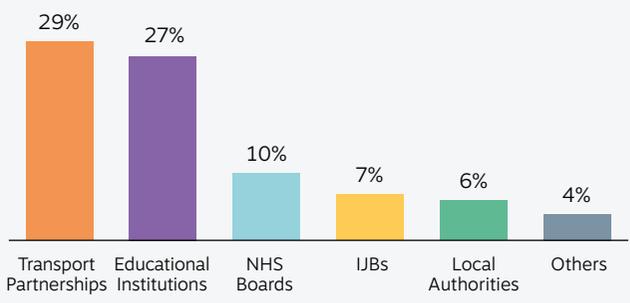
Improvements in the quality of information provided on quantitative targets, i.e. those with an absolute or percentage reduction and a target date, meant roughly double the number were assessed for progress compared with last year. It is a very mixed picture however, suggesting around one third of all quantitative targets are potentially behind delivery. For those with no interim targets there is a risk of assuming that progress is closer on track than may be the case.

Alignment of spending plans and resource use with targets was slightly more evident from reports than previously, with a more strategic approach being taken to ensure that all relevant planned spend and resource needs are considered with respect to impacts on emission targets and net zero pathways.

Adaptation

All reports, including from the IJB sector, were included in the adaptation analysis. There is still a relatively high number of bodies responding on emission reduction measures (mitigation) rather than adaptation.

Figure 4: Percentage of sectors responding on mitigation rather than adaptation measures



70% of bodies reported taking some form of climate risk assessment – representing a 4% increase over 2021/22. Fewer bodies reported taking no risk assessment and more bodies demonstrated taking an advanced approach that considers risks more strategically rather than single issue impacts e.g. from flooding. Action on adapting to climate change shows similar status with 72% of bodies reporting some form of action, although as for risk assessments, the majority of bodies report action on a single issue, typically flooding.

Executive summary continued

Context and changes

Covid-19 pandemic measures were more limited compared to the previous two reporting periods and this is evident in some areas, e.g. increasing return to pre-pandemic levels of travel, although a major shift to hybrid working and more online meetings are limiting a full-scale rebound.

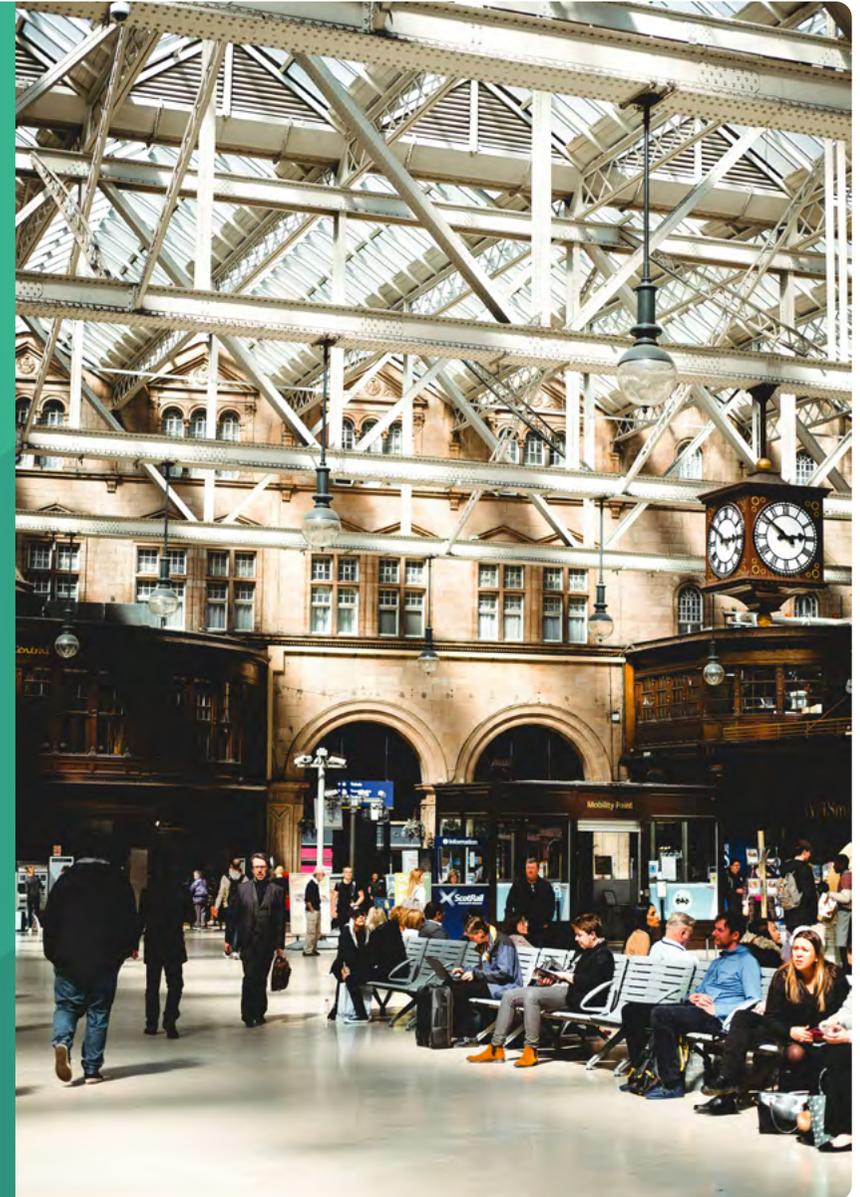
Other changes due to the impacts of such factors as the progressive EU exit (especially with respect to materials, labour and skills supply), inflation and increased energy costs all continued to affect activities to some degree.

The number of bodies subject to mandatory annual compliance reporting has increased from 150 to 188 bodies since it was first introduced in 2015. Over the intervening years, data capture and the quality of information provided in reports has improved. New targets and policy measures have also driven better monitoring and management of activities to help align with and support delivery of intended outcomes.

The most significant changes are in relation to emissions monitoring, specifically how best to determine and address the scale of emissions associated with the public sector supply chain and service provision.

Emissions from procurement are largely under-reported but can potentially account for more than 70% of an organisation's emissions footprint. This is a challenging area where pragmatic and proportionate approaches are needed by public bodies to drive internal action and influence contractors and supply chains. It requires not only more robust emissions accounting processes but also widespread adoption of circular procurement principles that inform budget planning and resource use to help secure 2045 and interim emission reduction targets.

The public sector has strong potential for bringing a coordinated approach to helping decarbonise supply chains and services while optimising other benefits, including for local communities and suppliers.



Corporate emissions

Please note: This analysis is based solely on reported emissions data and other information provided in public bodies' annual reports.

Data coverage

Public bodies report corporate greenhouse gas emissions² arising from operation of their estate, assets and services, with the exception of IJBs which act, from an emissions source perspective, as part of the respective NHS board and one or more local authorities. For this reason, IJBs are excluded from any emissions analysis.

Although reporting has improved in quality over the years there is still an indeterminate level of under-reporting. Table 2 shows percentage coverage of the main emission sources by sectors and an “average” public sector percentage coverage. These simple averages however are, in some cases, deceptive as data coverage is not and never will be 100% for all emission sources, bodies and sectors. For example, process gases are only relevant to a handful of bodies within the Education and Other sectors; the use of medical gases is confined mainly to the NHS sector; not all bodies own and operate a fleet of vehicles etc.

Means of addressing some of this uncertainty over data coverage are being considered to help future analysis illustrate whether data gaps are genuine or a particular emission source is less relevant and the actual sector average is <100%. Meantime, a high-level assessment has been provided to indicate whether the public sector average reflects actual circumstances based on tacit knowledge of each sector and constituent bodies.

Interpretation of “Average reflects actual?” column

This is a simple, high-level assessment designed to indicate where the actual, but as yet, undetermined level of public sector reporting per emissions source is:

- ✘ probably higher i.e. there is significant under-reporting;
- ? possibly higher but it is difficult to determine whether there is significant under-reporting without further information
- ✓ about right i.e. most or all bodies that are accountable for the emission source are already reporting it.

NB. this does not mean that all emissions associated with that source are being fully reported.

Table 2: Data coverage of emission sources by sector

Scope	Emission source	Local Authorities	NHS Boards	Educational Institutions	Others	Transport Partnerships	Public sector average	Average reflects actual?
1	Natural gas	91%	70%	89%	85%	29%	83%	✓
	Other heating & fuels	94%	70%	45%	37%	0%	54%	✓
	Fleet	100%	70%	73%	56%	14%	69%	✓
	Refrigerants	3%	30%	50%	17%	N/A	24%	✘
	Renewables	81%	50%	25%	19%	0%	36%	?
	Processes	N/A	N/A	2%	6%	N/A	4%	?
	Medical gases	N/A	55%	?	N/A	N/A	17%	✘
2	Electricity	100%	95%	100%	93%	57%	95%	✓
	Purchased heat & steam	19%	10%	7%	4%	0%	8%	?
3	Business travel - road	91%	90%	82%	85%	86%	86%	✓
	Business travel - air	34%	40%	70%	78%	57%	62%	?
	Business travel - other	38%	55%	73%	81%	71%	66%	?
	Water & sewage	88%	90%	95%	80%	43%	85%	✓
	Waste	94%	85%	93%	80%	43%	85%	✓
	Procurement	9%	45%	57%	35%	14%	36%	✘
	Commuting	13%	5%	39%	19%	43%	22%	✘
	Homeworking	72%	35%	82%	85%	71%	75%	?

² See the [GHG Protocol Corporate Accounting and Reporting Standard](#)

Corporate emissions continued

Some bodies and sectors are expanding their reporting boundaries to include other emission sources, as governance improves and data systems and processes mature. The number of bodies reporting additional sources or sector-specific sources compared with earlier reporting periods is shown in Table 3.

Reporting of emissions associated with procurement has increased significantly. Robust methodologies for estimating such emissions are still, however, under-developed and rely principally on spend as a proxy rather than actual emissions associated with a product or service supply. Reporting of fugitive emissions from potent greenhouse gases used as refrigerants, in air-conditioning units and in some laboratories has improved

but may still be under-representative of actual use. Medical gases are only relevant to NHS Boards and some university research facilities but are still under-reported.

Hybrid working has been common practice for many years but energy consumption due to employees working remotely (e.g. from home) was not reported until pandemic lockdown measures were introduced in 2020. Since 2020/21 more bodies have been reporting homeworking and reported emissions account for 62% of the listed bodies total FTEs. Conversely, staff commuting emissions, which are inversely related to homeworking emissions, remain significantly under-reported, representing only 21% of FTEs.

Table 3: Number of bodies reporting specific emission sources

Emissions Source	Number of bodies reporting specific emission sources			
	2015/16	2020/21	2021/22	2022/23
Procurement	1	5	17	56
Commuting	3	7	16	34 (21% of FTEs)
Homeworking	N/A	104	129	117 (62% of FTEs)
Medical gases ³	N/A	N/A	6	11
Refrigerants	5	22	24	38

³ Previously included under Processes

Changes to reported emission scopes over time

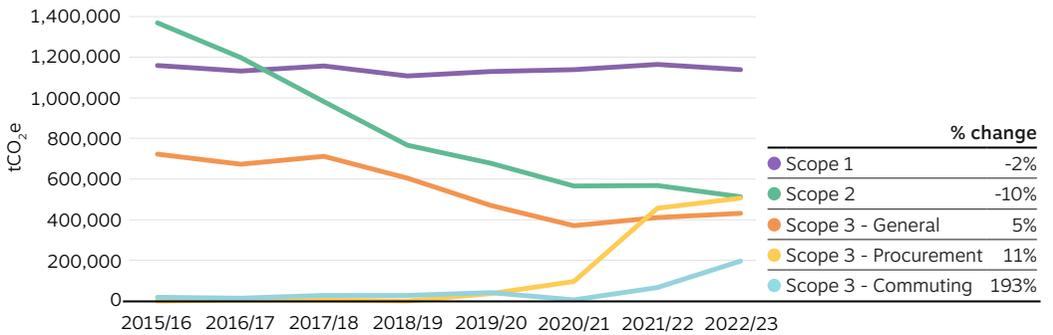
The steepest decline is evident for Scope 2 (indirect emissions) which have fallen by 63% since 2015/16. This is attributable to a 14% drop in electricity demand from the UK grid in tandem with the carbon intensity of the grid reducing by 58% over the same period.

Direct (Scope 1) reported emissions have only reduced by 2% since mandatory reporting began in 2015/16. A reduction of 2% since 2021/22 appears to be due largely to reduced gas consumption, discussed further below.

As mentioned above, public bodies' systems for monitoring and reporting of emissions have improved over the eight years that mandatory reporting has been in place.

The most notable impact is in relation to Scope 3 indirect emission sources. Since 2021/22 there has been a progressive improvement in reporting of emissions associated with supply chains and procurement of services, with over a third of bodies now reporting some element of procurement emissions. Emissions data on commuting is also now being provided, although overall coverage for all public bodies is still low at 22%.

Figure 5: Reported emissions by scopes since 2015/16 and percentage changes since 2022/23



Corporate emissions continued

Total Scope 1 and 2 reported emissions have decreased across all sectors since the first reporting period 2015/16 and the previous reporting period 2021/22.

As mentioned above, more bodies are expanding their reporting boundaries to include emissions from supply chains and the procurement of goods and services (Scope 3). Emissions due to commuting are also increasingly being reported. Of most significance is the impact of reporting student commuting, especially “relocation” travel between terms, as part of Educational Institutions Scope 3 emissions.

