

Public Bodies Climate Change Reporting 2018/19

Analysis Report

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Executive Summary

The Scottish Government declared a Climate Emergency in April 2019 and the urgency of prioritising climate change was reflected in "Protecting Scotland's Future: the Government's Programme for Scotland 2019-20" in September 2019. Scotland's world-leading climate change legislation sets a target date for net zero emissions for all greenhouse gases by 2045. Public sector bodies play a key role in meeting this ambitious target.

Public sector bodies have a statutory duty to cut greenhouse gas emissions, prepare for the impacts of climate change, act sustainably and report on their climate actions. This is the fourth year of mandatory reporting by public bodies and this report presents a summary of the key findings from the reported corporate emissions submitted for 2018/19. Reported emissions from the public sector continue to decrease, with Scope 1 and Scope 2 emissions down 12.4% compared to 2017/18 and down 26% since mandatory reporting began in 2015/16. This is a very positive direction of travel with carbon emission reporting now embedded in most organisations.

However, a 'cleaner' electricity grid has had a pivotal role to play in emission reduction as organisations have benefitted by default as the emission factor reflects cleaner electricity generation. In addition, there has been a reduction in the number of emissions saved from projects implemented in 2018/19 compared to 2017/18. While progress is being made, this analysis points to the need for more leadership, planning, investment and action, especially in relation to heating and fleet emissions, if the public sector is to be at the forefront of Scotland's transition to a net zero future.

Carbon management and reporting is now reasonably well-established in Scotland's public sector bodies. Now is the time to link this emissions data more directly with decision-making, and to work together to better align the whole public sector with Scotland's new emissions targets on the path to net zero by 2045.

1. Introduction

The <u>Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Order 2015</u> requires the 180 public bodies classified as major players to prepare an annual "Report on Compliance with Climate Change Duties" (Schedule 2).

The annual report provides information on what actions the public body is taking in the exercise of its functions, to reduce greenhouse gas emissions, adapt to a changing climate and act sustainably.

Reports include information on:

- Profile of the public body
- · Governance, management and strategy
- Corporate emissions
- Adaptation
- Procurement
- Validation

It is recommended that public bodies also voluntarily report their 'wider influence' on climate change and other notable activity relating to sustainable development.

This report presents high-level analysis of quantitative data provided in annual reports for the reporting period 2018/19.

2. Overview

In 2018/19, 171 public bodies submitted climate change reports by the 30 November deadline. Seven Integrated Joint Boards and 2 educational institutions failed to submit a report and are therefore non-compliant.

The scope of this analysis comprises quantitative data provided under Part 3: Emissions, Targets and Projects in compliance reports received from 148 out of a full complement of 150 bodies¹.

Emissions data is quality assured prior to analysis to:

- · Correct mis-allocation of emission scopes.
- Add obvious omissions (for example, emissions reported under electricity generation have corresponding emissions associated with grid transmission and distribution losses).
- Identify obvious errors of scale.

Key facts and figures



- ¹ IJB reports are not part of this analysis. Emissions data relating to integrated health and social care services is captured and reported within the corresponding NHS and one or more local authority reports.
- ² CO₂e, or carbon dioxide equivalent, is a standard unit for measuring carbon footprints and includes the different greenhouse gases in one unit. tCO₂e refers to tonnes CO₂e.

Sector	2018/19			
Sector	Number of submitted reports	Number of bodies in sector		
Local Authorities	32	32		
National Health Service	19	19		
Educational Institutions	42	44		
Transport Partnerships	7	7		
Others*	48	48		
Integration Joint Boards	23	30		
Total	171	180		

Number of reports by sector

* National and regional public bodies

Insights

- 99% of reports were submitted by the deadline for all sectors other than IJBs.
- Of the 13% reduction in reported emissions around 2% is as a result of action by public bodies, including projects to intentionally reduce emissions and as a consequence of changes to public estate and staff numbers. The remaining 11% is due to a range of other variables including two substantive factors, which are beyond public bodies' control, specifically:
 - the generation of electricity being less carbon intensive³ (the UK grid is now 'cleaner' due to increased renewable electricity generation);
 - · Less demand for heating with 2018/19 being a warmer year than 2017/18.
- The chart below shows the progress public sector bodies have made in reducing reported emissions over the four years since mandatory reporting came into effect. There is a clear year-on-year decreasing trend since 2015/16.



