

4.9 PROGRESS ON COUNCIL'S JOURNEY TO NET ZERO

Responsible Director: Jarrod Doake

RECOMMENDATION

That Council notes the first Progress Report on the Zero Net Carbon Action Plan (ZNCAP) which provides a status of the nominated actions that have been undertaken since the plan was endorsed in August 2020 to deliver carbon neutrality by 2025. Achievements to date include:

- a 78% reduction of GHG emissions since the 2018-19 baseline*
- a 28% reduction in electricity costs (equating to \$611,000 pa), and*
- enhanced progress on projects to realise savings earlier.*

PURPOSE

This report and attached Progress Report provides an update on the delivery of the activities under the Zero Net Carbon Action Plan (ZNCAP) and the progress to reaching carbon neutrality by 2025 for corporate greenhouse gas (GHG) emissions.

INTRODUCTION

Council has a commitment to be carbon neutral by 2025 and is guided by the ZNCAP (endorsed by Council in August 2020). This commitment has been embedded into Council strategies and plans.

BACKGROUND

The ZNCAP covers a comprehensive range of actions to reduce corporate GHG emissions and support the reduction of community GHG emissions.

Summary of the key actions to reduce GHG emissions include:

1. Sourcing 100% renewable electricity through the LGPPA.
2. Major public lighting upgrading to LED.
3. Improving the energy efficiency of our major buildings.
4. Energy efficiency and roof top solar for key community facilities.
5. Fleet optimisation to reduce fuel use and transition to electric.
6. Sustainable Procurement to reduce GHG emissions and increase recycled content.
7. Environmentally Sustainable Design (ESD) for Council buildings and infrastructure.

To determine the Zero Net Carbon target, Council's corporate GHG emissions baseline was determined to be **20,503 tCO₂e**, which was the annual GHG emissions for 2018-19. Nearly 90% of corporate GHG emissions were sourced from electricity, gas, transport fuel, and concrete and asphalt, and the priority actions focus on reducing corporate GHG emissions from these sources.

DISCUSSION

Since August 2020, the first and most significant action to have a positive impact on reducing corporate GHG emissions was the commitment by Council to purchase 100% renewable electricity for all corporate buildings from 1 July 2021.

This was accomplished in partnership with 46 Victorian councils, under the Victorian Energy Collaboration (VECO), which was led by the Victorian Greenhouse Alliances and Darebin City Council (now managed by Glen Eira Council).

Council's **target** by 1 July 2022 was **60% GHG emission reduction**.

Pleasingly, a **78% reduction in Corporate GHG emissions** reduction has been achieved, thanks to purchasing 100% renewable electricity through VECO from July 2021 and some other energy efficiency activities, an 18% improvement on the target.

Table 1 Carbon Inventory Status

YEAR	Non COVID scenario (est.) tCO2e*	% GHG emissions reduction	Actual (COVID restrictions) tCO2e	% reduction
2018-19 (baseline)	20,503	0	20,503	0
2019-20	19,930	3	18,869	8
2020-21	15,797	23	12,689	38
<i>2021-22 target</i>	<i>8,201</i>	<i>60</i>	<i>na</i>	<i>na</i>
2021-22	4,536.8	78	4,536.8	78

*tCO2e - tonnes of CO2 equivalent emissions.

In 2019-20 and 2020-21, the lockdowns due to COVID due caused a reduction of overall electricity, fuel and gas use across council, and a noticeable decrease in GHG emissions. However, it was unclear whether this would be sustained when service returned to normal. Thus, estimated emissions in a non-COVID scenario were also tracked.

In addition to the introduction of 100% renewable electricity, another key achievement to date was the endorsement of the ESD policy for buildings and infrastructure by Council in January 2022.

This policy will guide future building and infrastructure projects to ensure they have lower environmental impact and reduce energy and GHG emissions, during construction and their lifecycle.

The first stage of major energy efficiency upgrades in our largest corporate buildings and aquatic facilities commenced in 2021/22 and are approaching 85% complete and should start to provide a significant reduction in costs and energy use from December 2022. The second year of this program is now underway.

Other activities addressing the key actions underway include:

- Eight energy audits completed for community buildings (grant funded).
- Feedback into procurement policy to encourage energy efficiency, GHG emission reduction, circular economy and increase use of recycled content materials.
- More electric vehicles, charging stations and improved fleet efficiency.
- Roll out of weekly food waste collection (reducing community GHG emissions).
- Ongoing support of Energy Savers for business and Solar Savers for community.

Having a clear action plan and purpose has enabled Council to attract nearly \$1.7million grants to deliver low emissions actions in the plan and these will continue to be sought in the future. The ZNCAP was nominated as a finalist in the City Power Partnership Awards and was used to pledge our zero net emissions commitment to the Victorian State Government.

POLICY IMPLICATIONS

Monash Council acknowledges the importance of mitigation and adaption with a key priority in GHG emissions reduction in addressing Strategic Risk (#7) in the Corporate Risk management plan associated with managing emerging impacts of environmental issues.

The ZNCAP provided guidance to address this risk and also aligns with Priority 3: Climate Change of the Environmental Sustainability Strategy, in particular the following action:

3.1.1 To develop and implement a Climate Change Action Plan which recognises a whole of council approach to mitigation, adaptation, risk management, innovation and alternative energy sources.

The ZVCAP also aligns with the following strategic documents:

- Council Plan, and the Monash 2040
- Sustainable Procurement Policy
- Asset Management, Urban Biodiversity Strategy, Monash Urban Landscape and Vegetation Canopy Strategy, Street Tree Strategy, and the Open Space Strategy.
- Leadership and support to the Monash community and businesses to reduce energy costs and GHG emissions across the municipality and be resilient in a changing climate which supports Healthy and Resilient Monash (the Integrated Health and Wellbeing Plan) 2017-2021 and Monash Integrated Transport Strategy 2017.

SOCIAL IMPLICATIONS

While the focus of the ZNCAP is to reach zero net corporate emissions by 2025, it acknowledges council's role in leading by example for the community to reduce GHG emission and their impact.

With electricity and gas sourced from coal being the key sources of GHG emissions, approaches to improve energy efficiency and seek alternative renewable sources can also reduce living costs for the community, reduce local business costs and improve the local environment.

The ZNCAP includes actions to support businesses and residents to reduce their GHG emissions, including the delivery of waste avoidance programs.

Having a clear response to climate change, and a defined way forward, will position Monash as a leader and allow us to be an advocate to other levels of government for the benefit of our community. To achieve this, it is critical to have the executive and the organisation see this as a priority.

GENDER EQUITY ASSESSMENT

A gender impact assessment will not be undertaken on this program of works at this time as most of the work is currently operational. When this program of works is up for review, Council will reconsider whether or not a gender impact assessment is required.

CONSULTATION

The draft Progress Report on the ZNCAP was presented to the August Council strategy meeting and an update was provided to the July Environmental Advisory Group meeting. The Eastern Alliance for Greenhouse Action (EAGA) continues to play a key role in reducing GHG emissions across council and the community, and Council works closely with them to advise programs and projects to be delivered.

