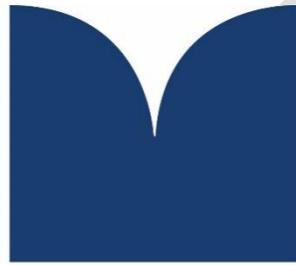


# Further Emission Reduction Strategies for Monash City Council

Monash City Council



CITY OF  
**MONASH**



## Contacts

Client	Consultancy
Monash City Council "Council"	Carbonetix Pty Ltd "CarbonetiX"

Client contact	CarbonetiX contact
Trish McGee	Kerrin Naidoo

## Document control

Revision	Prepared by	Reviewed by	Authorised by	Date
Draft	Kerrin Naidoo	Mitchell Benders		
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## About CarbonetiX

CarbonetiX is a multi-disciplinary energy and resource optimisation company. It is our mission to improve our clients' energy and resource management by utilising expertise and leading-edge technologies to deliver practical, cost effective solutions that enhance environmental performance.

We specialise in the design, delivery, implementation and monitoring of cost-effective energy and water efficiency measures across a broad range of commercial, industrial and government facilities throughout Australia. We provide beginning to end practical solutions, tailored to reduce your sites energy and water use.

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## 1 Introduction

CarbonetiX was engaged by Monash City Council to further investigate carbon reduction opportunities above those that were modelled in the previous report. This involved identifying and comparing the strategies which other local Councils are using to achieve their own carbon reduction targets and providing recommendations for Monash to consider as they move towards carbon neutrality.

## 2 Project Scope

The service was delivered in two stages, with the *'Implementation Plan for Council's Emission Reduction Initiatives'* report a key deliverable of stage two. The scope of stage two, and hence the content of this report, is to encompass the following:

- Review work undertaken by other leading councils to manage GHG emissions.
- Provide ways in which Council can prioritise the use of recycled materials in its operations, reduce emissions from employee commute and transition gas equipment to electricity with a focus on aquatic centres.
- Assess emissions reduction opportunities including respective challenges, financial and environmental costs.
- Examine current and planned Monash Council GHG emission reduction programs.

The information ascertained through this project will support the development of a whole of Council strategy for tackling climate change, as referred to in the Environmental Sustainability Strategy 2016-2026, with an aim to have it presented to Council by September 2020 (this actual strategy is outside of the scope of this project).

## 3 Methodology

The following steps were undertaken in delivery of stage 2 of this project:

1. Initial kick-off meeting between consulting team and Council stakeholders to:
  - a. discuss project delivery
  - b. define the scope of review of work undertaken by other leading councils and:
  - c. discuss data collection strategy
2. Examine current and planned Monash Council GHG emission reduction programs.
3. Collection of available data on other leading Councils GHG emission reduction programs.
4. Determine ways in which Monash City Council can address their Scope 3 emissions such as:
  - a. prioritising the use of recycled materials in Council operations.
  - b. reducing employee commute
  - c. transitioning gas equipment to electricity with focus on aquatic centres
5. Compare, where information is available, different Councils' GHG emission reduction programs by their assessing the capital costs, environmental cost and benefits, timelines, challenges and resources required
6. Determine implementation plan for Monash City Council's emission reduction initiatives.
7. Provide implementation plan for Council to reach carbon neutrality by 2025, 2030 and 2040.

## 4 Prioritising the use of recycled materials in Council operations

The need to minimise waste has become an increasingly important aspect of Local Government sustainability strategies. This is due in part to China's ban on importing waste in 2018, which created a global recycling crisis. This recycling crisis came with the increased financial burden for the local governments which needed to be addressed. For Monash, the net cost is \$1.5 million as now council has to pay for the materials to be recycled and no longer receive a rebate for the recycles.

Both Federal and State Governments have also been advocating for increased recycling programs and reduced waste by developing a range of policy documents. The Federal Government's '2018 National Waste Policy' emphasises adopting the concept of a 'Circular Economy' in waste management with goals to "increase use of recycled material and build demand and market for recycled products"

In 2018, the Victorian Government published their 'Recycling Industry Strategic Plan' which includes the development of a whole-of government circular economy, aiming to improve the quality of recycled material and expand the market of recycled material. \$1.6 million has been invested in Victorian projects to develop products sourced from recycled glass, plastic, paper and e-waste.

