



Zero Waste Scotland’s Environmental Impacts

Annual Report (April 2019 – March 2020)

Publication date: May 2020

This paper provides:

1. An overview of Zero Waste Scotland’s overall annual environmental impacts (including paper prints and staff commuting data);
2. An update on the company’s 2019/20 RES Pledges and EMS objectives.
3. A list of net zero carbon commitments for 2020/21 and beyond.
4. Impacts of Coronavirus on operational emissions.

The organisation’s overall environmental impacts

Summary

Total climate change impacts, expressed in carbon dioxide equivalent, in FY 2019/2020 were 261 tonne of CO₂ eq., 36 tCO₂e (12%) lower than the previous year impacts. Since FY 2018/19, there has been an absolute increase in staff commuting impacts (+4%). There has however been a significant decrease in corporate travel impacts (41%). Much of this can be attributed to stringent flight monitoring; but is also due to the coronavirus pandemic in Q4 of FY 2019/20. This, and an overall decrease in corporate travel explains why **Total impacts per employee fell 25% YoY**, despite a 20% staff increase (see Figure 1).

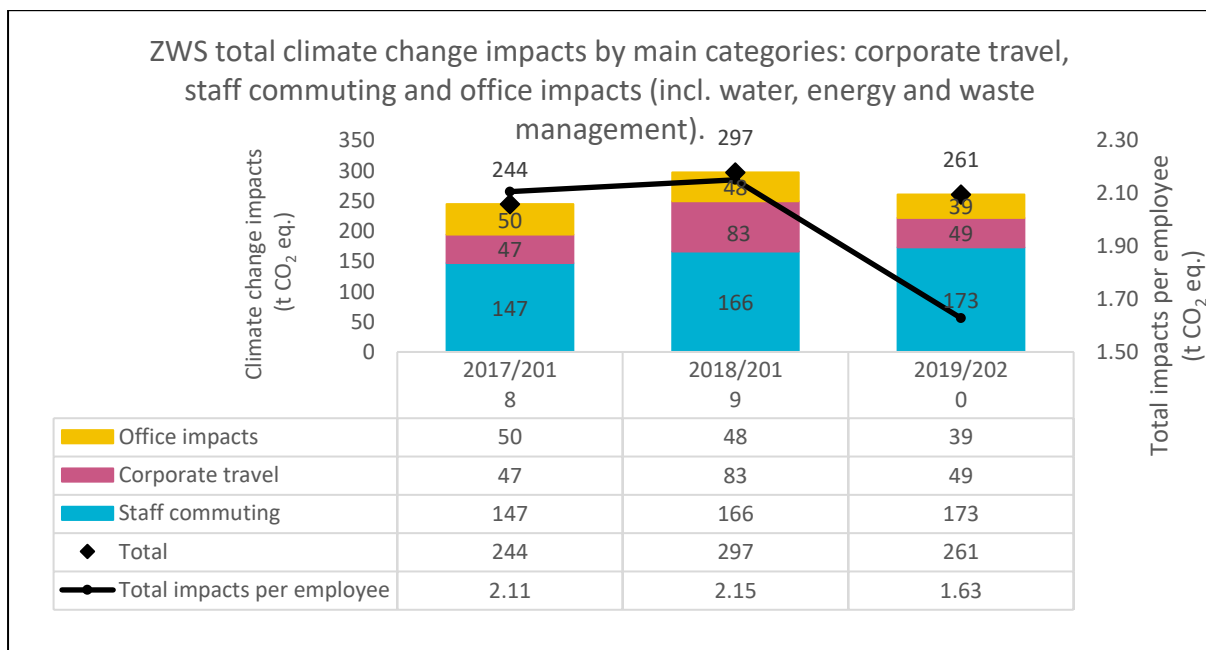


Figure 1 Total climate change impacts.



Corporate travel impacts

Figure 2 shows corporate travel mileages by mode of transport in 2019/20. **Flights mileage fell 74% compared with the previous year. Flight impacts for this financial year account for only 23% of all travel impacts, compared with 59% of total travel impacts for 2018/19. Trains again¹ account for the highest proportion of mileage (65%), whilst accounting for only 31% of emissions.** Figure 3 shows ZWS performance for the year, in relation to the imposed flight cap.

Corporate impacts per employee in the previous financial year (2018/19) were 32% higher than in 2017/18 (Figure 4), and so emissions reduction efforts were very much focused on this area in 2019/20. Due to increased uptake in hire vehicles and public transport, together with the successful flight cap and no-fly zone; **per capita travel impacts in FY 2019/20 fell to 305 kgCO₂e – a 49% reduction on the previous year.** No flights were taken by Zero Waste Scotland in Q4 of 2019/20. While coronavirus did significantly reduce travel in the latter half of Q4, the majority of travel impact savings in 2019/20 were the result of operational and behavioural changes across the business.

