CASE STUDY

PV Module Test System

OVERVIEW

Installer: SOCO snc

Project: Porta Franco (SOCO snc)

Installation Date: 27/09/2011

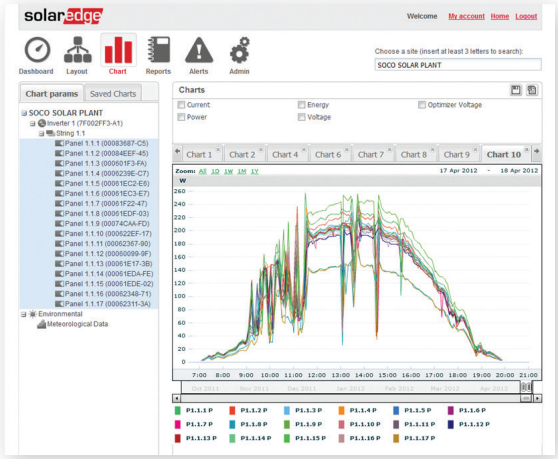
Location: Lombardy Italy

Installed Capacity: 3.955 kWp

Modules:
Sanyo HIT-H 250 E01 / Sanyo HIT-N 240 SE10 / Solon Black 230 240Wp / Solon Blue 235 Wp / Schott POLY 235 wp/ Bosch M240 3BB-17 / SolarWorld SW230 Mono Black / SolarWorld SW 235 POLY + / YINGLI YL 235 P 29 B / Jinko JKM 235M 96 /2 ∗ REC solar 235 / Solarday px60 230/ Solarday PX BLACK / 3 ∗ solar frontier 85 / 2 ∗ Ningbo 180 W

Inverter: 1 ∗ SE4000

Layout: 1 string (Each module was connected to one power optimizer. The 3 TFI modules were connected to one power optimizer)



Graph illustrates that power throughput of each module is optimal and independent of other modules

In 2011, SOCO snc, an Italian installer, with over a decade of experience in photovoltaic (PV) installations, approached SolarEdge about installing a SolarEdge system on the roof of SOCO's engineering office, which was renovated according to the National Association of Bioecological Architecture (ANAB) and Green Architecture guidelines, with a ventilated roof, radiant heating and heat pumps. The building lacked only a PV system, and unlike other systems previously installed by SOCO, this system was designed to assist them in testing the module technologies offered to their customers.

The SolarEdge power optimizers optimize power harvesting for every module individually and therefore eliminate the need to maintain conformity between modules, allowing SOCO to connect multiple module types in one string. The SolarEdge system also enables installation of modules in multiple orientations, tilts and under partial shading conditions with minimum effect on system efficiency, thus maximizing the flexibility of the test environment.

SOCO wanted to establish a real photovoltaic laboratory: accessible 24/7, with various technologies and installation layouts. The only solution on the market that allowed for accurate measure and display of the performance of each module individually was the SolarEdge system. Therefore, a PV system was installed on the roof consisting of 19 modules from 11 different manufacturers, with multiple orientations and artificial partial shading, one of the modules was manufactured in 1998. SolarEdge's technology provided SOCO with the insight needed in order to help their customers make informed decisions about the right modules and layouts. For example, one of the performance tests conducted by SOCO was on two modules from the same make and model, in which SOCO regularly cleaned one module and not the other, comparing their power output.

SOCO installed a power optimizer on each module, except in the case of thin film modules where a power optimizer managed three modules in parallel. The mismatch problem was eliminated as each module operated at its individual optimal current and voltage, independently of the other modules.

During the first few months following the installation, the data SOCO gathered, confirmed the good performance of the chosen modules. To confirm the capabilities of the SolarEdge system, SOCO created artificial shadows above some of the modules throughout the day. By using the SolarEdge module-level monitoring portal, power generation for each PV module was recorded for every module separately, showing that each module was performing optimally even when it deviated from its original spec. The data from the SolarEdge monitoring server was cross-referenced with data collected from SOCO's photovoltaic field and from their weather station, to further validate the system's performance. The SolarEdge monitoring portal generated reports and graphs comparing new and old data in different times of the day and under varying environmental conditions. A "playback" movie generated by the portal showed which modules were the first to start power generation under each test condition. This surplus of information allowed SOCO to create an in-depth module catalogue library for its current and future customers. The combination of high quality, tested solar modules and the numerous benefits offered by the SolarEdge system, including design flexibility, safety during installation and maintenance, and module level power optimization, monitoring and maintenance guarantee premium service for SOCO's customers.

"This successful testing site and its profound data will only help to increase SOCO's leading position within the PV community in Italy", said Andrea Porta, Manager and Partner at SOCO snc, Italy.