

Carbon and Energy

FY19

Why this is important to Stockland

We have a longstanding commitment to manage climate change risk and reduce our carbon emissions. We recognise our role to influence the energy efficiency of our assets and have taken a proactive approach to developing energy efficiency programs and implementing action plans over a number of years.

The increasing cost of energy, particularly electricity, poses a challenge for the property industry and for all Australians. As electricity is an increasing proportion of our assets' operating expenditure, improvements in energy efficiency enable us to reduce cost and improve our operational efficiency. Integrating energy efficiency considerations into the design and construction of our assets can also help to reduce the energy requirements (and electricity costs) of our tenants and residents.

The increasing cost of power also means that renewable energy options such as solar have become cost-effective choices for our energy supply. The declining cost of solar infrastructure works in tandem with the increasing cost of conventional energy to make solar a sound business investment. We look to design and technology innovation and access to alternative energy supplies to help us and our customers realise a cost efficient, low carbon future. Improving the energy efficiency of our assets and communities not only improves environmental outcomes, but also provides cost of living benefits and economic advantages for our business.

This Deep Dive document is a component of our FY19 sustainability reporting suite, which is publicly available on our [website](#). Our sustainability reporting is third-party assured and drafted in accordance with the GRI Standards.¹ The material in this Deep Dive is supported by a wider collection of performance metrics contained in our [Environmental Data Pack](#).

This Deep Dive is to be read in conjunction with our published management approach to carbon and energy, available as part of our sustainability reporting suite at [Our Management Approach to Carbon and Energy](#).



Our key achievements

- 10.9% reduction in emissions intensity across Commercial Property
- Completed a further 12.1MW of solar capacity in FY19 bringing our total portfolio solar capacity to 16.4MW and expected generation capacity of approximately 21,900,000 kWh in renewable energy annually.
- Exceeded our residential energy performance target by 17 per cent.
- Committed to additional solar photovoltaic (PV) that brings our total investment in solar to around \$32 million with an expected 17.9 MW of solar PV capacity across our Commercial Property portfolio by the end of FY20.
- Continued the installation of electric vehicle charging stations across our retail town centres, bringing our total to 82 electric vehicle charging ports in 24 locations.
- Completed LED lighting upgrades across a number of our retail town centres that will result in approximately 1,160,000 kWh of annual electricity savings.
- Publicly committed to achieving net zero carbon by 2030 for our Retirement Living and Industrial portfolio and Corporate Head Offices based on the World Green Building Council "Net Zero Carbon Buildings Commitment".

¹ The GRI Standards are global standards for sustainability reporting published by the Global Reporting Initiative (<https://www.globalreporting.org/standards/>)

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- Commenced a Net Zero Energy Pilot at Stockland Willowdale Retirement Village, including the facilitation of a workshop for builders to support the education of Net Zero Energy and available products on the market.
- Commenced a partnership with the Victorian Government (Sustainability Victoria) to participate in a pilot program designed to work with volume home builders to design, build and market the first “Zero Net Carbon” (ZNC) Homes in Australia.
- Provided owners of 72 homes along Sustainable Drive at Highlands with an offer of a 5 kW solar system and 9.3 kWh battery at zero cost. 3.5 kW solar systems were installed at 14 townhomes at Waterlea (Vic). Each home is been designed to be battery ready for future installation.
- Mandated a minimum 2.5 kW of rooftop solar PV per home at Minta (Vic), our first project to do so.

