

Carbon Audit of Matraville Medical Complex.

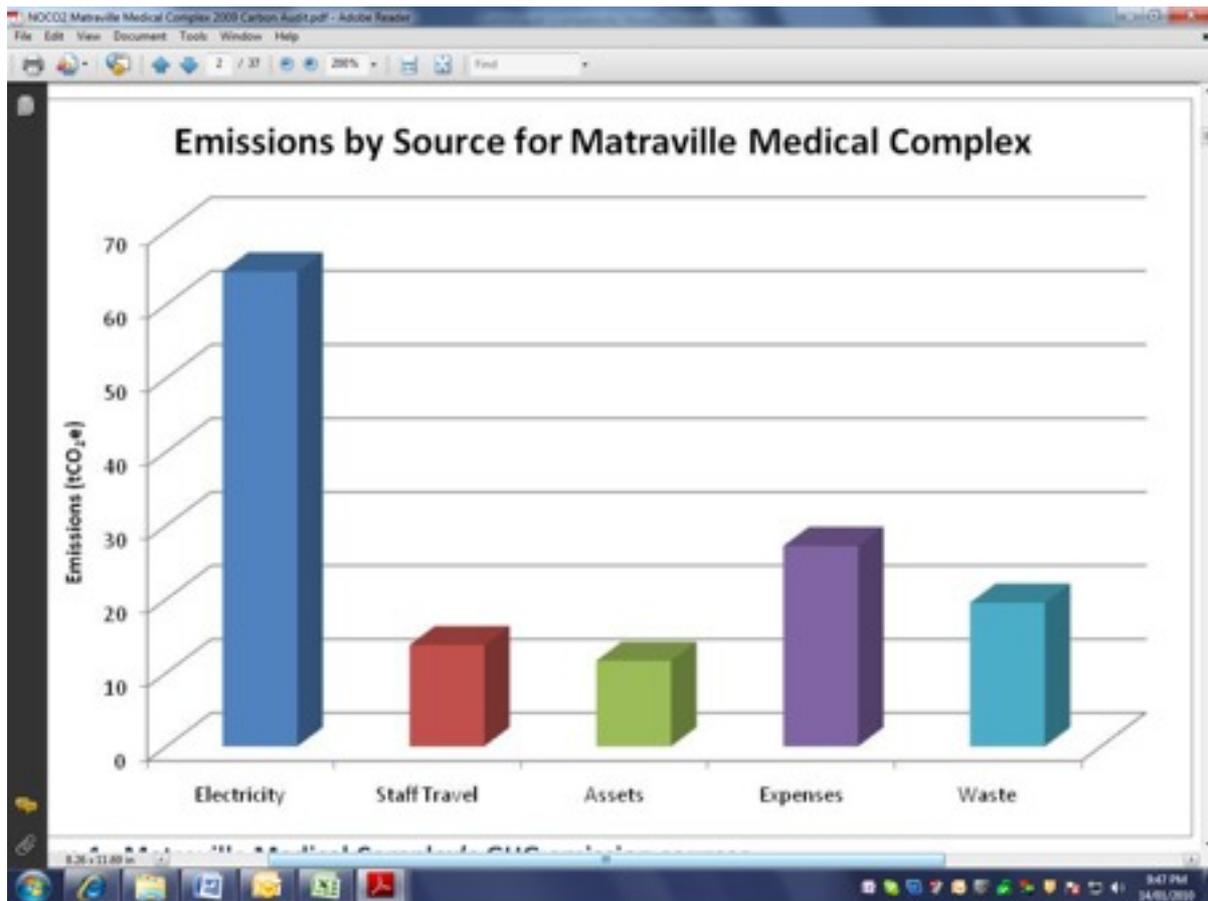
Executive Summary

This audit is part of the Low Carbon Doctor's Initiative, developed jointly by the Carbon Reduction Institute and the Medical Observer. The Medical Observer supports the initiative allowing medical clinics and related businesses the opportunity to undergo a free carbon assessment. The initiative aims to measure, reduce and offset the carbon emissions of medical practices, whilst educating and engaging the community.

