Reuniwatt

*Excellence in forecasting*

# Solar energy forecasting using Space data

Marion Lafuma

# Reuniwatt: a leader in solar & wind forecasting


Founded

**2010**

- Renewable energies
- Atmospheric science
- Defence & Space

>300 projects in

**45**

countries

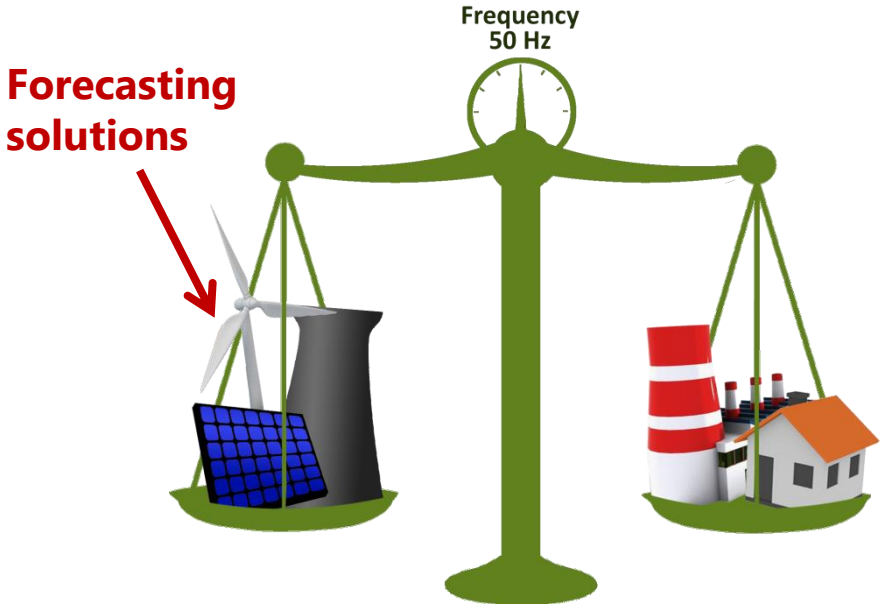
Strong R&D investments

**300,000**

hours, >100 publications, 5 patents

# Capability as of February 2023

# The need for solar forecasts: Grid stability




**PRODUCTION = CONSUMPTION**

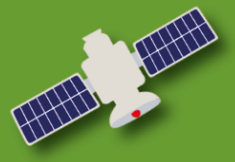
**Otherwise:**
**BLACK-OUTS!**
**MATERIAL DEGRADATION**

A cloud passing in front of the sun can instantly cause an **80% decrease** of the local ground irradiance

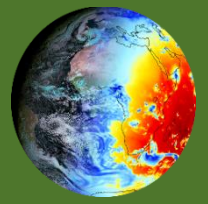
# Solar forecasting products & services and their use

**InstaCast™**
*intrahour solar forecasts*

**HourCast™**
*intraday solar forecasts*



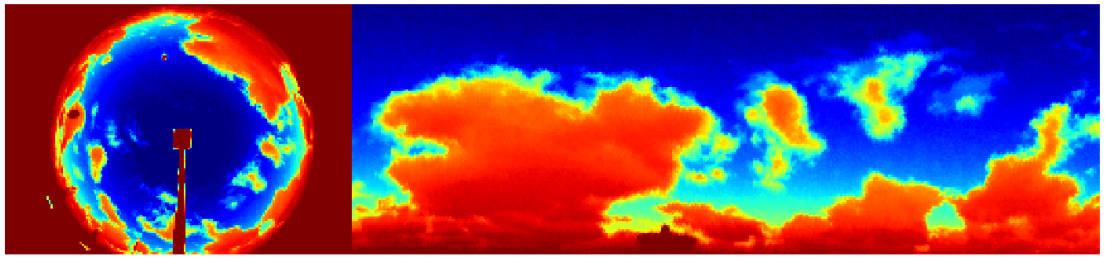
**DayCast™**
*day-ahead solar forecasts*



Forecasting

**SOLAR FORECASTING**

Track clouds from the ground



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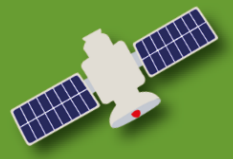