FINANCIAL IMPLICATIONS

Project expenditure for 2021-22 was \$2,897,320 against a budget of \$3,547,836 ex GST. Unspent funds were carried forward to 2022-23 to complete projects. There were also costs of \$200,000 (1.8FTE) in 2021/22 to manage delivery of key infrastructure projects and ongoing community and business education and projects under ZNCAP, and approximately \$25,000 for community education resourcing and utility management to support carbon inventory assessment. (Table 4)

In 2022-23, the expected expenditure is \$4,668,476 ex GST and at the end of October 2022, approximately \$343,000 has been spent to date on major projects and just over \$100,000 for staffing and community project resourcing.

Investment in the actions set out in the ZNCAP are already showing significant reductions in GHG emissions. Actions that reduce GHG emissions typically also reduce energy and maintenance costs, creating ongoing savings for council.

Once the major energy efficiency projects linked to the current investment are complete, it is expected that the guaranteed 11.6% return on investment per annum will be realised.

In terms of savings to date, Monash transferred to the VECO contract in July 2021, which is sourcing 100% renewable electricity at a costs per kwh expected to be at or better than Business as Usual (BAU). In the 2021-22 financial year, council's electricity costs reduced by \$611,000 which is more than 25% reduction compared to the baseline costs (electricity and usage charges). This saving is ongoing.

As the VECO contract is fixed until 2030, Council will continue to save. The rates (c/kwh) for VECO are currently 23% better than BAU and 53% better than current wholesale value of electricity.

With energy prices for electricity and gas predicted to increase further in coming years, it supports a transition from gas to electric appliances to further benefit from VECO savings and GHG emissions reduction. This approach is in line with the new ESD policy for Council Buildings and Infrastructure and will further reduce GHG emissions while improving operational and energy efficiency.

Additional grant funding has enabled the expansion of some key actions such as main roads street lighting LED change over which now includes reserve, carpark, traffic and decorative lighting. It has also allowed for the installation of public and council electric vehicle charging. To date over \$1.95 million has been received in grants. Further grants will be sought to support delivery of actions for council and the community.

Tracking Investment Against the ZNCAP

To deliver the key corporate actions in the Zero Net Carbon Action Plan, the original project investment was estimated to be \$10.46 million, exclusive of staff costs of \$200,000 per annum. During the delivery phase of the Action Plan, major energy efficiency upgrade projects have been brought forward into 2021-22 and 22-23 in order for Council could take advantage of the energy savings costs earlier. These should be realised from July 2023.

Public lighting change over should also be complete by July 2023, generating more savings.

At June 2022, council has spent \$3,450,109 on delivering the Zero Net Carbon Action Plan key actions. In 2022-23, expenditure is budgeted for \$4,668,476, with \$343,783 of actual expenditure up to October 2022.

Over the next three months, a number of the major infrastructure projects will be completed, and the remainder of the public lighting units purchased, followed by the installation up to the end of the financial year.

In 2023-24 and 2024-25, the focus will be on smaller scale energy efficiency upgrades in our community facilities, promotion of ESD and sustainable procurement to reduce future emissions sources, effective offset strategy to reach carbon neutrality and electrifying our fleet. Approximately \$1.1m is allocated for the deliver for each year.

It is expected by 2025 that expenditure will total \$10.4M approximately and it should be noted that this includes additional street lighting, EV charging stations and recycled content trials will have been delivered through the assistance of grant funding.

From 2025 – Council will need to allocate at least \$100,000 per annum for offsets to maintain our carbon neutral status.

CONCLUSION

The ZNCAP provides a comprehensive approach for Council to become carbon neutral by 2025 and lead our Monash businesses and community to reduce GHG emission, reduce waste and protect the environment across the whole municipality.

The journey toward carbon neutrality has progressed well over the last two years, and projects in place will see further positive progress to this target.

ATTACHMENTS

Attachment 1: Progress report on the ZNCAP.

Progress Report for the Zero Net Carbon Action Plan

November 2022



Sustainable Monash

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Summary

As the first progress report on the implementation of ZNCAP, it has provided a positive result with:

- 78% reduction in corporate emissions since the 2018-19 baseline, which is a significant reduction of 18% and well ahead of expectations.
- annual \$611,000 saving in electricity costs in the first year of the VECO contract (2021-22) which will continue and increase over the next 9 years.
- received approximately \$1.95 mill in grant funds to support low emissions projects which allowed more LED lighting upgrades across Monash, installation of EV charger, and using low emissions concrete and asphalt in roads projects.
- enhanced progress on delivery our major infrastructure projects to realise energy savings and further emission reductions sooner.
- A number of key actions have been achieved in the last year and groundwork is place for delivery in the near future.

This progress report does not yet include the savings as a result of energy efficiency upgrades, avoided costs of replacement or sale of CEC credits for public lighting upgrade or major solar/ energy efficiency installations. But these projects are progressing well, and the benefits of these projects will be reported in next year's annual progress report.

There has also been good progress in the Community sector with the roll out of food organics in the green bin, Solar savers, Energy Savers, planning for a Microforest to combat urban heat island affect and will also support local biodiversity.

Introduction

This is the first report on progress on the delivery of the activities under the Zero Net Carbon Action Plan (ZNCAP) and Council's progress to reaching carbon neutrality by 2025 for corporate greenhouse gas (GHG) emissions. The Sustainable Monash team are leading the delivery, in collaboration with key internal and external stakeholders across council, the Greenhouse Alliances and Monash University. The Zero Net Carbon Action Plan was endorsed in August 2020, and budget was allocated in July 2021. This report provides a status of the program to date.

Background

In February 2020, Monash Council committed to working towards becoming carbon neutral, by setting a target of zero net corporate GHG emissions by 2025. This commitment has been embedded in key Council strategies and plans, including carbon neutrality in the 2021-25 Council Plan and aligning with Priority 3: Climate Change from the Environmental Sustainability Strategy 2016-26 (ESS).

The ZNCAP (endorsed by council in August 2020) provides a pathway for achieving the goal of carbon neutrality by 2025, through effective methodology. Council strives to keep services and public spaces available through extreme weather and maintain Monash's 'garden city' character in a changing climate.

Monash Council acknowledges the importance of mitigation and adaption with a key priority in GHG emissions reduction in addressing Strategic Risk (#7) in the Corporate Risk management plan associated with managing emerging impacts of environmental issues.

This commitment has been based on research and detailed independent modelling by CarbonetiX and Iron Bark sustainability, which determined the annual corporate greenhouse gas emissions baseline generated for Council and guided the selection of suitable actions required to minimise our impact on the environment and achieve carbon neutrality by 2025.

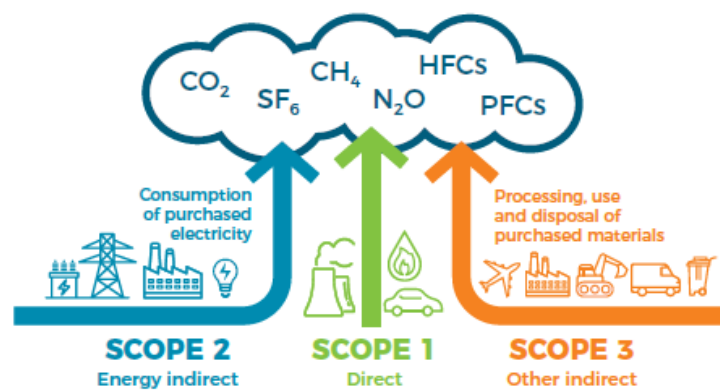
Whilst the focus of the Zero Net Carbon Action Plan is the reduction in GHG emissions for Council as a corporate entity, there is also actions relating to municipal GHG emissions and showing leadership to our community.

