

Shetland Islands Council Annual Climate Change Report 2023 - 24
Appendix C - Emissions Breakdown

Raw energy, consumption and usage data

| Sector | Sub-Sector | Emissions Source | Unit | 2019 | 2020 | 2021 | 2022 | 2023 |
|----------------|--------------------------------|--|--------------|---------------|---------------|---------------|---------------|---------------|
| Domestic | All | Grid Electricity - Home Analytics Database | kWh | 26,519,466.00 | 25,881,606.14 | 25,486,426.63 | 25,225,396.00 | 26,575,886.00 |
| Domestic | All | Burning Oil - Home Analytics Database | kWh | 151,114.51 | 150,413.29 | 144,659.32 | 148,957.00 | 104,490.00 |
| Domestic | All | District Heating - Home Analytics Database | kWh | 1,299,286.06 | 1,293,256.90 | 1,380,230.04 | 1,465,809.10 | 1,379,299.00 |
| Domestic | All | Wood pellets - Home Analytics Database | kWh | 684,334.64 | 681,159.08 | 684,371.81 | 609,423.53 | 397,350.00 |
| Domestic | All | Water - Home Analytics Database | cubic meters | 211,714.00 | 218,593.00 | 218,847.00 | 216,809.00 | 221,395.00 |
| Non-Domestic | All | Grid electricity | kWh | 8,699,091.22 | 7,901,663.00 | 8,413,534.00 | 8,244,923.00 | 8,236,809.00 |
| Non-Domestic | All | District Heating | kWh | 6,589,781.00 | 6,593,450.00 | 6,628,106.33 | 5,979,112.00 | 6,016,116.00 |
| Non-Domestic | All | LPG | kWh | 8,567.00 | 153,176.00 | 146,584.00 | 153,075.22 | 198,487.24 |
| Non-Domestic | All | Gas Oil | kWh | 7,218,877.07 | 6,904,170.00 | 7,163,449.00 | 7,381,676.00 | 6,976,352.00 |
| Non-Domestic | All | Burning Oil | kWh | 507,188.29 | 379,729.00 | 454,120.00 | 362,568.00 | 343,793.00 |
| Non-Domestic | All | Water | cubic meters | 75,902.00 | 62,243.00 | 77,458.00 | 83,484.00 | 68,374.00 |
| Non-Domestic | All | Refrigerants | kg | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Non-Domestic | All | Wood Pellets | kWh | 1,167,951.00 | 1,017,783.00 | 1,262,474.00 | 1,072,718.00 | 1,127,338.00 |
| Non-Domestic | All | Hydrogen (Green) | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Council Vehicle Fleet | Diesel | kWh | 4,996,742.40 | 3,882,151.31 | 4,597,540.94 | 6,715,897.72 | 7,001,829.21 |
| Transport | Council Vehicle Fleet | Gas oil | kWh | 2,587,814.58 | 2,364,990.95 | 1,742,577.98 | 556,661.18 | 484,625.33 |
| Transport | Council Vehicle Fleet | Grid Electricity | kWh | 0.00 | 0.00 | 0.00 | 4,286.00 | 14,315.00 |
| Transport | Council Vehicle Fleet | Petrol | km | 700,955.00 | 700,955.00 | 849,264.00 | 755,450.00 | 702,120.00 |
| Transport | Council Vehicle Fleet | Hydrogen (Green) | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Vessels | Grid electricity | kWh | 901,987.00 | 894,727.00 | 838,274.00 | 905,440.00 | 850,804.00 |
| Transport | Vessels | Marine Gas Oil | kWh | 53,918,858.07 | 45,611,590.00 | 49,485,558.00 | 47,659,332.18 | 49,363,819.03 |
| Transport | Vessels | Biodiesel | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Vessels | Hydrogen (Green) | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Aircraft | Aviation Spirit | kWh | 536,811.12 | 367,141.86 | 433,370.81 | 496,291.66 | 463,918.15 |