FY19 priorities and progress

Commercial Property

FY19 PRIORITIES	STATUS	FY19 PROGRESS
Achieve net zero carbon by 2030 for our Industrial portfolio and Corporate Head Offices based on the World Green Building Council “Net Zero Carbon Buildings Commitment”.	In progress	Solar PV systems have been installed in several locations in our Logistics portfolio including 200kW at Ingleburn (NSW) and 90kW at Somerton (NSW). In the second quarter of FY20, 770kW is expected to be installed at Yennora (NSW).
Achieve a 60 per cent carbon reduction intensity target for Retail Town Centre, Workplace, and Business Parks assets (FY06 – FY25)	In progress	At 30 June 2019, we have achieved a carbon intensity reduction of 57.5 per cent against FY06 for the Retail Town Centre, Workplace, and Business Parks portfolio.
Reduce carbon intensity in our Retail Town Centre portfolio by 10 per cent by FY20, against the FY17 benchmark	Achieved	At 30 June 2019, we have achieved a carbon intensity reduction of 20.2 per cent against FY17 for our Retail Town Centre portfolio.
Reduce carbon intensity in Workplace by five per cent by FY20, against the FY17 benchmark	In progress	At 30 June 2019, our carbon intensity decreased by 1 per cent against FY17 for our Workplace portfolio.
Achieve a 4.5 stars NABERS Energy average for our Retail Town Centre portfolio by FY20	In progress	Our NABERS Energy average for our Retail Town Centre portfolio is 4.34 stars (up from 4.18 stars at end of FY18).
Achieve a 5 stars NABERS Energy portfolio average in our Workplace and Business Parks portfolio by FY20	In progress	Our NABERS Energy average for our Workplace and Business Parks portfolio is 4.48 stars (up from 4.35 stars at end of FY18). The decline since we achieved 4.74 stars in FY17 is attributable to asset disposals, portfolio vacancies and increased hours of occupancy at one of our business parks resulting in higher energy usage.
Continue to install electric vehicle charging stations across our Retail Town Centre portfolio	In progress	We have installed new ChargePoint chargers at Stockland Bundaberg (Qld), Stockland Cleveland (Qld), Stockland Traralgon (Vic), Stockland Wendouree (Vic) and Stockland Nowra (NSW) in addition to the rollout of 43 Tesla destination chargers at 23 centres across the Retail Town Centre portfolio.
Install a further 12 MW of solar photovoltaic capacity across eleven retail town centres by the end of FY19.	In progress	All committed projects installed with the exception of Gladstone (Qld) due to structural roof works being necessary. Our total portfolio solar capacity now stands at 16.4 MW with the capacity to generate approximately 21,900,000 kWh in renewable energy annually.



Communities

Residential

FY19 PRIORITIES	STATUS	FY19 PROGRESS
Exceed relevant minimum energy related compliance standards by 10 per cent within our residential communities	Achieved	We achieved a 27 per cent improvement on energy relative to local compliance standards, for homes completed during the year, this is a 17 per cent improvement over our 10 per cent improvement target.
Develop an alternative energy infrastructure strategy to help drive appropriate delivery of renewable infrastructure in our residential developments.	In progress	A cross business energy strategy was prepared during the year to provide a guide to energy focus areas over the next three years. Key areas of focus for FY19 have included the review of solar and embedded network opportunities for residential communities.
Deliver solar and battery packages to 72 homes within our Highlands (Vic) project in partnership with a large industry supplier, and monitor the performance of these homes to understand how solar and battery can be more efficiently delivered and used by home owners.	In progress	Residents have been offered solar and battery packages with first installations due early FY20. We are looking to use the data to provide insights around comfort, affordability and liveability.

Retirement Living

FY19 PRIORITIES	STATUS	FY19 PROGRESS
Achieve net zero carbon by 2030 for our Retirement Living portfolio based on the World Green Building Council "Net Zero Carbon Buildings Commitment".	In progress	In September 2018 Stockland publicly committed to achieving net zero carbon by 2030 for our Retirement Living and Industrial portfolio and Corporate Head Offices. This is a long term target and planning for next steps will occur in FY20.
Exceed relevant minimum energy related compliance standards by 10 per cent in all new developments	Not applicable	No new developments commenced in FY19. Current developments that commenced before FY19 include Newport (Qld) and Shine (Birtinya - Qld) and are targeting a 4 Star certified Green Star Design & As Built rating and in doing so will meet the minimum energy requirements within the Energy criteria of the rating tool.
Continue to roll-out solar installations to meet or exceed our target of five installations across clubhouses and community centres in our retirement living communities by FY20.	In progress	An additional 13.4 kW solar system has been installed in FY19 to Fig Tree Village common area, taking total solar generation capacity to 26.8 kW. In FY18 installations had been completed at Fig Tree (Qld) and Wamberal Gardens (NSW).
Achieve a five per cent energy reduction target by FY20 (for villages with sub-metering)	In progress	Our pilot sub-metering and monitoring program has led to a 1.6% decrease in energy consumption at Tarneit Skies (Vic) and 7.2% increase in energy consumption at The Willows (NSW).
Formalise solar guidelines and supporting documentation that apply to village residents	Not achieved	The solar guidelines have been drafted and this priority is expected to be achieved in FY20.
Implement an operational efficiency review at three of our most energy intensive operational villages.	Achieved	Energy Audits have been completed at six villages these are; Unity (SA), Willowdale (NSW), Maybrook (NSW), Shine (Birtinya, Qld), Cardinal Freeman (NSW) and North Lakes (Qld). Findings have been shared nationally to the operational village teams and will be fed into CAPEX budgets for FY20 where appropriate.
Implement key recommendations from our pilot sub-metering and monitoring program and share lessons learned.	In progress	Monitoring on-going to increase data for establishment of benchmarks and help develop future portfolio-wide metering and monitoring strategy.



