

Case study

Energy storage system - Campania, Italy

Nidec ASI's energy storage systems help stabilize Italy's national power grid

Project Summary

Project: SANC

Client: Terna Storage (TSO)

Application: Electric Energy Storage Systems for Italy's national grid

Grid Connection Point: Transmission Grid

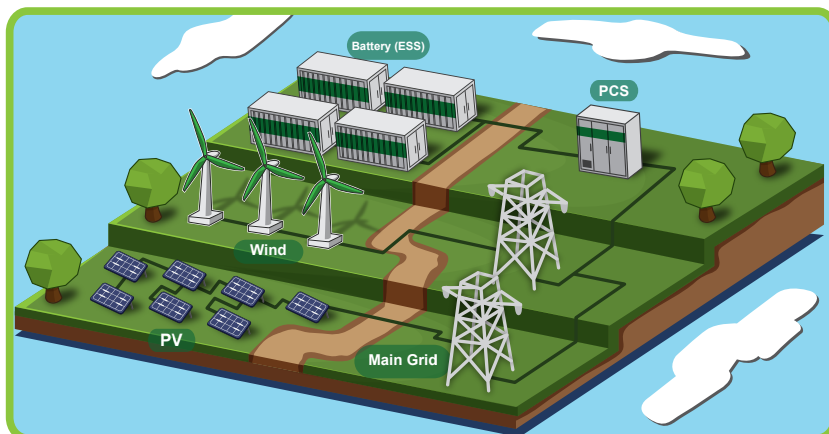
Nidec ASI's role

Nidec ASI supplied Terna with 25 Power Conversion Systems (PCS) which together deliver 34.8 MW of energy storage. The PCS's convert energy from AC to DC voltage and store it in batteries until it is needed.

Nidec ASI's inverters are modular, enabling the company to configure each PCS according to each battery group's needs. The charging and discharging of the batteries are controlled by separate DC/DC converters. The system is designed to optimize charging and discharging cycles to optimize renewable energy production.

The control system is designed to:

- Deliver separate control of active (P) and reactive (Q) power
- Meet balancing, grid frequency and voltage regulations
- Function in both black start and islanding mode
- Provide control, monitoring and diagnostics of each PCS's conversion cabinet
- Link to Nidec ASI's Scada system, Artics Smart Energy, which provides the control functions and monitoring tools to manage and optimize energy production
- Operate in LVRT/OVRT mode



The challenge:

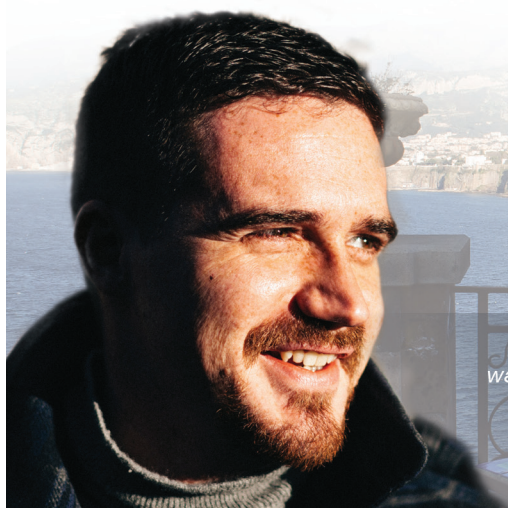
To enable Italy's power grid to better accommodate renewable energy sources

In recent years, a considerable amount of solar, wind and other renewable -- but fluctuating -- energy resources have been added to Italy's electrical power grid. The grid itself, however, has remained geared toward the needs of the traditional coal-fired and nuclear power plants that operate continuously, resulting in inefficient use of available power. Terna sought a way to stabilize the national grid, while improving its ability to absorb green power and balance energy output with demand.

The solution:

Electric Energy Storage Systems

To add flexibility to its existing grid, Terna chose to create a system for storing excess energy in giant batteries for later use. The SANC project was developed to create three battery storage systems in southern Italy with a total capacity of 34.8 MWh. Designed to recover and store hundreds of gigawatts of power produced by wind farms, the systems not only increase the safety and efficiency of the electrical grid, but it would also help reduce energy costs and substantially reduce greenhouse gas emissions. It would be the first large-scale battery energy storage system installation in European grid system.



Gennaro inherited the hotel from his father and hopes to pass it on to his son. He was concerned that the increasing risk of blackouts in his region would damage his business. Now he can dream easily about the future.

Nidec ASI, turning dreams into results

Nidec ASI

System components supplied by Nidec ASI

Each of 25 Power Conversion Systems (PCS) includes:

- a PCS Converter, including
 - an AC/DC converter in Active Front End configuration
 - a DC/DC converter for DC bus control
- a PCS Controller for the control, supervision and monitoring of the entire PCS Cabin
- a water cooling system with external dry cooler

Power Conversion Systems Technical Data							
Project	Battery	Solution	Grid Side (AC voltage)		Battery Side (DC voltage)		Cooling Systems
			Voltage [V]	Power* [KVA]	Voltage [V]	Power [kW]	
Terna Storage SANC "Ginestra"	NGK	Nr 6 PCS	550	2460 (Qty 4)	465	2520	Water
				1230 (Qty 2)	745	1260	
Terna Storage SANC "Flumeri"	NGK	Nr 10 PCS	550	1230	465-745	1260	Water
Terna Storage SANC "Scampitella"	NGK	Nr 9 PCS	550	1230	465-745	1260	Water

"Ginestra 2.4 MW" PCS – AC/DC Section



"Ginestra 2.4MW" Internal view of PCS Cabin



"Flumeri 1.2MW" PCS – AC/DC Section (AFE)



"Flumeri 1.2MW" PCS – DC/DC Section (CHOPPER)

