



LG Solar

7 Reasons LG Panels Will Save You

Check out: LGenergy.com.au or call LG Solar direct on **1300 152 179**

Reason 1

LG Solar offers strength, stability and reliability

As a global electronics manufacturing pioneer, LG has more than 60 years of experience in product development and innovation. Now, with over 30 years of research and development in the solar industry behind us, we're proud to be one of the leading innovators and manufacturers of solar panels globally and in Australia and New Zealand.



The leading LG consumer product range makes LG a uniquely diversified and strong partner in the Australian and New Zealand solar landscape.

 **LG Electronics**

A safe harbour in a stormy solar sea



LARGEST
Consumer Brand
operating in solar in
Australia and NZ.



More than
1.2 MILLION
solar panels sold in
Australia & NZ since 2010



Operations in
140 Countries



Founded in
1958



Revenue (2018)
54.4 billion USD

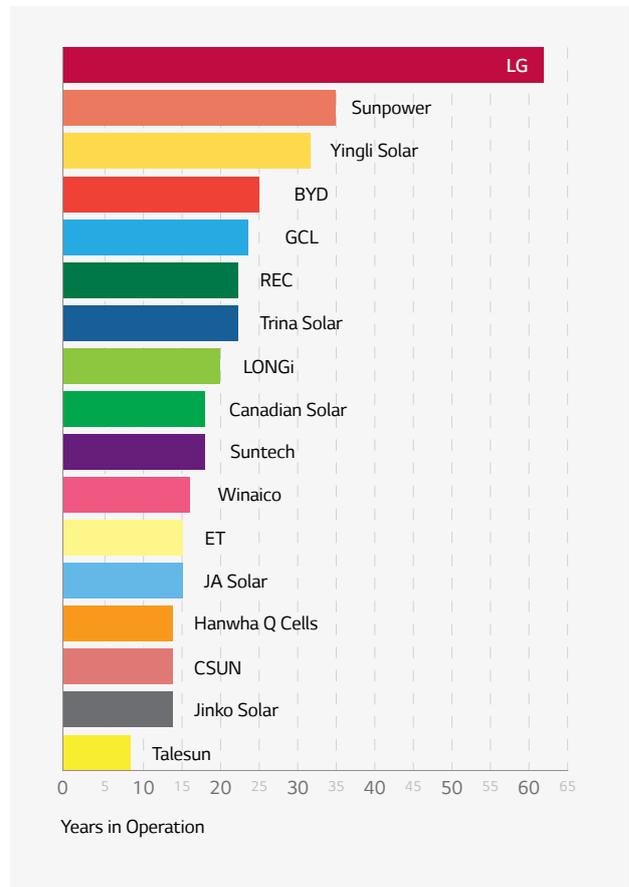


Global Workforce
72,600

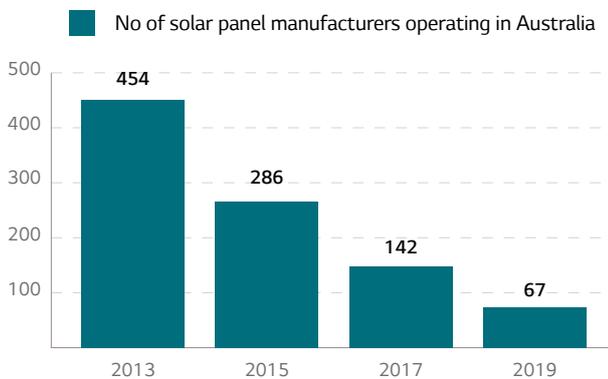
The Warrantor's 2018 Sales in Billions of US Dollars*



Global Manufacturing Companies: Years in Operations



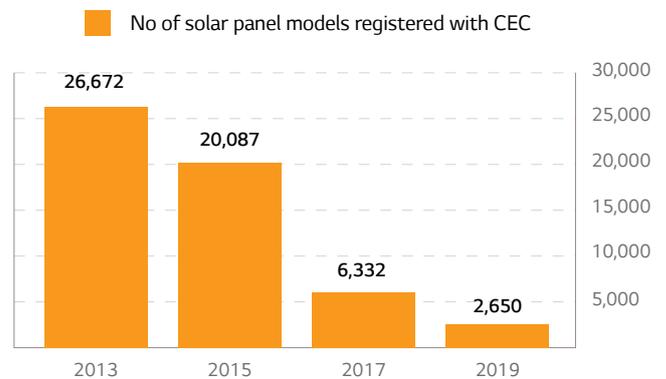
Reducing Number of Solar Panel Manufacturers 2013 - 2019



