

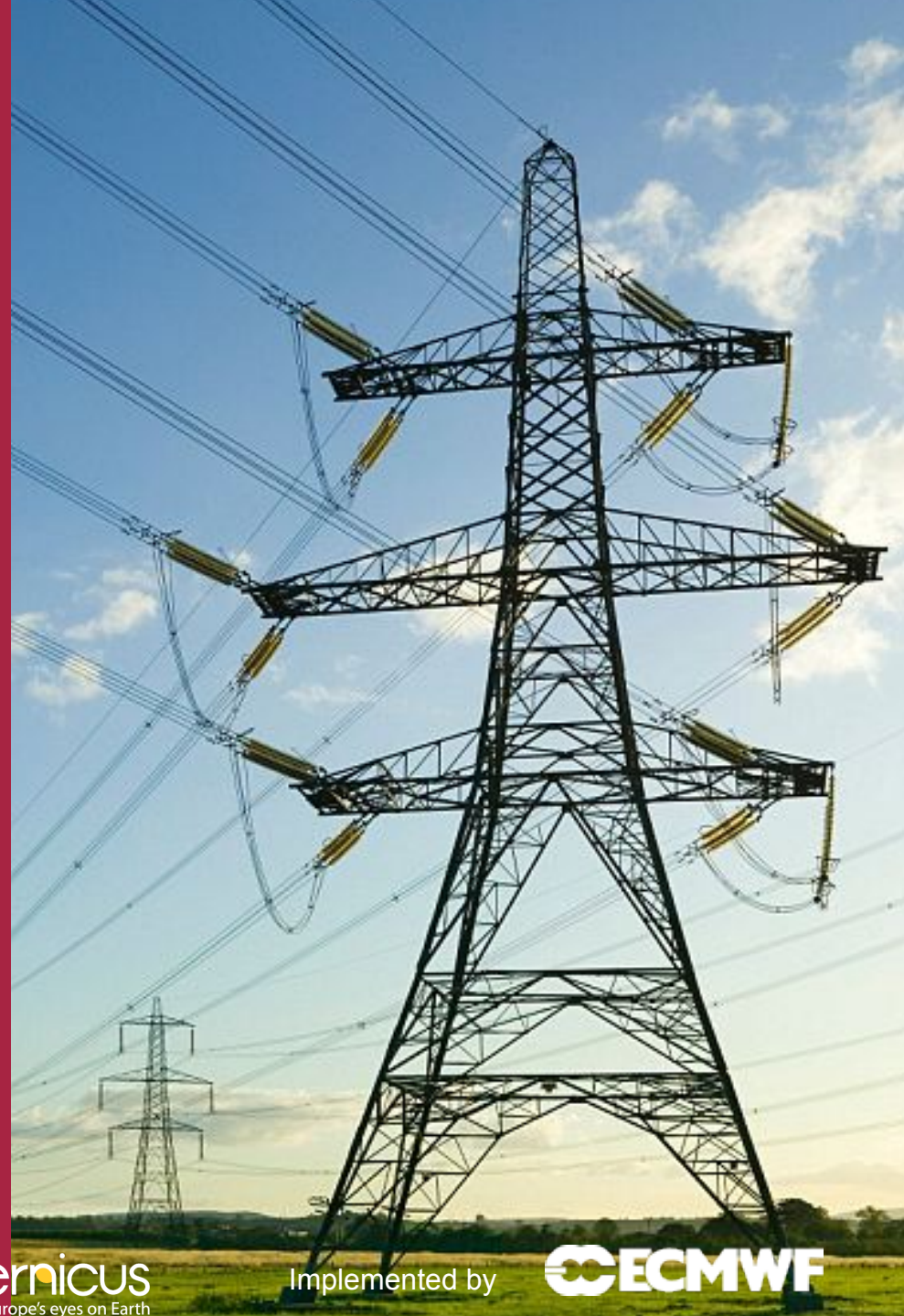
The ECEM demonstrator

*Clare Goodess and
Jon Blower
with thanks to Maik Riechert*

London, June 28 2016

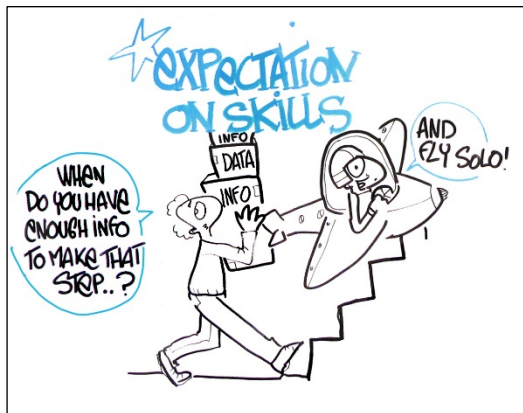


Implemented by



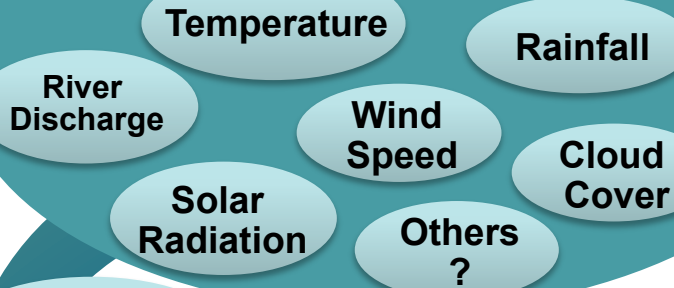
The ECEM Demonstrator

The purpose of the ECEM demonstrator is to enable the energy industry and policymakers to assess how well different energy supply mixes in Europe will meet demand, over different time horizons (from seasonal to long-term decadal planning), focusing on the role climate has on the mixes.



