

CASE STUDY

comparative analysis

Energy Output Comparison, Module Mismatch, Ouddorp, NETHERLANDS

OVERVIEW

Highlighted Features: Design Flexibility, Mismatch Mitigation

Installer: Centrotec

Installation Date: Jul. 2010

Location: Ouddorp, Netherlands

Average Irradiance:
1,100 kWh/m²/Year

Modules: 9 Ubbink 185W in each installation

Inverters: 1 traditional 1500W inverter, 1 SolarEdge SE3300 inverter + 9 power optimizers

Layout: Two inverters with 1 string each. Modules placed in a staggered manner



As a leading international company in the field of sustainable development, Centrotec is committed to high level building integrated energy management. Its managers are constantly looking for solutions to maximize Solar PV energy and improve the efficiency of their photovoltaic installations, leading to the decision to test the SolarEdge system. In a field study Centrotec compared the energy output and the design flexibility of SolarEdge to those of a traditional inverter brand.

Comparing SolarEdge to a traditional system:

The study took place in Ouddorp, a small town in the Netherlands, on the roof of a family home building. Centrotec installed two 1.6 kW systems using respectively the SolarEdge SE3300 inverter with a 250W power optimizer per module and a traditional 1.6kW inverter.

Photo: The photo shows the Centrotec test site in Ouddorp, Netherlands with two test systems used for a comparative case study between a regular inverter and SolarEdge.

For both systems, Centrotec used nine Ubbink 185W modules.

Both systems were mounted side by side and were exposed to the exact same light and shading conditions. One string with nine modules each was connected to each inverter. The modules in the string were installed with different tilts in order to simulate different roof facets. The modules were subject to shading from nearby trees and a roof mounted satellite dish. In order to guarantee equal settings and exposure to shading and light patterns across the day, the two systems were installed in a chessboard manner: modules were given numbers from 1 to 18. Uneven numbers were connected to the traditional inverter and even numbers were connected to the SolarEdge system.

Test results:

The energy output was registered by the public utility energy meter over the period of five months from October 2010 to March 2011. The measurements were taken on a daily basis. During this period **the traditional inverter produced 181.32 kWh, while SolarEdge produced 235.38 kWh, a total of 29.8% more energy.** The table shows an extract from the measurements. The difference in energy output is consistent.

SolarEdge power optimizers provide maximum power point tracking for each module separately. The optimizers adjust the current to the specific maximum power point current of each module and guarantee that the modules work at their maximum capacity. Because each module is

