Climate Change

C3S Energy Webinar
Global Wind and Solar Power Energy Indicators

10 July 2024

¨Introduction to C3S Operational Service for the energy sector¨

Nube Gonzalez-Reviriego (C3S, ECMWF)

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Copernicus Services

WHAT's COPERNICUS?

Copernicus is the Earth Observation component of the European Union's Space Programme

COPERNICUS' AIM FOR

developing European services based on satellite Earth Observation and in situ (non space) data

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Copernicus Climate Change Service (C3S)

Climate Change

Climate Change Service

The Copernicus Climate Change Service (C3S) supports society by providing authoritative information about the past, present and future climate in Europe and the rest of the World.

OPEN DATA
Provide reliable and open, free of charge, access to climate datasets

TRACEABILITY
Provide documentation, workflows and code that allow a full traceability of the information

SECTORAL IMPACTS
Showcase how different sectors use C3S data for real applications

QUALITY ASSURANCE
Offer quality information of the datasets by independent experts

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More information on C3S activities

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https://climate.copernicus.eu/webinars

Webinar 1 - Global Climate Indicators

Webinar slides:

- Introduction, Nube Gonzalez-Reviriego (ECMWF)
- Welcome, Alberto Troccoli (ICS)
- Processing methodologies and selected examples of global climate indicators for the C3S Global Energy Climate Service, Letizia Lusito (ICS)
- Tools for climate data processing: temporal downscaling, exclusion layers and spatial aggregation, Stefano Campostrini (ICS)

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C3S Energy (1st phase)

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https://climate.copernicus.eu/opeational-service-energy-sector

The C3S Operational service for the energy sector provide free and quality assured data that help in:

- **Identifying optimal sites**
- **Planning grid extension**
- **Assessing potential yield**
- **Adapting to adverse conditions**
- **Among others…**

Welcome to the Climate Data Store

Dive into this wealth of information about the Earth's past, present and future climate.

It is freely available and functions as a one-stop shop to explore climate data. Register for free to obtain access to the CDS and its Toolbox.

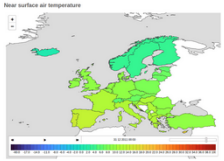
We are constantly improving the services and adding new datasets. For latest announcements, watch the posts on the C3S forum.

Climate and energy indicators for Europe from 1979 to present derived from reanalysis

Dataset | Energy | Reanalysis | Europe

The Copernicus climate change service (C3S) operational energy dataset provides climate and energy indicators for the European energy sector. The climate-relevant indicators for the energy sector considered are: air temperature, precipitation, incoming solar radiation, wind speed at 10 m and 100 m, and mean sea level air pressure. The energy indicators are electricity demand and power generation f...

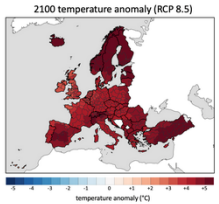
Updated 2024-04-16



Climate and energy indicators for Europe from 2005 to 2100 derived from climate projections

Dataset | Energy | Europe | Atmosphere (surface) | Climate projections

This dataset provides climate and energy indicators for the Europe as part of the Copernicus climate change service (C3S) Energy operational service. The climate-relevant indicators for the energy sector considered are: air temperature, precipitation, incoming solar radiation, wind speed at 10 m and 100 m, and mean sea level air pressure. The energy indicators are electricity demand and power gene...



