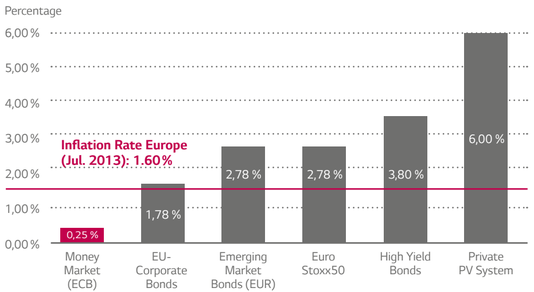

LG MonoX™ NeON
FOR YOUR SUCCESS.
LG
Life's Good

## 1. THE SMART SYSTEM: PHOTOVOLTAICS FROM LG

A PV installation allows you to create value and optimise your asset structures. The current inflation rate in Europe is approximately 1.60 %. Any financial investment with a net return of less than 1.60 % therefore represents a loss on capital. Efficient PV installations with quality modules, on the other hand, could generate returns of more than 1.60 %.

**PV installations therefore represent a good opportunity to invest for the future**




Sources: YPOS-Consulting GmbH; Reuters Eikon

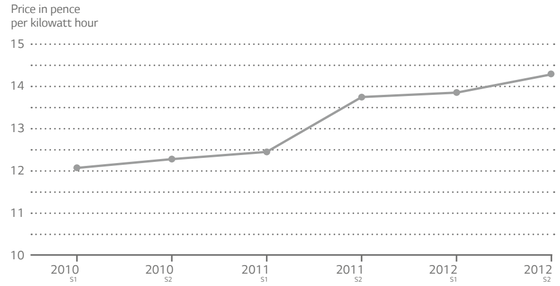
Inflation = CPI Europe; Government Bond UK: 20 years residual term; Government Bond Italy: 20 years duration; Governmanet Bond Denmark: 10 years duration; emerging markets bonds: FTSE EURO EMERGING MARKETS ALL MATS YIELD Index; High yield Bonds MARKIT/IBOXX EURO LIQUID HIGH YIELD INDEX; EuroStoxx50: Dividend yield. PV Returns provided by LG ElectronicsDate: 15.01.2013.
**Note: The quoted yields are indicative and do not guarantee future results. Any form of investment may lead to a total loss.**

## 2. THIS IS HOW YOU CAN REDUCE YOUR ELECTRICITY BILL

PROFITABLE INVESTMENT

- The possibility of further electricity price increases in the coming years cannot be ruled out.
- Become independent and take control of your energy budget.
- With LG MonoX™ NeON modules, you will generate valuable energy every day and save money.
- Enjoy double benefits and use all the electricity produced for your home.

**Electricity price development (2010 – 2012)**




Sources: http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database



WHY PHOTOVOLTAICS AND WHY NOW?

## 3. FOR ENVIRONMENT – AND THE WALLET

$CO_2$ emissions and their impact on the climate are putting increasing pressure on our environment. A photovoltaic installation with LG solar modules makes it possible to generate electricity for at least 20 years – without $CO_2$, without noise, and without feeling guilty. For example, a 4.2 kWp PV installation can **reduce $CO_2$ emissions by up to 31 tonnes.**

**31-tonne reduction in $CO_2$ emissions (over 20 years)**

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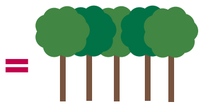


**That's about the same amount of $CO_2$ absorbed by 57 trees in 20 years.**

**31 tonnes of $CO_2$**

=

31 tonnes of $CO_2$ is emitted by driving a typical small car up to **7 times round the world.***

**That's a distance of approx. 276.810 km.**

* Sources:
http://www.adac.de/_ext/itr/tests/Autotest/AT4290_VW_Polo_16_TDI_BlueMotion_Technology_Trendline_DPF/VW_Polo_16_TDI_BlueMotion_Technology_Trendline_DPF.pdf
Assumption: The average $CO_2$ emission of a VW Polo 1.6 TDI is 112 g per kilometre. The distance involved in a theoretical round-the-world trip at the equator is 40,075 km. The theoretical $CO_2$ emissions per round-the-world trip with a VW Polo 1.6 TDI therefore come to approx. 4,488,400 g. Based on our example calculation above, the 31-tonne reduction in $CO_2$ emissions over 20 years would therefore be the equivalent of approx. 6.9 round-the-world trips.

