

# 30 LG Panel Advantages

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# 30 LG PANEL ADVANTAGES AND THEIR BENEFITS FOR YOU

A solar panel harvests the sun and converts it into electricity and is together with the inverter the most important part of a solar system. A solar system only achieves a positive return on investment after a number of years. Contrary to some cheap panel sales spin, the fact is - Not all solar panels are built equal. Given that a solar panel is exposed to wind and weather and has to endure many temperature variations, while producing electricity, the built quality of a solar panel is very important.

With non branded cheaper panels, even within one manufacturer there are variations in built 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 no variations as to the built quality meaning our panels shipped to Vietnam or Indonesia are the same as the ones exported to Germany, Japan, the US or Australia.

Choosing long lasting, high efficient LG solar panels and quality inverter solutions will ensure you will have a long lasting trouble free system. Longer lasting systems will provide a higher financial return than cheaper, poor quality systems, which in Australia have failed by the thousands after only a few years in service. So while LG panels initially cost more than some non-brand competitor panels over the life of the system LG panels can create one of the best financial and environmental results for you.

## Great Visual Appearance

### ① Great looks for your roof

LG Mono X Plus and NeON<sup>®</sup> 2 panels have been designed with appearance in mind. Their black cells and glossy black frames give an aesthetically pleasing uniform appearance. Standard competitor poly panels have blue cells and plain aluminium frames. For very aesthetic conscious customers LG is also offering a stunning looking complete black version of their NeON<sup>®</sup> range.

**YOUR BENEFIT:** Ensuring you have panels that are high quality, attractive panels and make your roof look great and may preserve or increase the resale value for your home.



LG 330W NeON<sup>®</sup> 2



LG 315W NeON<sup>®</sup> 2 Black

Why LG panels lead the pack



## Higher Performance through winning technology

### ② Proven field performance

LG and other companies, including the Australian consumer organisation Choice have been involved in a number of comparison tests of the LG modules against many other brand panels. LG Mono X<sup>®</sup> and NeON<sup>®</sup> 2 panels are consistently one of the highest performing panels in these tests. In the Choice test conducted between October 2015 and January 2017 the LG NeON<sup>®</sup> 300W won against 15 competitors as the highest output per watt panel.

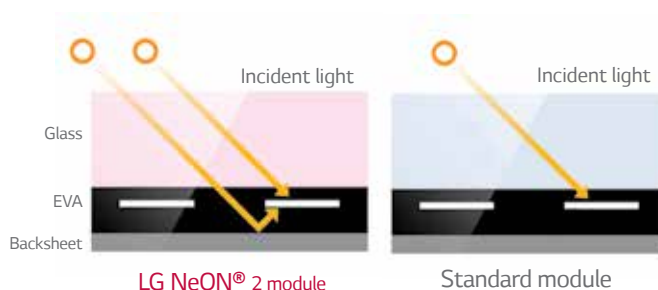
**YOUR BENEFIT:** Improved performance in all weather conditions.



### ③ Double sided cell structure for NeON<sup>®</sup>2 panels

The LG NeON<sup>®</sup>2 panel produces energy from both the front and the back of the cell. This innovative approach allows the absorption of light from the front and the back of the panel, which raises the panel's performance. The LG NeON<sup>®</sup> panel is the only panel in Australia offering this feature. In 2013 LG won the Intersolar Award in Germany for this innovation. Other NeON<sup>®</sup> panel innovations also won further Intersolar Awards in 2015 and 2016.

**YOUR BENEFIT:** Additional electricity generation from light hitting the edge and back of the solar cell



### ④ Maximising roof space for future expansions (More power per square Metre)

LG Mono<sup>®</sup> X Plus and NeON<sup>®</sup> 2 panels are rated at 300W and 330W per panel, whereas many conventional panels achieve only a 260W rating. This equates to 15% more power from LG Mono<sup>®</sup> X plus and 26% more for the NeON<sup>®</sup> 2 panel than many 260W panels that are the same physical size.