Figure 6: Scope 1 and 2 emissions by sector and percentage change since 2021/22

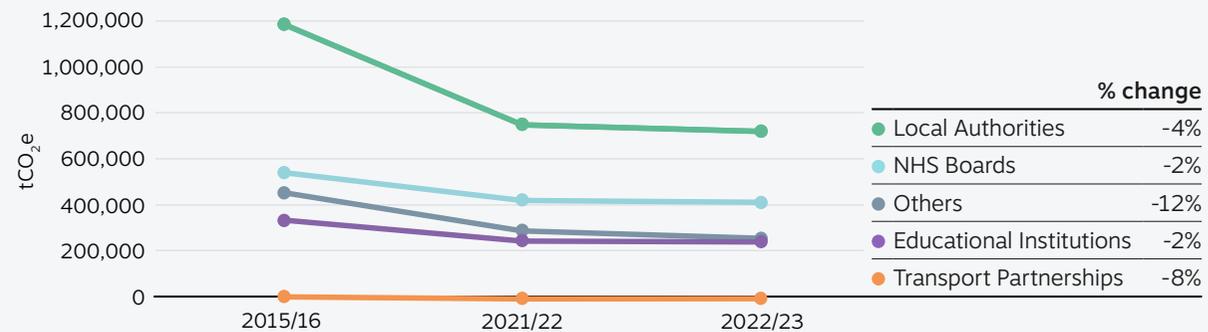
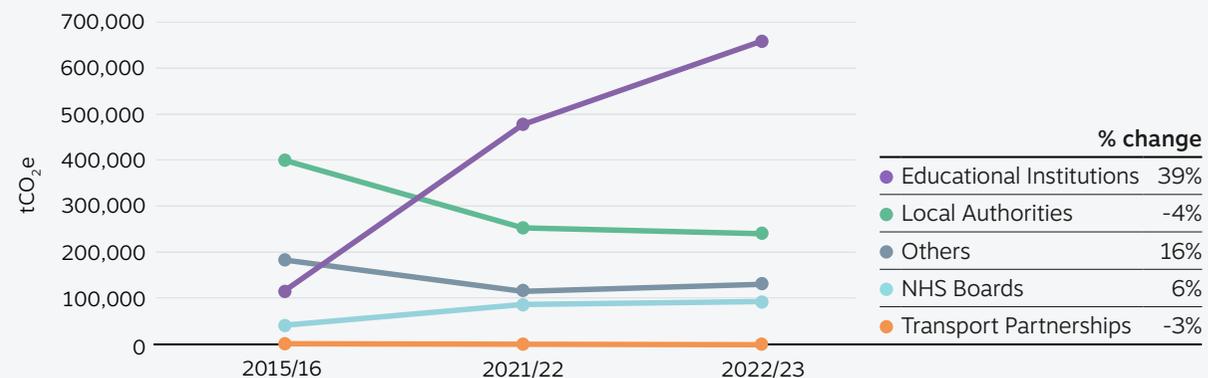


Figure 7: Scope 3 emissions by sector and percentage change since 2021/22



Corporate emissions continued

Key changes in significant sources of reported emissions

Percentage changes in reported emissions by source since 2015/16 and 2021/22 are shown in Table 4. Emission sources are ranked in descending order, therefore a small change in a large emission source at the top of the table is of more significance than a large change in a smaller source ranked towards the bottom of the table, although relative coverage of data sources should also be kept in mind.

The reason for changes in reported emissions can be complex and multi-faceted and may reflect a mix of direct efforts to reduce emissions through performance management measures, including effective project delivery and operational changes, and indirect impacts as a result of other organisational and strategic activities to improve operational efficiencies, service delivery or reduce costs. It is not feasible to elaborate on how some of these key drivers are influencing emissions as part of the analysis provided for this report. Some high-level factors to consider in the context of the changes shown in Table 4 include:

- more bodies reporting on a previously un-reported source e.g. commuting
- an actual change in an activity e.g. business travel rebounding following peak pandemic periods or improved control of a source e.g. refrigerant fugitive emissions
- a change to the UK emission factor e.g. for the electricity grid
- changes to monitoring methodologies and accounting of emissions using proxy data.

With the above context in mind, some of the more significant changes are discussed below.

Table 4: Changes in emissions by source

Emission source	Emissions (tCO ₂ e)			% Change since	
	2015/16	2021/22	2022/23	2015/16	2021/22
Natural gas	843,615	824,281	789,398	-6%	-4%
Electricity	1,550,894	623,175	587,100	-62%	-6%
Procurement	-	457,326	506,484	N/A	11%
Fleet	207,559	208,669	219,800	6%	5%
Commuting	18,193	66,975	196,381	979%	193%
Waste	314,744	183,434	162,946	-48%	-11%
Business travel	136,532	75,667	105,560	-23%	40%
Processes	47,772	70,708	74,124	55%	5%
Other heating fuel	133,536	68,769	61,192	-53%	-11%
Homeworking	N/A	30,449	33,833	N/A	11%
Medical gases	N/A	13,461	25,737	N/A	91%
Refrigerants	620	21,289	14,406	2224%	-32%
Purchased heat & steam	N/A	3,813	5,866	N/A	54%
Water and sewage	13,655	4,478	4,793	-65%	7%
Other	640	645	522	-18%	-19%

Corporate emissions continued

The two largest emissions sources, natural gas and electricity, exhibit marginal reductions since 2021/22 which appear to reflect consumption patterns and decarbonisation of the UK electricity grid, as discussed below.

Natural Gas Scope 1

Annual gas consumption fell by nearly 5% from 2021/22 and is the lowest since reporting began in 2015/16. This coincides with 2022/23 having the fewest heating degree days and being the warmest year since reporting began, according to the latest [Digest of UK Energy Statistics \(Weather\)](#). This is reflected in emission reductions of 6% since 2015/16 and 4% since 2021/22.

Electricity Scope 2

Electricity indirect emissions reduced by nearly 6% from 2021/22. This is largely attributable to an almost 9% decrease in the UK electricity grid's carbon intensity between 2021 and 2022 (Figure 9) as consumption remained fairly stable (<1% increase, Figure 10) over the 2022/23 reporting period. The grid has decarbonised by nearly 60% since 2015/16 as more renewable generation supplies have been connected and coal has been largely phased out as a fuel supply. The [2023 emission factor](#), however, shows the first increase in carbon intensity of supply since reporting began.

→ See “Why does the UK electricity grid factor change” on page 12

Figure 8: Natural gas energy consumption (GWh) and percentage change since 2015/16

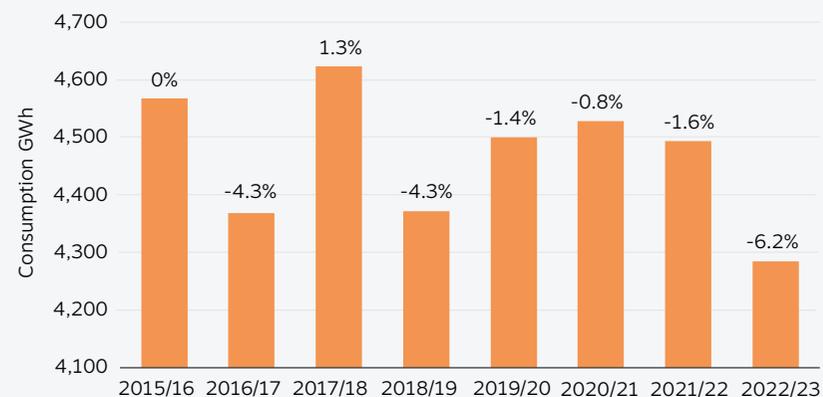
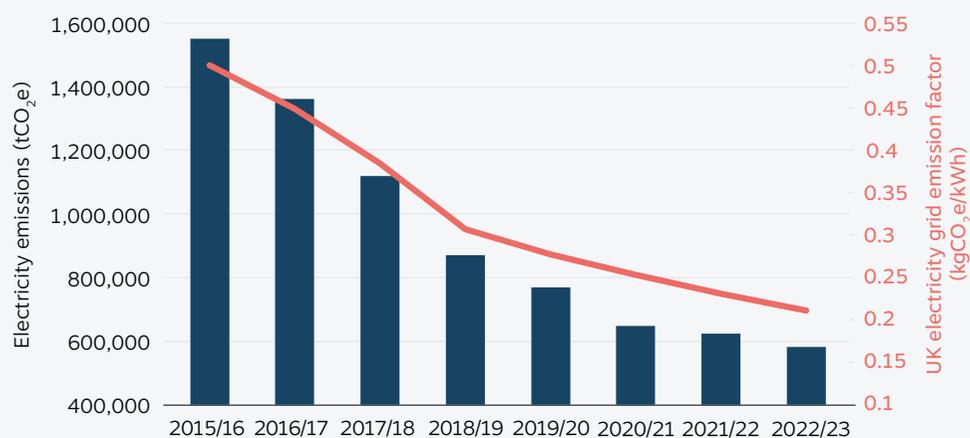


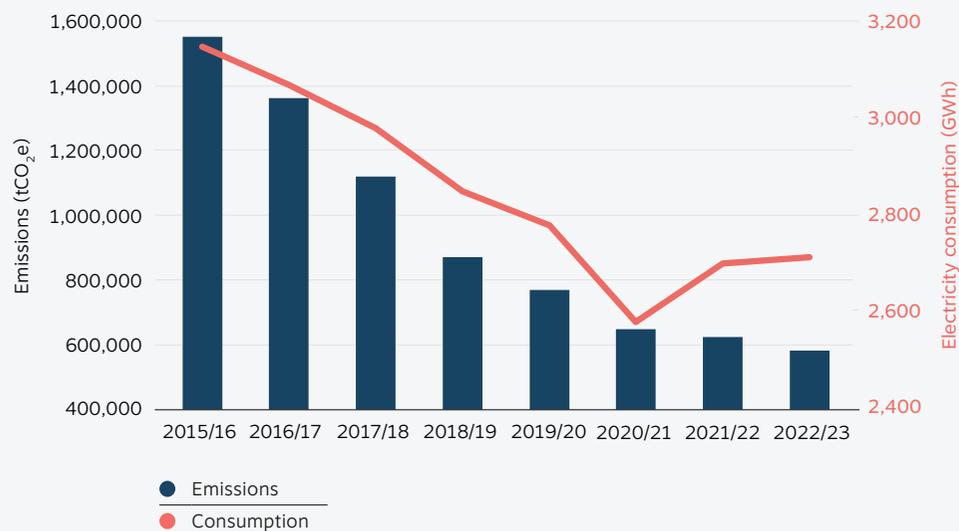
Figure 9: Grid electricity emissions since 2015/16 and corresponding UK grid emission factor



Approximately 24% of bodies applied the 7% higher 2023 factor which applies only to academic year reporting. This represents about 14% of total reported Scope 2 electricity emissions. The majority of public bodies will adopt the 2023 factor for the 2023/24 reporting period. This could see electricity emissions increase by some 7% unless significant energy efficiency measures have been adopted over the period and/or renewable electricity generation across the public sector estate increases. Energy efficiency may be driven by necessity due to increased energy costs, for example, an average 2000% increase in the unit cost of [Renewable Energy Guarantees of Origin \(REGO\)](#) accredited supplies under the latest [electricity framework agreement for Scotland's public bodies](#) that took effect April 2024.

Corporate emissions continued

Figure 10: Electricity emissions and consumption since 2015/16



Electricity consumption shows a relatively steady decline until 2019/20, Figure 10 above. The steeper decline over 2020/21 coincides with the greatest impact of pandemic measures, including a series of lockdowns. Consumption increases thereafter, plateauing between 2021 and 2023.

This signal is more noticeable for electricity than gas consumption as electricity use is driven by staff occupancy and behaviours while heating tends to be more centrally controlled. For example, premises such as schools, had to increase gas heating to allow windows to remain open for ventilation and airflow during colder periods as a Covid-19 control measure.

Why does the UK electricity grid factor change?

“The UK electricity factor is prone to fluctuate from year to year as the fuel mix consumed in UK power stations (and auto-generators) and the proportion of net imported electricity changes. These annual changes can be large as the factor depends very heavily on the relative prices of coal and natural gas as well as fluctuations in peak demand and renewables.

In the 2019 GHG Conversion Factors, there was a 10% decrease in the UK Electricity CO₂e factor compared to the previous year. In the 2020 update, the CO₂e factor decreased (compared with 2019) again by 9%. In the 2021 update, the CO₂e factor again decreased by 9% (in comparison to the 2020 update). The above decreases are all due to a decrease in coal use in electricity generation and an increase in renewable generation.

In the 2023 update, the UK Electricity CO₂e factor has increased by 7% (compared to the 2022 update) due to an increase in natural gas use in electricity generation and a decrease in renewable generation.”

➔ [Read ‘Greenhouse gas reporting: conversion factors 2023’ by the Department for Energy Security and Net Zero](#)



Corporate emissions continued

Scope 3 emissions

Procurement emissions currently rank third highest as a source, approaching a similar scale to reported emissions from electricity consumption. Although a further 34 bodies reported some procurement, there is still a significant level of under-reporting. This is due to the lack of agreed standard methodologies that public bodies can adopt, and the complexity and inherent high uncertainty of estimating procurement emissions. Educational Institutions are the most advanced, however, the methodology currently adopted is based on spend which is not always directly correlated with the actual emissions intensity of a product supply chain or service provision. NHS Boards reported the largest sector change, but 99% of the reported emissions are from prescription inhalers, reassigned from Scope 1 in 2021/22. More bodies within the Others sector have reported procurement than before but, as with other sectors, there is still a high-level of under-reporting.

Commuting emissions increased by 193%, accounting now for c.7% of the public sector's total reported emissions. This increase is mainly due to some Educational Institutions expanding their reporting boundary to include student commuting (9 bodies) and student "relocation" emissions between term times (6 bodies), the latter alone contributing over 40% of the reported increase.

Despite the large increase overall, only c.20% of public sector bodies reported commuting emissions. This is, with high certainty, a significant level of under-reporting for an emissions source that applies to all public bodies, irrespective of the amount of homeworking taking place. If the entire Education sector adopts reporting of student commuting including "relocation" emissions, and as commuting reporting improves overall, this will potentially outrank current levels of Scope 1 and 2 reported emissions with the exception of procurement and financial investments.

Business travel emissions increased 40% after falling significantly through peak periods of the pandemic. The main contributing factors are increased flights, especially long-haul amongst Educational Institutions and the 2023 emission factors being increased⁴ to reflect lower load and occupancy rates in recent years. Whether and when emission factors are subsequently adjusted to reflect a return to pre-pandemic occupancy levels remains to be seen but this will have a bearing again, depending on the scale of change.

Table 5: Commuting emissions - coverage by sector and changes since 2021/22

Sector	No. of bodies reporting commuting emissions		Reported commuting emissions (TCO ₂ e)		Change since 2021/22
	2021/22	2022/23	2021/22	2022/23	
● Educational Institutions	13	17	48,922	172,046	252%
● NHS Boards	1	1	15,327	12,005	-22%
● Local Authorities	2	4	1,612	8,611	434%
● Others	6	10	1,113	3,718	113%
● Transport Partnerships	1	3	0.3	1	234%
Total	23	35	66,975	196,381	193%

⁴ UK DESNZ 2023 emission factor increases – 35% long-haul, 21% short-haul and 11% domestic flights.