Total reported emissions across mandatory reporting years

³ The grid electricity factor is on average 18% lower than it was during the 2017/18 reporting cycle. (An average is used here because the higher education sector reports on an academic year basis while the remainder of the public sector organisations report on a financial year basis).

3. Common types of emission reduction projects reported for 2018/19

The following table details common types of emission reduction projects reported in 2018/19.

Emission Source	Examples			
Electricity	 LED lighting Lighting – Internal, external and street lighting Photovoltaic (PV) panels CHP installations IT server upgrades 			
Business travel	 CO₂ cap on leased fleet Video conferencing projects Bike shelter alterations Sustainable business travel awareness policies 			
Fleet transport	 Expansion of EV networks Fleet replacement, including hydrogen and electric vehicles 			
Natural gas	 Boiler upgrade or replacement BMS upgrades Biomass boiler installations Insulation improvements Draught reduction 			
Other heating fuels	 Replacement fuel boilers (oil to gas or oil to biomass) BMS upgrades 			
Waste	 Diversion of waste to landfill projects through recycling and reuse projects Projects to reduce paper use Removal of single use plastic Installation of food bins 			
Water and sewerage	 Water efficiency measures Waterless urinals Water leakage reduction Rain water harvester upgrades 			

4. Corporate Emissions Breakdown



All sectors have reported a decrease in emissions from 2017/18

Public bodies report on their corporate greenhouse gas (GHG) emissions⁴. Corporate emissions include emissions from operation and management of the organisation's estate, owned assets and service delivery.

A public body determines what to include in its reporting boundary. The majority of bodies include emissions from gas, fuel use, water and electricity consumption (Scopes 1 & 2). Inclusion of emissions from other activities such as waste, non-fleet business travel, and procurement (Scope 3) varies across the sector.

i. Reported emissions, split by sector

	2016/17	2017/18	2018/19 ⁵	% change
Sector	Emissions (tCO ₂ e)	Emissions (tCO ₂ e)	Emissions (tCO ₂ e)	2018/19 versus 2017/18
Local Government	1,463,298	1,436,627	1,218,438	-15.2%
National Health Service	541,381	509,551	444,052	-12.9%
Educational Institutions	432,079	410,138	381,801	-6.9%
Transport Partnerships	7,345	6,571	5,537	-15.7%
Others	578,780	519,902	455,801	-12.3%
Total	3,022,885	2,882,788	2,505,629	-13.1%

Total emissions (tCO₂e)



⁴ Reported as tonnes of carbon dioxide equivalent, tCO₂e.

⁵ It should be noted that two less reports were analysed in 2018/19. This has negligible impact on overall emissions reported.

Insights

 Local Authorities represent the biggest share (49%) of emissions. This is consistent with the last four years of mandatory reporting.

2016/17 2017/18 2018/19 % change 2018/19 versus Scope Emissions Emissions Emissions 2017/18 (tCO,e) (tCO,e) (tCO,e) -4.2% Scope 1 1,132,344 1,156,837 1,107,785 Scope 2 1,198,287 981,931 765,992 -22.0% Scope 3 692,254 744,020 -15.1% 631,852 Outside of Scope (OOS)** 61,998 55.096 75,133 36.4% **Total (Not including** 3,022,885 2,882,788 2,505,629 -13.1% **OOS** emissions)

ii. Corporate emissions, split by scope*

* For more information on emission scopes, see Chapter 4 of the GHG Protocol Corporate Standard: https://ghgprotocol.org/corporate-standard

** Out of Scope emissions are "direct CO₂ emissions from biologically sequestered carbon (e.g. CO₂ from burning biomass/ biofuels), reported separately from the scopes." (GHG Protocol, Corporate Standard).



