POWEROPTIMAL
ELON

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THE FUTURE OF ENERGY

The PowerOptimal Elon™

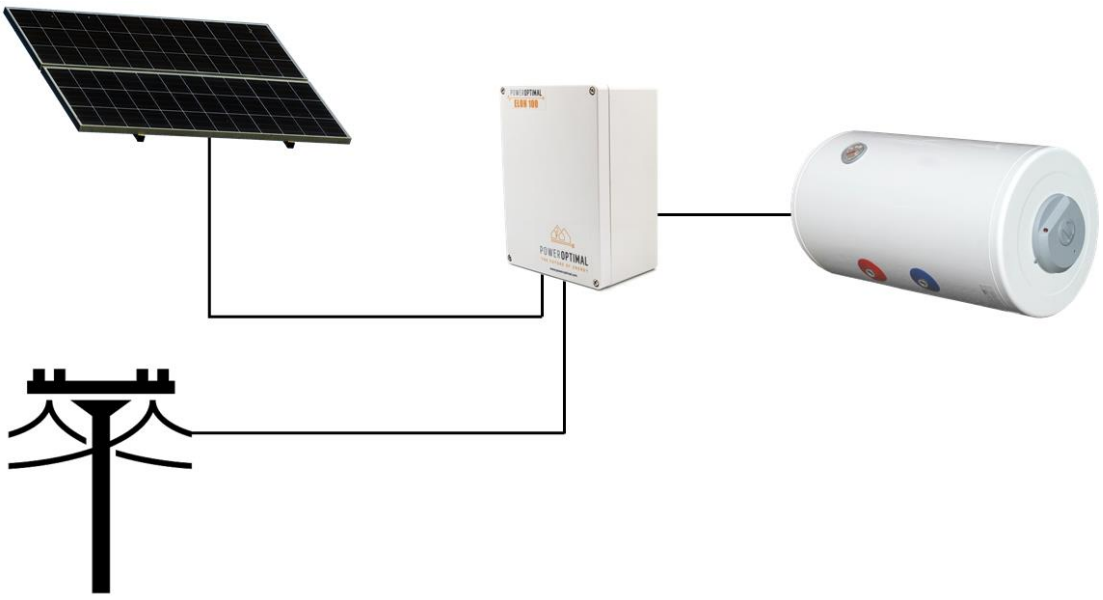
The Most Cost-Effective Solar Water Heating Solution

Conventional wisdom has it that solar thermal is the most cost-effective solar water heating solution. Well, it is time to update conventional wisdom! The innovative and patent-pending PowerOptimal Elon™ breaks the mould in bringing solar PV (photovoltaic) and water heating together in the most cost-effective package ever. Meeting national building regulations on water heating is now made easy with the PowerOptimal Elon™.

With competitive capital cost, very long lifetimes and almost non-existent maintenance, this is the lowest cost per kWh of water heating your money can buy anywhere.

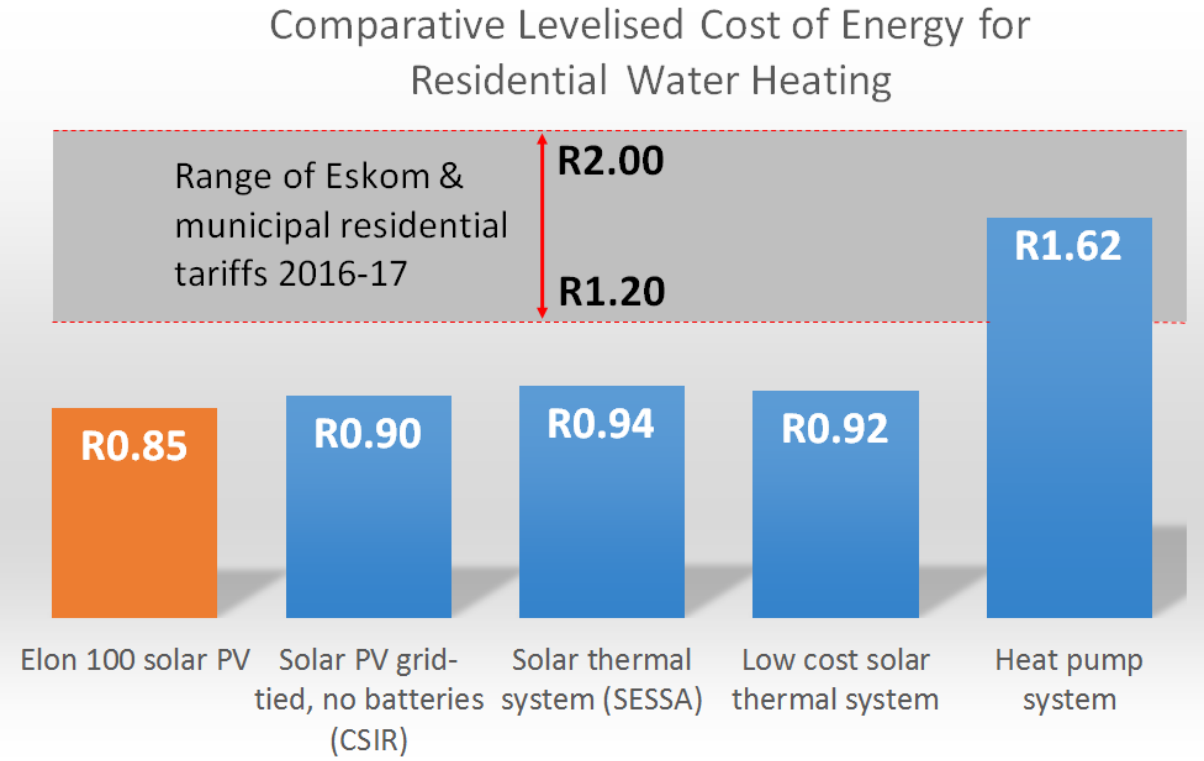
HOW IT WORKS

The Elon uses advanced proprietary switching technology to allow for **direct provision of DC (Direct Current) power from solar PV (photovoltaic) modules to electric geyser** and optimised solar power use in a single compact unit. The system can be connected to the grid (AC mains) as well, and intelligently switches between AC and solar power supply. The system requires **no inverter and no battery**, and can be connected to **standard AC geyser heating elements and AC thermostats**, which translates into the most cost-effective solar water heating option today.