Corporate emissions continued

Homeworking emissions increased by 11% but much of this was expected as the result of adopting the UK DESNZ methodology and emission factor⁵. The UK factor was first published in June 2022, so it did not become fully applicable to all sectors until the 2022/23 reporting period.

74% of bodies reported homeworking emissions accounting for 62% of total FTEs (see Data Coverage) and 1% of total emissions. Homeworking emissions are generally based on staff surveys and/or informed by personnel data where available. For some administrative bodies within the Other sector (especially those with relatively fewer staff or co-located within larger public body estates) commuting, homeworking and business travel may be the most significant emission sources. Such bodies may have no direct control or limited influence over building energy management and may have no fleet either. Except for those sectors, bodies and staff with business-critical delivery demands on-site, there is effectively a trade-off between homeworking and commuting.

As three quarters of public sector bodies are now reporting emissions related to homeworking the critical gap concerns commuting emissions, as discussed above. For example, SEPA determined that a shift to homeworking has reduced corporate emissions by over 30% and brings other benefits including environmental, economic and in respect of staff health and wellbeing.

→ [See Spotlight on page 33](#)

Medical gas emissions have almost doubled (91% increase) with the number of NHS bodies reporting emissions increasing from 6 to 11. The sector continues to improve methods for monitoring and determining emissions associated with the use of critical gases for which no alternatives are currently available. Nevertheless, just over half of eligible NHS bodies reported any medical gas emissions so it is still an under-reported emission source.



⁵ The original homeworking factor was developed by SSN in 2020 at the request of the Scottish Government in response to initial pandemic lockdowns. It was based on information and methodologies available at the time. In order to keep the approach as simple as possible an FTE average annualised year factor was agreed. This was recognised as tending towards a “lower” public sector average, but allowed to some extent, for reduced commuting as a result of pandemic measures at the time and for which there was no pre-pandemic baseline. The DESNZ factor is based on an FTE working hour. For those bodies with longer or more working days per annum than was assumed for the SSN factor (7 hours and 200 days respectively) calculated emissions have subsequently increased.

Corporate emissions continued

Emission sources by sector

The breakdown of emission sources by sector contributions, provided in Figure 11, provides some insight into which sectors are reporting the major share of a particular source, e.g. procurement, or where reporting is more evenly distributed, as for homeworking. Sectors with large estates such as Local Authorities and NHS Boards understandably represent a major share of **natural gas emissions** from heating of buildings, especially hospitals, care homes and large schools.

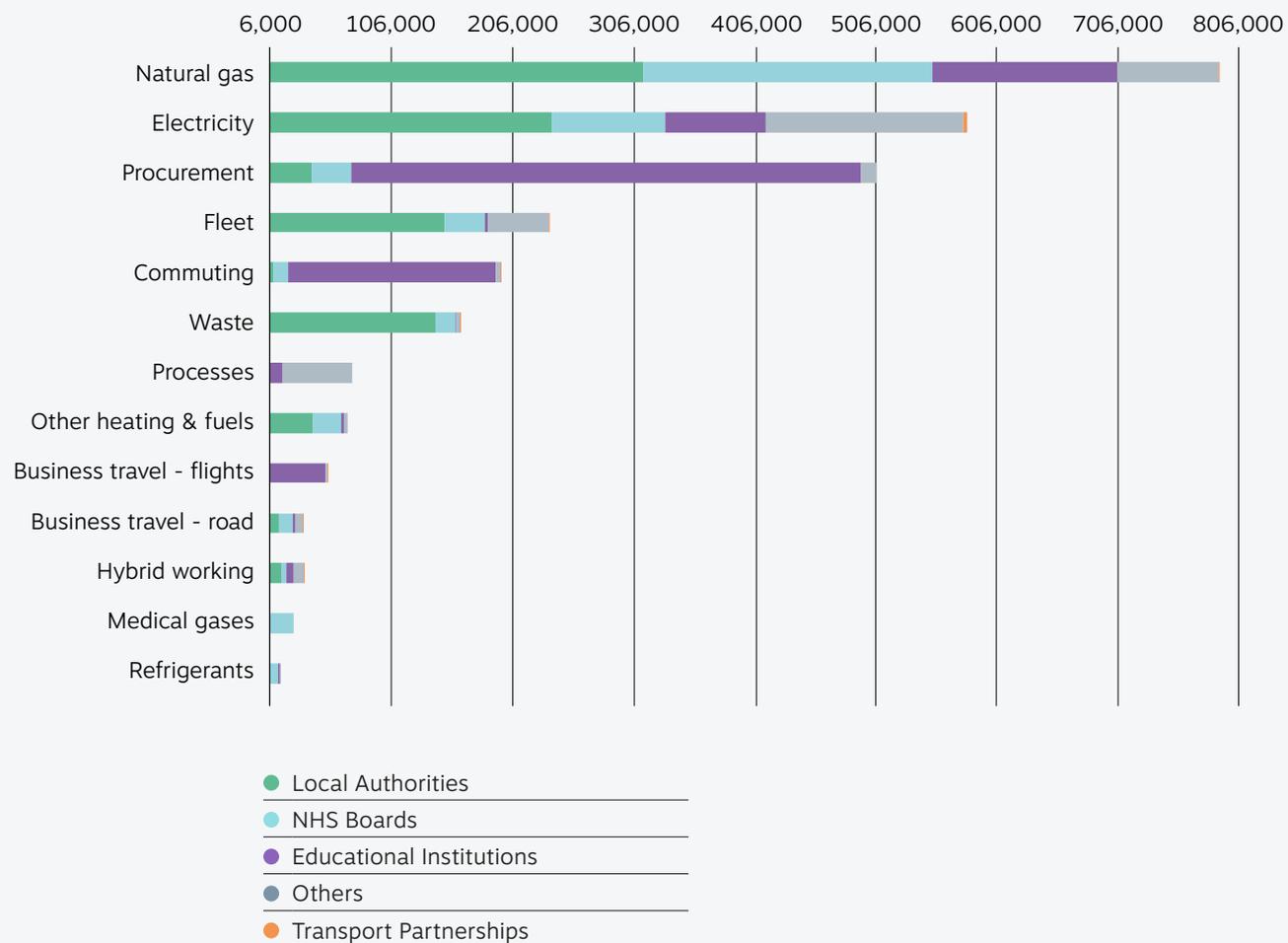
As discussed above, Educational Institutions are furthest ahead as a sector on reporting **procurement emissions** but emissions are based on spend which is a crude proxy for actual emissions.

Despite a potential element of under-reporting of **fleet emissions**, as more vehicles are scrapped at end-of-life or replaced by EVs or hybrids (where feasible) emissions from owned and operated transport is expected to reduce. Newer EVs coming to market, however, are associated with higher energy intensity which may offset future savings to some extent.

Commuting emissions are significantly under-reported by all sectors. Educational Institutions currently report the greatest emissions share and will continue to do so if the sector seeks to account for emissions from student commuting in addition to those of staff.

Local authorities feature overwhelmingly regarding **waste emissions** due to their unique sector function in collecting and disposing of municipal waste.

Figure 11: Sector share of total emission sources exceeding 6000 tCO₂e 2022/23



Projects

Emission reduction projects are planned activities intended to reduce carbon and other GHG emissions. Emission savings are provided for the reporting period only, so do not reflect cumulative life-time savings for the project or intervention. Projects include measures to reduce energy demand e.g. energy efficiency improvements and behaviour change; and to reduce emissions from the supply of energy, e.g. fuel substitutions.

Table 6: Types of emissions reduction projects

Electricity	Heating	Fleet transport	Business travel	Waste	Water
					
<p>LED lighting upgrades including estate and street lighting</p> <p>Battery upgrades</p> <p>Installation of submetering</p> <p>Switch off schemes to reduce consumption</p>	<p>Building Energy Management Systems (BEMS) upgrades</p> <p>Switch off schemes to reduce consumption</p> <p>Electrifying commercial kitchens (induction hobs)</p> <p>Efficiency upgrades (insulation, glazing etc.)</p> <p>Boiler upgrade or replacement</p>	<p>Expansion of electric vehicle (EV) charging infrastructure</p> <p>Fleet replacement, including hydrogen and electric vehicles</p> <p>Use of Hydrotreated Vegetable Oil to replace diesel</p>	<p>Sustainable business travel policies, travel hierarchies</p> <p>Active travel investment</p>	<p>Landfill diversion</p> <p>Food waste hubs and campaigns</p> <p>Furniture recycling schemes</p>	<p>Waterless urinals</p> <p>Water efficiency measures</p>

Despite a 36% increase in emissions savings from reported projects compared to 2021/22, savings are 35% lower than 2020/21. This may be due to a range of factors including stretched budgets, higher costs, continued supply chain disruption and labour shortages as a result of ripple effects from the pandemic, EU exit and the energy cost crisis. Uncertainty for many bodies over long-term estate changes to reduce running costs continues to affect funding priorities and project investment. There may also be an element of a natural peak having been achieved for some bodies with respect to material improvements such as lighting, heating and BMS upgrades to more efficient systems. Projects that are partially or wholly dependent on behavioural or cultural change can be more difficult to attribute emissions savings to, and are also subject to slippage over time e.g. “switch-off” schemes.

Projects continued

Project savings by emission source

Electricity and gas projects accounted for c.55% of total reported savings for the period (29,000 tCO₂e). Savings from natural gas projects were >60% higher than 2021/22 due mainly to new biomass plants, and fleet projects showed a similar increase (59%).

Electricity project savings fell by 11% but have almost halved since 2020/21. This could be due to a number of reasons already mentioned above but it may also reflect peak savings having already been achieved by the large savings accrued from the conversion of streetlighting to LEDs. Further analysis would be needed to determine underlying reasons.

The biggest change is a large increase in savings from waste projects (422%) mainly due to more waste being diverted from landfill but these savings are still half of those reported in 2020/21.

Water projects showed the largest drop in savings, down 48% since 2021/22.

Project savings by sector

Local Authorities contributed >50% of emissions savings from projects implemented over the last three reporting periods and drove much of the 36% increase in savings witnessed since 2021/22, with a 70% rise in savings by the sector (c.10,000 tCO₂e). NHS Boards achieved the largest sector increase in savings, more than doubling since 2021/22 but are still the lowest overall, aside from Transport Partnerships which did not report any project savings. The comparatively large savings reported for this sector in 2020/21 were due mostly to one project.

Figure 12: Project savings by type since 2020/21 and percentage change since 2021/22

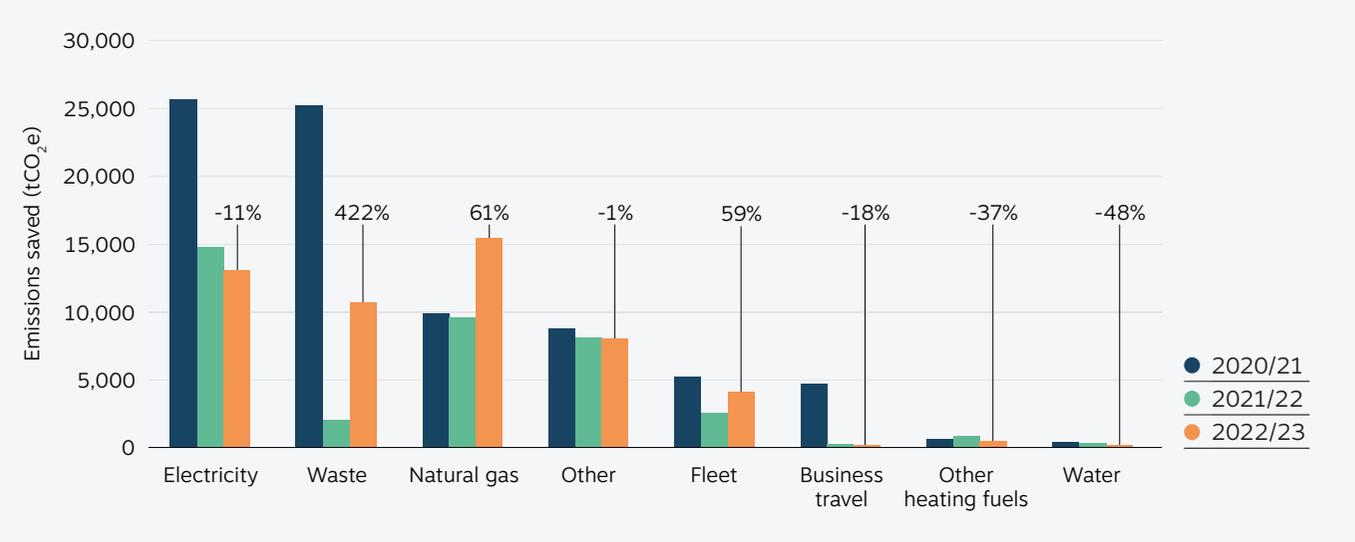
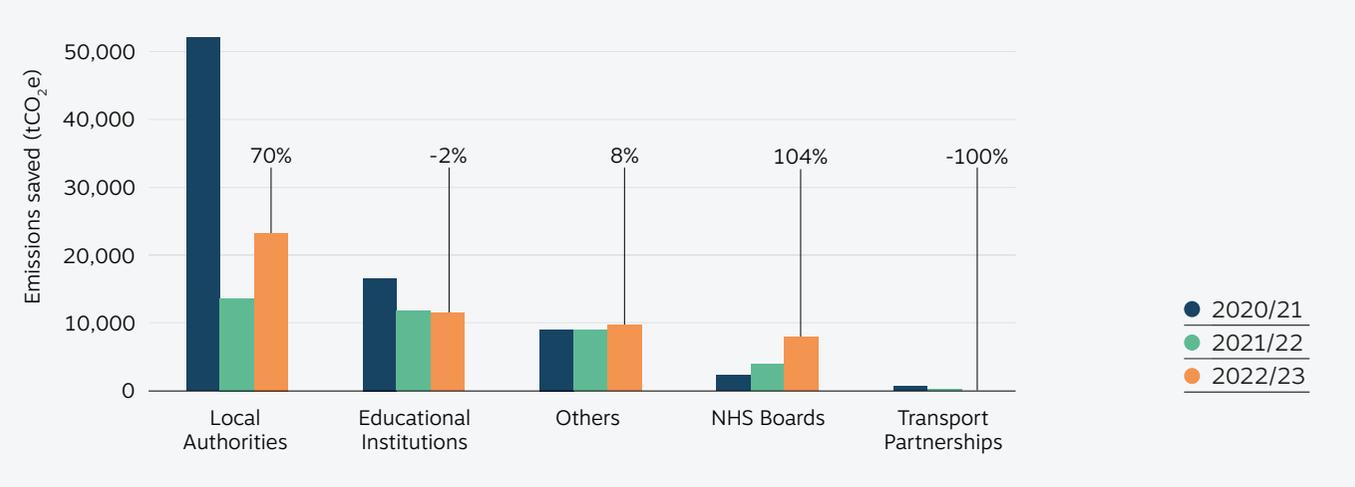


