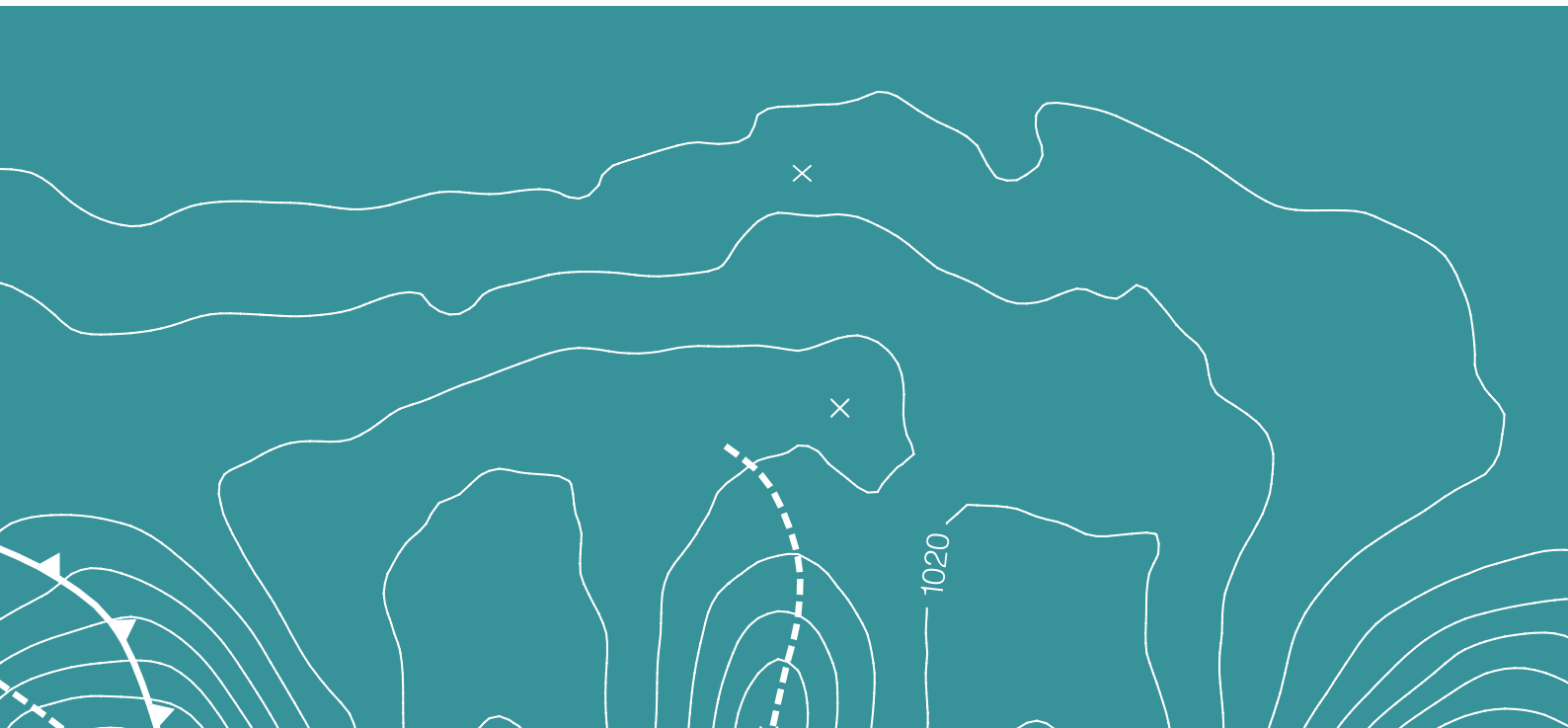
WAGA
Western Alliance for Greenhouse Action

LEADWEST
Leadership for the west

Regional Development
Regional Development Australia and Regional Development Victoria
WESTERN MELBOURNE

LOW CARBON WEST

Urban Growth and Development
Sector Report



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1. INTRODUCTION

Low Carbon West is a transitional strategy for the region encompassed by the municipalities in the Western Alliance for Greenhouse Action (WAGA).

The strategy will support the growth of this vibrant and diverse region while limiting the increase in greenhouse gas (GHG) emissions associated with that growth. Action to reduce emissions is necessary everywhere, but the opportunity and need for action are particularly clear in the WAGA region.

This is the fastest growing region in Australia, and its councils and stakeholders are well placed to demonstrate national leadership in responding to the threat of climate change. There is an opportunity to combine continued economic growth with improved carbon productivity; that is, reducing the level of carbon emitted for each unit of output across the region. Transitioning to a low carbon economy will provide a new engine for growth, creating jobs and investment opportunities.

Low Carbon West has been developed by the Western Alliance for Greenhouse Action (WAGA) with project partners LeadWest and Regional Development Australia (RDA) Western Melbourne. AECOM and Arup were jointly commissioned as the project consultants and have the led the consultation, analysis and strategy development. Over one hundred people provided feedback and input to inform the Low Carbon West plan.

The overarching strategy establishes a vision for a Low Carbon West. It presents a current and future business as usual (BAU) emissions baseline and establishes priority actions to reduce the region's emissions against this baseline. It also sets out a clear implementation plan for identified sectors, including an approach for monitoring the success of the plan over time. It is hoped that the regional focus for Low Carbon West will facilitate collaboration and knowledge sharing between businesses, governments, and other stakeholders and act as a catalyst for direct regional and local action to reduce GHG emissions.

The strategy encompasses four sub-strategies for **business and industry, urban growth and development, transporting people and freight** and **communities**.

This report covers the business and industry sector.

Section 2.0 describes the current patterns of development in the WAGA region, as well as baseline and projected emissions.

Section 3.0 outlines the initiatives already underway to reduce emissions.

Section 4.0 provides an overview of the impact of proposed new actions on emissions in 2020.

Section 5.0 describes actions in detail.

Section 6.0 outlines how the sector actions can be implemented.

Section 7.0 summarises the requirements for monitoring progress towards achieving Low Carbon West.

2

"Sustainable development …meets the needs of the present, without comprising the ability of future generations to meet their own needs." (The Western Agenda)

2. URBAN GROWTH AND DEVELOPMENT SECTOR CONTEXT

2.1. Urban growth and development trends in the WAGA region

The changes in land use and the efficiency of new built form will fundamentally affect the WAGA region's transition to a low carbon economy. The WAGA region is experiencing rapid growth in its residential population and number of dwellings, with up to 180,000 new homes required by 2031.

A number of suburbs in the WAGA region are amongst the fastest growing suburbs in the nation. Outside the metropolitan boundary, the City of Greater Geelong and the Shire of Moorabool both face the challenge of accommodating tens of thousands of new residents whilst upgrading regional infrastructure.

The WAGA region also houses a range of non-residential buildings and facilities, particularly State-significant clusters of manufacturing and defence industries. With the closure and redevelopment of many of these industrial sites, the WAGA region is experiencing considerable changes to its patterns of land uses.

It is anticipated that as the WAGA region economy diversifies, professional services, retail and other non-manufacturing sectors will drive the growth in non-residential buildings.

Plan Melbourne identifies major employment centres in the west, including:

- the Sunshine Employment Cluster, which hosts 13,800 jobs, with strengths in education, research and health-related activities, and
- the East Werribee Employment Cluster, which has the potential to provide 50,000 jobs by building on the existing health, education and high-tech research industries.

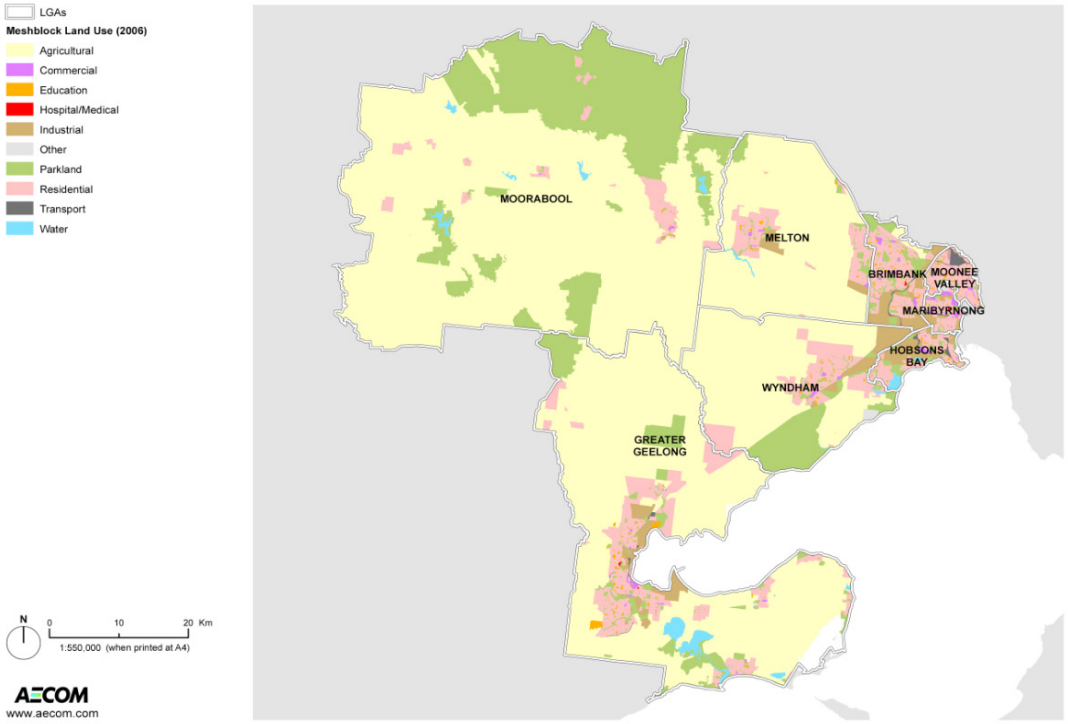
This sector report focuses on the emissions impact and opportunities related to new residential and non-residential development.

2.1.1 Residential development

Growth in dwellings

As shown in Figure 1, the metropolitan region is densely populated, whilst outside the metropolitan area there is a mix of large agricultural land (particularly in Moorabool, Greater Geelong, and parts of Melton and Wyndham).

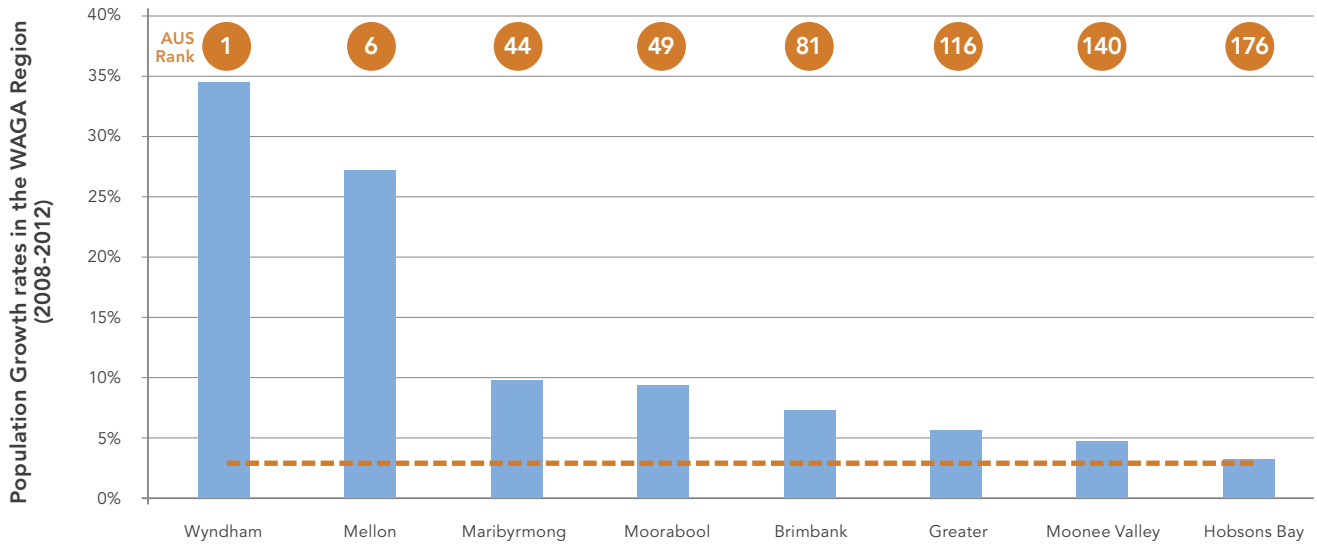
Figure 1 Land Use for the WAGA region (2006)



The WAGA region has one of the highest rates of settlement in Australia. Between 2006 and 2011, the region's population grew by 4.3% per annum, which is around twice the Victorian average rate of population growth. Figure 2 shows that the region contains some of the fastest growing municipalities in Australia. Wyndham (ranked the fastest growing) and Melton (ranked the fifth fastest growing) are in the top ten fastest grown local government areas in Australia[8].