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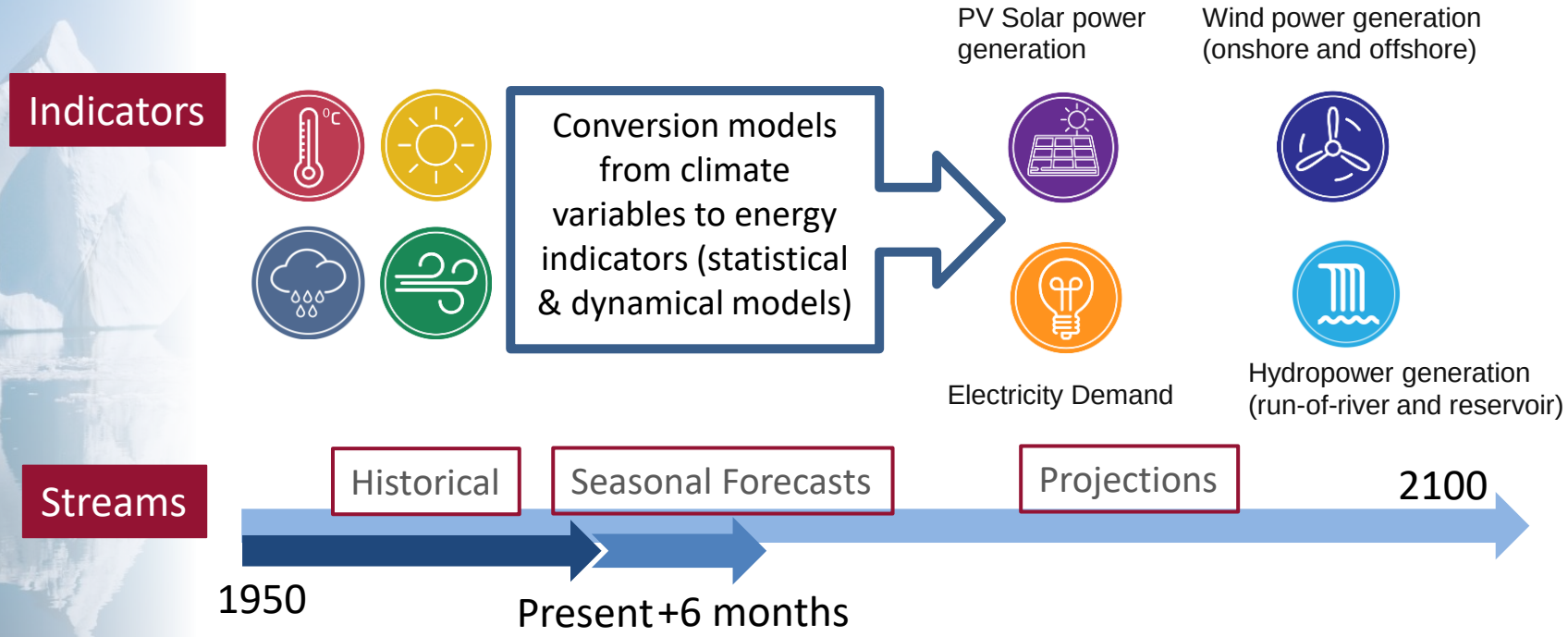
C3S Energy (2nd phase)

Enhance operational service for the energy sector: expand globally, improve conversion models and add seasonal data.



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C3S Energy – Climate Indicators by Stream

Table 3: Summary of products to be delivered by C3S Energy. Note on abbreviations used in the Table: EC stands for ECMWF, MF for Météo-France, MO for Met Office, E-Cordex: Euro-Cordex, BA: Bias-Adjusted, C&C: Country and Cluster (the latter are sub-country regions/areas), B.o.: Based on.

Variable	Timescale	Source	Highest Temporal Resolution	Highest Spatial Resolution	Spatial Aggregation
CLIMATE INDICATORS					
Temperature	Historical	ERA5	1 hour	0.25 deg	C&C
	Seasonal	EC, MF, MO	1 day	1 deg	Country
	Projection	E-Cordex (BA)	3 hour	0.25 deg	C&C
Precipitation	Historical	ERA5	1 hour	0.25 deg	C&C
	Seasonal	EC, MF, MO	1 day	1 deg	Country
	Projection	E-Cordex (BA)	1 day	0.25 deg	C&C
Wind (10 m and 100 m)	Historical	ERA5	1 hour	0.25 deg	C&C
	Seasonal	EC, MF, MO	6 hours	1 deg	Country
	Projection	E-Cordex (BA)	3 hour	0.25 deg	C&C
Solar Radiation at surface	Historical	ERA5 (BA)	1 hour	0.25 deg	C&C
	Seasonal	EC, MF, MO	1 day	1 deg	Country
	Projection	E-Cordex (BA)	3 hour	0.25 deg	C&C
Mean Sea Level Pressure	Historical	ERA5	1 hour	0.25 deg	Country
	Projection	Euro-Cordex	1 day	0.25 deg	Country