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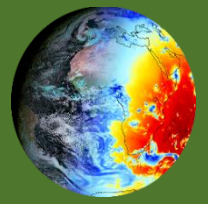
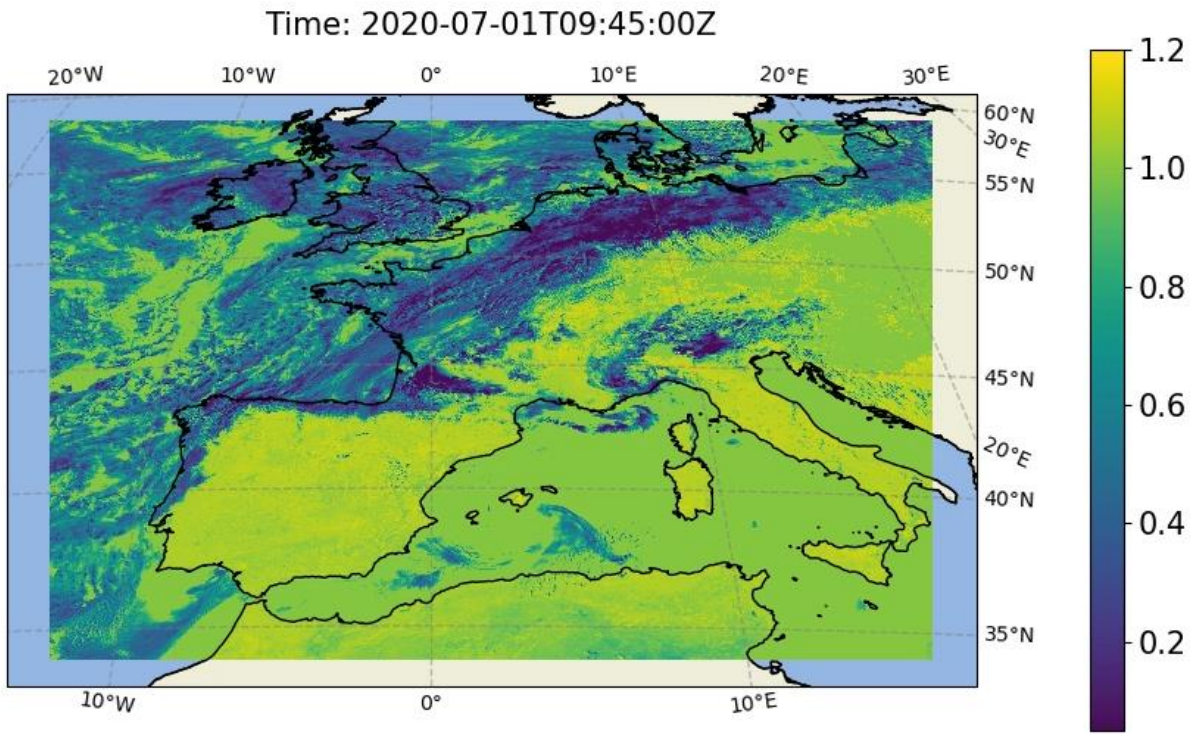


