

The Added Value of Seasonal Climate Forecasting for Integrated Risk Management

How can seasonal climate forecasts help your business?

Prof. Alberto Troccoli

University of East Anglia and World Energy & Meteorology Council, Norwich, UK

1st SECLI-FIRM Stakeholder Workshop, Brussels, 7 June 2018







- <u>Why</u> this EU H2020 Research & Innovation Project The Added Value of Seasonal Climate Forecasts for Integrated Risk Management Decisions (SECLI-FIRM)?
- <u>How</u> SECLI-FIRM will assess the value of seasonal climate forecasts
- What will SECLI-FIRM produce





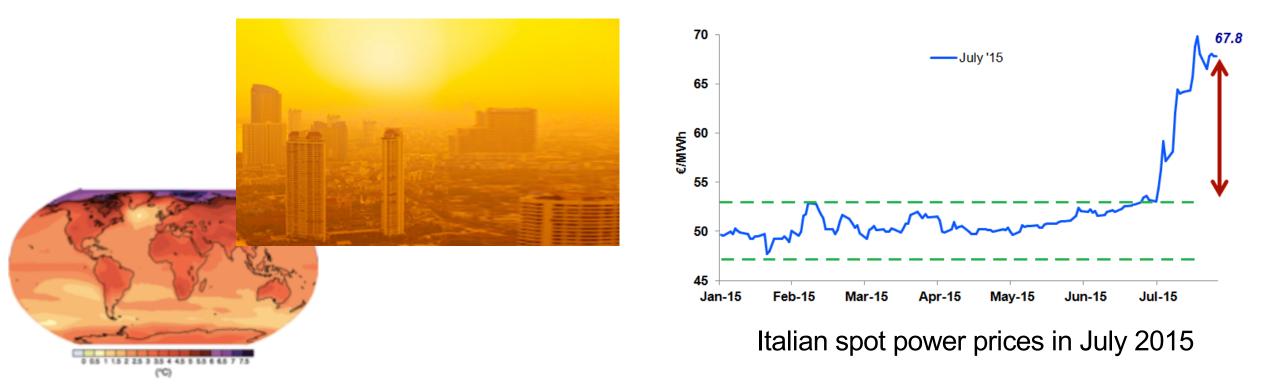


The Added Value of **Sea**sonal **Cli**mate Forecasts for Integrated **R**isk **M**anagement **D**ecisions (SECLI-FIRM)

- Duration: 42 months Feb 2018-Jul 2021
- Partners: 9 (see logos below)
- Budget: 4.6 M€



The Why



Climatic factors play an increasing key role in portfolio management of energy and water industries due to changes in both the climate and industry





The Why



An increasing proportion of weather-dependent generation is being injected into the power systems. Let's not forget energy demand also is affected by climate.











Skill of seasonal forecast

Correlation for Summer (Jun-Jul-Aug) with forecast start date 1 May

Wind speed Precipitation Irradiance Relative humidity Temperature ECMWF Sys 4.4 -6.2 6.8 6.2 6.4 6.6 service consistent for (14 temperature -0.4 -0.2 0.0 0.2 0.4 0.4 aroun correlation for LDR aind speed at 10m 48 48 42 00 02 04 -0.4 -0.2 0.0 0.2 0.4 Peanue constatue for 1.0 instance Météo-France Sys -42 68 62 64 GloSea5 Office Met -0.4 -0.2 0.0 12 14 -04 -03 63 64

Bett et al., 2018

SECLI

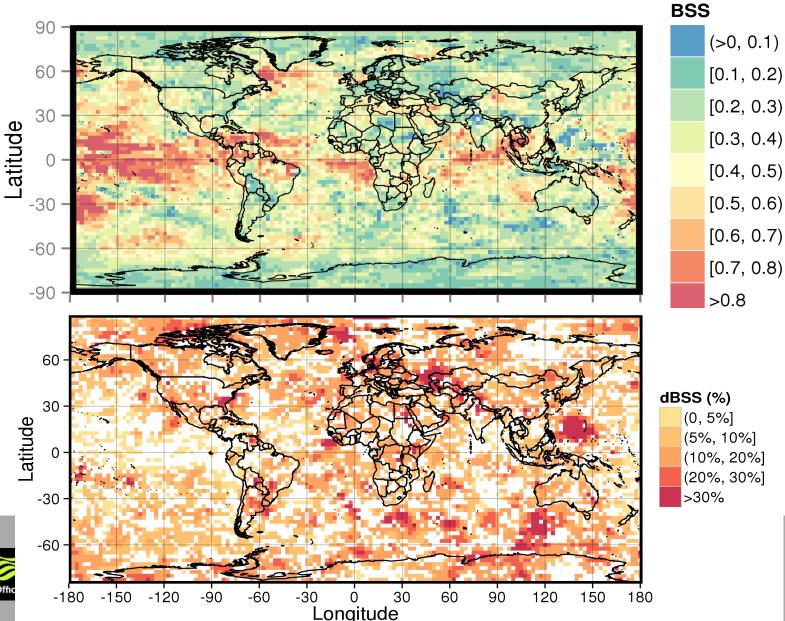
The 'power' of multi-model

Max [Grand MME]

