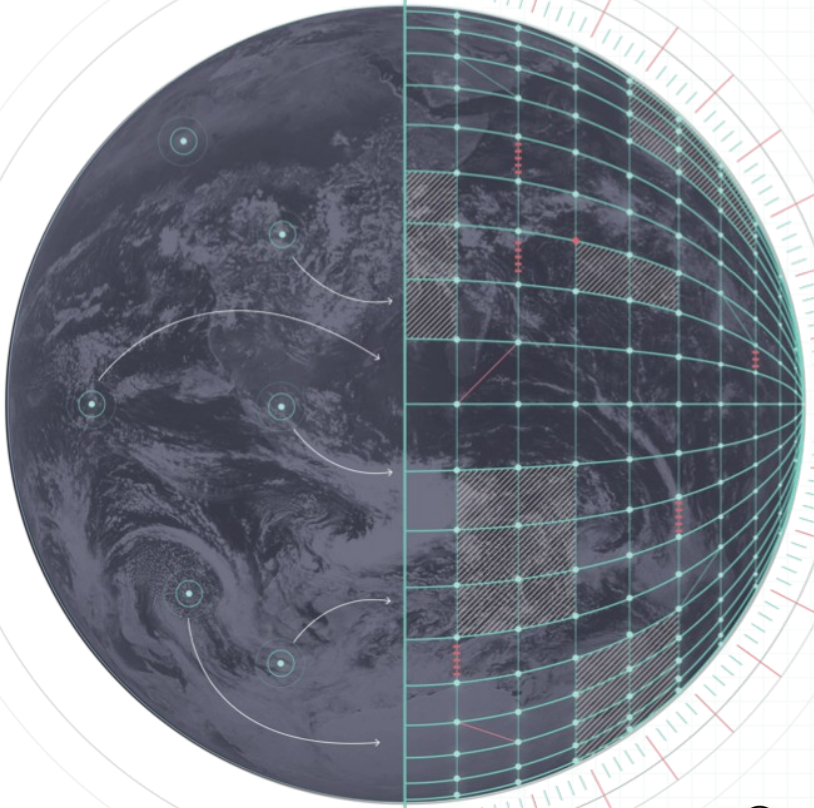


Renewable Energy Indicators in the ClimateDT (DE340)

Destination Earth Annual Meeting,

Bonn, September 2026

Francesc Roura-Adserias, on behalf of the Climate Services Team from the BSC

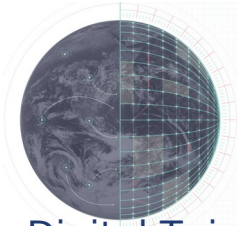
energy-destine@bsc.es

User interaction is fundamental

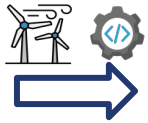


Physical world

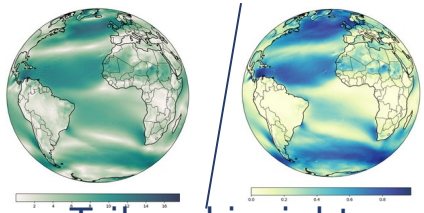
Earth System Models



Digital Twin (simulated 'living' replica)



Energy indicators



Tailored insights (e.g; Wind energy sectors)

End User



Variables used
Wind speed at 10m
Wind speed at 100m
Temperature at 2m
Solar radiation



Variables used
Wind speed at 10m
Wind speed at 100m
Temperature at 2m
Solar radiation



Variables needed
Wind speed at further hight levels
Further radiation variables
Metocean (ocean waves)



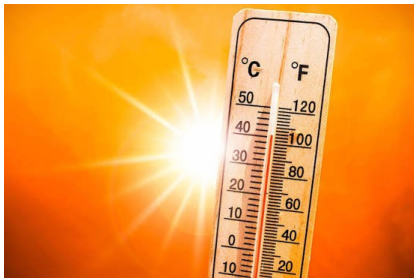


Indicators produced

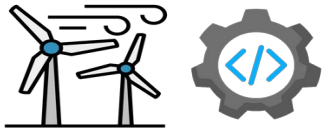
Temperature-based demand indicators (cooling and heating)

Wind speed statistics

Production indicators (solar, wind)