Forecasting

**SOLAR FORECASTING**

Track clouds from space



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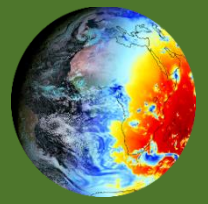
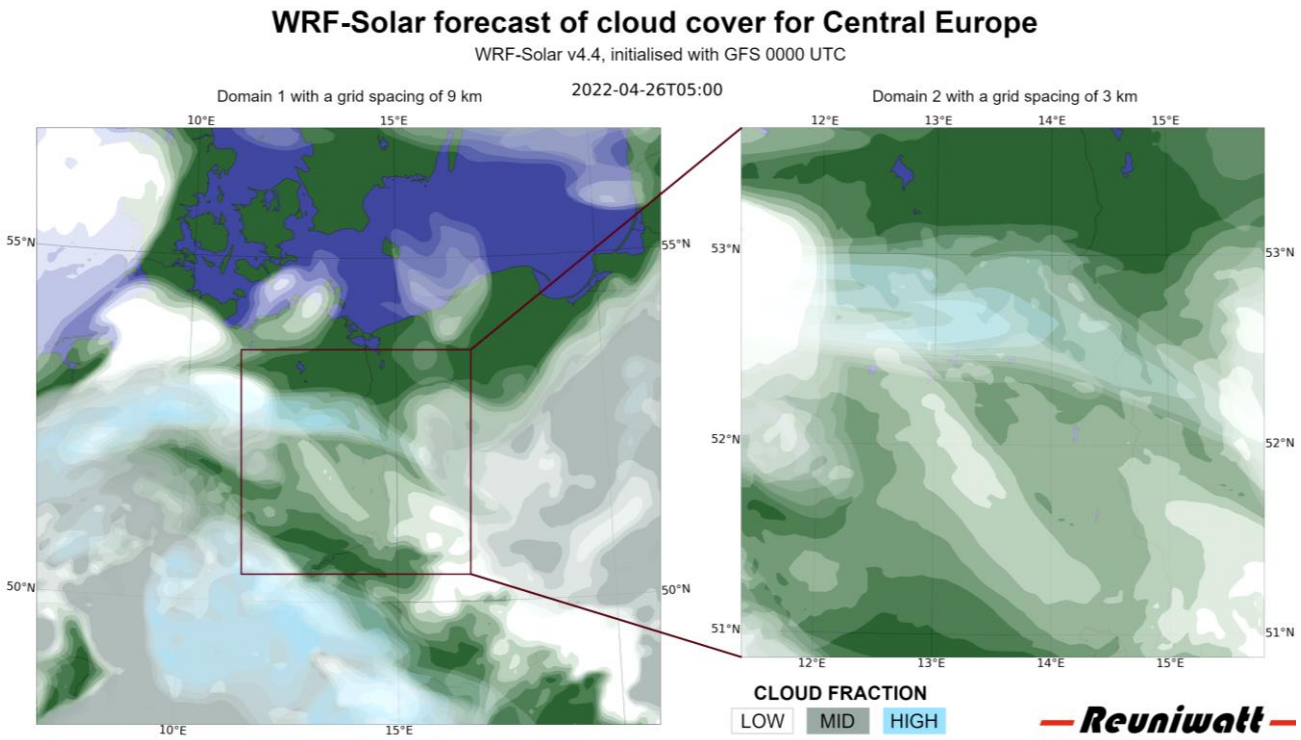