Total emissions by scope (tCO₂e)

Insights

- Scope 1 emissions have decreased slightly, likely attributable to 2018/19 being a warmer year (compared to 2017/18) so reducing the demand for gas and heating fuels. Taking account of degree days, natural gas consumption has remained flat for the past three years.
- Scope 2 (electricity) represents the biggest change compared to 2017/18 figures. This is largely due to an average 18% drop to the national grid factor this year, although there has been a 4.4% reduction in electricity consumption (kWh) overall.
- Scope 3 emissions have decreased by over 15%. This is due in part to a reduction in emissions associated with transmission and distribution losses across the UK grid as a result of a cleaner mix of energy supply and more renewables generation. A reported increase in diversion of municipal waste from landfill to incineration and refuse-derived fuel alongside increased kerbside recycling rates are also accountable for this change.

SPOTLIGHT Fife Council

Dunfermline Community Energy Scheme District Heating System

This scheme initially used landfill gas to fuel combined heat and power (CHP) units supplying electricity for the grid and heat to warm a mix of non-domestic, domestic and commercial buildings in Dunfermline. Food and garden waste is now diverted to an anaerobic digestion plant to produce methane which fuels a biogas CHP unit also supplying heat to the scheme. The resulting deficit in heat from landfill gas has been replaced by heat from a biomass boiler with a second in the design stage. A previously proposed extension to the scheme proved uneconomic, however, 2 large buildings with circa 180 households are planned to connect to the scheme in the next few years.



iii. Total emissions by source

	2016/17	2017/18	2018/19	2018/19
Sector	Emissions (tCO ₂ e)	Emissions (tCO ₂ e)	Emissions (tCO ₂ e)	% share of emissions
Electricity	1,360,690	1,119,642	869,585	34.7%
Natural gas	804,047	851,158	804,041	32.1%
Other heating fuel	145,319	129,744	116,046	4.6%
Process	48,048	28,025	36,717	1.5%
Refrigerants	1,129	1,056	1,921	0.1%
Waste	283,657	381,315	306,879	12.2%
Water and sewerage	17,345	15,540	17,392	0.7%
Travel*	140,587	132,091	130,801	5.2%
Transport fuel*	196,272	190,002	191,250	7.6%
Commuting	13,295	27,286	27,785	1.1%
Procurement**	5,000	5,000	-	0.0%
Other***	4,391	178	141	0.0%
Renewables	3,105	1,750	3,073	0.1%
Total	3,022,885	2,882,788	2,505,629	100%

* Travel is business travel by staff private vehicles; Transport fuel is fuel consumption in fleet vehicles.

** No reporting bodies reported on this source in 2018/19.

*** Emissions that were unable to be allocated into any listed category or emissions that no information was given on source.

Total emissions by source (tCO_2e)



Insights

- Electricity and gas (essentially heating and lighting of premises) make up almost 70% of overall reported emissions in the public sector.
- Reduction in electricity emissions is attributable to the cleaner electricity grid as well as a 4.4% drop in electricity consumption.
- Decrease in natural gas emissions relates to an almost 6% decrease in consumption when compared to reports submitted in 2017/18. This may in part relate to 2017/18 being a warmer year, taking account of degree-day adjustment. Accounting for degree days this shows that the natural gas consumption versus 2017/18 is essentially flat, as it was last year.
- There was a 21% reduction in reported tonnage sent to landfill from 2017/18 to 2018/19. This may be due to under reporting in some areas as well as an increase in the volume of waste being incinerated.

SPOTLIGHT University of the West of Scotland

Project awards and nominations

UWS has award winning examples of climate change and sustainability initiatives including:

- UWS Residences National Green Impact Community Action award winner 2019, selected by DEFRA. Initiatives included bike loan schemes, halls reuse and resource efficiency projects.
- IT Department Travel Reduction shortlisted for a Green Gown Award 2018 the team developed an initiative involving software solutions and agile working to significantly reduce commuting and business travel needs across the universities five campuses, reducing emissions by 50 tonnes per annum and saving over 9600 travel hours.