| Transport | Aircraft | Grid Electricity | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Aircraft | Hydrogen (Green) | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Aircraft | Sustainable Aviation Fuel | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Business Travel | Taxi | km | 1,373.00 | 711.54 | 829.56 | 862.43 | 912.00 |
| Transport | Business Travel | Rail Travel | km | 25,447.00 | 13,187.58 | 15,375.04 | 15,984.18 | 16,900.00 |
| Transport | Business Travel | Air Travel | km | 541,515.00 | 280,633.11 | 327,182.50 | 340,145.05 | 359,639.00 |
| Transport | Employee Commute | Unknown Transport Fuel | km | 10,035,933.00 | 5,200,991.74 | 6,063,696.67 | 6,303,930.53 | 6,665,204.00 |
| Transport | Employee Commute | Local bus | km | 424,053.00 | 219,759.95 | 256,212.14 | 266,362.94 | 281,628.00 |
| Transport | Employee Commute | BEV | km | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Grey Vehicle Fleet | Petrol | km | 1,605,801.83 | 832,186.00 | 970,223.00 | 1,008,662.00 | 1,066,468.00 |
| Transport | Grey Vehicle Fleet | BEV | km | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infrastructure | Waste and other infrastructure | Grid Electricity | kWh | 5,357,846.67 | 4,761,204.00 | 4,344,901.00 | 4,182,971.00 | 4,091,950.00 |
| Infrastructure | Waste and other infrastructure | Burning Oil | kWh | 1,275,594.56 | 941,380.00 | 1,581,432.00 | 1,683,076.82 | 1,588,611.02 |
| Infrastructure | Waste and other infrastructure | Gas Oil | kWh | 1,491,942.82 | 1,380,197.00 | 1,307,470.00 | 1,242,108.20 | 1,278,641.74 |
| Infrastructure | Waste and other infrastructure | Water | cubic meters | 19,147.00 | 17,016.41 | 18,612.82 | 14,574.25 | 7,658.00 |
| Infrastructure | Waste and other infrastructure | ERP | tonnes | 21,411.00 | 22,844.00 | 19,535.00 | 23,681.00 | 23,410.00 |
| Infrastructure | Waste and other infrastructure | Landfill - Food & drink / organic | tonnes | 4.10 | 36.00 | 63.00 | 33.00 | 21.00 |
| Infrastructure | Waste and other infrastructure | Landfill - Commercial & Industrial | tonnes | 9,364.00 | 10,059.00 | 19,380.00 | 11,284.00 | 12,867.00 |
| Infrastructure | Waste and other infrastructure | Landfill - MSW | tonnes | 5,056.00 | 3,476.00 | 6,031.00 | 2,292.00 | 3,133.00 |
| Infrastructure | Waste and other infrastructure | Landfill - Textiles | tonnes | 81.00 | 209.00 | 194.00 | 182.00 | 395.00 |
| Infrastructure | Waste and other infrastructure | Landfill - Glass | tonnes | 19.10 | 3.00 | 17.00 | 0.00 | 11.00 |
| Infrastructure | Waste and other infrastructure | Landfill - Wood | tonnes | 6.10 | 9.00 | 16.00 | 6.00 | 9.00 |
| Infrastructure | Waste and other infrastructure | ERP-CCS | tonnes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infrastructure | Waste and other infrastructure | Recycling - All metals | tonnes | 699.00 | 862.00 | 713.00 | 658.00 | 629.00 |
| Infrastructure | Waste and other infrastructure | Recycling - Paper / board | tonnes | 643.00 | 775.00 | 792.00 | 769.00 | 702.00 |
| Infrastructure | Waste and other infrastructure | Recycling - Glass | tonnes | 639.00 | 549.00 | 449.00 | 777.00 | 566.00 |

