ExSolar (A Division of The Exporter Cc.)
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Save 50% of the cost of a solar energy system by installing ExSolar's

Smart Energy Controller

(Grid Tie Limiter)

- For Solar Tie Grid connected systems - eliminating the need for batteries.
- For systems with pre-paid electricity meters.
- European Inverters of the highest quality
- Full monitoring of the solar system:
  - ✓ AC single phase or three phase capability.
  - ✓ DC Monitoring of Voltage and Current.
  - ✓ Detailed on-board Graphical Reporting.
  - ✓ Per second Memory Card Logging.
  - ✓ Data export for real-time Database Integration.
  - ✓ GSM, Wi-Fi or Ethernet modules available.
  - ✓ Network access to data in real time.
  - ✓ Dynamic control of Fronius Grid Tie Inverters.

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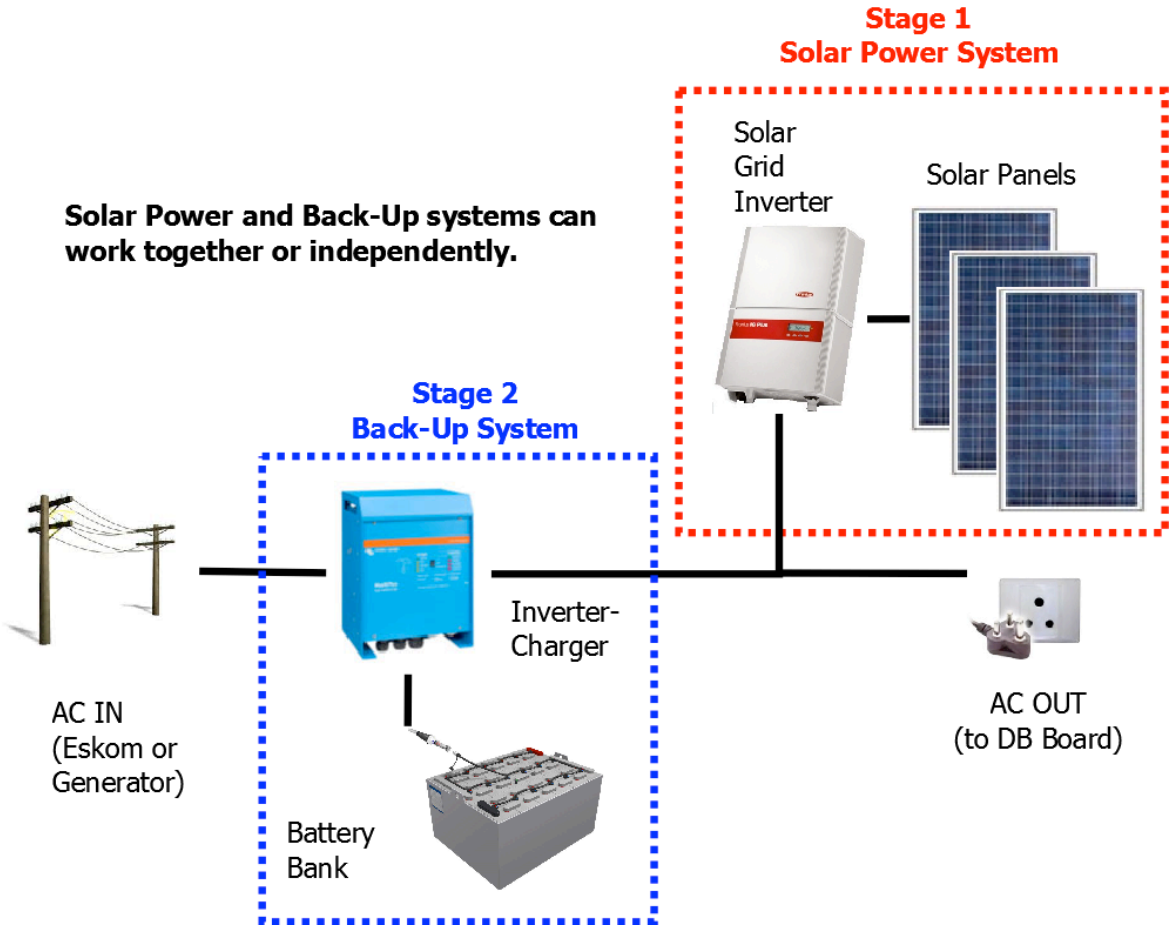
The components that make up a residential solar system are typically determined by the type of electricity meter at the premises. Consequently the type of meter has a significant influence on the overall system cost as well as the type of installation performed. The main issue is that pre-paid electricity meters do not "see" the direction of the current. Hence in a solar system that has excess energy that is unused by the client, it is push back to the grid – the pre-paid meter "sees" this energy as a standard electricity usage and therefore bills the client for the energy the PV systems produces (very undesirable)!