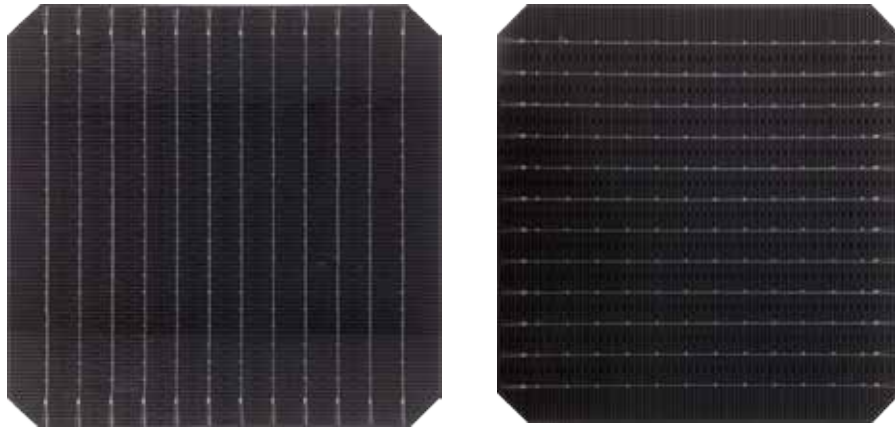
**YOUR BENEFIT:** You use less roof space for a given system capacity and/or have room for future system expansions for batteries and even electric car charging in years to come.

## Higher Performance through winning technology

### 5 12 wire busbars ("CELLO" Technology Increases Power) with NeON<sup>®</sup> 2

LG's "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. In 2015 LG won the Intersolar Award in Germany for this innovation.

**YOUR BENEFIT:** Higher electricity output than conventional panels in all weather conditions and latest technology ensures your panel stays relevant in future years.

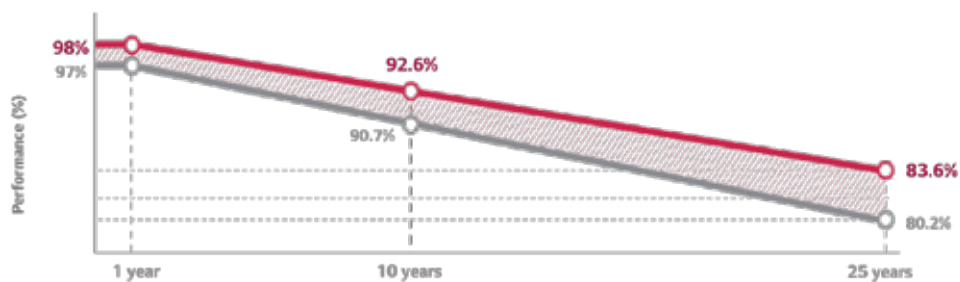


Front and rear of NeON<sup>®</sup> 2 cell

### 6 Lower degradation than industry standard

Solar panels degrade over their lifetime and produce less electricity each year. LG has reduced the al degradation of our Mono X plus panels by applying our new LiLy (LID- Improvement for lifetime yield) Technology, which controls the reaction of Boron and Oxygen, a key factor in light induced degradation (LID). The NeON<sup>®</sup>2 also has a very low LID, due to the use of N type treatment of the cells which uses phosphorous as a replacement for Boron.

**YOUR BENEFIT:** Less degradation of electricity production than conventional panels as the panel ages.



### 7 Anti-reflective coating increases output

LG is using an anti-reflective coating technology on the glass and on the cells of our panels to ensure more light is absorbed in the panel and not reflected.

**YOUR BENEFIT:** More absorbed light means more electricity generation.

### 8 Improved High Temperature Performance

Solar panels slowly lose ability to generate power as they get hotter. On a very hot summer day panels can be as hot as 70 degrees which means for many panels a performance loss of over 20% over a panel that is only 25 degrees hot, on a milder day. LG Mono X plus and NeON<sup>®</sup>2 have one of the best temperature performance characteristics, which means even in very high temperatures our panels will deliver higher output than standard panels.