Emission factor entry, kgCO2e/unit

| | | | 2019 | 2020 | 2021 | 2022 | 2023 |
|------------------------------------|--|--------------|---------|---------|---------|---------|---------|
| Energy based factors | | | | | | | |
| Grid Electricity | | kWh | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 |
| Grid Electricity T&D Losses | | kWh | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| Burning Oil | Litres must be converted to kWh | kWh | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| District Heating | Emissions per unit of heat delivered to council assets | kWh | 0.07 | 0.05 | 0.08 | 0.03 | 0.04 |
| Wood pellets | Tonnes must be converted to kWh | kWh | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 |
| LPG | Litres must be converted to kWh | kWh | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| Diesel | Litres must be converted to kWh | kWh | 0.24 | 0.24 | 0.24 | 0.24 | 0.25 |
| Gas oil | Litres must be converted to kWh | kWh | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| Marine Gas Oil | Litres must be converted to kWh | kWh | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| Aviation Spirit | Litres must be converted to kWh | kWh | 0.24 | 0.25 | 0.24 | 0.24 | 0.24 |
| Sustainable Aviation Fuel | Litres must be converted to kWh | kWh | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| Hydrogen (Green) | | kWh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Biodiesel | Litres must be converted to kWh | kWh | 0.00 | 0.02 | 0.02 | 0.02 | 0.24 |
| Usage based factors | | | | | | | |
| Water Supply | | cubic meters | 0.34 | 0.34 | 0.15 | 0.15 | 0.18 |
| Water Treatment | | cubic meters | 0.71 | 0.71 | 0.27 | 0.27 | 0.20 |
| Refrigerants | Average - Assumed R410a in 2019 | kg | 2088.00 | 2088.00 | 2088.00 | 2088.00 | 1924.00 |
| ERP | Note that this is average annual emissions factor | tonnes | 616.57 | 616.57 | 616.57 | 616.57 | 616.57 |
| Landfill - Food & drink / organic | | tonnes | 605.61 | 605.59 | 605.58 | 605.58 | 678.93 |
| Landfill - Commercial & Industrial | | tonnes | 131.29 | 159.60 | 98.56 | 154.82 | 146.43 |
| Landfill - MSW | | tonnes | 565.16 | 416.06 | 424.95 | 424.92 | 475.76 |
| Landfill - Textiles | | tonnes | 423.67 | 423.66 | 423.67 | 423.65 | 475.40 |
| Landfill - Glass | | tonnes | 8.99 | 8.93 | 8.90 | 8.88 | 8.88 |
| Landfill - Wood | | tonnes | 806.76 | 806.75 | 806.74 | 806.73 | 903.96 |
| Recycling - All metals | | tonnes | 21.35 | 21.32 | 21.29 | 21.28 | 21.28 |
| Recycling - Paper / board | | tonnes | 21.35 | 21.32 | 21.29 | 21.28 | 21.28 |
| Recycling - Glass | | tonnes | 21.35 | 21.32 | 21.29 | 21.28 | 21.28 |
| Distance based factors | | | | | | | |
| Petrol | | km | 0.18 | 0.17 | 0.17 | 0.17 | 0.16 |
| BEV | | km | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 |
| Taxi | | km | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| Rail Travel | | km | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| Air Travel | | km | 0.25 | 0.24 | 0.25 | 0.25 | 0.27 |
| Unknown Transport Fuel | | km | 0.18 | 0.17 | 0.17 | 0.17 | 0.17 |
| Local bus | | km | 0.12 | 0.12 | 0.12 | 0.11 | 0.12 |