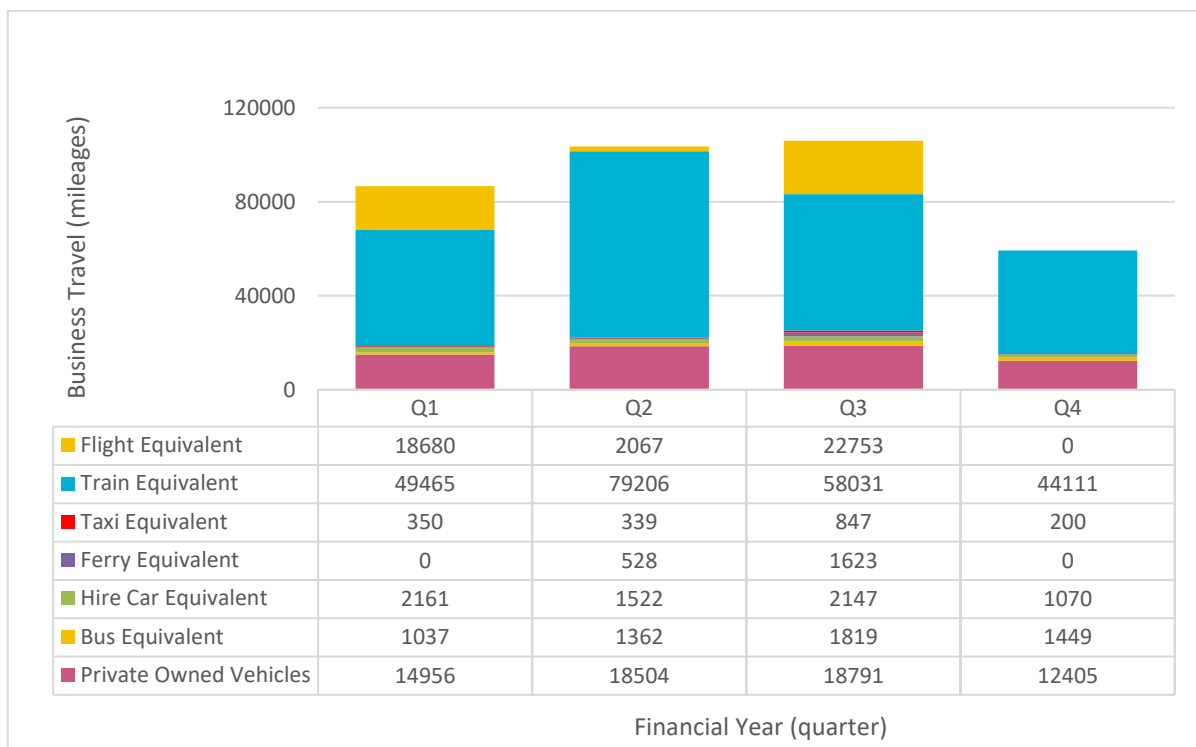


Figure 2 Breakdown of business travel (mileages) in FY 2019/20 by Quarter.

¹ Due to a previous error in reporting, and a failure to capture procurement card data; travel mileages were underreported. This issue has now been rectified, and corporate travel figures are now up to date. The largest increase in mileage was in relation to train travel, which now accounts for the most significant proportion of travel mileage for 2018/19 and 2019/20.



As Figure 3 below shows, no flights were taken in Q4 of FY 2019/20. This has allowed ZWS to undercut its flight cap of 101,430 miles; by 56% (56,832 miles). This is a significant achievement, and one which the organisation plans to build on in order to continue making meaningful reductions to its flight mileage, but also to ensure its net zero commitments are upheld.