Figure 13: Project savings by sector since 2020/21 and % change since 2021/22



Renewable energy generation

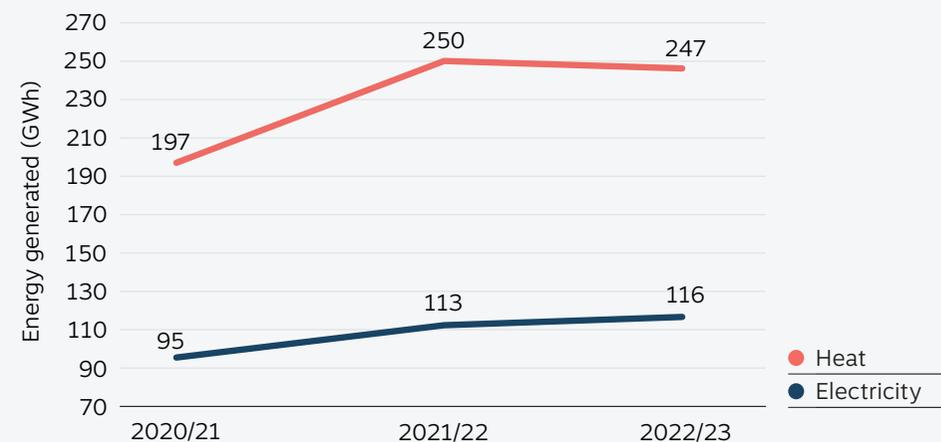
Renewable energy generation initiatives help reduce supply-side emissions rather than actual demand. There is a trade-off from a broader sustainability perspective, e.g. dependency on sourcing raw materials for solar panels, but in terms of simple emissions reduction, renewable energy supplies make sense for large public sector estates and certain remote or off-grid assets. Solar panels and biomass boilers are the most common technologies adopted by public bodies followed by heat pumps, solar thermal and wind turbines.



There is no net change from the total renewable energy generation of 363 GWh reported in 2021/22. There was a 3GWh gain for renewable electricity and equivalent loss for renewable heat. Total generation equates to emissions savings of c.74,000 tCO₂e, split 30:70 between electricity and heat and roughly 3% of total reported emissions.

This suggests potential scope for much greater adoption of renewable energy generation where financially and environmentally feasible across the public sector estate. 68% of savings were from renewable heat generation and 32% from renewable electricity, essentially in line with last year.

Figure 14: Renewables generation (GWh)



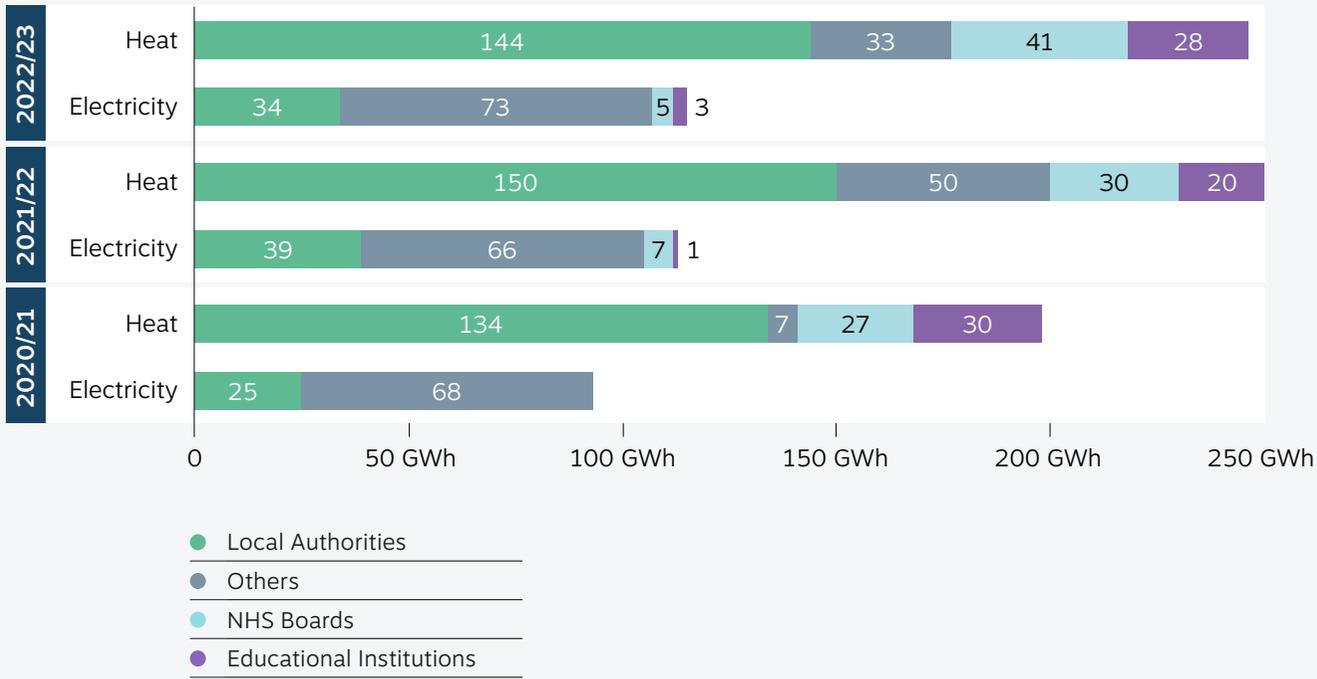
Renewable energy generation continued

Renewable energy generation by sector

The number of bodies reporting renewables increased from 53% to 58%. All but one local authority reported one or more renewable energy sources, as did two thirds of NHS Boards and over half of the Education sector. Local Authorities generated 50% of the reported renewable energy during 2022/23. The Others sector generates the most renewable electricity, the majority of which is from [Scottish Water assets](#). Transport Partnerships have reported 0.01 GWh of renewable electricity for the last three periods and no renewable heat. For purposes of presentation this is not included in the graphs below.

Emissions displaced as a result of using renewable energy supplies can be estimated from renewable gas and heat generation data. The efficiency of savings will vary, especially for electricity, in relation to the rate of UK grid decarbonisation. For example, 1GWh of renewable electricity generated 10 years ago would accrue higher emissions savings as the UK grid had a higher carbon intensity at that time.

Figure 15: Renewable electricity generation by sector since 2020/21 (GWh)



Renewable energy generation continued

Renewable electricity emission savings

Emission savings from renewable electricity for the Education sector increased the most (132%) but it is still reporting marginal supplies compared to the other sectors. Part of the reason may be due to less access to funding available to other public bodies. Similar funding constraints in accessing funding for renewables has hampered greater uptake by the NHS Boards, which witnessed the second steepest decline in savings. The Other sector remained fairly flat but Local Authority sector savings fell by 16%. Impacts of variations in the weather and other environmental conditions such as wind, rainfall and solar intensity on renewable energy generation have not been taken into account, although they may have a year-on-year effect on overall supply.

Renewable heat

Emissions savings from the generation of renewable heat increased across all sectors except for a drop of 34% by the Other sector, due to operational changes at a number of Scottish Water sites. The NHS sector demonstrated the largest real-term savings increase of 26% due to three more boards reporting for the first time and increased capacity at existing sites. The Education sector's apparent increase in emission savings of 40% is effectively a rebound to 2020/21 levels, mainly due to a return to normal operations following temporary shutdown of the University of St Andrew's large biomass plant during 2021/22.

Figure 16: Renewable electricity emission savings (tCO₂e) by sector and percentage change since 2021/22

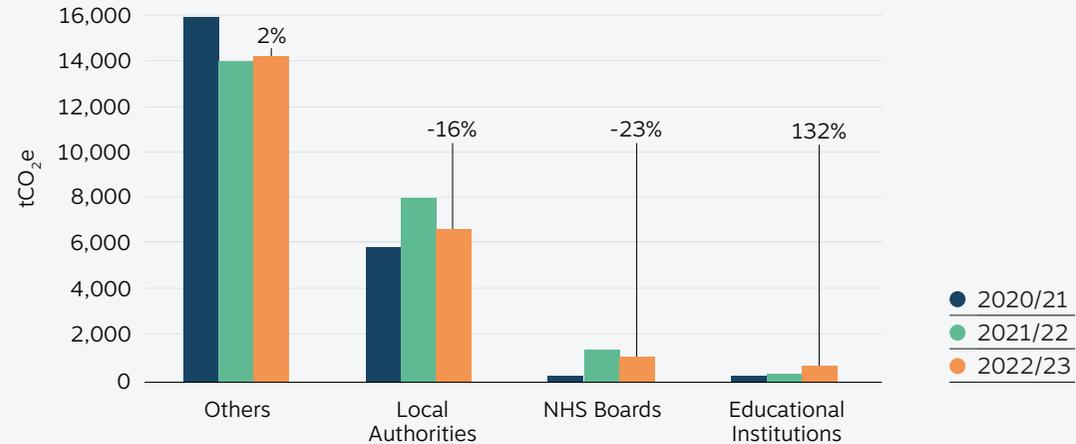
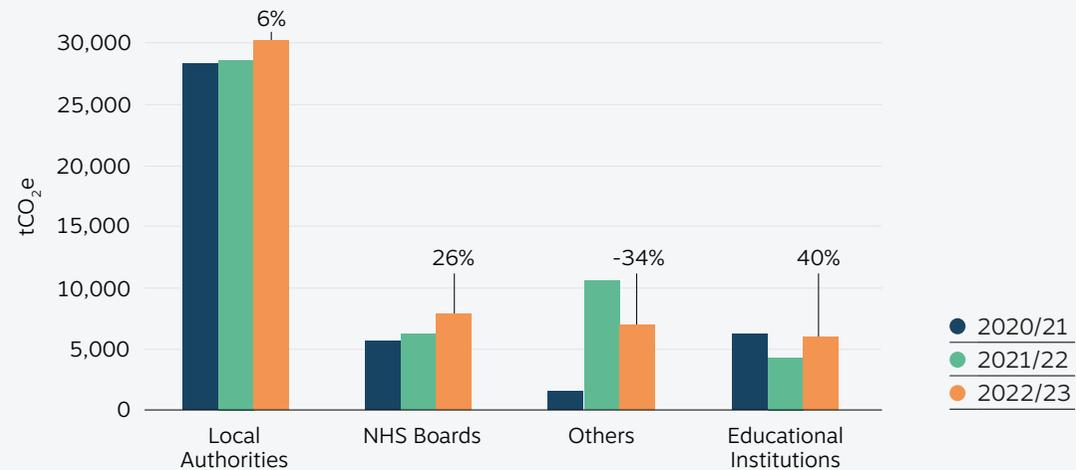


Figure 17: Renewable heat emission savings (tCO₂e) since 2020/21 and percentage change since 2021/22



🎯 Emission targets

Many bodies have made strong public commitments to contributing towards Scotland's policy on becoming a net zero nation by 2045.

Scottish Water has a [Net Zero Routemap](#) for achieving net zero emissions by 2040. Some local authorities have set more ambitious dates as early as 2030. Collective commitments have also been made by some sectors, e.g. NHS Scotland aims to become a [net zero health service by 2040](#) and the [Scottish Funding Council](#) references collective net zero targets of 2040 for Scotland's colleges and 2045 for Scottish universities.

The analysis conducted last year was based solely on what individual public bodies provided in their 2021/22 reports. This did not always reflect the above collective sector commitments. This year's analysis of targets is based again solely on what has been reported by bodies. While there are improvements that demonstrate better alignment and read-through to published net zero targets, reporting gaps still remain. This may be indicative of various issues ranging from sector leadership and governance through to accountability and quality control of reports within individual bodies.

Total targets coverage by sector

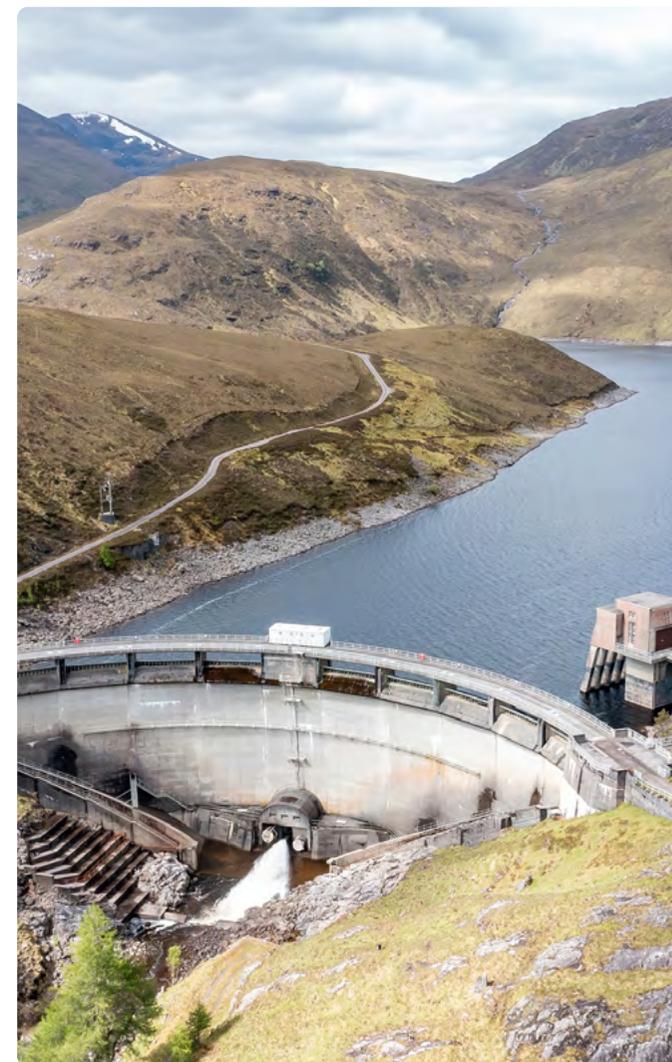
Although some improvements are evident in the quality of reporting, the diversity of target types and bodies' interpretation of national policies on targets is still proving challenging for quantitative analysis, especially with respect to progress and trends.