There are two main types of the grid tie solar systems; those with batteries and those without. To date clients with a digital or prepaid meter required a system that included batteries in order to store excess energy produced – this prevented the energy from being fed back to Eskom. Unfortunately any system that includes batteries is typically twice as expensive.



Above: A sample grid tie solar system where Stage 1 of the installation includes the solar panels and a Grid Tie Inverter (an old electricity meter would then turn backwards). Stage 2 then shows the battery back-up situation - in the case when a Prepaid Meter is present, both Stage 1 and Stage 2 would have to be installed to prevent feeding power back to Eskom.

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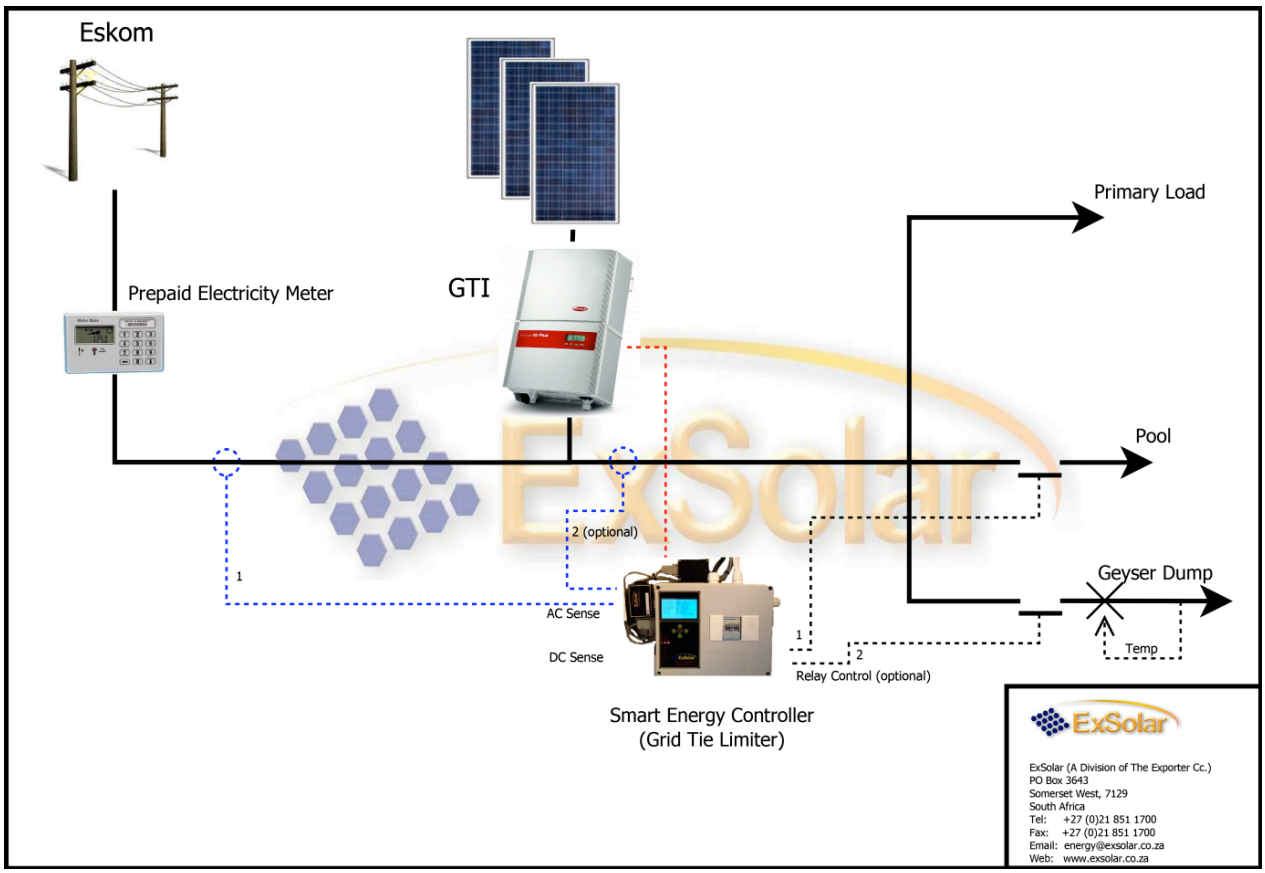
So the challenge presented to our engineers was to design a system that would be able to work with a prepaid meter and prevent this excess energy from being fed back to the grid. After two years of development, and in collaboration with the engineers at Fronius, we have developed a **Smart Energy Controller (Grid Tie Limiter)** that performs the desired result!