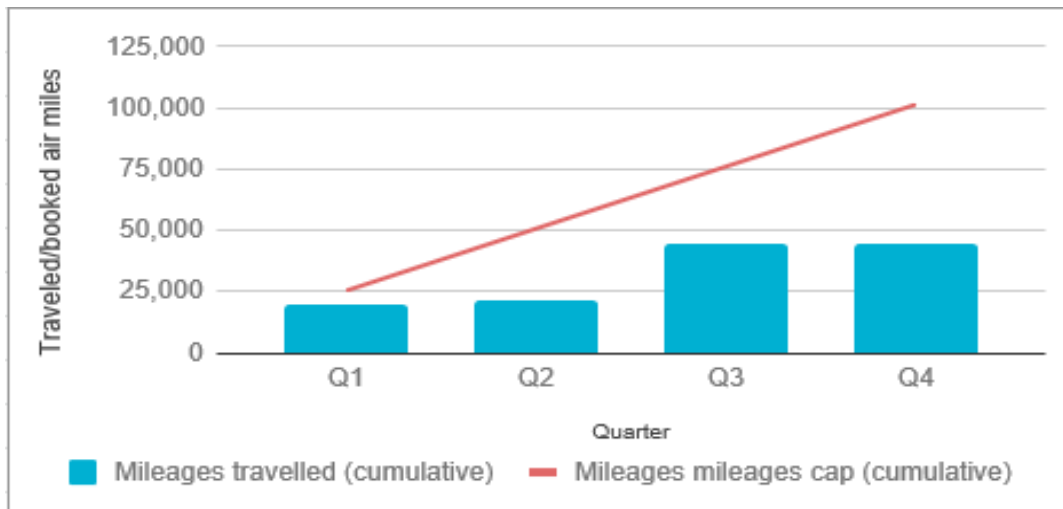


Figure 3 - Air miles travelled vs flight cap – 2019/20

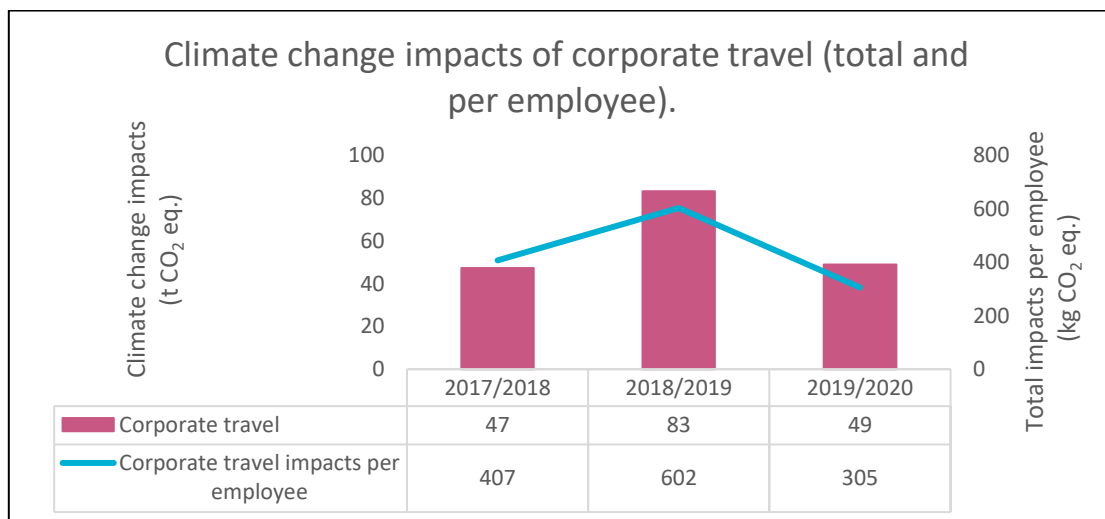


Figure 4 The company corporate travel: total vs per employee



Office impacts

Electricity

Impacts of electricity consumption in 2019/20 were ~22 tonnes² of CO₂ eq., 26% below the previous year (i.e., ~30 tonnes CO₂ eq.). The reduction is primarily attributed to grid decarbonisation and a period of reduced impacts due to COVID-19 homeworking. Figure 5 shows monthly climate change impacts associated with electricity consumption over the last two financial years.

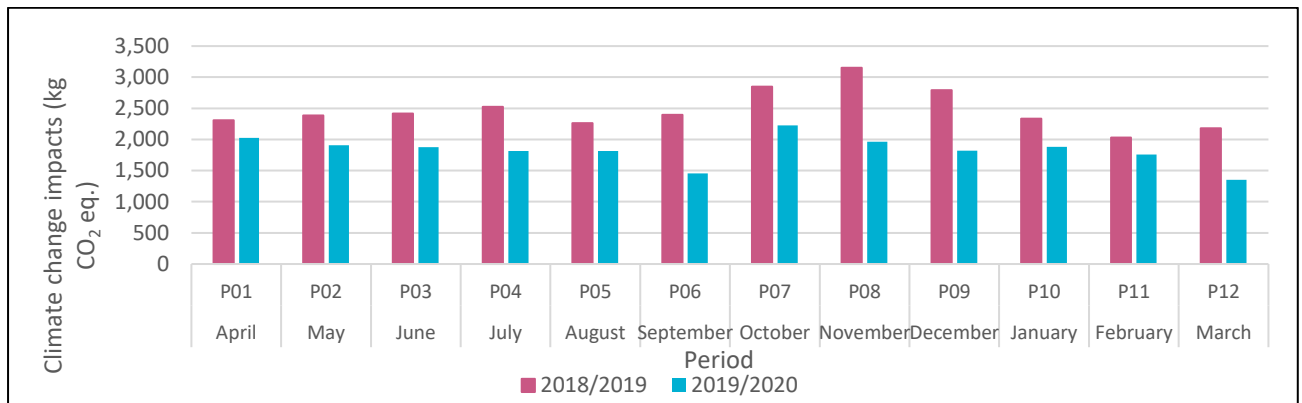


Figure 5 Climate change impacts of electricity (End-of-Year 2019/20).

Heating (Gas)

The impacts of gas consumptions dropped by 7% YoY, from 14 tCO₂ eq. to ~13 tCO₂ despite colder weather in 2019/20 than in the previous year, as shown in Figure 6. This is in part due to the installation of a new low-carbon district heating system in October 2019. Savings here would have been more pronounced, but were initially constrained due to calibration issues with the system.