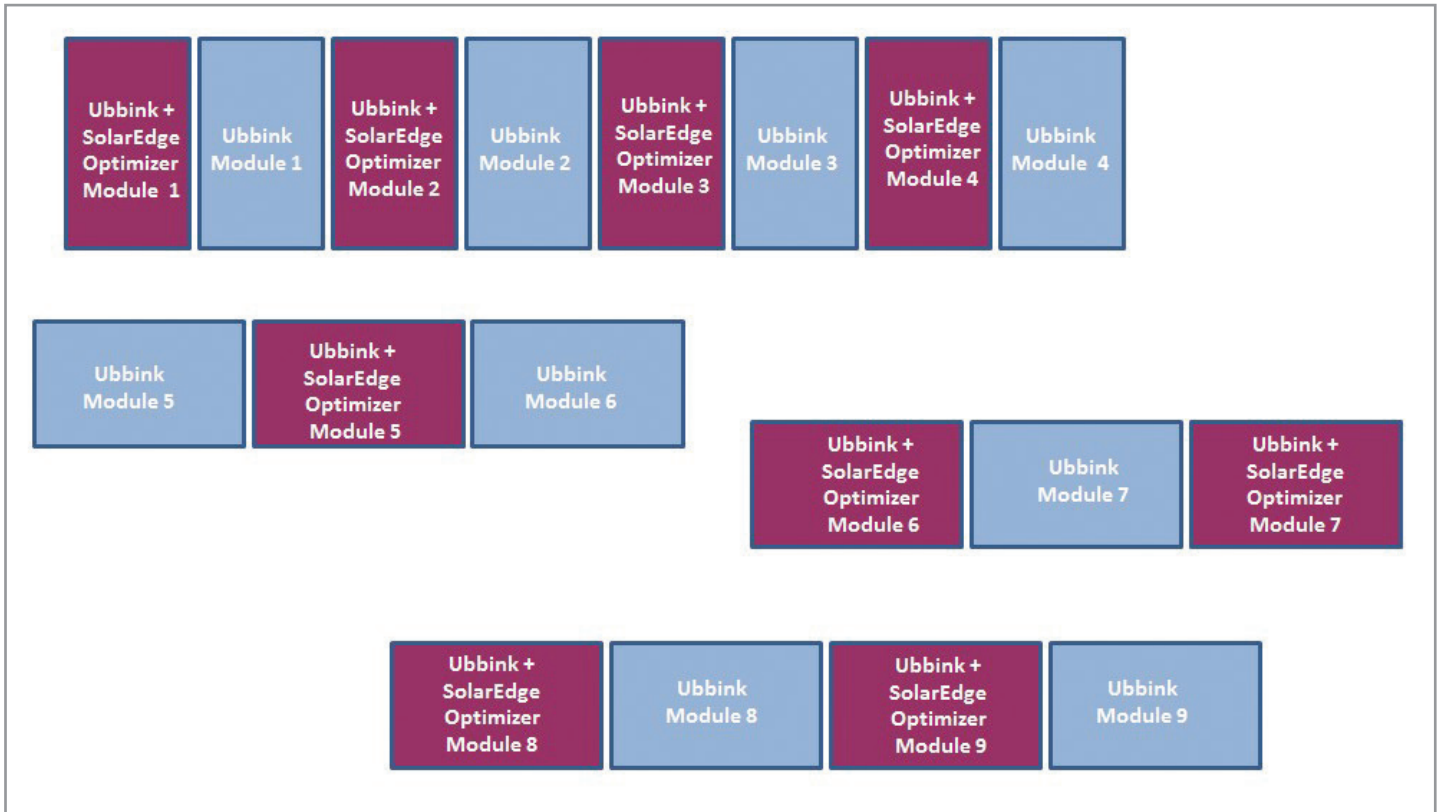


Illustration: A sketch of two installations in a chessboard manner.

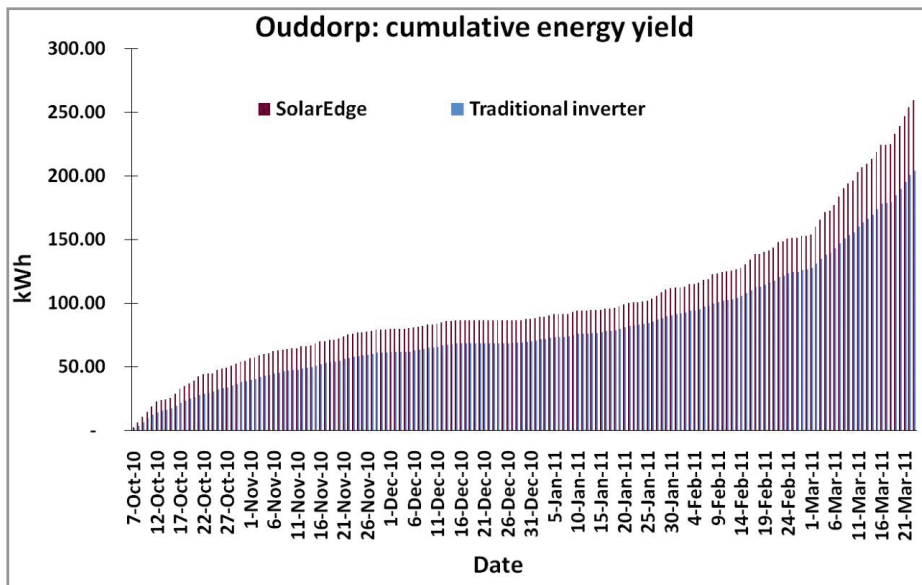


Chart: The chart shows the energy output of the SolarEdge system in comparison to a traditional inverter system over the course of 5 months from October 2010 to March 2011

managed individually, modules with lower output do not influence others in the string. As a result only a small amount of energy is lost due to partial shading and no energy is lost due to mismatch. Waiving the traditional dependency of the modules also allows the installation of modules on different roof facets with uneven tilt and azimuth angles.

Real-life Applications:

The great design flexibility offered by SolarEdge is crucial in many cases.

1. Installers can cover roof space exposed to partial shading caused by nearby objects such as antennas or chimneys, without causing disproportionate energy losses.
2. Green building designers are able to use modules on different

façades of a house and on pergolas, connecting all modules to a single inverter.

3. The installer has the possibility to connect modules of different power ratings. Hence, no stocks of modules needs to be kept and inventory costs can be saved.

4. The installer saves on BoS components such as wires, cable ducts, disconnects and combiner boxes, thanks to the possibility to connect longer strings.

“SolarEdge offered us a solution which addresses both optimized energy output and design flexibility. In order to conduct a reliable evaluation, we compared the energy output and design flexibility of SolarEdge to that of a traditional inverter brand. I was particularly amazed by SolarEdge’s ability to avoid MPPT losses on mismatch. The results clearly speak in favor of SolarEdge”

Maurits Boogaard
VP Technology, Centrotec