Fewer and fewer Solar Panel Manufacturers operating in Australia

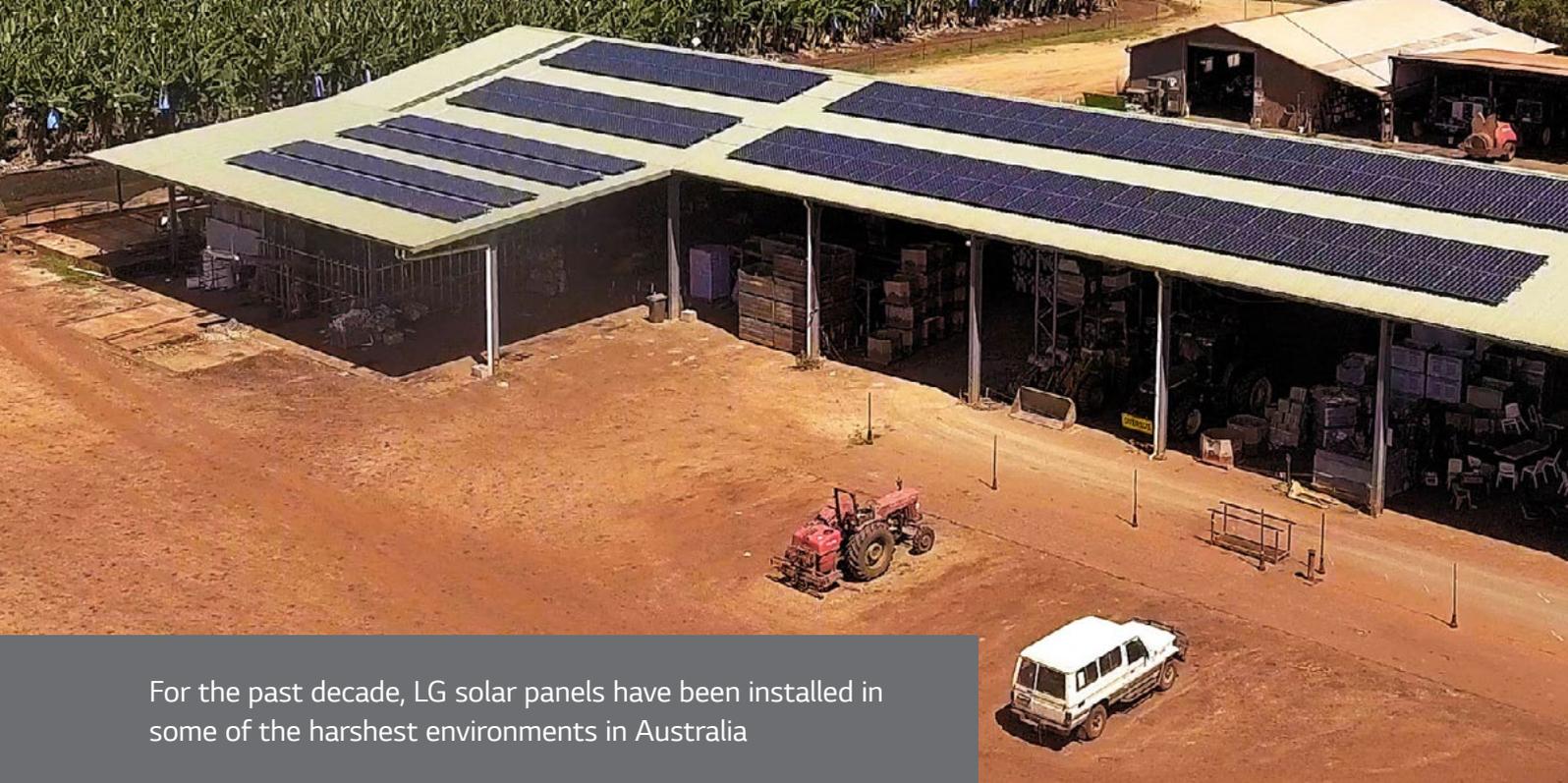
Number of manufacturers offering solar modules with 25 year performance warranty, registered by the Clean Energy Council – indicating how many have come and gone – leaving customers very exposed.

Vastly Reducing Number of Approved Solar Panels 2013 - 2019



Panel models listed on CEC approved list reducing strongly

The drastic reduction of solar panel models means over 20,000 panels offered for sale only a few years ago are now not supported and have no warranty.



For the past decade, LG solar panels have been installed in some of the harshest environments in Australia

When you purchase solar panels from LG Solar, you are investing in a product backed by years of experience and manufactured with the help of stringent research and testing standards.

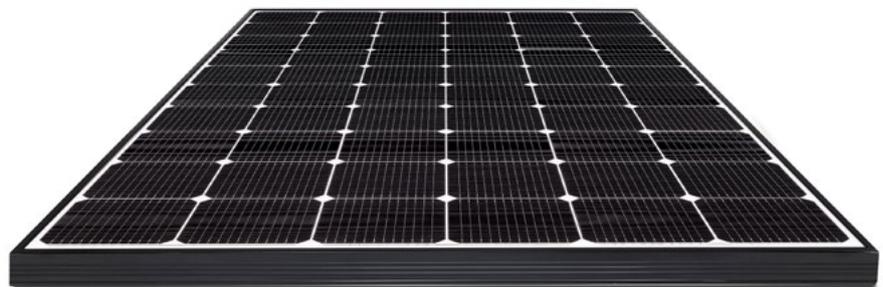
LG sees the last 30 years as just the beginning. We look forward to being a major contributor to the solar industry - and global sustainability efforts - for many years to come.

LG Electronics is a global company with over 70,000 employees in 140 countries and USD \$54 billion* in annual revenue. We are here for the long term.

LG solar have over the past decade sold many millions of high quality panels around the world with only a very low proportion of warranty claims. That's the type of partner you want for a 25 year plus relationship.

LG Electronics also has the know-how in energy storage, heat pumps, air conditioning and many other electronic appliances. This makes LG Electronics not only the right partner for you when it comes to solar panels, but also for other home energy solutions.

* 2018 income for LGE



Reason 2

Better Financial Return Over Time

The majority of customers purchase solar to reduce their electricity bills. Companies selling cheap solar often argue it is worthwhile to buy cheaper solar, as the return on investment is better. This claim is incorrect, as quality solar has a much better long term financial return.

Also from an environmental perspective, cheap, shorter lasting solar systems will not generate as much electricity as high quality durable panels and inverters. This results in quality systems providing a better environmental CO² abatement outcome. For the same input of raw materials a much better abatement outcome will be achieved by using high quality panels and inverters.

Technology in 2020

Cheaper panel sales persons sometimes argue that it is not worthwhile to buy longer lasting panels. The rationale being, technology does change quickly and it is better to buy cheaper equipment, as it will allow them to buy newer product with better technology in a few years again. **WRONG**

In the early 2000's typical solar panels were 175W. A new generation of panels was developed in 2010/11 and the panels became bigger and heavier and moved to 250W. In the last 10 years changes in raw materials and cell technology have pushed the output to 330W per standard panel and 350-360W for higher efficiency panels.



LG NeON[®] 2 - a highly efficient and great looking panel

LG Solar believes the pace of efficiency improvements has now slowed, whereby over the next 10 years an increase in output per panel to around 350W for a standard panel is expected. This is far less than the efficiency growth we have seen over the past decade. Any new technology that will increase output also has a higher price point. This means a high efficient panel purchased today will have technological relevance for a long time.

Very cheap solar puts less money into your pocket

An example: Lets say a very low cost and poor quality 6.6kw solar system delivers a \$1,600 annual electricity cost savings in Sydney at a system cost of \$3,700. Often these systems with lower quality of the components last only 5 years before major repairs or complete replacement are required.

Over 5 years the cheap solar purchaser saved \$8,000, being 5 x \$1,600.

Therefore the owner of such a cheap system had a Net Gain of \$4,300, being \$8,000 in electricity cost saving - \$3,700 (cost of system) = **\$4,300 Net Gain.**

In 5 years when they then have to buy another system, they have to pay to remove old panels off the roof. If they then buy a new system the solar rebate will have reduced (as the rebates reduce every year). So a substantial part of the initial \$4,300 net benefit will be lost in investing once more into a new system, at a lower rebate.

Recent improvements in solar panel technology means that efficiency improvements have slowed. Further improvements in the next 10 years are predicted to be gradual, meaning high efficient panels made in 2020 will still have relevant performance in 2030 and beyond.



