




Key Takeaways




Total 2021 emissions for Aberdeen City
1,152.9 ktCO₂e




Rise in emissions since 2020*
3%




Largest sector in 2021: Stationary Energy
769.8 ktCO₂e



Total 2021 emissions for Scotland
38,504.6 ktCO₂e

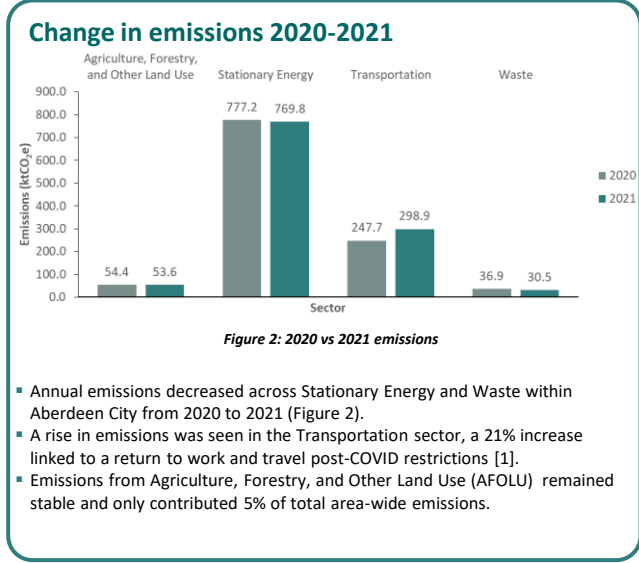
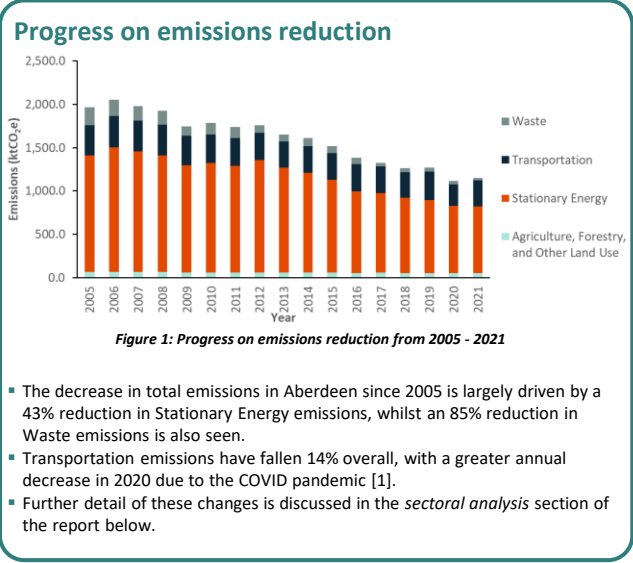


