



Operational Emissions Progress Report 2020-2025

ZERO EMISSIONS Shellharbour

Tackling Climate Change Together

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Organisational Information

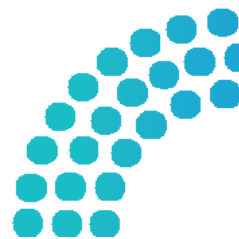
Entity name	COUNCIL OF THE CITY OF SHELLHARBOUR
Agencies and divisions	Shellharbour City Council operationally controlled facilities, assets and services.
Reporting period	FY2019/20 – Baseline FY2022/23 to FY2024/25
Reporting Boundary	Operational Control
Description of Operations	Shellharbour City Council is a local government authority responsible for the delivery of infrastructure, services, facilities, waste management, and community programs within the Shellharbour Local Government Area, NSW.

Emissions Boundary

Included in emissions boundary	Included in emissions boundary	Excluded from boundary
Quantified	Non-quantified	Outside boundary or not relevant
Carbon Offsets Electricity Natural Gas Stationary Fuel Transport Fuel Waste (sent to landfill)	Accommodation Acquisitions Advertising & Media Bottled Gas (LPG and industrial) Bulk Fuel (Generators) Business Travel Carbon Credits (Created) Carbon Credits (Purchased and retired) Catering Cleaning & Chemicals Consumables Events Floor Coverings & Furniture Hardware ICT services and equipment Infrastructure materials Insurances Labour Hire Library Services Licenses and Subscriptions Office equipment and supplies Office Supplies Oils, Lubricants, and greases Organic Waste Paints & Sealants Plant Purchase & Hire Postage, courier and freight Professional services Recycled Waste Refrigerants Regulatory Fees, Government Charges and fines Repairs and Maintenance Training and Development Turf & Landscaping Uniform & Protective Equipment Water Waste management services	Land use, land use change and forestry (LULUCF) Wastewater treatment (fugitive emissions)

Justification for non-quantification or exclusions

This report focuses on Scope 1 and Scope 2 emissions. Process development to collect reliable and accurate data for Scope 3 emissions is ongoing and will be included in future emissions reporting. Items excluded from the emissions boundary do not occur within Shellharbour City Council's operational control.



Carbon Neutral Commitment & Offsetting

Shellharbour City Council has committed to achieving net zero operational emissions by 2035, as adopted in the Zero Emissions Shellharbour Strategy 2022–2050. This report has been prepared in good faith to support transparency and Council’s pathway toward future Climate Active certification by documenting emissions, reduction actions, and indicative offset requirements. Shellharbour City Council is not yet making a certified carbon neutral claim for the reporting period, as eligible offsets have not yet been formally retired.

Renewable Electricity

Council sources renewable electricity through a combination of:

- Renewable Power Purchase Agreements (RPPAs) for large sites and streetlighting
- 100% GreenPower for smaller facilities
- Onsite solar PV generation

Renewable electricity instruments (LGCs / GreenPower certificates) will be documented and disclosed in future reporting prior to pursuing Climate Active certification.

Emission calculation methodologies, guidance and emission factors

Verification and assurance

Council’s emissions inventory has been prepared in alignment with:

- National Greenhouse and Energy Reporting (NGER) framework
- Australian National Greenhouse Accounts (NGA) Factors
- Climate Active Carbon Neutral Standard for Organisations

Independent third party validation will be undertaken prior to any formal Climate Active carbon neutral claim.

Calculation methodology/guidance adopted

Electricity (NSW/ACT)

- **2019–2020:** NGER Measurement Determination 2019, NGA Factors 2019
- **2020–2021:** NGA Factors, Australian National Greenhouse Accounts, Oct 2020
- **2021–2022:** NGER Measurement Determination 2021, NGA Factors 2021
- **2022–2023:** NGER Measurement Determination 2022, NGA Factors 2022
- **2023–2024:** Australian National Greenhouse Accounts Factors, Aug 2023
- **2024–2025:** DCCEEW 2024A

Natural Gas (NSW/ACT)

- **2019–2020:** NGER Measurement Determination 2019, NGA Factors 2019
- **2020–2021:** NGA Factors, Australian National Greenhouse Accounts, Oct 2020
- **2021–2022:** NGER Measurement Determination 2021, NGA Factors 2021
- **2022–2023:** NGER Measurement Determination 2022, NGA Factors 2022
- **2023–2024:** Australian National Greenhouse Accounts Factors, Aug 2023
- **2024–2025:** DCCEEW 2024A

Stationary & Transport Fuels

- **2019–2020:** NGER Measurement Determination 2019, NGA Factors 2019
- **2020–2021:** NGA Factors, Australian National Greenhouse Accounts, Oct 2020
- **2021–2022:** NGER Measurement Determination 2021, NGA Factors 2021
- **2022–2023:** NGER Measurement Determination 2022, NGA Factors 2022
- **2023–2024:** Australian National Greenhouse Accounts Factors, Aug 2023
- **2024–2025:** DCCEEW 2024A

Waste (Landfill & Organic)

- **2019–2020:** DCCEEW 2019
- **2022–2023:** DCCEEW 2022
- **2023–2024:** DCCEEW 20203
- **2024–2025:** DCCEEW 2024A

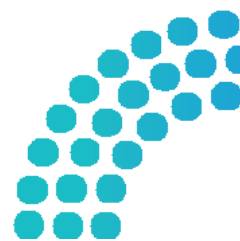
Offsets

- Calculated by Trellis Technologies and Shell Energy GreenPower program.

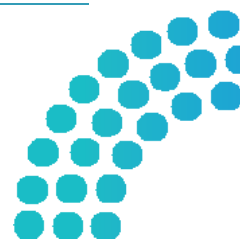


Definitions

TERM	DEFINITION
Adaptation	Refers to the process of adjusting to actual or expected climate and environmental changes to reduce risks and enhance resilience. It includes measures such as infrastructure upgrades, policy changes, and community planning to mitigate the impacts of climate change on ecosystems, economies, and societies.
Tonnes Carbon Dioxide Equivalence (tCO ₂ -e)	A standard measure that takes account of the global warming potential of different greenhouse gases and expresses the effect in a common unit.
Carbon Footprint	The amount of carbon dioxide re- leased into the atmosphere as a result of the activities of a particular individual, organisation, or community.
Carbon Neutral	(see also Net Zero Emissions) refers to when the net emissions associated with an activity are equal to zero because emissions have been reduced and/or offset to fully account for all emissions. Usually, offsets are created through purchasing carbon credits to make up the difference. The best practice approach is to reduce, or avoid, carbon emissions first, then offset any unavoidable emissions.
Circular Economy	An economic model that prioritises waste minimisation, resource efficiency, and the reuse, repair, and recycling of materials to reduce environmental impact.
Climate Active (Carbon Neutral Standard)	A standard for making carbon neutral claims; maintained by Australian Government Department of the Environment and Energy; sets rules for measuring, reducing, validating and reporting emissions. The standard is available for organisations, products and service, buildings, precincts and events. (Previously National Carbon Offset Standard)
Climate Active Certification	An Australian Government certification for organisations, products, or services that achieve net zero emissions through verified emissions reduction and offsetting initiatives.
Climate Resilience	Refers to the ability of communities, ecosystems, and infrastructure to anticipate, prepare for, respond to, and recover from climate-related impacts. It involves strengthening adaptive capacity, reducing vulnerabilities, and implementing strategies that enhance long-term sustainability in the face of extreme weather events, rising temperatures, and other climate risks.
Emissions Boundary (See also, Scope 1, Scope 2, and Scope 3)	An emissions boundary is the extent to which an organisation or entity defines the scope of emissions within their inventory. It can include sources of emissions resulting either directly or indirectly from the operations or facilities within the organisation or entity, and is categorised into Scope 1, Scope 2 or Scope 3 emissions.
Energy Efficiency	Using less energy to achieve the same output.
Energy Saving Certificates (ESCs)	A financial incentive program where organisations earn tradeable certificates for implementing energy-saving projects, which can be sold to obligated parties to meet regulatory requirements.
Environmental, Social, and Governance (ESG)	refers to a framework used to assess an organisation's sustainability and ethical impact. It includes environmental factors such as carbon emissions, energy use, and resource management, social aspects including community engagement, diversity, and labor practices, and governance considerations such as transparency, ethics, and corporate accountability.
Greenhouse Gas (GHG)	The atmospheric gases responsible for causing global warming and climate change. The Kyoto Protocol lists six greenhouse gases – carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur-hexafluoride (SF ₆) – with the addition of nitrogen trifluoride (NF ₃) from the beginning of the protocol's second commitment period.



