

# Solar PV for businesses in the Western Cape



## Main insights

*Solar PV can save businesses up to 16% in electricity costs, meaning systems can often pay for themselves within 3 - 8 years of installation.*

*In the Western Cape, the installed solar PV capacity as at Q2/2017 is 38MW.*

## Case Study Bayside Mall

# 01

500kWp solar PV plant located in Tableview, Cape Town, installed by Sustainable Power Solutions.

### Technology:

2000 Trina Solar modules  
30 Danfoss FLX PRO 17 inverters (17kW 3PH)  
3300sqm roof space

### Return on Investment:

775MWh generated annually  
5% reduction on electricity costs p.a.  
8 years payback period  
767 tonnes p.a. carbon emissions saved

## Solar PV is providing business benefits

In the Western Cape Province, there has been an exponential increase in the installation of solar PV by the retail, commercial, industrial and agricultural business sectors. Installations are driven by supportive local government policy frameworks, above-inflation electricity price increases and decreasing technology costs. The case studies throughout this brief highlight the benefits businesses have reaped following installations in this changing environment.

### This industry brief highlights:

- The financial viability of solar PV installations in the Western Cape.
- The local and national government support available to customers, including information on small scale embedded generation (SSEG) regulations for installing solar PV.
- The municipalities that allow the installation of solar PV and where electricity can be fed into the grid.

## How financially viable are solar PV installations for businesses?

**The financial viability of solar PV is dependent on a number of different factors:**

- **Installation size:** larger projects produce cheaper electricity as fixed costs, such as design and specification, are spread over more panels.
- **Technology choice and exchange rate:** prices still vary and some components need to be imported.
- **Location, roof type and direction:** influence the amount of sun reaching the solar panels.
- **Financing model:** depends on the client's risk profile or financial standing.
- **Current electricity tariff:** solar PV's viable increases as electricity tariffs increase.
- **Consumption patterns:** Eskom charges a peak charge during periods of highest use (typically, in a business context, during the day). Generating one's own electricity (also most effective during sunny periods) results in greater savings.



## Case Study Old Mutual

# 02

1MW solar PV plant located in Pinelands, Cape Town, installed by SOLA Future Energy.

### Technology:

3600 Jinko Solar poly-crystalline modules  
20 ABB TRIO 50.0 Inverters (50kW 3PH)  
Carport /surface area of 7000sqm

### Return on Investment:

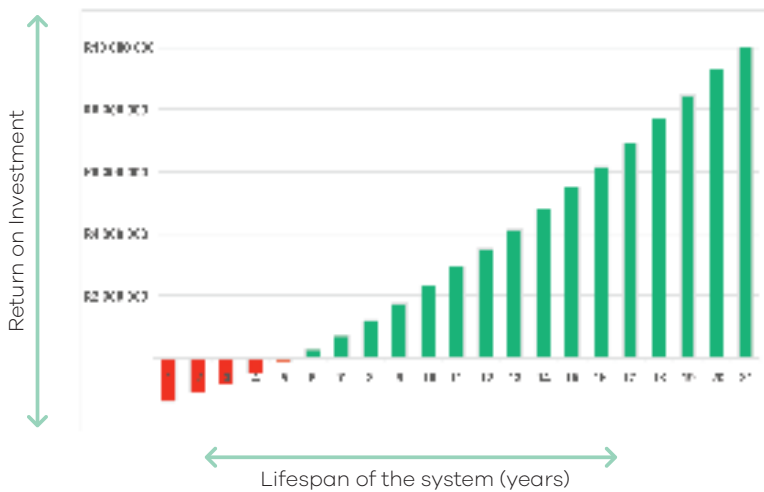
1.9GWh generated annually  
5% reduction on electricity costs p.a.  
6 years payback period  
2125 tonnes p.a carbon emissions saved

## What are the returns on solar PV systems?

In a modelling exercise performed by GreenCape based on actual industry costs, an approximate payback period of five years is achieved for a 100kWp system (see figure 1).

**As solar PV systems have an average lifespan of 20-25 years, this can mean 15-20 years of free energy.**

*The Western Cape government aims to increase the contribution of rooftop PV to the Western Cape electricity supply to 135MW by 2020.*



### kWp vs kWh

KiloWatt Peak (kWp) measures the most power the system can produce, i.e. the size of the system. Kilo Watt Hour (kWh) measures the energy the system produces.

These systems can be paid for in two ways – either by buying the system yourself, or by signing a power purchase agreement (PPA) with a PPA provider. The PPAs generally have no capital costs, just a per kWh energy cost (see next section for more on financing options).