Future priorities

Group

- Develop our next phase of long term carbon and energy targets (FY21-23)
- Achieve net zero carbon by 2030 for our Industrial portfolio and Corporate Head Offices based on the World Green Building Council "Net Zero Carbon Buildings Commitment".
- Review our approach to carbon accounting giving consideration to our large scale solar projects.

Commercial Property

- Achieve a 60 per cent carbon intensity reduction for Retail Town Centre, Workplace and Business Parks assets (FY06 – FY25).
- Reduce carbon intensity in our Retail Town Centre portfolio by 10 per cent, and in our Workplace portfolio by five per cent, by FY20 (FY17 baseline).
- Achieve an average NABERS Energy rating of 4.5 stars for our Retail Town Centre portfolio, and 5 stars for our Workplace portfolio (by FY20)
- Install a further 1.9 MW of solar photovoltaic capacity across two retail town centres (Gladstone and Baringa) and one logistic (Yennora) asset by the end of FY20.
- Continue to install electric vehicle chargers across our Retail Town Centre portfolio.

Communities

Residential

- Exceed relevant minimum energy related compliance standards by 10 per cent within our residential Built Form communities.
- Design, construct and deliver two completed Zero Net Carbon (ZNC) homes within our Victorian residential communities by FY21, in partnership with Sustainability Victoria (SV)
- Deliver solar and battery packages to 72 homes within our Highlands (Vic) project in partnership with a large industry supplier, and monitor the performance of these homes to understand how solar and battery can be more efficiently delivered and used by home owners.

Retirement Living

- Exceed relevant minimum energy related compliance standards by 10 per cent in all new developments.
- Continue to roll-out an additional two solar installations across clubhouses and community centres in our retirement living communities.
- Continue Stage 2 (Design) of the Net Zero Energy Home Pilot at Willowdale Retirement Village (NSW).

FY19 performance and case studies

Total greenhouse gas (GHG) emissions

We reduced our Scope 1 emissions in FY19, primarily due to decreases in emissions associated with refrigerants (leaks/ top-up) within our commercial property business. There was also a decrease in gas consumed across our Retirement Living communities portfolio. Our Scope 2 emissions decreased largely due to reduced gross energy consumption at Commercial Property assets and an ongoing improvement in Communities energy data acquisition.

The table below outlines our Scope 1, 2 and 3 emissions over the last five years. For a detailed breakdown of our Scope 1, 2 and 3 emissions please refer to our [Environmental Data Pack](#).



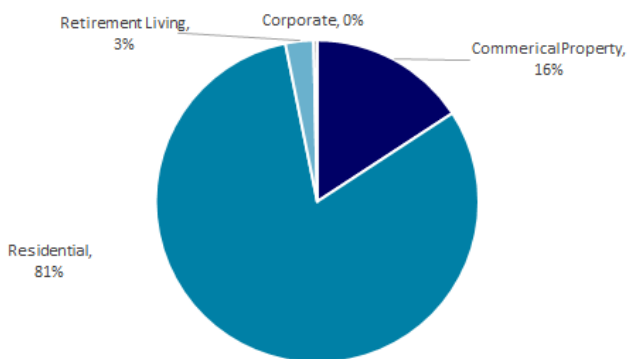
SCOPE 1, 2 AND 3 EMISSIONS (tCO₂-e)