## THE BOTTOM LINE

**RETURNS**

A PV installation represents a good investment of your customers' money as the **returns** are still **above the rate of inflation and other capital investments.**

**20 YEARS OF REDUCED COSTS**

Your customers can **lower their electricity costs for at least 20 years** by producing their own electricity, which they can either use themselves or feed into the electricity grid.

**LESS $CO_2$**

LG MonoX™ NeON is an **important contribution to environmental protection** as solar installations produce almost no $CO_2$, in sharp contrast to the usual methods of electricity generation.

**FREEDOM**

Show your customers the many advantages of LG MonoX™ NeON and explain to them how they can **become less dependent on their electricity provider.**

# LG PAYS OFF FOR EVERYONE

## WHAT MANY **INSTALLERS** ARE ASKING:

**Why should end customers choose LG solar modules?**
- **Awareness of and trust in the brand:** End customers trust LG which will help you during your sales meetings with end customers
- **Differentiation:** With high-quality LG Solar modules, you are positioning yourself as a premium supplier
- **Safety:** LG works to the highest quality standards (e.g. double IEC tests) and carries out precise checks of each module

**What are the particularly outstanding features of LG modules?**
- **High performance:** LG Solar produces high-p erformance modules with 60 cells, available from 260 to 300 Wp – and guaranteed to sell. Only 14 modules are needed in order to get very close to 4 kWp
- **High quality and load-bearing capacity:** LG modules can withstand pressure loads of 5.400 Pa
- **1st class guarantees backed from the parent company:** 10-year product guarantee and 25-year linear performance guarantee
- **Attractive appearance:** LG modules are attractive because they are unobtrusive

**What does MonoX™ NeON stand for? What advantages do the MonoX™ NeON modules offer me?**

MonoX™ NeON is an LG development with significant technical improvements:
- Use of n-type wafers (instead of p-type wafers) and bifacial cells
- Multi-layer anti-reflective coating as well as use of innovative nanotechnology

**What are the advantages for you?**
- Lower BOS and installation costs and therefore the possibility of higher margins
- Higher energy yields (more kWh/kWp) through better conversion of sunlight into electricity

**How can I obtain LG modules and/or get answers to other questions?**

In our partner network at www.lg-solar.com or by sending an e-mail to solar@lge.de

## WHAT MANY **END CUSTOMERS** ARE ASKING:

**What are the main points to consider when choosing a solar installation?**
- **Thorough selection:** The solar installation you choose will stay on your rooftop for 25 years and in many cases is a one-time acquisition
- **Reputation and quality of module manufacturer:** Many solar companies are experiencing financial problems and might have difficulties honouring guarantees after exiting the PV industry. In addition, some of them use low-quality materials. LG has a rigorous quality system deriving from the high-tech areas (TVs, smartphones, home appliances)
- **Reputation of installer:** In the end, a solar installation will only work well if the individual components (e.g. modules, inverters) as well as the installation are very good; **LG therefore only works with qualified specialist installers and will be happy to show you its references**

**What makes LG solar modules special?**
- **High performance:** LG Solar produces high-performance modules with 60 cells, available from 260 to 300 Wp
- **Quality and load-bearing capacity:** LG modules can withstand pressure loads of up to 5.400 Pa
- **Attractive appearance:** Black frame and black cells blend unobtrusively into your rooftop
- **1st class guarantees from the parent company:** 10-year product guarantee and 25-year linear performance guarantee

**What is MonoX™ NeON? What advantages do the MonoX™ NeON modules offer me?**

MonoX™ NeON is an LG development for increased output and yield:
- Use of n-type wafers (instead of p-type wafers) and bifacial cells
- Mult-layer anti-reflective coating as well as innovative nanotechnology