Inspecting cheap panels, that failed after 3 years and were pulled off the roof. The consumer was unable to claim against the manufacturer who had left Australia.

Quality Solar generates more savings

A 6.6kw top quality system can costs \$8,000 plus and in the Northern Territory will be more due to special

regulations. Such a solar power system will deliver on average a \$1700* per year benefit in Sydney in electricity savings.

* The \$100 more assumed income per annum are due to better hot weather and low light performance, lower annual degradation and technological advantages of the quality panels generating a higher output

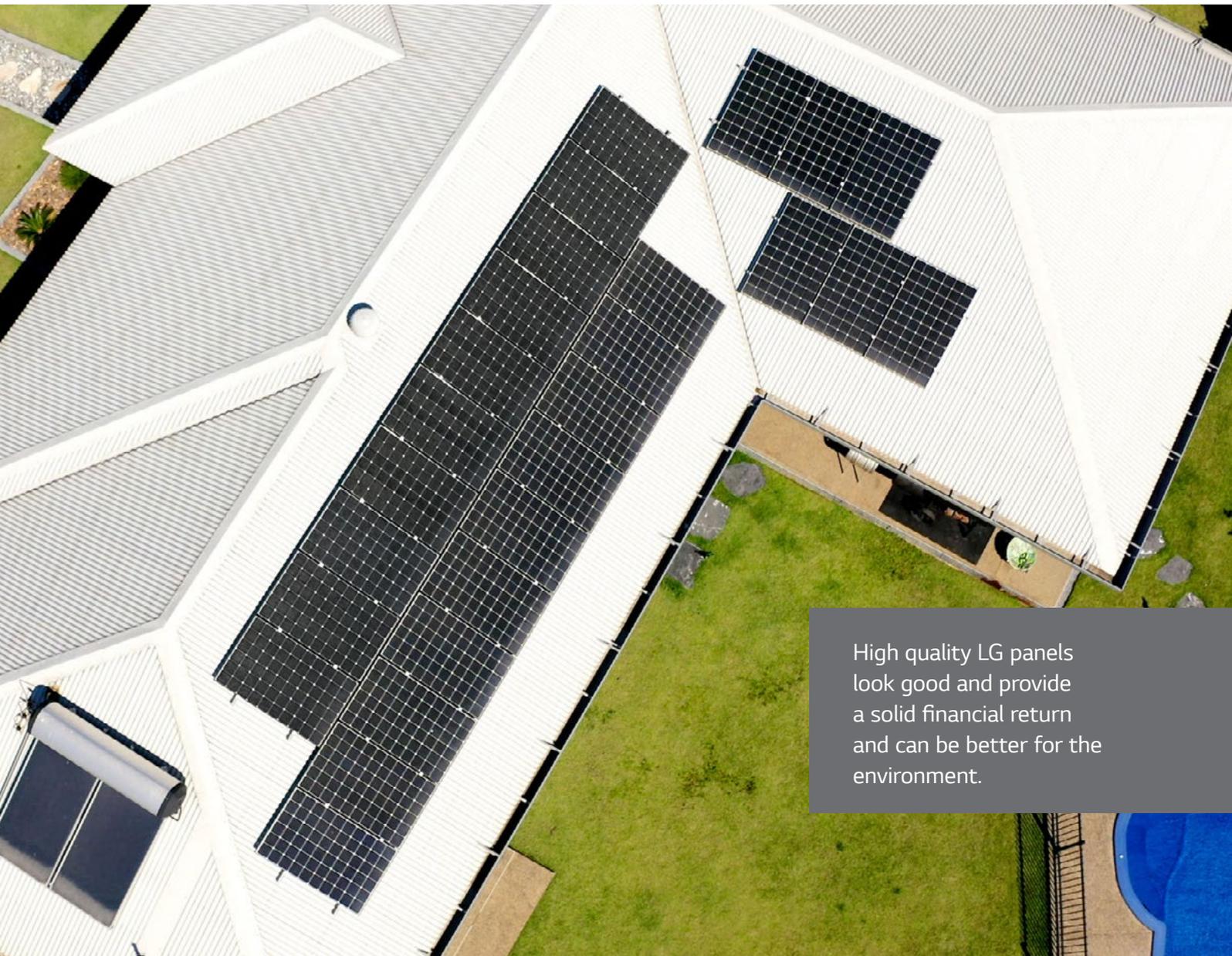
As this system has a solid 25 year panel product warranty, meaning if there are issues it will get new panels.

So as long as the inverter continues to operate a saving of \$42,500 over 25 years is possible.

Therefore a net benefit of \$42,500 income less \$8,000 for initial system purchase, less \$2,000 for the cost of inverter replacement at year 13 results in a **\$32,500 Net Gain**.

For the initial additional expenditure of \$4,300 – which is the difference between a cheap and a quality system, the purchaser gained a significantly higher income over the life of the system, by going with quality. Of course the longer lasting system generated not only much more renewable energy, but consequently also a much better environmental outcome, via a much larger CO² reduction.

A quality system which lasts longer generates a much better long term financial return.



High quality LG panels look good and provide a solid financial return and can be better for the environment.

Standard Solar versus Quality Solar

Financial Return Tables

The following assumptions apply:

Electricity

- \$600 electricity bill every 3 months.
- 27 c/kWh & \$95 fixed charge per 3 months.
- 11 cents Feed in Tariff (FIT).
- 60% of solar self-consumption.
- 40% of solar export.
- 2.5% annual increase in electricity price.

- Degradation of 2% year 1 and 0.3% thereafter.
- Life span of 25 years.
- Allows for one inverter replacement of \$1,700 after year 13.

Sample: 6.6kW Solar Systems in Sydney

System 1

- Powered by LG NeON[®] 2 350W.
- Cost \$8,200 after rebate.

System 2

- Powered by a standard panel.
- Costs \$5,200 after STC rebate.
- Degradation of 3% year 1 and 0.7% thereafter.
- Life span of 12 years.
- No inverter replacement cost allowed for.

System 1 - LG NeON [®] 2 Panels			
Years system installed	kWh generated	Income per year	Total income up to this year
1	9,439	\$1,993	\$1,993
2	9,405	\$1,985	\$3,978
3	9,372	\$1,978	\$5,956
4	9,339	\$1,971	\$7,927
5	9,306	\$1,964	\$9,891
6	9,273	\$1,957	\$11,848
7	9,240	\$1,951	\$13,799
8	9,207	\$1,944	\$15,743
9	9,174	\$1,937	\$17,680
10	9,141	\$1,930	\$19,610
15	8,981	\$1,896	\$29,157
20	8,822	\$1,862	\$38,535
25	8,667	\$1,830	\$47,749
Total	226,192		\$47,749

Estimated net benefit at end of system life after subtracting system purchase costs.