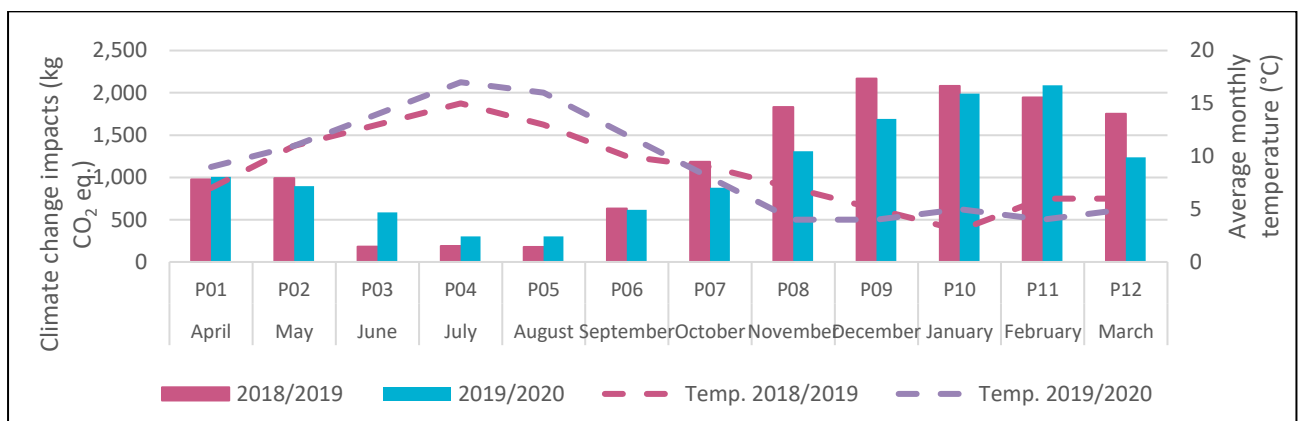


Figure 6 Monthly climate change impacts of gas consumption in our offices vs. average monthly temperature³.

² Due to a fault with the electricity monitoring equipment at Moray House; ZWS was under-reporting its electricity consumption. This issue has now been resolved and the figures in this document confirmed as being accurate.

³ <https://www.worldweatheronline.com/stirling-weather-averages/stirling/gb.aspx>



Resources loss and waste management

Full-time employees (FTEs) increased from 138 to 173 FTEs (+20%)⁴ in 2019/20, resulting in an 8% increase in food waste generation. Annual data, plotted in Figure , shows that water and other waste decreased by 19% and 22% respectively. The increase in food waste generation can likely be attributed to a significant increase in staffing levels in this financial year. The notable reduction in material or ‘other’ waste was achieved through implementation of the successful reusable milk bottle initiative, and other waste-saving measures such as introducing clearer signage; but is partly explained by coronavirus and subsequent imposed homeworking.

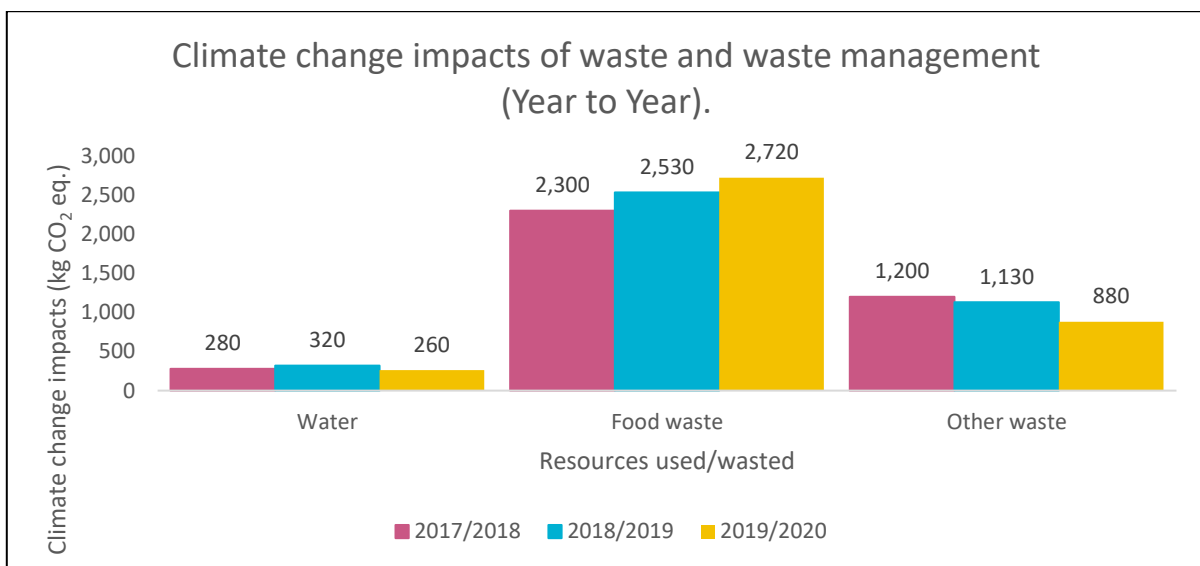


Figure 7 Climate change impacts of water and waste management (Year to Year).

⁴ This is a rough estimate based on data collected by the Environmental Analyst as part of the company Prints C&T scheme.



Staff commuting impacts

Staff survey results show total commuter mileages exceeded 1,000,000 miles, resulting in nearly 173 tonnes of CO₂ eq., 4% higher than the last financial year.

Normalised results show commuting carbon impacts/FTE fell 17%, with a 22% decrease in mileage/FTE (see Table 1). Much of the emissions savings can be attributed to increases of 107%, 53% and 16% travelled by foot, bike and car share respectively, as shown in figure 8 (below).

Table 1 Results of relative comparison of staff commuting data.