Figure 1: Illustration of payback period for one scenario

## What do solar PV systems cost?

System size	Capital cost of system (cost per kWp)	Power purchase agreement tariff (price per kWh)
< 100 kWp	R 13 500 - R16 000	R 1.20 - R1.45
> 100kWp and <500 kWp	R 11 500 - R14 000	R 1.05 - R1.25
> 500 kWp	R 10 500 - R13 000	R 0.90 - R1.15

Our modelling also shows that the economies of scale are significant with larger systems currently being more financially viable. The table above shows that small systems (< 100 kWp) cost ~R15k per kWp compared to large systems (> 500 kWp) that cost up to R13k per kWp. This is highlighted by the national snapshot of solar PV and is also reflected in the PPA tariffs with decreasing tariffs as system size increases.

# Which municipalities allow small scale embedded generation in the Western Cape?

Municipality	SSEG tariffs	SSEG policies
Beaufort West	Yes	Council resolution
Bergrivier	No	In progress
City of Cape Town	Yes	Yes
Drakenstein	Yes	Yes
George	Yes	Yes
Mossel Bay	Yes	Yes
Oudshoorn	Yes	Yes
Overstrand	Yes	Yes
Stellenbosch	Yes	Yes
Swartland	Yes	Yes
Theewaterskloof	Yes	Yes
Langeberg	Yes	Yes
Breede Valley	Yes	Yes
Saldana Bay	In progress	Yes
Witzenberg	In progress	Interim policy
Prince Albert	Council resolution	Council resolution
Laingsburg	Council resolution	Council resolution
Cederberg	Yes	In progress
Cape Agulhas	No	Yes



Figure 2: Municipalities that allow small scale embedded generation

Please contact your local municipality electricity department for more info.

## How to finance solar PV

There are three financing options available in South Africa

### Self-funded

01

- Client purchases 100% of the solar PV system using available funding. (See capital costs in table on pg.2).
- All tax benefits and incentives apply (See 'Solar PV incentives', pg.4).

### Bank-funded

02

- Financing institutions are increasingly able to provide patient and more affordable finance packages for solar PV.
- Bank provides a term loan covering 70-100% of capital costs with a five- to ten-year loan.
- Projects designed so that solar installation savings are more than the loan repayments for a zero cash flow impact.
- All tax benefits and incentives apply (see 'Solar PV incentives', pg.4).

### Power purchase agreements and rooftop rental

03

- Power purchase agreements are long-term contracts between developers and PV system buyers, for the buyer to purchase electricity at a predetermined rate.
- There are zero upfront costs and developer absorbs the cost proposal, design, construction, operation, and maintenance of the system.
- PPAs are a hedge against future electricity costs; they protect customers against uncertain Eskom electricity hikes. Roof must be leased for the solar PV system's life span.

The development of online platforms for peer to peer lending and the use of the block chain are important developments to keep an eye on in this market.



## Case Study EuroChoc/HQ Foods 03

326kWp solar PV plant located in Lansdowne, Cape Town, installed by Emergent Energy.

### Technology:

816 Canadian solar modules  
11 Schneider Electric CL25 (25kW 3-PH)  
Roof space of 4000sqm

### Return on Investment:

640MWh generated annually  
15% reduction on electricity costs p.a.  
4 years payback period

## Case Study Graham Beck Wine Estate 04

312kWp Solar PV plant located in Robertson, Western Cape, installed by Solareff.

### Technology:

1200 Canadian Solar panels  
6 Delta RPI 50 Inverters (50kW 3-PH)  
Roof space of 2384sqm

### Return on Investment:

Annual generation of 470MWh  
16% reduction on electricity costs p.a.  
Carbon emission savings of 474 tonnes p.a.

## Solar PV incentives

### Feed-in tariffs

Customers are 'paid' for any electricity they feed onto the grid, through reductions in their energy bills.

### Tax benefit (12b) applies

100% accelerated depreciation in the first financial year. In effect, it equates to a 28% discount on the price of the solar system.

### Tax benefit (12i) applies

Tax allowance incentive designed to support greenfield and brownfield investments through support for both capital investment and training.

### Solar PV is VAT deductible

VAT registered entities can deduct the VAT portion of the solar PV system.

### Pay less carbon tax

As a low carbon energy source, solar PV will reduce the impact of the impending national carbon tax on businesses.

### Green Tourism Incentive Programme

Small and micro tourism businesses can qualify for up to R1m in grants when they switch to renewable energy sources.

Authors: Jack-Vincent Radmore and Seraj Chilwan

[www.greencape.co.za](http://www.greencape.co.za) / [info@greencape.co.za](mailto:info@greencape.co.za) / (021) 811 0250



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