\$47,749 - \$8200 for system purchase and - \$1700 for inverter replacement
= \$37,849 saving with LG

System 2 - Standard Panels			
Years system installed	kWh generated	Income per year	Total income up to this year
1	8,641	\$1,824	\$1,824
2	8,580	\$1,811	\$3,635
3	8,519	\$1,798	\$5,433
4	8,459	\$1,786	\$7,219
5	8,399	\$1,773	\$8,992
6	8,340	\$1,761	\$10,753
7	8,281	\$1,748	\$12,501
8	8,223	\$1,736	\$14,237
9	8,165	\$1,724	\$15,961
10	8,107	\$1,711	\$17,927
12	7,993	\$1,687	\$21,058
15	System Dead Replacement needs to be purchased again		
20			
25			
Total	99,757		\$21,363

Estimated net benefit at end of system life after subtracting system purchase costs.

\$21,058 - \$5,200 for system purchase
= \$15,858 saving with standard panel

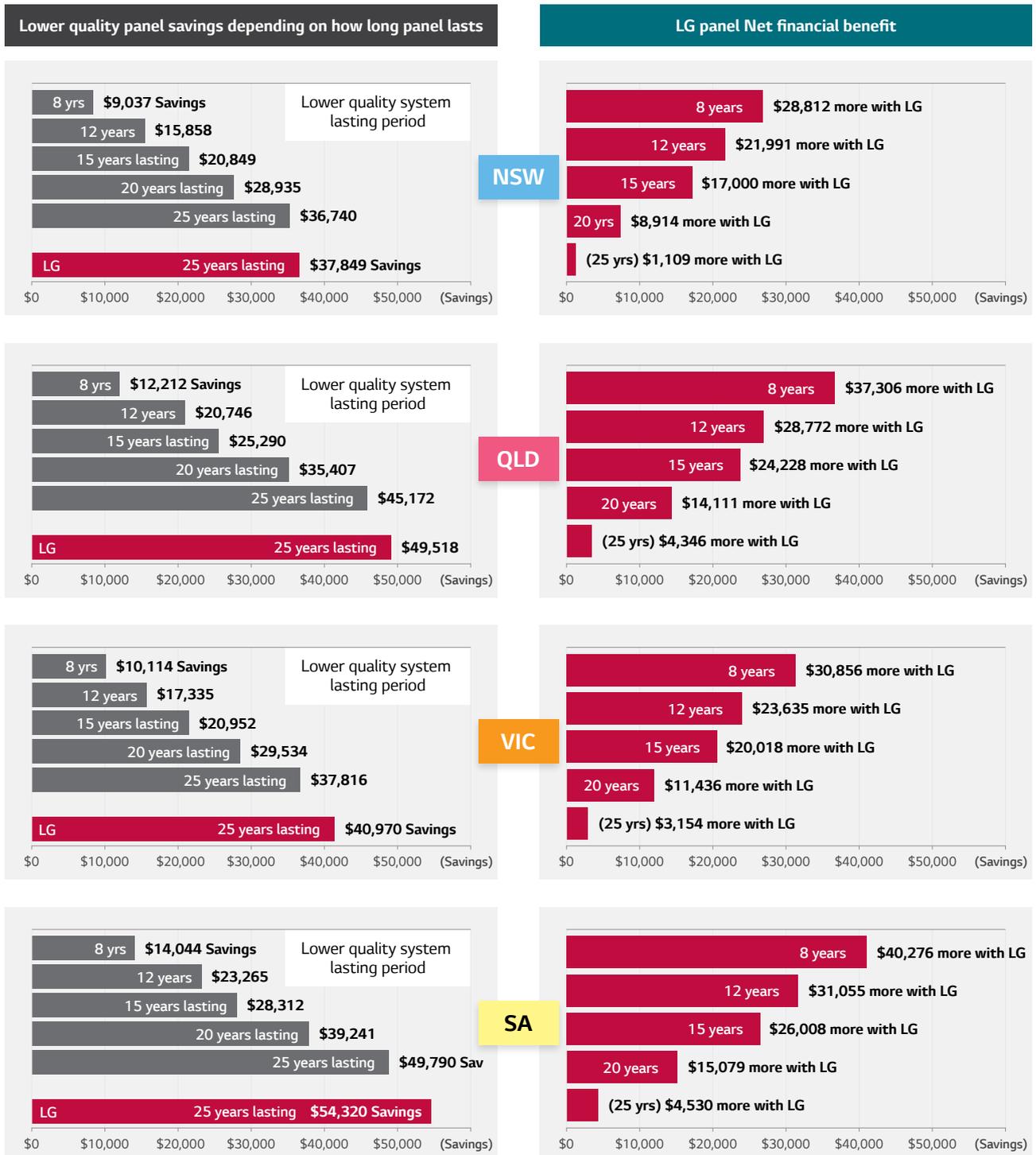
Higher income for the LG System against cheaper system sample: **\$21,991**

See lgenergy.com.au/solar-calculators/solar-income-roi-calculator for your own calculations

LG Panels Savings Advantages*

Using the sample from the left page a similar financial calculation was undertaken for some States. These financial return calculations are based on the assumptions as outlined on page 15.

They are based on a 6.6kW system - one with a cheaper, less long lasting panel and one for the high quality LG solar product with 25 year product replacement warranty. It shows using long lasting panels and inverter product may give you a great financial and environmental outcome.



* Estimated result for WA on back page

Reason 3

More Electricity For You

Not all solar panels are the same. LG has ensured that our NeON® range delivers some of the best performance on the market.

Proven field performance

LG and others such as the Australian consumer organisation Choice have been involved in a number of comparison tests of the LG modules against many other panels.

LG NeON® 2 and NeON® R panels are consistently one of the highest performing panels in these tests. This means you get excellent electricity generation in low light and all other weather conditions.

One of the reasons why the NeON® 2 panels perform so well is that they have a double sided cell structure.

This innovative approach allows the absorption of light from the front and the back of the cell, which raises the panel's performance, as there is additional electricity generation from light hitting the edge and back of the solar cell. This has also been recognised via the prestigious Intersolar Award in 2016.