Council has several options available to address the recycling crisis. Monash City Council may prioritise using recycled materials in its operations through sustainable procurement policy which includes developing standards, policies and procurement guidelines that focus on products that include recycled materials. Darebin council followed a similar trajectory in 2018 when by tendering for road surfacing materials and seeking a product that had a minimum of 95% recycled content. Monash City Council may also help to promote a market for recycled materials through the introduction of materials in the regular office operations which contain recycled content. Several councils' procurement strategy includes using only 100% recycled paper and encouraging less reliance on paper in processes (which Monash City Council is currently moving towards through their digital strategy). Furthermore, Monash may continue to identify opportunities to purchase recycled materials used in council operations.

Monash is tending towards moving to a circular economy which aims to reduce waste by re-using and recycling resources as much as possible. This is increasingly seen as an essential sustainability strategy for government and organisations, with the Victorian State Government currently developing new policy including an action plan to improve resource recovery and recycling processes. Other groups such as the CSIRO are working to develop new re-usable or recyclable products to replace those that typically end up in landfill.

## 5 Other Councils' Emission Reduction Programs

Local Victorian Councils are currently in the process of reducing their carbon emissions using various sustainability strategies, carbon reduction schemes and environmental targets. It is important for Monash City Council to assess their own emissions reduction opportunities by reviewing other city councils' strategies and implementation pathways. The following section highlights emissions reduction opportunities undertaken by other city councils, both leading Councils in the climate change space, and those similar to Monash in size and location as well as with similar emission reduction priorities. This is conducted to encourage Monash City Council to implement similar strategies which allow them to prioritise the use of recycled materials in Council operations, reduce employee commute, transition gas equipment to electricity with a focus on aquatic centres and subsequently reduce community emissions.

## **5.1 Darebin City Council**

### **5.1.1 Energy foundation**

Darebin City Council has set up a climate think tank to aid the council and community in achieving meaningful action. The foundation aims to aid community members by identifying and assisting in the implementing of energy efficiency opportunities as well as crowd fund community projects and advocate to government for increased climate action.

### **5.1.2 Facility upgrades**

Darebin's successful Energy Efficiency Program has reduced energy costs by \$1.3m since 2008, concentrating on the buildings using the largest amount of energy, including Council offices, libraries and aquatic and entertainment centres.

### **5.1.3 Green Travel program**

Being closer to the city, Darebin Council has access to all types of public transport for commuting. To leverage this, Darebin is continuing its Green Travel program, which incentivises staff to use sustainable forms of transport to commute.

### **5.1.4 Recycled content in asphalt**

In 2018-19, the entirety of City of Darebin's road resurfacing contract included over 4,500 tonnes of Asphalttech's DuraGrip product which consists of 85% recycled material. The stone mastic asphalt is made by replacing all stone with steel slag and contains rubber from truck tyres sourced from the northern suburbs of Melbourne.

### **5.1.5 Community Measures**

Darebin have initiated a range of measures to reduce their community emissions. Their Solar Savers program has installed over 1,800 kW of PV systems on low income and pensioner households; their LightSmart program has retrofitted over 140 businesses with LED upgrades; the Green Business network rates businesses and offers certificates for sustainable organisations; the Talking My Language Program offers energy efficiency information in multiple languages to help immigrant communities reduce their emissions. Darebin also buy solar panels and hot water systems in bulk to pass savings on to residents and have provided and installed 1000 fans to vulnerable residents for free.

## **5.2 Whitehorse City Council**

### **5.2.1 Electrification of gas equipment**

Whitehorse City Council teams are in the process of replacing gas intensive equipment with electrical alternatives to reduce gas emissions. Notably, Whitehorse was able to remove all gas equipment including the gas meter at the Schwerkolt Cottage Museum Complex due to the replacement and upgrade of all gas equipment. The initiative is largely driven by internal Council departments who are severely hindered by the lack of an ESD policy that supports the electrification of gas equipment in Council facilities.

### **5.2.2 EPCs**

Whitehorse has focused primarily on increasing renewables and improving the efficiency of their equipment. They are currently undertaking an EPC which is expected to reduce Council's emissions by approximately 1,500 tonnes. As part of this, they are optimising control systems and installing new software at the Box Hill Aqualink which will reduce gas consumption by over 2,000 GJ.