WHAT ARE THE BENEFITS?

Based on a lifetime cost per kWh of water heating (Levelised Cost of Energy or LCOE), the Elon 100 brings you the lowest cost of any water heating option in South Africa at about **R0.85/kWh**. The average residential price of electricity in South Africa in 2016 (supplied by Eskom or municipalities) was about R1.60/kWh, and increases every year. **Reduce your exposure to ever-increasing electricity prices by installing an Elon 100 system.**



There are many other **benefits** to the PowerOptimal Elon™ solar PV water heating system:

- No tank on the roof
- Easy installation - no plumbing changes for retrofit
- You can use your existing electric geyser
- No noise (unlike heat pumps or solar geysers with circulation pumps)
- Lower weight of rooftop components compared to solar geysers means easier installation
- Much longer life and lower maintenance than solar thermal or heat pump systems
- Intelligent grid power backup means you won't have cold water even when there is no sun, whilst grid power use is minimised
- Excellent option for meeting SANS 10400-XA energy efficiency requirements
- Hot water during power failures
- The patent-pending AC-DC switching technology is the smallest and lowest cost solar DC switching solution on the market
- Less vandal-prone than solar geyser systems
- Patent-pending solar power availability detection technology means that no photocell is required compared to solar PV-inverter systems
- Delivers power to loads at lower voltage than what is possible with inverters (from just 20V under load)
- Efficiency dial to set efficiency from solar only to substantial grid backup
- Override button to use grid power

WHO IS POWEROPTIMAL?

PowerOptimal is an award-winning company with a mission to bring affordable, reliable and sustainable energy solutions to households and businesses across the African continent. The company is built on proven South African electricity demand management technology, with a strong track record of successful installations over more than 7 years.

FAQ – Frequently Asked Questions

How can solar PV water heating be more cost-effective than solar thermal? Isn't solar thermal efficiency much better than solar PV?

It is true that solar thermal collectors are currently more efficient per square meter (area) than solar PV modules in collecting solar energy. However, overall efficiency must also take into consideration factors such as heat loss in piping (especially in winter) and energy use of solar thermal circulation pumps.

Solar thermal system lifetimes range from about 7 years (for cheap imports) to about 15 years for high quality (and more expensive) systems. (In a comprehensive analysis, Sandia National Laboratories found that about 50% of solar thermal systems fail within a 10-year period.) Solar PV modules are routinely guaranteed at 80% performance after 25 years, and the US National Renewable Energy Laboratory uses a lifetime of 33 years in its solar PV system calculations.

Solar PV module costs have dropped dramatically – by over 80% in the past 5 years – and the trend is continuing. This has **changed the paradigm**. Whilst solar PV systems will continue to require more roof space than solar thermal in the short term, the key issue is not roof space, but cost. Solar PV systems have become cost-competitive to solar thermal, and the much longer lifetimes and lower maintenance translate into a lower lifetime cost per kWh.

What is SANS 10400-XA?

It is a set of energy efficiency regulations that are compulsory for new buildings and for additions and extensions to existing buildings. One of the key requirements of SANS 10400-XA is that **no more than 50% of the annual volume of domestic hot water must be heated using grid electricity**.

The PowerOptimal Elon™ makes meeting this requirement easier than ever before, providing a new cost-effective alternative to heat pump and solar thermal systems.

Do I need to change the heating element on my existing geyser to install a PowerOptimal Elon™ system?

Not necessarily. PowerOptimal Elon™ works with existing standard AC heater elements, but the best element size (power rating) depends on the size of your solar PV array. If you are building a new house, you can just specify the right heater element from the start. Refer to the PowerOptimal Elon™ 100 Technical Specifications

for a guide or ask the PowerOptimal team about the best module & element matching configuration for your needs.

How many solar modules do I need?

This depends on your geyser size / choice, number of people in the household, module power rating and hot water usage levels. For example, a 1.2 to 1.5 kW_p array should be sufficient for a household of 2 people, whilst 2 to 3 kW_p is more appropriate for a household of 4 people. Refer to the PowerOptimal Elon™ 100 Technical Specifications for a more detailed guide.

What products are available in the Elon range?

There are two systems in the range: the Elon 100 and the Elon 400. The Elon 100 is focused solely on water heating using solar PV, whilst the Elon 400 is aimed at electrical utilities and includes additional functionality (such as internet connectivity, demand management of 4 electrical loads, remote solar metering and dispatchable demand response).

What is the payback period for an Elon system?

This depends on your current electricity tariff, how many solar modules you install, your hot water use, and electricity price increases in the next few years, but typically payback period is in the range of 4 to 6 years. With a typical solar module life expectancy of more than 30 years, this means that you will enjoy at least 25 years of free hot water!

Where can I learn more about the PowerOptimal Elon™?

Visit our website at www.poweroptimal.com or contact the PowerOptimal team for more information and technical data sheets.

CONTACT US TODAY TO GET A QUOTE OR LEARN MORE ABOUT THE POWEROPTIMAL ELON

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