Decrease in emissions since 2005*
41%

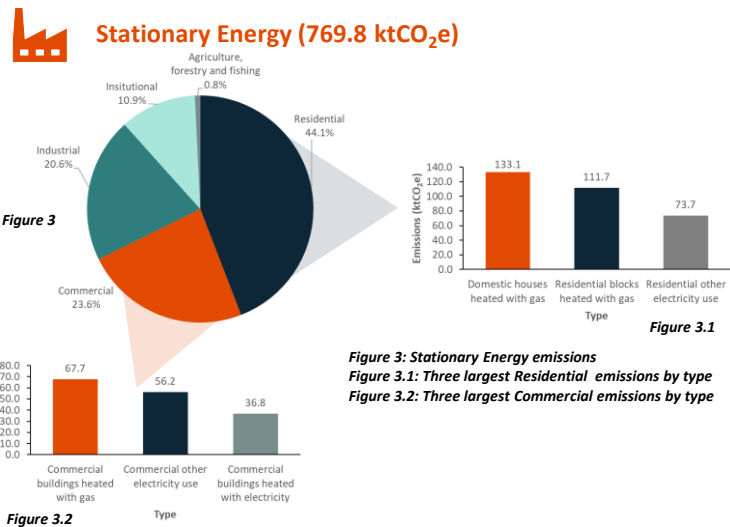


Total sequestered emissions in 2021
-16.2 ktCO₂e

* This does not include negative emissions



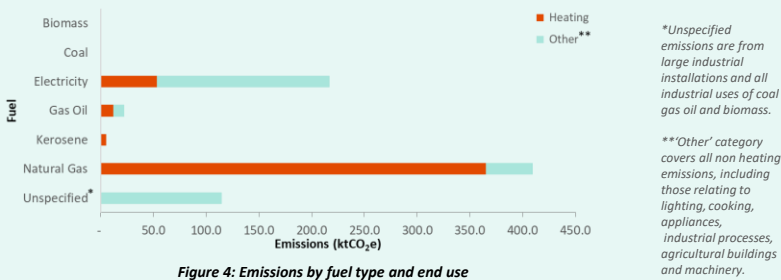
Sectoral Analysis



Over 44% of Stationary Energy emissions result from Residential fuel use in Aberdeen City in 2021. Commercial was the next most significant category at 24% of emissions (Figure 3). The largest emissions source in both categories was natural gas use for heating. Other electricity use, which includes lighting, cooking and appliance use, was responsible for 22% of all Residential emissions (Figure 3.1) and 31% of all Commercial emissions (Figure 3.2).

An investigation into fuel usage

In Aberdeen City in 2021, 53% of all Stationary Energy emissions were the result of natural gas use, 28% from electricity and 15% related to 'unspecified' industrial fuel use. Fuel use for *Heating* resulted in 57% of Stationary Energy emissions, with 84% of those from natural gas use and only 12% related to electricity use (Figure 4).



A note on energy consumption

The fall in emissions since 2005 masks a more complex picture (Figure 5). As can be seen, emissions per capita have been falling steadily. The increased level of renewables feeding into the electricity grid has resulted in a reduction in electricity emissions per unit consumed [2,3]. This is reflected in the emissions factor for electricity which fell from 0.467 kgCO₂e/kWh in 2005 to 0.207 kgCO₂e/kWh in 2021, contributing to the fall in per capita emissions. Energy consumption has reduced at a much slower rate with fluctuations in part related to the variation in retail price of natural gas and electricity. As the rate of grid decarbonisation slows, achieving further emission reductions will require a decrease in consumption.

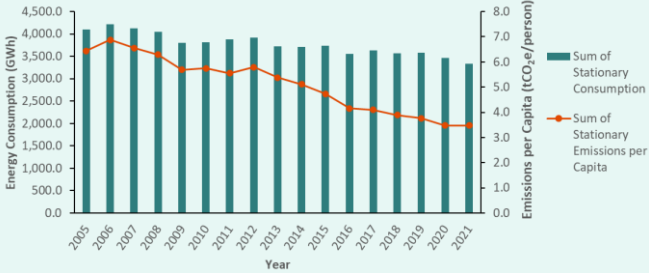


Figure 5: Stationary consumption and emissions per capita



Transportation (299.0 ktCO₂e)

Figure 6 illustrates the breakdown of emissions by mode of transport. Of Transportation emissions included in Aberdeen's inventory, 95% were generated by on-road travel, including 62% from cars and 18% light goods vehicles. However, it should be noted that aviation travel has not been included yet and so a change in proportion is expected in future reports. Unlike Stationary Energy, Transportation emissions have remained high, notwithstanding a fall during 2020 when COVID reduced travel [1]. The waterborne transport category, responsible for 4.6% of emissions, includes all remaining Transportation emissions which did not fit into other categories. For example, this includes airport-based land vehicle emissions. In the next iteration of the area-wide emissions inventory these emissions will potentially be separated and more clearly defined.

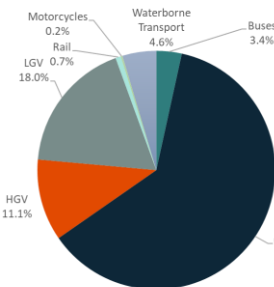


Figure 6: Transportation emissions



Waste (30.5 ktCO₂e)

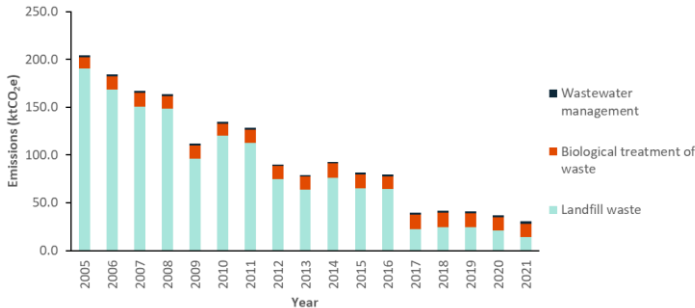


Figure 7: Waste emissions

As previously described in Figure 1, Waste emissions in Aberdeen have reduced by 85% since 2005. Figure 7 demonstrates that this is solely due to a decrease in landfill emissions. In 2021 Waste contributed less than 3% of area-wide emissions. The large annual percentage decrease in 2017 corresponded to the opening of a large recycling facility in the city, however this does not explain the full decrease from 2005. These emission figures are taken from the Department of Energy Security and Net Zero data[4], and it is important to note that calculation of Waste emissions will be subject to improvements in future with updates to the methodology used.