### **5.2.3 Solar installation**

Whitehorse are also currently running multiple programs to increase the amount of solar installed throughout Council. These include the EAGA Scaling Up Solar program, which aims to increase the amount of solar on Council's smaller buildings, and the Solar Savers program which supports pensioners to install solar. Monash City Council is also a part of this initiative which has recently been expanded to include all Monash Council residents.

## **5.3 Knox City Council**

### **5.3.1 Incentivising alternative employee commute**

A health initiative run at Knox City Council directly lowers employee commute carbon emissions by incentivising their workers to walk and/or cycle to work. With the intention to encourage a more active lifestyle, the Knox City Council's transport team hosts a raffle for employees who have walked or rode to work each week. Although the program is centred around health, it has a dual benefit of also lowering Knox City Council's scope 3 transport fuel emissions. It should be noted that Knox City already has the benefit of multiple shared use bike paths that pass near the Civic Centre as well as established end of journey facilities for staff to use.

## **5.4 Yarra Ranges Council**

### **5.4.1 Electrification of gas equipment**

Yarra Ranges Council released a climate change statement indicating that Council is creating a transition plan for Council operations to move from natural gas and LPG energy sources to renewable electricity. This will be achieved through upgrades of gas and LPG equipment, in combination with Yarra Ranges Council's intention to engage in a power purchase agreement (PPA) that will ensure all Council's electricity is renewably sourced. While the PPA will eliminate all electricity emissions, the transition from gas and LPG sources will decrease all emission from natural gas.

### **5.4.2 Facility upgrades**

Facility upgrades have already been performed on the top 10 most energy intensive facilities in Yarra Ranges Council. These sites underwent significant LED lighting upgrades as well as upgrades to heating and cooling equipment which reduced energy demand by 140,000 kWh annually.

### **5.4.3 Fleet electrification**

To encourage renewable energy usage, Yarra Ranges Council have also purchased two Hyundai Ioniq electric vehicles at a cost of \$40,000 each. Yarra Ranges Council has estimated that this will result in \$2,000 worth of annual savings. Council intends to use solar powered charging stations at their council offices to avoid causing any carbon emissions and to promote sustainability in the community.

### **5.4.4 Ribbons of Green**

Community projects such as Ribbons of Green program have also been used to promote sustainable living in the Yarra Ranges Council community. The program offers free native plants for applicable private properties, schools and community groups through the program. While all site preparation and planting are done by the landholder, Yarra Ranges Council provides advice on how to prepare the site, weed control and plant species selection. Through this program, over 800,000 trees have been planted in the community.

#### **5.4.5 Warburton Hydro Project**

Yarra Ranges also promotes sustainability in its community by supporting community-based renewable energy projects such as the Warburton Community Hydro project. The project refurbished, and grid connected a hydro turbine which now powers the equivalent of 150 houses and can generate power around the clock.

### **5.5 Kingston City Council**

#### **5.5.1 Solar Farm**

Kingston City Council have committed to investigating the feasibility of large-scale solar PV farms on decommissioned landfill sites. They are currently leading the investigation into the potential to install a solar farm at the Clayton Landfill site which was closed in 2016.

#### **5.5.2 Community emissions reduction target**

Kingston also plan to support the community to reduce their overall emissions by 15% by 2025. This will involve increased advocacy through the development of policy and strategies, and increased facilitation via offering finance mechanisms and offering support to businesses and households.

### **5.6 Boroondara**

#### **5.6.1 Solar installation**

Boroondara has focused heavily on increasing the amount of solar installed across their facilities. They currently have a \$300k budget to install further solar PV systems.

### **5.7 Monash University**

#### **5.7.1 Emission reduction initiatives**

Monash University has committed to be carbon neutral by 2030 and have already undertaken a range of measures including the establishment of an on-site microgrid. Monash University are one of the biggest energy users within Monash City Council and are looking to reduce their emissions through energy efficiency upgrades, electrification of all gas equipment, and through the installation of solar PV. They are also running several research programs aimed at developing innovative new technologies to help drive sustainability measures.

### **5.8 Nillumbik Shire Council**

#### **5.8.1 Solar car park**

Nillumbik have installed a solar system which also powers an electric car charging station for corporate council use. Nillumbik have plans to establish more charging stations for community use.

### **5.9 Stonnington City Council**

#### **5.9.1 Recycled Materials**

Stonnington City Council have committed to increasing their use of recycled materials in order to reduce the amount of waste sent to landfill. This will be achieved by processing organic waste into compost, using recycled glass and plastics in asphalt and concrete, and using recycled plastics to build street furniture.