The purpose of this report is to define and quantify the greenhouse gas emissions of Matraville Medical Complex, so that they can then be reduced and offset. Ultimately, this report will serve as a benchmark year for the Carbon Reduction Institute's NoCO2 Certification Program. This report is prepared in accordance with ISO 14064.1-2006 but has not been verified.

The first aim of this report is therefore to identify all the directly controllable carbon emissions caused by Matraville Medical Complex's business activities. These emissions are split into three main categories (or scopes) as per the Greenhouse Gas Protocol.¹

It has been determined through the work carried out in this report that the greenhouse gas emissions resulting from Matraville Medical Complex's activities and operations totalled to 136.52 tonnes of CO₂ equivalent gases (tCO₂e) per year. The breakdown for the sources of these emissions can be seen below.



This emissions breakdown highlights that the majority of Matraville Medical Complex's greenhouse gas emissions are primarily from Electricity usage and the emissions embodied in the supply chain.

NoCO2 Certification Program

The NoCO2 Certification program is a logo certification system that rewards organisations that take action against climate change. It offers two levels of company certification: NoCO2 Certification and LowCO2 Certification.

NoCO2 Certification is awarded to organisations that force their carbon footprint to zero (otherwise known as carbon neutral) through internal emission reductions and through the purchase of carbon credits. 'Carbon Neutrality', as termed by CRI and defined through its NoCO2 certification program, makes it mandatory for the organisation or entity being measured to include the embodied emissions within all products and services that they sell, as well as the embodied emissions from all products and services used to deliver their service.

The LowCO2 certification model

allows large companies with significant embedded emissions in their supply chain to effectively communicate their reduction strategy and the context through which it has been achieved. Many major corporations and banks are claiming to be carbon neutral without

accounting for their supply chain impacts. This effectively demeans the term ‘carbon neutral’ and lowers the value for other organisations that have truly accounted for their emissions.

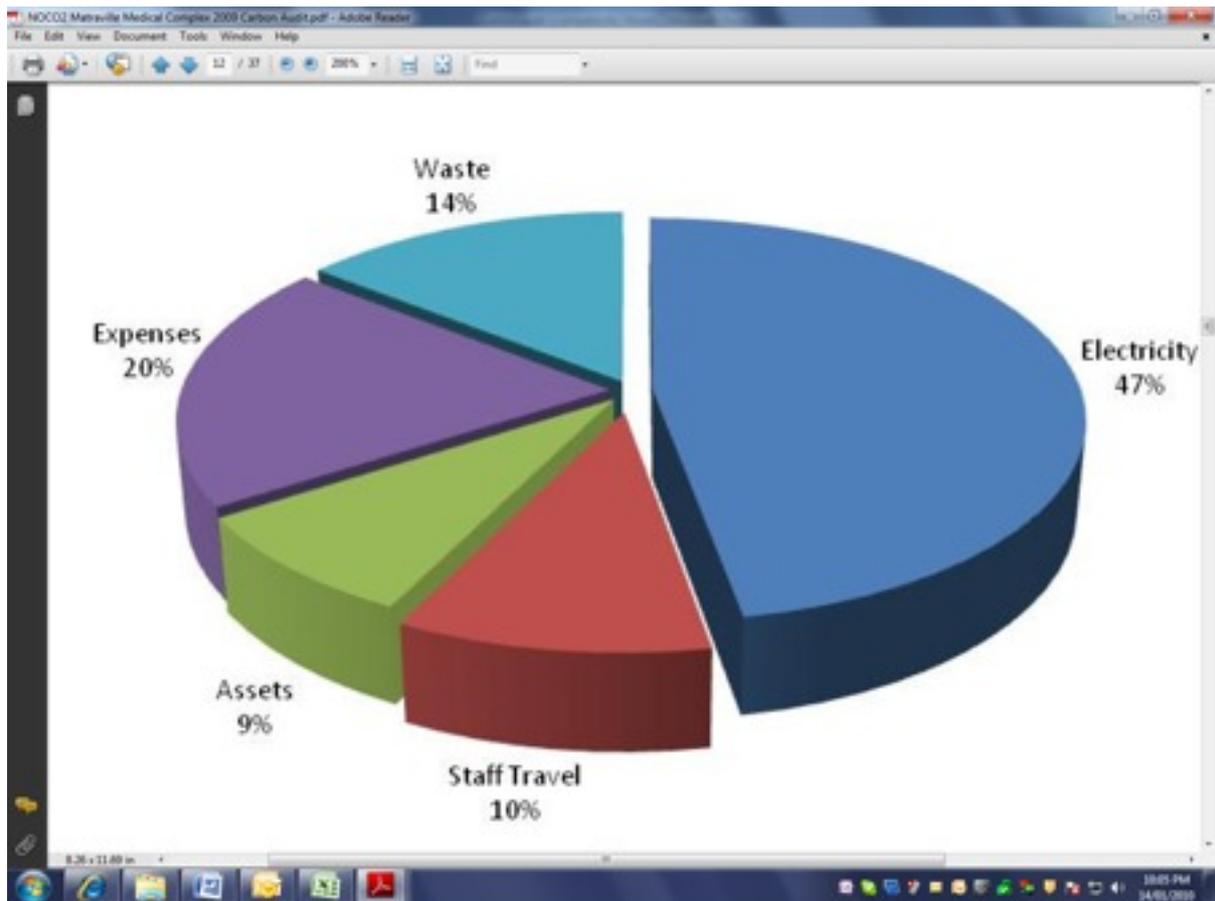
Matrville Medical Complex Greenhouse Emissions Inventory