5. Emission Reduction Projects



Reported emission reduction projects implemented in 2018/19 have resulted in carbon savings of around 76 ktCO₂e in the reporting year. This is a decrease of over 8% compared to 2017/18.

As with previous years, the decrease compared to last year's project savings, may not be an indication of organisations doing less to reduce emissions but may be due to the fact that many standard solutions to reduce emissions have already been implemented.

Emission reduction projects are planned activities intended to reduce emissions within the annual reporting period. Projects include measures to reduce energy demand (for example, energy efficiency projects) and to reduce emissions from the supply of energy (for example, renewable energy projects).

	2016/17		2017/18		2018/19	
Sector	Emissions saved (tCO ₂ e)	% of total sector emissions	Emissions (tCO ₂ e)	% of total sector emissions	Emissions saved (tCO ₂ e)	% of total sector emissions
Local Authorities	45,918	3.14%	43,714	3.04%	47,885	3.93%
National Health Service	26,595	4.91%	12,667	2.49%	10,317	2.32%
Educational Institutions	24,611	5.70%	17,457	4.26%	8,251	2.16%
Transport Partnerships	-	0.00%	158	2.40%	2	0.04%
Others	11,811	2.04%	9,235	1.78%	9,776	2.14%
Total	108,935		83,230		76,231	

i. Emissions saved due to projects, by sector



SPOTLIGHT Scottish Water

Leakage Reduction

Scottish Water has reduced its operational carbon footprint by 41% since it began calculating it in 2006/07. During the early years, a major contributing factor was reducing leakage – fixing leaks means less water needs to be treated and pumped, thereby saving energy. The organisation continues to detect and repair leaks, but diminishing marginal returns and lower carbon intensity of the electricity grid means that savings are inevitably become smaller. During 2018/19, leakage was cut from 492 to 480 megalitres per day saving 408 tCO₂e.





ii. Emissions saved due to projects, by source

The reported emission reduction projects had an impact on a range of emission sources.

	2016/17	2017/18	2018/19
Emissions Source	Emissions saved (tCO ₂ e)	Emissions saved (tCO ₂ e)	Emissions saved (tCO ₂ e)
Electricity	66,337	40,970	34,215
Natural gas	3,993	11,532	12,901
Other heating fuels	10,257	2,023	2,412
Waste	23,188	15,533	17,366
Water and sewerage	1,166	423	674
Business travel	2,739	1,208	1,713
Fleet transport	403	3,675	3,394
Other	852	7,867	3,554
Total	108,935	83,230	76,231

Emissions saved due to projects, by source (tCO₂e)



Insights

- Almost 45% of reported savings are from projects that reduce electricity emissions, with waste projects being the second biggest contributor (23%).
- Local Authorities report the largest savings (48,000 tCO₂e), particularly from projects reducing electricity, gas and waste emissions. This was also the case in 2017/18 and is to be expected given that they are by far the biggest sector. They also saved the most emissions relative to their total emissions.
- The amount of emissions saved through waste and electricity projects decreased compared to 2017/18. This has been the case for two years now and may be due to "early wins" having already been implemented (e.g. LED lighting projects).
- Savings from transport related projects increased slightly again in 2018/19. However, the diminutive increase in savings this year may indicate a stagnation in progress requiring greater innovation longer-term to achieve further emission reductions.



SPOTLIGHT East Dunbartonshire Council

Biomass investment

Increasing biomass capacity during 2018/19 contributed to reducing East Dunbartonshire Council's carbon emissions. An ongoing programme of retrofits and new-build installations means that 17 Council assets now boast biomass boilers in place of fossil-fuelled heating systems, in addition to five solar photo-voltaic installations. The Council is now exploring alternative sources of renewable energy, with a trial of air-source heat pumps having recently begun.



6. Renewable Energy Initiatives



There has been a 28% decrease in reported carbon savings from all renewable generation compared to 2017/18

Renewable energy initiatives provide effective means to reduce emissions from public bodies. Activity on renewables was reported by 71% of public bodies (up from 63% last year) with all sectors reporting at least one renewable energy initiative⁶. All Local Authorities have at least one renewable energy source as do three quarters of educational institutions.