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C3S Energy – Energy Indicators by Stream

ENERGY INDICATORS					
Electricity Demand	Historical	B.o. ERA5	1 day	Country	Country
	Seasonal	B.o. EC, MF, MO	1 day	Country	Country
	Projection	B.o. E-Cordex	1 day	Country	Country
Wind Power (onshore and offshore)	Historical	B.o. ERA5	1 hour	0.25 deg	C&C
	Seasonal	B.o. EC, MF, MO	6 hours	1 deg	Country
	Projection	B.o. E-Cordex	3 hour	0.25 deg	C&C
Solar Power (PV)	Historical	B.o. ERA5	1 hour	0.25 deg	C&C
	Seasonal	B.o. EC, MF, MO	1 day	1 deg	Country
	Projection	B.o. E-Cordex	3 hour	0.25 deg	C&C
Hydro Power (Run-of-River and Reservoir)	Historical	B.o. ERA5	1 day	Country	Country
	Seasonal	B.o. EC, MF, MO	1 day	Country	Country
	Projection	B.o. E-Cordex	1 day	Country	Country

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C3S Energy - General Workflow

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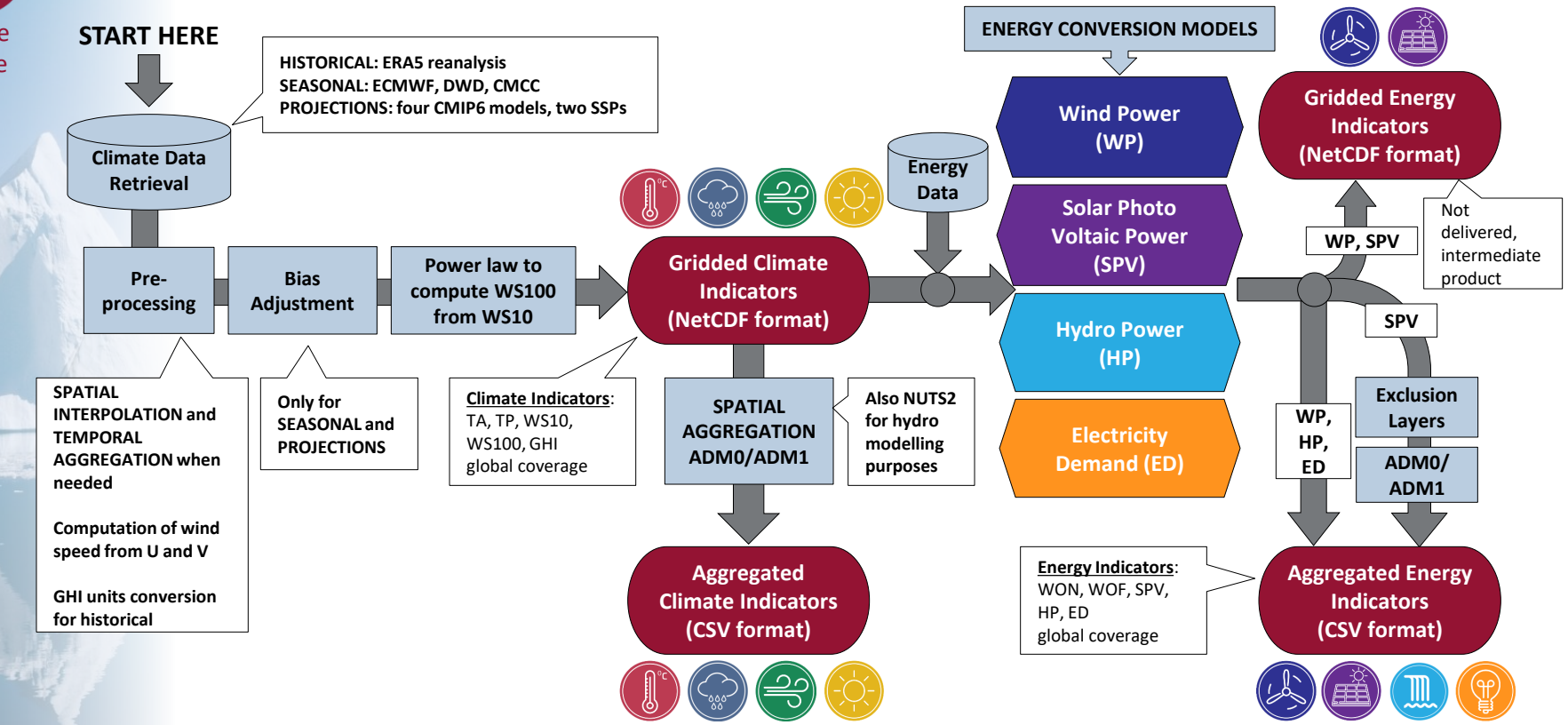