**YOUR BENEFIT:** Better performance on hot days than most conventional panels means more power generates to use to run air-conditioning, pool pumps and fans for example.

## Higher Performance through winning technology

### 9 Excellent low light performance

Great performance under low light conditions due to LG technology and our own cell manufacturing with low tolerances, ensuring highly consistent performing panels. At 200W/m<sup>2</sup> LG panel efficiency drop is -2% while many conventional panels reduce by -4%.

**YOUR BENEFIT:** Better performance on low light days including cloudy or early morning/late afternoon, the time when performance really counts.

### 10 Multi Award Winner

LG panels have won numerous awards over the past year. For example the NeON<sup>®</sup> panel range has won the Intersolar Award for Photovoltaic Innovation in Germany, three times since 2013. The LG solar brand has won the "Top Brand" in Australia Award in 2017 and 2016 and the Top Brand for many countries in Europe in 2017, 2016 and in 2015.

**YOUR BENEFIT:** Panels have been recognised as innovative and cutting edge by industry experts giving you confidence in the quality and performance of the product.

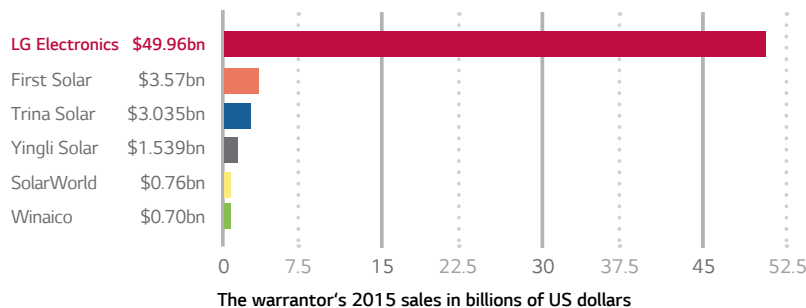


## Peace of mind warranties

### 11 Diversified manufacturer– stable and strong warranty

In mid 2016 there were over 220 panel manufacturers with panels registered for sale with the Clean Energy Council in Australia. It is likely that in future there may be a significant consolidation of solar manufacturers taking place with potentially only a fraction of these manufacturers operating in Australia long term. LG with its diversified manufacturing, strong bankability, diversified product portfolio and its multi-billion dollar size has a better opportunity than many others to be a leader in solar in decades to come.

**YOUR BENEFIT:** A peace of mind, strong warranty.



### 12 Twelve (12) year parts and labour manufacturer's warranty

LG offers a 12 year parts and labour warranty which includes the cost of shipping panels as well as the labour cost of un-installing and re-installing the panel, compared to the 10 year manufacturer's warranty offered most other manufacturers, which is the current industry standard.

**YOUR BENEFIT:** You get a longer warranty than many other panels on the market (12 yrs v 10 yrs).

Also as the majority of conventional panels do not cover labour and/or transport for replacement panels.

LG has also developed a detailed customer friendly warranty brochure to help you, should there ever be a claim.



LG invests heavily into solar research.

### 13 Warranty registration with LG Australia/NZ

LG offers a simple warranty registration process via [lgenergy.com.au](http://lgenergy.com.au) in Australia and New Zealand.

**YOUR BENEFIT:** LG has a record of your purchase details in case of a warranty claim.

### 14 Tier 1 Ranking by Bloomberg New Energy Finance

LG panels have been recognised by Bloomberg New Energy Finance as a Tier 1 Solar Manufacturer. The Bloomberg Tier 1 ranking is widely recognised within the industry as a measure for bankability of the manufacturer. It does not reflect built quality or longevity of the panels. Other manufacturers sometimes use the Tier 1 label as a sign of built quality or financial stability of the manufacturer – which IT IS NOT.