8 ABS (2014) 3218.0 - Regional Population Growth, Australia, 2012-2013, accessible at http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02012-13?OpenDocument

Figure 2 Population growth rates in the WAGA region, with rank of LGA by growth rates in Australia[9]

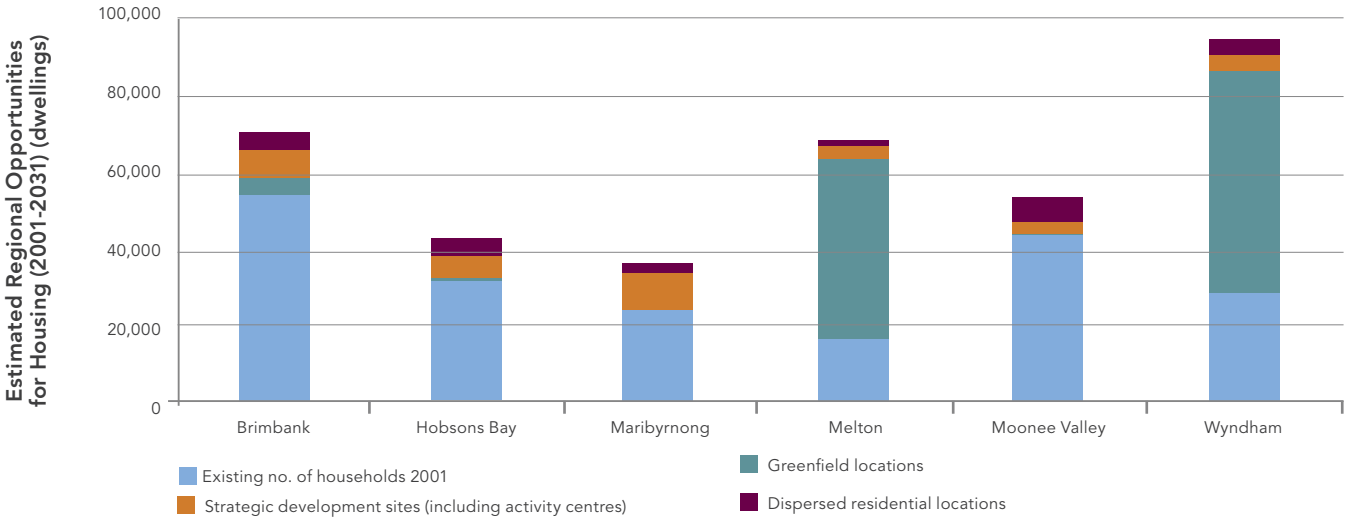


9 All local government areas with population densities below 10 persons per square kilometre have been removed from ranking

By 2020, the number of dwellings is expected to increase by 21% to 479,200 dwellings. The population is projected to grow by 20% to 1.22 million people by 2020.

The WAGA region is experiencing growth predominantly through 'greenfield' development in the outer suburbs. As shown in Figure 3, these housing growth opportunities are largely in Melton and Wyndham. The City of Greater Geelong is planning for 41,000 new dwellings in the same period, and the Shire of Mooralbool is forecasting around 17,000 new residents. In addition, significant 'brownfield' development will occur through urban renewal and housing stock regeneration in the inner-suburban areas of the WAGA region.

Figure 3 Overview of Estimated Regional Opportunities for Housing in Western Metropolitan Melbourne (2001-2031), Source: Western Regional Housing Working Group (2006) Western Regional Housing Statement



Whilst housing growth is important for housing affordability and economic development, new homes will lead to an increase in GHG emissions for the region. Aside from the increase in dwelling numbers, emissions are also influenced by the type, quality and size of new dwellings. As residential areas are developed, there are also opportunities to reduce the urban heat island effect by building green infrastructure such as wetland systems, tree canopy, green open space and street landscaping.

Changes in land consumption per dwelling

Figure 4 shows that new dwellings tend to take up less land compared to existing dwellings. This trend is most significant in Hobsons Bay and Melton, where land consumption per dwelling has dropped by 51% and 54% respectively. In contrast, in growth areas such as Wyndham and Melton, median land consumption per dwelling is similar for existing and new dwellings. The land consumed by residential development in these growth areas will largely be grasslands and do not involve the removal of significant tracts of woodland or other bushland.

Figure 4 Median Land Consumed per Dwelling (Median 2004-2008 vs. New Dwellings 2004-2008), Source: *DTPLI (2013) Housing Development Data: 2004 to 2008, Statistical Summary Report, Metropolitan Melbourne*

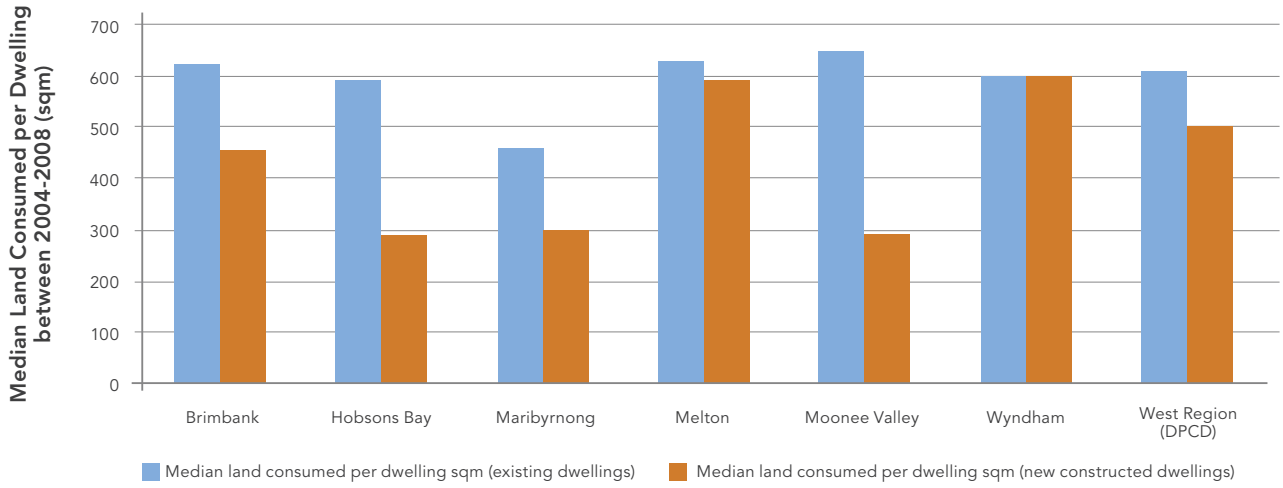
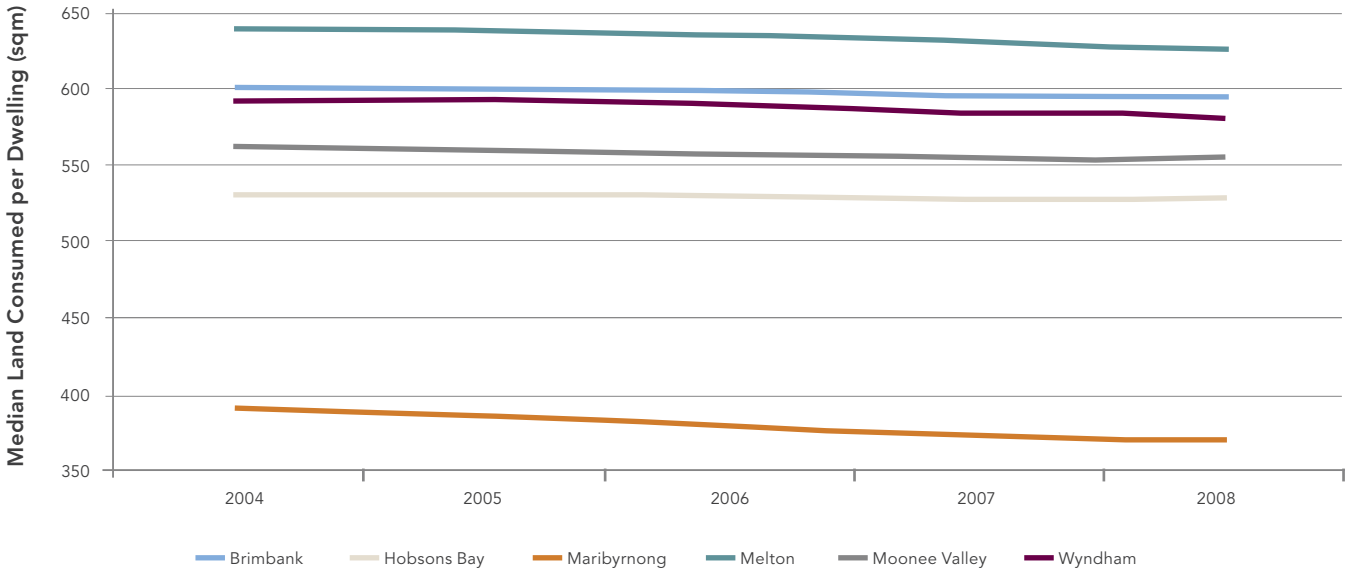


Figure 5 shows how land consumption per dwelling has changed in the five years from 2004 to 2008. All local government areas show a downward trend, with Maribyrnong showing the largest decrease, from 391 to 368 sqm per dwelling. As with Figure 4, Wyndham and Melton show minimal change in dwelling land consumption over this period.

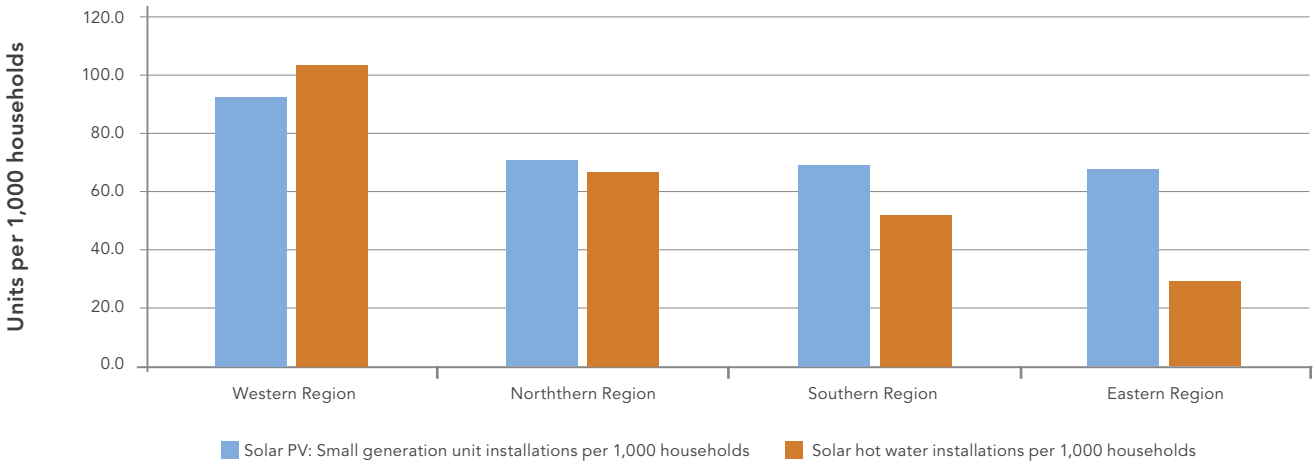
Figure 5 Median Land Consumed per Dwelling (sqm) –2004 to 2008, Source: DTPLI (2013) Housing Development Data: 2004 to 2008, Statistical Summary Report, Metropolitan Melbourne



Trends in residential solar power

Households in the WAGA region are driving the shift towards renewable energy. Figure 6 shows that of all the Melbourne metropolitan regions, the Western region has the highest numbers of small solar photovoltaic (PV) panels and hot water installations per 1000 households. This may be partly due to the high numbers of new dwellings, which must meet building regulation requirements to install sustainable features such as solar hot water[10].