Last year all sectors were analysed, including responses from two IJBs. Only four IJBs included any responses on targets for 2022/23, all of which referred to the respective NHS board or local authority. To avoid double-counting and skewing of the analysis, therefore, IJBs were excluded from targets analysis this year. Any anomalies as a result of this change have been taken account of when comparing different reporting periods, although differences are so marginal as to be insignificant.

Over 80% of bodies have now set one or more targets compared with 70% last year. Total target numbers have decreased by 5% due to some bodies having consolidated targets, discussed below.

Table 7: Total targets reported per sector

Sector	Local Authorities	Educational Institutions	Others	NHS Boards	Transport Partnerships	Average
Percentage of sector with one or more targets	100%	80%	78%	75%	71%	81%
Total no. of targets	140	123	151	61	9	484



Emission targets continued

Sector targets by type

Target types for recent reporting periods are shown in Table 8. “All emissions” is the most common, accounting for 36% of all targets. “Energy use in buildings” represents roughly half again, c.17% of total targets. Percentage changes in target types relative to 2021/22 are shown below. The largest increases are for Scope 2 and combined Scope 1 and 2 target types although adoption of either remains low overall. A 43% drop in Staff Travel targets is due partly to consolidation e.g. the University of Edinburgh consolidated six business travel targets into one. Some short-term targets reported last year may have been met so are no longer included but there may also be an element of under-reporting compared to last year. Similar issues underlie some of the significant reductions for other target types e.g. Scope 3.

Alignment with national policy targets

An attempt to assess alignment of reported targets with public sector relevant national policies on emissions targets was undertaken last year for the first time. A similar assessment is provided in Table 9. The net zero Scope 1 by 2045 was assessed more broadly this year by including any 2045 net zero target that included Scope 1 irrespective of other emission sources covered, e.g. Scopes 1 and 2.

6 Some exceptions apply for specialised, including emergency, vehicles.

7 Some bodies include Scope 2 electricity use and other indirect emission sources as part of an overall building target.

8 From 2020 baseline, see [Transport Scotland routemap](#). This covers a mix of direct and indirect emissions.

Table 8: Target types per reporting period

Target type	2020/21	2021/22	2022/23	% change since 2021/22
All emissions	106	163	169	7%
Energy use in buildings	81	80	83	6%
Waste	48	71	66	-7%
Fleet	30	43	45	5%
Scope 3	6	33	25	-24%
Scope 1	4	25	25	0%
Other	65	33	24	-27%
Business travel	14	28	16	-43%
Scope 2	5	11	13	18%
Water and sewage	11	12	9	-25%
Scopes 1 and 2	4	9	9	11%
Total	374	508	484	-5%

Table 9: Number of bodies per sector reporting target date(s) for direct emissions reduction

Targets	No. of bodies per sector (some bodies have >1 target per type)					Total no. of bodies
	Others	Educational Institutions	Local Authorities	NHS Boards	Transport Partnerships	
Net zero Scope 1 emissions by 2045	31	33	26	13	3	109
Zero tailpipe emissions from fleet by 2030 ⁶	6	4	7	6	0	23
Zero emissions from heating or buildings no later than 2038 ⁷	7	6	6	3	0	22
20% reduction in car mileage by 2030 ⁸	2	2	3	0	1	8

Emission targets continued

Progress against quantitative targets

Approximately 50% of the total reported targets included sufficient information to assess progress, i.e. an absolute or percentage reduction by either a target date or over a specified time period. This is double the number assessed for progress last year (122) which demonstrates the significant improvements made in the quality of target reporting and that more bodies are setting smarter targets, where feasible.

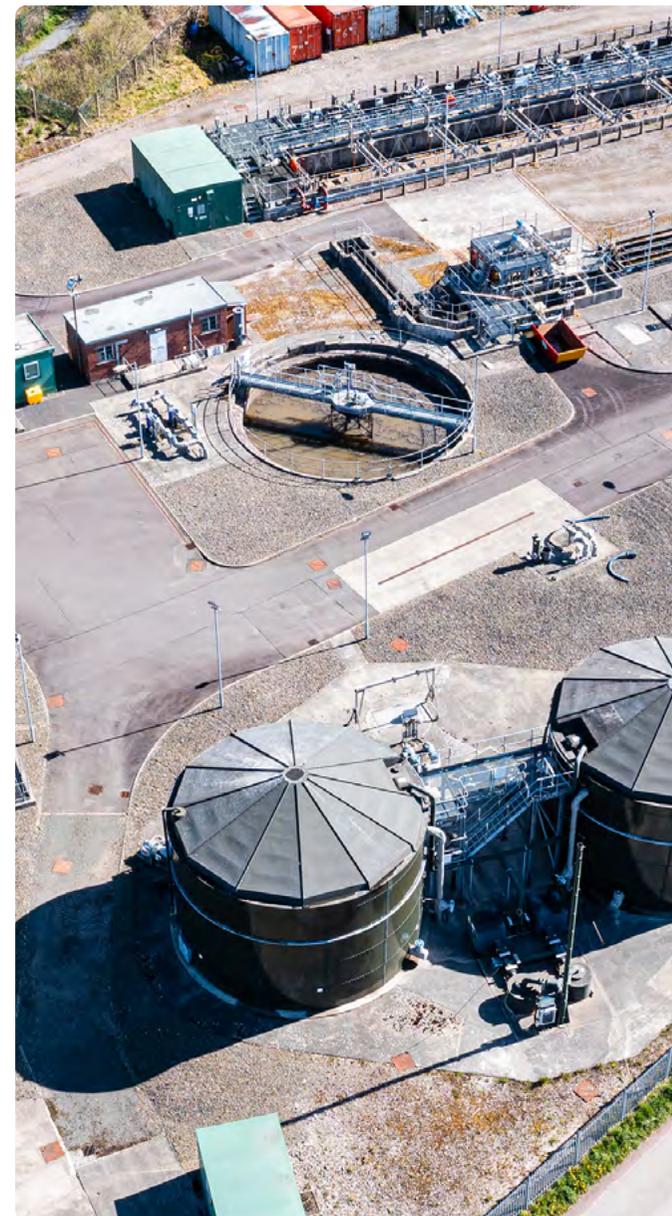
On average nearly 64% of all quantitative targets are on-track or ahead of delivery but 36% of emissions targets are behind. Emission targets comprise the bulk of quantitative targets so this is potentially a significant delivery risk. Far fewer quantitative targets are reported for energy, waste and fleet and assessment of progress suggests up to a third are behind on planned delivery.

Targets with a later deadline, e.g. 2045 with no intermediate milestone or realistic pathway to monitor and manage progress, are potentially at greater risk of failure. Also, bodies that are not re-baselining in tandem with changes to their reporting boundaries, or ensuring that Scope 3 emissions are clearly managed and monitored separately from Scope 1 and Scope 2 emissions, may be jeopardising target delivery, especially where large-scale emission sources are being introduced, such as from commuting and procurement.

Targets can also be impacted by a range of other factors that are often not within a body's or sector's control. For example, targets for electricity emissions reduction that are dependent on the UK grid decarbonising will be sensitive to any delays in progress and should also be cognisant that National Grid is working to the UK Government's 2050 net zero targets rather than Scotland's 2045 national target for net zero.

Table 10: Progress against quantitative targets

	Progress against quantitative targets				Total
	Ahead	On-track	Behind	% Behind	
Emissions	64	31	70	42%	165
Energy	15	11	5	16%	31
Waste	11	5	5	24%	21
Fleet	12	0	5	29%	17
Other	2	0	1	33%	3
Water	1	0	1	50%	2
Total	105	47	87	36%	239



Emission targets continued

Alignment of spending plans and resource use with emission reduction targets

Public bodies should take account of the potential impacts of budgetary and resource planning and decision-making processes on achieving emission reduction targets that support a just and sustainable transition towards a net zero Scotland by 2045.

Table 11 shows how bodies are aligning spending plans and resource use to reduce emissions and deliver their emission reduction targets. The orange bars indicate the previous assessment and the underlying blue bars show this year's assessment. The assessment categories have been reworded slightly but are essentially the same as last year:

- ✘ **No response** or claimed not applicable
- ☹️ **No evidence** that emission targets are informing budgets and resource planning
- 😐 **Some evidence** that emission targets are informing budgets and resource planning but only for specific areas, not a strategic, corporate approach
- ✅ **Fair evidence** that a corporate or strategic approach is planned or in embryonic stages
- 😊 **Strong evidence** of a strategic approach that considers all relevant budgets and resource needs with respect to an established net zero pathway or emissions budget.

Table 11: Budget alignment with net zero targets

Sector	Rating				
	✘	☹️	😐	✅	😊
Transport Partnerships	1	2	4	0	0
NHS Boards	5	8	6	0	1
Local Authorities	3	3	6	15	5
Educational Institutions	11	5	22	6	1
Others	9	7	19	16	3
Total	29	25	57	37	10
	25	34	49	34	16

● 2021/22
● 2022/23

The public sector as a whole shows improvement with a further four bodies providing evidence of a more strategic approach and fewer bodies providing either no response or responding “not applicable”. The Others and Local Authorities sectors have shown the most positive shifts. Educational Institutions have shown improvements also, especially at the lower end. Transport Partnerships show

no change and the assessment suggests only marginal slippage for NHS Boards. Slippage may be due to a number of reasons but could be as a result of quality control or report validation oversights rather than a material change, although budgetary constraints or capacity issues might conceivably delay measures that were anticipated during the previous reporting period.

Examples of high scoring actions:

- 😊 **The University of Strathclyde** has set up a Climate Finance Task Group within the new Sustainability Governance structure. The group is looking at funding options for climate neutral districts and considering larger scale alignment of spending plans to reduce emissions. For example, £3.5million was allocated in August 2022 to net zero projects to accelerate development of capital projects and climate neutral, climate resilient districts which deliver on the University's net zero targets. Some of this funding has been allocated, along with £80k of Rockefeller Foundation funding, to develop the Climate Neutral Glasgow City Innovation District heating scheme. The remainder will be used to pilot fabric improvements and complete design work and secure planning permission for at-scale deployment of renewable technologies.
- 😊 **The Scottish Police Authority's** new Environmental and Sustainability Board gives the highest governance priority to sustainability and climate change issues under the Authority's scheme of delegation. Sustainability projects are now considered by executive staff representatives for the SPA and Police Scotland.
- 😊 **Glasgow City Council** has created a new climate finance manager post and a corresponding internal Climate Investment Board, chaired by the Leader of the Council.

Emission targets continued

Publishing progress towards targets

Public bodies must be transparent about progress being made towards targets. Annual climate change reports are published on the [SSN website](#) but the format is not very accessible for demonstrating progress year-on-year, although the quality of target reporting is better following improvements to the [SSN reporting guidance](#). Public bodies should publish progress towards achieving emission reduction targets via other means such as corporate performance reports or annual accounts.

Table 12 illustrates changes in assessment for each sector and overall assessment since last year's analysis. As before, orange bars represent last year and blue bars this year's assessment of responses against the following categories:

- ✘ **No response** or claimed not applicable
- ☹️ **Planning** how to make information on progress towards emission reduction targets available
- 😐 **Progress against targets available online or in general communications** but not included in corporate reports or annual accounts
- 😊 **Progress against targets is published** in corporate reports or annual accounts

Table 12: Publication of target progress

Sector	Rating			
	✘	☹️	😐	😊
Transport Partnerships	1	1	5	0
NHS Boards	2	4	9	5
Local Authorities	1	0	11	20
Educational Institutions	11	4	18	12
Others	7	6	17	24
Total	23	17	62	56
	18	14	65	61

● 2021/22
● 2022/23

This year's assessment shows improvements overall based on the responses provided, with a general shift from lower to higher categories. Local authorities rank highest as a sector with the majority landing in the upper categories.

This is to be expected given standard practice of committee reports being made publicly available online. Educational Institutions have improved upon lower rankings last year as have NHS Boards. The Other sector shows minimal change and Transport Partnerships none.

Examples of high scoring actions:

- 😊 **Royal Conservatoire of Scotland** publishes annual carbon consumption with comparative information each year in its annual accounts and commentary on how this has moved. This will expand as more comprehensive carbon reduction plans are developed and implemented.
- 😊 **Stirling Council**, in addition to reporting progress through external committee meetings for minuting and publication online, in keeping with standard practice for many Local Authorities, also reports progress in the Council's Annual Performance Report and the [Pentana public performance reporting dashboard](#).
- 😊 **Scottish Enterprise** updates their net zero framework for action highlighting progress over the past 12 months and identifies new priority actions for the year ahead.

Adaptation

Analysis of adaptation responses

All sectors, including IJBs, are included in the analysis of adaptation responses.

The data provided by public bodies in response to the adaptation questions is qualitative and therefore is not readily analysed by an objective, more quantitative approach applied to other parts of the report e.g. on emissions.

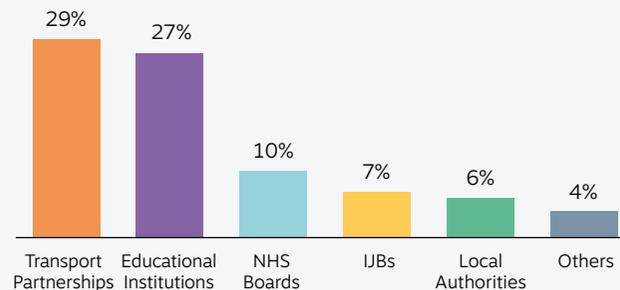
A high-level analytical framework was developed for 2020/21 reports. This was expanded upon in 2021/22 to enable semi-quantitative assessment, however, the method still entails some degree of subjective assessment when interpreting responses.

Relevance of responses

Responses indicate that there is still significant conflation of **mitigating impacts on climate change**, i.e. reducing emissions, with **adapting to the impacts of a changing climate**. For example, 20% of responses on adaptation priorities concerned emissions reduction measures, such as improving energy efficiency or recycling waste. The highest incidence was amongst Educational Institutions and Transport Partnerships.

