

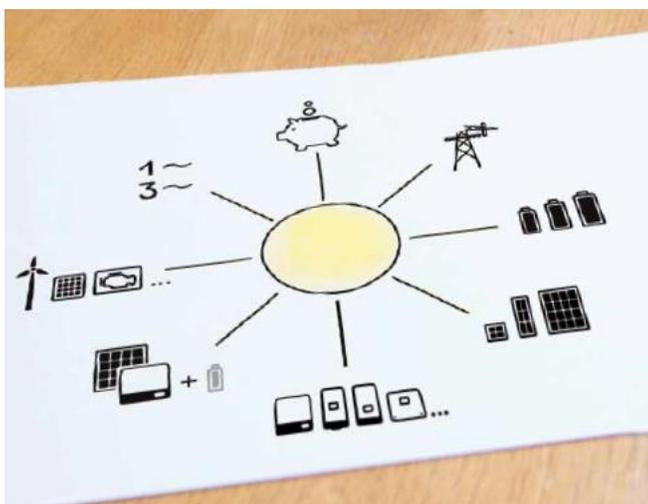
Energy Future Independence Grid Tie Residential PV Systems January 2019



Foreword

We have reached a tipping point in our energy requirements worldwide

- You can generate your own electricity for less than local authorities can deliver it to your home.
- Electricity in South Africa is taxed to cross subsidize other projects in our cities
- Electric cars are a reality and will be common place in the near future.
- VW announced 9 new electric models, China now manufactures more electric car than any other country in the world, Tesla will have a showroom in SA 2019
- Fuel is heavily taxed in South Africa and dependent on Rand Dollar fluctuations.
- Our cities do not provide a competitive feed in tariff and have implemented a daily service fee for domestic users
- The world cannot afford to wait any longer to change to renewable energy.
- South Africa has very high levels of solar radiation making perfect for solar power.
- Solar panels have a 25-yr. warrantee SMA inverters 10-yr. Lithium batteries 10-yr, with far longer life expectancies.



What do I do next?

You need to take note of the following statements and questions in order to make your own choice.

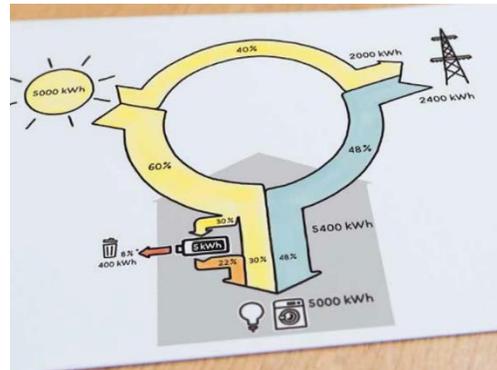
- If you simply want backup during power failures, purchase a generator large enough to drive the entire house.
 - The cost and difficulty to separate a distribution board into essential and non-essential load during a power failure is very high and often requires a complete rewire. This often costs more than the cost of a larger generator.
- If your main concern is to reduce your electricity bill
 - Install and register a Grid tied inverter system that feeds your home while the sun is shining and exports excess electricity to local authority if the service is available.
 - The city of Cape Town Charges a daily service fee for exporting your green energy, @ R 426 per month
 - The city limits you to how much solar power you can install on your own roof. From the list below most home owners can only install 3,5 Kw that will produce about 16 kWh per day (Units)

Service connection		
No. of Phases*	Service Circuit Breaker Size (A)	Maximum Total Generation Capacity** of SSEG (kVA***)
1	40	2.3
1	60	3.5
1	80	4.6
3	40	6.9
3	60	10.4
3	80	13.9
3	100	17.3

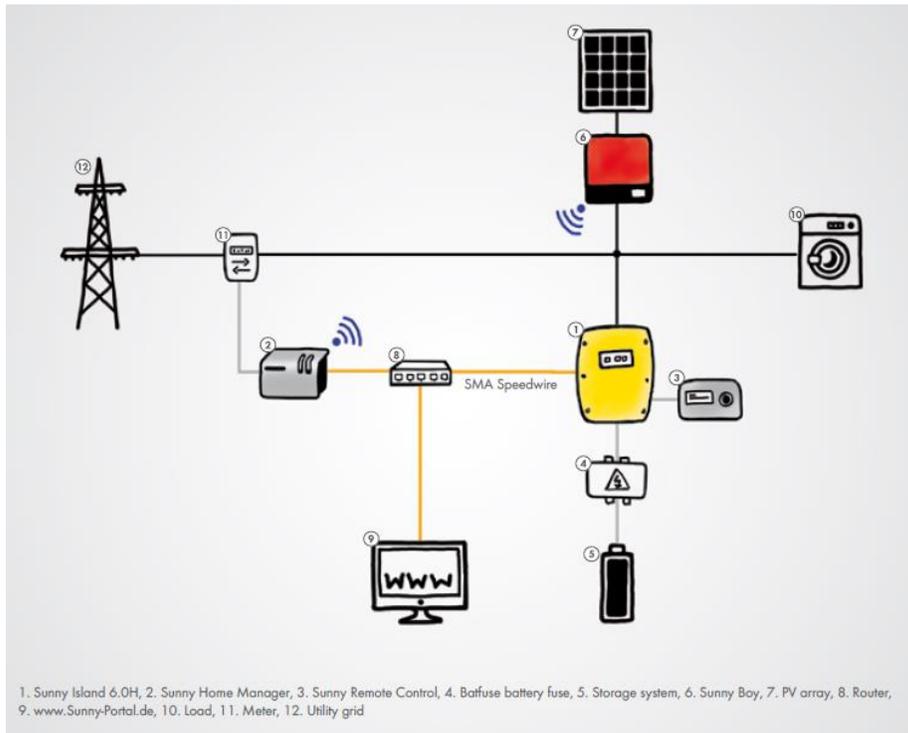
- *Table 1. Residential SSEG size limitations as derived from NRS 097-2-3*
- A grid tied inverter does not provide any backup and will stop producing power as soon the power system becomes unstable or fails.
- Worldwide the trend is now to store excess energy in your own batteries as opposed to export your excess to the City
 - Cape Town will pay you Ro.84 per unit you export and will charge you up to R2.55 per unit when you buy power from the city.
 - Despite the low feed in tariff the high cost of electricity makes grid tie systems very cost effective with returns of investment of up to 20%