Baseline

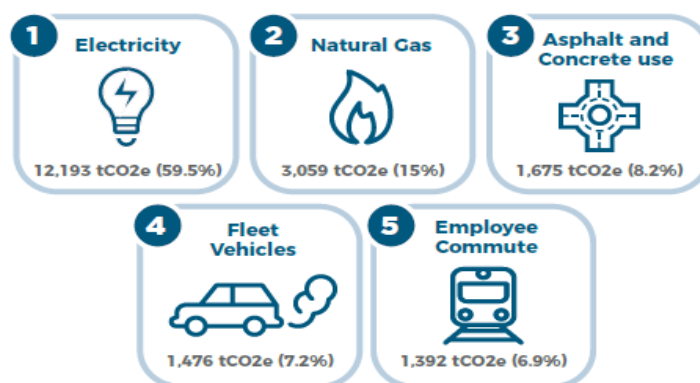
In 2018-19, 20,503 tCO₂e was established as our corporate GHG emissions baseline and the base where Council measures our net zero commitment. Corporate emissions relate to GHG emissions generated by council only activities and not the wider community.

Our corporate GHG emissions baseline accounts for:

- direct emissions from use of gas and refrigerants (known as Scope1),
- indirect emissions from purchased electricity (Scope 2), and
- indirect emissions from processing, use and disposal of materials (Scope 3).



Our top five sources of corporate greenhouse gas emissions in Council are:



Council's GHG emission reduction actions were prioritised based on 2018-19 findings.

Progress to getting to net zero

To track our progress to getting to zero net carbon emissions, annual carbon inventory assessments have been undertaken. Please refer to Table 1 for an overview of progress over the last three years from when the baseline was set.

Table 1 Annual Carbon Inventory Status

YEAR	Non COVID scenario (est.) tCO2e*	% Reduction	Actual (COVID restrictions) tCO2e	% Reduction
2018-19 (baseline)	20,503	0	20,503	0
2019-20	19,930	3	18,869	8
2020-21	15,797	23	12,689	38
<i>2021-22 target</i>	<i>8,201</i>	<i>60</i>	<i>na</i>	<i>na</i>
2021-22	4,536.8	78	4,536.8	78

*tCO2e - tonnes of CO2 equivalent emissions.

Mandated lockdowns and restrictions to manage the Coronavirus Pandemic (COVID) reduced the overall electricity, fuel and gas use across council, and led to a considerable decrease in GHG emissions during 2019-20 and 2020-21. Thus, an estimate has been provided to show how the likely GHG emission reduction in a Non COVID scenario.

As the ZNCAP was endorsed in August 2020, funds for new GHG emission reduction projects to be undertaken were first allocated for the 2021-22 financial year. Any reduction in GHG emissions reduction in 2019-20 and 2020-21 estimated in the Non COVID scenario were largely due to initiatives already identified in the ESS such as improvements to fleet and buildings, such as the new Oakleigh Recreation Centre.

In 2021-22, a **78% reduction** in Corporate GHG emissions was achieved.

Our GHG emission reduction target for 2021-22 was a **60%** (from the 2018-19 baseline).

This represents an **18%** improvement on the target.

The VECO contract started in July 2021, and enabled council to source 100% renewable and zero emissions electricity for all of our facilities and public lighting is a significant contributor especially between 2020-21 and 2021/22.

However, the detailed 2021-22 GHG emissions inventory below shows that in addition to GHG emission reduction as a result of the VECO contract, there has also been a reduction in emissions for most of the Scope 1, 2 and 3 GHG emissions (Table 2).

Table 2: Summary of 2021/22 GHG emission inventory

Emissions Source Category	Units		2021/22 Emissions (t CO ₂ -e)	2020/21 Emissions (t CO ₂ -e)	2018-19 Baseline emissions (t CO ₂ -e)
Scope 1 - Direct Emissions					
Natural Gas (Council Buildings & Facilities)	MJ	25,627,285	1,321	685	2844
Transport Fuels (Fleet)			1002	1,202	1404
Refrigerants			221	15	179
Total Scope 1			2,640	1,901.9	4427
Scope 2 - Indirect Emissions					
Electricity - Council operations	kWh	6,718,578	NIL	4,432.3	7872
Total Scope 2				4,432.3	7872
Scope 3 - Indirect Emission, Voluntary, supply chain					
Public lighting	kWh	3,991,433	NIL	3,215	3612
Electricity Transmission losses			NIL	487	709
Natural Gas Transmission Losses			110	53	215
Transport Fuels losses (Fleet)			57	62	
Business Travel (Flights)	km	5,617	34	1	14
Business Travel (Taxi)	km	1,638	0.5	0.096	
Business Travel (Personal Vehicle) NEW	km	363,726	103	NA	NA
Paper Use	reams	30,466	120		87
Water Supply (NEW)	kL	250,609	91	68	NA
Corporate Waste (Waste to Landfill)			317	317	428
Construction Materials (Asphalt, Reconophalt & Concrete)			344	1,322	1675
Employee Commute - (Public Transport)			8	8	
Employee Commute - (Private Transport)	km	4,160,000	725	823	1392
Total Scope 3			1910.1	6,355.2	8204
Total Scope 1,2 Emissions			2,640	6,334	12,229
Total Scope 1,2 and 3 Emissions			4549.8	12,689.4	20,503
Abatements					
Emissions reduced through exported/surplus renewable energy	kWh	13514	13	NA	NA
Total Abatements			13		
Total Net Emissions			4,536.8	12,689.4	20,503

Gas use has more than halved since 2018-19, partly due to some restrictions and improvements in energy efficiency, as well as the move away from gas appliances in new buildings (in line with the new ESD Policy). This is also the first year there has been visible benefits in increased solar generation across our buildings which is promising.

Where data was not able to be captured for the 2021-22 year, the information from the previous year was considered and utilised. Some data may vary based on available information and servicing programs (such as refrigeration gas).

In 2021-22, there was an additional source of data identified regarding business travel using personal vehicles which needed to be added. Despite these additions, there has still been significant decrease in GHG emissions for council.

Delivery of key infrastructure projects and implementation of policy updates should see further reductions in GHG emission in 2022-23 and beyond. (Figure 1)

Monash Council is currently on track and exceeding on annual target GHG emission reduction by more than 18%.