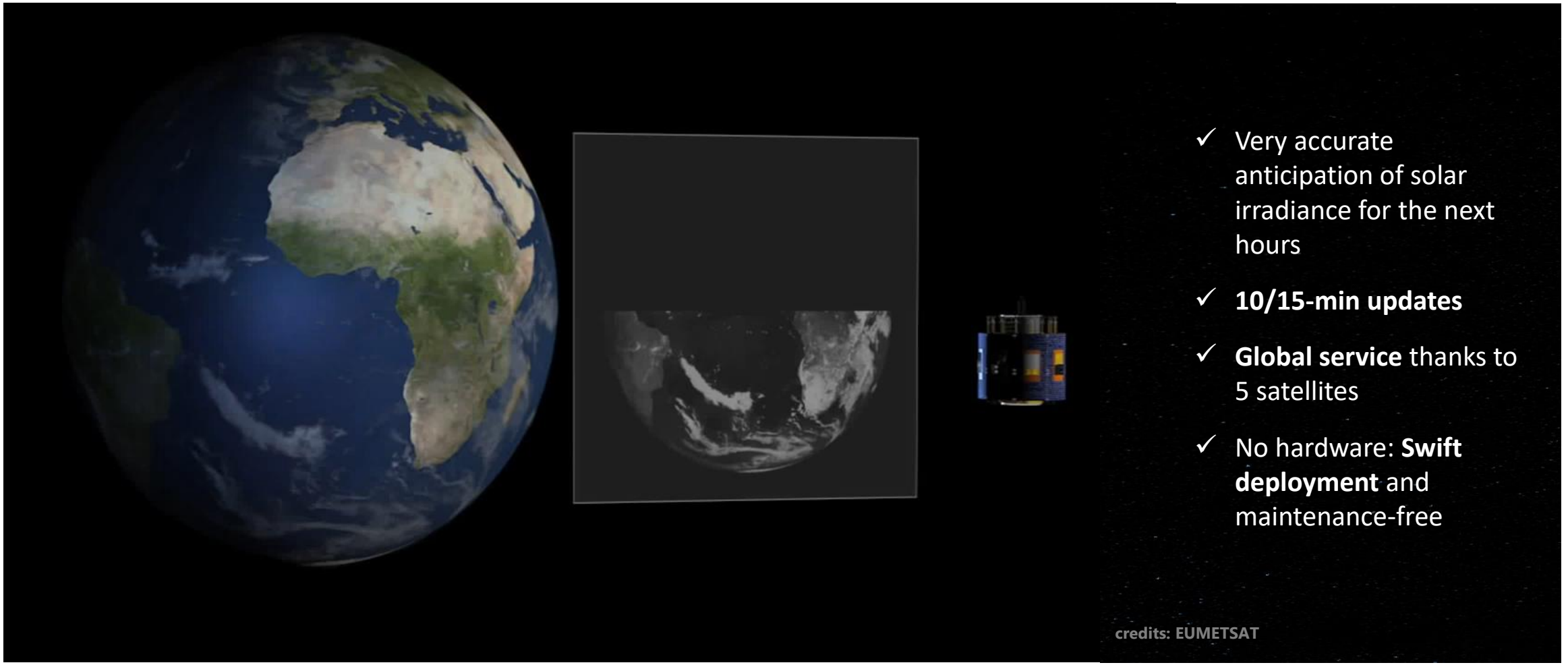
**Forecasting**

**SOLAR FORECASTING**

Track clouds using NWP



# HourCast™: intraday forecasting using satellite images



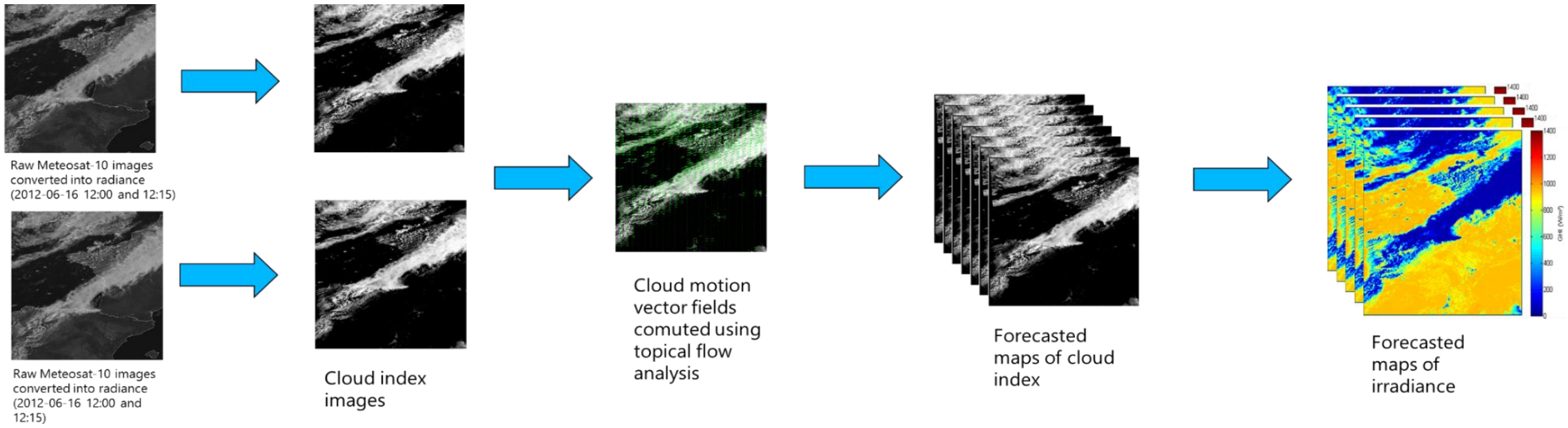
- ✓ Very accurate anticipation of solar irradiance for the next hours
- ✓ **10/15-min updates**
- ✓ **Global service** thanks to 5 satellites
- ✓ No hardware: **Swift deployment** and maintenance-free

credits: EUMETSAT

# HourCast™ method

Reuniwatt's proprietary method for **irradiance estimation from satellite images** is improving the method Heliosat-2 and is compatible with the different geostationary satellites.