Max [Grand MME] minus Max [ENSEMBLES or CliPAS/APCC] JJA

Alessandri et al., 2017







The How – Set up



A control case will only utilise climatological conditions based on historical averages, while a test case will also consider individually optimised and tailored state-of-the-art probabilistic seasonal forecasts

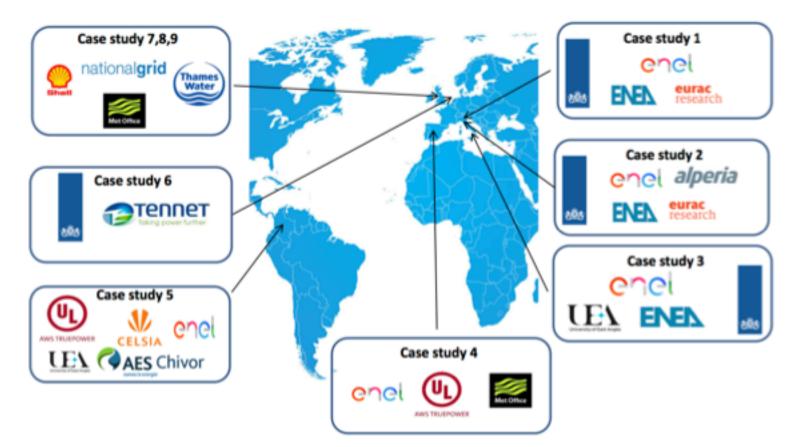




The How – Experiments

Nine cases for Europe and S. America will be investigated.

These represent recent seasons with anomalous climate conditions leading to problematic and quantifiable impacts for the energy and/or water industry. They will be co-designed by industrial and research partners









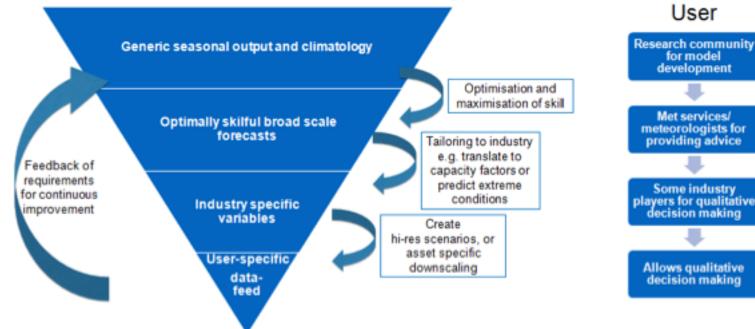


n 776868

The How

Process Chain for Seasonal Forecasting

SECLi



SECLI-FIRM will tailor seasonal climate forecast for decision making according to tested procedures



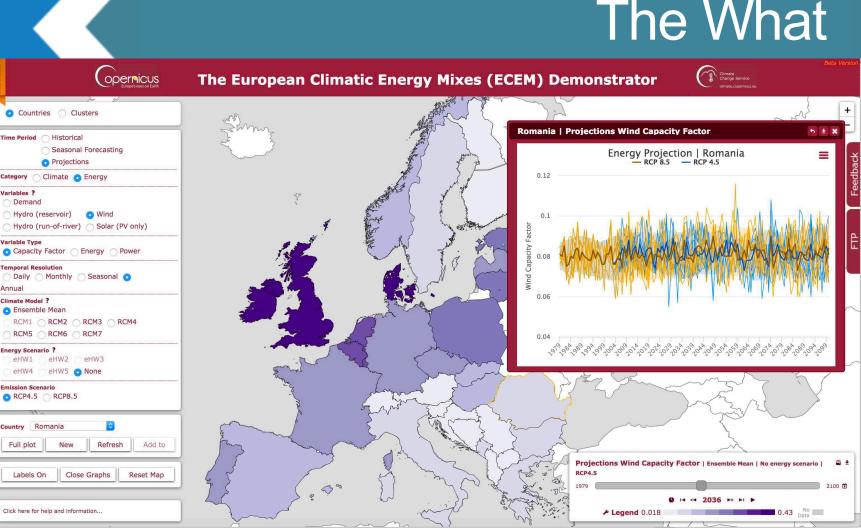


- 1. Enhanced performance of seasonal climate forecasts in specific geographical areas applied to particular industry user-defined questions
- 2. Quantified (socio-)economic added-value of seasonal climate forecasts for the case study examples
- 3. A proof of concept/demonstrator of climate service, building on existing technology developed by EU Copernicus Climate Change Service