**YOUR BENEFIT:** Being a Tier 1 panel along, does not guarantee a long lasting panel. It is the combination of many manufacturing aspects as demonstrated in these pages, that bears witness to LGs excellent solar panel quality.

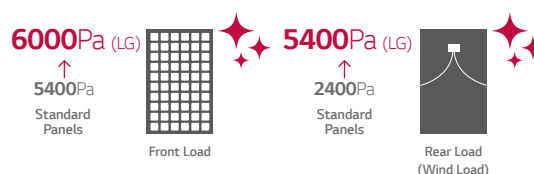
## Quality built and testing for better reliability

Not all solar panels are built the same, and many struggle to achieve the LG build quality. In Australia & NZ some cheaper modules have failed in as little as 2-3 years. Reasons for failures and low output performance include hot spots, corrosion, water ingress, failed bypass diodes, poor sealants, delaminations and micro cracks.

### 15 Cyclone wind load resistance

LG modules have a strong double walled frame. When it comes to wind forces (rear load) many competitor modules are certified to 2400 Pascals. LG modules are certified to more than double, 5400 Pascals, making them very sturdy and one of the strongest on the market.

**YOUR BENEFIT:** Less likely issues with panel failure in extreme wind conditions and wind load exposure over many years.



### 16 Extensive testing program - up to 4 times international standard

One of LG's specialties is their 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 4 times the IEC standards by LG in-house testing laboratories. LG also chooses to spend a significant amount of money on research and development. In fact, 25% of their entire solar focussed workforce is dedicated to discovering new technologies and improving their solar technology.

**YOUR BENEFIT:** Confidence in the product and ensuring a very robust and longer lasting solar module.

### 17 Lightweight but strong

Even though LG panels having high wind stability, our 60 cell panels at 18kg are lighter than most of the competition panels.

**YOUR BENEFIT:** Less weight and stress on your roof structure, especially for larger systems.

### 18 High quality components

Our LG panels use quality junction boxes which are completely water proof (IP67) and use the original Swiss MC4 panel connection plugs, not copies, like some lower priced competitors do.

**YOUR BENEFIT:** Confidence in the product and ensuring a very robust and longer lasting solar module.



### 19 Fully Automated production line

LG panels are manufactured in Gumi, South Korea in a fully automated factory. The wafers, cells and panels are manufactured in one seamless process production line, which emulates the air purity of semi conductor manufacturing environment.

**YOUR BENEFIT:** A consistent and high quality solar product.

### 20 Premium quality control on input materials and production

LG controls its supply chain very thoroughly to ensure a consistent and high quality solar module. During the fully automated standardised manufacturing process very low variation tolerances are allowed during the 500 quality control processes.

**YOUR BENEFIT:** A consistent and high quality solar product.

### 21 Anti PID technology for yield security

PID (Potential Induced Degradation) has been a more recent discovery that can affect the long term performance of the panel. LG panels are manufactured with anti PID technology and have been extensively tested by leading third party testing laboratories regarding PID and passed these tests.

**YOUR BENEFIT:** This means LG panels are more likely to give decades of clean power.

### 22 Positive tolerance (0/+3%)

If we sell you a 330 Watt rated solar panel then the flash test of this panel will show at least 330W and can be up to 339.6W. Some competitor panels have +/- tolerance, so you could get a flash test result below the rated Watt, (e.g. a 250W panel may really only be 243W) meaning you pay for Watts you never get.

**YOUR BENEFIT:** Every Watt you pay for is delivered with LG solar, plus a little more.

### 23 Passed fire test

All LG modules have passed fire safety tests and contain flame retardant materials, meaning should any electrical malfunction occur the panel will not combust and catch fire, as required by Australian registration regulation.

