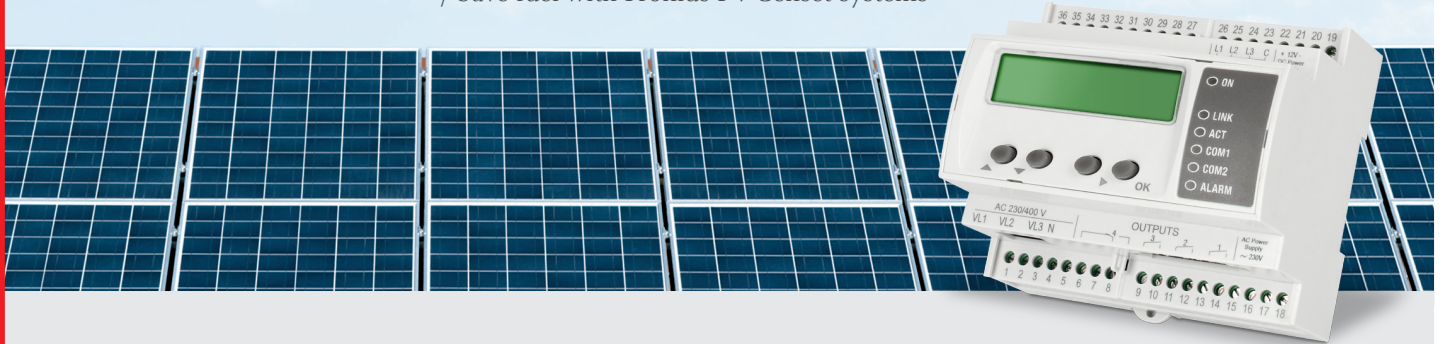


FRONIUS PV-GENSET SOLUTION

/ Save fuel with Fronius PV-Genset systems



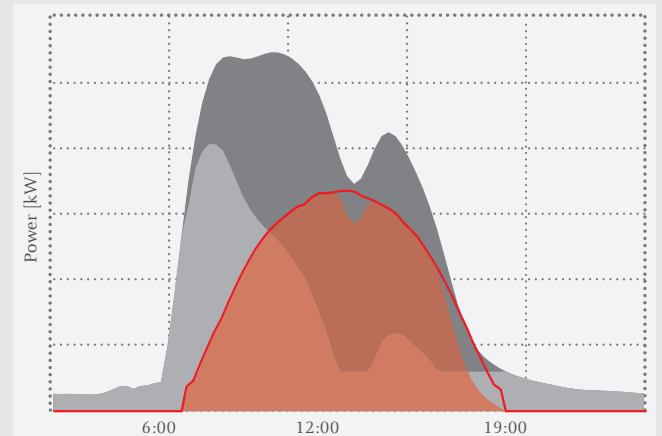
/ Diesel gensets and photovoltaic technology can be combined in perfect harmony. Although these technologies have rarely been in demand by the same users in the past, combining them has now become extremely beneficial technically, ecologically and, last but not least, in terms of cost effectiveness. To control the entire system the new Fronius PV-System Controller is the first choice. Fronius also provides support in planning the PV-Genset solution.

FRONIUS PV-GENSET SOLUTION MINIMISES COSTS

/ In remote areas or regions where the electricity supply is patchy or extremely expensive, grids powered by diesel gensets are an absolute must. The cost per kilowatt hour of electricity from a diesel genset is largely changeable, depending as it does on fuel and other variable costs. Only a small proportion is fixed. The costs can vary widely depending on country, transport distance and increasing oil costs on the global market (€ 0.05 - 2.5 per kWh).

/ The price trend in the photovoltaics sector is much more positive. Over the past few years the costs per kWh from PV systems have dropped dramatically around the globe (€ 0.07 - 0.14 per kWh).

/ For this reason there is a clear financial justification for integrating a Fronius PV-Genset solution into almost every diesel-powered system. Every unused diesel kWh saves money.



