

# Carbon Management and Energy Reduction Plan



CESSNOCK  
CITY COUNCIL

Planning & Environment

## Carbon Management and Energy Reduction Plan

Cessnock City Council

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**Document Review**

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## **Introduction**

### **1.1 Background**

There is recognition across the three tiers of Government in Australia that action must be taken to address carbon emissions. Climate change and its associated risks, benefits, costs and mitigation has become one of the single biggest discussion points of recent times, both scientifically and politically.

In response to this Cessnock City Council (CCC) was presented a report detailing the organisation's Carbon footprint in September 2010. The report was adopted as an information report by Council and foreshadowed the potential implications of a "carbon future".

Council has undertaken a range of activities following the report to address a number of the elements identified (see Appendix 1). This strategy has been developed to build on those activities and provide a framework to continue and consolidate the achievements in a strategic and transparent manner.

In addition the progress of Council down the "Fit for the Future" reform path has further highlighted the importance of Council's Financial Sustainability Initiative. The Carbon Management and Energy reduction Strategy is a key component of this Initiative.

This strategy focusses Council to now consider the implications of its carbon emissions and energy use and actively manage them to mitigate the costs of these emissions and illustrate its environmental leadership.

### **1.2 Aim**

The aim of the Carbon Management and Energy Reduction Strategy is to actively pursue opportunities to reduce Council's carbon emissions and energy use.

### **1.3 Objectives**

The key objectives of the Carbon Management and Energy Reduction are:

- Reduce Council's financial and social liability for carbon emissions
- Reduce Council's energy costs
- Reduce the impact of Council's operations on the environment
- Clearly identify the roles and responsibilities of the sections of the organisation who have a part to play in managing Council's energy consumption

## 2 Strategic and Regulatory Framework

### 2.1 NSW Local Government Act 1993

The NSW Local Government Act 1993 identifies within Charter of Councils (Section 8) a number of principles to guide Council. Those principles that relate to the Carbon Management and Energy Reduction Strategy are:

- *to provide directly or on behalf of other levels of government, after due consultation, adequate, equitable and appropriate services and facilities for the community and to ensure that those services and facilities are managed efficiently and effectively*
- *to exercise community leadership*
- *to properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development*
- *to have regard to the long term and cumulative effects of its decisions*

### 2.2 Cessnock 2023 Community Strategic Plan and 2013-2017 Delivery Plan

The Project has been listed in Council's 2013-2017 Delivery Program as item 3.1.7 – *"Prepare a comprehensive Carbon Management Strategy and commence implementation"*. The 2013-2014 Operational Plan identified the development of the plan as a priority for that financial year.

The Carbon Management & Energy Reduction Strategy is consistent with the community's desired outcome of a healthy and sustainable environment.

### 2.3 Financial Sustainability Initiative

Council has adopted a Financial Sustainability initiative which aims, over the long term, to generate sufficient funds to provide the levels of service and infrastructure agreed with our community.

The Carbon Management & Energy Reduction Strategy supports Council's adopted Financial Sustainability Initiative (FSI), in particular the objectives to reduce costs and improve value-for-money. It is anticipated that the outcomes of this strategy will augment the energy efficiency initiatives that have already been identified in the FSI's Productivity Improvements & Cost Saving project.

## 3 Carbon Management and Energy Reduction Focus Areas

### 3.1 Baseline data

Council collects a range of data from various sources and this has been collated and reported in past State of the Environment Reports. The only comprehensive assessment of carbon emissions was

undertaken in 2010 by Hyder through the Calculation of Cessnock City Council Organisational Carbon Footprint. There is recognition that to effectively manage carbon and energy use the collection of baseline and subsequent data is important.

### 3.1.1 Carbon footprint

In 2010 Hyder Consulting identified Council's emissions in the following summary table

*Table 1: Summary of GHG emissions from CCC operations 2010*

Scope	Emissions Source	Emissions tCO <sub>2</sub> -e	% of total emissions
Scope 1	Landfill emissions	28,287	84
	Transport based emissions	1,729	5
	Stationary combustion based emissions	312	1
	Emissions from main natural gas	90	<1
	Fugitive emissions from refrigerants	28	<1
Scope 2	Electricity use	3,385	10

It was clear from this data that Council's focus is on three priority areas; waste, electricity and transport. While a carbon strategy may make reference to the sources of the less than 1% remaining emissions, actions to address these areas would only be undertaken following a positive cost-benefit analysis.