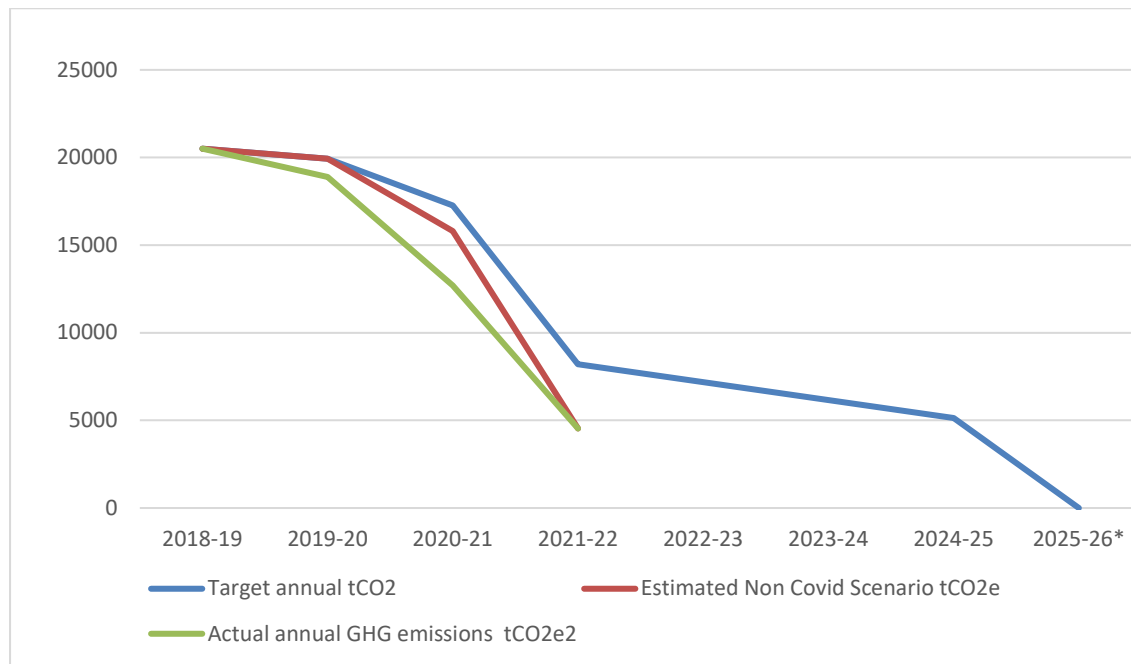


Figure 1: Tracking annual GHG emissions reduction

The Environment Protection Authority’s (EPA) carbon management principles were applied to guide Council’s carbon management and reduction program.

Utility management and GHG emissions are monitored through a dedicated utility management and GHG emissions tracking portal.

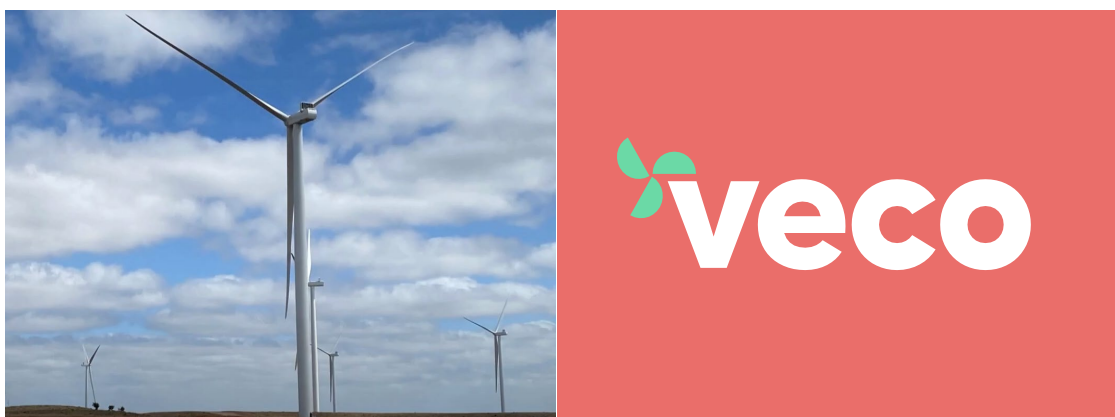
Progress on key actions to reach Zero Net Carbon

Each of the key actions and supporting actions from the Zero Net Carbon Action Plan are listed in this section and a summary have been provided on the activities undertaken and achievements to date to support emission reduction for council's corporate GHG emissions, and GHG emissions across the municipality of Monash.

a) Corporate Action

1. Sourcing 100% renewable electricity by 2021

- Council to purchase electricity from 100% renewable sources from July 2021. **ACHIEVED**



Since August 2020, the first and most significant action undertaken by Council which has had a positive impact on reducing corporate GHG emissions, is the commitment to purchasing 100% renewable electricity for all corporate buildings from 1 July 2021.

After a number of years of planning and negotiation, this was accomplished in partnership with 46 other Victorian councils and led by the Victorian Greenhouse Alliances and Darebin City Council under the Victorian Energy Collaboration (VECO). The contract is with Red Energy and energy is sourced from two Windfarms in western Victorian (Mortlake and Horsham) with costs per kwh expected to be at or better than Business as Usual (BAU).

This is a 9-year fixed price contract and is purchasing electricity at or better than Business as usual (BAU) pricing. There are now another 5 councils in this partnership bridging the total to 51.

In the 2021-22 financial year, council's electricity costs reduced by \$611,000 which is more than a 25% reduction compared to the baseline costs (electricity and usage charges).

Since the VECO contract is fixed until 2030, Council will continue to save. The rates (c/kwh) for VECO are currently 23% better than BAU and 53% better than current wholesale value of electricity.

With energy prices for electricity and gas predicted to increase further in coming years, it supports a transition from gas to electric appliances to further benefit from VECO savings and GHG emissions reduction.

2. Street Lighting Changeover to LED

- Council will replace main road street lighting with LED lights
- Consider smart lighting opportunities as part of the major road lighting upgrade to LED
- Negotiate with United Energy to change residential streetlights to LED in the next five years.

Council have started the design work and procurement for the upgrade of our main road public lights (unmetered) in partnership with United Energy under a cost share arrangement. Lighting upgrades have been extended to include the changeover of decorative and traffic lighting upgrades (metered). There are approximately 1850 unmetered main road lights will be upgraded to LED units which will reduce overall GHG emissions generation, they have been purchased and should be completed by July 2023. Nearly \$1.1m has been invested to date to support the purchase of lighting and undertake planning and preparation for the upgrade. This will include the replacement of more than 500 Mercury Vapor lights which is now banned from use.

Due to the receipt of federal grants – the LED lighting upgrade has now been extended to 1100 metered lights, including decorative, reserves, carparks and traffic lighting.

Work is also underway to incorporate smart lighting at key hubs such as Oakleigh.

3. Improving energy efficiency of our largest major buildings

- Set up an Energy Performance Contracts with priority energy conservation measures to reduce electricity, gas and water use and provide guaranteed savings to improve operation of Council's major buildings.

Energy Performance Contract was first initiated in 2017-18 in partnership with EAGA and Whitehorse Council with the preparation of a Detailed Facility Study (following a competitive procurement process) to identify priority projects to maximise energy efficiency, GHG emissions reduction with a less than 10-year return on investment. These projects were nominated in the Zero Net Carbon Action plan and in July 2021, approval was provided to proceed with the first tranche of the EPC. 3E group (formerly EcoSave) were appointed in October 2021 to undertake an Energy Performance Contract.