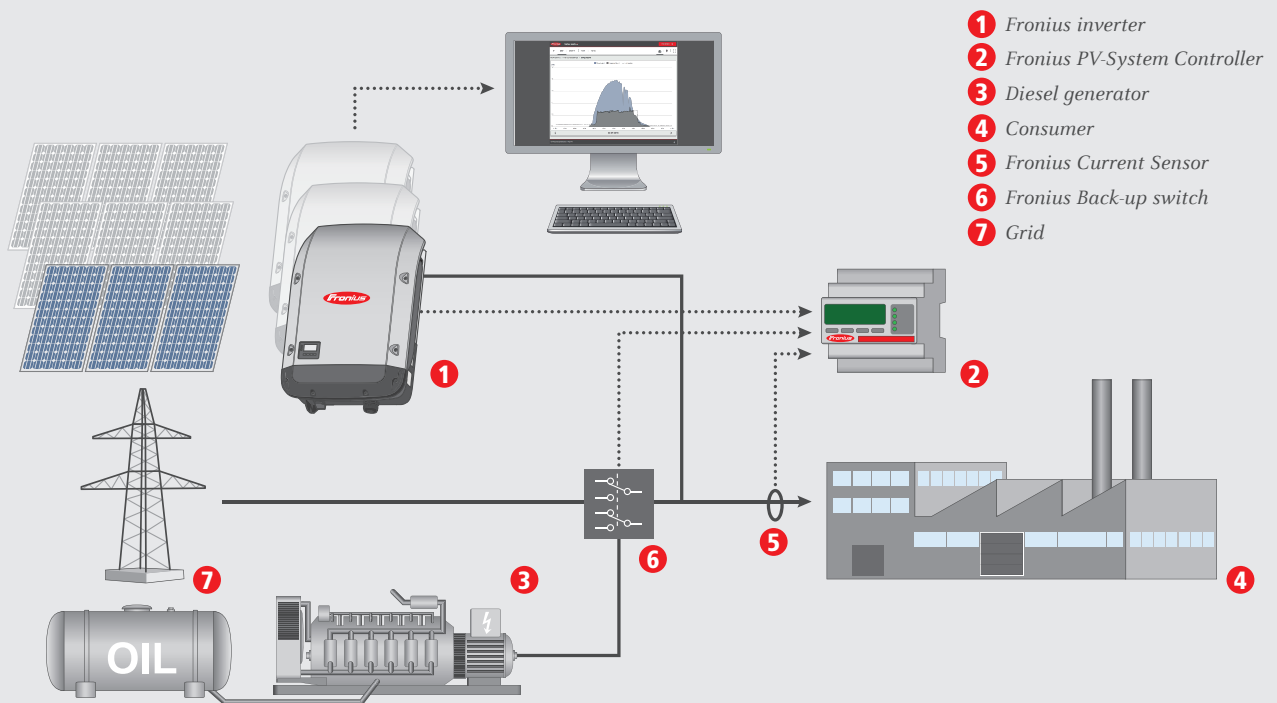
- The load profile of an example load
- The area in red represents power from PV and therefore the saving in expensive diesel
- The difference between load and PV is met as before by the diesel genset

INTELLIGENT TECHNOLOGY

/ A stable PV-Genset system is the highest priority. Using photovoltaics must not result in diesel gensets being operated at unfavourable or prohibited operating points, where an increased load causes premature ageing. As a result it becomes absolutely essential that the inverters (and, where necessary, the diesel gensets too) in systems above a certain size are subject to an intelligent control mechanism.

FRONIUS PV-GENSET EASY

/ With the Fronius PV-Genset Easy solution, photovoltaic systems can be integrated into existing diesel systems quickly and easily. The solution is optimised for low-voltage applications with a diesel generator.