TERM	DEFINITION
Kilowatt-hour (kWh)	A kilowatt-hour (kWh) is a unit of energy equal to one kilowatt of power used (or produced) continuously for one hour.
Landfill Capping	Refers to a containment technology that involves placing a cover over contaminated material, such as landfill waste, thereby shielding humans and the environment from the harmful effects of its contents.
Local carbon offsetting	Refers to certified carbon offsetting or sequestration activities and projects within the Shellharbour LGA or wider Illawarra area, used to offset the emissions whilst simultaneously stimulating the local economy.
Landfill Gas Capture & Flare	A process where methane gas produced from waste decomposition in landfills is captured and combusted (flared) to reduce greenhouse gas emissions.
Local Government Area (LGA)	The administrative area covered by local government councils in Australia
Megawatt-hour (MWh)	A megawatt-hour (MWh) is a unit of energy equal to one megawatt of power used (or produced) continuously for one hour (1 MWh = 1,000 kWh).
Mitigate	In relation to climate change, refers to efforts to reduce or prevent emission of greenhouse gases.
Net Zero Emissions	(see also Carbon Neutral) refers to when the net emissions associated with an activity are equal to zero because emissions have been reduced and/or offset to fully account for all emissions. Usually offsets are created through purchasing carbon credits to make up the difference. The best practice approach is to reduce, or avoid, carbon emissions first, then offset any unavoidable emissions.
Offsetting	The activity of cancelling offset units/carbon credits, where an entity has directly exchanged the value of their emissions for an equivalent value of carbon sequestered from the atmosphere.
Renewable Energy	Energy from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat.
Renewable Power Purchase Agreement (RPPA)	A long-term contract between an electricity buyer (such as Council) and a renewable energy generator to procure a fixed amount of electricity at a stable price, ensuring cost certainty and emissions reductions.
Scope	Refers to the categorisation of emissions sources into direct and indirect sources.
Scope 1 Emissions	The release of greenhouse gases into the atmosphere as a direct result of activities occurring within a responsible entity's control (or geographic boundary).
Scope 2 Emissions	The release of greenhouse gases into the atmosphere from the consumption of electricity, heating, cooling or steam that is generated outside of a responsible entity's control (or geographic boundary).
Scope 3 Emissions	Greenhouse gases emitted as a consequence of a responsible entity's activities but emitted outside the responsible entity's control (or geographic boundary).
Sustainability Revolving Fund (SRF)	An internal funding mechanism designed to finance sustainability projects that generate emissions reductions and financial savings, with cost savings reinvested into future initiatives.
Trellis	An emissions data software platform used by Council to collect, manage, and report greenhouse gas emissions data, aligning with national and international accounting standards.



1. Executive Summary

This report provides an overview of Shellharbour City Council's operational greenhouse gas emissions for the financial years 2020 to 2025, including an update to Council's 2019/20 emissions baseline to reflect improved data quality and boundary adjustments.

The report assesses Council's progress toward the targets established in the Zero Emissions Shellharbour Strategy 2022–2050 and the Operational Emissions Reduction Plan. Sustainability remains a core value of Shellharbour City Council, embedded across decision making, strategic planning, and operational practices. By tracking emissions performance, identifying reduction opportunities, and maintaining transparent reporting, Council continues to demonstrate leadership in climate action and alignment with state and federal policy direction-making, strategic planning, and operational practices.

Key Findings

Significant progress has been achieved in reducing emissions from Council's electricity use, driven by energy efficiency upgrades and increased adoption of renewable energy across Council facilities and within the electricity network. Notable achievements include:

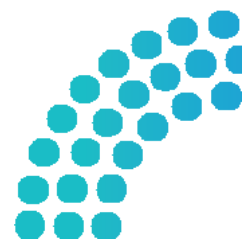
- 8% reduction in emissions from overall electricity consumption
- 63% reduction in emissions from streetlighting

These reductions reflect optimisation of energy assets, widespread LED upgrades, and procurement of renewable electricity. Increases were observed in Natural Gas, Waste (sent to landfill), and Fuel consumption, however, Council has maintained a 0% net increase in emissions since 2019/20. Growth in landfill emissions is the largest source of Council's operational carbon footprint, and highlights the need to accelerate waste related mitigation initiatives, including landfill gas capture and diversion strategies.

The table below shows Council's Scope 1 and Scope 2 emissions for the reporting period and the overall change (see Chapter 4 for more information).

Emission source	FY2019-20 (tCO ₂ -e)	FY2022-23 (tCO ₂ -e)	FY2023-24 (tCO ₂ -e)	FY2024-25 (tCO ₂ -e)	Change (%)
Electricity	3,133	2,983	2,894	2,870	-8%
Streetlighting	2,751	1,819	1,119	1,018	-63%
Natural gas	306	644	411	504	64%
Stationary fuel	288	298	320	317	10%
Transport fuel	578	892	950	1,002	12%
Waste (sent to landfill)	41,554	45,068	49,869	51,043	23%
Total gross emissions	48,610	51,704	55,563	56,754	17%
Carbon offsets (capture & Flare)	-18,810	-29,578	-23,694	-25,755	40%*
GreenPower offsetting electricity	0	-1984	-2919	-1233	-38%*
Total net emissions	29,800	20,142	28,950	29,766	0%

This report outlines Council's key emissions reduction actions delivered between 2020 and 2025 and provides recommendations to ensure continued progress toward the target of net zero operational emissions by 2035.



Council has worked to progress the seven objectives of the Zero Emissions Shellharbour Strategy 2022-2050 during the reporting period and has completed 14 of the 45 actions outlined in the Operational Emissions Reduction Plan (OERP) to achieve Council's three net zero targets:

Council's Operational Targets



Community Target



2. Achieving Net Zero

Local Government Emissions Reporting Obligations

Councils in New South Wales operate under the Local Government Act 1993 and associated regulatory frameworks, including the Integrated Planning and Reporting (IP&R) framework, which requires transparent reporting on organisational performance, sustainability outcomes and risk management. While there is currently no statutory obligation for councils to report their greenhouse gas emissions, climate change considerations and risk disclosures are increasingly embedded within broader reporting expectations for public entities.