## **5.10 Melbourne City Council**

### **5.10.1 Community Projects**

Melbourne City Council have established several community funds such as the Waste Minimisation and Innovation Fund which promote action and innovation within the community. Melbourne City Council also established the Sustainable Melbourne Fund which was initially established in 2002 to help drive sustainable development for businesses operating within the municipality. They have offered loans of up to \$2 million with repayments made through Council rates. The program has recently been expanded nationally as the Sustainable Australia Fund.

### **5.10.2 East Melbourne Library & Community Centre**

Through implementation of Melbourne City Council's ESD policies, the East Melbourne Library & Community Centre was built with ground sourced heat exchangers to eliminate energy usage for heating and cooling.

## **6 Further Emission Reduction Opportunities for Monash City Council**

Given the context of other city councils' emission reduction initiatives, Monash City Council has several ways in which their emissions may be addressed. The following measures represent opportunities for Council to reduce both their own scope 1 and 3 emissions as well as reducing community emissions.

### **6.1 Electrification of Gas Equipment**

The implementation of PPAs at several City Councils creates a unique opportunity to capitalise on being provided with 100% renewable electricity. It is an excellent opportunity for Monash City Council to convert gas heating systems and appliances to electric equipment. This includes installing split systems in pavilions to replace gas heaters and installing electric stoves to replace gas stoves and ovens. This should be implemented across any pavilions and halls which still have gas equipment. Similar to Yarra Ranges Council, it is recommended that Monash City Council create a transition plan for implementing these upgrades as it requires feasibility studies to identify and prioritise sites with gas equipment and to ensure that any new electric infrastructure is appropriately sized for each building's unique size and requirements.

Similar to the facility upgrades performed at Yarra Ranges Council, larger facilities such as the Monash Aquatic and Recreation Centre (MARC) may replace gas equipment as needed through EPCs. Currently, Council officers are waiting on funding in the next financial year to commence work on four major sites, although some work may be able to be achieved through renewal activities. A detailed facility study for these sites have been completed in 2019 though some work is on hold due to development of integrated site plans. More projects may be added to the EPC depending on the carbon neutral target chosen by Council. Removing or even upgrading gas intensive equipment at Monash City Council facilities would drastically reduce Monash City Council's scope 1 and 3 gas emissions. This initiative will be supported by the new ESD guidelines that Monash is currently developing with EAGA.

### **6.2 Using Recycled Materials in Council Operations**

Monash City Council have recognised the need to incorporate more recycled materials within their operations and in October 2019, began trials to add recycled content to asphalt, reducing the amount of aggregate used. The use of geopolymers concrete is also being considered for use in Council roads and

footpaths. To ensure an effective implementation of this initiative, it is recommended that Monash City Council's ESD policy include measures that support and/or mandate the use of recycled content in asphalt and concrete production.

Monash could also consider funding innovative recycling projects within the community, similar to Melbourne City Council. Melbourne recently established the Waste Minimisation and Innovation Fund which supports groups to develop new technologies and processes and to take action. Projects that have been funded include new composting centres, education programs, and research on a new permeable pavement technology which is made from recycled tyres and aggregates.

### **6.3 Reducing Employee Commute**

To address their Scope 3 transport fuel emissions, Council will need to influence how their employees commute to work. As part of this project, a Monash Travel Survey was conducted to determine the amount of emissions caused by employee commuting. The survey asked for ideas on ways Monash City Council could promote more sustainable methods for staff to commute to work. The top responses were:

- Discounts for public transport tickets (108 responses, 35.2%)
- Upgrades to end of trip facilities such as bike storage and showers (84 responses, 27.4%)
- Establishing a carpool program (81 responses, 26.4%)
- More frequent and reliable public transport options (12 responses, 3.9%)

Implementing these strategies would encourage more staff to utilise low or zero emissions travel methods which will help to reduce Council's scope three emissions. There are several ways that the success of this initiative can be managed, ranging from regular commuter surveys to use of commuter tracking apps which are available for smart phones. These initiatives may be expanded upon to encourage physical activity amongst Monash City Council staff in a similar manner as Knox City Council. This can be achieved by incentivising walking or cycling to work by hosting raffles and awarding prizes to staff who consistently choose alternative commuting options. Linking health with sustainability may allow Monash City Council to diversify these initiatives' capital budget to alleviate some financial strain from the sustainability department.

