Climate Service for energy management:
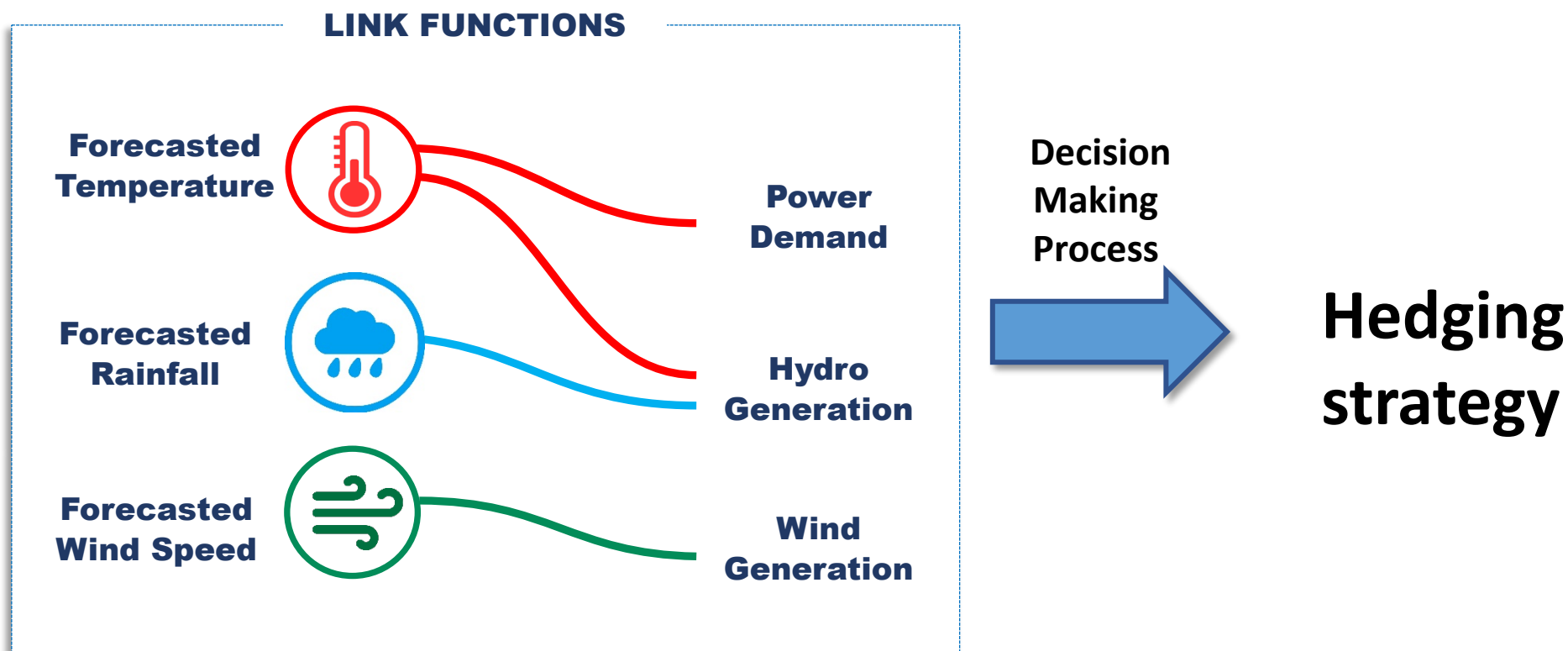# a practical example from the SECLI-FIRM project