	FY19	FY18	FY17	FY16	FY15
Scope 1 ²	24,230	25,453	26,884	35,036	26,368
Scope 2 ³	70,545	82,591	87,860	89,881	97,763
Total Scope 1+2 emissions	94,774	108,044	114,743	124,917	124,131
Scope 3 ⁴	27,572	33,866	31,115	39,628 ⁵	21,002

Total Scope 1 emissions by business unit

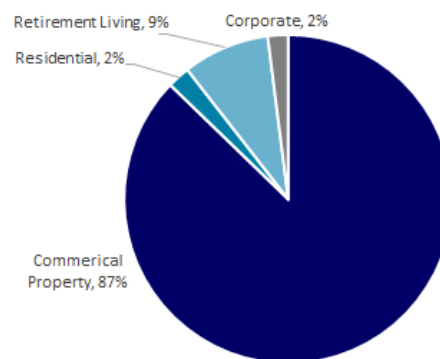
The chart below outlines the percentage allocation of our Scope 1 emissions by business units. Communities constitutes the largest proportion of our Scope 1 emissions due to contractor construction activity during development.

Residential communities with large construction activities in FY19 included: Aura and Newport (Qld), Sienna Wood and Calleya (WA), Elara (NSW), Cloverton and Highlands (Vic).



Total Scope 2 emissions by business unit

Commercial Property constitutes our largest proportion of Scope 2 emissions and remains the focus of our strategic energy efficiency initiatives. Scope 2 emissions have decreased significantly due to the increased implementation of solar power system across retail.



Commercial Property

NABERS Energy Ratings

Following the NABERS ratings undertaken in FY19 on our Retail Town Centre portfolio, the area weighted portfolio average for NABERS Energy has improved to 4.34 stars (4.18 stars in FY18) against our target of 4.5 stars by FY20. Eight assets out of 23 achieved an improved energy rating in FY19, and one asset achieved a lower rating.

In our Workplace and Business Parks portfolio for FY19, NABERS Energy the area weighted portfolio average has improved to 4.64 stars (4.52 stars in FY18) for our Workplace portfolio and 4.37 stars (4.22 stars in FY18) for our Business Parks portfolio. The combined portfolio average for Workplace and Business Parks is 4.48 stars which is an improvement on the FY18 result of 4.35 stars.

From 16 Workplace and Business Park assets rated, three achieved a higher energy rating in FY19 with none achieving a lower rating. We expect this portfolio rating to increase toward our FY20 target of 5 stars with increased occupancy, upgrades to building management systems and installation of additional sub-metering.

² Scope 1 emissions are direct emissions, i.e. emissions from fuels that are combusted on site (including natural gas, diesel and petrol from fleet) as well as refrigerant leakage. This includes direct emissions reported by contractors where we have operational control (typically residential community projects).

³ Scope 2 emissions are indirect emissions from the consumption of electricity only. This includes indirect emissions reported by contractors where we have operational control (typically residential community projects) and emissions from base building electricity across the Workplace and Business Parks, Retail Town Centre, Logistics, Residential and Retirement Living assets for which we have operational control.

⁴ Scope 3 emissions are other indirect emissions, including hire cars, rental vehicles and airline travel, transmission and production losses from purchased electricity, gas and fleet fuel and operational waste from our Commercial Property portfolio.

⁵ From FY16 we expanded our boundary to include Scope 3 emissions from waste generated at our Commercial Property assets.



More information on our NABERS ratings across our portfolio is provided in the [Asset Rating and Certification Deep Dive](#) and [Environmental Data Pack](#).

CASE STUDY

Introducing the first ‘carbon neutral’ logistics asset in Australia

The Stockland-owned logistics facility 32-54 Toll Drive, Altona North, Victoria has been certified ‘carbon neutral’ under the National Carbon Offset Standard. The warehouse has also received a Green Star Performance rating, the first Green Star rating for our Logistics portfolio, with points awarded across energy, water, waste and innovation.

Tony D’Addona, General Manager – Workplace and Logistics said current tenant Toll was excited to achieve the carbon neutral goal. “Stockland, Toll and our sustainability consultants NettZero have all worked hard to complete a range of sustainability initiatives over the last few years, with the ultimate goal of reducing the warehouse greenhouse gas (GHG) emissions,” Tony said.