Lower degradation than industry standard

Solar panels degrade over their lifetime and produce less electricity each year. The NeON® 2 and NeON® R have a very low annual degradation due to the use of N type treatment of the cells which uses Phosphorous as a replacement for Boron. Over the life of the LG panels your system will typically experience 10% less degradation than cheaper panels. This adds up to many dollars of additional electricity production over the years with LG NeON® panels.



The Choice consumer organisation has LG panels on their roof in Marrickville, NSW

Technological Innovation

The LG “CELLO” Multi wire busbar cell technology lowers electrical resistance and increases panel efficiency, giving more power per panel and providing a more uniform look to the panel. LG won the highly recognised Intersolar Award for this innovation as well.

Improved High Temperature Performance

Australia is getting hotter and a 40°C to 45°C day can see panel temperature as high as 90°C. Cheaper panels are only tested up to 85°C, while LG panel are tested up to 90°C.

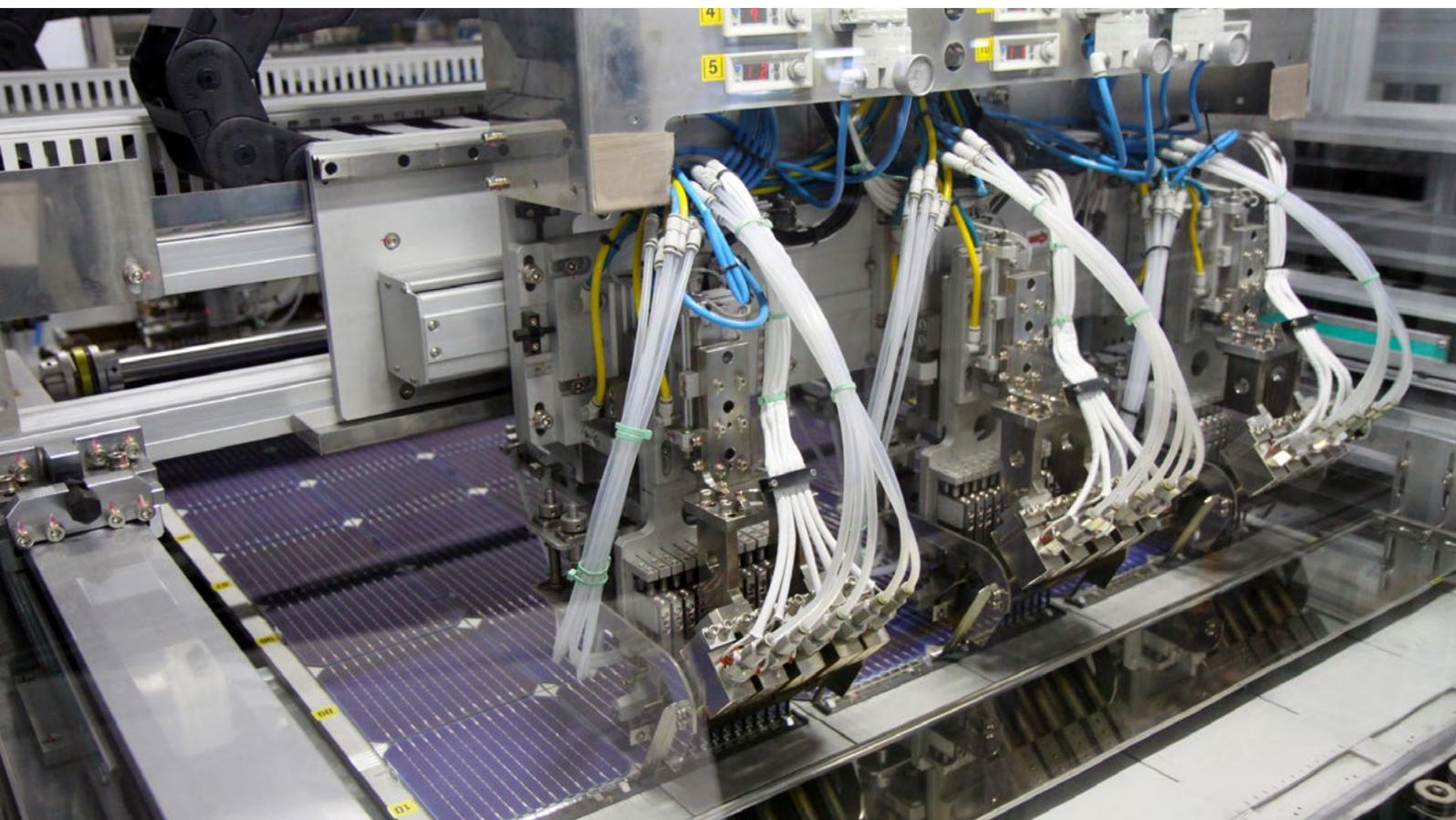
Solar panels slowly lose their ability to generate power as they get hotter, which means for cheaper panels a significant performance loss from a 25°C summer day to one where temperatures hit 40°C.

LG NeON® 2 and NeON® R have one of the best temperature performance characteristics, which means even in very high temperatures our panels will deliver higher output than many competing panels. So if you run an air conditioner on a very hot day, your LG panels will still perform well to help support your energy load and not let you down.

Excellent low light performance

Great performance under low light conditions with LG technology and our own cell manufacturing with low tolerances, ensuring highly consistent performing panels. At 200W/m² LG panel efficiency drop is -2% while many competitors' panels reduce by -4%. This means an LG system will start earlier and finish later than many other solar systems.

High level quality control at the LG solar panel factory in Gumi, South Korea



Reason 4

Long Term, Reliable Warranty Support for Australia & NZ

25 year product warranty, by the biggest consumer brand in solar*

LG offers one of the most meaningful panel warranties in solar. On offer is a 25 year parts and labour warranty which includes the cost of shipping panels for the NeON[®] 2 and NeON[®] R, as well as the labour cost of un-installing and re-installing the panel. This compares very favourably to the 10, 12, 15 or even 25 year manufacturer's warranty offered by manufacturers who do not have the LG exposure in the local market. There is no point feeling secure by a long warranty - if the company backing it will not be around.