**What are the advantages for you?**
- Higher module output per square metre for higher energy yields (more kWh/kWp)
- More electricity generated than with conventional solar modules
- Reduced electricity costs, most likely for minimum 25 years

**For further information, visit www.lg-solar.com**



# LG MonoX™ NeON CASE STUDY

## THE RIGHT CHOICE PAYS OFF

**Simply more economical:**

In the UK roof space is often limited. MonoX™ NeON 285 Wp modules allow to achieve the optimum 4 kWp solar system size with only 14 modules.

**The big difference: LG MonoX™ NeON installation compared with no PV installation.**

| | NO PV INSTALLATION ON ROOFTOP | PV INSTALLATION WITH LG MonoX™ NeON 285 WP MODULES | ADVANTAGE OF LG MonoX™ NeON VS. NO PV INSTALLATION |
|---|---|---|---|
| **Electricity demand of 4-person household over 20 years** | 76.000 kWh | 76.000 kWh | |
| Installed PV power | 0 Wp | 3.990 Wp | 3.990 Wp |
| Produced PV power over 20 years | 0 kWh | 67.830 kWh | 67.830 kWh |
| Reduced electricity costs | £ 0 | £ 4.341 | £ 4.341 |
| Income from feed-in-tariff (FIT) over 20 years | £ 0 | £ 10.107 | £ 10.107 |
| Export Tariff (60 %) | £ 0 | £ 1.888 | £ 1.888 |
| **Possible electricity savings and FIT payments over approx. 20 years** | £ 0 | **£ 16.336** | **£ 16.336** |
| $CO_2$ emissions avoided over 20 years | £ 0 | 31 t | 31 t |

**The key difference: LG MonoX™ NeON installation compared with a PV installation with conventional modules.**

| | PV INSTALLATION WITH STANDARD 250 WP MODULES | PV INSTALLATION WITH LG MonoX™ NeON 285 WP MODULES | ADVANTAGE OF LG MonoX™ NeON VS. CONVENTIONAL MODULES |
|---|---|---|---|
| **Electricity demand of 4-person household over 20 years** | 76.000 kWh | 76.000 kWh | |
| Installed PV power | 3.500 Wp | 3.990 Wp | 490 Wp |
| Produced PV power over 20 years | 59.500 kWh | 67.830 kWh | 8.330 kWh |
| Reduced electricity costs | £ 3.808 | £ 4.341 | £ 533 |
| Income from feed-in-tariff (FIT) over 20 years | £ 8.866 | £ 10.107 | £ 1.241 |
| Export Tariff (60 %) | £ 1.656 | £ 1.888 | £ 232 |
| **Possible electricity savings and FIT payments over approx. 20 years** | **£ 14.330** | **£ 16.336** | **£ 2.006** |
| $CO_2$ emissions avoided over 20 years | 27,2 t | 31 t | 3,8 t |

* Assumptions:
Simplified simulation for 24 $m^2$ of available roof area (14 modules), 40 % household consumption. Export Tariff = £ 0,0464/kWh Average electricity procurement costs over 20 years = £ 0,16/kWh, 100 % feed-in. Feed-in tariff over 20 years = £ 0,149/kWh, electricity requirement for 4-person household = 3.800 kWh p.a., average specific PV yield = 850 kWh/kWp, both for LG MonoX™ NeON and standard 250 Wp modules. An additional yield can be expected from LG MonoX™ NeON. Without interest and taxes. $CO_2$ emissions avoided = 0.457 kg per kWh.
Source: INTERNATIONAL ENERGY AGENCY, http://www.iea.org/co2highlights