#### Waste

As illustrated above Hyder Consulting identified the landfill operation emissions of 28,429 tCO<sub>2</sub>-e. Council has identified the issue of Greenhouse Gas Emissions in its 2014-2019 Waste Strategy and range of activities has been undertaken by Council's Waste section to address these emissions and include:

- Methane capture and flaring – operational since 2013 and has flared in excess of 3,700,000 cubic metres of methane.
- Transition to a green waste collection and management system – due to be operational in June 2016.

Council receives monthly data on the flaring of methane form the Landfill.

#### Electricity

Street lighting was the highest source of electricity related emissions at 1,295.8 tCO<sub>2</sub>-e. This amounted to 38% of all emissions associated with electricity use. A further 36% (or 1,225.9 tCO<sub>2</sub>-e) of emissions related to electricity was attributable to Council buildings and the remaining 26% (or

862.8 tCO<sub>2</sub>-e) was due to recreational facilities. A number of initiatives have been undertaken in this area including the management of lights and air conditioning at the administration centre to align with staff attendance times. Renovations undertaken in 2012 may have impacted upon these so their operations may need to be revisited.

There is no centralised point for energy charges to be assessed and reconciled. The development of a database of electricity assets and liabilities should be considered to manage the issue. Allocation of responsibility and delegation for electricity accounts of all sizes is required. When this information is available further investigation for energy reduction will commence.

Data is available from Webgraphs for the consumption of electricity at Council's large sites (see Appendix 2) and information available from ERM (the energy supplier) for the smaller sites.

## Fleet

Council's fleet is generally made up of passenger vehicles, waste trucks and other maintenance and construction vehicles. Council's asset list at the time of the study indicated that its fleet includes 60 cars, 30 utility vehicles, 28 trucks (including waste and water tankers) and 33 maintenance and construction vehicles. Fuel use data was available from CCC as total annual volume purchased for diesel and petrol. Data was not available on specifically where and how this fuel was combusted.

In a review of the Vehicle Contributions Agreement in 2012 it was identified that Council's light fleet travelled around 3.1million kilometres using approximately 300,000L of fuel.

Council's fleet and fuel consumption is now monitored and managed by a new version of Ausfleet software, this will provide useful data for assessing the effectiveness of any energy reduction strategies. There is a further review of the Vehicle Contributions Agreement commencing in 2015.

### 3.1.2 Future Data Sources

The calculation of the 2010 footprint was designed in such a way that the methodology could be replicated by Council staff at a future date. It is a recommendation that Council undertake a recalculation of its footprint as a first step, both to assess achievements to date and establish a new baseline.

## 4 Strategic Approach

In order to achieve a reduction in carbon emission and energy use, the hierarchy for addressing energy use and minimising carbon emissions is - eliminate its use, reduce the amount used, use it more efficiently and convert to renewable energy. The potential purchase of offsets and consideration of sequestration activities will be undertaken in a future iteration of the strategy.

### 4.1 Eliminate

Eliminating non-essential energy use is the surest way to reduce consumption. To achieve this an assessment of each of the organisation's energy consuming activities is required and a determination as to their contribution to the operations of the organisation is required.

## **4.2 Reduce**

Identifying opportunities for the reduced amount of energy consumed is the next priority in the hierarchy. Actions could include the shutting down of appliances when not in use (e.g. computers overnight), installing timers on hot water systems, etc.

## **4.3 Efficiency**

The introduction of energy efficiency measures is the next step to reduce energy consumption and costs. Actions in this area include the retrofitting of more energy efficient lighting, driver behaviour in relation to fleet fuel consumption, etc.

## **4.4 Renewable Energy**

The use of renewable energy is an effective way to reduce energy consumption. This has already been undertaken at the Council Depot with the installation of solar photovoltaics to supplement the electricity use at that facility.