First year projects include:

- Heat pump and boiler for pool at Monash Aquatic & Recreation Centre (MARC)
- 220kW solar system at MARC
- 200kW solar system at Clayton Aquatic & Health Club (CAHC)
- 90kW solar system at Monash Operations Centre.
- Boiler and heat pump at Oakleigh Recreation Centre (ORC)
- Building tuning to optimise energy saving.

Second Year projects include:

- Upgrade of Central Plant and related works at CAHC
- Hybrid heat pump for CAHC and high efficiency pool pump
- Chilled Water Interconnect, BMS works and plant optimisation at MARC
- MARC high efficiency lighting
- 80kW solar at Civic Centre

The first year of work is 85% delivered and due to be completed in Summer 2022-2023. Full completion has been impacted by equipment delivery delays. Work on the second-year projects is also underway. This will significantly reduce the energy used in our largest corporate buildings and aquatic facilities and add 590kW of solar to our buildings. A number of the projects were originally going to be delivered over four years but based on feedback from Council were brought forward to the first two years so council could benefit from the savings earlier.

On completion of the major energy efficiency projects linked to the current investment, significant additional savings in annual energy costs will be visible, based on the guaranteed 11.6% return on investment per annum.



Solar at Clayton Community Centre

4. Energy efficiency and roof top solar for key community facilities

- Install solar on buildings which provide the best GHG emission reduction and return on investment
- Identify opportunities to reduce utility costs in community buildings through energy audits and implement efficiency activities such as LED lighting change over, insulation, and education.

Council has completed LED lighting upgrades across 15 facilities in 2021-22 and another seven up until October 2022 including:

- | | |
|----------------------------------|---------------------------------|
| - Ashwood Hall | - Hughesdale Hall |
| - Princes Hwy Pavilion | - Mulgrave Community centre |
| - Mt Waverley Community Centre | - Fregon Reserve Pavilion |
| - Mt Waverley Youth Centre | - Wellington Reserve Pavilion |
| - Glen Waverley Community Centre | - Monash Operations Centre |
| - Oakleigh Mechanical Hall | - Tally Ho Tennis Club |
| - Jordanville Community Centre | - Brandon Park Community Centre |
| - Clayton Senior Citizen | - Monash Community Inn |
| - Clayton Hall | - Jells Park Preschool |
| - Fregon Hall | - Halcyon Day Centre |
| - Huntingdale Hall | - Oakleigh Golf Course |

The budget for this was \$79,880 or \$3631 per site on average and was funded through current maintenance budgets.

A new agreement between clubs and council has been put in place to outline the roles for maintenance and management of the solar and other upgrades for the life of the installation between parties.

Monash council also assisted one of our clubs at Princes Hwy Reserve Pavillion to access a 50% grant for \$10,635 for a 21kW solar system which was installed in October 2022. Council will pay the balance upfront and the club will reimburse council with the savings over 10 years. This could be an attractive program to fast track solar across our community facilities and is seen as a pilot to inform future investment.

Monash was also successful in receiving grants (to the value of \$28,800) to undertake Level 2 energy audits only at eight facilities including two community facilities and six sporting facilities. Since the completion of the audits, Waverley Woodworkers have already received a grant for the installation of 10.56 kW (larger than suggested in the audit) solar on their site (approximate \$10,000 in value).

Key project opportunities are listed in Table 3. The results of the audits will be assessed for value and return on investment and will help identify priority upgrade projects to be considered in future budgets or where there are grants available.

Table 3 Outcomes of community facility Level 2 Energy Audits to identify potential projects

Site	Key Initiatives identified by the Energy Auditors	Potential Investment	Potential annual savings for Club	Estimated GHG emissions avoided (tCO2e/year)	Payback period with rebates (years)
Monash Men's Shed at Bogong Reserve, Glen Waverley	8.3kW solar Installation of timers on boiler units	\$12,387	\$1,600	13.3	5.4
Scammell Reserve Pavillion, Oakleigh	15kW solar Timer for lighting system	\$18,570	\$3892	10	5.8
Waverley Woodworkers and Gem Club at Central Reserve, Glen Waverley	9.2kW solar for Gem Club Install timer on boiler units Implement PE Cells for outdoor lighting (6.9kW for woodworkers)	\$25,256	\$1,850	15	6.85
Oakleigh Golf Club	5kW Solar Lighting upgrade to LED Heat pump hot water Timer for lighting, hot water and air conditioner	\$22,220	\$2,236	7	9.9
South Oakleigh Bowls Club	Heat pump, LED upgrade, timer for lighting, hot water and air conditioning system	\$15,975	\$1203	5	13.2
Wellington Tennis Club Mulgrave	10kW Solar and 13.5kW battery Heat pump LED lighting upgrade	\$32,601	\$3,023	5-10	8
Southern Reserve Pavillion, Mulgrave	10kW solar LED lighting upgrade Timer for lighting system	\$14,090	\$2,332	5-10	6
Holmesglen Pavillion, Ashwood	Replace hot water system with heat pump, florescent lighting upgrade and timer for hot water.	\$10,190	\$450	2	22.6

During the audits, it was identified that these clubs had an average electricity cost of 18-25 cents per kWh while Wellington Tassin Club was up to 55c per kWh. This can add huge burden on the clubs especially if they are running flood lights. In contrast Council currently pays 5-6c/per kWh, through VECO for renewable energy, excluding service charges.

A VECO tenants guide is available to transfer club accounts to Council, where the club can benefit from our electricity rates and source 100% renewable energy. For this to function, Council would receive the VECO bill and request a reimbursement for the costs. This requires some extra administration to manage the additional accounts and recover the funds from the clubs but might be a cost-effective way of reducing emissions across council facilities.

5. Fleet optimisation to reduce fuel use and transition to electric

- Upgrade light fleet initially with hybrids and gradually introduce EVs in current replacement cycle (Until 2026). Install at least 1 charging point per EV subject to available load on site or consider locating offsite. Accelerate electrification as EV prices decrease post-2026
- Purchase heavy diesel vehicles with the latest Euro standard, and upgrade to hybrid/electric or more sustainable alternative fuels such as hydrogen and biodiesel as options become available
- To improve fuel economy, introduce driver training, install GPS tracking for route optimisation, and implement fleet booking system with utilisation data to increase staff carpooling
- Develop a staff green travel plan to encourage sustainable transport and commuting options
- Investigate opportunities to establish solar car parks to charge electric vehicle.

Monash currently has five Electric Vehicles (EV) in the fleet and seven Electric vehicle EV charging stations. One of the new vehicles is a private commuter vehicle. Availability of suitable EVs in the market is hindering further uptake at present.

In March 2022, the Fleet policy was updated and nominates only hybrids or electric vehicles in the selection of vehicles available, as these are the only vehicles which meet new emission standards set. There was an original target of moving to a carbon neutral fleet by 2035 but this has been moved to 2030.

Council also received a DELWP grant for the installation of a 50kW and 22kW charger for council fleet use to the value of \$37,500 which should be operational at the end of the year.