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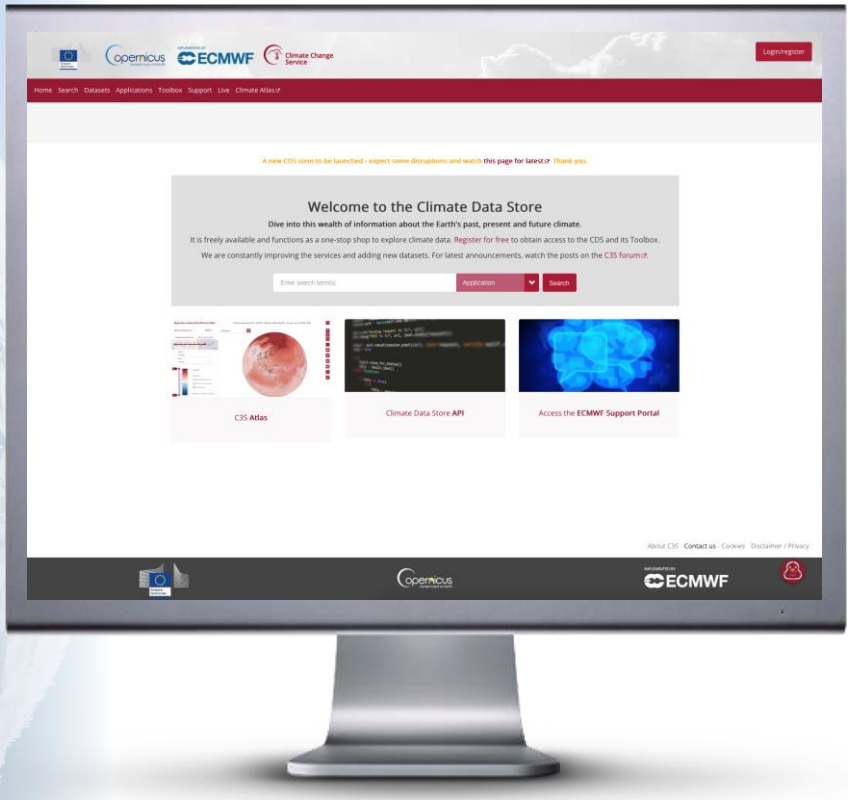
Where to find the energy datasets?



The energy datasets will be available at the C3S Climate Data Store (CDS)

- Open data
- Free-of-charge
- Fully documented
- Quality assured

https://cds.climate.copernicus.eu

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THANK YOU!

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