The NSW Government has established a range of climate-related reporting frameworks and tools to support public sector transparency and progress towards State emissions reduction objectives, including greenhouse gas emissions accounting guidance aligned with international standards.

Emissions reporting is currently voluntary but strategically valuable, supports climate governance, and positions Council for future regulatory alignment and community transparency. New Australian Sustainability Reporting Standards have been introduced, and Council may be obligated to meet local government requirements in the future.

Net Zero in Practice

Net zero refers to balancing the amount of greenhouse gases (GHGs) emitted with the amount removed from the atmosphere. This is achieved by reducing emissions as much as possible through operational controls and then offsetting any remaining emissions through activities like carbon sequestration or purchasing accredited carbon offsets.



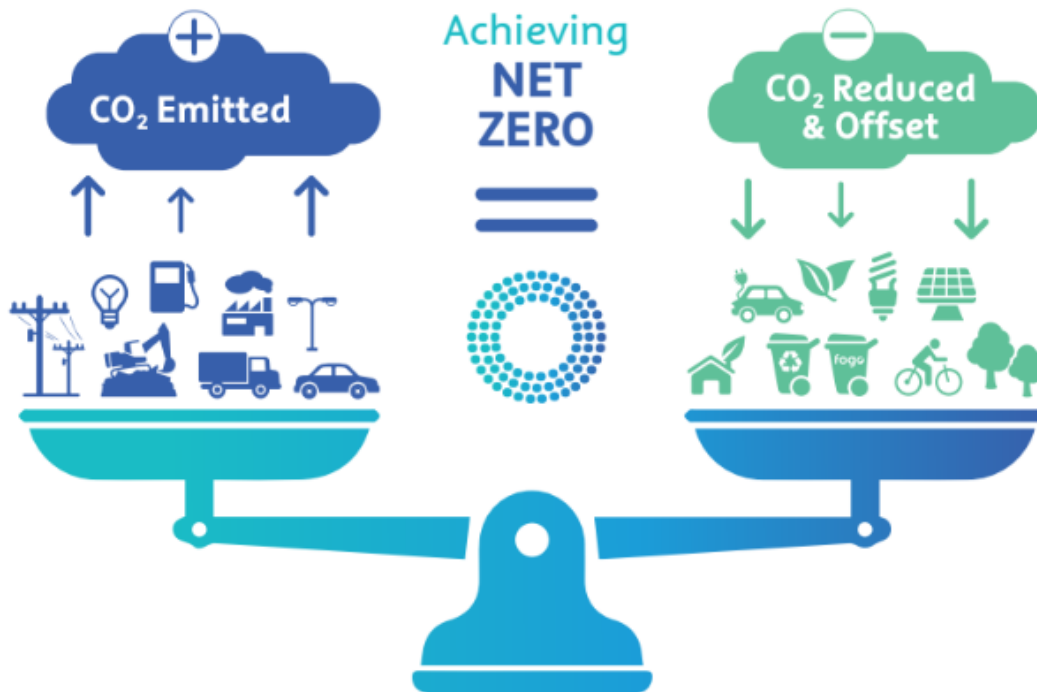


Figure 1 Achieving net zero – Zero Emissions Shellharbour Strategy 2022-2050

Strategic Alignment

Australia's Net Zero Plan

2030 Interim Target: A 43% reduction in emissions below 2005 levels

2035 Interim Target: A 62-70% reduction below 2005 levels, set as a key step towards 2050

Overall Goal: Legislatively enshrined under the Climate Change Act 2022 to achieve net zero greenhouse gas emissions by 2050

NSW Net Zero: Stage 1 2020-2030

2030 Interim Target: 50% reduction in emissions compared to 2005 levels

2035 Interim Target: 70% reduction in emissions compared to 2005 levels (an acceleration of the pathway)

Overall Goal: Achieve net zero greenhouse gas emissions by 2050

NSW Illawarra Shoalhaven Regional Plan 2041

Objective 15 *Plan for a net zero region by 2050* details the actions and initiatives needed at a regional level to meet state and federal targets

Community Strategic Plan (CSP)

Objective 2.1 *We are sustainable and resilient*, includes actions that mitigate the impacts of climate change through policies and practices that prioritise environmental integrity and emissions reduction

strategies for Council and the community

Local Strategic Planning Statement (LSPS)

Planning Priority 3: Protect and enhance Shellharbour's blue and green corridors

Planning Priority 4: Plan for a sustainable and resilient City

Planning Priority 5: Foster resilient places and communities that adapt to climate change

Zero Emissions Shellharbour Strategy (ZESS) 2022-2050

Objective A - Electricity: Improve electricity efficiency and transition to 100% renewable energy by 2025

Objective B - Fuel: Optimise fuel efficiency and transition to renewable fuel sources

Objective C - Natural Gas: Eliminate natural gas consumption across Council facilities

Objective D - Waste: Improve Operational Energy Efficiency of Dunmore Waste & Recycling Depot and reduce emissions from landfill

Objective E - Governance: Build capacity of Council to reduce emissions as business as usual

Objective F - Scope 3 Emissions: Define and reduce Scope 3 emissions from Council's operations

Objective G - Carbon Offsets: Offset remaining emissions to reach net zero target with preference for local offsetting in Shellharbour LGA

Operational Emissions Reduction Plan (OERP)

The OERP outlines 45 actions to reduce emissions across seven key sustainability areas. Council's OERP review cycle is biennial to keep pace with emerging technology, funding opportunities, and to ensure the actions are driving progress towards the targets set under the ZESS.

3. Carbon Accounting Principles

Frameworks and Standards

Council's emissions reporting aligns with national and internationally recognised frameworks and carbon accounting standards to ensure transparency, comparability, and compliance:

- **GHG Protocol (Greenhouse Gas Protocol)**
The world's most widely used standard for corporate greenhouse gas accounting and reporting, including Scope 1 (direct), Scope 2 (purchased electricity), and Scope 3 (value chain) emissions.
- **Australian National Greenhouse Accounts (ANGA)**
The Australian National Greenhouse Accounts are the overall national system for measuring and reporting Australia's greenhouse gas emissions and removals. They are used by the Australian Government to track national emissions over time, meet



international reporting obligations (e.g. under the UNFCCC and Paris Agreement) and set and assess national climate targets.

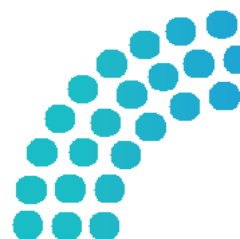
- **National Greenhouse and Energy Reporting (NGER) Scheme**
Australia's mandatory national framework for large organisations to measure and report greenhouse gas emissions, energy production and energy consumption under the *NGER Act 2007*.
- **Climate Active**
The Australian Government's voluntary carbon neutrality framework that sets requirements to measure emissions, reduce where possible, and offset the remainder using eligible carbon credits to claim "carbon neutral" certification.
- **National Greenhouse Accounts Factors (NGA Factors)**
Australian Government-published annual emission factors (e.g., electricity, fuels, waste) used to calculate greenhouse gas emissions consistently in line with national inventory methods.
- **ISO Sustainability Standards**
International standards that support consistent sustainability and emissions management across organisations; commonly including ISO 14064 (GHG accounting/verification), ISO 14001 (environmental management systems), and ISO 50001 (energy management).