Item	2018/19	2019/20	Difference
Number of employees	138	173	+20%
Carbon (kgCO ₂ e)	1,208	1,003	-17%
Mileages	7,801	6,066	-22%

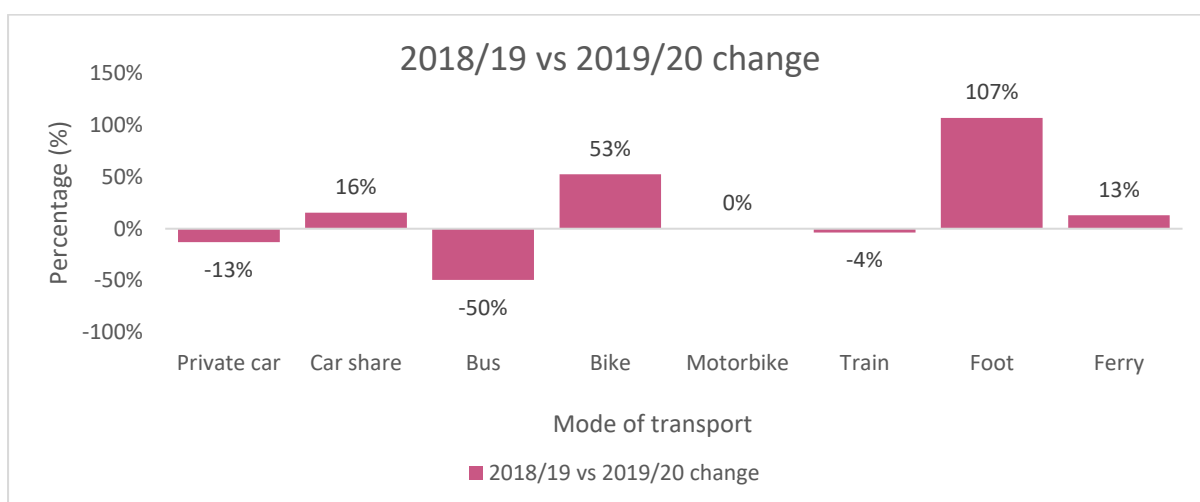


Figure 8 Changes in the mode of transport in 2019/20 compared to 2018/19.

Figure 9 shows commuting impacts by transport type for the last two financial years. Figure 10 shows the contribution of mileages and their associated impacts. Unsurprisingly, private car remains the highest contributor with 76% of the total environmental impacts. Trains account for 29% of total mileages however are responsible for only 12% of total impacts. Encouragingly, there has been a significant increase in active travel (walking and cycling are up 107% and 53% respectively), but a slight reduction in commuting via public transport compared with the previous year (bus and train travel are down 50% and 4% respectively).

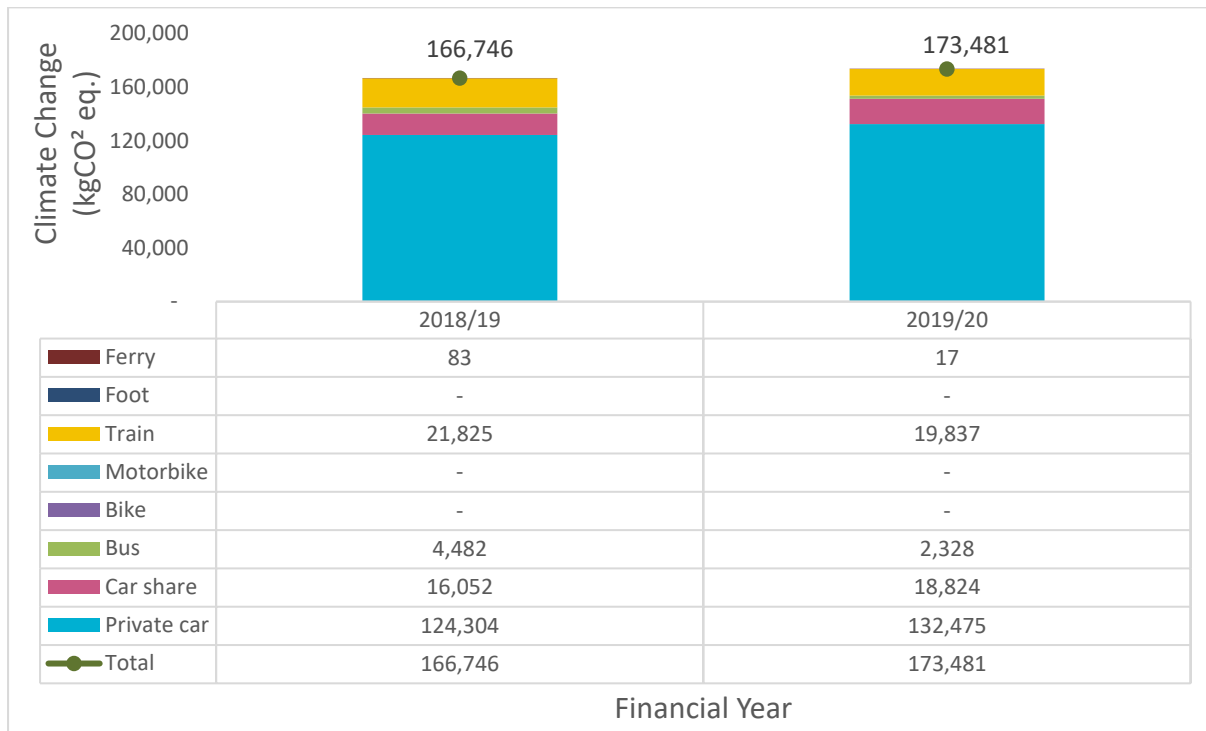


Figure 9 Climate change impacts associated with staff commuting in 2018/19 and 2019/20.