## TECHNOLOGICAL INNOVATIONS LEAD TO HIGHER OUTPUT AND YIELD – FOR AT LEAST 25 YEARS.

1 **Advantage 1**
N-type wafers and nanotechnology ➤ **higher output**

2 **Advantage 2**
Bifacial cell (active on both sides) ➤ **higher yield**

3 **Advantage 3**
Triple anti-reflective coating ➤ **higher yield**

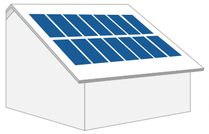
MonoX™ NeON



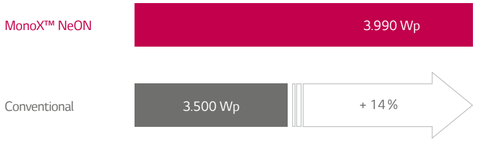

WHY LG MonoX™ NeON?

## 14 % MORE OUTPUT

**Simply more:**
By using n-type wafers, 14 % more output per m² can be achieved than with conventional modules.



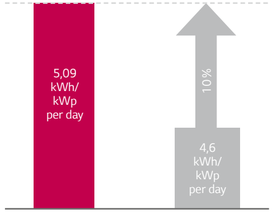
**Installation with 14 modules**




## UP TO 10 % MORE YIELD

**Simply better:**
Higher yields through

1 n-type wafers
2 bifacial cells
3 multiple AR coating

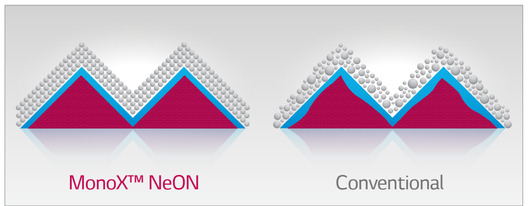



Source: LG measurements

## HIGHER OUTPUT – THANKS TO N-TYPE WAFERS

**Cells that are more effective**

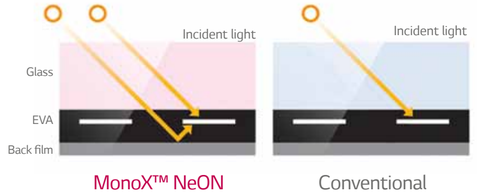
MonoX™ NeON technology involves the use of processes that LG has carried over from its experience with semiconductor technology and applied to photovoltaics. This has led to an optimisation of cell surface homogeneity, helping to increase cell efficiency to over 21 %.




## HIGHER YIELD – THANKS TO BIFACIAL CELLS

**Maximising light absorption**

Solar cells with MonoX™ NeON technology can utilise the incident light from the cell front and back. This particularly applies to the smaller angles of incidence associated with morning and afternoon sunlight. This makes solar cells with MonoX™ NeON technology more efficient than conventional solar cells.



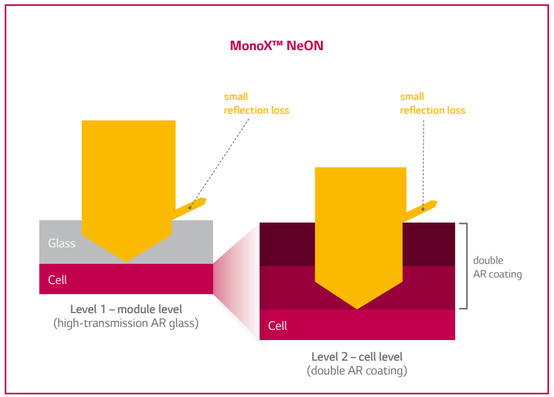


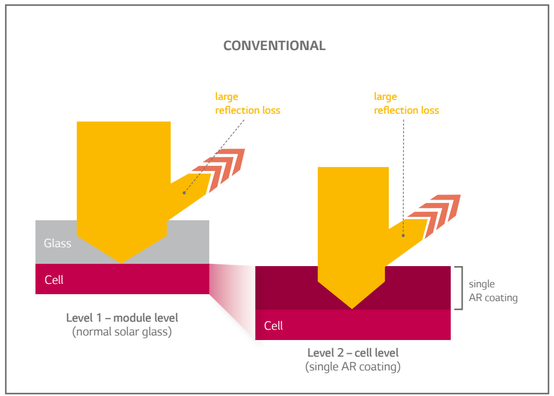

WHY LG MonoX™ NeON?