ExSolar connects the Fronius solar grid inverter to the Smart Energy Controller (Grid Tie Limiter), and it then has the ability to either re-direct the overproduced energy to specific appliance (like a geyser or a pool pump) or limit the production of the PV panels to meet the energy consumption needs of the client. This system is a very cost effective solution for customers who are looking for a solar system that would lower their electricity consumption but without the expensive batteries and a back-up system for power blackouts.



As you may be aware, solar production in Europe has peaked in recent years and as a result, there are many high quality Grid Tie Inverters (GTI) available on the market at very reasonable prices. (Grid Tie Inverters allow the independent PV solar systems to be connected to the grid).

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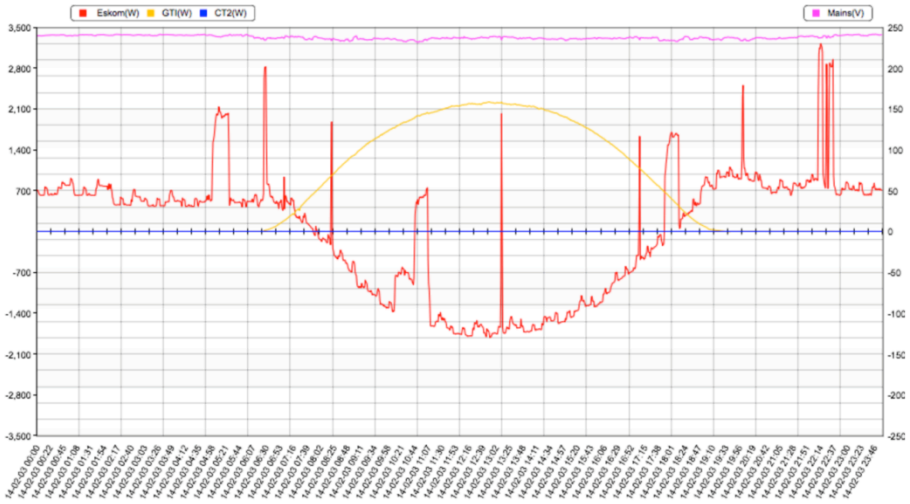
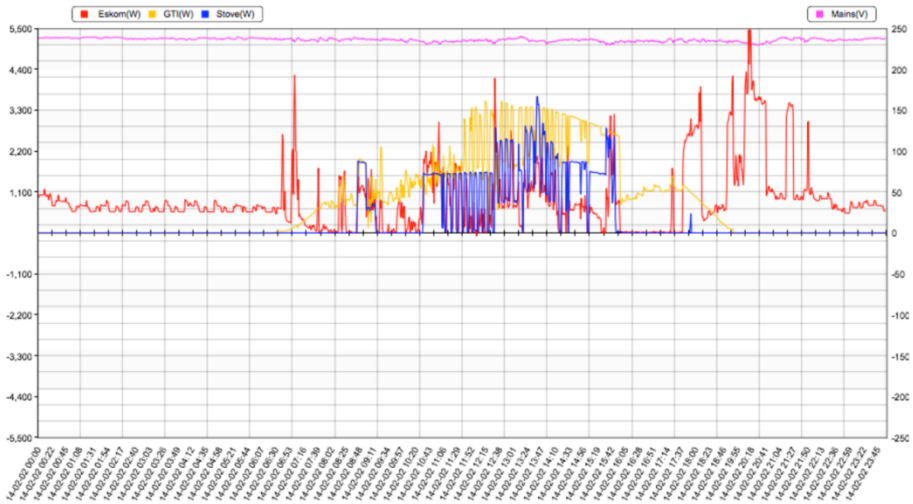
The Fronius brand from Austria is one such inverter that, combined with the standard 5 year warranty (extendable to 20 years), offers a great investment opportunity in terms of a self-production solar powered system. The problem however is that the South African government has not come to the party in terms of allowing the feed-in of unused solar energy back into the Eskom grid. Eskom has however announced a feed-in tariff structure that is actually quite laughable – not forgetting the fact that you have to purchase a new 4-quaddrant meter AND pay a premium rate to have this facility available at your house. These additional costs make it totally unfeasible to install a solar system and rely on Eskom rebates to finance the project.

In light of the above problem, in conjunction with our existing Smart Energy Monitor, we have developed an additional module that directly communicates with the Fronius Grid inverters and backs down (or limits) the power production to match your load. That is, as the load in your house varies, the Energy Monitor will communicate with the Fronius GTI and prevent feedback of any excess energy via your pre-paid meter.

A screen-shot of one system **without the grid tie limiting function.** Notice that the excess energy is pushed back to Eskom (negative values).



The **Yellow** line is the solar production, and the **Red** line is the Eskom usage

In comparison, a system **with the grid tie limiting function**.
Notice the red line never goes below zero, indicating that no energy is pushed back to Eskom.