Scopes of Emissions

Greenhouse gas emissions are typically categorised into **Scopes 1, 2 and 3** to distinguish between **direct** and **indirect** sources:

- **Scope 1 (Direct emissions):** Emissions released directly from sources an organisation owns or controls, such as fuel combustion in fleet vehicles, natural gas use in buildings, and refrigerant leakage.
- **Scope 2 (Indirect emissions – energy):** Emissions generated off-site from the production of purchased electricity (and sometimes steam, heating or cooling) that the organisation consumes.
- **Scope 3 (Indirect emissions – value chain):** All other indirect emissions occurring across the organisation's value chain, including purchased goods and services, waste, business travel, employee commuting, and upstream/downstream transport and distribution.

Council reports emissions using these categories to provide a comprehensive view of its operational and value chain impacts.



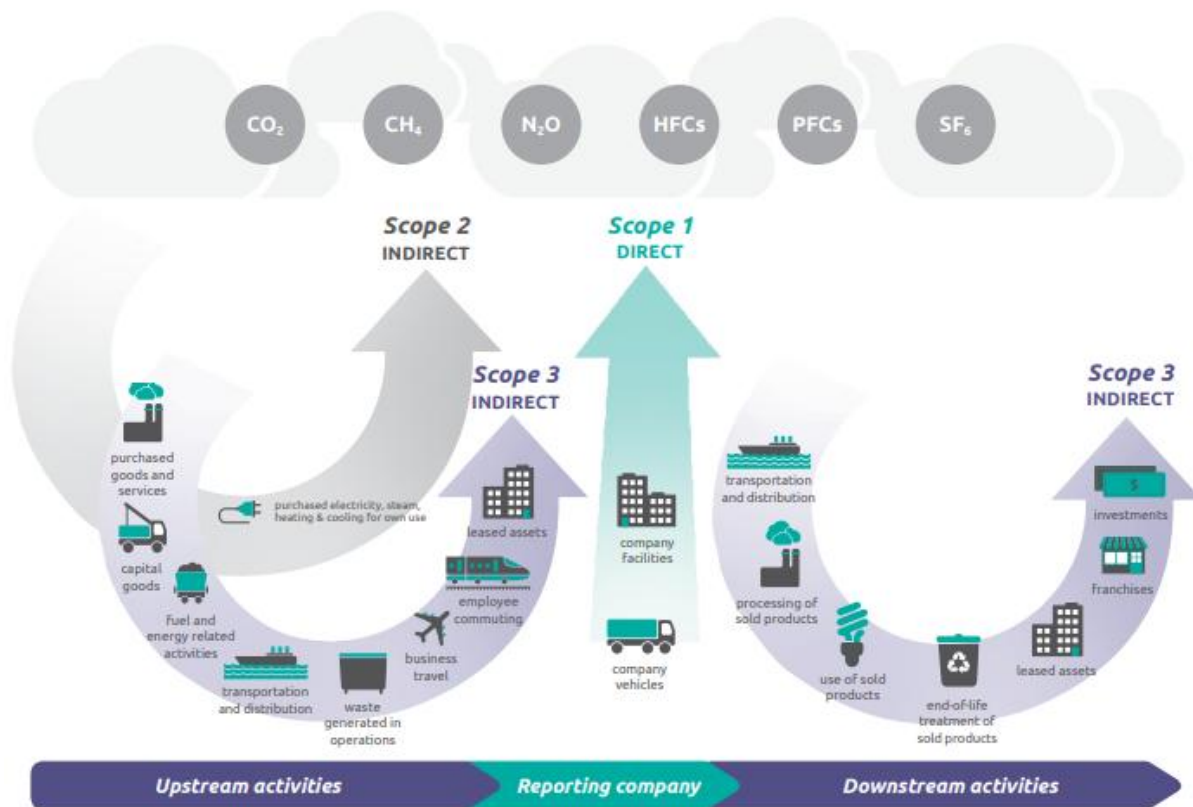


Figure 1: [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#)

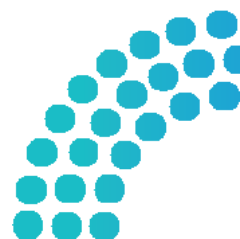
Reporting Process

Accurate carbon accounting depends on robust data management. Council uses the *Trellis Technologies* emissions data platform, which was procured in 2023 for automated tracking, management, calculation and reporting of emissions data. This approach supports compliance with national and international frameworks, improving transparency, efficiency, and confidence for decision-making.

Council’s annual emissions reporting follows a structured process:

Step	Description
1. Data Collection	Gather primary data (energy bills, fuel records, waste data) and evaluate relevance, completeness, accuracy throughout the year
2. Emissions Calculation	Data is third-party validated through the Trellis Technologies system and appropriate emissions factors applied
3. Internal Review	Conduct internal review of draft results
4. Audit & Assurance	Independent verification may be undertaken periodically to enhance credibility and assurance.
5. Submission & Disclosure	Report emissions to Council, regulatory bodies, and publish publicly

This structured process ensures emissions data is accurate, transparent, and aligned with compliance frameworks, fostering stakeholder confidence and informed decision-making.



4. Emissions Profile Overview

In 2022, Council engaged Ironbark Sustainability to undertake an operational emissions baseline assessment. The initial baseline of **7,521 tCO₂-e**, reported in the *Zero Emissions Shellharbour Strategy*, has since been revised to **29,800 tCO₂-e** to include emissions from Waste (sent to landfill). These emissions were previously excluded as they did not meet the National Greenhouse and Energy Reporting (NGER) threshold. However, fugitive emissions (methane and carbon dioxide from waste and animal product decomposition) fall within Council's operational control as detailed in the GHG Protocol Corporate Standard: [Waste – Scope 1 Emissions Sources](#). The inclusion reflects Council's capacity to reduce impacts through optimised landfill gas capture and flare systems, as well as community education and behaviour change initiatives.

2019/20 – 2024/25 Overview

While electricity-related emissions have declined due to renewable energy procurement and efficiency upgrades, gross emissions in all other Scope 1 and Scope 2 areas have increased since FY22/23, primarily due to landfill contributions. This trend underscores the need to accelerate waste management initiatives, explore carbon offsetting opportunities, and expand Scope 3 reporting to maintain progress toward Council's 2035 net zero target. Council has made progress through optimising the landfill gas capture and flare system, which has resulted in an average of 52% carbon abatement across the years.

The tables below show gross annual emissions by source and year.