It is good practice, as part of adaptation risk assessments and action-planning, to optimise potential co-benefits and minimise possible constraints, especially longer-term such as avoiding lock-in to high building energy consumption as part of thermal comfort needs. Assessing adaptation risks and mitigation measures in tandem helps identify synergies and manage unintended consequences or trade-offs, e.g. the provision of nature-based solutions in urbanised areas can help alleviate flooding, minimise urban heat island effects with multiple benefits for human health, wellbeing, nature and biodiversity. However, very few of the 20% of responses that mentioned mitigation also referenced adaptation, which implies an ongoing and substantive level of misinterpretation.

Figure 18: Percentage of sectors responding on mitigation rather than adaptation measures



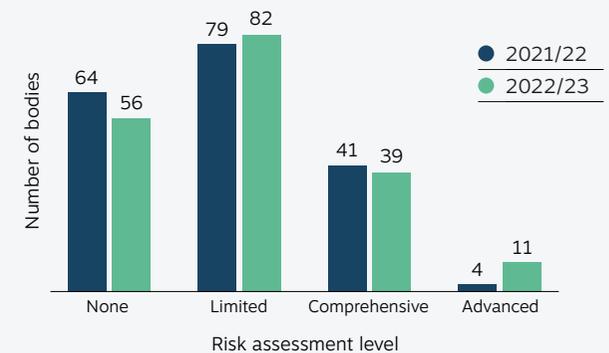
Climate change risk assessment

Assessing climate-related risks is an important first step in ensuring that a public body understands what risks are relevant, in order to prioritise and plan actions to improve resilience and adapt to current and longer-term direct and indirect impacts of a changing climate. For the purposes of this analysis, the maturity of risk assessment was determined according to the following categories:

- **None** – no response or stated not applicable
- **Limited** assessment focused on a single issue (e.g. flooding)
- **Comprehensive** assessment, addressing a range of climate risks
- **Advanced** approach combining comprehensive risk assessment with stakeholder engagement

There is some marginal improvement in risk assessment overall, with fewer bodies reporting no risk assessment and more bodies having an advanced approach. 70% of bodies reported some form of risk assessment – representing a 4% increase over 2021/22.

Figure 19: Progress on assessing risks from climate change since 2021/22



Adaptation continued

Maturity of risk assessments by sectors

The NHS sector demonstrates a high maturity of risk assessment compared to other sectors, with 65% having carried out a comprehensive or advanced risk assessment and only one NHS Board reporting no risk assessment. While every local authority has carried out some form of risk assessment and 53% of the sector has done so to a comprehensive or advanced degree, nearly half (47%) of local authority reports indicate that only single-issue risks have been considered, i.e. flooding. Given the roles and functions of local authorities it is unsurprising that they are more advanced than some other sectors, however, every local authority needs to understand the broader scope of risks and impacts presented by climate change.

The majority of Educational Institutions (62%) have undertaken single issue risk assessments or infer that some assessment has been undertaken as part of a corporate risk register, but with no detail provided on specific climate change risks. Other bodies show a similar level of risk assessment although some provide evidence of an advanced approach. Most Transport Partnerships and IJBs have not undertaken a risk assessment or only with respect to a single issue. This may be due to corporate adaptation risks being addressed by the host body taking responsibility for addressing direct risks to occupied estate and shared assets and services. However, both IJBs and RTPs should be addressing climate change adaptation at a strategic planning level, in line with their functions.

Progress on adaptation action

Having determined the likelihood and severity of direct and indirect climate change impacts, bodies can prioritise adaptation actions accordingly. The extent of action reported was assessed according to the following categories:

- **None** – no action reported or no response
- **Limited** action or policy measures with no evidence of how risks are being addressed.
- **Comprehensive** action to address a suite of risks.
- **Advanced** strategy or adaptation pathway with targets to assess progress on risk management and actions to address shortfalls.

There is marginal improvement in the extent of adaptation action being reported by bodies compared to 2021/22. More bodies are taking some form of action (72%) albeit the majority are still reporting action on a single risk aspect, mainly flooding. Approximately 20% have a more comprehensive approach and a further 4% have adopted an adaptation strategy and targets to monitor and manage risk longer-term.

Figure 20: Maturity of risk assessment by sector

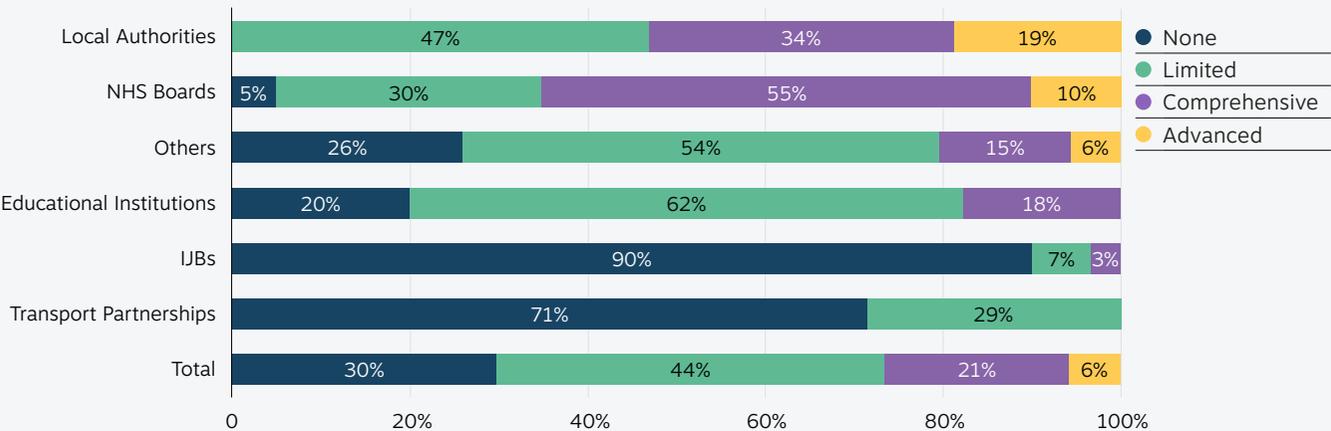
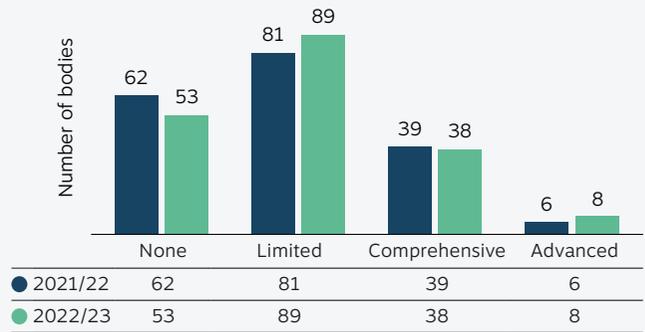


Figure 21: Progress on adaptation action since 2021/22



Adaptation continued

Action taken by sectors

All local authorities report some degree of climate action; the majority (72%) demonstrating comprehensive or advanced action. This reflects the maturity of climate risk assessment across the sector, as noted above. Although the Others sector also demonstrates some degree of advanced action, responses suggest that no or limited action is being taken by the majority of the sector (c.76%).

While there are many administrative-type bodies within the sector that may have less scope for advanced or comprehensive action, the high number of large bodies with land-based roles or functions related to the delivery of essential services suggests that a greater percentage should be taking comprehensive action at the very least.

Despite the NHS sector being one of the most mature in assessing risks from climate change this is not yet feeding through to action. Although 20% of NHS Boards are taking comprehensive action, the majority of responses suggest that action is still limited to single issue risks. Educational Institutions lag behind other sectors, with 87% reporting little or no action which is of concern, given the large scale of operations and campus size of universities and many colleges.

IJBs and Transport Partnerships show no changes compared to last year and report the least action. As mentioned above, this may reflect institutional arrangements, especially where staff are co-located on a larger NHS or local authority estate.

Correlating extent of action with maturity of risk assessment

Some correlation between the level of action and the maturity of risk assessment undertaken by bodies may be inferred, (marked green in Table 13 below). This is most pronounced at the lower end of both scales, e.g. 21% of bodies have not conducted a risk assessment and not taken any action. A lag in the extent of action reflecting the maturity of a risk assessment is not critical or unexpected (blue). Based on this rudimentary assessment, however, 20% of the public sector appears to be taking action that goes beyond the maturity of risk assessment undertaken (orange). This may indicate the lack of a strategic approach and a feasible adaptation pathway which are necessary to avoid addressing risks in isolation, including maladaptation, and to optimise potential co-benefits.

Figure 22: Extent of climate action by sector

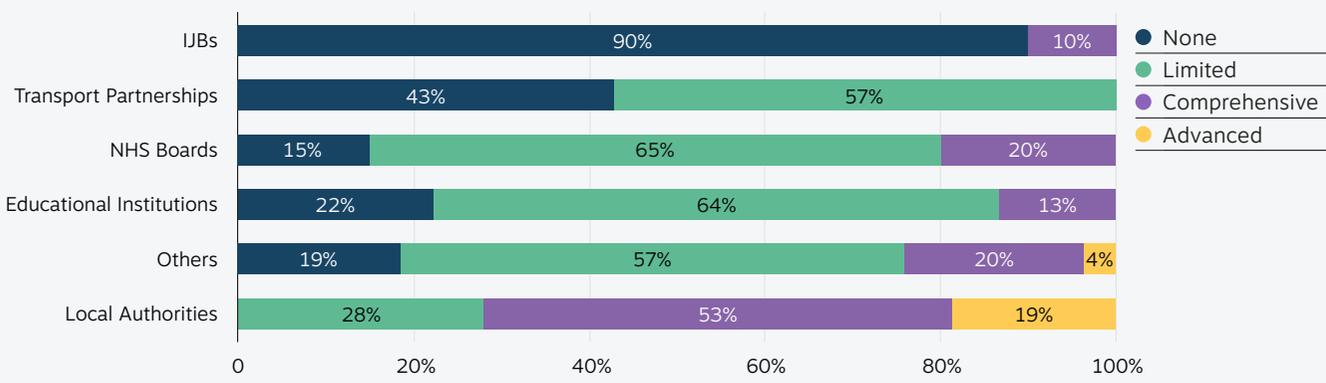


Table 13: Correlation of action with risk assessment maturity

Risk assessment maturity	Extent of action (percentage)			
	None	Some	Comprehensive	Advanced
Advanced	0	1%	2%	3%
Comprehensive	1%	9%	10%	2%
Limited	6%	29%	9%	0
None	21%	9%	0	0

Adaptation continued

Adaptation priorities

This is only the second time that responses on adaptation priorities have been assessed for the purposes of this report. As for most of the adaptation section, the question on adaptation priorities is open and generates many diverse responses (906 in total, 22% increase) which presents analytical challenges when trying to draw meaningful insights and comparisons. To assist semi-quantitative analysis, responses were grouped according to the nature of the priority, e.g. Adaptation Planning and Delivery; Assessing Risks and Impacts etc. Table 14 shows the changes in the number of responses per priority group since 2021/22.

The biggest change is for the topic-based grouping. Topics mentioned most frequently within this group include buildings and infrastructure (58); nature and biodiversity (57); travel and transport (36); health and wellbeing (15); food and agriculture (2) and climate justice (2). Due to insufficient information provided in the responses it is not obvious what stage of action or the intention is in relation to the topic mentioned e.g. it could be assessing risks to buildings or collaboration on nature and biodiversity action.

As effective adaptation action typically requires medium to long-term planning, large shifts in priorities might not be expected year-on-year. This appears to be the case with the exception of communication and engagement which has slipped as a priority. Adaptation Planning and Delivery, including developing pathways and strategies, and Assessing Risks and Impacts remain the highest priorities. Training and Capacity Building, Finance and Costs, and Partnerships and Collaboration have all shown similar levels of increased priority.

Table 14: Priority groups

Priority groups	21/22	22/23	% change
Adaptation planning and delivery	210	220	5%
Assessing risks and impacts	170	196	15%
Topic-based, insufficient info to allocate to specific priority group	108	185	71%
Partnerships and collaboration	68	100	47%
Tools, standards, indicators	71	76	7%
Training and Capacity building	37	55	49%
Communications and engagement	56	43	-23%
Finance and costs	21	31	48%
Total	741	906	22%

Monitoring and evaluation

The Climate Change Committee (CCC), recently advised that monitoring and evaluation of adaptation in Scotland is slowly improving but remains limited, [Adapting to Climate Change, Progress in Scotland, 2023](#). Although nearly 50% of public bodies mentioned monitoring and evaluation arrangements, it is usually in relation to general risk management processes or risk registers rather than identifying climate change adaptation specifically. A few themes, however, are emerging to help determine progress on key issues, including flood impact monitoring; governance and oversight provisions; stakeholder engagement; use of tools, indicators and indices; biodiversity monitoring, etc.

Annex legislative background

Climate change duties

Section 44 of the Climate Change (Scotland) Act 2009 places duties on relevant public bodies, in exercising their functions, to:

- act in the way best calculated to contribute to the delivery of Scotland’s national emission reduction targets by reducing greenhouse gas emissions;
- act in the way best calculated to help deliver Scotland’s national adaptation programme (improve resilience to the impacts of a changing climate); and
- act in the most sustainable way (demonstrate sustainability as a core value).

Voluntary reporting

A commitment to voluntary reporting is helping some public bodies improve governance and management in respect of their duties, drive greater action across operations, and help plan business delivery in accordance with climate change policy and targets. Voluntary reports were received from:

- Environmental Standards Scotland
- Healthcare Improvement Scotland
- Architecture and Design Scotland

These bodies are not subject to mandatory reporting therefore their reports do not inform this analysis, but they are available on the [SSN website](#).

Reporting compliance with the duties

The [Climate Change \(Duties of Public Bodies: Reporting Requirements\) \(Scotland\) Order 2015](#), as amended by [The Climate Change \(Duties of Public Bodies: Reporting Requirements\) \(Scotland\) Amendment Order 2020](#), requires public bodies listed in [Schedule 1](#) to report annually by 30th November on compliance with the above duties.

The annual report template, prescribed by the Order, sets out questions under six different parts:

Part 1	Profile of the body – e.g. budget and staff numbers
Part 2	Climate change governance, management and strategy
Part 3	Corporate emissions, projects and targets
Part 4	Adaptation – including risk assessments and management
Part 5	Procurement – how policies and activities contribute to compliance with climate change duties
Part 6	Validation of report data and information

Public bodies may also report on their ‘wider influence’ on climate change and sustainable development under Part 7. This part of the report is voluntary and does not currently inform the summary analysis.