Figure 6 Solar PV and solar hot water unit installations by Melbourne Region, Source: NORTHLink (2014) Northern Horizons – 50 Year Infrastructure Strategy for Melbourne's North



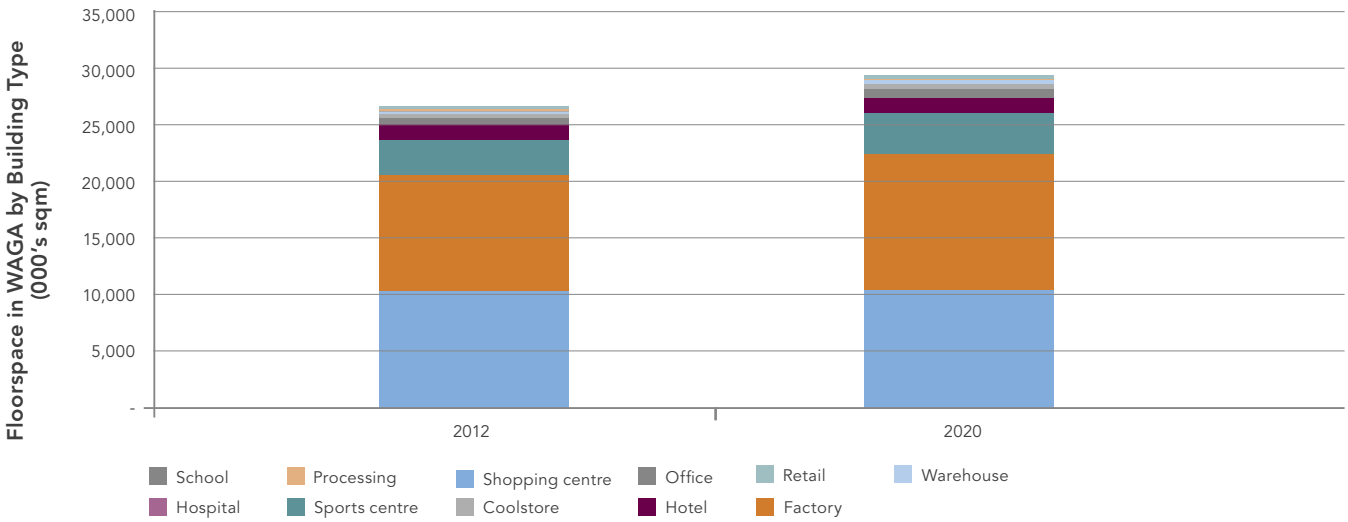
10 Victorian Building Authority (2014) Six Star Standard, accessible at http://www.vba.vic.gov.au/consumer-resources/other/6-star-standard

2.1.2 Non-residential development

The WAGA region hosts a range of businesses in Victoria, including much of the state's manufacturing industry. The region is expected to experience growth in commercial and industrial buildings to support population, job and economic growth.

Figure 7 shows the composition of non-residential building floorspace in the WAGA region. Most of the floorspace is for factories and warehouses (78% of total floorspace).

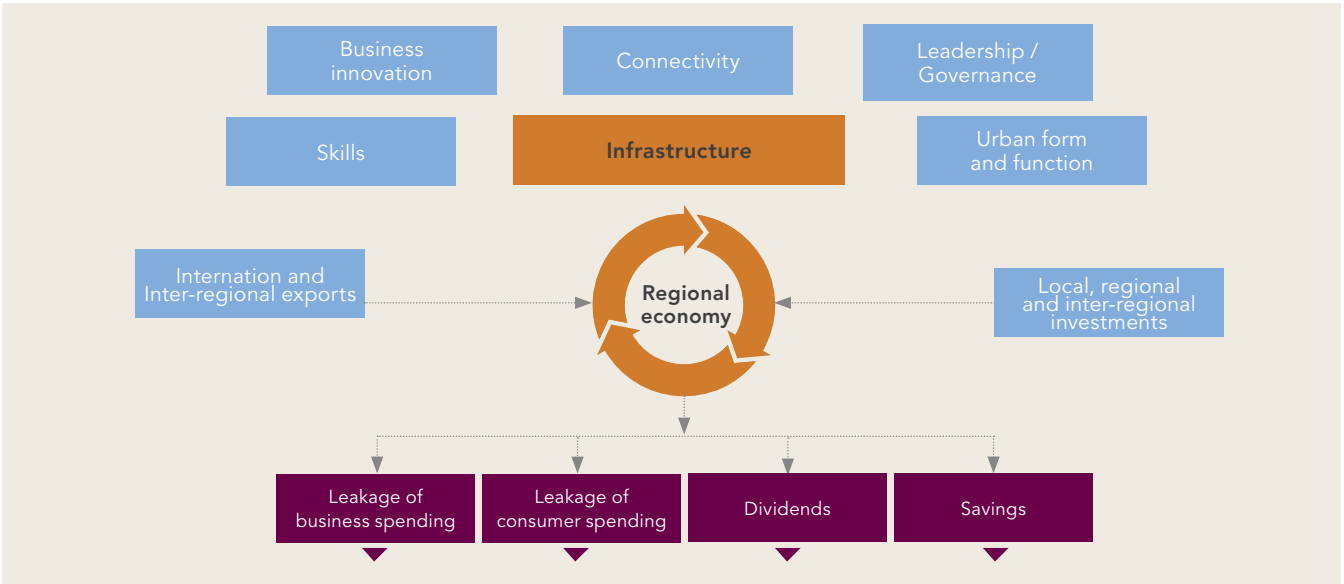
Figure 7 Floorspace in WAGA by Building Type (000'sqm), developed on Valuer General floorspace data



Economic and market growth must be enabled by urban form and function (buildings, transport infrastructure, land use planning). Environmental sustainability is part of what makes urban form and function work. LeadWest highlights this in *Looking West: Melbourne's West - Victoria's Gateway*: there is a need to "ensure that…commercial and industrial buildings are created using high standards of design to improve amenity, and high environmental standards that will increase sustainability and long term competitiveness"[11].

11 Regional Development Victoria (2013) Looking West: Melbourne's West - Victoria's Gateway, Western Melbourne RDA Committee

Figure 8 Regional Economy supported by infrastructure and the consideration of urban form and function[12]



12 Regional Development Victoria, LeadWest (2013) A Jobs and Industry Strategy for Melbourne's West

There are a number of new commercial and industrial precincts planned and these offer the opportunity for high performance energy efficiency and renewable energy. Precincts with new development or renewal potential include:

- Brooklyn-Tottenham Industrial Precinct
- Maribyrnong Defence site (previously industrial but will become largely residential with some mixed use areas)
- Western Freight Activity Centre
- East Werribee Employment Precinct
- Emerging Sunshine Employment Cluster
- Flemington-Newmarket Precinct
- Robinsons Road Employment Area
- Airport West and Essendon Fields
- Altona North
- Footscray
- Diggers Rest Precinct
- Melton North Precinct
- Taylors Hill West Precinct
- Toolern Precinct

Commercial buildings in the WAGA region are already responding to existing low carbon initiatives and programs. The federal Commercial Building Disclosure (CBD) Program requires leased office spaces [13] of 2000 square metres or more to disclose the energy usage of the building. This program encourages market demand for efficient buildings.

The WAGA region also hosts a number of exemplar non-residential buildings, as demonstrated by their achievements under the Green Star sustainability rating scheme:

- No.1 McNab Avenue – *5 star Green Star Rating Office Design v3*
- Victoria University Learning Commons and Exercise Science and Sport Precinct – *5 star Green Star Rating Education PILOT*
- Geelong Library & Heritage Centre – *registered for Green Star Public Design v1*
- Melton Library and Learning Hub – *registered for Green Star Public Building As Built PILOT*
- Western Business Accelerator and Centre for Excellence – *registered for Green Star Office Design v3*
- Wyndham Vale Select Entry School – *5 Star Green Star Education Design v*1
- Victoria University Sunshine Construction Futures – *6 star Green Star Rating Education Design v1*

13 Applicable to constitutional corporations, as defined in http://www.cbd.gov.au/does-this-apply-to-me/who-is-affected

CS **Case Study:** Best-practice buildings: Victoria University – Building and Construction Training Facility

The Building and Construction training facility at Victoria University's Sunshine Campus has been awarded a 6 Star Green Star – Education Design v1 rating from the Green Building Council of Australia. Representing world leadership in environmentally sustainable building practices, the facility is only the eleventh building in Australia and the third in Victoria to achieve this certification.

The building incorporates renewable energy, water preservation, solar design and temperature technologies. Specifically, the building incorporates:

- Active mass heating and cooling through hydronic tubes
- A night-time heat purging system
- A fresh air intake through a gabion rock store in the ground
- Passive air circulation fans
- An internal plant wall to improve air quality

2.1.3 Municipal waste

Residential, commercial and industrial buildings generate waste, which is typically sent to landfill. As waste decomposes in landfills, the powerful greenhouse gas methane is released.

There are a number of landfills operated by local councils in the WAGA region: Werribee (Wyndham) and Drysdale (Greater Geelong). The privately-operated Boral Western Landfill in Deer Park (Brimbank) serves a number of municipal areas in Melbourne. Waste from the WAGA region is also sent to landfills outside of the region, such as the Campbellfield and Sunbury landfills in the Hume municipality.

As population increases, so too will emissions from waste to landfill. Increased population puts further pressure on existing landfills, which have limited remaining capacity. These pressures lead to applications to expand landfill operations, such as those proposed for the Boral Western Landfill. In response, the Metropolitan Waste and Resource Recovery Strategic Plan (MWRRSP) for Melbourne aims to maximise the recovery of valuable resources from waste streams.

2.2 Understanding of sector emissions

The Low Carbon West Regional Emissions Baseline Report provides an overview of the baseline (2012) and projected (2020) emissions for the region. It contains details on the source data and methodologies used.

The baseline report categorises the regional GHG emissions into eight categories. The urban growth and development sector includes emissions from:

- Energy used in existing buildings and new buildings (residential and non-residential), and
- Municipal waste.

This sector is closely related to the transport sector, as changes in built form affects travel patterns. Refer to the transport sector report for further commentary.

2.2.1 Residential buildings

Residential building emissions data has been compiled using electricity and gas consumption data provided by the electricity distribution businesses (Jemena, Powercor and SP AusNet). They include scope 1 emissions from the consumption of natural gas, and scope 2 emissions from the purchase and use of grid electricity. Figure 9 provides the baseline emissions in 2012, and the projected 2020 emissions based on population growth factors in the WAGA region.

Figure 9 2012 baseline emissions and 2020 projections for each LGA within residential buildings

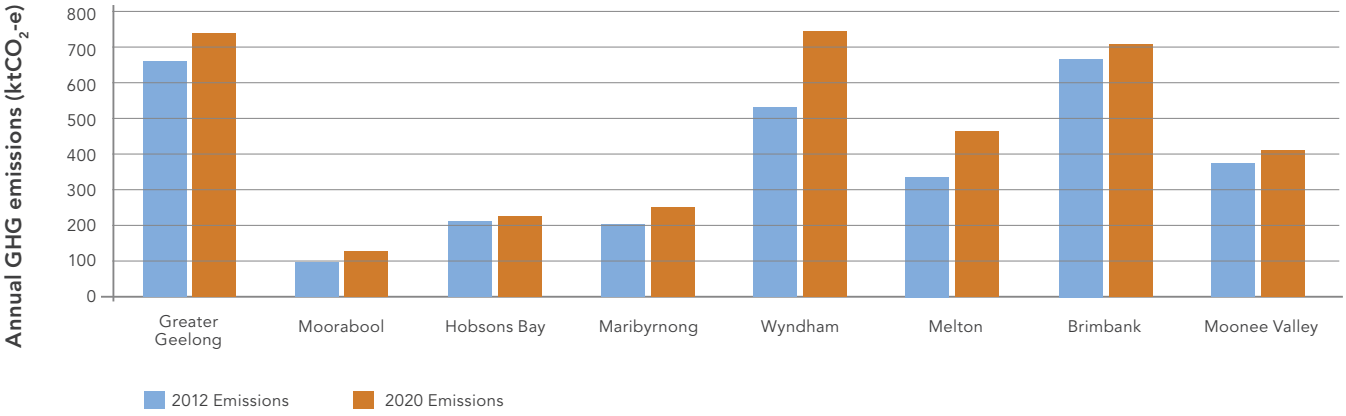
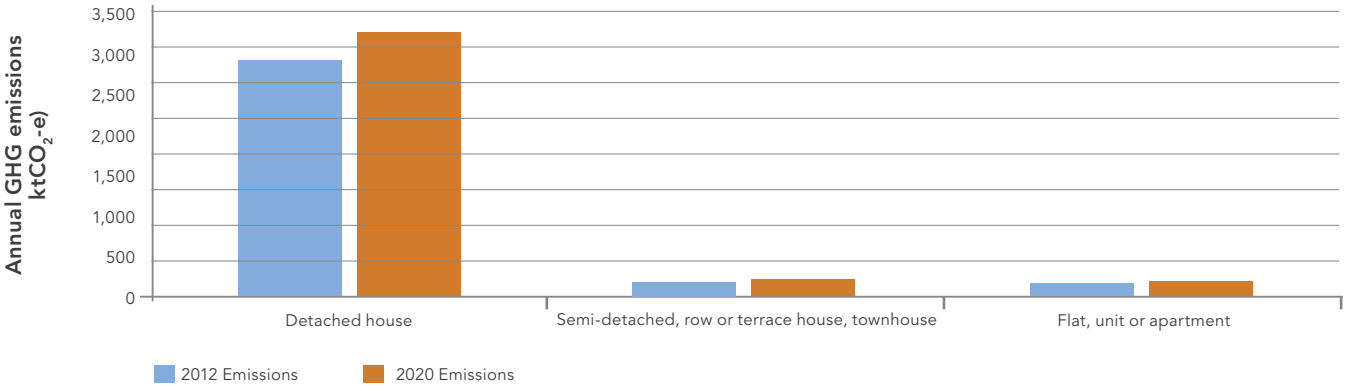


Figure 10 2012 baseline emissions and 2020 projections for residential buildings broken down by dwelling type



As shown in Figure 10, residential building emissions have also been categorised by dwelling type using household type and energy data from the Australian Bureau of Statistics (ABS). They include scope 1 emissions from the consumption of natural gas, and scope 2 emissions from the purchase and use of grid electricity. Electricity and gas consumption are assumed to grow according to growth factors by dwelling type. For example, residential building emissions from detached houses are anticipated to increase by 16% (≈ 3,200 ktCO2-e per annum).