The warehouse upgrades included changing all lighting to LEDs and a carton re-use program. It also meant committing to capturing, storing and analysing energy and water usage data on a monthly basis. “The Carbon Neutral certification process has certainly helped us improve our management approach to sustainability and has been a worthwhile education process for our facility managers for our future Green Star ratings,” said Tony.

By calculating actual greenhouse gas emissions from the warehouse, the tenants Toll and Nike, were able to purchase Carbon Offset Certificates. The GHG emission savings associated with the offset certificates equalled the GHG emission attributed to the Centre. “This first official Green Star rating for a Stockland logistics property is a good starting point and we will look to continue to build on this and apply our learnings to future developments, and in operations,” Tony said.

Stockland have also just signed a heads of agreement for a renewal with Toll at the property. As part of the renewal Stockland will be funding a 99kw solar PV installation later this year. This will further enhance the green credentials of the site, assisting in the reduction of electricity consumption from the grid and reducing carbon emissions.



Carbon neutral in action at Toll Drive.

Energy efficiency

We have actively invested in energy efficiency improvements across our Commercial Property developments and operations since we set our first energy and emissions targets in FY09. Energy is an important operational expenditure item for our

business and as a result we have adopted an active management approach to deliver strong financial returns whilst reducing our carbon footprint.

Our energy efficiency investments made in FY19 are projected to generate energy savings of approximately 1,500,000 kWh annually. These investments include the installation of a heating, ventilation and air conditioning (HVAC) chiller optimisation unit at Stockland Merrylands (NSW) to reduce electricity consumption by better managing chiller demand and load. This upgrade is projected to save approximately 200,000 kWh per annum which equates to approximately five per cent of the total base building annual consumption. We also completed a large HVAC refurbishment at Stockland Mulgrave which will improve the overall control strategy and efficiency of the air conditioning system without compromising on thermal comfort. The annual expected energy savings is 218,900kWh equivalent to half a star NABERS improvement.

We continued our LED lighting upgrades across our retail town centres, with upgrades at Stockland The Pines (Vic), Stockland Cairns (Qld), Stockland Traralgon (Vic), Stockland Rockhampton (Qld) and Stockland Wetherill Park (NSW). The upgrades are expected to achieve approximately 1,160,000 kWh electricity savings annually.

Renewable energy

As of 30 June 2019 we had installed a further 12.1MW of solar PV capacity across 10 of our shopping centres and two logistics assets, including one our largest installation of 1.8 MW at Stockland Cairns (Qld). This takes our total operational solar PV capacity to 16.4MW.

We are in the middle of our next wave of solar installations at two retail town centres and one logistics asset which will bring an additional 1.9MW of solar PV capacity. The installations will bring the total investment in renewable energy to over \$32 million providing a total of 17.9 MW of generating capacity and producing an estimated 23,000,000kWh of renewable energy annually.

The table below illustrates our solar generation over the past five years.

RENEWABLE ENERGY GENERATED USING SOLAR POWER

	FY19	FY18	FY17	FY16	FY15
Energy generated using solar PV (kWh)	12,958,224	3,274,463	2,387,168	1,940,689	292,124
Per cent of Retail Town Centre portfolio electricity usage	19.9	5.1	3.6	2.8	0.4
Total solar PV capacity at end of reporting period (kW)	16,400	4,360	2,260	1,360	1,360

CASE STUDY

Thirteen years of carbon and energy leadership

At Stockland, we have a longstanding commitment to managing climate change risk and reducing our carbon emissions. Since 2006 we have reduced our emissions intensity by over 57 per cent and saved over \$106 million through energy efficiency initiatives to deliver shared value for us and our stakeholders. We are as committed to transparency as we are to action. In 2018 we became an early adopter of the Task Force on Climate-related Financial Disclosures recommendations, demonstrating active management of climate risks and our ability to capitalise on climate opportunities.

Our leadership in carbon and energy was reinforced in September 2018, when we signed the World Green Building Council's (WorldGBC) Net Zero Carbon Buildings Commitment – the first Australian listed property group to commit, and amongst the first 15 organisations globally. A net zero carbon building, as defined by the WorldGBC, is highly energy efficient and fully powered on-site or by off-site renewable energy sources. Our new net zero target commits us to achieving net zero carbon emissions by 2030 across our logistics centres, retirement living communities, and corporate head offices by installing 11MW of solar panels.