The **economic** value of weather forecast
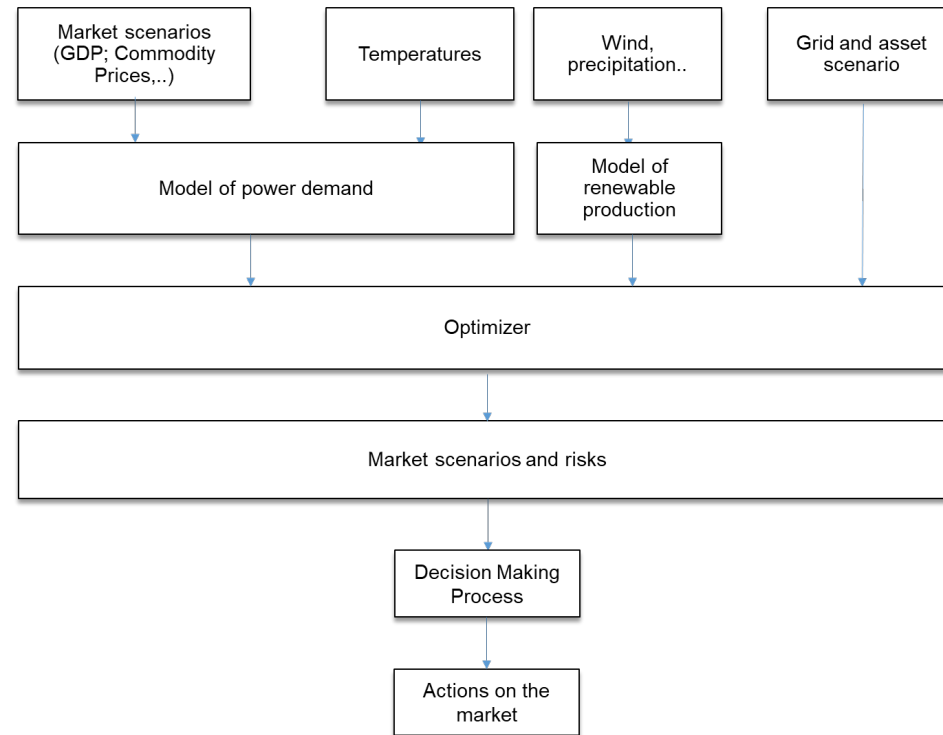

LINK FUNCTIONS

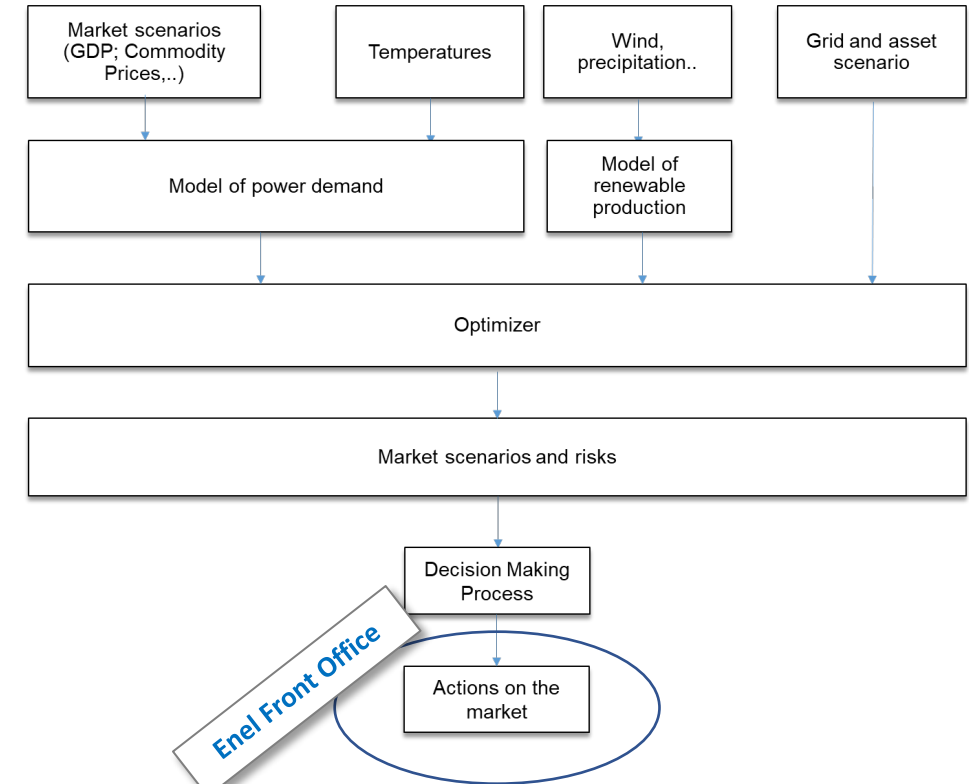Forecasted Temperature

Forecasted Rainfall

Forecasted Wind Speed

Power Demand

Hydro Generation

Wind Generation

Decision Making Process

Hedging strategy

SECLIFIRM

The Added Value of Seasonal Climate Forecasting for Integrated Risk Management

Enel Middle Office

Weather forecasts

Enel Decision Process

| Market scenarios (GDP; Commodity Prices,..) | Temperatures | Wind, precipitation.. | Grid and asset scenario |

Model of power demand | Model of renewable production

Optimizer

Market scenarios and risks

Decision Making Process

Actions on the market

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Enel Front Office

Actions on the market

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Example of actions on the market

Company revenues

Buy Weather Derivatives

Expected scenario

"I have enough money to last me the rest of my life, unless I buy something."