The case study below shows how the Armstrong Creek development aims to manage the impact of new housing development.

CS Case Study: Armstrong Creek

The Armstrong Creek growth area is a mixed-use development of around 2,500ha of developable land. Located ten kilometres south of the Geelong CBD, it is one of the largest growth fronts in the country.

- The Armstrong Creek growth area will provide:
- Housing for between 55,000 to 65,000 people
- Approximately 22,000 residential homes
- Approximately 22,000 jobs, with a focus on high technology jobs

The vision for the Armstrong Creek urban growth area is that it will be "developed into a sustainable community that sets new benchmarks in best practice urban development"[8]. An analysis of sustainable energy supply and demand options has been completed. The analysis reviews the feasibility of distributed energy generation scenarios including cogeneration, tri-generation and solar PV. In addition, the development plans focus on walkability, public transport provision and sustainable water use.

The development will also offer more sustainable housing choices, with the 7 star Armstrong Creek Sustainable House providing residents with information on improving the sustainability of their home. The house emphasises the benefits of sustainable building including:

- Saving money in the long-term
- Reducing impact on the environment
- Improving well-being

The house showcases sustainability ideas under the key areas of energy, water, waste and garden. It features:

- A north facing building orientation
- LED down-lights
- Double glazing
- A gas boosted solar hot water system
- Evaporative air-conditioning
- Back-draft damper exhaust fans
- Motion sensors that turn lights on and off

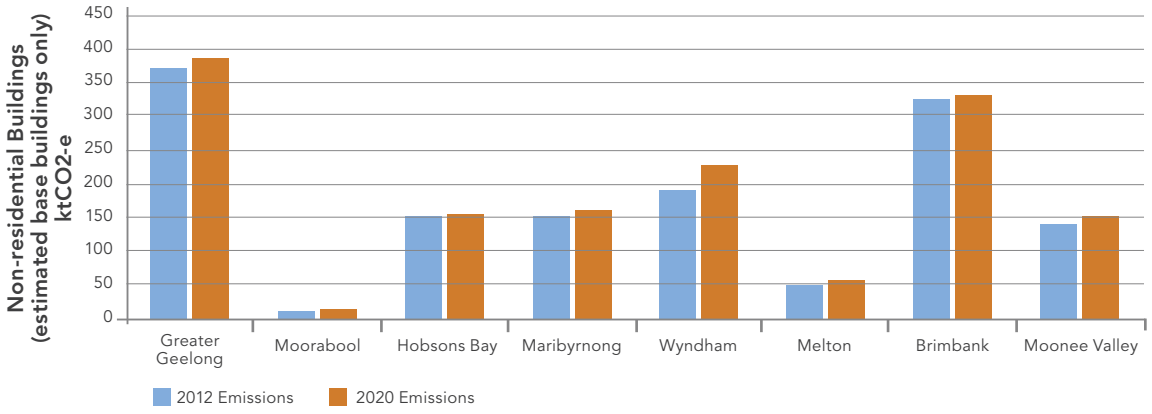
8 City of Greater Geelong (2014) Armstrong Creek Geelong's Growth Area, accessed at https://www.geelongaustralia.com.au/armstrongcreek/

2.2.2 Non-residential buildings

Emissions from non-residential building have been calculated using electricity and gas consumption data provided by the distribution businesses (Jemena, Powercor and SP AusNet).

Figure 11 provides the baseline emissions in 2012 by municipality, and the projected 2020 emissions based on job growth factors within the region. Only emissions from the base building are including, as these relate to the quality of building fabric and core building services equipment.

Figure 11 2012 baseline emissions and 2020 projections for each LGA within non-residential buildings

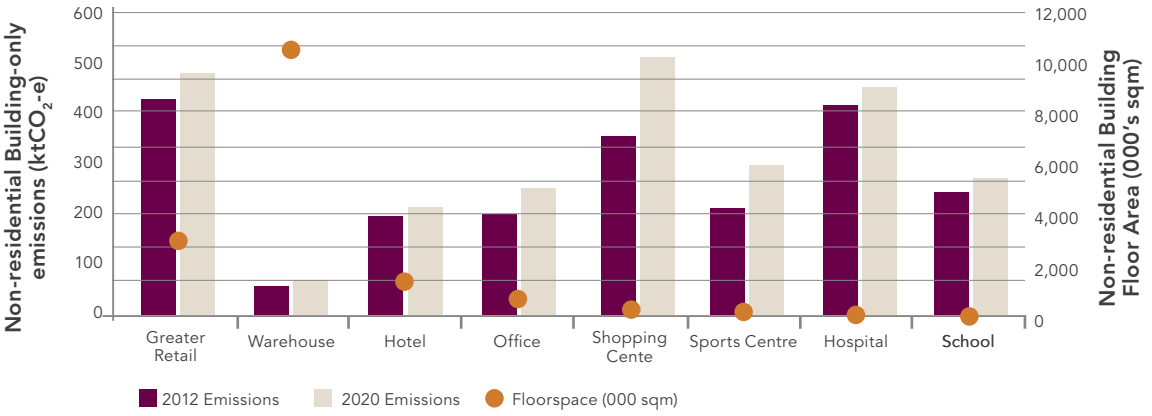


Electricity and gas consumption are assumed to grow according to local job projections. Assuming grid electricity emission factors do not change significantly within the next decade, non-residential base building emissions are anticipated to increase by 6%, amounting to 88 ktCO2e.

Figure 12 below provides the baseline emissions in 2012, and the projected 2020 emissions by building type. This data has been calculated using floorspace data provided by the Valuer General, and by estimating base building energy requirements.

Electricity and gas consumption are assumed to grow according to local job projections. Emissions from retail buildings are anticipated to grow significantly.

Figure 12 2012 Baseline and 2020 Emission Projections for Non-Residential Buildings (estimated base-buildings only), by Type



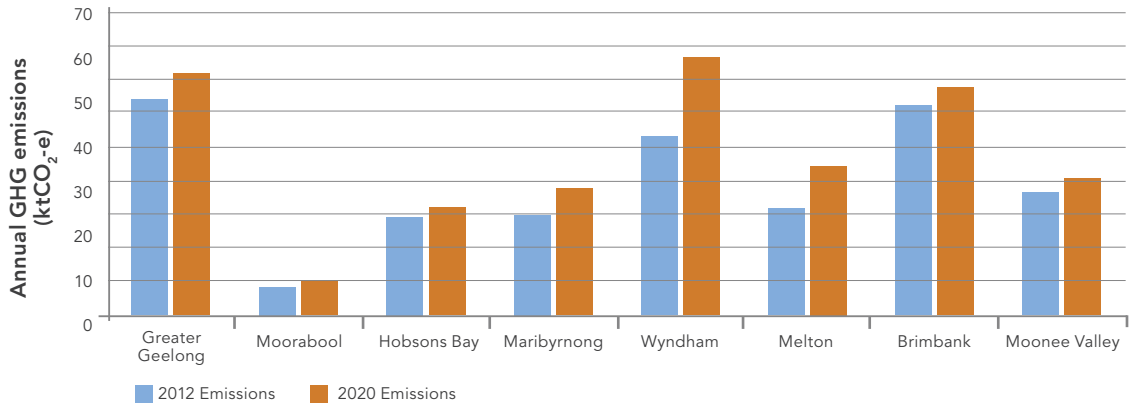
Also from Figure 12, it is estimated that most non-residential building emissions are associated with the retail, warehouse and hospitality industries. Although warehouses is by far the largest floorspace type in the WAGA region, warehouses are relatively less energy intensive per square metre and so are second to retail buildings as a source of total emissions.

2.2.3 Municipal Waste

Municipal waste emissions have been calculated based on municipal waste sent to landfill. These emissions are accounted as scope 3 methane emissions from decomposing waste.

Figure 13 below provides the baseline emissions in 2012 and the projected 2020 emissions based on the projected growth in dwellings in the region.

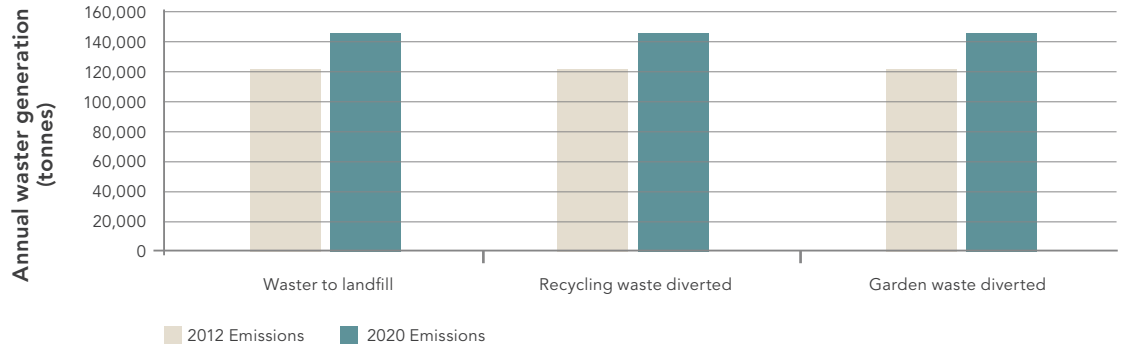
Figure 13 2012 baseline emissions and 2020 projections for each LGA from municipal waste at landfill



Emissions from municipal waste are projected to increase by 21% by 2020, if current waste generation and recycling rates are maintained. The municipalities with the largest growth in waste emissions are Wyndham and Melton, which are anticipated to increase by 43% and 39% respectively. Together, these two local government areas will increase their contribution from 27% to 32% of the WAGA region's waste emissions.

Municipal waste generation was determined by combining municipal waste data with Sustainability Victoria diversion rates. Figure 14 below provides the breakdown by waste management method for the baseline in 2012 and projection in 2020.

Figure 14 2012 baseline municipal waste generation and 2020 projections broken down by waste type



Under 'business as usual' it is assumed that the proportion of recycling waste and garden waste being diverted will remain constant at 32% and 10%, respectively.

3

3. A PLATFORM FOR ACTION

The Low Carbon West strategy builds on climate change action already underway in the WAGA region. There are existing business networks, associations and programs that WAGA can draw on to reduce emissions from the urban growth and development sector. The following initiatives are aligned to this strategy.

