

— Reuniwatt —



FLAGSHIP PROJECTS

CSP and PV mega-projects in Morocco

#Solar #PV #CSP #ThermalStorage

#Grid-connected

#Africa

#SkyCamVision #InstaCast #HourCast #DayCast



Credits: Masen

Morocco – A Vision of sustainable development through Solar Energy

Morocco, which benefits from its abundant solar resource, aspires to become an international solar energy champion through innovation and integrated development of installation at the highest standards. Masen, the Moroccan Agency for Sustainable Energy Masen selected Reuniwatt following a tender process for solar forecasting services for PV and CSP plants with more than 1.4 GW total capacity, including the massive Noor Ouarzazate project with 582MWp.



Total Capacity	582 MWp
Location	Ouarzazate, Morocco
Type	Noor 1: CSP (parabolic through) Noor 2: CSP (parabolic through) Noor 3: CSP (solar power tower) Noor 4: PV

These projects use Reuniwatt's

SkyCam Vision™ + Insta/Hour/DayCast™

Solar Power between the Atlas Mountains and the Sahara

Morocco is committed to achieve 6000 MW of renewable energy capacity by 2030, largely through Masen, a privately owned company with public funding, that develops renewable energy projects to fulfil the country's aim of raising the share of renewables in its energy mix to 42% by 2021, and 52% by 2030.

The Ouarzazate project is situated on a plateau south of the High Atlas Mountains of Morocco and consists of four phases: Noor I with 160MW CSP parabolic through capacity has been connected to the grid since 2016. Noor II more than doubled that capacity adding 200MW. Noor III added another 150MW of CSP capacity using a solar power tower. The project is currently being completed with Noor IV, a 72MW PV plant, and a thermal storage unit. The massive solar complex is totalling 582MWp. Together with the PV projects Laâyoune and Boujdour, it completes Masen's Noor PV I program.



The Sky Cam Vision™ sky imager as installed at two locations in Morocco.

Sky Cam Vision™ is an industrial-class sky imager developed by Reuniwatt for high-resolution sky observation and tracking of the cloud cover. It offers a very accurate forecast of the irradiance for the next minutes. The method is based on image processing techniques for cloud retrieval and motion tracking, and machine learning techniques in order to adapt to the site's specific conditions.

In addition, forecasts for the next hours and up to 10 days in advance are offered with a combination of HourCast™ and DayCast™ services.



Credits: Masen

Largescale Injection of Solar Energy into the Grid: Forecasting is crucial

Ouarzazate is located within the so-called global solar belt. Despite the excellent solar availability, the massive use of renewable energy systems on a national level requires advanced forecasting techniques for the safe integration of that renewable energy into the grid. In order to use solar energy to reliably meet the electricity demand, fluctuations in solar irradiance levels and the consequent variability in the energy generated must be considered. Forecasts allow to avoid curtailment and maximise the solar output, thus reduce the dependence on fossil fuels, plus use existing storage units in an optimal way.

Reuniwatt’s all-sky-imager Sky Cam Vision™ provides highly accurate local data. In combination with Reuniwatt’s forecasting services InstaCast™/HourCast™/DayCast™, which are adapted specifically to regional weather conditions, solar forecasting enables grid managers to mitigate the challenges of solar variability by providing information about the type of variability that is to be experienced, such as average, maximum and minimum power or ramp rates. Short-term forecasts from our sky imager are especially useful for the optimization of control parameters, while day-ahead forecasts ensure a stable level of quality and reliability.



Credits: Masen

Impact of Noor Ouarzazate



3,000 Ha

the mega-project is equal in size to 3,437 football fields



1,000,000

households are powered with energy from this project, which is twice the population of Marrakech



802,000

tons/year of CO2 emissions avoided alone by CSP projects Noor 1-3

About Reuniwatt

Reuniwatt is a major player of the solar radiation and cloud cover assessment and forecasting. Based on solid Research and Development works, the company offers reliable products and services intended for professionals of various fields, making the best out of two key facets of meteorology: atmospheric physics and data sciences. A particular focus has been placed on solar energy forecasting, while developing cutting edge solutions to improve short-term prediction of the solar resource. The company has won many grants, including H2020's SME Phase 1 programme, which makes Reuniwatt a European Champion with regard to innovation. Reuniwatt has also been selected among the national fast-growing companies to join the prestigious French Tech 120 programme in January 2020.