Solar panels and biomass boilers are by far the most widely reported renewable technology being installed, in keeping with the past three years. Other common renewables reported include heat pumps, solar thermal and wind.

	201	6/17	201	7/18	2018/19				
Sector	Electricity generation (GWh)	Heat generation (GWh)	Electricity generation (GWh)	Heat generation (GWh)	Electricity generation (GWh)	gei			
Local Authorities	35.51	92.60	36.77	116.35	22.97				
National Health Service	1.17	45.48	0.66	37.74	0.85				
Educational Institutions	0.80	17.82	0.87	14.37	4.42				
Transport Partnerships	0.02	-	0.02	-	0.02				
Others	65.93	21.48	66.94	20.25	59.62				

177

i. Renewable energy generation



SPOTLIGHT Inverness College

103

UHI Renewables

Total

Inverness College has deployed a range of low carbon technologies to provide heating in campus buildings. Four ground-source heat pumps provide under-floor heating for the main campus building which has complex large spaces including an atrium. A biomass boiler provides all space heating via under-floor heating in the Scottish School of Forestry building. The building is naturally ventilated so there is no cooling load requirement. An air source heat pump provides both closed and open water heating for the nursery building.

105

189

generation (GWh)

> 116.50 37.60 25.98

> > 19.25 199

88

Renewable energy generation in 2018/19 (GWh) Local Government **National Health Services Educational Institutions Transport Partnerships** Others **Integration Joint Boards** 20 40 60 80 100 120 140 Electricity generation Heat generation

Insights

- Reported renewables generated 88 GWh of renewable electricity and 199 GWh of renewable heat in 2018/19. This equates to a removal of around 54,000 tCO₂e of emissions.
- In terms of renewable energy generated this is a decrease of 2% versus 2017/18 figures which is relatively flat and suggests that there has not been any dramatic change in renewable policies by organisations.
- Local Authorities are responsible for almost half of the reported renewable energy generated in 2018/19 (139 GWh). The 'Other' sector is also strong on renewables with almost 80GWh generated in 2018/19.
- For Local Authorities, National Health Service and Educational Institutions renewable heat appears to be a more viable option than renewable electricity.



SPOTLIGHT Scottish Fire and Rescue Service

PowerNow Energy Monitoring

The Scottish Fire and Rescue Service (SFRS) has recently installed the EDF PowerNow Smart Energy monitoring technology into five of its main building types. This technology allows circuit level and energy monitoring in real time to map energy use patterns and identify areas of excessive energy use within each building. The data is enabling SFRS to take targeted action on reducing energy use and carbon emissions. It is expected to help reduce consumption by 15-20% across the sites, decrease emissions by c. 216 tCO₂e per annum and accrue over \pounds 60,000 savings annually.

i. Emission savings from renewables, 2018/19 compared to 2017/18 and 2016/17

Using the data on energy generation from renewables, it is possible to deduce the corresponding emission savings, shown below.

	2016/17		201	2017/18		8/19
Sector	Estimated annual carbon saving from renewable electricity (tCO ₂ e)	Estimated annual carbon saving from renewable heat (tCO ₂ e)	Estimated annual carbon saving from renewable electricity (tCO ₂ e)	Estimated annual carbon saving from renewable heat (tCO ₂ e)	Estimated annual carbon saving from renewable electricity (tCO ₂ e)	Estimated annual carbon saving from renewable heat (tCO ₂ e)
Local Authorities	14,154	19,375	12,926	24,208	6,494	16,069
National Health Service	482	9,622	222	7,992	240	5,543
Educational Institutions	285	3,772	248	2,095	237	4,658
Transport Partnerships	7	-	6	-	5	-
Others	27,167	4,545	23,335	4,163	16,876	3,891
Total	42,095	37,315	36,737	38,458	23,853	30,162

Emissions savings from renewables across three reporting periods



Insights

- There has been a 28% decrease in reported carbon savings from all renewable generation compared to 2017/18.
- The drop in emission savings is mostly due to a reduction in the electricity emission factor which in turn reduces the emissions savings from renewable electricity generation.
- Other factors include ambient weather conditions, downtime due to maintenance or faults, operational or contractual issues etc.