Initiative type and names	Partners involved	Low Carbon West Synergies
Building standards and advocacy • Future Proofing Geelong • Property Council of Australia (Victoria): Sustainable Buildings Committee	Greater Geelong Property Council of Australia	*Future Proofing Geelong* is a group supported by the City of Greater Geelong and other organisations. The group focuses on enabling ideas to move Geelong into a resource efficient city by 2030. One focus of the group is to enhance energy efficiency in commercial buildings. The Property Council of Australia (PCA) is an industry body representing investors, property developers, and professional services. The PCA Sustainable Buildings Sub-Committee discusses issues relating to sustainable building development in Victoria. Both Future Proofing Geelong and the PCA represent existing networks that could be used to drive actions for improving standards for non-residential and commercial buildings.
Best-practice sustainable buildings • No.1 McNab Avenue – *5 star Green Star Rating Office Design v3* • Victoria University Learning Commons and Exercise Science and Sport Precinct – *5 star Green Star Rating Education PILOT* • Geelong Library & Heritage Centre – registered for Green Star Public Design v1 • Melton Library and Learning Hub – *registered for Green Star Public Building As Built PILOT* • Western Business Accelerator and Centre for Excellence – *registered for Green Star Rating Office Design v3* • Wyndham Vale Select Entry School – 5 Star Green Star Education Design v1 • Victoria University Sunshine Construction Futures – *6 star Green Star Rating Education Design v1*	Maribyrnong Greater Geelong Melton Melton Wyndham Brimbank	The Low Carbon West strategy encourages higher performance standards for new non-residential buildings. Exemplar buildings will be vital as tangible demonstrations to the development industry. The Green Building Council of Australia's Green Star rating scheme is a useful program that could be applied to new developments and buildings across the WAGA Region. Certain councils such as Melton and Geelong have registered new buildings under Green Star, and these will be demonstration projects for new development in their municipality and the region.

Initiative type and names	Partners involved	Low Carbon West Synergies
Demonstration renewable energy installations for buildings • Keilor Library – 5kW solar PV • Water Transfer Station – 30kWp solar PV • Kellaway Neighbourhood Centre – 39.3kWp solar PV • 200W Wind Turbine • Community Centres (x3) – solar PV (1.5-5kWp) • Pavilions (x2), Community Centres (x5), senior Citizens (x1) – solar hot water • Childcare centres (x3) – solar PV (5-10kWp) • North Zone Depot – 12kWp solar PV • City Hall, National Wool Museum – 6kWp solar PV • Limeburners Point – 3kW wind turbine • Geelong ecoCHALLENGE: Renewable Energy Project - www.geelongaustralia.com.au/energy/ • Altona Library – solar PV • Council offices – 945l solar hot water	Brimbank Moonee Valley Wyndham Maribyrnong Greater Geelong Hobsons Bay	For residential homes, the mandatory NatHERS 6 star rating requires a solar hot water or rainwater tank for each dwelling. For commercial buildings, no renewable energy standard exists. Several councils have installed renewable energy generation systems on council-owned buildings and assets. These systems can act as demonstrable case studies to support the uptake of renewable energy for buildings. These case studies can also help support advocacy for more sustainable residential and non-residential building standards.
Waste-focused activities • Clean and Green Maribyrnong • Moorabool Environment Group • Melton Bowerbirds • Melton FreecycleTM • Various Environment and Friends groups • Various Biodiversity and Environment groups • Burbank Zero Waste Home	Various community groups Burbank	Clean and Green Maribyrnong is an active group of volunteers coordinated by the Maribyrnong City Council. Activities include litter clean up and tree planting days. Moorabool Environment Group is a community group focused on environmental issues in the Shire of Moorabool. They are involved in activities including Clean Up Australia events. Melton Bowerbirds and Melton FreecycleTM are community groups focused on diverting materials from landfill through reuse, recycling and repurposing. In addition, there are various other environmental groups contributing to clean up, revegetation works, tree planting and weed control amongst many other initiatives. Burbank's Zero Waste Home in Melton South has demonstrated that it is possible to divert 99 % of construction waste from landfill. This has been achieved through smart design, intelligent management of logistics and cooperation from trades and suppliers.

CS Case Study: Melton Library and Learning Hub

The Melton Library and Learning Hub has been awarded a 5 Star Green Star accreditation from the Green Building Council of Australia. The facility includes a seminar room, research, study and discussion areas, and multimedia and computer-based learning areas.

The facility minimises environmental impact through:

- Sustainable building materials and energy efficient design to minimise heating and cooling costs
- Reduced light spillage
- Filtered storm water discharge
- Minimal noise pollution
- No ozone depleting insulation
- Collection and reuse of rainwater for toilets and watering the garden
- Plantings of indigenous, drought tolerant species to enhance the external aspects of the building

These measures have resulted in 52% less electricity use, 60% less gas use, 82% less water use and a 45% reduction in GHG emissions.

4

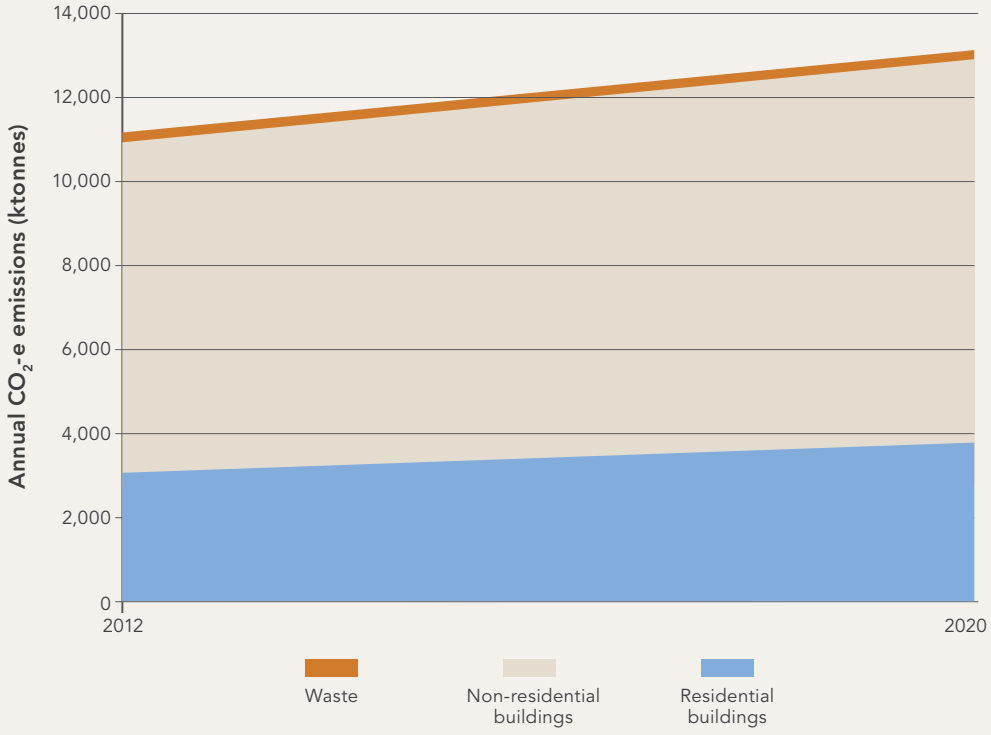
4. THE ROLE OF URBAN GROWTH AND DEVELOPMENT IN TRANSITION TO A LOW CARBON ECONOMY

4.1. Business as usual

The current (2012) and projected (2020) emissions from urban growth and development in the WAGA region are shown in Figure 15 below. These emissions make up around 65% of total emissions in 2012 and 2020. Total emissions are expected to increase by around 2,600 ktCO2-e over this period, with emissions from the urban growth and development sector contributing around 1,800 ktCO2-e of this increase.

These emissions are partly due to heating, lighting and powering new residential buildings and non-residential buildings, especially retail, warehousing and hotel buildings.

Figure 15 Urban Growth and Development Baseline and Projected Emissions, WAGA Region



4.2. Best case

As shown in Figure 15, if new buildings were to be constructed to the same standards as current average buildings, GHG emissions would grow proportionally with floor area.

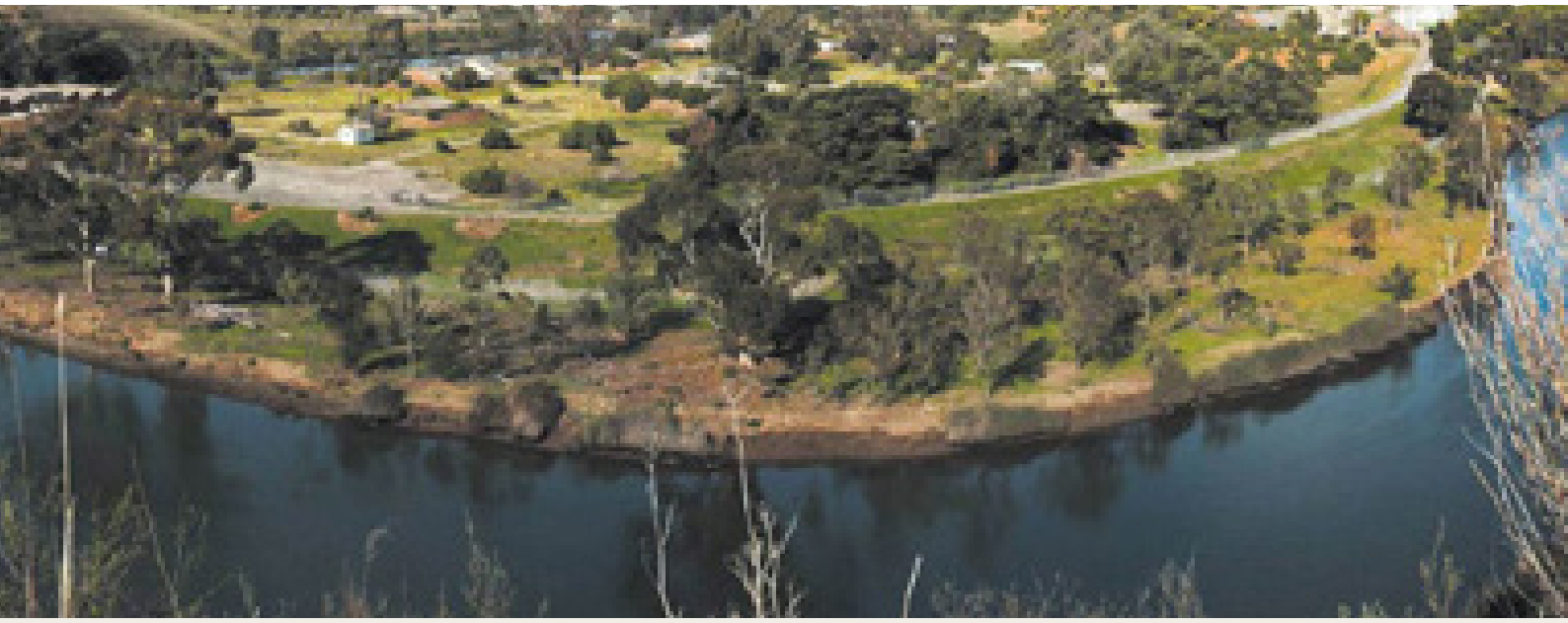
Therefore, there is an opportunity to require new buildings to be designed to be energy efficient and renewably powered. Over the past decades, building energy efficiency standards have improved substantially. For example, the Victorian minimum standard for new homes is 6-star NatHERS, an improvement since the 4-Star requirements of 2003.

The WAGA region will experience tremendous growth between 2012 and 2020. Therefore building energy standards is a key lever for low carbon growth. There are a number of forthcoming precinct developments that could act as demonstrations of best-practice.

These include:

- East Werribee Employment Precinct
- Emerging Sunshine Employment Cluster
- Maribyrnong Parcel A & B
- Flemington-Newmarket Precinct

The significance of these projects has been highlighted in the Victorian Government's Plan Melbourne strategy, and the Property Council of Australia's 20 Projects: Victoria's Best Investment Sites report.



CS Case Study: Maribyrnong Defence Site

The Maribyrnong Defence Site is owned by the Federal Department of Defence. It is potentially one of Melbourne's most significant urban renewal initiatives. The site could offer 3,000 new dwellings. The site could also cater for 360,000sqm of office space.

The site is expected to be developed by Places Victoria on behalf of the Victorian Government. The current public vision of the site is for the development to set a benchmark in sustainable building design.

The 2010 *Maribyrnong Shared Vision*[8] aspires for "a development and community which leads by example". The project is to set the benchmark for sustainability in urban design and lifestyle. Buildings could designed for best practice energy efficiency and precinct-scale low-carbon or renewable energy sources.

The site is currently undergoing remediation for at least the next three years, with construction scheduled to begin once the site is prepared. Once construction starts, the whole project is expected to take ten to 15 years to be completed.

8 Places Victoria (2010) Maribyrnong Shared Vision, accessed at http://www.places.vic.gov.au/our-projects/maribyrnong

The growth areas of Melton and Wyndham both have significant areas for greenfield development (on previously undeveloped land). These will comprise new residential buildings, as well as supporting services such as major infrastructure and local activity centres. Non-residential facilities include healthcare, schools, retail and office space and community centres.