**YOUR BENEFIT:** Safety for your home.

### 24 High compatibility with all quality inverter and racking solutions

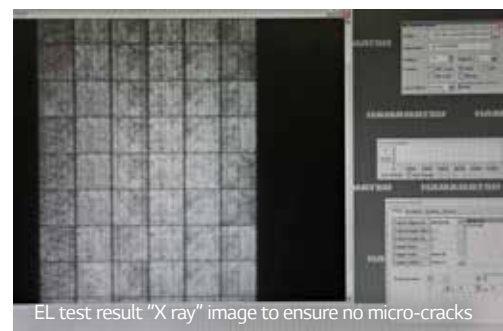
LG modules are designed for residential, commercial and utility scale systems. The panels will work with all inverter and micro inverter solutions on the Australian and NZ market. The panels can be mounted for roof top or ground mount in vertical (landscape) and horizontal (portrait) installation position.

**YOUR BENEFIT:** Maximum system design flexibility, allowing a bigger system to be installed in some roof situation, due to landscape install option.

### 25 Micro crack testing

Two EL "flash" tests are performed on the LG module during production to ensure no cells with microscopic cracks are used. One test is conducted before lamination and one after lamination. An image of each micro crack free panel with serial number is stored in LG's database in case of any future warranty claim.

**YOUR BENEFIT:** A well built module without microcracks leaving the factory.



### 26 LG Testing Laboratory Certification

LG has had its internal testing facilities certified by 4 major international testing laboratories (VDE, UL, TUV Rheinland and Intertek) and to ensure the ongoing accuracy reliability of the internal testing processes. This is a first within the solar industry.

**YOUR BENEFIT:** Shows LG commitment to producing panels of uncompromising quality.

## Environmental leadership

### 27 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. LG has calculated the embodied energy in an LG solar panel as 297.65kg of CO<sub>2</sub> from resourcing of raw materials, to manufacture, and including transporting and installing product. In Brisbane, Australia, the average energy payback of a 330w NeON<sup>®</sup> 2 for example is under 1 year, 5 months as opposed to a standard 260w panel which is close to 2 years. Because LG panels are also built to last long, this means each LG panel can create more clean energy during their working life.

**YOUR BENEFIT:** Higher environmental benefits via LG panels in regards to CO<sub>2</sub> abatement compared to less efficient panels which use the same amount of raw materials.

### 28 Recognised Sustainable Leadership

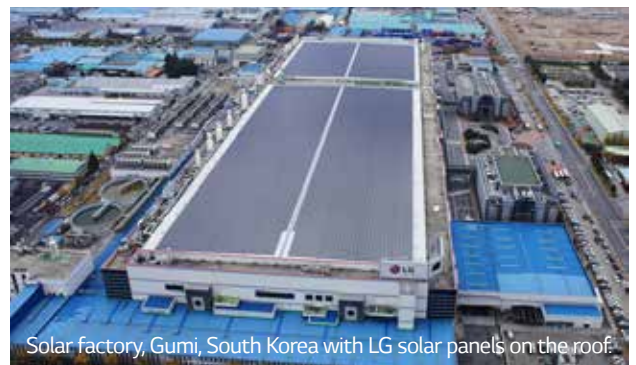
LG was awarded 44th of the 100 most sustainable corporations in the world by Corporate Knights for 2016, up 7 spots from 2015. Corporate Knights uses a comprehensive measurement system to gauge the Sustainability of a company based on both environmental and societal outcomes. LG are also rated in the top 10 of the Silicon Valley Toxic coalition scorecard for Sustainability and Social Justice.

### 29 No Ozone depleting gases in manufacturing process

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

### 30 LG panels part powering the Solar Factory

LG has installed a 3.2MW of solar power (over 11,000 panels) on the roof of our solar factory in Gumi, South Korea to generate some of the electricity to manufacture the panels. Since 2014 LG has installed over 18MW of Solar panels across its manufacturing facilities across Korea including electrical appliance and battery factories.



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