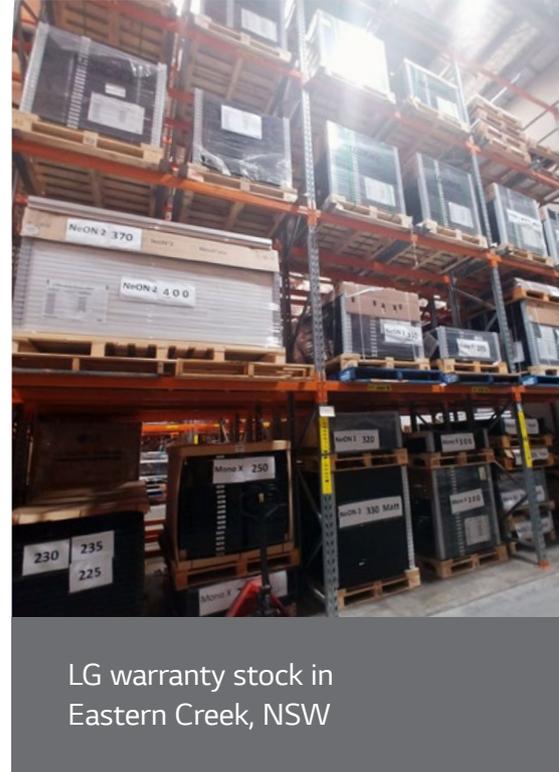
LG Solar Australia has also got a direct help line being: **1300 152179** - so you can reach the LG office easily, should you have any warranty claim. No other panel manufacturer in Australia is offering such a service as per January 2020. If in New Zealand please email solar.sales@lge.com.au.

LG has had so few panel warranty claims since 2010, that we still have compatible panels of every model sold since 2010 in our NSW warehouse, available for distribution throughout Australia and New Zealand, in the unlikely event of a product failure.

Warranty registration within Australia/NZ

LG solar offers a simple warranty registration process via LGenergy.com.au in Australia and LGenergy.co.nz in New Zealand. The process also generates a warranty certificate. In case you lose the paper work over the decades you can be reassured, as LG has a record of your purchase details in case of a warranty claim.

* In Australia and New Zealand



LG warranty stock in Eastern Creek, NSW



Australia-wide LG Panel Dealer Network

LG has partnered with 80 quality focused and reputable installation companies to install our solar panels Australia-wide. This means wherever you are in Australia an LG installer is only a phone call away. As at January 2020, LG is the only solar panel manufacturer in the market that has such an extensive installation network, selling the majority of panels via their partners.

Being a part of the LG Installer Network is special. It has taken LG Solar about 5 years to recruit across Australia what we believe are the best companies that install solar. What do our partners need to do?

- Excellence in customer service;
- Long term availability for system upgrades (eg batteries);
- Be available promptly if there are any warranty issues.

It's the service level that we really look at when we recruit. Also we want our partners not to just use great panels

but they need to use quality inverter solutions to create a very good long term solution.

The other big issue in Australia right now is that close to 750 installation companies have left the industry since 2011. That means those customers who have chosen these companies are without support. Even close to 400 panel manufactures have left Australia and again there is no support.

LG has been in Australia for over 20 years and internationally for over 60 years. We have close to \$1 billion business in Australia, we don't just have a virtual

office and can leave within 5 minutes, we are here to commit and give you good long term service.

If one of our partners decides to retire we will make sure that we find another LG installation company for that area. It means you are not without long term support. That's the difference with the LG partner network.



Choosing LG Solar means you will get ongoing long term product support. A peace of mind solution.

Reason 5

LG Panels Are Built To Last

Not all solar panels are built the same, and many struggle to achieve the LG build quality. In Australia & NZ some competitors' panels have failed in as little as 3 years. Reasons for failures and low output performance include hot spots, corrosion, water ingress, failed bypass diodes, poor sealants, delamination and micro cracks.

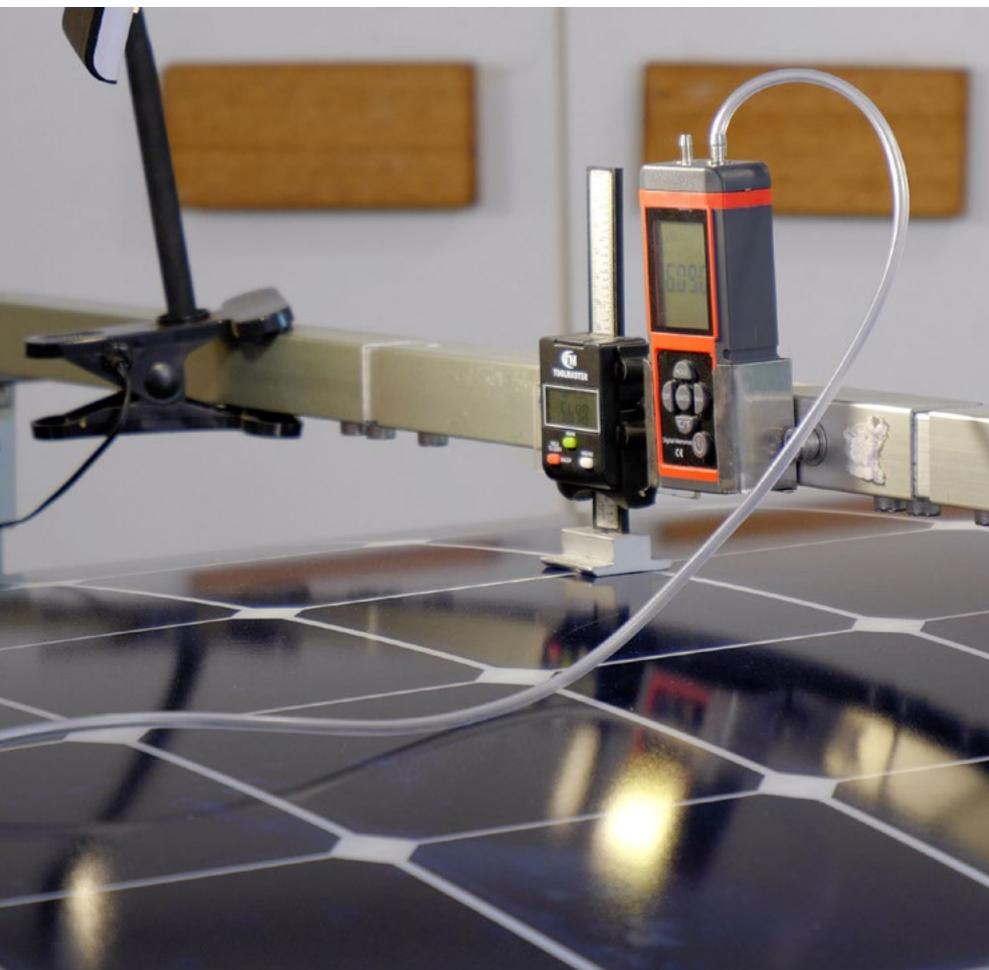
Extensive testing program

One of the LG strengths is our focus on testing. In order to be sold in Australia solar modules have to be tested and pass the IEC standard tests once. LG solar panels are regularly tested up to 3 times the IEC standards by LG in-house testing laboratories to ensure a robust module.