Increased self-consumption



Sizing your system



With the cost of electricity fast becoming the same as the repayment of a small sedan it is a real consideration in your monthly budget.

- It does not pay to install a small solar system as the relative cost is only fractionally more for larger systems.
- The cost of a larger backup/ self-consuming inverter is only fractionally more than a small unit.
- A backup inverter should be able to carry your entire house load excluding your hot water cylinder and large stove.
 - The cost of trying to separate the plug points is often more than more than the cost of a larger system.
- When considering battery sizing it important that the battery can handle the peak loads to make sure that we avoid exporting power to the city or using power when we run peak loads.
- The return on investment for hybrid solar system out performs almost all investment options to domestic and commercial electricity users.

Grid Tie solar

4 Kw solar power



3.96Kw solar panel

SMA 3.6kw inverter

SMA energy meter

Installed cost including Certificate of compliance and City of Cape town registration

R 69 800 Excluding vat (cost per watt installed R17.62)

This solar system should deliver about 6400 Kwh per year or a saving of R 12 000 per year

Grid Tie solar

5.6 Kw solar power



5.6 Kw solar panel

SMA 5 kw inverter

SMA energy meter

Installed cost including Certificate of compliance and City of Cape town registration

R 89 500 Excluding vat (cost per watt installed R15.67)

This solar system should deliver about 9000 Kwh per year or a saving of R 15 000 per year

Hybrid solar storage + Backup

3.3 kw Off grid system for part



SMA 3.3 Kw Sunny island BYD 5.12 Kwh backup lithium Plug play backup Db +Load shed

R 108500 excluding Vat

Installed cost including Certificate of compliance

System connects to the solar system seamlessly providing full off grid capability and automated load shedding of non-essential load.

6 Kw Off grid solution 1 Phase or



SMA 6 Kw Sunny island BYD 7.4 Kwh backup lithium Plug play backup Db +Load shed

R 149000 excluding Vat

Installed cost including Certificate of compliance

System connects to the solar system seamlessly providing full off grid capability and automated load shedding of non-essential load.

Should you like to provide drive your single phase to everything instead of 3 phase load you can upgrade the Smart Db for an additional R2300

BYD B-Box BATTERY STORAGE

B-Box Compact



Model	B-Box Compact 2.5
Battery type	LiFePO ₄
Battery module	B-Plus 2.5 (2.56 kWh) 1 module
Usable Energy ^[1] [kWh]	2.56
Max Output Power [kW]	2.56
Peak Output Power [kW]	5.12, 30s
Round-Trip Efficiency	≥ 95.3% (Under test condition [1])
Nominal Voltage [V]	51.2
Operating Voltage Range [V]	43.2-56.4
Communication	CAN / RS485
Dimension (W×H×D,mm)	483×130×478
Net Weight of B-Plus [kg]	34
Net Weight [kg]	38
Enclosure Protection Rating	IP20
Warranty	10 years
Ambient Temperature Range ^[2] [°C]	-10 ~ +50
Certification & Safety Standard	TUV / CE / RCM / UN38.3
Scalability	Max. 2 B-Plus 2.5 in parallel
Compatible Inverters	SMA / GOODWE / SOLAX / Victron, more brands to be announced