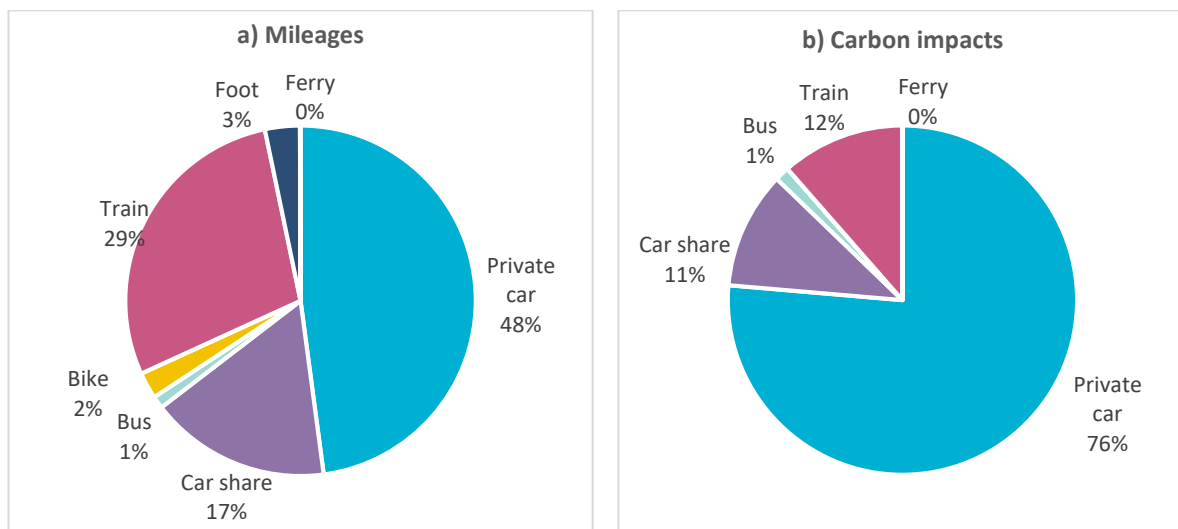


Figure 10 Breakdown of staff commuting activities by (a) mileages and (b) their associated climate change impacts.

Prints analysis

Zero Waste Scotland has achieved reduction in paper use for the fourth consecutive year. In 2019/20, staff printed 24,153 sheets, 32% less than last year. Average prints per employee in 2019/20 were 21% lower than last year’s average. Figure 11 below shows the total and per capita paper use for 2019/20, compared with previous years.

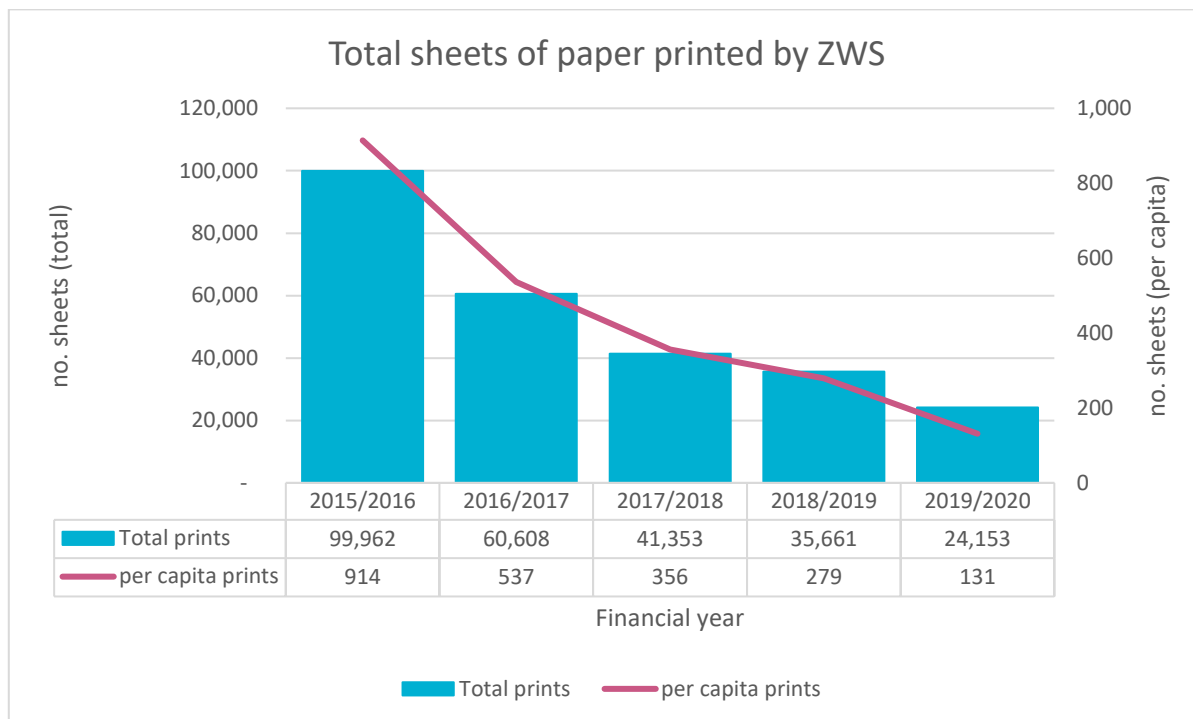


Figure 11 Total and per capita prints by financial year.