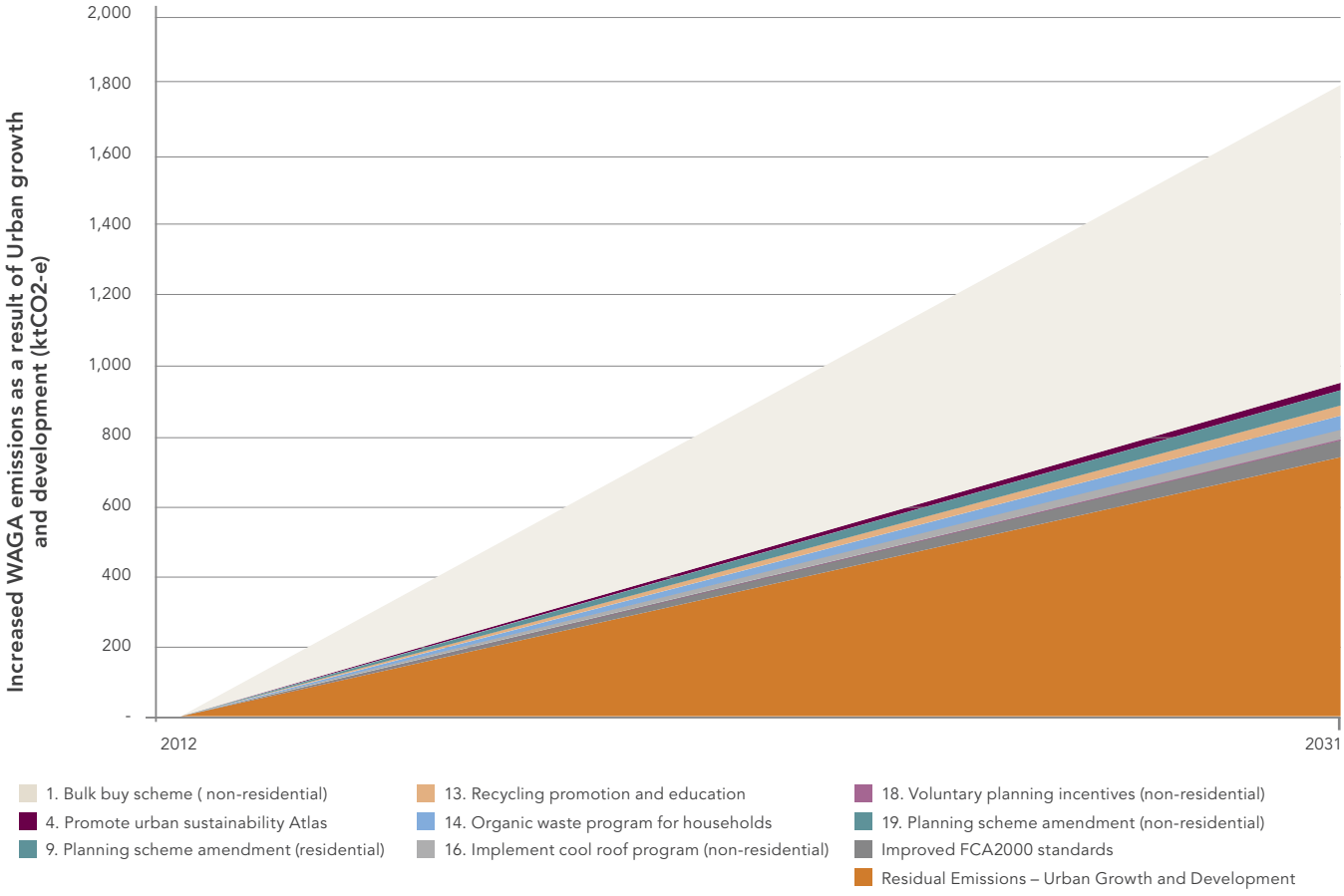
There are currently sixteen completed Precinct Structure Plans (each planning for 10,000 to 30,000 people):

- Melton – Rockbank North, Diggers Rest, Melton North, Robinsons Road Employment Area North, Taylors Hill West, Toolern
- Wyndham – Alfred Road, Black Forest Road South, Point Cook West, Manor Lakes, Point Cook Homestead Road, Riverwalk, Truganina South, Tarneit West, Truganina Employment Area, Wyndham North DCP, Ballan Road, Westbrook

A number of Precinct Structure Plans and Planning Scheme Amendments are still being developed, amended, or being prepared. There is an opportunity to influence the design of these precincts to host energy efficient buildings.

Figure 16 summarises the GHG emissions associated with new buildings and waste. The figure also shows the contribution of each strategy action (described in Section 5.0) to reducing emissions. If all actions were fully implemented, this would reduce projected emissions growth by 56%. This equates to a reduction in emissions of around 1,000 ktCO2-e.

Figure 16 Actions summary for urban growth and development sector



5

5. ACTIONS THAT MAKE A DIFFERENCE

5.1. Cross sector actions

Through the development of Low Carbon West, a long list of 57 regional actions across all sectors was produced. Surveys and discussion were used to reduce this list to a shortlist of 24 actions. There are factsheets available online for each of the shortlisted 24 actions. These detail how emissions reduction and costs have been estimated and include notes from consultation sessions, such as the strengths, weaknesses, opportunities and threats for each action.

Upon further consultation, several actions were removed from the shortlist, leaving 20 key actions that form the basis of Low Carbon West. Of these, eight relate to the **urban growth and development** sector. These 20 actions were qualitatively assessed and prioritised based on the following indicators:

- **Emissions benefit** – What is the extent of the emissions that are avoided as a result of implementation?
- **Cost effectiveness** – What is the financial investment required to achieve the emission reductions?
- **Co-benefits** – Does implementing the action lead to benefits beyond emissions reductions, such as the creation of local jobs or local economic growth?
- **Speed of implementation** – How quickly can the actions be implemented and completed, particularly before 2020?
- **Business or stakeholder support** – How supportive would businesses and other key stakeholders be in progressing the action?
- **Leadership or innovation** – Does the action help the WAGA region become a leader or show innovation in the sector?
- **Ease of implementation** – How great are the barriers to implementation of the action?

The prioritised actions related to the **business and industry** sector are summarised over the page, and described in detail in **Section 5.2**. The RA number of each action refers to its priority ranking among the 20 shortlisted actions.

RA#	Actions – Communities	Brief description	Emissions benefit (ktCO2-e)	Focus	Emissions benefit	Cost effectiveness	Co-benefits	Speed of implementation	Business or stakeholder support	Leadership or innovation	Ease of implementation
1	Bulk-buy scheme (non-residential)	Create bulk-buy schemes for solar PV panels to be installed in new non-residential buildings	853	New non-residential buildings	H	H	H	H	H	M	M
4	Promote Urban Sustainability Atlas	Promote sustainability measures to the community through the Urban Sustainability Atlas, particularly for new buildings to identify opportunities for solar PV installations at a proposed location	12.6	New or renovated residential buildings	M	H	H	M	H	H	H
9	Planning scheme amendment (residential)	Implement planning scheme requirements for high performance buildings / Advocate for reforms to improve national building standards (such as the National Construction Code)	41.3	New or renovated residential buildings	M	H	H	M	M	H	M
13	Recycling promotion and education	Run recycling promotion and education programs, to consolidate and build upon current programs	38.4	Waste	M	M	H	M	M	M	M
14	Organic waste program for households	Implement organic waste diversion and distribute compost back to households	27.3	Waste	M	M	H	M	M	M	M
16	Implement cool roofs program (non-residential)	Implement a 'White Roofs' or 'Cool Roofs' program	31.8	New non-residential buildings	M	L	M	H	H	M	M
18	Voluntary planning incentives for high environmental performance (non-residential)	Provide planning benefits or incentives for high performance building applicants	1.7	New non-residential buildings	L	H	H	M	H	H	M
19	Planning scheme amendment (non-residential)	Implement planning scheme requirements for high performance buildings, and advocate for reforms to improve national building standards (such as the Building Code of Australia)	1.3	New non-residential buildings	L	H	H	M	M	H	M

H High M Medium L Low

RA 1 Bulk-buy scheme (non-residential)

Specific

A program to drive greater uptake of photovoltaics (energy generation) on non-residential building roofs in the WAGA region, through improved procurement and delivery efficiency (bulk-buy). Creating a bulk-buy scheme for sustainable technology has potential to reduce the capital cost of installing the technology for individual consumers. This action focuses on installing solar PV panels and efficient lighting upgrades – specifically for non-residential buildings. The earlier Big Roofs project identified 14km2 of unoccupied roof in the region.

Benefits

The potential emissions reduction associated with each technology can be determined by estimating the uptake of the program and determining the savings from PV panels or lighting upgrades. It was assumed for this analysis that uptake of the bulk-buy program is 30% of new floor area. The estimated emissions reduction would be **853 ktCO2-e**. This represents a **4.3%** saving across the WAGA region.

This would generate $165 million per annum in energy cost savings for the WAGA region. Wider benefits would include jobs growth, particularly in sustainability and energy-efficiency advice, and material supply (particularly in renewable energy sector), increased quality of regional building stock and reduction in energy costs for industry.

Attainable

The potential benefits for bulk-buy schemes should be re-tested due to the sharp decline in costs of PV panels and likely reduced profit margins as more panel suppliers are in the market. The financial benefit of bulk-buy might be reducing as the base level costs of PV drop. In addition there is less uniformity in the non-residential market compared with the residential market, which may make it more challenging to establish a clear pipeline of projects. On a positive note, the Big Roofs of the West do lend themselves to solar technologies and the bulk-buy scheme could be linked to a future solar Environmental Upgrade Agreement (EUA). Overall a bulk-buy scheme is expected to be a cost-effective action to implement, and demonstrates a medium level of innovation.

Scoping

Bulk-buy schemes will require significant direct engagement with potential customers and in the past have delivered lower than expected uptake. Limited success has been shown in Hobsons Bay and Moonee Valley at a residential level. WAGA should consider lessons learned from earlier regional bulk-buy programs before progressing with this action. A scoping study should be undertaken to estimate the likely resource requirements and costs to administer such a program and to consider the effort that required to re-build the reputation of bulk-buy following previous projects in the region that have experienced limited success.

Collaboration

- Local government (or nominated lead agency) can be seen as the trusted advisor.
- There may be benefit in linking a business bulk-buy program with earlier residential programs (e.g. EcoHome makeover / Sustainable Suburbs)
- Bulk-buy could be promoted through industrial clusters or existing business networks
- Can work with the Sustainable Melbourne Fund for solar funding (EUAs)
- Can build on earlier work completed under the Big Roofs banner (Arup 2010)
- Potential to link with Australian manufacturers of solar (e.g. Tinto Solar)
- Possibility to use the program for skills transfer / regional skills development (e.g. automotive industry fund)

Potential Ownership

- WAGA – potential lead
- NAGA, EAGA, MEFL and YEF – potential collaboration
- Clean Energy Finance Corporation, Sustainable Melbourne Fund – potential funding source
- Big Roofs pilot companies - Toll Holdings, GPT, Goodman Property, K-Mart, Toyota, Dulux, Origin and Australand

Timing

- Decision to proceed by mid-2015.
- Review points every six months
- High speed of implementation

RA 4 Promote Urban Sustainability Atlas

Specific

The Urban Sustainability Atlas is a tool that provides an assessment of the potential for rooftop solar energy generation and rainwater capture from the rooftops of selected buildings. Although the Atlas is currently not publicly available, work is being undertaken to launch the tool for use.

The Atlas can be used by residents in the WAGA region to quickly assess the financial and environmental benefits of installing solar PV and solar hot water, customised to the resident's location. A resident's decision to invest in renewable technology can be informed by the balance between the ongoing savings and capital costs.

Promotion of the Atlas is expected to result in an increase in the uptake of solar PV and solar hot water installations. This can be focused also on potential house buyers or home builders in the region.

Benefits

Emissions benefit has been estimated at **12.6 ktCO2-e** against the 2020 baseline. This represents a **0.06%** saving across the WAGA region. Other benefits would include the increased uptake of solar PV and solar hot water, growth in 'green' jobs and engagement of the community with sustainability.

Attainable

This action already has buy-in and investment from the WAGA councils, and there has been interest from other regions. The Atlas could act as an enabler for other programs and also provides the opportunity for community engagement and education. It should be noted however, that the Atlas is useful in providing information to the industry and to the community, but it may not be the primary source of consumer decisions. The Atlas should be used in conjunction with other actions (such as bulk-buy schemes and planning scheme amendments) to encourage uptake of solar PV. The novel nature of this action gives it a high rating for innovation. In addition, it is considered to have a high level of cost effectiveness as the costs are mainly in development and administration of the tool.