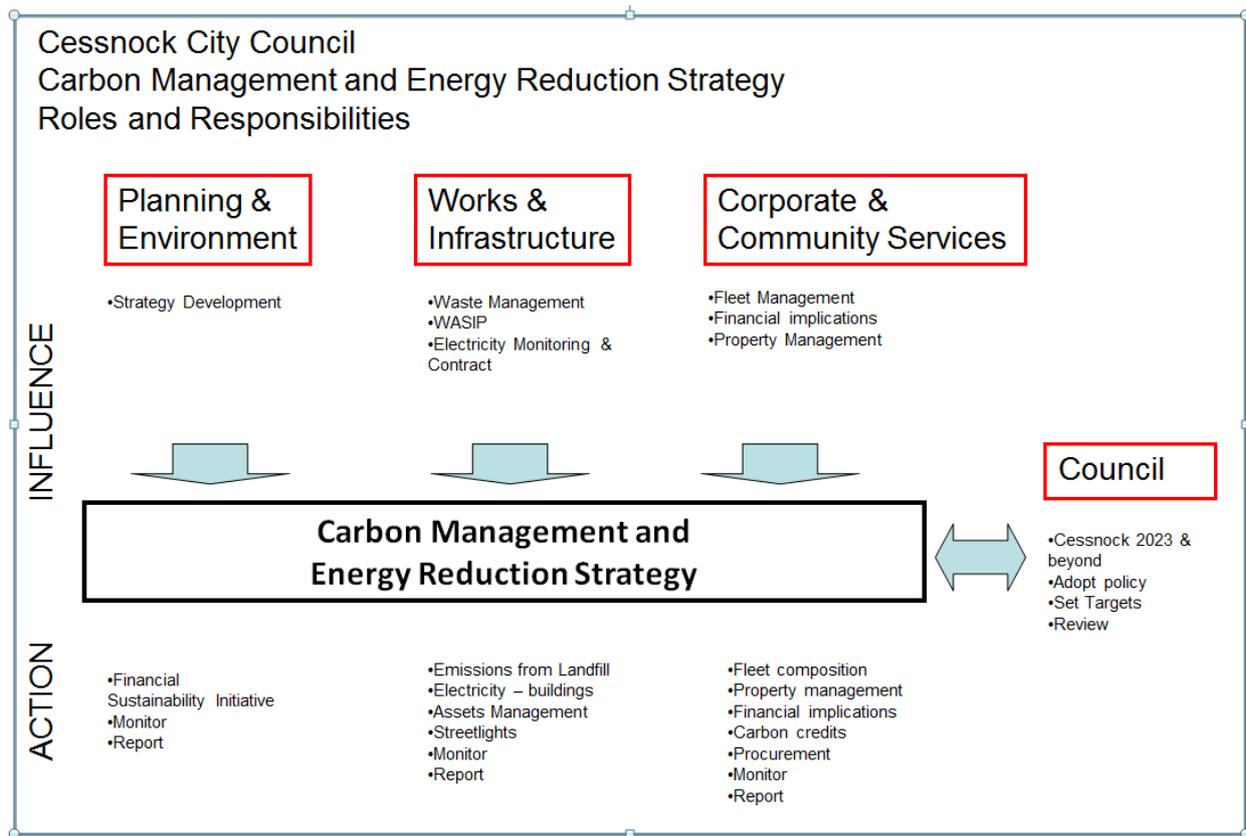
It is using the above hierarchy that the organisation will approach the management of emissions and reduction of energy consumption.

# **5 Strategy Implementation**

The strategy has not identified specific tasks however, it has identified a number of discrete actions that will result in energy consumption reduction. The process owners with assistance from staff with expertise in the area (eg Sustainability Staff) will work cooperatively to ensure the actions are undertaken using best practice and where possible an innovative approach.

The following table identifies the broad areas of responsibilities and through the development of project plans for each of the actions will see roles assigned. The following table emphasises that the approach must be organisation wide to ensure the most effective outcome.

## 5.1 Process owners



## 6 Review

The actions within this strategy can be commenced immediately and it is envisaged that the majority will be in train or completed within two years. The strategy will be reviewed in October 2016 and actions included in the 2017-2021 Delivery Program as an element of Council's adopted Environment Framework.

## 7 References

Cessnock City Council Waste Strategy

<http://www.cessnock.nsw.gov.au/resources/file/Environment/Waste/Adopted%20Cessnock%20Waste%20Management%20Strategy.pdf>

Hyder 2010, Calculation of Council's Organisational Carbon Footprint (DOC 2015/017764).