SECLi

SECLI-FIRM will demonstrate how the use of improved seasonal climate forecasts can add socio-economic value to decision-making, in the energy sector, as well as in the water sector, with implications for other sectors



http://ecem.climate.copernicus.eu/demo









n 776868



Case Study – Grid

Use of seasonal forecasts by the UK National Grid Operator



The objective is to illustrate the benefits of using seasonal forecast information to better predict the UK winter mean electricity demand and wind power



Executive Summary: Use of seasonal forecasts by the UK National Grid Operator

Boosting Decision Making

The objective is to illustrate the benefits of using seasonal forecast information to better predict the UK winter mean electricity demand and wind power.

The seasonal forecasting context

The case study focuses on demonstrating the impact of using seasonal temperature, wind and atmospheric circulation forecast information for the United Kingdom (UK) National Grid operator. The climate forecasts will be translated into energy information, to give a forecast of writter UK energy demand and wind power.

Sectoral challenges and opportunities

The gid network has a central role to play in the future energy mix. In a fast-shanging energy indicadpe, National Gid is working to meet ambitosia to vacinom energy targets, connect new sources of energy to the people who use them, and find innovative ways to enable the decatorionisticn of the and transport. Thesid of each wither, the UK gid operator must estimate the demand over the coming winter, with a particular focus on peak electricity and and over the coming winter, with a particular focus on peak electricity by demitying potential risks to the system ahead of the writer, we will explore whether it is possible to relocab electricity supply available to meet the demand.

Grank Agreement II. 770000		Grant Agreement n. 776868	
	SECLI	- N.A.	















Case Study – Marine

Wind and wave conditions during seasonal 'shoulder' months in the North Sea and energy logistics



The aim of this case study is to illustrate the application of seasonal forecast in the offshore oil and gas industry for the identification of calm weather windows in autumn and spring months to reduce operational costs



Executive Summary: Wind and wave conditions during seasonal 'shoulder' months in the North Sea and Energy logistics

Boosting Decision Making

The aim of this case study is to illustrate the application of longer-range forceast data than are typically used by the offshore oil and gas industry for the identification of calm weather windows in autumn and spring months, facilitating earlier decision-making and reduced operational costs for the marine energy sector.

The seasonal forecasting contex

Seasonal forecast evaluation will consider the skill of predicting calm weather windows in autumn (September to November) and spring (March to May) months in the North Sea withon the years 2016 to 2018 – Illustrated from the point of view of the Asset Manager or Metocean Engineer planning operations such as those involving drilling, large infrastructure installation or decommissioning activities.

Sectoral challenges and opportunities

The expense of working in the offshore environment places special emphasis on the equirement to reduce supply chain costs, such as those related to vesel charter and eresonnel management, through efficient operational planning. Al present, the application of the latest weather science developments by the offshore oil and gas inductive is traditionally ery conservative, with limited use of fortigibility, monthly and sub-seasonal outputs, or even limite projections and teleconnections.















Case Study – Water

Use of seasonal forecasts for water management to identify periods of stress to the supply-demand balance



By targeting periods of stress to the UK supplydemand balance, we will assess the role of seasonal forecasts in the operational management of the water system and in the experience of the consumer through supply restrictions



Executive Summary: Use of seasonal forecasts for water management to identify periods of stress to the supply-demand balance.

Boosting Decision Making

The water industry case studies will explore the application of seasonal forecasting to identify periods of stress to the UK supply-demand balance. These seasonal signatures may highlight chronic or acute periods of stress many weeks out, which will affect the operational management of the water system and experience of the consumer through supply restrictions.

The seasonal forecasting conte

The shift to identify periods of chronic stress (protonged excessively high demarch) including conditions including at a discuption externate protologe deask in demand due to toing periods of below werage temperatures or dy and hot summers will be explored. If such conditions were precidable at sessonal resolution, it would he figh sign demand and support preparedress in terms of capacity and demand management. The ability to identify and ability beginded the demand) including the alwases or actempt oid whiter conditions will ability excluding in demand and support preparedress in terms of capacity in the ability to identify acting the other and and support preparedress in terms or estimation. If would he fit figs high visability if reachers the sessonal resolution, it would he fit figs high visability if reachers the sessonal resolution, it would he fit figs high visability if reachers the sessonal resolution. It would he fit figs high visability if reachers the sessonal resolution.

	www.secli-firm.eu
--	-------------------













Thank you for your attention

If you would like to know more about the SECLI-FIRM project, please visit: http://www.secli-firm.eu