We are also focused on helping our residential customers enjoy the benefits of low carbon living, currently partnering with the Victorian Government on a two-year program to build Zero Net Carbon Homes. These commitments and projects present opportunities to not only reduce carbon emissions, but improve our operational efficiency in a cost-effective manner at our assets, whilst reinforcing the climate resilience of our portfolio.

Performance against emissions reduction targets

We track our greenhouse gas emissions on a per square metre intensity basis as a means to understand our energy impacts while taking divestments and investments into account. Our greenhouse gas emissions intensity has been steadily decreasing across commercial property and we will continue to monitor and invest in technology to assist us in achieving our FY20 target (10 per cent intensity reduction in Retail Town Centres, five per cent reduction in Workplace and Business Parks, from FY17 baseline).

The table below outlines our greenhouse gas emissions intensity data since FY15.

COMMERCIAL PROPERTY GREENHOUSE GAS EMISSIONS INTENSITY (kg CO₂-e/m²)

	FY19	FY18	FY17	FY16	FY15
Workplaces	61.18	60.41	61.70	64.98	67.32
Retail Town Centres	42.25	49.54	52.92	56.58	58.32
Commercial Property	46.32	52.00	54.93	58.55	60.66

In FY19 we reduced our Retail Town Centre portfolio emissions intensity by 14.7 per cent compared with FY18. These decreases are attributable to continued energy monitoring and capital investments in efficiency initiatives such as LED lighting, heating, ventilation, and air conditioning optimisations and solar PV. Our Workplace emissions intensity increased by one per cent compared with FY18, which is driven by the increase in occupancy and operating hours.

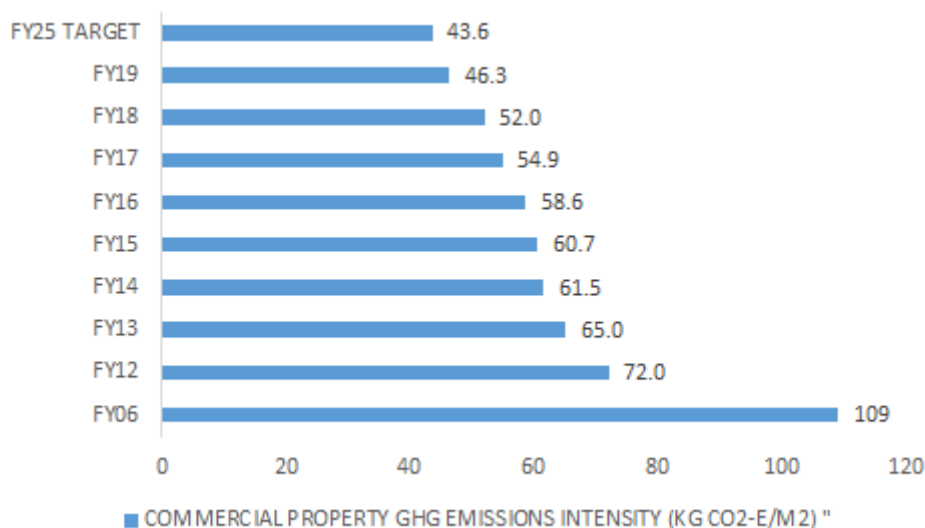
The table below outlines our Commercial Property year-on-year emissions intensity reductions over the last five years.

COMMERCIAL PROPERTY ANNUAL CHANGES IN EMISSIONS INTENSITY

	FY19	FY18	FY17	FY16	FY15
Workplaces	1%	-2%	-5%	-4%	0%
Retail Town Centres	-14.7%	-6%	-6%	-3%	-2%
Commercial Property	-10.9%	-5%	-6%	-4%	-1%

We have set emissions reduction targets every three years in support of our overarching target to reduce emissions intensity by 60 per cent across our Commercial Property portfolio by FY25 (using FY06 baseline). The chart below indicates progress toward our FY25 target.