Leaves the position open

The hedging strategy is decided according to weather forecast

Expected scenario
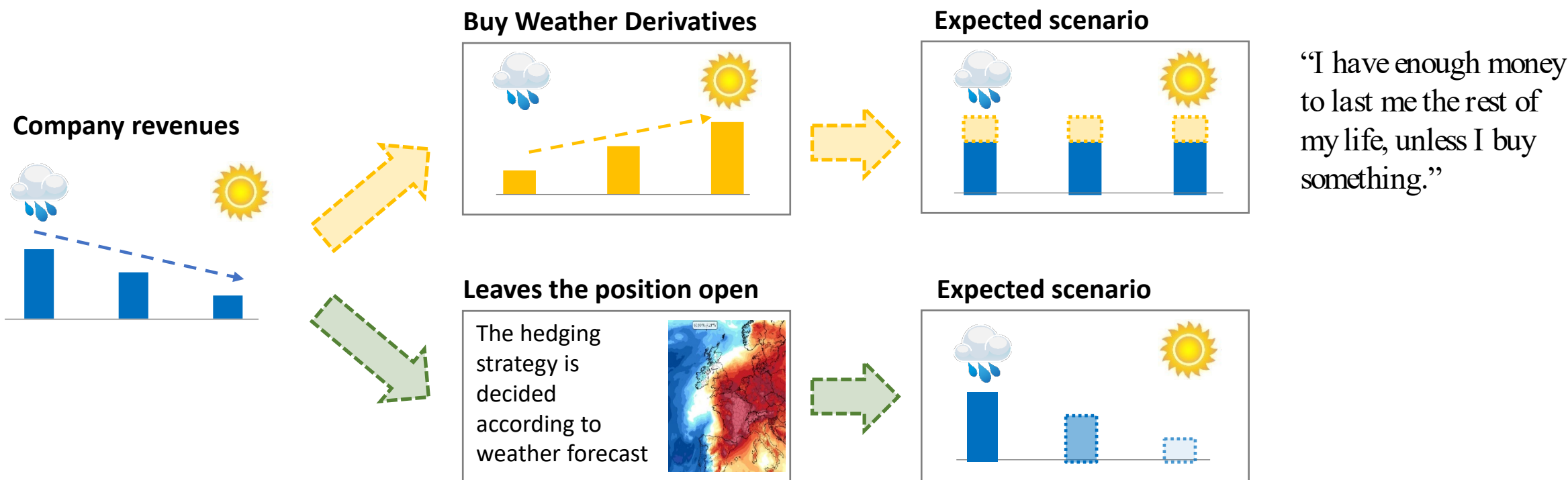
Real past case: case 1, July 2015 Heat wave in Italy

Case study 1
Heat waves in southern Europe and energy generation
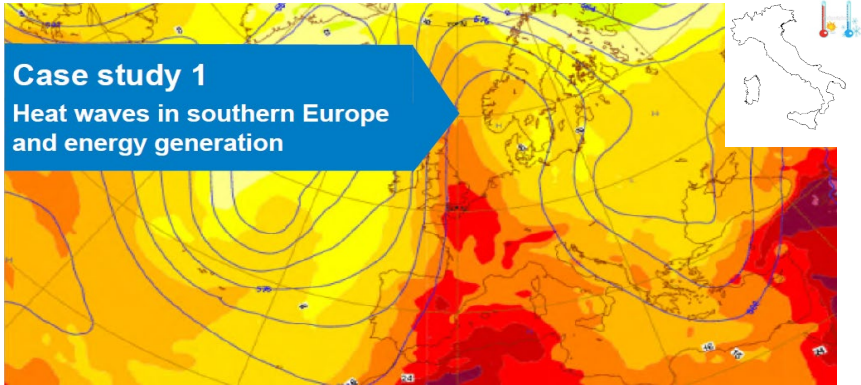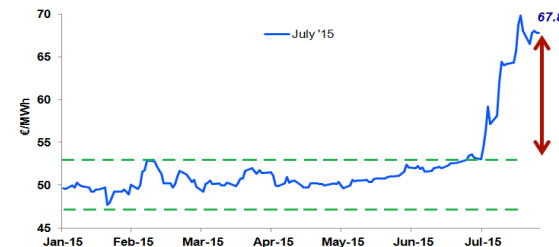
✓ **When**: July 2015.