## 8 Carbon Management and Energy Reduction Strategy

### 8.1 Baseline Data

Code	Action	Priority	Timeframe	Lead/ Partners	Funding required?
BD1	Recalculate the CCC Carbon footprint <ul style="list-style-type: none"> <li>Identify and celebrate substantial improvements</li> <li>identify priority areas.</li> </ul>	High	6 Months	Sustainability, Principal natural Environment Planner, Communications	Nil
BD2	Use Ausfleet to its full potential including assessment of CO2 emissions and fuel consumption.	High	6 Months	Fleet Supervisor	Unsure
BD3	Develop a centralised database developed for electricity accounts <ul style="list-style-type: none"> <li>ensure each account has, delegated person responsible for authorising and is a cost that should be attributed to Council.</li> </ul>	High	1 year	Finance	Nil
BD4	Review the need for developing National Greenhouse Emission Reduction Scheme report (lodged or otherwise).	High	6 months	Sustainability	Nil
BD5	Ensure data is available to effectively measure any proposed energy reduction or carbon management project.	High	6 Months	Project Managers	Nil

### 8.2 Waste

Code	Action	Priority	Timeframe	Lead/ Partners	Funding required?
W1	Implement actions from Waste Strategy <ul style="list-style-type: none"> <li>Organics collection &amp; recycling</li> </ul>	High	18 Months	Waste & Environment	Funded.
W2	Investigate the re-use of Landfill methane.	Med	1yr	Waste & Environment	Nil
W3	New Transfer station to be built to sustainability standard.	Med	1yr	Waste & Environment	Yes
W4	Investigate energy efficient vehicles for new transfer station	Med	2 yr	Waste & Environment	Yes

### 8.3 Electricity

Code	Action	Priority	Timeframe	Lead/ Partners	Funding required?
E1	Revisit Council's resolution to refer the development of Renewable Energy Fund to Environmental Strategy & Management Committee..	High	3 months	PNEP	Nil
E2	Electricity sites identified and incorporated into asset database.	High	6 months	Sustainability, Assets	Nil
E3	Review energy consumption at all sites - identify opportunities for elimination reduction, efficiency measures.	Mod	1 yr	Sustainability Asset Owner/Manager	Likely
E4	Identify candidate sites for renewable energy (PAC, VIC, Airport) <ul style="list-style-type: none"> <li>- develop criteria for candidacy</li> <li>- Build business case for implementation.</li> </ul>	High	6 months	Sustainability	Nil
E5	Review actions from Level 1 audits undertaken on Council sites.	High	6 months	Sustainability Asset Owner	Nil
E6	Review actions previously undertaken to ensure still applicable – eg energy saving actions at Admin centre.	High	6 months	Sustainability Asset Owner	Unknown
E7	Allocate responsibility of Street lighting Management to a single Manager.	High	2 months	ELT	Nil
E8	Active participation in data management (review of maintenance charges)  RMS returns audit  New development streetlight policy and procedures (eg Huntlee)	High	6 months	Streetlight Manager / Land Use Planning	Unknown
E9	Review the SSROC accelerated refit of streetlights to be more energy efficient. Identify cost savings and funding opportunities. Develop business case.	High	12 months	Streetlight Manager	Unknown
E10	Implement Council resolution on solar lighting for Council spaces (parks etc)	mod	12 months	Rec Services Manager	Unknown

## 8.4 Fleet

Code	Action	Priority	Timeframe	Lead/ Partners	Funding required?
F1	Vehicle contribution Agreement review	High	1 yr	Procurement and Contracts Manager Management Team	Nil
F2	Investigate the option for new potential leaseback holders to take payment in lieu of car (offset allowance).	High	1 yr	Chief Financial Officer & Procurement and Contracts Manager	Nil
F3	Review Policy to include energy efficiency measures.	High	1 yr	Procurement and Contracts Manager	Nil
F4	Incorporate emissions and efficiency into procurement process	High	1 yr	Procurement and Contracts Manager	Unknown
F5	Identify opportunities for car pooling	Mod	2 yrs	Procurement and Contracts Manager	Nil
F6	Investigate fleet of pooled vehicles based at admin centre.	Mod	2 yrs	Sustainability Team	Unknown
F7	Undertake training on energy efficient driving (in conjunction with safety).	Mod	1 yr	Fleet Manager Road Safety Officer	Unknown

## 8.5 Community

Code	Action	Priority	Timeframe	Lead/ Partners	Funding required?
C1	Staff education and Engagement program developed and implemented.	High	6 Months	Sustainability, Principal Natural Environment Planner	Nil
C2	Work with external agencies to increase awareness and opportunities.	High	6 months	Sustainability Team	Unknown
C3	Publicise Council's efforts and achievements in energy reduction and financial savings	High	6 months	Communications Officer	Nil