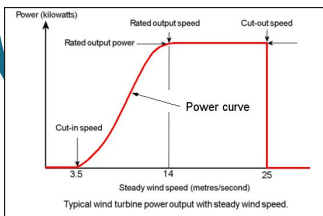
From Climate variables to Energy systems

Calibrated ECVs (WP2)

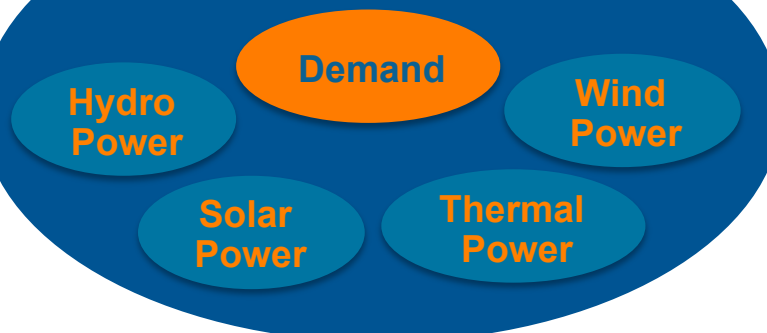


+Ancillary

Define Models / Transfer Functions
Select / Gather relevant Datasets



Energy Variables



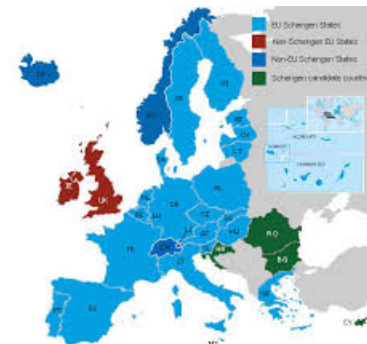
- Skill & Reliability
- Assessment of Seasonal Forecasts of Energy Variables

+ Extreme Events Case Studies

Impacts of Climate Variability & Change on Energy Variables

- Country Scale
- Historical Period
- Seas. Fcst
- Clim. Proj.

WP4



Underlying principles

- ★ Platform independent (interoperability)
- ★ Based on open-source software
- ★ Flexible design to allow further development & enhancement
- ★ Design optimised for use on laptops & tablets (not smartphones)
- ★ All data available through the Demonstrator will be open access
- ★ All development very well and clearly documented

- ★ Aiming for an iterative approach with frequent input from you
- ★ Key stages:
 - ★ Wireframe – December 2016
 - ★ Major review – April 2017
 - ★ Pre-operational system – November 2017-January 2018

Menu choices and variants – for the wireframe

- ★ Spatial aggregation
 - ★ 96 clusters or 33 countries
- ★ Time series (annual, seasonal, monthly), shortest timestep:
 - ★ Daily for historic
 - ★ Daily or intra-monthly spread for seasonal forecasts
 - ★ Monthly for climate projections
- ★ Time period averages
 - ★ 1979-2015 (historic)
 - ★ 1981-2010 (historic and modelled baseline)
 - ★ 2035-2064 (i.e., 30 years centres on 2050)

Climate variables (in wireframe)

- ★ Temperature (mean, and max/min?)
- ★ Precipitation
- ★ Global radiation
- ★ Sunshine hours
- ★ Relative humidity
- ★ Wind speed at 10m and 100m

- ★ Historical – based on ERA-interim
- ★ Seasonal forecasts – details to be determined
- ★ Climate projections
 - ★ Absolute values or anomalies (change from baseline)
 - ★ CMIP5 GCMs/Euro-CORDEX RCMs, RCP2.6/RCP4.5, RCP8.5
 - ★ Multi-model mean with 5th/95th percentiles

Energy variables (in wireframe)

- ★ Supply – conditional on choice of five e-Highway scenarios, plus present-day baseline – as well as climate (H, SF, CC)
 - ★ Total
 - ★ Hydro, Solar, Offshore/onshore wind, Thermal, Biofuel
 - ★ Energy (Wh) or Power (W)
- ★ Total demand (electricity only, Wh or W)
 - ★ Single estimate per country/cluster
 - ★ Not conditional on choice of e-Highway scenario
 - ★ Will be conditional on population (ancillary data) & climate
- ★ Energy balance (Wh or W)
 - ★ Demand minus total supply

Display functionalities (outputs)

- ★ Maps – Europe wide
 - ★ Countries/clusters
 - ★ Timestepping – manual/animation
- ★ Time-series plots
 - ★ Single series (with uncertainty estimates where relevant)
 - ★ Multiple series
- ★ Pie charts and bar charts
 - ★ Energy supply broken down by type (solar, wind etc)
- ★ Data download
 - ★ csv format from individual plots

How will the ECEM demonstrator look?

How will the user interact with the system?

Questions about the ECEM demonstrator for YOU!

- ★ Is the navigation intuitive?
- ★ Is the main menu structure appropriate?
 - ★ Will it cope with increased complexity, more choices etc?
- ★ What sort of timeseries/charts/maps do you want to compare with each other?
 - ★ On the same plot?
 - ★ In the same window/a new window?
- ★ What do you want to plot on maps?
- ★ How should countries/clusters be coloured in the default view?
- ★ How could we incorporate information about threshold exceedance?
 - ★ As frequency counts?
 - ★ As horizontal lines on time series?
 - ★ What thresholds are you interested in?