CRI was able to collect information that enabled it to create a GHG inventory for Matrville Medical Complex. In creating this GHG inventory, CRI endeavours to use the most relevant and accurate data sources available.

Matrville Medical Complex final emissions impact was 136.52 tCO₂e. The table below presents a summary of the services required, products consumed and the corresponding emissions that were the result of Matrville Medical Complex’s operations.

Sources of Matrville Medical Complex’s Emissions – no CO₂ boundaries

Scope	Emission Source	Emissions (tCO ₂ e/year)
Indirect -Scope 2	Electricity	53.62
Indirect -Scope 3		
	Supply of Electricity	10.84
	Staff Travel	13.75
	Assets	11.62
	Expenses	27.19
	Waste	19.50
Total		136.52



This emissions breakdown highlights that the majority of Matraville Medical Complex's greenhouse gas emissions are the result of electricity (47%) and the supply chain, with expenses accounting for 20% and waste to landfill producing 14% of emissions.

a) Scope 1 Emissions

Fuel usage for work purposes purchased by the company, combusted in vehicles and gas burnt onsite owned by the company is classed as a Scope 1 emission. As with all fuel use, it also incurs a Scope 3 emission, which takes into account emissions that are produced in the fuel's extraction, processing and transportation. The emissions are determined with reference to the fuel emission factors outlined in the Department of Climate Change's National Greenhouse Account Factors¹⁴.

Matraville Medical Complex reported no fuel nor gas use and therefore no corresponding emissions from this category.

b) Scope 2 Emissions

Scope 2 emissions are those that are emitted offsite but as a direct result of Matraville Medical Complex's electricity usage. Electricity generation is the world's largest source of greenhouse gas emissions, which is due to the global economy's heavy reliance upon cheap electricity from coal and gas reserves. Frameworks and data sets exist both within Australia and internationally that enable simple calculations of emissions from electricity, which follow the formulae below.

c) Scope 3 Emissions

Scope 3 emissions are defined as indirect emissions that occur from sources offsite. Scope 3 emissions sources are assessed through the application of life-cycle emissions coefficients in the case of travel, expenses, assets and waste. The emissions impact and the calculations behind all scope 3 sources are depicted below (with the exception of the scope 3 impacts of electricity consumption and fuel use, which have already been discussed previously).

- Emissions from Staff Air Travel

Emissions from flights are calculated with respect to the distance between the airports, the emissions factor associated with passenger flights, the Radiative Forcing Index factor and the Greater Circle Flight factor.