Key Considerations

These are not mandates or requirements but are suggestions for tackling the emissions identified in this report

Stationary Energy:

- Decarbonising heating could have a significant effect on total area-wide emissions, given that 57% of all Stationary Energy emissions relate to fuel use for heating and 80% of emissions from heating relate to natural gas use. *Aberdeen City buildings and heat strategy* [5] identifies a range of options to address this, including decarbonisation and extension of existing heat networks and use of low carbon heating options such as air source heat pumps for properties outside the reach of these networks.
- Alongside this, retrofit of energy efficiency measures could reduce fuel demand and therefore further lower emissions in the sector. It is understood that this could present a particular challenge to Aberdeen, due to the high percentage of aged or historic granite buildings with poor insulation [5]
- As 22% of Residential and 31% of Commercial emissions arise from other sources, programmes to increase uptake of energy efficient lighting and appliances could also be explored.

Transportation:

- With 80% of Aberdeen's Transportation emissions generated by cars (petrol and diesel) and vans, options to further reduce emissions by minimising distance travelled by these vehicles could be considered, particularly given the compact nature of Aberdeen City which makes it conducive to alternative modes of transport.
- The *Regional Transport Strategy* [6] identifies achieving a 50-50 mode split between car journeys and sustainable modes of transport as a key priority. Measures highlighted in the strategy to achieve this include continuing to develop active travel networks, delivery of the *Aberdeen Rapid Transit* and improved integration of transport networks.
- Alongside this the development of a hydrogen hub which could provide a hydrogen refuelling facility to city vehicles is underway [7].

References

1. *Progress in reducing emissions in Scotland*, March 2024, Climate Change Committee. Available from: www.theccc.org.uk/wp-content/uploads/2024/03/Progress-in-reducing-emissions-in-Scotland-2023-Report-to-Parliament.pdf

2. *Digest of UK Energy Statistics Annual data for UK, 2021*, July 2022, Department for Business Energy and Industrial Strategy. Available from: www.assets.publishing.service.gov.uk/media/63e67810d3bf7f05c90013b4/DUKES_2022.pdf

3. *Energy Statistics for Scotland Q4 2021 Figures*, March 2022, Scottish Government. Available from: www.gov.scot/binaries/content/documents/govscot/publications/statistics/2018/10/quarterly-energy-statistics-bulletins/documents/energy-statistics-summary-march-2022/energy-statistics-summary-march-2022/govscot%3Adocument/Scotland%2BEnergy%2BStats%2BQ4%2B2021.pdf

4. *UK local and regional greenhouse gas emissions estimates for 2005-2022 Technical Report*, June 2024. Available from: assets.publishing.service.gov.uk/media/667ad7a7c7f64e234208ffc2/local-authority-ghg-technical-report-2022.pdf

5. *Buildings and Heat Strategy*, 2022, Net Zero Aberdeen. Available at: www.aberdeencity.gov.uk/sites/default/files/2022-11/Buildings%20and%20Heat%20Strategy.pdf

6. *Nestrans 2040 Regional Transport Strategy For the North East Of Scotland*, Nov 2021, Nestrans. Available from: www.nestrans.org.uk/wp-content/uploads/2021/12/Nestrans-RTS_PUBLISHED.pdf

7. *bp Aberdeen Hydrogen Hub*, 2025, bp Aberdeen Hydrogen Energy Ltd. Available at: www.bpabderdeenhydrogenhub.com/the-project/

This report intends to provide an overview of your area-wide greenhouse gas emissions in 2021.

(Note: The results are based on the SCIS teams' interpretation and methodology, which is continually being updated and is subject to future change and improvement. Data and analysis are correct as of January 2025. A reference sheet has been shared alongside this document defining each sector and with further clarity on some sub-sector categories).

Should you have any questions, please contact your Local Lead or email the SCIS team at

info@climateintelligenceservice.scot. We are more than happy to discuss details of this report in greater depth.