Net Zero Carbon plan

In October 2019, Zero Waste Scotland undertook the journey towards becoming a net-zero carbon organisation; and publication of the plan detailing this path is scheduled for May 2020. In it, a robust methodology is outlined that will take ZWS to net-zero status in FY 2020/21 by use of targeted mitigation strategies and high-quality offsetting measures. A list of current net-zero commitments can be found in appendix 1. These are primarily targeted at corporate travel (specifically flights and private vehicle miles); electricity and gas use which together account for 97% of ZWS corporate emissions for the baseline year (2018/19).

Commitments under the Zero Waste Scotland net-zero carbon strategy replace previous RES and EMS pledges from previous reporting periods.

Coronavirus

2019/20 saw a reduction in emissions from almost all sources that are currently tracked by ZWS (except for food waste and commuting in absolute terms). This is partly due to successful implementation of mitigation strategies but is also due to the coronavirus pandemic, which imposed universal homeworking throughout Scotland and within the organisation towards the end of Q4 and beyond.

Mandatory homeworking has effectively nullified travel and office-based emissions. At time of writing it may continue to do so for some time and work is under way to quantify and account for rebound



emissions occurring through continued homeworking - however long it may be in force. Appendix 2 indicates relevant work already completed in this area, and which shows that even accounting for rebound homeworking emissions; emissions reductions recorded during this time are significant.

Update on 2019/20 RES pledges

The Resource Efficiency Pledge is a nationwide scheme backed by Scottish Government to help Scottish businesses use energy, water and raw materials more efficiently throughout their operations. Table 2 below lists pledges made in 2019/2020, supporting actions, and final status. As of 2020/21; Zero Waste Scotland RES pledges will be replaced with commitments under the net zero carbon strategy (appendix 1).

Table 2 2019/20 RES pledges, supporting actions, and final status (as of End of Year 2019/20)

No.	Pledge	Action	Status
1	transition to low carbon catering	- Zero Waste Scotland environmental policy now mandates low carbon, vegetarian meals at all ZWS-held events.	Complete
2	Ensure that satellite offices comply with Environmental Policy	- Meetings held with landlords of both satellite offices. - Landlords appear reluctant to update their environmental policies and waste disposal methods. - Facilities are currently researching alternative office spaces - Progress on this pledge has been suspended indefinitely	In progress
3	To redevelop and relaunch the staff marketplace	- Staff marketplace successfully launched and fully operational	Complete

Update on 2019/20 EMS Objectives

Error! Reference source not found. lists the company's 2019/20 EMS objectives, supporting actions delivered, and final status (as of End of Year). As of 2020/21; EMS objectives will be replaced by commitments under the net zero carbon plan (appendix 1).

Table 3 2019/20 EMS objectives, implemented actions, and final status (as of End of Year).

No.	Impact Area	EMS objectives / actions	Status
1	Corporate flights	Reduction in mileages of annual business flights below 2018/2019 levels.	Achieved
2	Staff commuting	Reduction of per-employee carbon impacts of commuting activities by 5% below 2018/19 levels by 31st March 2020.	Achieved
3	CE Business Models	The adoption of a circular approach to procurement is being reviewed and has not yet been implemented. Procurement are altering the contract award process to compel contractors to measure their carbon footprint.	Under review



		<p>The environmental Analysis team, together with IT, are developing an online tool that allows third-party contractors to measure their carbon footprint, to enable measurement of carbon emissions occurring in the course of business undertaken for ZWS.</p>	
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Document preparation

	Name	Team	Date
Written by	Fraser Millar	PRE	14.05.2020
Reviewed by	Michael Lenaghan	PRE	18.05.2020



Appendix 1: List of commitments under the net zero plan

Below is a list of commitments that form the basis of the Zero Waste Scotland net zero carbon plan. The plan is due for publication in May 2020, and as such the commitments expressed under it are in their early stages. This list replaces EMS objectives and RES commitments for previous years.

Table 4. Forthcoming net zero commitments and status

No.	Impact Area	Actions	Start date
1	Offsetting	Offset to net-negative status – a long list of offsetting options has been devised and will be sent out to staff for consultation	01/04/2020
2	Commuting	Encourage use of cycling through improvement of cycling facilities – A clothes drying unit has been purchased and will be installed within Moray House to encourage staff to cycle to work	01/04/2020
3	Corp. Travel	Cap and reduce flight miles by 20% per annum until 2022/23 – On-going measure, supported by ‘no-fly zone’ and stricter accountability air travel.	01/04/2019 – Ongoing commitment
4	Corp. Travel	Cap and reduce private vehicle miles by 50% per annum until 2022/23 – ZWS has worked closely with local car hire rental firms to promote greater use of electric and hybrid hire vehicles, including an EV familiarisation day. The travel policy is also being redrafted in support of this measure.	01/04/2020 – Ongoing commitment
5	Office impacts	Installation of double glazing within Moray House – Air quality monitoring tests have been completed in support of this measure, and talks are on-going with Stirling council. Long term aspiration.	01/04/2020 – (estimated completion 2022)
6	Office impacts	Move 60% of servers to the cloud – Work is underway in support of this measure, and the I.T Department are currently transferring ZWS data to Sharepoint cloud-based server.	01/04/2020 – (estimated completion 2021)
7	Procurement	Switch to ~50% oat milk for the office – taste testing sessions have been rolled out and a survey drawn up – currently postponed due to coronavirus homeworking	01/07/2020 – Delayed
8	Commuting	Undertake gap analysis of commuting with Sustrans – Sustrans have agreed to assist ZWS with this measure, however currently postponed due to coronavirus homeworking	01/07/2020
9	Procurement	Establish system for measuring catering and contract impacts – E.A team and I.T. are working to develop an online carbon calculation tool, for use by caterers and contractors.	01/07/2020 -
10	Office impacts	Establish system for measuring impacts of satellite offices - talks on-going. Measure on-hold due to coronavirus, and assessment of whether satellite offices will be retained upon easing of homeworking restrictions	01/07/2020 – Delayed
11	Office impacts	Explore options to own and operate renewable electricity infrastructure.	01/10/2020
12	Commuting	Explore options to encourage greater commuting by train – net-zero team is currently researching case studies of how other organisations are achieving this.	01/10/2020
13	Corp. Travel	Improve video conferencing and video calling facilities within Stirling offices – measure postponed until offices are again occupied, however this measure will be prioritised due to inevitable increase in tele-conferencing.	01/04/2021