## MULTIPLE COATINGS FOR MORE YIELD

**Light absorption effect**

The solar cell's reflective behaviour is significantly improved by high-transmission AR glass as well as a double passivation layer. Electron recombination in the cell is reduced and low-light performance improved. With LG MonoX™ NeON, there is up to 5 % less reflection loss than with conventional solar modules.



# WHY SOLAR MODULES FROM LG?

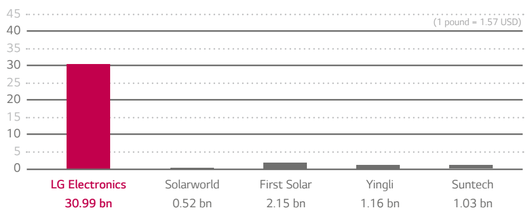
## GUARANTEES YOU CAN COUNT ON

**GOOD TO KNOW:**
When companies file for insolvency, this can put guarantees provided at an earlier time at risk. As a global company with a strong financial background, LG can provide reliable and sound long-term guarantees.

**WHAT MAKES LG SPECIAL:**
- Annual consolidated sales of approx. 84 billion pounds within LG group
- Annual sales of approx. 31 billion pounds in LG Electronics (guarantee provider for LG solar modules)
- Global market leader in TVs, smartphones, home appliances, LED lighting, air conditioning systems and heat pumps

**HOW YOU BENEFIT:**
- The high degree of certainty that LG will honour its guarantees
- The very high probability that LG will still exist in 25 years' time
- The good feeling that your installation is a sound investment for the future

**The warrantor's 2012 sales in billions of pounds**



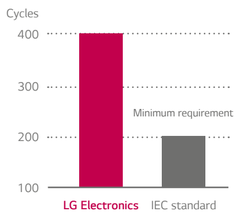

## LG STANDS FOR TOP QUALITY

**GOOD TO KNOW:**
- Quality and reliability are the be-all and end-all when it comes to a solar installation
- Thorough planning and selection of the modules is crucial for the future

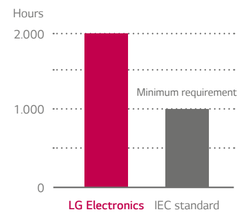
**WHAT MAKES LG SPECIAL:**
- Test winner in Fraunhofer PID Test 2012
- LG test laboratory is TÜV- and UL-certified
- Participation in all relevant quality tests (PID, EL, ammonia, 5.400 Pa etc.)
- Doubly intensive load tests, as prescribed by IEC standards

**HOW YOU BENEFIT:**
- Advanced module technology
- Quality test before delivery of modules
- Guarantee that all modules were produced by LG (no OEM modules)
- No risks with regard to PID, hot spots etc.

**Temperature change test**




**Damp heat test**






# REFERENCE EXAMPLES

## EXPERIENCES THAT SPEAK FOR THEMSELVES – AND FOR LG

*"LG Solar's new offering, the MonoX™ NeON is the best panel to date, boasting several major enhancements over its predecessor, the MonoX™. The increased output and efficiency – along with the sturdiness, reduced weight and easy handling – means that residential users and businesses will get more from their investment over a longer term. LG Solar's commitment to research and development is evident and we are happy to extend our portfolio with more high-quality solar products. All of this helps users gain more independence from energy price fluctuations. We are pleased that our customers now have an even wider range of solar products to choose from, and we look forward to making the LG Solar brand more successful in the UK."*
***Richard Waxman | Chairman Waxman Group***

*"With LG Solar we always have a story to tell: New innovative technologies, trustworthy warranties and high quality in order to achieve long term incomes. This is much more convincing than always talking about the price."*

*"LG Electronics is the best kept secret in Solar."*
***Ian Draisey | Managing Director DulasMHH Ltd.***