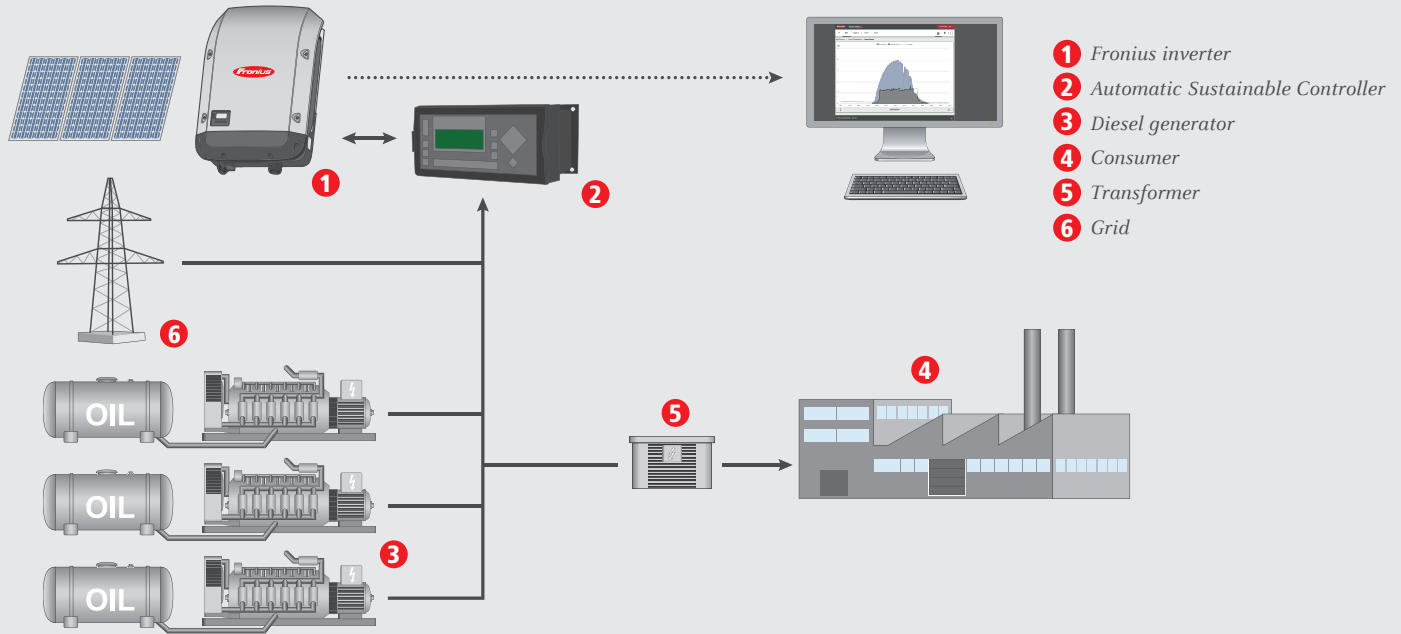


/ A consistent power balance (reactive and effective power) must be guaranteed within a PV-Genset system at all times. Both the load and the PV power available are subject to fluctuations. In small PV systems (just as in systems with no PV element), these variations are met by the diesel genset. Yet if the power from the photovoltaics system is proportionally quite large, the entire system must be optimally controlled to obtain the best possible diesel savings.

/ This is where the Fronius PV-System Controller comes into play. By using data from the Fronius inverters together with load measurements (as well as diesel genset measurements where necessary), the entire system can be monitored. Fronius inverters can thus be controlled so that the minimum load of the diesel generator is not undershot and the system remains stable.

FRONIUS PV-GENSET ADVANCED AND PROFESSIONAL

/ With the Fronius PV-Genset Advanced and Professional, PV systems can be quickly and easily integrated into diesel systems in which several diesel generators are used. The controller is the communication interface for the photovoltaic system and diesel generator and assumes all control functions over the system. The solution is suitable for both low-voltage and medium-voltage applications.



Fronius PV-Genset Advanced is the retrofit solution for multi-generator systems.

Fronius PV-Genset Professional is the fully-integrated solution for multi-generator systems.

OPTIMISING THE PV-GENSET SYSTEM

/ It is very easy for a small PV system in relation to the load to pay for itself financially, but it does not represent a cost-effective form of optimisation. As the PV output never has to be restricted, the savings can simply be identified from the annual energy calculated in the respective region.

The difference between the costs of producing PV energy and the costs of producing electricity from diesel is normally quite large. The saving is therefore much higher if the size of the PV system has been designed so that temporary power restrictions are the norm or so that multiple generators can

be controlled automatically. This significantly increases the amount of power supplied from photovoltaics. In order to identify the most cost-effective PV system size for each project, it is important to examine the insolation and load profile alongside the variable diesel power costs and the cost of the PV system.

Simulations are then used to calculate the highest possible savings that could be achieved. Fronius can provide you with unbeatable support in the planning of your PV-Genset system.

ONLINE SYSTEM MONITORING



/ Fronius Solar.web App

/ Every PV-Genset system can be designed, monitored, analysed and visualised at any time using the Fronius Solar.web online portal. Up-to-date system data can be accessed at any time and is clearly presented: the portal is very user-friendly and easy to use, and a comprehensive range of analysis functions is included.

/ Fronius Solar.web is also available as an app to allow you to check your PV system data from your smartphone at your own convenience.

PRODUCTS FOR THE FRONIUS PV-GENSET SOLUTION

Products for the Fronius PV-Genset Easy Solution:

- / Fronius PV-System Controller
- / Fronius Genset Measurement Extension
- / Fronius Current Sensors
- / Fronius inverter with Fronius Datamanager or Fronius Datamanager Box



/ Fronius Datamanager 2.0 Box

Products for the Fronius PV-Genset Advanced Solution:

- / Automatic Sustainable Controller ASC, DEIF A/S
- / Fronius inverter with Fronius Datamanager or Fronius Datamanager Box

Products for the Fronius PV-Genset Professional Solution:

- / Automatic Sustainable Controller ASC, DEIF A/S
- / Automatic Genset Controller AGC, DEIF A/S
- / Fronius inverter with Fronius Datamanager or Fronius Datamanager Box

/ Due to the open nature of Fronius communication solutions, it is also possible to implement individual solutions containing third-party components. With the Fronius Datamanager 2.0 or Fronius Datamanager Box 2.0, it is possible to incorporate all components into a control system using Modbus RTU or TCP with the SunSpec Inverter Control Model.

/ Perfect Welding / Solar Energy / Perfect Charging

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,800 employees worldwide, we shift the limits of what's possible - our record of over 1,200 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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