## 9 Appendix 1 - Council Energy Reduction Action Table (top 10 sites)

Facility	Actions Undertaken
<p>Kurri Kurri Aquatic Centre</p> <p>(note: under terms of lease this site s bills are paid by the lease and not Council)</p>	<p>Level 1 Energy Audit completed June 2011 identifying following actions:</p> <ul style="list-style-type: none"> <li>• Install variable speed drives to filtration pumps</li> <li>• Replace T8 fluorescent lighting with high output T5 fittings.</li> <li>• Replace halogen down lights</li> <li>• Replace exit signs</li> <li>• Install timer and contractor to HWS in Plant Room</li> <li>• Install power factor correction</li> <li>• Investigate mercury vapour alternatives</li> </ul> <p>Total estimated cost of \$41,780 (allocated from 2010-11 WaSIP funds). Total estimated annual savings of \$23,897, 96,468 kWh i.e. saving of 14% total consumption and 103t CO<sub>2</sub>-e per year.</p>
<p>Council Administration Building</p>	<p>Over a period of time the following initiatives have been implemented:</p> <ul style="list-style-type: none"> <li>• Timer switches and motion sensors in low use rooms</li> <li>• Lighting review and installation of triphosphor tubes.</li> <li>• Linking the lighting, boiling hot water units and air-conditioners to the existing electronic security system ensuring that systems are not left operating when the building is not occupied.</li> <li>• Energy star computers and printers enabled.</li> <li>• Minor repairs and adjustments to the main air handling unit</li> <li>• Provision of a shade structure over the bank of air conditioning package units located on the roof (by reducing exposure to extremes of temperature, the units are able to run more evenly thus minimising down time due to defrosting or overheating).</li> <li>• LED lights installed in foyer and front counter area with painting in 2014-15</li> </ul>
<p>Works Depot</p>	<p>Energy review in conjunction with Cleaner Production Assessment completed in 2003.</p> <p>Level 1 energy audit conducted identified savings in:</p> <ul style="list-style-type: none"> <li>○ Workshop lighting costing \$6,200 with 1.5 yr payback</li> <li>○ General lighting costing \$23,000 with 5 yr payback.</li> <li>○ HVAC</li> <li>○ Water heating and cooling costing \$1,000</li> <li>○ Office equipment.</li> </ul> <p>Management changes to be implemented in July 2012.</p> <p>20kW solar power system installed in June 2013. Savings to date ~\$7,800.</p>

Facility	Actions Undertaken
Cessnock Performing Arts Centre	Site visit conducted prior to undertaking level 1 energy audit identified that there wasn't much that could be done currently at the site and we would be better using service at another site.
Cessnock Pool	<p>Level 1 energy audit conducted identified savings in:</p> <ul style="list-style-type: none"> <li>○ Large pool pump with installation of VSD with 15% energy savings.</li> <li>○ Facilities lighting with 1% energy savings</li> <li>○ Energy management at no cost achieving 10% savings.</li> </ul> <p>Management changes to be implemented in July 2012.</p> <p>CEEP grant application submitted to convert pool heating from electric heat pumps to solar. Grant unsuccessful.</p>
Cessnock Library	Lighting refit completed in January 2012
Baddeley Park Stadium	<p>Level 1 Energy Audit conducted identified savings in:</p> <ul style="list-style-type: none"> <li>○ Energy management at no cost achieving 10% savings.</li> <li>○ Facilities lighting with 14% energy savings.</li> <li>○ Water heating</li> <li>○ Office equipment through management.</li> </ul> <p>Management changes to be implemented in July 2012.</p>
Houselights HWCIC	<p>Retrofit of existing light fittings in the public area with a combination of 150W PAR lamps (same fitting); 75-watt PAR38 Halogen Floods; 12V 20-watt IRC Halogen Lamps; 12V 35-watt IRC Halogen Lamps; 50-watt R80 Halogen Floods; and, 3-watt MR16 LED Lamps in 2006</p> <p>Currently investigating site for solar power installation with airport</p>
Richmond Main Colliery	
Kurri Library	Level 1 Energy Review completed 2006
Other sites	<p>Installation of energy efficient lights as part of routine maintenance.</p> <p>Continuing installation of energy efficient lights as part of routine maintenance.</p>

## 10 Appendix 2 – Energy Consumption

In 2009 the NSW Office of Environment and Heritage through the Waste and Sustainability Improvement Payment Program required Council to:

Undertake an audit using 12 months of energy usage data to identify council's existing baseline energy use for its facilities within the LGA. An updated audit is to be undertaken every four years from first audit date. Identify the top ten energy usage sites. Provide OEH with the data. Develop and commence implementation of initiatives to reduce energy consumption at these 10 sites.

The following outlines the top ten energy using sites and their energy consumption.