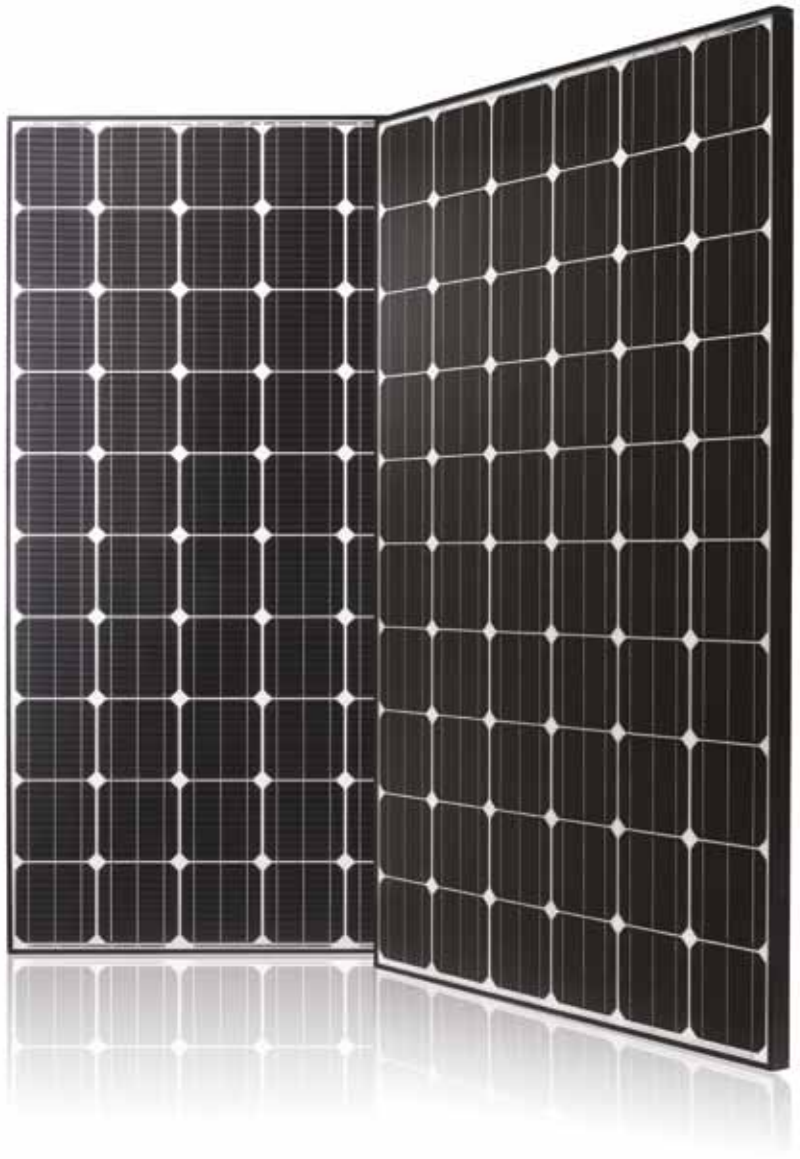
*"As a national installer of solar panels within the UK it is important to Solarlec PV Solutions Ltd that the equipment used is of the highest standards in terms of efficiency, long term performance, reliability and warranties. With this in mind Solarlec have been installing LG Solar panels for over 2 years and have a test system on their head office which has outperformed 2 other well-known competitors."*

*"The launch of the New LG NeON panels has therefore been warmly welcomed by our Energy Advisors as LG is already an established and proven manufacturer in the Solar Industry. Added to the known reliability and performance, the New 285 Wp LG NeON now enables us to help our customers maximise their roof space and thus further reduce their electricity bills and receive the maximum FiT tariff benefit."*

*"It is pleasing to note that since the launch of the LG NeON panels sales have increased and we look forward to this trend continuing as our clients are increasingly becoming aware of the importance of choosing a trusted brand."*

***Ged Rowbottom DIRECTOR | SOLARLEC PV SOLUTIONS LTD***

MonoX™ NeON



LG
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