Scoping

The current scope of the Urban Sustainability Atlas is limited to solar PV, solar hot water and rainwater harvesting. The greatest potential for the Low Carbon West strategy is in solar PV. There is potential to connect this action with community programs to capture households who may not otherwise consider investing (e.g. women's groups, culturally and linguistically diverse (CALD) groups).

Collaboration

There are opportunities for partnerships and collaboration with developers, community programs for households, electricity/gas distributors, state government and other LGAs.

WAGA and the City of Port Phillip are the current custodians of the Urban Sustainability Atlas, and the program was initiated by the Victorian Department of Environment and Primary Industries. The project partners are currently undergoing a twelve-month pilot phase to test the costs and benefits of post-trial use of the Atlas in its current form. The development of the Atlas can progress in parallel with implementation of the Low Carbon West strategy.

Potential Ownership

- WAGA – potential lead, managing the Atlas and disseminating information
- Councils (within region) – potential funders
- Councils (outside region) – potential funders and expansion of tool and resources
- Business – support and links directly to manufacturers

Timing

- Confirm decision to publicly release Atlas in 2015
- Identify opportunities to promote Low Carbon West through Atlas in 2015
- Review points every three months
- Medium speed of implementation

RA 9

Planning scheme amendment (residential)

Specific

This action focuses particularly on new residential dwelling design and construction. There are a range of possible energy efficiency standards that could be applied through the planning scheme. In Australia, the primary building standards are set by the National Construction Code (NCC), which includes the Building Code of Australia (BCA).

These codes currently set standards for thermal performance and lighting efficiency, with the current minimum BCA standard in Victoria as 6-star Nationwide House Energy Rating Scheme (NatHERS) rating. This can be improved further, and WAGA stakeholders can advocate or implement planning scheme requirements to improve building standards.

Benefits

The estimated emissions reduction from this action is **41.3 ktCO2-e** against the 2020 baseline (assuming a new minimum performance of 7-star rating for new residential homes) – this represents a **0.2%** saving across the WAGA region.

The other indirect benefits associated with this action is the potential increase in skills and jobs within the region, particularly for building construction and energy-efficiency advice or design. For councils, the community may gain a raised awareness of environmental benefits, and financially benefit from lower energy costs from new residential homes.

Attainable

Mandatory requirements already ask for reasonably high performance (6-star NatHERS for new Victorian homes). In addition, there is a growing culture of higher energy standards; currently, some developers offer homes that achieve energy standards beyond compliance, such as the Burbank Future Collection (minimum 7-star), and Lend Lease's Laurimar AusZEH Demonstration House (8-star). The industry can already design and build these houses for purchase, demonstrating a current market for energy-efficient homes. With energy costs (gas and electricity) on increasing trajectories, there are also financial advantages to investing in energy efficient new homes. As such, this action is considered to have a high level of cost effectiveness.

Scoping

Certain residential developers have demonstration houses that represent good or best practice in energy-efficient house designs. Some of these are located within the growth areas of the WAGA region.

As the initiative focuses on new construction, consideration should be given to the housing renewal rates in councils, i.e. as time goes on, existing buildings will be demolished or extensively renovated, and will be impacted by new planning scheme requirements. Also, there are opportunities to extend these requirements to renovations, although these are dependent on the council.

Collaboration

Similar planning scheme requirements or advocacy work has been done in this area of improving energy efficiency standards within Victoria. In 2013, several councils (Yarra, Banyule, Moreland, Port Phillip, Stonington, and Whitehorse) presented a joint submission for a planning scheme amendment to improve environmental sustainable design in their municipalities. The proposed amendment suggests the adoption of sustainable tools to be applied to residential development (particularly mixed-use dwellings or apartments).

WAGA can implement similar amendments (or expanded amendments) to improve energy efficiency in residential buildings. Interest from other councils in Melbourne may also assist with advocacy to improve state-wide or national building standards. Due to the relatively novel nature of this approach, this action is considered to have a high level of innovation.

Potential Ownership

- WAGA as the potential lead
- Councils (or individual WAGA councils) – implementation of planning scheme amendments
- LeadWest – engagement with property developers

Timing

- Decision to proceed by mid-2015.
- Research and drafting of amendment in late-2015.
- Begin implementation of planning scheme amendment lodgement in 2016.
- Medium speed of implementation

RA 13

Recycling promotion and education

Specific

The decomposition of waste sent to landfill (particularly organic waste, paper and cardboard) emits methane gas to the atmosphere over a long period of time. Methane is a greenhouse gas with 21 times the warming potential of carbon dioxide, and the gases from decomposing waste have an effect on the atmosphere for several decades after waste is initially sent to the landfill.

The diversion of recyclable waste, such as paper and cardboard from landfill will reduce emissions from decomposing waste. Under this action, a program would be implemented to better educate residents on recycling practices and the associated benefits, and encourage residents to recycle more.

Benefits

Emissions benefit has been estimated at **38.4 ktCO2-e** against the 2020 baseline. This represents a **0.2%** saving across the WAGA region.

Other benefits would include reduction in waste sent to landfill, reduced requirements for virgin materials due to increased availability of recycled materials and increased engagement of the community with sustainability.

Attainable

Current state government policies support the increase of council waste to landfill diversion rates. In addition, there are significant financial benefits from diverting waste to landfill (rebate for recycling, and reduced costs from high landfill levies and fees). This action is considered to have a medium level of cost effectiveness.

All councils in the region have existing recycling education programs. Most councils reference the Victorian Government's Get It Right On Bin Night initiative. As such, this action is considered to have a medium level of innovation.

It should be noted that there is a growing public interest in landfill expansions or developments. In May 2014 [8], Melton City Council has initially rejected Boral's application to expand landfill operations in Deer Park. However, a lack of existing recycling and reprocessing infrastructure may limit this action.

Scoping

This action should be considered as part of an overall resource recovery action for the region. WAGA councils may collaborate to implement a coordinated approach for waste recycling and recovery. This may begin with the establishment of three bin systems, including the reduction of landfill bin sizes. Linkages with waste to energy should also be considered.

Collaboration

There are opportunities for partnerships and collaboration with Sustainability Victoria, EPA Victoria, existing council facilities (sharing of information, resources and facility capacity) and existing waste processing businesses. In addition, potential synergies should be explored with the State and Metropolitan Waste and Resource Recovery Strategic Plans.

There are also opportunities to draw on existing community groups, such as the Clean and Green Maribyrnong and Moorabool Environment Group, which are associated with Clean Up Australia events and activities.

Potential Ownership

- Councils – potential lead
- WAGA and MWRRG – collaboration / support
- Existing community groups that focus on improved waste management
- Existing landfills or resource recovery facilities within the region

Timing

- Decision to proceed by mid-2015
- Consult on project brief
- Review points every three months
- Medium speed of implementation

8 Melton City Council (May 2014) Council rejects Boral application to expand landfill operations, accessed at www.melton.vic.gov.au/Home/News/Council_rejects_Boral_application_to_expand_landfill_operations

RA 14

Organic waste program for households

Specific

The decomposition of waste sent to landfill (particularly organic waste, paper and cardboard) emits greenhouse gases to the atmosphere over several decades. The majority of councils within the WAGA region already have voluntary green waste collection, where garden waste is composted and used in agriculture and public parks.

This action focuses on increasing the rate of green waste collection and possibly providing residents with the opportunity to purchase compost for household use. The analysis assumes a green waste diversion target of 20% (measured as the proportion of green waste compared with the sum of garbage sent to landfill, recycling and green waste). Note that this action only includes garden waste, and excludes food waste.

Benefits

Emissions benefit has been estimated at **27.3 ktCO2-e** against the 2020 baseline. This represents a **0.1%** saving across the WAGA region. Other benefits would include additional jobs for collecting and processing waste and a reduction in waste sent to landfill. This could lead to financial savings from avoided landfill levies and theavoided cost of developing expensive new landfills for the WAGA region (which is already facing capacity constraints).

These programs can also be used to increase community engagement with sustainability, and be linked with existing community programs (particularly those related to Clean Up Australia).

Attainable

Infrastructure currently exists to enable the implementation of this action (i.e. Veolia processing plant). There is precedent in that Geelong already has in place a three bin system that separates organics at the household or business. This program separates approximately 35 tonnes of organic waste per year. Furthermore, the majority of the councils in WAGA participate in the Back to Earth Victoria initiative. As such, this action is considered to have a medium level of innovation.

In municipalities outside the WAGA region, communities already have reduced size landfill bins and access to subsidised organic composting equipment. This action is considered to have a medium level of cost effectiveness.

Scoping

This action should be considered as part of an overall resource recovery action for the region. WAGA councils may collaborate to implement a coordinated approach for organic waste diversion and recovery. This may begin with the establishment of three bin systems, including the reduction of landfill bin sizes. Linkages with waste-to-energy should also be considered.

Collaboration

Green waste collected from the councils is sent to a processing facility in Bulla, which uses composting technology to process organic waste. This action assumes that the councils will continue to use this facility.

In addition, potential synergies should be explored with the State and Metropolitan Waste and Resource Recovery Strategic Plans.

There are also opportunities to draw on existing community groups, such as the Clean and Green Maribyrnong and Moorabool Environment Group, which are associated with Clean Up Australia events and activities.

Potential Ownership

- Councils – potential lead and to implement policy changes
- WAGA and MWRRG – collaboration / support
- Existing community groups that focus on improved waste management
- Existing landfills or resource recovery facilities within the region

Timing

- Decision to proceed by mid-2015.
- Consult on project brief
- Review points every three months
- Medium speed of implementation

RA 16

Implement cool roofs program (non-residential)

Specific

This action focuses on improving the energy efficiency of existing buildings through the use of white roofs to reduce summer demands for cooling. The action is to provide information and resources for the business and industry to facilitate them investing in painting their roofs. Research conducted in Melbourne and internationally has shown that white roofs can reduce cooling demand, depending on the building type. This is due to the reflective nature of white roofs when compared with darker colours. According to a study by the University of Melbourne, white roofs for commercial buildings have anywhere between 3-20% benefit on cooling loads.

Benefits

Emissions benefit has been estimated at **31.8 ktCO2-e** against the 2020 baseline. This represents a **0.2%** saving across the WAGA region.

Other benefits would include economic growth (particularly regarding the paint industry and additional material purchases) and reductions in energy costs for industry.

Attainable

This action is based on a simple concept that is easy to explain and publicise. Also, the program can be linked with the existing Urban Sustainability Atlas, highlighting areas of high solar irradiation.

There are also a number of existing case studies that describe the benefits of cool roofs in industrial and non-residential buildings. The most well-known case study is Melbourne Airport's SkyCool roofing, which has contributed to reduced demand for heating and cooling energy. As such, this action is considered to have a medium level of innovation. However, due to high upfront cost and modest emissions benefit this action is considered to have a low level of cost effectiveness.

Scoping

This action is mainly suited for large roof areas (factories, warehouses) that require cooling and thus specific engagement will be required in this sector. It should be noted that WAGA has undertaken the Big Roofs program in the past, which focused on solar PV and rainwater harvesting project. A 'cool roofs' program could extend this project or re-launch the project.

Collaboration

There is no existing 'Cool Roofs' program designed for a regional approach. Both the City of Greater Geelong and Wyndham City Council undertook investigations to understand urban heat island impacts. A cool roofs program can build on these studies.

The region should also consider opportunities to learn from facilities that have cool roofs installed, such as the Melbourne Airport and Dulux buildings. Cool roofs have also been investigated for commercial buildings by the City of Melbourne in conjunction with Melbourne University.

Potential Ownership

- WAGA – potential lead
- Big Roofs pilot companies - Toll Holdings, GPT, Goodman Property, K-Mart, Toyota, Dulux, Origin and Australand
- Existing facilities with 'cool roofs'

Timing

- Decision to proceed by mid-2015.
- Review points every six months
- High speed of implementation

RA 18

Voluntary planning incentives for high environmental performance (non-residential)

Specific

This action provides planning incentives for developers of new buildings to design and construct high-performance (energy efficient and low carbon) buildings. This may be achieved by expediting planning processes for building designs that can demonstrate excellent energy-efficient performance. There are a range of existing tools that may be used for developers to demonstrate high-performance, such as showing evidence of commitment to achieving a certain NABERS star rating, Green Star rating, or to the Sustainable Design Scorecard (SDS).

Benefits

Emissions benefit has been estimated at **1.7 ktCO2-e** against the 2020 baseline. This represents a **0.01%** saving across the WAGA region.