6. Sustainable Procurement

- Strengthen sustainable procurement and tender processes to preference the use of sustainable products, technologies and services, and minimising GHG emissions, including the impact of the supply chain
- Review of internal project development and procurement stages, and implement guidelines to increase the opportunity to use recycled content, carbon neutral and sustainable materials
- Source recycled content and carbon neutral paper, preferably from ethical sources, and move away from physical documents to reduce paper use. Extend approach to external printing
- Increase the use of recycled content and lower GHG emission asphalt and concrete by 2022, updating local government design standards/specifications, and undertake training
- Specify energy efficiency and GHG emission reduction standards to establish transparency on the purchase of energy equipment, particularly in major projects.

Feedback and updates have been provided on Council's Procurement Policy and Contracts Management Plan and tools to further encourage energy efficiency, GHG emission reduction, and circular economy as well as the increased use of recycled content materials.

Sustainability Victoria provided a grant of \$158,000 under the Sustainable Infrastructure Fund (SIF) to trial the use of low GHG emission/ recycled content asphalt and concrete in car parks and other recycled content materials for cycling infrastructure across three projects delivered in 2021 and 2022.

7. Environmentally Sustainable Design for Council infrastructure

- Finalise and implement an Environmentally Sustainable Design Policy for Buildings and Infrastructure
ACHIEVED
- Establish monitoring program to track the application of the policy to achieve minimum ESD requirements, reduce GHG emissions and lower building running costs. This may include the use of building benchmark tools such as NABERS or BESS.

In January 2022, Monash Council endorsed its **Environmentally Sustainable Design (ESD) Policy** for Council Buildings and Infrastructure. It seeks to improve the sustainability, environmental performance and climate resilience when constructing or upgrading Council-owned and managed buildings and infrastructure. The policy sets out a consistent approach for achieving best practice ESD outcomes in the design, construction and operation of buildings and infrastructure. It's based on a model policy by the Eastern Alliance for Greenhouse Action (EAGA), in collaboration with its member councils (including Monash) and includes a guideline to support the policy delivery.

Council trialled the policy in 2021 to guide the design of the Wellington Children's Hub and Mulgrave Pavilion projects and used this to change or update the policy so it met ESD commitments whilst remaining within budget. This included the addition of building thermal efficiency consideration and inspection of insulation at lock up stage, improved building metering and monitoring, and the preference for electric over gas appliances where possible. The policy has also been promoted across the organisations, so key stakeholders are aware of how it can be used and the benefits for future infrastructure projects in a series of workshops. This includes all council managers, as well as key representatives from City Design, Capital Works, and Facilities Maintenance, Planning, Horticulture, Asset Management, Active Monash, and Community Development.

8. Achieving Carbon Neutrality through Offsets

In consideration of the wider community expectations, Monash City Council's preference is to source offsets from local sources where possible. This may include:

- Sourcing offsets locally from Monash businesses or where it can provide a high social-economic benefit for our local community
- Maximising solar on Council and community buildings
- Utilising public or private roof space or land for solar through a share cost arrangement
- Investigate how to create offsets through tree planting and the creation of an Urban Forest. The balance of carbon offsets required will be sourced from Australian and International accredited suppliers to achieve our Zero Net Carbon commitment.
- Publicly disclose how we have achieved and are maintaining our carbon neutral commitment from 2025.

Zero net emissions are achieved by replacing current activities with more resource or energy efficient activities or those which do not generate GHG emissions (like solar). Where GHG emission generation cannot be avoided, offsets may be acquired to provide a net zero emissions balance.

There is a preference in council to source local offsets to support our community. This may also include tree planting in partnership with regional councils to achieve offsets or quantify the carbon storage in our own vegetation and creating urban forests.

A range of opportunities are currently being investigated.

To be Carbon Neutral in 2022, based on current cost of carbon credits (\$29.75), could cost council approximately **\$135,000** by purchasing credits (per annum).

GHG emissions and cost would continue to reduce annually as the major energy efficiency projects are commissioned, changing to LED lighting and the move away from the use of gas.

There is still incentive to look at a range of options which could benefit local businesses and the local environment as well.



b) Reducing GHG emissions in the community actions

While it is a priority for Monash Council's to be Carbon neutral by 2025, corporate/council GHG emissions contribute only 1% to the Monash municipality emissions. This highlights the important role for council to play in leading by example for our Monash community to reduce GHG emissions.

In 2018/19, the Community GHG emissions generated Monash businesses and residents was 2,903,000 tCO₂-e. Being the highest employer outside of the CBD, Monash is ranked 6th highest in Great Melbourne for Community GHG Emissions. Ninety seven percent of GHG emissions were generated from electricity, gas, and transport fuel.

A) Leading in the Reduction of Municipal-wide GHG Emissions

- Review and expand on current programs to increase opportunities to further reduce Municipal GHG emissions, energy and costs, through advocacy and delivery
- Investigate establishment of a Zero Net Emission Foundation to facilitate community action.
- Promote energy audits and environment upgrades for businesses and homes.
- Investigate establishment of 100% renewable public electric vehicle charging stations
- Partnering on Zero Net Precincts and research collaborations with Monash University
- Establish business resilience programs to promote energy efficiency, and GHG emissions reduction actions.
- Develop a climate adaptation strategy to minimise the impacts of a changing climate.
- Update the Environmentally Sustainable Development policy (Monash Planning Scheme), to address GHG emission reductions

Council is delivering a range of projects to support reduction of community GHG emissions: Our partnership with EAGA has been instrumental in supporting not only our corporate emissions reduction but that of our community.

- In 2021-22, Council received \$228,000 (ex GST) to deliver the Small Business Energy Saver program on behalf of EAGA and engaged with 1500 business across the region including **460** in Monash. This program is continuing with funding from EAGA councils and is expanding to medium businesses, providing advice and guidance to save energy, costs and GHG emissions.



- Solar savers program is available to Monash residents to provide advice and a vetted provides for solar installations and support in accessing rebates. Council also endorsed a Solar savers special charge to allow 10 pensioner homeowners provide an interest free loan to install solar.
- Encouraging improved state and federal planning, energy and climate change policy through the collaborative advocacy by EAGA and the Greenhouse alliances
- Promoting a Business Power Purchase Renewable Energy Agreement (similar to VECO)

- Council continues to offer Environmental Upgrade finance to businesses to improve their environmental performance and reduce upfront costs for tenants and building owners through Better Building Finance.
- Ongoing community education activities on solar, energy efficiency and sustainable homes for the community through workshops and energy kits.
- Collaboration with Monash University on their community engagement on the Monash Zero Net Emissions Precinct and promoting Zero Net Carbon concept. This includes supporting deliver of a Renewable Liquid (Green) Hydrogen Supply Hub feasibility study project (they received \$75,000 grant). The study involves the analysis of hydrogen fuel in Monash, sourced from renewable electricity, which will be useful to Monash Council regarding any decisions on carbon neutral fuel for trucks and other larger fleet, where electronic vehicle (EV) charging is not suitable.