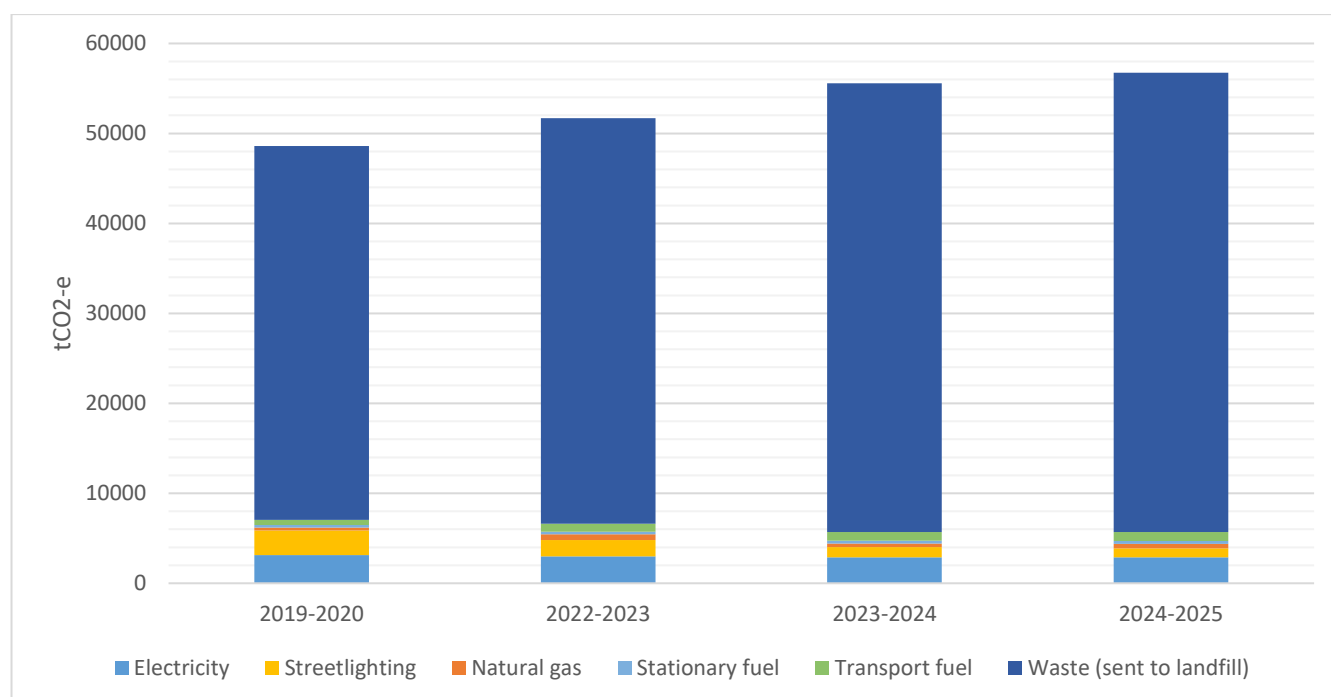
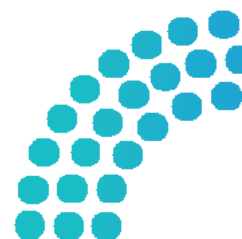


Figure 2 Trellis export – Gross Carbon footprint over time for each emission source (t CO₂-e)



Emission source	FY2019-20 (tCO ₂ -e)	FY2022-23 (tCO ₂ -e)	FY2023-24 (tCO ₂ -e)	FY2024-25 (tCO ₂ -e)	Change (%)
Electricity	3,133	2,983	2,894	2,870	-8%
Streetlighting	2,751	1,819	1,119	1,018	-63%
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Total gross emissions	48,610	51,704	55,563	56,754	17%
Carbon offsets (capture & Flare)	-18,810	-29,578	-23,694	-25,755	40%*
GreenPower offsetting electricity	0	-1984	-2919	-1233	-38%*
Total net emissions	29,800	20,142	28,950	29,766	0%

Figure 3 Trellis export – Scope 1 and Scope 2 GHG emissions by source and year

* A positive carbon offset (capture & flare) total indicates improved methane capture and flaring performance, which reduces overall greenhouse gas intensity by converting methane into the less potent carbon dioxide. A negative carbon offset (GreenPower) indicates a reduction in electricity consumed from the grid that is required to be offset.

2019/2020 – Baseline (revised)

Emissions Summary

Shellharbour City Council's operational emissions for the 2019/20 baseline year totalled **29,800 tCO₂-e**. The largest contributor to gross emissions was Waste, accounting for 85.5% of emissions, followed by electricity at 6.4% and streetlighting at 5.7%. Transport Fuel represented 1.2%, while Natural Gas and Stationary Fuel each contributed <1%.

The landfill gas capture and flaring system achieved total abatement of 18,810 tCO₂-e, 45% of waste emissions.

Overall, Scope 1 direct emissions made up 86% of Council's operational emissions, with Scope 2 accounting for 12%.

Scope 3 emissions were immaterial and separately account for <3% of the total emissions profile at 1,343 tCO₂-e.

2020/2021 & 2021/2022

No data quantified due to significantly disrupted operations during the global corona virus pandemic throughout 2020 to 2022.



2022/2023

Emissions Summary

Shellharbour City Council's operational emissions for the 2022/23 reporting year totalled **20,142 tCO₂-e**. The largest contributor to gross emissions was Waste, accounting for 87.2% of emissions, followed by Electricity at 5.8% and Streetlighting at 3.5%. Transport Fuel represented 1.7%, Natural Gas at 1.2%, and Stationary Fuel <1%.

The landfill gas capture and flaring system achieved total abatement of 29,578 tCO₂-e, 66% of waste emissions.

Overall, Scope 1 direct emissions made up 86% of Council's operational emissions, with Scope 2 accounting for 9%.

Scope 3 emissions were immaterial or incomplete and separately account for 5% of the total emissions profile at 2,813 tCO₂-e.

2023/2024

Emissions Summary

Shellharbour City Council's operational emissions for the 2023/24 reporting year totalled **28,950 tCO₂-e**. The largest contributor to gross emissions was Waste, accounting for 89.8% of emissions, followed by Electricity at 5.2% and Streetlighting at 2%. Transport Fuel represented 1.7%, while Natural Gas and Stationary Fuel each contributed <1%.

The landfill gas capture and flaring system achieved total abatement of 23,694 tCO₂-e, 48% of waste emissions.

Overall, Scope 1 direct emissions made up 89.4% of Council's operational emissions, with Scope 2 accounting for 7%.

Scope 3 emissions were immaterial or incomplete and separately account for <4% of the total emissions profile at 2,128 tCO₂-e.

2024/2025

Emissions Summary

Shellharbour City Council's operational emissions for the 2024/25 reporting year totalled **29,766 tCO₂-e**. The largest contributor to gross emissions was Waste, accounting for 89.9% of emissions, followed by Electricity at 5.1% and Streetlighting at 1.8%. Transport Fuel represented 1.8%, while Natural Gas and Stationary Fuel each contributed <1%.

The landfill gas capture and flaring system achieved total abatement of 25,755 tCO₂-e, 50% of waste emissions.

Overall, Scope 1 direct emissions made up 93% of Council's operational emissions, with Scope 2 accounting for 7%.

Scope 3 emissions were immaterial or incomplete and separately account for 4% of the total emissions profile at 2,136 tCO₂-e.



Scope 3

Council is actively progressing work to incorporate additional Scope 3 emissions sources in alignment with Objective F – Expanding the Scope 3 Inventory, reinforcing its commitment to a more comprehensive and transparent approach to carbon accounting. This expanded methodology will strengthen Council’s capacity to identify, measure, and reduce indirect emissions associated with service delivery, supporting improved sustainability outcomes and alignment with best-practice reporting frameworks.