The other indirect benefits associated with this action are the potential increase in skills and jobs in within the region, particularly for building construction and energy efficiency advice or design. The industry may gain a raised awareness of environmental benefits, and financially benefit from lower energy costs from more thermally efficient non-residential buildings.

Attainable

Depending on the council, this activity may involve minimal costs. If the incentive is quicker planning approvals, this can be embedded into council processes. If the incentive is reduction in planning fees, then this source of revenue will decrease. This action may require additional time for staff to assess the evidence of submitted building designs. As such, this action is considered to have a high level of cost effectiveness. In addition, this action is considered to have a high level of innovation due to its relatively novel approach.

Scoping

This action would only influence new developments and would not address the existing building stock. Many industrial and commercial developments apply a 'cookie cutter' approach to new buildings, and the opportunity is to influence and increase the design performance of these buildings.

Collaboration

The Cities of Port Phillip and Moreland have developed a tool to help assess non-residential buildings for planning purposes. The Sustainable Design Scorecard (SDS) is mature and established, and can be used (or enhanced) to help assess high-performance building designs. The SDS requires certain buildings to demonstrate a 10% improvement compared to Section J of the BCA.

Potential Ownership

- WAGA as the potential lead
- Councils (or individual WAGA councils) - implementation and administration of incentives

Timing

- Decision to proceed by mid-2015.
- Review points every six months
- Medium speed of implementation

RA 19

Planning scheme amendment (non-residential)

Specific

There is range of possible energy efficiency standards that could be applied through the planning scheme. The amendment requires proposals specifically for non-residential buildings (office, retail, education, and accommodation) to demonstrate how energy efficiency performance measures would be achieved. These energy efficiency performance measures are beyond those required as part of the National Construction Code (NCC).

Potential emissions reductions for the region are by assuming a 10% improvement on thermal and lighting performance on base-building energy only (electricity and gas), using BCA 2010 Section J requirements.

Benefits

Emissions benefit has been estimated at **1.3 ktCO2-e** against the 2020 baseline. This represents a **0.01%** saving across the WAGA region.

The other indirect benefits associated with this action are the potential increase in skills and jobs in within the region, particularly for building construction and energy efficiency advice or design. The industry may gain a raised awareness of environmental benefits, and financially benefit from lower energy costs from more thermally efficient non-residential buildings.

Attainable

This action requires direct council action to make it enforceable. Although there are minimum standards required in the BCA, local planning schemes can be used to enhance these standards for energy efficiency performance. As this action mainly involves administrative cost, it is considered to have a high level of cost efficiency.

There is also precedent for this action, as the City of Melbourne successfully introduced Planning Scheme Amendment C187 to achieve high environmental performance standards at design, construction and operation phases for particular building types. Furthermore, several other councils (Yarra, Banyule, Moreland, Port Phillip, Stonington, and Whitehorse) are currently presenting a joint submission for planning scheme amendments to improve environmental sustainable design in their municipalities.

Scoping

In 2013, several councils (Yarra, Banyule, Moreland, Port Phillip, Stonington, and Whitehorse) presented a joint submission for a planning scheme amendment to improve environmental sustainable design in their municipalities. WAGA can implement similar amendments (or expanded amendments) to improve energy efficiency in non-residential buildings. Interest from other councils in Melbourne may also assist with advocacy to improve state or national building standards. Due to the relatively novel nature of this approach, this action is considered to have a high level of innovation.

Collaboration

There are opportunities for partnerships and collaboration with similar councils and industry bodies. There are also opportunities to work with councils that have undergone these amendments, and learn from the experiences and requirements of these amendments.

Furthermore, there is opportunity to work with the existing rating tools, such as the Green Building Council of Australia's GreenStar rating scheme, NABERS rating system, and the Sustainable Design Scorecard (initially designed for Cities of Port Phillip and Moreland).

Potential Ownership

- WAGA as the potential lead
- Councils (or individual WAGA councils) - implementation of planning scheme amendments
- LeadWest - engagement with property developers

Timing

- Decision to proceed by mid-2015
- Research and drafting of amendment in late-2015
- Begin implementation of planning scheme amendment lodgement in 2016
- Medium speed of implementation

6

6. A PLAN FOR IMPLEMENTATION

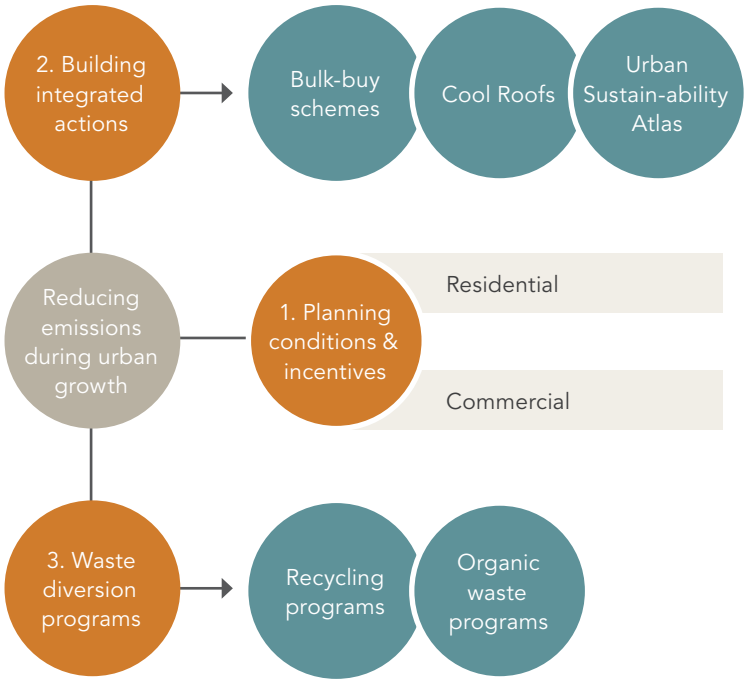
The Low Carbon West strategy sets eight actions in the urban growth and development sector to limit the increase in GHG emissions as the WAGA region grows.

These actions can be coordinated through the following three programs:

1. Implementing planning conditions and incentives
2. Supporting building integrated actions
3. Enhancing waste diversion programs

Each of these programs will require a separate implementation plan detailing the agreed program components (initiatives or projects), program objectives, partners, advocacy approaches, funding requirements, milestones and steps for program monitoring and review.

Figure 17 Figure 17: Potential elements of a program focusing on carbon emission reductions in urban growth and development



An outline implementation plan for each of the three programs is included below.

Program 1: Reducing business premises emissions	
Program objectives	• Implement planning scheme amendments and incentives to enhance environmental sustainability performance in new buildings • Work towards delivering 44 ktCO2-e emissions savings per year, against the current emissions baseline
Program audience	Department of Transport, Planning and Local Infrastructure, property developers, building designers, architects and engineers, Local Government planners
Program elements / initiatives	1. Implement planning scheme requirements for higher thermal performance residential buildings and homes 2. Advocate for reforms to improve national building standards (particularly for thermal performance) of residential buildings and homes 3. Implement planning scheme amendment for non-residential buildings 4. Advocate for reforms to improve national building standards for new non-residential buildings 5. Provide planning incentives for high-performance non-residential buildings applicants, utilising existing rating schemes such as SDS and Green Star
The role of WAGA	Lead facilitator, co-ordination, collaboration and gathering learnings from other council and alliance experiences.
Key partners	All local councils within region, consultants and legal counsel
The role of key partners	Sustainability Victoria, Green Building Council of Australia – key partners should engage with these stakeholders to obtain necessary the necessary data as evidence for the planning scheme amendment process.
Timeline	Investigate options for planning scheme amendments by January 2015, reviewing the processes undertaken by other experienced councils. Engage in planning scheme amendment process by June 2015.
Program funding and resourcing	This process is currently being undertaken by several councils in metropolitan Melbourne. Planning scheme amendments require a range of : • Designated council or WAGA resource (approx. one EFT position) to manage process • Designated council or WAGA resource (or outsourcing – approximately one EFT position) to undertake background research required to support planning scheme amendment • Engaging of expert witnesses for panel • Legal counsel to present case to panel

Program 2: Supporting building integrated actions			
Program objectives	Implement bulk-buy scheme for non-residential buildings and engage builders or property developers particularly for inclusion on new buildings	Design 'cool roofs' program for non-residential buildings	Publicly release Urban Sustainability Atlas
	Work towards delivering **897 ktCO2-e** emissions savings per year, against the current emissions baseline		
Program audience	**Solar PV suppliers, commercial property developers, building designers, architects and engineers**	**Commercial property developers, building designers, architects and engineers**	**Commercial property developers and investors**
Program elements / initiatives	1. Conduct scoping study to estimate the likely resource requirements and costs to administer program 2. Conduct market research into builder and developer interest in bulk-purchase of solar panels 3. Identify suitable suppliers within municipalities 4. Coordinate and implement regional (or local municipal) bulk-buy schemes	1. Undertake research (or collect existing research) on 'cool roofs' potential of non-residential buildings in the WAGA region 2. Publicly release 'cool roofs' program 3. Sign-up demonstration or case study buildings 4. Implement program regionally	1. Further development and consultation 2. Publicly release the Urban Sustainability Atlas 3. Link with bulk-buy scheme for non-residential buildings (solar PV)
The role of WAGA	Program co-ordination, manage council collaboration	Program co-ordination, manage council collaboration	Lead facilitator, co-ordination, manage council collaboration
Key partners	Local councils	Companies engaged as part of the Big Roof project, University of Melbourne, councils that have investigated urban heat island effect (Greater Geelong, Wyndham)	WAGA, Urban Sustainability Atlas council members
The role of key partners	Work with local suppliers and builders/developers to develop scheme	Participate in research and case study development	Refine the tool and support the public release of the tool
Timeline	• Investigate options for bulk-buy and conduct market research • Launch program in 2015	• Undertake research and case-studies in 2014-2015 • Launch program September 2015	• Launch Atlas late 2014 • Report six monthly
Program funding and resourcing	• Designated council or WAGA resource (approximately one EFT position) to engage interested businesses	• Designated council or WAGA resource (approximately one EFT position) to engage interested businesses	• Designated council or WAGA resource (approximately one EFT position) to manage Atlas • Potential funding from Clean Energy Finance Corporation

Program 3: Enhancing waste diversion programs	
Program objectives	• Implement waste diversion programs (recycling and organic waste) across all municipalities within the WAGA region • Work towards delivering 66 ktCO2-e emissions savings per year, against the current emissions baseline
Program audience	Community
Program elements / initiatives	1. Review current recycling and organic waste diversion rates in community 2. Set regional targets for waste diversion opportunities 3. Investigate options to divert organic waste streams and liaise with councils that have successfully implemented such programs 4. Design recycling and organic waste diversion education programs 5. Implement regional program for community
The role of WAGA	Program initiation
Key partners	All local councils within region, Metropolitan Waste and Resource Recovery Group (MWRRG) established waste-related community groups
The role of key partners	Ongoing program coordination and management, research on current diversion rates, extension of community engagement programs, partnering with established community groups
Timeline	• Investigate options for waste diversion programs by January 2015, reviewing the initiatives undertaken by other councils. • Engage in waste diversion activities from June 2015.
Program funding and resourcing	• Investigate options for waste diversion programs by January 2015, reviewing the initiatives undertaken by other councils. • Engage in waste diversion activities from June 2015.

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Low Carbon West is a comprehensive plan for reducing regional GHG emissions in the WAGA region over the coming years. To understand the effectiveness of these actions in mitigating emissions, WAGA will develop a monitoring and evaluation plan towards the end of 2014. WAGA staff will be responsible for the measurement and evaluation of Low Carbon West, and progress reporting to the WAGA Executive Committee.

The monitoring plan will be delineated by sector and consist of a series of key performance indicators (KPIs) based on the actions prioritisation framework within Low Carbon West. In addition, the monitoring plan will define the reporting timeline and format. As the actions cover a breadth of sectors, the information sources to inform progress in each sector will also differ. A significant part of setting up the monitoring framework will be the identification of data sources. The data sources used to develop the 2012 current baseline provide the primary means of tracking the level of emissions reduction over the coming years.

The KPIs are likely to cover:

- Communications and advocacy with key stakeholders of Low Carbon West
- Engagement with industry through action implementation
- Co-benefits associated with implementation
- Number of projects identified, funded and implemented for each action
- Barriers or challenges associated with implementation
- Project case studies / fact sheets developed, in particular demonstrating leadership or innovation in the WAGA region
- Implementation resources and costs incurred and required over the coming year to support further implementation of Low Carbon West
- Overall energy and emissions savings by action, sector, by LGA and for the region.

Simple reporting templates will be set up to capture this information in a consistent format.

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