B) Reducing waste generation and diverting waste from landfill (zero waste)

- Council will require contractors to separate corporate waste data from community waste, including waste generated by leased sites such as childcare centres and scout halls.
- Deliver on the targets of Monash's Waste Management Strategy and implement measures to improve waste monitoring and reporting and moving to zero waste in landfill. Provide incentives such as grants, workshops and guidance to help the community and businesses to minimise waste, reuse materials and practice sustainable procurement.
- Develop business case for a Circular Economy shop to divert suitable items from landfill, sell recycled content and low emission products, and facilitate repair of goods
- Investigate the opportunity to create a local solar farm at the Clayton Landfill or similar suitable site.

In August 2022, Council successfully implemented weekly food waste recycling for the community following an extensive eight months of engagement and education. Diversion of food waste will help to avoid the generation of GHG in landfill. Food waste will also be diverted from Council facilities. Council is also working on other key actions as part of the ongoing delivery of the Waste Management Strategy. Weekly food waste collection could increase diversion of food waste from landfill by up from 80%.

Waste contributes 2% toward the total Municipality GHG emissions. Actions to divert waste from landfill, especially organic waste, and improving recycling and reuse, will also significantly reduce greenhouse gas emissions for Council and the community.

C) Create an Urban Carbon Forest in Monash (30% coverage) through the following activities

- Increased canopy cover revegetation works on Council land to provide social and environmental benefit to the community, improving air quality and reducing summer air temperatures
- Strengthen planning scheme controls to increase planting, retention, and protection of trees on private and public land
- Consider stronger penalties for tree removal, support for tree bonds and development contributions to fund vegetation maintenance and resource tree removal investigations
- Investigate the development of a Nature Trust to secure and expand land available for vegetation, including understory and biodiversity
- Encourage business, residents, and schools to grow native plants on their own land
- Undertake investigation to understand if suitable carbon offsets can be created through our tree planting program in Monash
- Tree education to building awareness of their value to the community amenity and biodiversity
- Consider partnering with universities to identify urban heat island reduction opportunities.

These actions also align with the delivery of the Monash Urban Biodiversity and Open Space Strategies, especially regarding increasing canopy which supports carbon storage, shading and cooling of our suburbs. Our Gardens for Wildlife program positively engages with community members, schools and corporates in tree planting and biodiversity activities.

Horticulture has undertaken urban forest performance monitoring with LiDAR to create a tree ledger which aligns with current asset data and aerial photography to track and forecast greening targets along with monitoring trees at an individual scale. It will help to address issues which may impact tree canopy such as electrical line clearance to minimise tree loss.

Council recently received a \$20,000 grant to create Micro Forest at Wellington reserve. A Microforest includes high density planting to create a rich habitat using a wide diversity of climate ready resilient species. Melbourne University is participating in the design and plant selection. Microforests are fast growing and can create corridors of green in a shorter space of time. If the trial is successful, it may provide a new approach to increasing canopy coverage across Monash.

c) Investment in zero net carbon

- Source upfront funding through loans, grants, or service agreements early on to fast-track projects.
- Set up a revolving sustainability fund as a budget line item to reinvest savings from major energy efficiency projects.

Monash Council has attracted a number of grants to support actions in the plan and will continue to seek these in the future. Council has received approximately \$1.95 million in grants to support public lighting upgrades, EV charging station installations, energy audits and creation of a Microforest.

Eastern Alliance for Greenhouse Action (EAGA) and member councils as well as the other Greenhouse Alliances continue to play a key role supporting council to reduce GHG emissions across council and the community.

External funding bodies were investigated to support delivery but, in the end, Council decided to invest its own funds in these projects. Initial stages of a revolving sustainability fund are being investigated.

Investment to date

Project expenditure for 2021-22 was \$2,897,320 against a budget of \$3,547,836 ex GST. Unspent funds were carried forward to 2022-23 to complete some projects. There were also costs of \$200,000 (1.8FTE) in 2021/22 to manage delivery of key infrastructure projects and ongoing community and business education and projects under ZNCAP, and approximately \$25,000 for community education resourcing and utility management to support carbon inventory assessment. (Table 4)

In 2022-23, the expected expenditure is \$4,668,476 ex GST and at the end of October 2022, approximately \$343,000 has been spent to date on major projects and just over \$100,000 for staffing and community project resourcing.

This will see the bulk of the investment in major infrastructure projects outlined in the ZNCAP complete by end of 2022-23. The focus from 2024 will be monitoring, delivering smaller scale projects (community energy efficiency and solar) and education to reduce and maintain the emissions reduction so we meet our target.

The Energy Performance Contract projects were brought forward into the first two years of ZNCAP delivery so council could access the return-on-investment savings earlier. Once the major energy efficiency projects linked to the current investment are complete, the expected return on investment, guaranteed at 11.6% per annum, will be realised.

Investment in the actions set out in the ZNCAP is already showing significant reductions in GHG emissions. Actions that reduce GHG emissions typically also reduce energy and maintenance costs, creating ongoing savings for council.

In terms of savings to date, Monash transferred to the VECO contract in July 2021, which is sourcing 100% renewable electricity at a costs per kwh expected to be at or better than Business as Usual (BAU). In the 2021-22 financial year, council's electricity costs reduced by \$611,000 which is more than 25% reduction compared to the baseline costs (electricity and usage charges). As the VECO contract is fixed until 2030, Council will continue to save. The rates (c/kwh) for VECO are currently 23% better than BAU and 53% better than current wholesale value of electricity.

With energy prices for electricity and gas predicted to increase further in coming years, it supports a transition from gas to electric appliances to further benefit from VECO savings and GHG emissions reduction. This approach is in line with the new ESD policy for Council Buildings and Infrastructure and will further reduce GHG emissions while improving operational and energy efficiency.

Tracking Investment Against the ZNCAP

To deliver the key corporate actions in the Zero Net Carbon Action Plan, the original project investment was estimated to be \$10.46 million, exclusive of staff costs of \$200,000 per annum. During the delivery phase of the Action Plan, major energy efficiency upgrade projects have been brought forward into 2021-22 and 22-23 in order for Council could take advantage of the energy savings costs earlier. These should be realised from July 2023. Public lighting change over should also be complete by July 2023, generating more savings.

At June 2022, council has spent \$3,450,109 on delivering the Zero Net Carbon Action Plan key actions. In 2022-23, expenditure is budgeted for \$4,668,476, with \$343,783 of actual expenditure up to October 2022.

Over the next three months, a number of the major infrastructure projects will be completed, and the remainder of the public lighting units purchased, followed by the installation up to the end of the financial year.

In 2023-24 and 2024-25, the focus will be on smaller scale energy efficiency upgrades in our community facilities, promotion of ESD and sustainable procurement to reduce future emissions sources, effective offset strategy to reach carbon neutrality and electrifying our fleet. Approximately \$1.1m is allocated for the deliver for each year.

It is expected by 2025 that expenditure will total \$10.4M approximately and it should be noted that this includes additional street lighting, EV charging stations and recycled content trials will have been delivered through the assistance of grant funding.

From 2025 – Council will need to allocate at least \$100,000 per annum for offsets to maintain our carbon neutral status.

Cost savings in the process of getting to net zero

While still early in the process, 2021-22 financial year was the first year to not only see significant GHG emissions reductions but also cost savings for council.