Our forecasting method is based on the calculation of a Cloud Motion Vector. The process is illustrated below.




Overview of Reuniwatt's HourCast™ methodology

# Satellite forecasting use cases

Grid management

**Clients**: Electricity Network Operators

**Needs**: Anticipate the country/region's renewable energy production in the coming hours to adapt the overall means of production

Plant operations

**Clients**: Independent Power Producers, Plant Operators

**Needs**: Fulfil a country's grid code requirements in terms of forecasting to avoid penalties and maximise the injection of renewable energy sources in the energy mix

Energy trading, aggregation

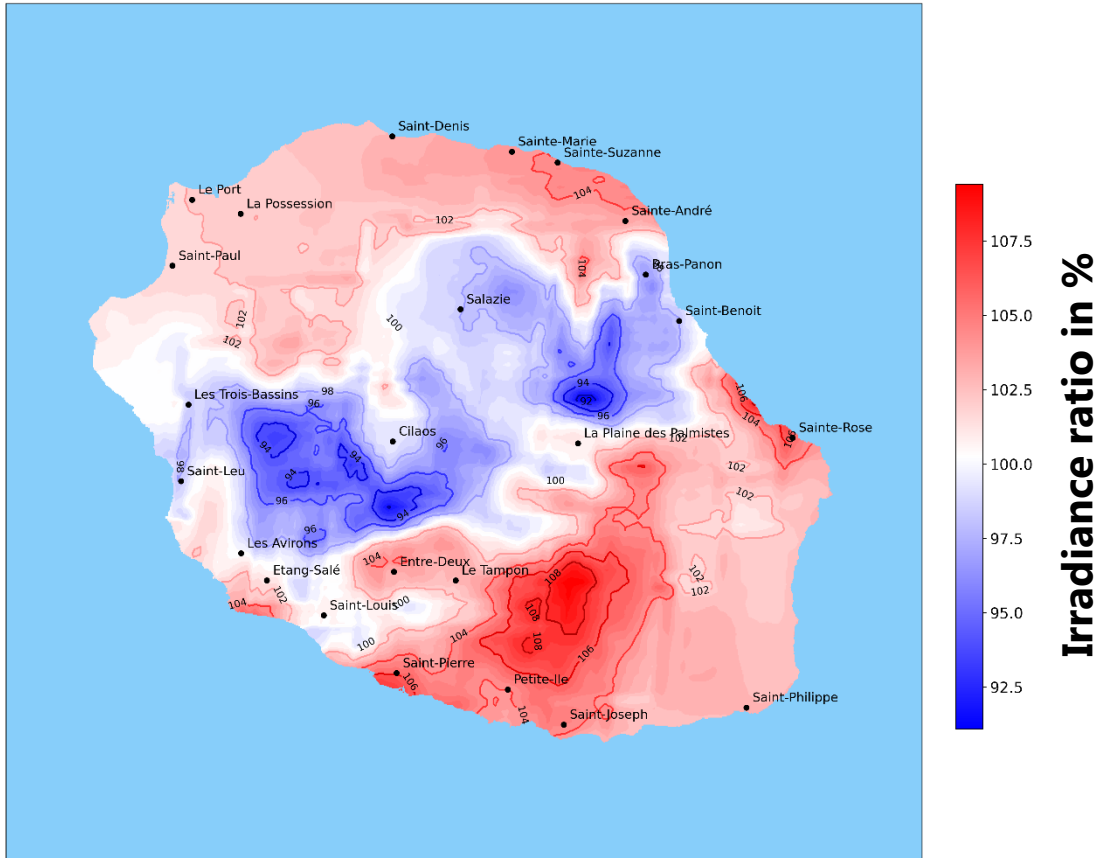
**Clients**: Energy traders, Aggregators

**Needs**: Optimise bids on the electricity markets, Reduce portfolio balancing costs, Anticipate electricity spot prices

# Other applications using satellite data

- Solar cadaster

**Reunion Island's cumulative annual ratio 2021/2020**




- Real-time monitoring for rooftop photovoltaic

# Resource Centre


- +20 Webinars on demand
- 4 Flagship projects
- 7 White Papers
- +100 Publications

# Questions welcome!

**Marion Lafuma**
**Business Development Manager**

marion.lafuma@reuniwatt.com