Currently Monash offers Myki tickets to employees to use as needed for public transport, however the cards are currently only available at the Civic Centre, which means staff working in other areas of Council must first travel to the Civic Centre to access the cards. A potential alternative method would be to promote public transport use through programs such as the Myki Commuter Club. This allows businesses to purchase yearly Myki cards for employees at a discounted rate with the savings passed on to the employees. Employees can pay via salary sacrifice which allows them to reduce tax costs while also paying a smaller monthly fee rather than a single bulk annual fee.

### **6.4 Solar Farms on Decommissioned Landfill**

Multiple Councils are currently investigating the possibility of installing solar farms on old landfill sites. This presents an opportunity to dramatically increase the amount of installed solar across Councils, with Kingston City Council, Knox City Council and Greater Dandenong City Council currently considering the initiative. This type of project has already been successfully implemented in Albury City where they currently have a 2.2 MW solar farm installed on a decommissioned landfill site.

However, Albury City is a rural Council with an abundance of open spaces and this type of initiative could face community opposition within metro Melbourne Councils. Greater Dandenong City Council has already received complaints from residents for a proposed solar farm in Springvale South as the site was initially flagged to be open space when the landfill was closed. Due to Monash Council's significant industrial roof space, there may be greater opportunities for Council to work with businesses on large scale solar installations on vacant roof space rather than on potential open space sites.

## 6.5 Community projects

Monash City Council has significant opportunities to support their residents to reduce community emissions. As community emissions account for most emissions generated within the boundaries of Council, reducing them should form an important part of Council's climate change strategy. Darebin City Council is a clear leader in their efforts to reduce community emissions. Monash City Council is already participating in the Solar Savers program and offers EUAs for local businesses which will increase the amount of solar PV installed across Council, however, there is a range of other measures they could include. Depending on funding availability, establishing lighting upgrade programs and educational/advocacy programs should be considered.

The establishment of an Energy Foundation should also be considered. Darebin City Council's Energy Foundation was designed to accelerate meaningful emissions reduction action within the Darebin community, with a focus on economically disadvantaged groups. The foundation has driven change within the community and a similar program within Monash would be expected to achieve similar results by offering energy consultation and advice to community members.

Further sustainability support may be given to Monash City Council's community through programs similar to Yarra Ranges. Monash Council may offer free native plants to appropriate private properties, schools and community groups to improve canopy cover and independently create carbon offsets.

As mentioned previously, Monash has a significant amount of industrial roof space which could be utilised for solar PV installations. Currently Monash is utilising EUAs to help fund sustainability initiatives, however they could also consider setting up a fund similar to Melbourne City Council's Sustainable Melbourne Fund. This was initially established in 2002 to help drive sustainable development for businesses operating within the municipality. They have offered loans of up to \$2 million with repayments made through Council rates. The program has recently been expanded nationally as the Sustainable Australia Fund.

As one of the major sources of community emissions is transport related, there is opportunity to install solar powered electric car charging stations to allow residents with electric cars to drive using zero emissions fuel sources. Councils such as Nillumbik Shire have already installed their first solar powered charging stations and Monash should consider following suit.

Another potential focus for Monash City Council would be to develop a partnership with Monash University. Monash University have established several innovative research programs, including ClimateWorks Australia, the Monash Energy Institute, and the Monash Sustainable Development Institute. These programs conduct research and develop solutions to a wide range of energy and sustainability problems. Partnering with an such an innovative organisation could provide Monash City Council with access to state-of-the-art technologies and resources to aid in Council's emissions reduction programs.

Furthermore, Monash City Council has been exploring opportunities to allow businesses to share roof space for solar equipment installation. This will allow businesses to be paid to offer their roof space for generating energy to be put back into the grid. A similar idea is being explored at Monash University where an on-site microgrid is being built at Clayton. This will allow renewable energy generation from multiple sources to be used by the constituents of the microgrid. It reduces dependence on the grid and allows for control on how and when energy is used on site. This may be desirable as Monash Council's energy network is currently quite constrained in some areas like Glen Waverly, Mount Waverly, Clayton and Mulgrave while there are also bigger industrial areas that simultaneously aren't. A partnership between Monash City Council and local businesses could allow for a microgrid or solar sharing program to be set up to allow businesses to support one another.

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The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into Council operations. Without this undertaking the proposed targets may not be achieved.