✓ **Where**: Center-West Mediterranean Basin – Italy.

✓ **What**: long lasting intrusion of tropical air from Sahara.

✓ **Weather Effects**: up to 30 days of extremes temperatures: maxima up to 41 °C.

✓ **Effects on the grid**: extremes values of power demand.

AVERAGE TEMPERATURES IN ITALY 01/07/2015 - 31/08/2015

- Avg. Temperatures
- 15 Years Normal

AVERAGE POWER DEMAND IN ITALY 01/07/2015 - 31/08/2015

- ◆ Power Demand
- — min 2010-2014
- — max 2010-2014

67.8

July '15
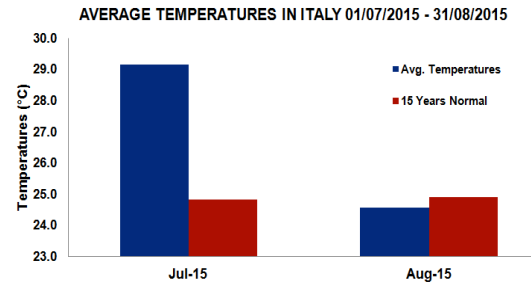
On a monthly basis the temperature anomaly of **July** was about 4.5 °C, really extreme values...
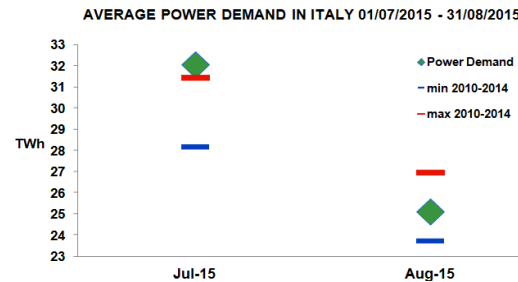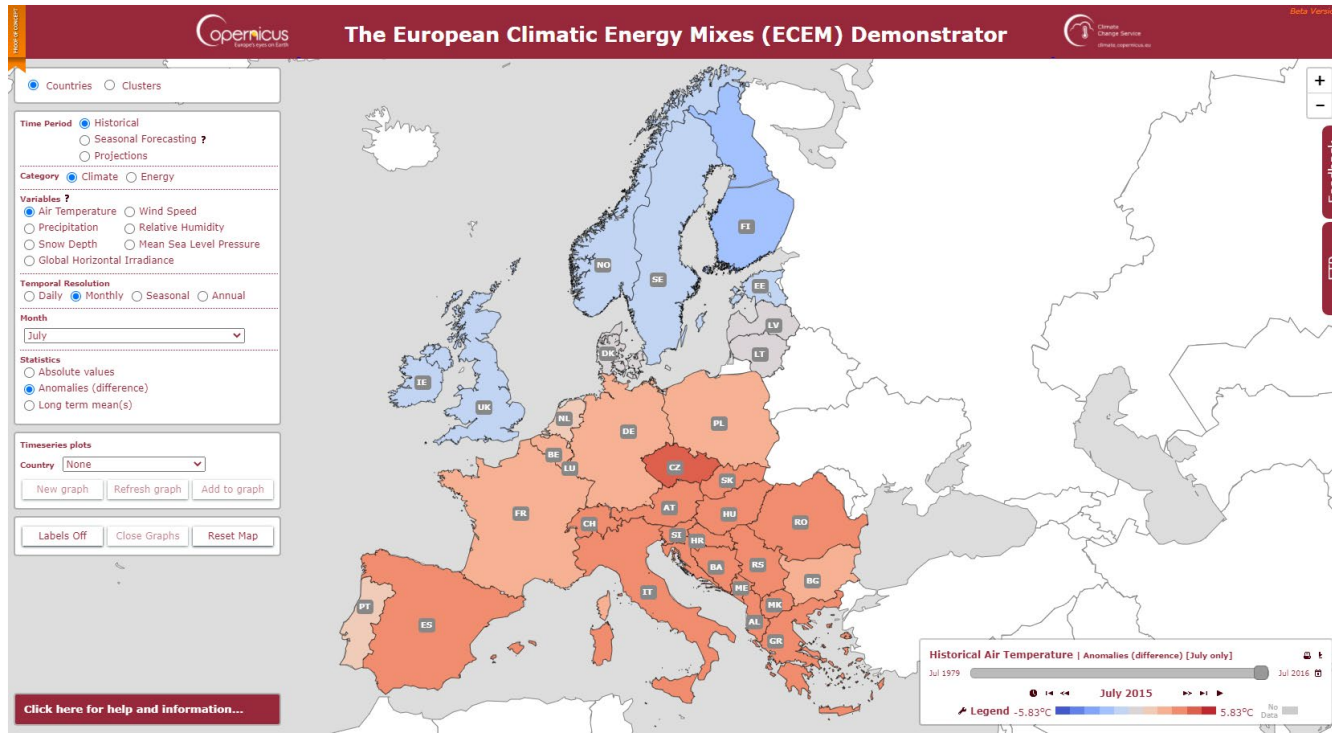
...so the power demand went to extremes too...