LG also invests a significant amount of money on research and development. In fact, 25% of the LG entire solar focused workforce is dedicated to discovering new technologies and improving our solar technology.

Cyclone wind load resistance

LG panels have a strong double walled frame. When it comes to wind forces (rear load) many competitor panels are certified to 2400 Pascals. LG panels are certified to 4000 Pascal, which can handle the wind load of a 290 km per hour wind. Independent windload tests were conducted in Darwin in 2018 and 2019 where LG panels resisted successfully windloads as high 350 km per hour. This testing demonstrates LG panels are designed very sturdy and are one of the strongest on the market.



LG Solar undertook separate independent wind load testing in Darwin in 2018 and 2019. The LG panels passed all local extreme wind load tests.

Made in South Korea

LG panels are manufactured in Gumi, South Korea in a fully automated state of the art factory. The wafers, cells and panels are manufactured in one seamless process production line, which emulates the air purity of a semi-conductor manufacturing environment. The result is a high quality and consistent solar product, with input materials specifically designed to last a long time.

Stronger Hail Test

While most panels are tested with 25 mm large hail stones being shot at the panel at

82.8km per hour. LG panels are tested with 35mm hail stones shot at 97.24km per hour, meaning LG panels are tested to withstand significantly tougher hail conditions.

In regards to insurance cover for hail it is advisable to let the home insurance know that you now have a solar system. In the past with most insurance companies, there has been no premium increase for this addition.

High quality components

The LG panels use top quality junction boxes which are

highly water resistant (IP68) and use premium Swiss MC4 panel connection plugs. This water resistance is higher than many competitor panels on the market.



LG panels are tested with larger hailstones (35mm) than standard panels (25mm). The stones in this image are approx 35 mm.

*Solar savings calculations assumptions					
The table below provides the background data to calculate the benefits information on page 9.					
	NSW	QLD	VIC	SA	WA
Average Bill per quarter	\$600	\$600	\$600	\$600	\$600
Calculation for Postcode	2000	4000	3000	500	6000
Assumed electricity supply charge	\$95	\$100	\$90	\$90	\$90
Average electricity purchase rate	\$0.27 c/kWh	\$0.29 c/kWh	\$0.32 c/kWh	\$0.36 c/kWh	\$0.28 c/kWh
Average Feed in Tarrif (FIT)	\$0.11 c/kWh	\$0.14 c/kWh	\$0.12 c/kWh	\$0.12 c/kWh	\$0.07 c/kWh
Solar used at home	60%	60%	60%	60%	60%
Solar exported	40%	40%	40%	40%	40%
System One - LG					
Cost of LG 6,6 kw system - string inverter	\$8,200	\$8,200	\$8,000	\$8,500	\$7,900
Degradation in 1st year	2%	2%	2%	2%	2%
Degradation after 1st year	0.33%	0.33%	0.33%	0.33%	0.33%
Life span of system	25 years				
Cost of Inverter replacement/ maintenance	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700
System Two - Lower Quality Panel					
Cost of System	\$5,200	\$5,600	\$5,000	\$5,200	\$4,600
Assumed lower output than system one per annum	7.50%	7.50%	7.50%	7.50%	7.50%
Degradation in 1st year	3.00%	3.00%	3.00%	3.00%	3.00%
Degradation after 1st year	0.70%	0.70%	0.70%	0.70%	0.70%
Life span of system (calculations for a range)	8 to 25 years				
Cost of Inverter replacement - year 12 onward	\$1,700	\$1,700	\$1,700	\$1,700	\$1,700

Reason 6

LG Shows Environmental Leadership

Lower energy payback time

Energy payback is the time it takes for a solar panel to generate the power it took to manufacture, ship and install the solar system. In January 2020, LG calculated the embodied energy in an LG NeON[®] R, 375W solar panel as being 297.65kg of CO² from resourcing of raw materials, to manufacture including transporting and installing the panel on the roof.

In Brisbane, Australia, the average energy payback of a 375W NeON[®] R for example is approx. 1 year 1 month as opposed to a standard 330W panel which is 1 year 4 month. Because LG panels are also built to last longer, this means each LG panel can create more clean energy during its working life, than panels designed for a shorter life span.

Therefore LG panels generate higher environmental benefits in regards to CO² abatement compared to less efficient, shorter lifespan and faster degradation panels which use a similar amount of raw materials in the manufacturing process.

LG panels part powering the LG Solar Factory

In 2015 LG installed a 3.2MW roof top solar farm (over 11,000 panels) on the roof of its solar factory in Gumi, South Korea to generate renewable energy for the manufacture of the LG panel range. Overall LG has installed over 18MW of solar across its manufacturing facilities in Korea.

LG has now also decided work towards making the full LG Electronics manufacturing operations for other appliances Carbon Neutral and is looking to cut its Carbon Emissions by over 1 million tonnes annually over the next decade.

No Ozone depleting gases in the panel manufacturing process

LG Electronics runs a Homogenous Substance Management system to ensure that no ozone depleting substances are used in the manufacturing of the LG solar panels, or any of the materials supplied to LG for manufacturing of the solar panels.