- Assets

When accounting for embodied emissions of assets, CRI scales the impact of an object over the same timeframe in which it is depreciated and reported for tax purposes. For example, if an object has a total embodied emissions impact of 4 tonnes, and is depreciated at a rate of 50%, then each year, the object's emissions impact on the overall GHG inventory will register as 2 tonnes CO₂e for each of the two years after it was purchased. This will ensure that Matraville Medical Complex can update its emissions inventory at the same time that it lists new purchases on its books for tax. Purchases that have been written off are not included in this assessment.

The annual emissions embodied in Matraville Medical Complex's assets for this reporting year totalled 11.62 tCO₂e.

- Expenses

Similarly to the assets, the expenses were calculated based on emissions per dollar values sourced from the Balancing act report. To attain NoCO₂ certification the embodied emissions in expenses must be accounted for and offset. Embodied emissions are premised on the basis that the end user is responsible for the impacts incurred in the life cycle of the products that they purchase²⁰. However, for some uses of products, services and trade between businesses, there is an issue of a shared responsibility for the emissions.

- Staff commuting

Staff travel includes emissions from private car travel incurred due to the existence of Matraville Medical Complex's operations. Greenhouse emissions resulting from the utilisation of public transport by Matraville Medical Complex and its staff are not attributed to Matraville Medical Complex as the emissions created from its utilisation of public transport cannot be affected by Matraville Medical Complex's actions through policy, technology or through direct authority.

The emissions from ground travel are proportional to the type and amount of fuel used; its emissions intensity and the number of people delivered by the corresponding fuel use. The final emissions impact was 13.75 tCO₂e.

Emissions from ground travel (cars and taxis) were calculated using information provided by Matraville Medical Complex's staff. The staff answered an online survey regarding their commuting and travel behaviour including details of the average number of kilometres travelled by different transport methods. Where private vehicles were used, the type of car and the type of fuel used was also obtained.

- Waste

Matraville Medical Complex provided information to CRI detailing its waste generated. The Department of Climate Change's National Greenhouse Accounts state that sending one tonne of municipal waste to landfill results in the emission of 1 tCO₂e, and that on average 1 kg of waste is equal to 8 litres of waste when compressed by hand.

Using the formula, it was found that Matraville Medical Complex generated 19.50 tCO₂e from waste sent to landfill.

Emissions Reduction Initiatives

The previous section detailed the emissions calculations for Matraville Medical Complex and separated each emissions item in terms of their scope 1, scope 2 and scope 3 impacts. This section investigates each of these emissions sources with a view to identify reductions within each. The reduction measures detailed in this section are recommended based on the nature of Matraville Medical Complex's operations and the emissions results from the previous chapter.

- Emissions from supply chain

Matraville Medical Complex's supply chain contributed to almost 30% of Matraville Medical Complex's carbon footprint. There are a few ways that the impact can be addressed to lower Matraville Medical Complex's footprint.

The first of these is to implement a purchasing policy that examines the embodied emission of the materials and products it purchases and incorporates the offset cost into its purchase decision making. If Matraville Medical Complex introduces a policy of prioritising products from low carbon or carbon neutral suppliers then it will not only reduce its own emissions but put pressure on other companies to do so. If Matraville Medical Complex follows this path it should ensure that it can identify carbon neutral products and services within its accounts for the yearly reaudit of its emissions. The second strategy Matraville Medical Complex could implement is to identify its major suppliers from its chart of accounts and ask them about the actions that they have taken on climate change. If they are unaware, then Matraville Medical Complex could explain the benefits of having a carbon audit (through the identification of energy saving and cost saving measures). The third strategy is to purchase within the

low carbon economy.

CRI's LowCO2 website: www.lowco2.com.au contains links to other carbon neutral or low carbon businesses and service providers. By purchasing from within the low carbon economy, Matraville Medical Complex will reduce the emissions impact from the purchases that it makes. It is hoped that early adopters of carbon neutrality will force changes down the supply chains and induce other organisations to take similar actions.