...and the power prices went up that were not properly forecasted in advance

University of East Anglia enel ENEA Met Office AWS TRUEPOWER WEMC World Energy & Meteorology Council eurac research alperia

The importance of WEMC Visual Tool
*Existing Prototype Functionality*

- Ability to plot historical climate and energy data alongside climate and energy projections at county and sub-country levels.

- As the prototype tool was intended for Educational audiences (high school students and teachers), **visual appeal and usability** were key factors in the development.

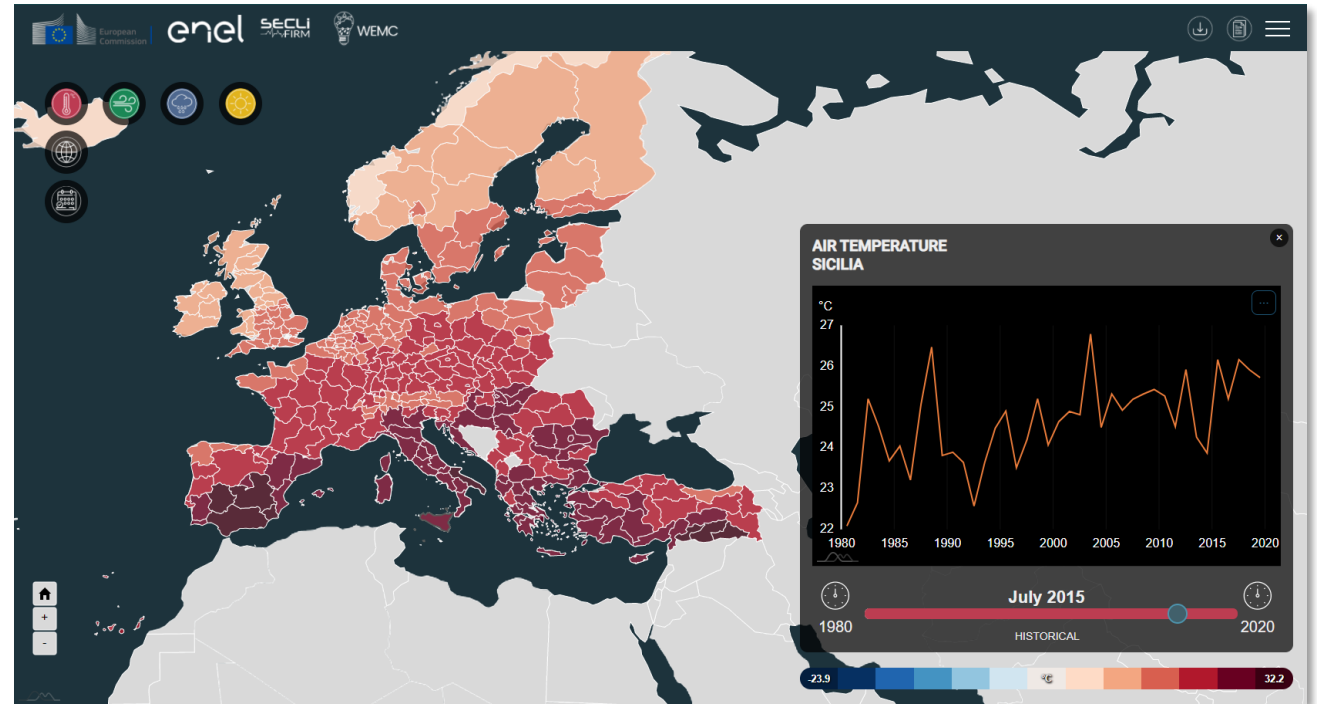# WEMC Visual Tool for Enel's needs
ENEL Feedback