7. Targets



Targets relating to overall emissions, as well as building energy use, are the most commonly applied by public bodies

Public bodies have a range of targets to help direct climate change action and emissions reduction. These targets can be overall emission reduction targets (percentage or absolute) as well as policy specific targets relating to emission sources or business activities.

i. Who has targets (split by sector)

Sector	Number of bodies with at least one target	% of organisations within each sector	Total targets
Local Authorities	29	91%	77
National Health Service	17	89%	46
Educational Institutions	29	66%	73
Transport Partnerships	5	71%	6
Others	38	79%	105
Total	118	79%	307



SPOTLIGHT NHS Boards

Reducing emissions

NHS Boards have been undertaking a range of measures to reduce emissions as part of planned upgrades and improvements to heating, cooling and lighting systems and decarbonisation of fleet vehicles. Savings in excess of over 4,000 tonnes CO₂e were reported for 2018/19. In addition to the adoption of low carbon and renewables technologies some Boards have reported other initiatives. Plastic recycling at NHS Dumfries and Galloway was vastly improved by targeting the recycling of specific bulk high quality plastic items. Distilled water containers at dental practices and renal fluid containers used in all renal units were simple to address by organising the placement of bins, arranging skips for bulk collections and scheduling uplifts.

ii. Nature/type of targets being set across the public sector and within sub-sectors

Sector	Local Government	National Health Service	Educational Institutions	Transport Partnerships	Others	Total
Energy use in buildings	24	29	15	0	24	92
All emissions	23	8	19	1	26	77
Waste	9	4	19	0	19	51
Other	8	3	9	2	18	40
Water and sewerage	5	1	4	0	6	16
Staff travel	1	0	5	0	9	15
Transport	7	1	2	3	3	16
Total	77	46	73	6	105	307

Target types



Insights

- Targets relating to the transport sector are the least reported for the third year running.
- Almost 80% of bodies have reported at least one target, in line with last year.

8. Conclusion

Analysis indicates positive developments, including:

- 95% of public bodies classified as major players submitted climate change reports in line with the Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Order 2015.
- Since reporting became mandatory in 2015/16, there has been a year on year trend in carbon emission reductions. In 2018/19 reported emissions are 13.1% less than for 2017/18 and 23.3% less compared to 2015/16. The influence of a cleaner electricity grid, however, has a large part to play in interpreting this trend.
- · Waste to landfill and electricity consumption are both declining steadily.
- The generation of waste (glass, paper and board, commercial and industrial waste, etc.) is on the decline. Recycling rates (particularly for glass) are starting to increase also. Not only are organisations generating less waste, they are also recycling more of the waste they generate.
- Emission savings from projects have decreased 8% compared to 2018/19. This is not surprising as many standard solutions to reduce emissions have already been implemented. Organisations need to look towards more innovative ways of reducing emissions to help meet the Scottish Government's net zero greenhouse gas emissions target by 2045.
- Energy generation from renewable technologies has decreased 2% compared to 2017/18.
- The quality of climate change reports is improving, with fewer quality assurance checks and corrections needed and an improvement in the quality and quantity of data reported, especially for projects and renewables.

Further information

This report presents high-level analysis of the information contained in the Public Bodies Climate Change Reports for the period 2018/19. It focuses on the quantitative information on the corporate emissions (Part 3) reported by public bodies. It does not consider other parts of the climate change reports – wider influence, adaptation, procurement or governance.

All submitted reports are published on the Sustainable Scotland Network website and are available to download:

https://sustainablescotlandnetwork.org/reports

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About the SSN

SSN is Scotland's network for public sector professionals engaged in sustainability and climate action. We showcase action taken to reduce emissions and support deeper commitment and innovation on climate change and sustainability through capacity building, training and events.

Our strategic partners are drawn from the sectors involved in Public Bodies Climate Change Duties – including NHS Scotland, EAUC Scotland, COSLA and other major players.

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