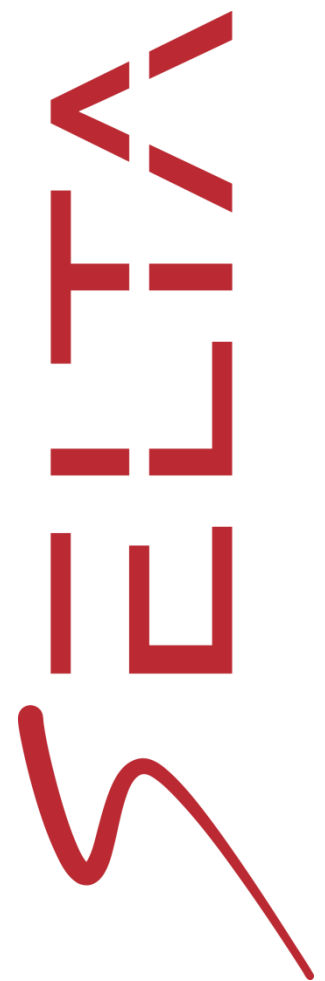




CONTROL SYSTEMS IN SOUTH AFRICA
SELTA for the very large photovoltaic park



NEED

In South Africa, a country that has invested heavily in the development of renewable energies, **Eskom** is the largest electricity operator controlled by the Government, generating 95% of the national electricity and 45% of the electricity used in the whole of Africa. As part of the plans to upgrade its network of **photovoltaic parks**, Eskom has decided to build two large plants in the areas of **Paleisheuvel** and **Tom Burke** (declared a national point of interest in 2017 for its strategic importance).

SOLUTION

Eskom has appointed Enel Green Power to build the two maxi plants including control systems supply from SELTA that, thanks to its long experience and expertise, has been able to meet the needs with a complete solution. The supply of SELTA includes:

- 100 **remote control units, SELTA STCE-R**, connected to a clusters of panels, to collect operating data
- the control units are connected to **plant SCADA systems**, which are redundant to ensure continuous operation. SCADA systems collect and transmit data to the **supervision center** at Enel Green Power in Johannesburg as well as transmit them to the Eskom center
- **monitoring and support** are provided for higher security also from the remote assistance center of SELTA (Piacenza)

Monitoring allows analysis at inverter level, so that the plant staff can be immediately present on potential problems and maximize efficiency. Solar panels are cleaned twice a year to maximize production.

BENEFITS

Thanks to this new "turnkey" project by SELTA for the two photovoltaic mega-parks, the South African company Eskom can satisfy the request of **86 thousand South African families** with a total **capacity of 148 MW** and an annual **production of 275 GWh**. Thanks to this typology of projects that SELTA realizes all over the world, by 2019 South Africa will be able to boast a capacity of 5000 MW in renewable energies, with the consequent positive impact on the reduction of CO₂ emissions.

The two plants were built in the areas of Paleisheuwel and Tom Burke. The **Paleisheuwel plant** is located 150 km north of Cape Town, near the west coast, it has 610 thousand photovoltaic panels distributed over 240 hectares, it has an installed capacity of 82.5 MW and is able to produce 153 GWh per year, equal to the annual consumption of 48 thousand South African families. The **Tom Burke plant**, in the north of the country, on the border with Botswana, it is equipped with over 500 thousand panels distributed over 200 hectares, with a capacity of 66 MW and capable of producing up to 122 GWh, equal to the needs of 38 thousand families. The plants were built thanks to SELTA's solutions, from RTU up to the SCADA and monitoring software SELTA eXpert. Transmission is based on customer-owned optic fiber.



The two plants are equipped with about 40 **inverter cabins**, inside which there is a **STCE-R** device having the function to acquire and communicate data through Modbus links and then send them to its collection center: each device transmits about 1500 field information, using the IEC 60870-5-104 protocol through the customer-owned fiber network.



The overall monitoring system consists of two interconnected systems: **the inverter monitoring system and the Power Plant Controller** which controls and monitors the solar inverter cabins; **the substation monitoring, control and protection system** which manages STEP UP and MV SUBSTATION CABIN.



In addition to the network of concentrators inverter, the system also manages a dozen third-party **protections** and two fiscal meters.



In the HV/MV substation, the system also includes a remote terminal unit, **SELTA STCE-RTU**, in charge to acquire High Voltage data.



Local **SCADAs** are installed in the substations and they transmit collected data to the central monitoring system via optic fiber owned by the customer.