In 2025/26, the Scope 3 program will focus on quantifying emissions generated through the construction, maintenance, and servicing of public infrastructure. This work represents a significant step towards capturing the embodied carbon impacts of Council’s capital and operational works programs.

The Sustainable Infrastructure Design (SID) Policy and Guidelines have been developed for operational practice to embed sustainability considerations into every infrastructure project. The SID framework enhances data capture processes for materials procurement, supply chain logistics, and construction activities, enabling more accurate and consistent reporting of infrastructure-related emissions.

This initiative will quantify the embodied carbon of key construction materials, such as concrete, steel, and asphalt used across capital works projects. These insights will support the assessment and adoption of low-carbon material alternatives, alongside the integration of circular economy principles, consistent with Council’s Procurement Policy.

Notable changes and anomalies

Several factors influenced Council’s emissions profile over the reporting period. The most significant was the revision of the 2019/20 baseline to include landfill emissions, aligning the inventory with Council’s operational control boundary and recognising landfill as the dominant source of operational emissions. A gap in emissions data between 2020 and 2022 occurred due to COVID-19 disruptions, limiting year-on-year trend analysis. From 2022/23 onwards, emissions increased as operations normalised post-pandemic, driven primarily by rising landfill emissions. Across this period, waste consistently accounted for an average of 88% of total emissions. Growth in landfill emissions reflects increased waste volumes in proportion to population growth, changes in waste composition, variable gas outputs from the biological processes of a landfill, improved data quality, and methodological alignment. Council continues to progressively expand gas capture infrastructure, and improve landfill management practices to further increase abatement efficiency over time.

Over the same period, Scope 2 emissions continued to decline due to sustained renewable electricity use, with streetlighting emissions reducing year-on-year following completion of the LED streetlighting upgrade project.

Council has transitioned the majority of its passenger vehicle fleet to low- and zero-emissions vehicles. While overall fuel use and costs increased due to a 23% expansion of the fleet, these impacts were largely offset by fleet optimisation and electrification. Fuel consumption has decreased by 36% compared to the 2019/20 baseline, resulting in a 43% reduction in emissions from Class C vehicles.

Increases in natural gas emissions are attributed to higher utilisation of community facilities, improved commercial performance, and the introduction of year-round pool heating at the Oak Flats 50-metre swimming pool.



5. OERP Progress

Council has 47% of OERP actions currently *on track*, demonstrating strong and consistent progress across key operational areas. A further 31% of actions have been *completed*, reflecting Council's commitment to implementing energy, fleet, governance and sustainability initiatives. Only 2% of actions have been *compromised*, while 9% are *not on track*, indicating targeted areas where additional resourcing or strategic review may be required. The actions marked '*not yet started*', represent work still to be delivered to achieve net zero by 2035.

Collectively, these results show that Council is progressing well toward its emissions-reduction commitments, with the majority of actions either completed or advancing as planned.

Objective	OERP Action	Task	Status	Progress outcome/update
(A) Electricity	A.1	Progress the installation of energy efficient street lighting (LED upgrade)	Complete	Completed in FY23/24 A major streetlighting upgrade replacing 8,040 lights with energy-efficient LEDs in partnership with Endeavour Energy. Key outcomes include a 55% drop in electricity consumption, a 63% reduction in annual emissions, and a 25% decrease in operational costs. The sale of 17,560 Energy Saving Certificates generated \$167,000, which has been reinvested into Council's Sustainability Revolving Fund to support future sustainability initiatives.
	A.2	Enter into a Renewable Power Purchase Agreement (RPPA) for Council's large sites	Complete	Completed in FY23/24 Council entered Renewable Power Purchase Agreements (RPPA) to secure stable, cost-effective renewable energy for all Council-owned facilities. This reduces emissions, protects against electricity price volatility, and will enable carbon-neutral electricity from January 2026. Small sites are already powered by 100% GreenPower through Shell Energy, while large sites and streetlighting are supplied under an RPPA with Flow Power from solar and wind farms in NSW.
	A.3	Further solar installations on eligible Council assets	On track	Council has installed more than 380 kW of solar capacity across 10 Council-owned facilities. These solar systems reduce reliance on grid electricity and lower operational costs and emissions. The renewable energy generated across these sites accounts for approximately 8% of Council's annual electricity consumption, avoids ~355 tCO ₂ -e, and saving ~\$130,000 in electricity per year.
	A.4	Undertake a feasibility study to gauge the suitability of all eligible remaining Council facilities for rooftop solar PV with battery storage	On track	An energy audit and solar capacity assessment has been undertaken internally. The data is being used to inform renewable energy infrastructure upgrades and installations in line with the annual delivery program.
	A.5	Investigate micro-grid opportunities where Council rooftop solar can provide energy to nearby users including community battery storage	Not on track	Initial investigations looked into micro-grid at the Shellharbour Airport precinct but did not progress due to limited resourcing and anticipated economic constraint.
	A.6	Investigate the installation of smart meters at small electricity sites to enable them to be included in Council's Renewable Power Purchase Agreement (RPPA)	Complete	Completed FY23/24 Smart meters were installed under existing RPPAs.

Objective	OERP Action	Task	Status	Progress outcome/update
	A.7	Conduct a trial for solar powered public lighting to investigate feasibility of broader solar lighting installation	Compromised	The trial was unsuccessful due to low reliability and performance, safety impacts, high maintenance needs, and issues arising from the coastal environment. As a result, the solar lighting bollards may be replaced with grid powered streetlighting, powered by renewable energy. Solar powered public lighting continues to be investigated for suitable locations.
	A.8	Develop and embed best practice in environmentally sustainable design and performance standards into the design phase for all new Council assets including provisions for solar power	Completed	Completed FY25/26 Council's Sustainable Infrastructure Design (SID) Policy and Guidelines were developed for operational use to embed environmentally sustainable development considerations into all new and renewed buildings and non-building infrastructure.
	A.9	Include provisions within asset renewal and maintenance programs to consider improved energy efficiency	On track	The SID Guidelines detail energy efficiency and optimisation of 'Ongoing Sustainable Building Maintenance' to ensure building systems are supported by preventative maintenance and continue to deliver intended benefits.
	A.10	Investigate possibilities for mid-scale renewable generation projects on Council land within the LGA	Not on track	A number of locations across the city were proposed by Council and investigated by Flow Power, however there were a range of constraints making them non-viable for a mid-scale renewable energy project. Investigations are continuing as technology evolves.
(B) Fuel	B.1	Continue transition of Council Class C fleet to hybrid vehicles	On track	Council's transition to a low-carbon fleet is a key initiative in reducing operational emissions and fuel consumption. Council has now transitioned 99% of its passenger fleet to include five electric vehicles (EV), 64 hybrid or plug-in hybrid electric vehicles (PHEVs), two hybrid light-duty trucks, and an electric maintenance cart, resulting in an annual emissions reduction of ~326 tCO ₂ -e.
	B.2	Continue to improve operational logistics to maximise fuel efficiency	On track	The fleet continues to seek improvements to maximise fuel efficiency. Telematics systems track fuel consumption, idle time, fuel burn, and total run time. In 2024/25 the Facilities and Presentation team's operational logistics were optimised by reducing the on-road travel of cleaning crews by 41%, with an estimated annual fuel reduction of ~2,964 litres, a cost saving of ~\$7,410, and emissions reduction of ~8 tCO ₂ -e p.a.
	B.3	Investigate the trial of an electric pool vehicle/s and installation of associated charging infrastructure	Complete	Completed FY25/26 Council now operates two permanent electric vehicle (EV) pool cars, with the trial demonstrating strong success over its first year. Utilisation has increased due to improvements to the pool vehicle booking system and a staff EV tutorial video on the intranet. Council has installed six 22 kW EV chargers and 16 slow charge points across key facilities. This growing charging network ensures staff have convenient access to charging infrastructure, supports the practical use of EV pool vehicles, and strengthens Council's broader strategy to reduce operational transport emissions. Additional EV charging infrastructure will be installed as the fleet continues to transition.
	B.4	Identify and purchase electric alternatives to Council equipment that meet financial and fit-for-purpose requirements, that can be charged at depot using solar energy	On track	Council continues to monitor emerging electric options for plant and equipment, considering electric alternatives at each asset replacement cycle where fit for purpose. Current electric equipment includes a maintenance cart (golf buggy), mowers, and a range of handheld tools and equipment.
	B.5	Investigate transition of plant and heavy vehicle fleet to lower emissions vehicles as part of the replacement program	Not on track	While low emission options for heavy vehicles are still emerging, Council continues to monitor industry developments. Progress is underway, with two hybrid light duty trucks added to the fleet.
(C) Natural Gas	C.1	Develop a policy for all new Council facilities, buildings, pool heating to be gas free	Complete	Completed FY25/26 Council's Sustainable Infrastructure Design (SID) Policy and Guidelines were developed for operational use to embed environmentally sustainable development considerations into all new and renewed