- Display historical to modelled seasonal forecast data on a world map at country level

- Ability for different spatial resolution views on pre-determined areas of interest (cities and market zones)

- Functionality for session recall as saveable 'presets'

- Cached Sessions

- It also includes two emissions scenarios for projections data.
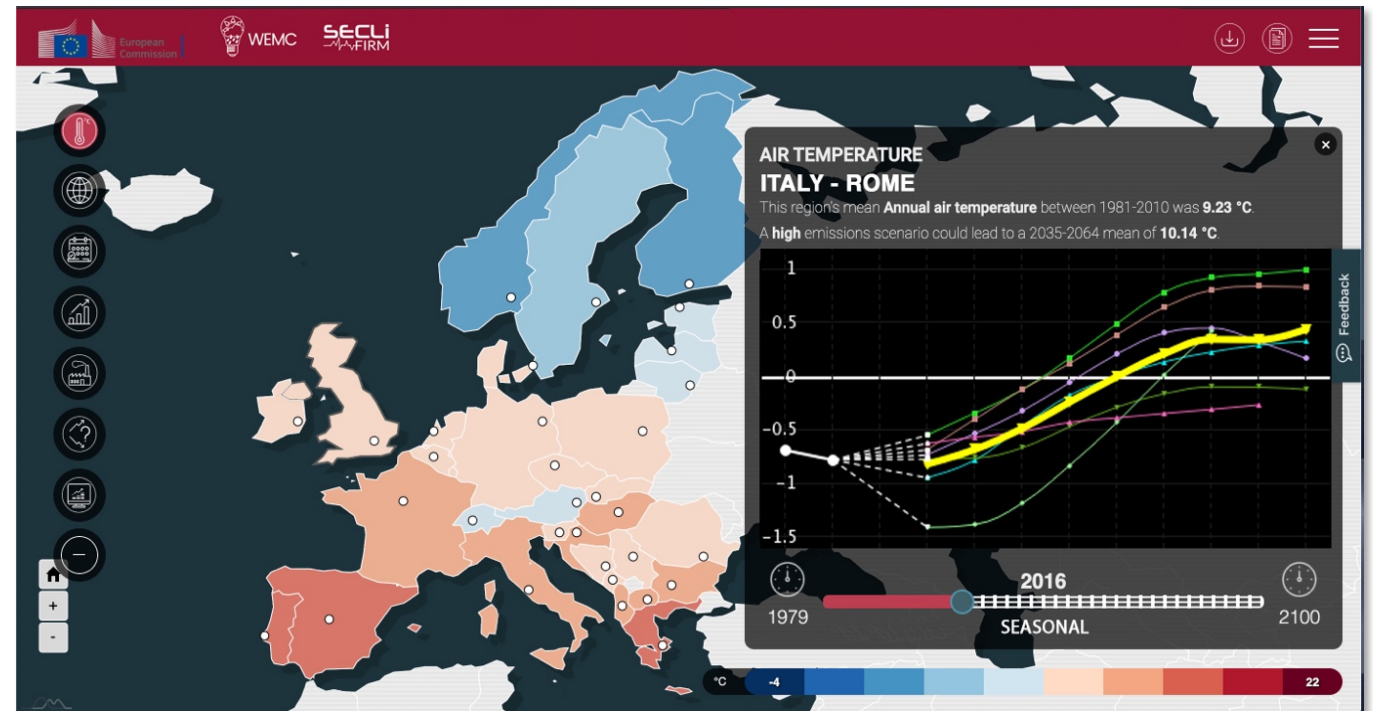
Functionality for Enel's needs

- Attractive and accessible user interface

- Responsive design for different platforms (desktop, mobile, tablet)

- Functionality for session recall as saveable 'presets'

- **Easy of use and easy access to data tailored to the user**