- Emissions Reductions from Electricity Usage

The emissions from electricity use at Matraville Medical Complex's facilities were calculated from energy usage figures (as shown in section 3.2 above). According to the figures used, electricity contributes 47% of Matraville Medical Complex's overall emissions impact. There is a number of general ways electricity usage and the emissions associated with it can be reduced. This strategy should focus on two areas; energy efficiency and user behaviours. CRI highly recommend that a short energy audit walk around should be conducted at Matraville Medical Complex, however some general suggestions on energy efficiency are advised below.

- User Behaviour Tips

A building's energy use can be controlled as much by occupancy behaviours as the technologies used. Simple things like switching energy consuming devices off when not needed and only using them as much as they are needed will go a long way toward reducing Matraville Medical Complex's emissions. CRI can assist Matraville Medical Complex's implementation of these reductions through sending out staff behaviour stickers and posters that will educate staff on the steps they can take.

- Energy Saving Lighting Suggestions

There are some key areas where energy efficiency measures can be undertaken to reduce costs. These suggestions will range in complexity and cost. As mentioned previously, a simple and cost free (we will supply stickers if needed) measure would be to place stickers next to all light switches in the offices with individual lighting controls. Switching off lighting in rooms (commonly meeting rooms or bathrooms) when not in use during work hours is an often overlooked, yet simple and effective way of minimising waste energy. Lighting appliances have developed considerably since the days of Thomas Edison although most buildings do not have the most up to date lighting appliances installed.

Some commercially available replacements for common lighting appliances are discussed in the following sections.

e.g. Conversion of fluorescent lighting from T8 to T5

e.g. Conversion of Halogen Lights to Compact Fluorescent Lights

- HVAC Suggestions

Some strategies that Matraville Medical Complex can conduct to reduce their HVAC electricity loads includes the following:

- Clean filters and grills associated with heating, air conditioning and ventilation systems at intervals recommended by the supplier
- Reduce cooling loads in summer by closing blinds and curtains when windows have direct sunlight incident on them.
- Reduce heating loads in winter by opening curtains when they have direct sunlight on them and closing curtains when it is cold outside to prevent heat loss.
- Turn off lights when not in use and open up your blinds to make use of natural daylight instead of artificial lights. Don't overdo it though because large windows will add to unwanted heat gain in summer and unwanted heat loss in winter.
- Turn heating and cooling off is the one of the most simple yet one of the most overlooked tips in reducing your carbon footprint. Leaving your HVAC system on for 24 hours a day can easily double your electricity costs. Therefore, it is wise to ensure that the last person to leave the medical practice turns off the HVAC system at the end of the day, especially over the weekends.
Alternatively, installing a timer that will turn off your systems outside of business hours may be a more convenient way of doing this automatically and the cost of a timer is inexpensive.
- Many ducted HVAC systems allow you to "zone" your building by allowing you to choose which areas should be heated or cooled and at what temperature. Make use of this feature by servicing only those areas that are in use and shut down unused areas, which ultimately reduces electricity loads from unnecessary heating.
- Adjust thermostats and appropriately set winter temperatures to around 18–20°C. Encourage staff to wear appropriate clothing for the winter season to assist them in finding these conditions comfortable. In addition, areas that are used infrequently such as storerooms and toilets can be set at lower temperatures, e.g. a temperature of 16°C in winter can decrease heating costs by about 30 per cent for these areas.
- Keep doors and windows closed since an open door can waste up to 50 per cent of HVAC energy costs. Therefore, it is vital that external doors are closed as well as any internal doors that can isolate rarely used areas.
- Make sure that doors and windows have tight seals and remain closed as much as possible.
- Ensure free airflow are coming out of the ducted HVAC system by making sure that the drapes, furniture or any other items are not blocking the vents or outlets of the HVAC system.
- Install thermostats in HVAC systems to regulate the most favourable temperatures that are energy efficient without compromising reasonable comfort levels. Thermostats should be installed away from heat sources and draughts so that temperature readings won't be corrupted and cause your HVAC system to function inefficiently. Your electronic equipment such as printers, computers and photocopiers are some forms of heat sources since they generate heat.
In addition, you can prevent your staff unnecessarily changing temperature settings by placing locking covers over the thermostats.
- Regular maintenance must be undertaken on HVAC systems to ensure that they are functioning at its best. Simple maintenance works include cleaning burners and air conditioner coils, replacing and cleaning air filters, and checking ducts and pipe insulation for leaks or damage. Maintenance checks just before winter and summer will help ensure that your system will function efficiently when it is most needed. A logbook recording past maintenance and scheduling future maintenance may also be helpful in reminding you when your system needs a system check. Ultimately, a well maintained system would cost less to run, provide better performance and increase the potential lifetime of the system.
- It may be more feasible for a medical clinic such as Matraville Medical Complex, which has a larger and more complex HVAC system to have your system professionally audited for energy usage and efficiency by professional auditors. In addition, the auditors can also advise on other efficiency measures that may be conducted. Check out Air Science (<http://www.airscience.com.au/HVAC-Restoration-pg6100.html>) and Coral Air (<http://www.coralair.com.au/commercial/service-maintenance>) who both provide these types of services. Have a look around for other companies that provide this type of service to find the one that best meets your needs.
- Depending on the age and type of your system, it may be time to replace your old HVAC system with a newer and more energy efficient one. Consider replacing your system with reverse cycle air conditioners and gas heaters that have high-energy efficiency ratings, which will allow you to save on energy costs as well as reduce greenhouse gas emissions. Check out www.energyrating.gov.au and compare different models and brands with their varying energy labels. Although, the more energy efficient models cost more, the savings in its lifetime will payback that extra initial cost.
- In some instances, portable heaters are more cost effective than a central system, especially in Matraville Medical Complex's spaces that require smaller areas to heat. Portable heaters may also be easier for maintenance purposes because they tend to be smaller. Next time, you might want to consider small electric fan heaters, column or radiant heaters, portable coolers or fans.