The 2020 Amendment Order introduced additional questions with effect from the 2021/22 reporting period. Reports must now also include, where applicable:

- the body’s target date for achieving zero direct emissions of greenhouse gases, or such other targets that demonstrate how the body is contributing to Scotland achieving its emissions reduction targets and how it will:
 - align its spending plans and use of resources to contribute to reducing emissions and delivering its emissions reduction targets;
 - publish, or otherwise make available, its progress to achieving its emissions reduction targets;
- targets for reducing indirect emissions of greenhouse gases;
- what contribution the body has made to helping deliver Scotland’s Climate Change Adaptation Programme.

Spotlights

Corporate emissions

Aberdeen City Council:

'Gold Standard' New Build Housing Programme

The New Build Council Housing Programme is underway to address a long-term shortage of affordable social rented housing in the city. Their vision is to create sustainable integrated communities and places, by delivering affordable homes designed for life. These homes are designed to meet residents' current and changing needs, while supporting the wellbeing and resilience of tenants.

Housing is being provided for single people, flats for families, terraced houses, wheelchair-friendly properties and a small number of amenity bungalows. Houses are being designed to exacting standards including housing for various needs, dementia friendly, low carbon, low maintenance and to meet the [Gold Standard](#).

The design specification for Gold Standard requires using energy efficient technologies to reduce carbon dioxide emissions (Dwelling Emission Rate) so emissions are 27% lower than the Target Emission Rate set by the 2015 Standards. This is achieved partially through using renewable energy to provide 50% of the hot water demand. Gold Standard also incorporates more effective insulation, air circulation techniques, and increased

natural light, all of which aim to make homes greener and cheaper to run, helping to tackle fuel poverty.

The majority of new-build Council Gold Standard homes are connected to district heating, which uses a central plant to heat a number of homes.

Maintenance costs are lower with a district heating system than for conventional heating systems. This is because there is only the centralised plant to maintain, rather than a large number of boilers situated in many properties.

The scheme generates power close to where it is needed, and uses heat produced in the process for heating and hot water, rather than letting it go to waste. All of the new housing developments are supplied with heat from gas powered CHPs (Combined Heat and Power). Other low and zero carbon renewable technologies are also being installed such as air and ground source heat pumps and solar PV.

During 2022/23, 92 homes were completed. Looking forward, work is ongoing to hand over 449 homes in 2024 and over a further 300 by 2026 all to Gold Standard.

Forestry and Land Scotland:

Improving Data Quality to Inform Targets and Reduce Emissions

Forestry and Land Scotland (FLS) recently undertook an exercise with an external consultant to determine a baseline for upstream contract emissions using a spend based methodology. It is anticipated that the baseline for FLS contract emissions (scope 3 Category 1, 2, 4) is 44,844 tCO₂e although it should be noted that data for this exercise was not of the highest quality.

The exercise highlighted the highest emissions areas and FLS are now including mechanisms in these contracts to get supplier specific data to help set reduction targets and build supplier capability in carbon reporting.

There are a wide range of projects being undertaken in land management which will reduce emissions and or capture carbon, but FLS are not at the stage of being able to quantify the associated emissions reductions.

Examples include:

- minimising the intensity of ground preparation at tree planting
- exploring where harvesting residues for use in biomass markets can be gathered instead of leaving them on the ground
- investing in additional capacity in nurseries to grow trees.
- Glentress Gateway Building – all internal lights upgraded to LED.
- Kirroughtree Visitor Centre – all external lighting bollards replaced to LED.

In addition to these projects, FLS has a renewables programme for both wind and hydro, working collaboratively with energy development partners in a landlord capacity to facilitate renewable infrastructure on Scottish Ministers land. The renewable wind and hydro schemes export 2,807,728,920 KWh and 193,552,200 KWh per year, respectively. FLS has entered into the Renewable Energy Guarantees of Origin (REGO) certification scheme again with EDF.

Corporate emissions

NHS Forth Valley: Mitigation Schemes

NHS Forth Valley has been implementing a range of emission reduction schemes, improving the sustainability of their estate through the Green Public Sector Estate Decarbonisation Scheme (GPSEDS).

Pre-Capital funding of £50k was secured to survey Primary Care sites (Health Centres) to identify and quantify energy conservation measures which informed the £1.9m successful GPSEDS funding bid. The bid secured funding for the implementation of measures in the next reporting period, with multiple energy conservation measures planned across 13 sites.

A further bid was successful for grant funding to deliver a 'Hybrid Heating' pathfinder project, resulting in a £527k grant from Scottish Government which added to £200k Board Capital. The project encompasses the costs and implications of the DL38 policy requirement for NHS Scotland to shift away from gas as the main fuel used to heat healthcare buildings: i.e. 'All NHS owned buildings must be heated from renewable sources by 2038 or earlier where possible'.

An additional £2m was secured for investment in improving the energy performance of Forth Valley Royal

Hospital, the Board's main Acute site that accounts for ~50% of the NHS FV total energy consumption. A programme of work (with significant PPP/PFI contractual implications to overcome) will see a range of energy conservation measures implemented at this site.

Hub and spoke arrangements for fleet electric vehicle charging infrastructure have been installed at key and rural sites and good progress is being made electrifying the NHS FV fleet.

The project will deliver lighting upgrades to LED and photovoltaic (PV) panel installs.

The Forth Valley Royal Hospital PV install was originally designed to have a 1.2MWp output however Scottish Power Energy Networks declined the application due to the fault levels in the local grid. The project will now see a 200kWp array installed on the energy centre roof to provide on-site electricity generation. The underspend (difference between a 1.2 MW array and a 200kW array) will now be invested in LED lighting upgrades at the site. Both projects will deliver significant electricity savings that have still to be confirmed. A new free-cooling chiller already installed delivers up to 70 tonnes CO₂e savings per year.

Transport emissions

Aberdeen City Council: Transitioning Fleet for the Future

Aberdeen City Council successfully completed Phase 1 of its Fleet Replacement Programme, which saw several large vehicles converted to dual fuel. The vehicles can operate on diesel alone but have been retrofitted to allow the injection of hydrogen gas. Phase 2 of the Programme began in 2022, reflecting the Council's Net Zero ambition to work towards decarbonising its in-house fleet.

In 2022/23, eight low emission vehicles were added to their fleet, (including Euro VI) bringing the total of low emissions vehicles to 88%. The fleet continue to seek zero tailpipe emission vehicles rather than low emission vehicles but are restricted by electric vehicle (EV) infrastructure, however work is progressing to overcome this. Eight EV chargers have been installed exclusively for Council fleet vehicles use in 2022/23, bringing the total to 16.

Due to data improvements, the Council are now able to quantify electricity usage from EVs from their Council buildings, enabling them to track usage. While unable to quantify the emissions savings from transition work so far, these figures will emerge as the Fleet Management System becomes fully operational.

It remains widely acknowledged that hydrogen will be the preferred technology for the large vehicle fleet (rather than electric, which will be the solution for cars and vans). However, there are only a limited range of fuel cell electric vehicles (FCEVs) that are 100% hydrogen on the market at present. Those that are available are currently heavily subsidised by grants as they range from double to triple the price of their diesel equivalent. As such, the Council has been pursuing an interim solution for its large vehicle fleet: hydrogen – diesel hybrids (H2ICEd). This technology injects hydrogen into the diesel engine, and burns with the diesel, to save about 30% in carbon emissions. The hydrogen can be sourced from either of the two publicly available refuelling stations with both supplying green hydrogen. Hydrogen is produced at each site via electrolysis with energy supplied from the National Grid on a green Power Purchase Agreement (PPA). Conversion costs around £40,000 per vehicle.

There is a plan in place to convert further vehicles over the next two years which will increase fleet conversions. However, this will be reliant on further funding and vehicle investigations.



Transport emissions

South Lanarkshire IJB:

Travel Emissions through Technology-Enabled Care

Technology-enabled care is increasingly supporting people across South Lanarkshire in managing self-care using simple smart technology and apps. Near Me, NHS Scotland's secure video platform, enables people to connect with their health and care professional from home and introduced a group consultations function in 2022. Group waiting areas can facilitate up to 60 participants to join a pre-arranged consultation, for a maximum of four hours. Each waiting area is accessible to the public via the waiting area link. Unlike regular consultations, group consultations can be hosted by multiple service providers.

By March 2023, 33 group consultation waiting areas were developed hosting over 340 care providers. 36,472 Near Me Consultations were carried out in NHS Lanarkshire between April 2022 to March 2023. This has saved an estimated 14,290 miles equating to patient savings of £12,000.



Scope 3: Hybrid working & commuting

SEPA:

The Impact of Home and Hybrid Working on Emissions

SEPA carried out a staff survey in August 2023 to determine the impact of hybrid working on commuting patterns and associated emissions. Since the onset of the COVID-19 pandemic in 2020, emissions associated with staff working from home (WFH) have been required as part of annual reporting. Prior to this, the reporting of commuting emissions was far less common, making changes in net emissions difficult to quantify.

The findings from the survey show that commuting emissions have fallen by 75% with the introduction of hybrid working, dropping from 28 to 7 kg CO₂e per FTE per week. This reduction equates to savings of 1,050 tonnes CO₂e per annum, based on 28% response rate for an average complement of 1,211 FTEs.

SEPA reported its 2022-23 WFH data to be 496 tonnes CO₂e. This is a significant net saving of c.555 tonnes, making up almost one third of SEPA's total emissions for the year.

The reduction in staff commuting provides other important benefits such as reduced financial cost; reduced risks and impacts associated with travel and transport including reduced pollution, congestion, accidents, and an improved work-life balance for employees.



Scope 3: Procurement emissions

Aberdeen City and Aberdeenshire Council:

Managed Print Contract

Aberdeen City Council's managed print contract has run since 2015. From an original estate of over 5,000 unmanaged print devices, the contract systematically eliminated use of small, inefficient desktop printers requiring regular consumable replacement and rationalised the printers by almost 50% by 2018, moving to ENERGY STAR® power saving models. This was supported by a Print Policy driving duplex and mono print as default, with imperative to scan and move paper to digital to reduce resources and eliminate waste produced.

Outcomes of the contract included reduced print volumes averaging at least 10% year on year, with an estimated 34 million fewer sheets of paper used since 2015 (the equivalent to 4,080 trees). Data provided by the contractor has indicated a greater than 30% reduction in: energy use, greenhouse gas emissions and solid waste. Compared to 2018, annual electricity consumption in 2023 reduced by 43%. Greenhouse gas emissions avoidance is estimated to be in excess of 145,897 kg CO₂e per annum from a 2017 baseline, as a result of reducing electricity, toner and paper use each year.

The contract ensures all removed devices are governed via Waste, Electrical and Electronic Equipment recycling (WEEE) compliant processes. Used consumables were managed through the supplier's programme to recycle, minimising environmental impacts.

Transport emissions

City of Glasgow College: The Sustainable Procurement Duty

City of Glasgow College has revised their Procurement Policy, making a commitment to climate and circular economy ambitions, to improve environmental wellbeing. To assist in this commitment procurement staff, together with internal stakeholders, will:

- Leverage buying power when buying goods, services or works, to champion innovation and future-proofed solutions, enabling businesses and the third sector to engage in supporting their climate ambitions to deliver against their climate targets. By working with markets, they can stimulate the development of a circular economy and low emission supply chains and solutions.
- Work collaboratively across departments to align climate-related policies, targets, milestones and supporting activities.
- Be climate literate and to have an appreciation of how contracting activity can support net zero aims for the College and Scotland as a whole. Capturing and driving opportunities to contribute to climate change ambitions through the procurement act.

These commitments reflect the vision of the City of Glasgow College Procurement Strategy, to give consideration to the environmental, social and economic issues relating to all regulated procurement. This means looking on a contract-by-contract basis at how stakeholders across the college and wider West Central Scotland can benefit from the College's procurement activities.

The College aims to make use of available tools and systems such as the Scottish Public Procurement Prioritisation Tool, the Sustainability Test, Life Cycle Impact Mapping, the Scottish Flexible Framework, as well as APUC's Code of Conduct, Sustain and Electronics Watch where relevant and proportionate to the scope of the procurement.

Registers of Scotland: Sustainable Procurement

During 2022/23, Registers of Scotland (RoS) updated their tender process to include a Climate Emergency Statement. They also developed their Invitation to Tender document adding an associated scored question for procurements of £50,000 or over, requiring prospective suppliers to support RoS in tackling the climate emergency.

In line with their Sustainable Procurement Policy, they have also begun to apply the Scottish Government's Sustainability Test to procured products and services of a value of £50,000 or over. This is done routinely for ICT-related procurement and where the Sustainability Test process identifies significant potential impacts. Appropriate specifications are included in the tender documentation and are reflected in its evaluation and contract management process, with the Sustainability Team being closely involved at all stages. During 2022/23, this process was undertaken for their multifunctional devices contract and led to the procurement of resource efficient products. Sustainability is also addressed in relevant lower-value contracts, with considered judgement being applied.

During 2022/23, RoS continued to work with suppliers to reduce their carbon footprint. Their partnership with Kinross Wooden Products has enabled them to manage their surplus furniture with minimal environmental impacts and significant social and economic benefits. By the end of 2022/23 reporting period, a cumulative total of 44 tonnes of furniture had been remanufactured and supplied back into the general marketplace as an alternative to items made with virgin materials. This has benefited jobseekers, disadvantaged young people and various charitable and community organisations, and has led to an estimated CO₂e saving of 126 tonnes since the outset of the partnership. RoS also achieve significant savings in relation to end-of-life IT equipment. Through their ongoing partnership with Restore Technology, over 5,000 kg of equipment was re-used or recycled during 2022/23.

£ Aligning resources and investment

University of Strathclyde:

Aligning Investment with Net Zero Ambitions

The University of Strathclyde has adapted their investment proposal and associated financial model template to encourage individuals to effectively address potential carbon emissions at the planning stage. Changes include the addition of specific sustainability and social responsibility questions relating to projects that have a spend of £500k and over.

Example template questions include:

- What is the expected output from the proposal on the University's greenhouse gas footprint and the University Sustainability and Social Impact Strategy?
- What other sustainability impacts and opportunities will arise and how will other environmental impacts be mitigated?
- Has the Sustainable Strathclyde Team been consulted on solutions and funding for mitigation and adaptation aspects?

The University is also seeking to implement similar questions when detailing projects with lower levels of spend to ensure that proposed expenditure is sense-checked against their net zero targets before they reach the Procurement team.