Appendix 2: The impact of Coronavirus Lockdown on Zero Waste Scotland’s Carbon Footprint

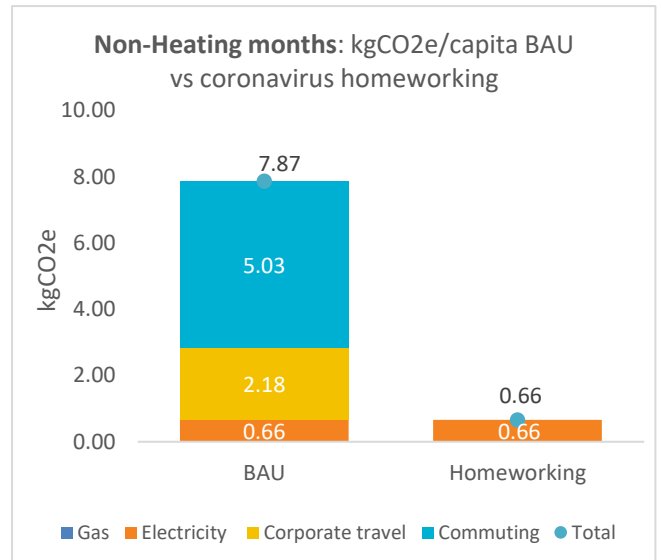
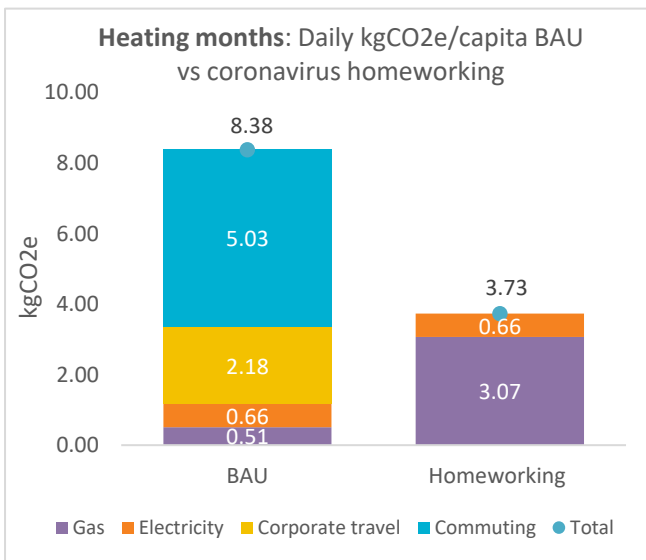
On March 16th, 2020, Zero Waste Scotland began universal homeworking in response to the coronavirus pandemic.

These new working conditions have significantly reduced the company’s carbon footprint, with a 26% reduction (4.6 tonnes carbon dioxide equivalent (tCO²e)) between 16th – 31st March vs business as usual (BAU).

Daily per-capita emissions during coronavirus

Average daily kgCO₂e/capita under coronavirus working conditions is 75% lower than BAU (54% lower during heating months, and 92% lower during non-heating months) due to avoided corporate and commuting travel. Assuming no change in corporate travel, savings would be 29% and 64% respectively meaning, **regardless of seasonal variation and corporate travel activity, homeworking provides significant year-round carbon savings over office working.**

- **Heating:** heating impacts are higher for homeworking than office working during heating months (October-March)⁵, as more energy is required to heat a hundred homes than an office of a hundred people.
- **Electricity:** electricity impacts are not significantly affected, as electricity for personal computers is simply shifted from the office to the home, while electricity for office servers is unchanged.
- **Corporate Travel:** the cessation of corporate travel has resulted in significant carbon savings.
- **Commuting:** The cessation of commuting has provided the greatest carbon savings vs BAU.



⁵ [Dept for Energy and Climate Change, 2013; 'Report 4: Main Heating Systems'; Energy Follow-up Survey 2011](#)



Embedded equipment emissions

Embedded carbon impacts of new I.T. equipment provided for homeworking is estimated at 5.1 tCO₂e or 29.3 kgCO₂e/capita. While this has reduced net savings in Q4 FY19/20, it is a one-off deduction which will not affect future savings.