- Computer, IT and Appliances Equipment Suggestions

Much of today's electronic office equipment such as computers and photocopiers has a 'Standby' feature. Whilst this reduces the power used throughout the day, if the machine is left on standby overnight then power consumption can still be significant over the long term. Additionally, even when 'switched off' using the machine interface, power is still drained!

Whilst energy wastage during office hours can be prevented by better user habits and awareness, standby and 'off' power wastage can be eliminated by simple timer placed at the wall power socket. Such timers are inexpensive and simple to install. For example, a HPM 24hour timer from hardware store Bunnings costs AU\$4.98. Where power timer devices are used, especially for computers, users should be made aware of the times when the power will automatically switch off to ensure that data loss does not occur. This can be done verbally and with the use of stickers on the appliances.

Some other strategies that Matraville Medical Complex can undertake to reduce its Computer and IT electricity loads include the following:

- If possible, try to centralise and minimise the number of computers, faxes, scanners and photocopiers in the office. These devices not only use large amounts of power when in use but also have significant standby power usage. Some devices will even consume power when they are apparently switched off! One option is purchasing or upgrading to a 'multi-function device' which is an integrated machine that combines faxes, printers and copiers into one.
- Reduce printing documents by encouraging staff members to read documents on the computer screen instead of printing as much as possible. Also, have your fax machines save incoming faxes as documents rather than printing them out, saving both power and paper.
- For existing equipment, switch off when not in use! For future equipment purchases, Matraville Medical Complex should endeavour to purchase energy efficient equipment with good power management features. For example, when choosing to purchase more computer monitors, consider buying LCD flat screen monitors than the old CRT monitors since they are more energy efficient.

- Medical Equipment

There are currently no universal performance standards to compare different medical equipment's energy use to choose the least energy intensive equipment for medical use. However, the basic principles discussed in previous sections are still applicable for medical equipment, which include the following:

- Keep equipment away from heat sources to lengthen the lifetime of the medical equipment and to reduce the unnecessary cooling loads of your HVAC systems.
- Turn off equipment that produce standby power and are safe to be turned off, such as Nebulizers and Spirometers.
- Perform regular maintenance on medical equipment as recommended in the user manuals to ensure that the equipment performs at its optimum levels.
- Ensure you purchase medical equipment that is more water and electricity efficient without compromising performance.