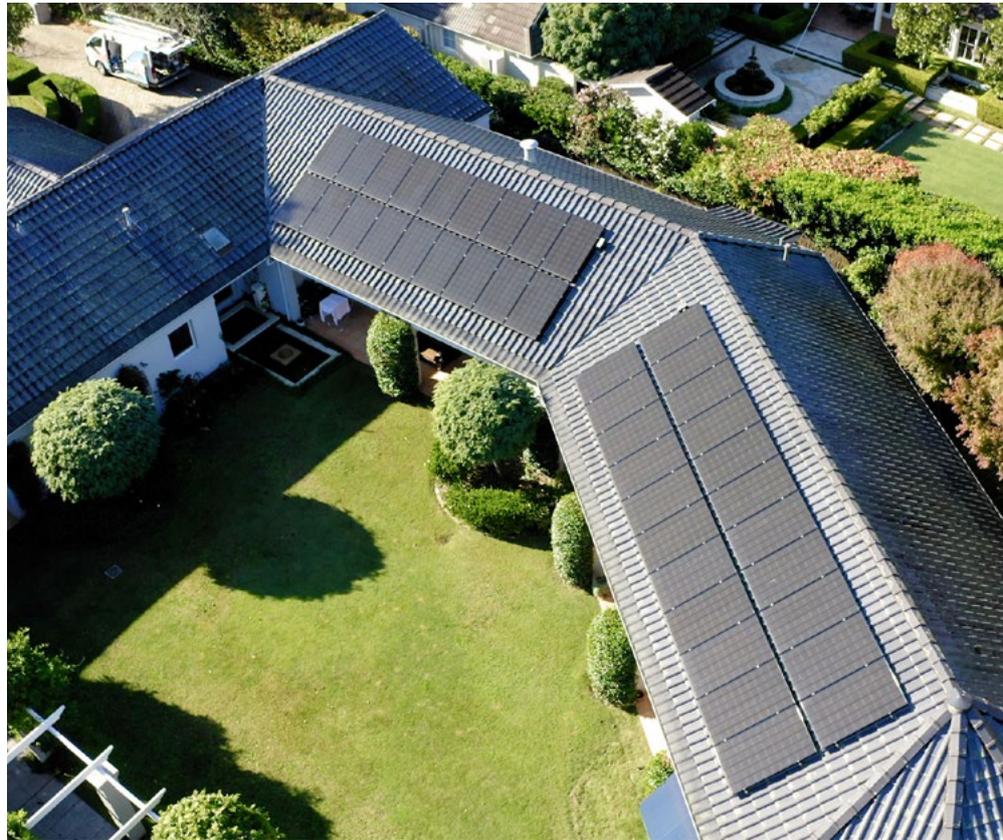
Over 11,000 LG panels help produce renewable energy used in the production of LG NeON[®] panels in Gumi, Korea.

Reason 7

Great Looking Brand Panels Can Help Enhance House Values

LG NeON[®] 2 and NeON[®] R panels have been designed with appearance in mind. Their black cells and black frames give an aesthetically pleasing uniform appearance. For very aesthetic conscious customers LG is also offering a stunning looking complete black version of their NeON[®] 2 range and a royal blue/black NeON[®] R Prime as well as the see through clear backing sheet - LG bifacial range.

By using these aesthetically pleasing solar panel products, your roof will look great, which may help preserve or increase the resale value for your home.



Multi Award Winning Panels

LG panels have won numerous awards over the years and they have been recognised as innovative and cutting edge by industry experts, giving you confidence in the quality and performance of the product. For example the NeON[®] panel range won the Intersolar Award for Photovoltaic Innovation in Germany, three times since 2013. The LG solar brand has won the "Top Brand" in Europe in since 2015 and in Australia each year since 2016.



Not All Solar Panels Are Built The Same

Given that a solar panel is exposed to wind and weather every hour of the day and has to endure many temperature variations, while producing electricity, the build quality of a solar panel is very important.

A solar system only achieves a positive return on investment after a number of years. With non-branded panels, there are variations in build quality, depending on the destination of the product and the originating factory.

LG panels all come from one factory in Gumi, South Korea and there are effectively no variations as to the build quality meaning our panels shipped to the Philippines are the same as the ones shipped to Germany, the US, NZ or Australia.

Choosing long lasting, high efficient LG solar panels and quality inverter solutions will help ensure you will have a long lasting trouble free system.

Longer lasting systems will in all likelihood provide a higher financial return than poor quality systems.

LG panels may initially cost more than some competitor panels. However over the life of the system, LG panels can create one of the best financial and environmental results for you and your family.



Electroluminescence (EL) image testing for micro cracks before factory shipout

Questions to Ask Before You Buy

Asking your solar installer a few essential questions may make a big difference to the service and benefits you receive. Make sure you get the answers in writing.

- 1 Get clarity as to what the responsibilities for each of the party are, including the installer and the customer?
- 2 Who is responsible for connecting your solar PV system to the electricity grid? Is it the installer or another subcontractor? When will it happen?
- 3 What is the estimated monthly and annual production in kWh of my system in its installation position
- 4 Who is responsible for your meter change? Make sure this is clarified. Quality installation companies with the chosen inverter solution? Also please check out the LG output calculator on [LGenergy](https://www.lgenergy.com.au/solarcalculators/solar-systemoutput-calculator) to get an estimate of kWh generation by your purchased system size in your postcode [LGenergy.com.au/solarcalculators/solar-systemoutput-calculator](https://www.lgenergy.com.au/solarcalculators/solar-systemoutput-calculator)
- 5 usually offer to accommodate the whole job. Ask how the installer will credit your solar rebate (STCs)?
- 6 Ask for a detailed hand over manual before you make a final payment.
- 7 Who will service and maintain my solar system? Get an address and contact details in writing, preferably of someone reasonably local.



Your LG Solar Team

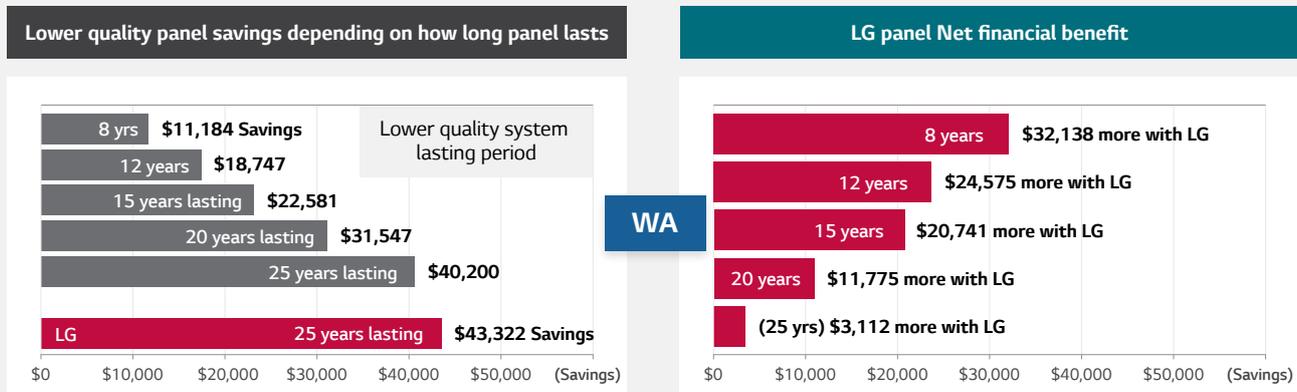
LG Solar has prepared 2 solar guides to give you even more solar info.

They can be downloaded via [LGenergy.com.au](https://www.lgenergy.com.au)



LG Panels Savings Advantages

(cont. from page 9)



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For further information or to find an Authorised LG Partner
please see: LGenergy.com.au or call **1300 152 179**



LG

Life's Good