[1] Test conditions: 100% DOD, 0.5C charge & discharge @+25°C

[2] -10°C-10°C will be derating

[3] Max. 32 B-Plus 2.5 in parallel with cabinet design

*System Usable Energy may be variant with different inverter brands

SUNNY ISLAND 4.4M / 6.0H / 8.0H FOR ON-GRID AND OFF-GRID APPLICATIONS



SI4.4M-12 / SI6.0H-12 / SI8.0H-12

WLAN communication is now included

<p>Communicative</p> <ul style="list-style-type: none"> • Communication via Ethernet and WLAN • Webconnect • Optimized data logging 	<p>Reliable</p> <ul style="list-style-type: none"> • 10-year warranty • Particularly high overload capability • IP54 for reliable operation in extreme environments 	<p>Flexible</p> <ul style="list-style-type: none"> • Works with self-consumption systems, battery backup systems and off-grid systems • Ideal for retrofits or modular expansions of single-phase and three-phase systems 	<ul style="list-style-type: none"> • All lead-acid batteries and over 20 different lithium-ion batteries can be used
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SUNNY ISLAND 4.4M / 6.0H / 8.0H

The most reliable all-purpose solution—easier than ever

The Sunny Island battery inverter supports a wide range of on- and off-grid installations with compelling product features—from operation in off-grid areas to home energy management. Users can benefit from SMA’s experience in having more than 70,000 Sunny Island inverters installed worldwide. Thanks to its integrated web interface and standard interfaces WLAN and Ethernet, the Sunny Island 4.4M/6.0H/8.0H can be easily configured and monitored via smartphone or tablet. And being a core element in the SMA Flexible Storage System, the Sunny Island temporarily stores self-generated power thus making it possible to use solar power around-the-clock.

Its high protection class, wide temperature range and exceptional overload capacity always provide the kind of reliability needed for off-grid use. Intelligent load and energy management keeps the system running even in critical situations. The Sunny Island is the ultimate all-purpose solution—and includes a 10-year warranty.





GCL-P6/72H

HIGH EFFICIENCY
MULTICRYSTALLINE MODULE

GCL-P6/72H 320-340 Watt

340^W

MAXIMUM POWER OUTPUT

17.5%

MAXIMUM MODULE EFFICIENCY

0~+5^W

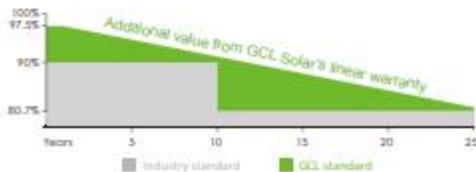
POWER OUTPUT GUARANTEE

Trust GCL to Deliver Reliable Performance Over Time

- World-class manufacturer of crystalline silicon photovoltaic modules
- Fully automatic facility and world-class technology
- Rigorous quality control to meet the highest standard:
ISO9001:2008, ISO 14001: 2004 and OHSAS: 18001 2007
- Tested for harsh environments (salt mist, ammonia corrosion and sand blowing test: IEC 61701, IEC 62716, DIN EN 60068-2-68)
- Long term reliability tests
- 2*100% EL inspection ensuring defect-free modules

LINEAR PERFORMANCE WARRANTY

10 Years Product Warranty 25 Years Linear Power Warranty



- ✓ Ideal choice for large scale utility solar plant
- ⊘ PID Selected encapsulating material and stringent production process control ensure product highly PID resistant
- ☂ Passed sand blowing test, salt mist test and ammonia test, flexible for harsh environments
- ⬆ Optimized system performance by module level current sorting
- 🔋 Special cell process ensures great performance in low irradiance environment
- 🔄 High quality wafer plus advanced cell technology guarantee high module efficiency
- 🧼 High transparent self-cleaning tempered glass increases module power output and ensures easy maintenance

Additional insurance backed by Swiss RE



Bringing Green Power to Life



SUNNY BOY 3.0 / 3.6 / 4.0 / 5.0 including SMA SMART CONNECTED



**What's new:
The complete solution for
100% ease and comfort**

SMA Smart Connected

- Investment security included
- Automatic monitoring by SMA
- Proactive information and automatic service

Easy to Use

- Safe plug and play installation
- Commissioning via smartphone or tablet
- WLAN and intuitive webserver

Everything at a Glance

- Free online monitoring
- PV system data viewable via smartphone

Future-Proof

- SMA storage solutions, intelligent energy management and Smart-module technology can be added at any time
- Dynamic feed-in control

SUNNY BOY 3.0 / 3.6 / 4.0 / 5.0

More than just an inverter. Smaller, simpler and more convenient with SMA Smart Connected

The new Sunny Boy 3.0 - 5.0 succeeds the globally successful Sunny Boy 3000 - 5000TL. It is more than just a PV inverter: with the integrated SMA Smart Connected service, it offers all-round comfort for PV system operators and installers alike. The automatic inverter monitoring by SMA analyzes operation, reports irregularities and thus minimizes downtime.

The Sunny Boy is ideally suited to solar power generation in private homes. Thanks to its extremely light design and location of the external connections, the device can be quickly installed and easily commissioned thanks to the intuitive webserver.

Current communication standards mean that intelligent energy management solutions as well as SMA storage solutions can be flexibly added to the inverter at any time.



Live access Your Energy usage and battery status



WEBCONNECT



Easy to Use

- Straightforward plug and play commissioning
- Clear display of the most important data

Economical

- Low investment costs and easy installation

Communicative

- Reliable online monitoring
- Clear display of the most important data

Direct

- Data exchange with Sunny Portal and Sunny Places without data transfer

Current Status