The Chief Finance Officer and wider Finance Department have been supportive of this work and are also looking to work with Estates to create a long-term Capital Investment Plan aligning spend to the University's 2040 net zero target.

The Internal Audit Team's review of the University's sustainability activities and governance in September 2022 resulted in several recommendations broadly grouped as:

- Sustainability and climate change to be further embedded in all levels of institutional decision making.
- More frequent and detailed reporting of performance against their net zero targets to senior management and sustainability team to work more closely with parallel governance structures across the University to ensure they are also cognisant of net zero ambitions including Strategy and Planning, Finance and Estates.
- Recognition of climate change to be embedded in the University's Corporate Risk Register.
- Topic or workstream specific suggestions.

📄 Reporting progress

University of Aberdeen:

Sustainability Data Dashboard

The University's Sustainability and Planning teams have developed the "Sustainability Data Dashboard", a tool designed to make emissions data more publicly available. Using Microsoft Power BI, emissions data going back to the University's reporting baseline year of 2015/16 is now available for staff, students and other interested parties to explore.

Launched in August 2023, the tool helps to identify and improve operational practices to reduce energy costs across the university's estate and inform an Estate Master Plan plus a consultation on "Reimagining our Campus". The Sustainability Team has engaged with users in different buildings and functions to explore opportunities to amend operational practices and reduce energy consumption.

The tool is part of the University of Aberdeen's efforts to respond to the Scottish Government's mandated Public Bodies Climate Change Reporting Duty on all public bodies to report their annual emissions data and progress towards reducing emissions.

The data highlights building by building energy usage, emissions associated with staff and student travel and other categories of emissions including those linked to waste management and the procurement of services and goods. It includes emissions from direct sources as well as indirect emissions or so-called Scope 3 emissions, which have traditionally been harder to track.

The dashboard was featured in Aberdeen University's [Sustainable Development Goals Annual Report 2023](#) under SDG 13 (Climate Action). It also supports the sharing of monitoring data for two key performance indicators which are part of the university's Net Zero Strategy [Aberdeen 2040: trends in energy consumption](#) (Scopes 1 and 2) and staff business travel.

The sustainability dashboard is expected to evolve to include data on decarbonisation projections, targets, and progress. Alongside improved emissions reporting the university is also developing a comprehensive net zero strategy, anticipated to be published in 2024.

Adaptation

NHS Ayrshire and Arran: Partnership working - Resilience and Climate Adaptation

NHS Ayrshire & Arran is part of the Ayrshire Local Resilience Partnership (ALRP), that operates a severe weather plan and co-ordinates voluntary groups. The ALRP is comprised of Category 1 and 2 responders, including Scottish Fire and Rescue Service, Police Scotland, Scottish Ambulance Service, SEPA, MET office, Scottish Water and transport operators such as CalMac and Glasgow Prestwick International Airport. The partnership addresses a range of climate risks including heat wave planning, major flood and fluvial risks, storms and high winds, water supply failures, severe weather warning by the MET office, local coastal and tidal flooding and flash flooding.

The ALRP has facilitated a multi-agency partnership approach during weather warnings, covering Ayrshire, bringing ALRP members together to gain a joint understanding of risk and to share situational awareness across partner agencies. This approach supports coordinated decision making around weather preparation and public messaging as well as any impact felt across agencies following the incident. The group also coordinates voluntary groups such as the 4x4 vehicle volunteer group, as required, on a service priority based on need, during severe weather.

The partnership sits on Council climate change groups across Ayrshire feeding into local delivery plans. The impacts of climate change are issues that the group reviews on a periodic basis through the Risk Preparedness Assessment.

Nature-based solutions

Fife Council: The River Leven Restoration

Restoration is being conducted along the river Leven and its tributaries, commissioned by Fife Council and the Scottish Environment Protection Agency (SEPA), supported initially with funding from the Water Environment Fund (WEF) and Fife Council. Key project drivers include climate change adaptation and addressing water scarcity.

Fife Coast and Countryside Trust (FCCT) are delivering the projects on behalf of the Council. Previous physical modifications including dams, narrowing and straightening (legacy from the area's industrial past) put environmental pressure on these waterways. Where practical, the project plans to allow the river to flow more naturally.

Project one focuses on a 2.5-mile River Leven section between Windygates and Leven, subject to permissions and funding from 2023 into 2025.

Operations planned include:

- Creation of shallow 'ponded' areas promoting wetland and wet woodland habitat.
- Placement of wood throughout river, boosting natural processes and wildlife shelter.
- Dam modifications for improved fish migration.
- Reprofilling the lower Kennoway Burn banks improving floodplain connectivity.
- Planting native trees and wetland plants along riverbanks and floodplains to improve biodiversity, capture surface run-off and encourage wet woodland habitat development.
- Removing rock bank protection and replacing it with more sustainable alternatives.

Project two investigating restoration potential of 5.8 km of Back Burn to a more natural state between Rhind Hill in the Lomond Hills and Newton.

Operations planned include:

- Removing redundant barriers including walls and fences, allowing unrestricted flow.
- Removing rock and stone bank protection enabling floodplain reconnection.
- Rerouting the burn at Coul Den down its original natural channel, creating significant ecological benefits.
- Wetland planting along banks and floodplains, improving biodiversity.
- Removing gabion baskets (stone filled wire baskets) downstream of Coul Reservoir and replacing them with a naturally functioning step pool like channel.
- Where practical removing small weirs within Balbirnie Park, improving fish habitat, whilst being sensitive to the heritage value of the Designed Landscape.
- Replacement of Balbirnie Park gabion basket bank protection with natural alternatives.

There are many coincident projects being delivered within the Leven Corridor; each has different legislative drivers and influence each other in terms of environmental dynamics e.g. ecosystems, water management and use. Other projects include River Leven Restoration, Levenmouth Reconnected and Active Travel, Leven Rail Link and Leven Flood Study.

It should be noted catchment modifications are not to the detriment of other factors, specifically flood risk to existing communities. The projects are taken forward on a 'neutral or better' principle. While there may be areas that will flood more frequently than before, that is intentional and may yield benefits to nearby communities. This has come about through a collaborative partnership approach between the projects, sharing pertinent information to avoid negation of improvements in one project by well-intentioned aspects of another. In all, the Levenmouth projects should be mutually beneficial.

Nature-based solutions

Renfrewshire Council: Clyde Peatlands

Peatland restoration is a nature-based solution to the climate and ecological crises. Healthy bogs lock up and store large carbon quantities however, if degraded, may instead emit more carbon than they remove. Healthy, functioning peatlands help mitigate the expected impacts of climate change, such as increased rainfall events, by storing and slowly releasing water back into the river network. Healthy peatlands are a biodiverse habitat home to an array of birds, plants, fungi, invertebrates and microorganisms.

Clyde Muirshiel Regional Park covers 28,000 hectares (110 sq. miles) of Inverclyde, North Ayrshire and Renfrewshire, stretching from Greenock in the north, down the coast to Largs and West Kilbride, and inland to Dalry and Lochwinnoch. The area includes around 10,000 hectares of Scotland's most accessible areas of wild land. Unlike many wild areas, two million people live within 30 minutes of the area. The landscape has been damaged by a long history of peatland drainage leading to coarse grass and heather prevalence rather than the original sphagnum moss. Drainage has also led to peat drying out and CO₂ emissions contributing to the climate crisis.

Clyde Peatlands engaged with local authorities across the City Region to consider the potential for 'early win' projects which demonstrate the benefits of peatland restoration, maximise use of funding available from NatureScot's

Peatland Action Programme and support the restoration of peat bogs across the City Region. Early engagement with Renfrewshire Council officers identified that the most significant opportunity for peatland restoration within Renfrewshire lies within West Tandlemuir Farm, Clyde Muirshiel Regional Park, Lochwinnoch.

A specialist feasibility evaluation of peat reserves at West Tandlemuir Farm, funded by NatureScot's Peatland Action team, concluded that an area of some 216ha of the farm was suitable for restoration, with the potential to sequester 556 tonnes of CO₂ per year. The area concerned represents less than 17% of the farm's total extent and is located on poorer quality grazing land.

The works identified within the feasibility study include the construction of 'wave dams' with reprofiling of ditches and gullies. The estimated cost of works, which will require a specialist contractor to be appointed, is circa £210,000.

Following approval of the Council's Planning and Climate Change Board in late 2023, officers are now working through the necessary consents and approvals, ahead of a funding application to the NatureScot Peatland Action programme in spring 2024. Subject to securing funding and necessary approvals, works could commence in autumn 2024.

Transport Scotland: Tree Planting Programme

Over the past few years Transport Scotland has commenced large scale tree planting across their estate, with woodland creation projects already registered and underway in Argyll & Bute (A83) and Dumfries & Galloway (M74).

Carbon sequestration through tree planting on the Transport Scotland estate will form a major element of their journey towards net zero with the aim of being "Net Zero primed" by 2025. While woodland creation will be vital to this, most of the work and cost associated with its development occurs long before any carbon capture.

The Woodland Carbon Code (WCC) is the UK Government backed quality assurance standard for woodland creation projects, providing woodland carbon credits. Through WCC, Transport Scotland will have planting programmes independently assessed and receive "Pending Issuance Units" (PIU), which represent a "promise to deliver" Woodland Carbon Units (a tonne of CO₂e sequestered in WCC-verified woodland) in the future.

As these projects are measured over decades, an offset cannot be claimed until any sequestration potential has been independently verified. An important element is the transparency of emission quantities produced and the amount of future Woodland Carbon Units they will require. As the offsetting associated with corporate Scope 3 emissions will not be fully matured by 2025, they will establish a "Net Zero Primed Emissions Overdraft" based on Transport Scotland's Scope 3 sources. They will compensate for emissions associated with corporate business from 2025 and future emissions from this date onward. Any Scope 3 emissions within the "overdraft" cannot be removed until a PIU has been converted to a verified WCC credit. Both balances will be reported via Public Bodies Climate Change Duties reporting.



Wider influence - partnership working

Borders College, West Lothian College and Forth Valley College:

Partnership Working to Build Capacity

In February 2021 Scotland's colleges declared a climate emergency and committed to achieving net zero by 2040. In response to this challenge Borders College, Forth Valley College and West Lothian College formed the Central & South Scotland College Partnership (CSSCP), supported by EAUC Scotland (the Alliance for Sustainability Leadership in Education).

Being among the smallest Further Education Institutions in Scotland and without any staff dedicated exclusively to sustainability, the colleges recognised that they would need additional support to achieve net zero. By combining their limited budgets through a shared services agreement, CSSCP secured a dedicated sustainability resource, hiring a Sustainability Project Manager whose time and costs are split equally between the colleges.

Since starting in January 2022, the Sustainability Project Manager has become integrated into the college teams and has helped the colleges to: develop new strategies including Net Zero Plans; secure funding for significant campus decarbonisation projects including air source heat pumps and other energy conservation measures; and introduce new initiatives such as climate change risk assessments. This style of partnership, spreading the Sustainability Project Manager across multiple institutions, has allowed experience and knowledge to be shared between the colleges, encouraging efficient use of resources and amplifying the impact of the Sustainability Project Manager's actions.

South of Scotland Enterprise:

Sustainable Business Projects

South of Scotland Enterprise (SOSE) supports sustainable businesses and enterprises throughout Dumfries & Galloway and the Scottish Borders with advice, expertise, training opportunities and funding. Some recent pilot programmes and projects SOSE has been involved with are:

Beacon Business Accelerator: Six businesses in the South of Scotland will benefit from 12 months of net zero support through a new pathfinder programme delivered by SOSE and Net Zero Nation. The new programme will give focused support to businesses on delivering their net zero plans and help realise the economic opportunities that net zero can bring.

Environmental Placement Programme (EPP): EPP, organised through Bright Green Business, offers opportunities for candidates to gain work experience in the environmental sector. Five placements were offered within South of Scotland businesses, with one of the EPP placements resulting in employment.

Fuel Change: Teams of apprentices, graduates and young people (16 to 25 years) took part in the [Fuel Change Challenge](#), sponsored by SOSE and delivered by [Fuel Change](#). The programme has involved young people working on creating solutions to real sustainability challenges set by industry, culminating in a showcase event in March 2023 in Dumfries that brought together participants, employers, industry and the public sector.

Stirling Council:

Stirling Re-use Hub

Stirling Re-use Hub was established by Transition Stirling, using funding from the Zero Waste Scotland Circular Economy Investment Fund. The Hub opened to the public in March 2022 in a large retail unit of approximately 13,000 square feet in Springkerse Industrial Estate. The Hub processes furniture, white goods, electricals, bric-a-brac and clothing and takes in a limited amount of stock from private organisations, such as office clearances, end of stock items and wood.

The project has collaborated with the Council's Learning and Employability Team, Stirling Voluntary Enterprise, and Forth Valley College.

The re-sale and upcycling of pre-loved items provides employment for 14 members of staff (9 FTEs) and 12 self-employed Makers, plus 50 volunteers. During 2022, volunteers gave more than 2,000 hours of time and approximately 50% of the workforce are on supported employment contracts.

The Hub offers 12 'Makers Spaces' which can be used by local residents to create niche products from 'waste'. There is no financial outlay for Makers as a workshop space, tools and materials are provided in return for a 20% commission, once any upcycled item is sold. This offers a low-risk opportunity for new business venture start-ups.

During the first nine months of operation, over 100 workshops and events were held to provide residents with opportunities to acquire skills in a range of circular economy skills. Between July and December 2022, estimated carbon savings from the Hub's re-use activity were 23,735 kgCO₂e, of which an estimated 1,229 kgCO₂e came from re-use of unwanted IT equipment.

If you require this document in an alternative format, such as large print or a coloured background, please contact Sustainable Scotland Network at ssn@ed.ac.uk

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About the Sustainable Scotland Network

The Sustainable Scotland Network (SSN) is Scotland's public sector climate change and sustainability network. SSN builds public sector capacity to accelerate action on climate change, in line with the duties placed on public bodies by Scotland's climate change legislation.

SSN shares knowledge, builds capacity, and enables the public sector to collaborate effectively to achieve Scotland's climate change and sustainability commitments.

SSN is supported by the Scottish Government, NHS Scotland, Scotland's Local Authorities, and other public sector bodies. The SSN Secretariat is part of the Edinburgh Climate Change Institute (ECCI) at the University of Edinburgh.



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