Objective	OERP Action	Task	Status	Progress outcome/update
				buildings and non-building infrastructure.
	C.2	Investigate replacing Oak Flats pool heating systems with zero emissions alternative (compare with cost of offsetting)	On track	In FY23/24 Council engaged consultants to undertake a feasibility study for the transition of gas heated pool assets. The project did not progress due as it was not financially viable. Council continues to investigate options for sustainable aquatic facilities.
	C.3	Investigate replacing gas systems in Civic Centre, Beachside Holiday Park, The Links and Oak Flats Works Depot	On track	Council investigates the replacement of gas appliances as they are required to be renewed or replaced.
(D) Waste	D.1	Investigate opportunities to capture landfill gas and convert it to energy	On track	Council's contractor expanded the Dunmore landfill gas system in May 2025 and are monitoring gas production and capture. The system expansion increased capture by approximately 25%.
	D.2	Repair faulty capping on old landfill cells	On track	Preliminary discussions have been held between Council's landfill gas contractor and Endeavour Energy regarding a connection to the site.
	D.3	Investigate new waste disposal technologies to maximise the amount of waste diverted from landfill, including waste to energy	On track	Council is monitoring available technologies in the industry, in collaboration with the Illawarra Shoalhaven Joint Organisation. No new technologies are currently available, however multiple energy from waste plants are progressing through the State Government planning approvals process, which will provide the industry with certainty regarding further proposals, which Council may be able to participate in.
(E) Governance	E.1	Engage a consultant to audit Council's baseline emissions and align Council's carbon accounting procedures with the requirements of the Climate Active Standard	Complete	Completed FY22/23 Ironbark Sustainability conducted the emissions baseline assessment.
	E.2	Procure a data management platform to enable accurate emissions inventories	Complete	Completed FY22/23 Trellis Technologies procured for inventory and data management and emissions reporting.
	E.3	Establish an internal Council Sustainability Revolving Fund to fund future emission reduction projects	Complete	Completed in FY23/24 The Sustainability Revolving Fund (SRF) was created to finance projects that cut operational emissions and deliver long-term cost savings. Seeded with \$123,000 from the sale of over 18,000 Energy Saving Certificates generated through the LED streetlighting upgrade, the SRF reinvests savings and returns from funded projects back into the fund. This self-replenishing model enables ongoing investment in energy efficiency and sustainability initiatives without requiring additional capital budget.
	E.4	Embed emissions reduction consideration into Senior Management Team (SMT), Executive Leadership Team (ELT) and Council reporting templates	Complete	Completed FY22/23 'Sustainability Considerations' section has been included in reporting templates.
	E.5	Integrate emissions reduction considerations into Project Management Framework (PMF)	Complete	Completed FY25/26 Council's Sustainable Infrastructure Design (SID) Policy and Guidelines were developed for operational use to embed environmentally sustainable development considerations into all new and renewed buildings and non-building infrastructure. The processes within the guidelines were developed in partnership with Infrastructure Planning to align with the PMF.
	E.6	Update the employee induction process to include information on the Climate & Sustainability Policy	Complete	Completed FY22/23 The Environment team is represented at the staff induction through a presentation.

Objective	OERP Action	Task	Status	Progress outcome/update
		and Zero Emissions Shellharbour program		
	E.7	Collaborate with neighbouring & Cities Power Partnership councils to align activities and benefit from increased buying power and consistency	On track	Council, together with other ISJO member council's, negotiated the existing RPPA contracts together for maximum benefit. In FY24/25 Council, in collaboration with ISJO, member Councils, and ShineHub, successfully delivered round one of the Community Renewables Program (CRP). To date, more than 330 households across the region have signed up for the solar and battery discount initiative with 80 participants (24%) from Shellharbour. The program has committed more than 1 MW of renewable energy infrastructure within the region. Additionally, 98% of participants have opted to integrate their systems with a Virtual Power Plant (VPP), unlocking further benefits for the community. The success of the round one program is equivalent to taking ~900 fossil fuelled vehicles off the road each year, or ~4,000 tCO2-e avoided annually.
	E.8	Engage with State and Federal Governments for combined approaches, knowledge and grant opportunities	On track	Through the Joint Organisation Net Zero Accelerator (JONZA) program, Council is able to work closely with DCCEEW at both state and federal level. The program enables smaller regional councils to benefit from expertise and guidance. Council is able to advocate for local government needs at the highest level through these partnerships.
	E.9	Lobby State and Federal Governments to ensure a consistent approach and support for emissions reduction across all levels of government	On track	In FY24/25, Council officers from ISJO member councils participated in the Net Zero Commission's Roundtable to advocate for the needs and priorities of local government in accelerating meaningful climate action. Since 2022, Council has also contributed 12 submissions to both state and federal climate-related consultations, ensuring local government perspectives are represented in policy development.
(F) Scope 3	F.1	Define and measure Scope 3 emissions for inclusion in Council's emission footprint as data becomes available	On track	Scope 3 data collation has begun, with a focus on materials and goods procured for the construction and upgrades of public infrastructure.
	F.2	Embed emission reduction considerations into procurement policies and procedures	Complete	Completed FY22/23 Council's Procurement Policy and Guidelines include considerations for 'Promoting Environmental Sustainability'.
	F.3	Investigate and trial recycled materials such as glass for Council capital works	On track	Recycled materials such as glass and plastics have been successfully trialled in roads, playgrounds, and street furniture. These projects have performed well to date, with recycled products demonstrating strong durability and resistance to wear and tear. Feasibility and suitability of materials are considered through project planning and delivery.
	F.4	Investigate and trial low carbon materials in capital works i.e. concrete	On track	Low carbon materials, including low carbon concrete, are becoming increasingly viable as the industry evolves and demand grows. Council will continue to investigate and adopt suitable low carbon materials where appropriate for future projects.
	F.5	Introduce low emission or alternative fuel vehicles for waste collection	On track	Council's waste collection contractor continues to utilise the hydrogen-powered domestic waste collection vehicle. More low emissions vehicles may be in operation when the new waste collection contract begins in 2027.
	F.6	Provide education to support staff to correctly dispose of all waste from Council facilities	On track	As part of our Plastic Free July campaign, the Waste team presented at the all-staff CEO briefing and followed up with NEST posts and giveaways to encourage Council staff to reduce their single-use plastic usage.
	F.7	Update Council's Sustainable Event Management Plan template and guidelines	Complete	Completed FY24/25 Council's Sustainable Event Management Plan Form & Guidelines are required to be completed and adhered to for all Council run activities.