Calculated emissions, kgCO2e

| Sector | Sub-Sector | Emissions Source | Unit | 2019 | 2020 | 2021 | 2022 | 2023 |
|----------------|--------------------------------|------------------------------------|--------|-------------|-------------|-------------|-------------|-------------|
| Domestic | All | Grid Electricity | kgCO2e | 19024652.23 | 18557111.60 | 18280032.66 | 18086608.93 | 19054910.26 |
| Domestic | All | Burning Oil | kgCO2e | 37287.51 | 37152.08 | 35730.85 | 37239.25 | 26122.50 |
| Domestic | All | District Heating | kgCO2e | 87310.41 | 70889.80 | 103745.50 | 38838.93 | 59338.44 |
| Domestic | All | Wood pellets | kgCO2e | 10696.15 | 10557.97 | 10573.54 | 6417.23 | 4267.54 |
| Domestic | All | Water | kgCO2e | 215228.45 | 222221.64 | 89158.27 | 88327.99 | 81462.29 |
| Non-Domestic | All | Grid electricity | kgCO2e | 6240592.68 | 5665492.37 | 6034571.99 | 5911609.79 | 5977492.05 |
| Non-Domestic | All | District Heating | kgCO2e | 442825.12 | 361419.55 | 498204.07 | 158426.02 | 258817.65 |
| Non-Domestic | All | LPG | kgCO2e | 1837.36 | 32851.66 | 31368.98 | 32145.80 | 41682.32 |
| Non-Domestic | All | Gas Oil | kgCO2e | 1853518.88 | 1772714.69 | 1841006.39 | 1919235.76 | 1813851.52 |
| Non-Domestic | All | Burning Oil | kgCO2e | 125148.71 | 93793.06 | 112167.64 | 90642.00 | 85948.25 |
| Non-Domestic | All | Water | kgCO2e | 77161.97 | 63276.23 | 31556.39 | 34011.38 | 25158.21 |
| Non-Domestic | All | Refrigerants | kgCO2e | 4221.51 | 4176.00 | 4176.00 | 4176.00 | 3848.00 |
| Non-Domestic | All | Wood Pellets | kgCO2e | 18255.07 | 15775.64 | 19505.22 | 11295.72 | 12107.61 |
| Non-Domestic | All | Hydrogen (Green) | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Council Vehicle Fleet | Diesel | kgCO2e | 1227302.13 | 935598.46 | 1089617.20 | 1611815.45 | 1762950.04 |
| Transport | Council Vehicle Fleet | Gas oil | kgCO2e | 664447.27 | 607235.08 | 447842.54 | 144731.91 | 126002.59 |
| Transport | Council Vehicle Fleet | Grid Electricity | kgCO2e | 0.72 | 0.00 | 0.00 | 3073.06 | 10263.86 |
| Transport | Council Vehicle Fleet | Petrol | kgCO2e | 126760.70 | 122176.46 | 148026.72 | 128804.23 | 115083.79 |
| Transport | Council Vehicle Fleet | BEV | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Council Vehicle Fleet | Hydrogen (Green) | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Vessels | Grid electricity | kgCO2e | 647071.44 | 641519.26 | 601248.51 | 649200.48 | 610026.47 |
| Transport | Vessels | Marine Gas Oil | kgCO2e | 13930476.17 | 11784210.39 | 1276273.96 | 12391426.37 | 12734748.10 |
| Transport | Vessels | Biodiesel | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Vessels | Hydrogen (Green) | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Aircraft | Aviation Spirit | kgCO2e | 131277.16 | 90001.16 | 105634.14 | 119110.00 | 113112.67 |
| Transport | Aircraft | Grid Electricity | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Aircraft | Hydrogen (Green) | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Aircraft | Sustainable Aviation Fuel | kgCO2e | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Business Travel | Taxi | kgCO2e | 206.20 | 103.52 | 123.41 | 128.30 | 135.67 |
| Transport | Business Travel | Rail Travel | kgCO2e | 1047.14 | 487.15 | 567.95 | 567.28 | 599.78 |
| Transport | Business Travel | Air Travel | kgCO2e | 138048.42 | 68558.67 | 80486.89 | 83631.46 | 98030.40 |
| Transport | Employee Commute | Unknown Transport Fuel | kgCO2e | 1777363.73 | 891449.98 | 1039923.64 | 1076080.94 | 1110682.93 |
| Transport | Employee Commute | Local bus | kgCO2e | 51208.64 | 26261.31 | 30166.42 | 28767.20 | 33334.33 |
| Transport | Employee Commute | BEV | kgCO2e | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| Transport | Grey Vehicle Fleet | Petrol | kgCO2e | 290393.20 | 145050.02 | 169109.87 | 171976.87 | 174803.70 |
| Transport | Grey Vehicle Fleet | BEV | kgCO2e | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infrastructure | Waste and other infrastructure | Grid Electricity | kgCO2e | 3843635.83 | 3413783.27 | 3116362.03 | 2999190.21 | 2933928.15 |
| Infrastructure | Waste and other infrastructure | Burning Oil | kgCO2e | 314752.96 | 232520.86 | 390613.70 | 420769.21 | 397152.76 |
| Infrastructure | Waste and other infrastructure | Gas Oil | kgCO2e | 883071.24 | 354379.38 | 336019.79 | 322948.13 | 332446.85 |
| Infrastructure | Waste and other infrastructure | Water | kgCO2e | 19464.84 | 17298.88 | 7582.86 | 5937.55 | 2517.76 |
| Infrastructure | Waste and other infrastructure | ERP | kgCO2e | 13201423.72 | 14085034.73 | 12044788.72 | 14601107.84 | 14434016.07 |
| Infrastructure | Waste and other infrastructure | Landfill - Food & drink / organic | kgCO2e | 2482.98 | 21801.24 | 38151.60 | 19984.01 | 14257.51 |
| Infrastructure | Waste and other infrastructure | Landfill - Commercial & Industrial | kgCO2e | 1229399.56 | 1605416.40 | 1910092.80 | 1746988.88 | 1884114.81 |
| Infrastructure | Waste and other infrastructure | Landfill - MSW | kgCO2e | 2857447.95 | 1446207.18 | 2562861.39 | 973925.81 | 1490568.61 |
| Infrastructure | Waste and other infrastructure | Landfill - Textiles | kgCO2e | 34317.59 | 88544.73 | 82192.76 | 77103.39 | 187783.79 |
| Infrastructure | Waste and other infrastructure | Landfill - Glass | kgCO2e | 171.69 | 26.80 | 151.33 | 0.00 | 97.72 |
| Infrastructure | Waste and other infrastructure | Landfill - Wood | kgCO2e | 4921.25 | 7260.73 | 12907.82 | 4840.40 | 8135.68 |
| Infrastructure | Waste and other infrastructure | ERP-CCS | kgCO2e | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infrastructure | Waste and other infrastructure | Recycling - All metals | kgCO2e | 14926.31 | 18375.25 | 15182.62 | 14215.04 | 13385.75 |
| Infrastructure | Waste and other infrastructure | Recycling - Paper / board | kgCO2e | 13730.49 | 16520.68 | 16864.85 | 16364.32 | 14939.26 |
| Infrastructure | Waste and other infrastructure | Recycling - Glass | kgCO2e | 13645.08 | 11703.03 | 9561.01 | 16534.56 | 12045.05 |