PROGRESS TOWARD OUR FY25 EMISSIONS INTENSITY TARGET (kg CO₂-e/m²)



Communities

Residential

As part of our commitment toward energy efficiency, we have successfully partnered with the Victorian Government (Sustainability Victoria) to deliver a number of Zero Net Carbon (ZNC) homes at our residential communities in Victoria. The Zero Net Carbon Home Pilot Program will see us design, construct and market two ZNC homes at our Highlands and Braybrook Orion communities. The project provides an opportunity for us to collaborate with two of our volume home builder partners VCON Homes (Highlands) and Creation Homes (Orion).

The first phase of the program, delivered during FY19, focused on the development of the ZNC design and construction methodology required to meet the net zero target. As part of the program, we have undertaken a number of activities with both Sustainability Victoria and our builder partners that included;

- On-site home air tightness and insulation integrity testing to establish a performance benchmark
- Detailed energy (NatHERS) and ZNC modelling simulations to inform the design of the nominated home product
- Design workshops to develop the ZNC design specification for each nominated home product
- Best practice construction workshops designed to educate our builders (and industry) on the best practice construction methodologies required to achieve air tightness specifications and ultimately a ZNC home.

The energy targets set for our Residential portfolio (set in FY17) focus on energy and emissions efficiency of residential product that we build (as opposed to also encompassing product built by third party builders on land that we sell). These targets aim to deliver a 10 per cent improvement by FY20 on existing energy and carbon compliance benchmarks established by regulation within the states where we operate and apply to our built form product.

We measured the performance of our homes constructed during the year across all of our projects; 318 dwellings were completed across six projects. The projects included Willowdale and Altrove in NSW, Eastside Highlands and Waterlea in Victoria, Calleya in WA and Vida at North Lakes in Queensland. Overall we achieved a 27 per cent improvement over compliance benchmarks. Our Waterlea project in Victoria was our best performer with a score of 96 per cent improvement. Initiatives delivered at Waterlea include an average of 7.4 star NatHERS, 5 star air conditioning systems, LED lighting throughout, gas boosted solar hot water and 3.5kw of solar PV per dwelling. Our NSW projects scored the lowest as a result of the high benchmark established by the BASIX compliance platform, which requires high performance baseline energy requirements for home approvals.

Some examples of broader energy and carbon reduction initiatives delivered within our Residential portfolio during FY19 are:

- 2.5 kW of solar mandated on each home at Minta Farm (Vic). A Tesla Powerwall II was also installed at the sales office to showcase the technology to customers.
- 72 homes on Sustainable Drive in Highlands (Vic) were offered 5 kW solar and 9.3 kW battery packages as part of the team's initiative to help customers make homes more comfortable, affordable and energy efficient.
- The sales office at Kalina (Qld) is now powered by a solar and battery installation, enabling the office to operate off grid at most times. This was a cost effective method to enable early establishment of the Sales and Information Centre. Sales staff have learned how to operate the solar and battery systems to ensure the battery retains sufficient charge to power the office early in the mornings before solar panels begin operating.
- LED street lighting has been installed at Birtinya Island and Bokarina Beach (Qld), Calleya (WA) and Willowdale (NSW).

Retirement Living

In FY19 we completed six energy audits across a spread of operational villages ranging from different ages, both horizontal and vertical living units. The villages were Cardinal Freeman (NSW), Maybrook (NSW), Willowdale (NSW), Unity (SA), North Lakes (Qld) and Shine (Qld). Potential upgrades such as energy efficient lighting and solar power were identified as offering estimated payback periods of between 5-10 years. Appropriate temperature setpoint adjustment was also noted to reduce unnecessary electricity consumption from common area air conditioning systems. Similarly, for villages with swimming pools, review of temperatures and filter pump operational hours to match bather usage will help to reduce overall energy consumption.



We completed an extensive refurbishment of the existing clubhouse at The Willows (NSW). The scope included an air conditioning system based on a mixed mode operation designed to save energy by reducing mechanical air conditioning during times when ambient conditions are favourable to draw in outside air. Estimates based on comparing energy consumption data (pre and post air-conditioning) of the village indicates a 30 per cent reduction in energy consumption over the Summer and Autumn months, when compared to a conventional air-cooled split system design.



To access the complete list of documents in Stockland's Sustainability Deep Dive Series, [click here](#).