Objective	OERP Action	Task	Status	Progress outcome/update
	F.8	Roll out a behaviour change program to promote sustainable transport e.g., ride to workdays and staff carpooling	Not on track	Council's Environment team publishes Seasonal Sustainability updates on NEST to inform and encourage staff to reduce their professional and personal carbon footprint. However, dedicated resourcing for a comprehensive behaviour change program is not currently available.
	F.9	Investigate the installation of user pays EV charging infrastructure at Council owned sites to encourage uptake of private EV use associated with staff commute	On track	In FY22/23, Council installed two 22 kW EV chargers at the Civic Centre, providing charging access for both staff and the community at a competitive market rate. Investigations into additional suitable locations for expanding EV charging infrastructure are ongoing.
(G) Carbon Offsets	G.1	Expand program with the Clean Energy Regulator for generating offsets associated with Dunmore Waste and Recycling Facility	Not started	No applicable programs that would allow generation of additional carbon offsets have arisen. Council will continue to monitor opportunities.
	G.2	Investigate offset projects on Council owned land through urban greening, reforestation, wetland conservation and management	On track	Council's Urban Greening Strategy is in early development, supported by several revegetation projects delivered in 2025. These include 1.19 ha of planting at Bensons Creek, 2 ha of Grey-headed Flying Fox habitat restoration with 30,000 plants, and 1.5 ha of rainforest restoration at Stoney Range Reserve, all nearing completion. Council was successful in obtaining funding through the <i>Greening Our Cities</i> grant to revegetate 0.5 ha at Keith Fletcher Park with 100 advanced trees and 20,000 understorey plants. The Environment Team is additionally exploring opportunities for Biodiversity Stewardship Sites along Lake Illawarra.
	G.3	Review Council's position on accepting residual land and investigate opportunities for carbon offsetting/ revegetation	Not started	No action taken yet.
	G.4	Conduct LGA wide assessment of carbon sequestration opportunities for Council owned land	Not started	Council is exploring opportunities for Biodiversity Stewardship Sites along Lake Illawarra.
	G.5	Develop a Carbon Emissions Offset Policy to align offset procurement with Council's values	Not started	No action taken yet.
	G.6	Become certified carbon neutral under the Australian Climate Active standard by 2035	Not started	No action taken yet.

6. Next steps

Council has made significant progress in establishing the foundations for a strong, accurate and transparent emissions management framework. Since the baseline assessment undertaken in 2022, the adoption of the Zero Emissions Shellharbour Strategy (ZESS) 2022–2050 has embedded emissions considerations into many of Council’s day-to-day operations.

With Council’s Scope 1 and Scope 2 emissions profile now comprehensively documented through the Trellis emissions data platform, the next phase of work will focus on delivery and continuous improvement.

Priority areas include:

- Reducing community waste to landfill
- Increasing landfill greenhouse gas (GHG) capture and flare capacity
- Investigating waste-to-energy opportunities
- Investigating and expanding renewable energy infrastructure across Council assets
- Developing a Renewable Energy Management Plan to improve long-term energy resilience and cost effectiveness
- Continuing the transition of fleet, plant, machinery and equipment
- Strengthening Scope 3 emissions data collection processes
- Urban Greening and revegetation initiatives
- Developing a carbon emissions offset strategy

On Council’s pathway to net zero, Council is currently cycling through steps 3-6; monitoring, reporting and reviewing our actions and performance. Step 6 involves reviewing the OERP and ZESS with the intent of delivering a comprehensive Climate Action Plan, including community emissions reduction actions to support city-wide resilience, mitigation and adaptation.



Figure 4 Pathway to Net Zero – Zero Emissions Shellharbour Strategy 2022-2050

7. Conclusion

Shellharbour City Council continues to demonstrate a strong and measurable commitment to reducing operational emissions and embedding sustainability across the organisation. Significant progress has been achieved and is evident in 0% net emissions increase across the reporting period. Between the revised 2019/20 baseline and 2024/25, electricity emissions decreased by 8% and streetlighting emissions by 63%, reflecting sustained investment in energy efficiency and renewable energy systems.

Waste emissions continue to dominate Council's operational emissions profile. Since 2022/23, landfill waste has accounted for an average of 88% of total emissions. Proportional waste volume increases, changes in waste composition, legacy waste behaviours, and updated landfill gas modelling have driven a 23% increase in landfill emissions since 2019/20.

Natural gas emissions increased by 65%, largely due to increased community use of facilities and enhanced heating requirements at aquatic centres. Transport emissions have remained relatively stable, with fleet optimisation, hybridisation, and expanded EV charging infrastructure largely offsetting increased service demand.

The Operational Emissions Reduction Plan (OERP) remains central to Council's emissions reduction efforts. As of 2025, 47% of actions are on track and 31% are complete, demonstrating strong alignment with Zero Emissions Shellharbour Strategy objectives across electricity, fleet, governance, procurement, and waste. Actions that are not on track or compromised largely reflect external constraints, including technology availability, resourcing, and market conditions. A review of the OERP is being undertaken in early 2026.

This report confirms that achieving net zero operational emissions by 2035 will require increased effort within the waste sector. Priorities include expanding landfill gas capture, advancing legacy cell capping, improving waste composition data, and accelerating diversion initiatives aligned with circular economy principles. Continued electrification of facilities, reduced reliance on natural gas, and ongoing fleet transition will also be critical to addressing remaining Scope 1 emissions.

From 2025/26, Council will expand Scope 3 reporting to include embodied emissions from construction materials. Supported by the Sustainable Infrastructure Design (SID) Policy and improved procurement data, this will strengthen governance, reveal new decarbonisation opportunities, and align Council with emerging national reporting expectations.

Looking ahead, the development of a Climate Action Plan and strategic renewable energy management frameworks will guide the next phase of decarbonisation, integrating operational and community emissions while strengthening resilience and adaptation. Through continued investment in data systems, sustainable technology, and strong collaboration with regional and state partners, Council is progressing toward its commitment to net zero operational emissions by 2035, while delivering long-term environmental, social, and economic benefits for the Shellharbour community.