Renewable Energy Options

After implementing energy efficiency measures, the next step in pursuing emission reductions from your energy usage is to invest in electricity sourced from renewable energy options such as solar or wind power. However, the current cost of direct or onsite renewable energy electricity options is high and therefore a major barrier compared with conventional sources (e.g. coal fired electricity) supplied by electricity retailers to grid connected customers.

A more cost effective action that can be taken immediately for offices within Australia is to purchase GreenPower electricity. Additionally, a cost effective onsite utilization of renewable energy can be achieved in some cases through the installation of a Solar Hot Water system. Unlike photovoltaics which converts the sun's energy into electricity, solar hot water systems use the sun's energy to directly heat water in an efficient and cost effective process.

GreenPower

GreenPower drives investment into zero emissions electricity generation.

Each unit of GreenPower purchased by Matraville Medical Complex is matched by the generation and delivery of a unit of energy from renewable energy generators. The approximate additional cost of 100% Green Power would be \$3,313, for a scenario where no reduction of energy usage occurs. This additional cost will vary between the accredited Green Power offerings of different electricity retailers. Note that the cost may vary slightly between the states.

Green Electricity Watch (GEW) was established in 2006 to provide consumers with trusted information on the different GreenPower providers. In 2007, GEW provided a report that rated the quality of different providers. CRI recommends that, if possible, Matraville Medical Complex elects to purchase the highest rated GreenPower products for its site if Matraville Medical Complex chooses to purchase GreenPower.

Alternatively, you can purchase carbon credits generated from Biomass to offset the 64.46 tonnes of CO₂e generated from your electricity use. Instead of paying \$3,313.41 for the cost of purchasing GreenPower, you can purchase carbon credits from CRI for just \$1,289.22 including GST.

Monitoring, reducing and offsetting your emissions

This audit found that Matraville Medical Complex was responsible for greenhouse emissions equivalent to 136.52 tonnes of CO₂e. This audit, covering one year of Matraville Medical Complex's activity forms the base year of Matraville Medical Complex's emissions. Each year Matraville Medical Complex's emissions should be reassessed to quantify any reduction achievements and to ensure that any claim to carbon neutrality remains valid. The methodology and data sets used in creating this audit are accessible and can be utilised for

emissions monitoring, and for benchmarking progress from any emission reductions that are achieved.

Under the NoCO2 certification program, CRI engages certified companies in quarterly emissions reporting. This is done for the following reasons:

- To cover and account for any changes in the greenhouse gas inventories of certified companies to ensure that the amount of carbon credits purchased truly matches the amount of greenhouse gases emitted.
- To ensure that carbon management and offsetting is something that is not a 'set and forget' feature or a guilt abatement, rather an integral part of an organisation's operations, thus ensuring that companies continue to search for reduction opportunities.
- Works on the premise that organisations will act to drive down their carbon footprint and so it gives these organisations the chance to reduce their emissions and be rewarded through a reduction in the number of carbon credits that need to be purchased to offset residual emissions. CRI recognises that it is impractical to report on each emissions source quarterly, particularly for emissions sources that impact negligibly to Matraville Medical Complex's total carbon footprint. Therefore, Matraville Medical Complex is only required to report all its emissions sources once each year in time for its annual re-audit. In addition, Matraville Medical Complex must implement systems to ensure that the data for the next audit is being recorded and stored so that it can be easily reported at the end of one year of certification.

CRI has sent out a certification plan with this emissions report that details the costs and methods for Matraville Medical Complex to become NoCO2 certified. Certification through CRI will enable Matraville Medical Complex to monitor and communicate the extent of its carbon reduction achievements and engage the community in actions that can help prevent mitigate the effects of climate change. We thank Matraville Medical Complex for undertaking an emissions audit with CRI and we hope to work together for a more sustainable future.

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