There was a drop in electricity use in 2019-20 and 2020-21, partly due to reduced services under COVID restrictions across the 182 sites). As normal operations resume, there was a 3% reduction in electricity use compared to pre COVID environment (Figure 2a).

However, with the initiation of the VECO contract in 2021-22, there was a saving of **\$611,000 per annum** (28% drop) compared to the 2018-19 baseline year and this annual saving will continue and increase as council operations become more energy efficient through equipment and lighting upgrades and fleet improvements (Figure 2b).

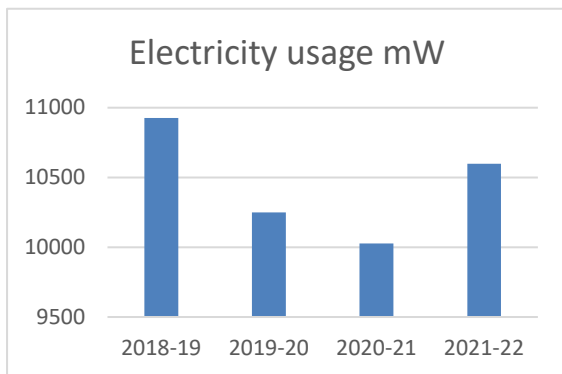


Figure 2a Electricity usage (mW)

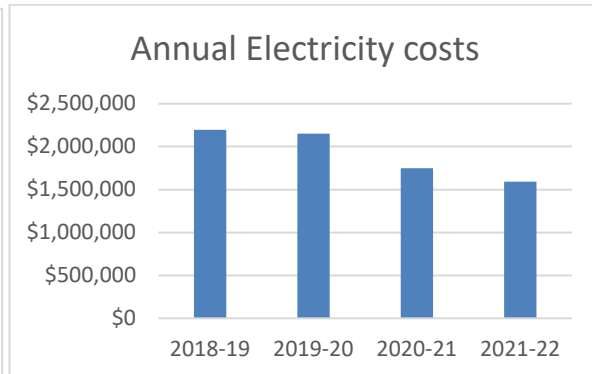


Figure 2b Annual Electricity costs

Council also should continue to benefit financially from the fixed pricing of the VECO contract over the next 9 years, until 2030. Council may also wish to consider including suitable community groups in the VECO, so they can also benefit from the savings and reduce community GHG emissions.

In 2021-22, the VECO price per MW of electricity was

- **up to 23 %** less than the BAU reference pricing and
- **up to 54 %** less than the current wholesale price

for electricity across the **whole portfolio of the 46** council accounts (excluding service charges).

The increased focus on reducing GHG emissions is attractive for grant funding and Council was successful in accessing a number of grants (up to \$1.95m) to support project delivery, especially for public lighting upgrades on main roads, energy audits and for installation of electric vehicle charging and solar installations. This allowed council to deliver more projects in this space. to further reduce GHG emissions.

Table 4: 2021-23 Expenditure for delivery of Zero Net Corporate GHG emissions by 2025.

#	Summary of quantifiable investment to get to Zero Net carbon by 2025 (ex GST)	2021-22 budget	2021-22 spend	2022-23 budget	Spend 1 July to 31 October 2022	Comments
1	100% Renewable Electricity for 100% of electricity (LGPPA)	*	*	*	*	\$25,000 paid in June 2020 to participate in contract
2	Changeover of major streetlights to LED	\$673,435	\$673,435	\$1,047,000	\$7,600	Program has expanded to include decorative, reserve, carpark and traffic lighting in addition to main roads lights. Received \$1,753,000 in grants to date. Unspent funds have been carried forward. Separate to this, in 2020-21 \$552,789 was spent purchasing lights.
3	a) Energy efficiency upgrades (EPC) Stage 1	\$2,718,648	\$2,052,034	\$675,004	\$3,200	Original 5-year plan was compressed to two years. Some impact from equipment delays and additional verification reviews also completed. Background work underway for work specifications but next milestones not quite completed and not yet invoiced.
	b) Energy efficiency upgrades (EPC) Stage 2	\$0	\$0	\$2,681,472	\$268,147	
4	a) Roof top solar for key community facilities	\$15,000	\$1,200	\$50,000	\$20,665	Received grant for six level 2 energy audits (\$28,000) of community facilities. Received grant for install and club will pay back over 10 years. Two community groups actually received grants to cover all costs. Lighting is also being upgraded to LED as part of maintenance schedule.
	b) Energy efficiency - audits, insulation, small scale lighting	\$50,000	\$51,480	\$50,000	\$29,350	
5	Fleet optimisation to reduce fuel use and transition to electric	\$42,233	\$54,126	\$150,000	\$12,354	Received \$37500 and \$25000 in grants for fleet and public chargers. A business case was undertaken on moving to an EV fleet. Includes fleet charging and estimated cost differential for purchasing EV.
6	Sustainable Procurement – Transition to recycled content and carbon neutral purchasing including asphalt, concrete and paper (internal and external printing)	\$45,000	\$32,725	\$15,000	\$1,467	Grant for trialling recycled content asphalt and concrete in infrastructure projects - \$80,000
7	Environmentally Sustainable Design Policy for buildings and infrastructure including implementation	\$3,520	\$3,520	integrated into projects	\$0	2021 - Trialled in the design of Wellington Children's Hub and Mulgrave Pavilion to test implementation while meeting budget. Now guiding new builds. Policy workshops completed with over 50 staff.
8	Investment in Carbon Offset which provide a high social-economic benefit, sourced from local businesses or alternatives	\$0	\$0	\$0	\$0	Pay annually from 2025
Investment subtotal		\$3,547,836	\$2,897,320	\$4,668,476	\$342,783	
Staff time resourcing to manage on ground projects and facilitate community & business education		\$200,000	\$200,000	\$220,000	\$77,000	Appointed October 2021
Utility billing portal		\$22,335	\$22,335	\$30,654	\$20,436	Includes utility data management and carbon inventory
Zero net carbon community projects		\$3,300	\$3,300	\$18,500	\$3,017	Sustainable transport, energy kits, solar savers rates loan, micro forest project
Total		\$3,773,471	\$3,122,955	\$4,947,630	\$443,236	

Next steps

Over the next year, the priorities for delivery in the Zero Net Carbon Action Plan will be:

- Complete delivery of current energy efficiency infrastructure projects under the Energy Performance Contract (EPC).
- Strengthen procurement and capital project delivery to maximise GHG emission reduction through implementation of the ESD policy.
- Review and address barriers to delivering projects through stakeholder management
- Increase EV charging and opportunities to electrify Council's fleet.
- Development of a Climate Adaptation/Response Plan to support our community to be resilient in a changing climate.
- Investigate the opportunity for energy storage through batteries.
- Ongoing community and business engagement to enable municipal emission reduction.
- Build partnerships across the region to support regional GHG emissions reduction and climate resilience through GSEM, Monash University Zero Net Precinct team, Business groups and community groups.
- Investigate independent certification of Carbon Neutrality in preparation to achieving carbon neutral status by 2025.
- Further investigate opportunities for local and regional carbon offsets including the use of local vegetation.