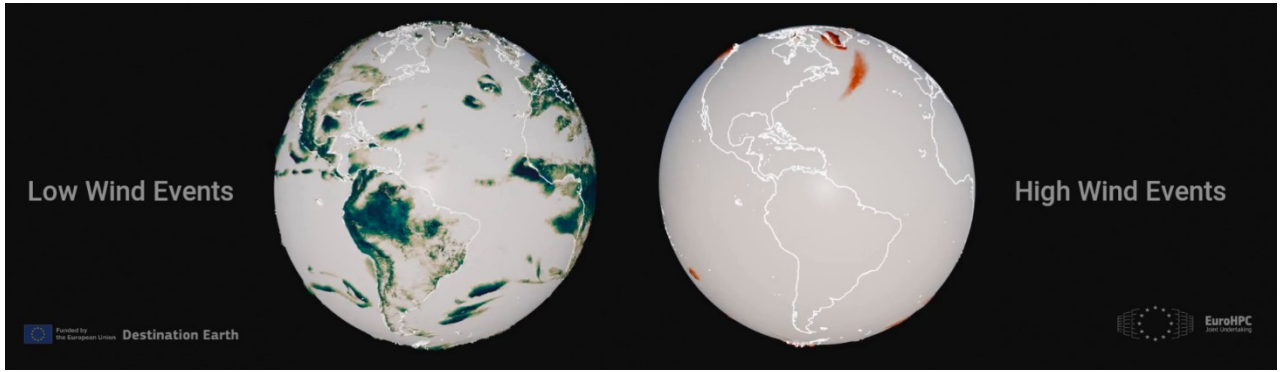


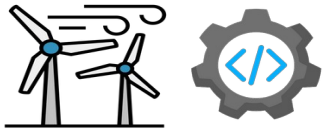
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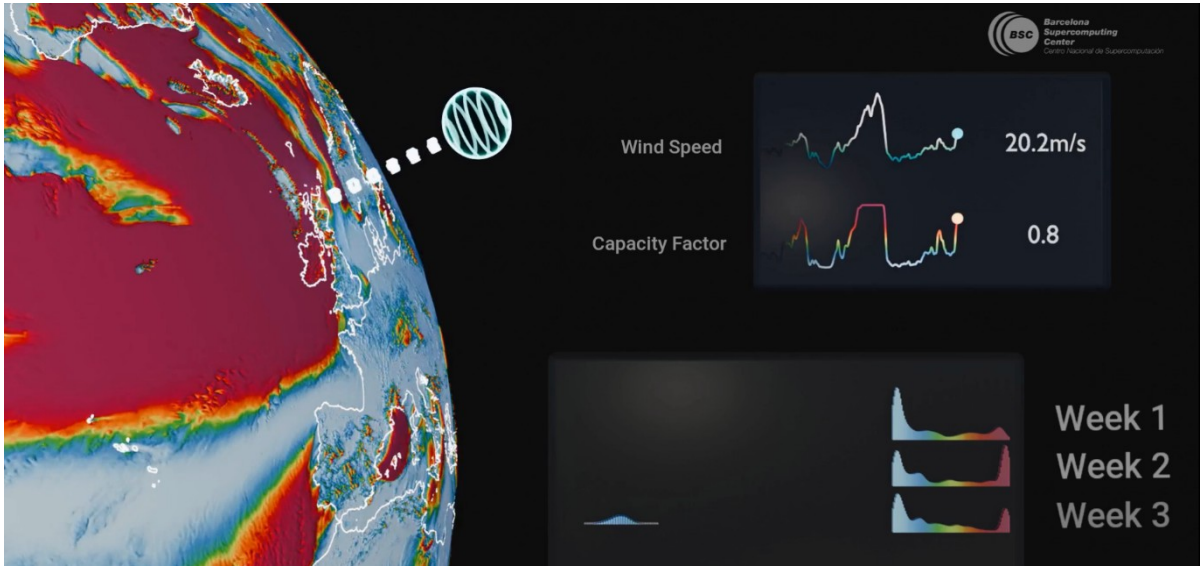


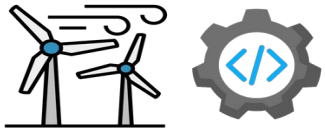
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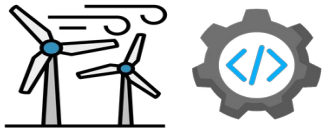
Production indicators (solar, wind)





Indicators produced
Temperature-based demand indicators (cooling and heating)
Wind speed statistics
Production indicators (solar, wind)

Indicators wanted
Spatially-aggregated time series
Installation/maintenance windows
Generic wind production indicator
Hydropower



Needs from the indicators' side

Variables needed
Wind speed at further hight levels
Further radiation variables
Metocean (ocean waves)

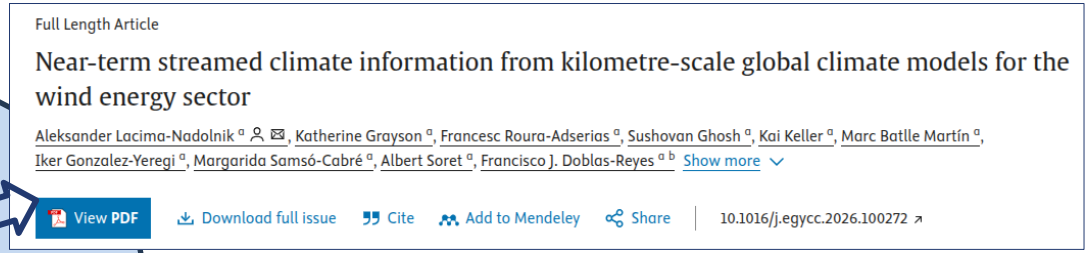
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Spatially-aggregated time series
Installation/maintenance windows
Generic wind production indicator
Hydropower

Can I trust the results?



End User

Can I trust the results?



Full Length Article

Near-term streamed climate information from kilometre-scale global climate models for the wind energy sector

Aleksander Lacima-Nadolnik [a], Katherine Grayson [a], Francesc Roura-Adserias [a], Sushovan Ghosh [a], Kai Keller [a], Marc Batlle Martín [a], Iker Gonzalez-Yeregi [a], Margarida Samsó-Cabré [a], Albert Soret [a], Francisco J. Doblas-Reyes [a b] Show more

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Kilometre-scale IFS-NEMO simulations from the Climate Change Adaptation Digital Twin for wind energy: evaluation and added value (Ghosh et al., submitted)

Energy indicators technical paper (under preparation)

End User



DestinE Use Cases

Take home messages

- Consolidated indicators are in production.
- Additions as a result of coproduction with key users are underway.
- Still there is a need to build trust.
- Data availability is key to boost interaction with the sector.

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Earth Sciences Department
Barcelona Supercomputing Center
Centro Nacional de Supercomputación

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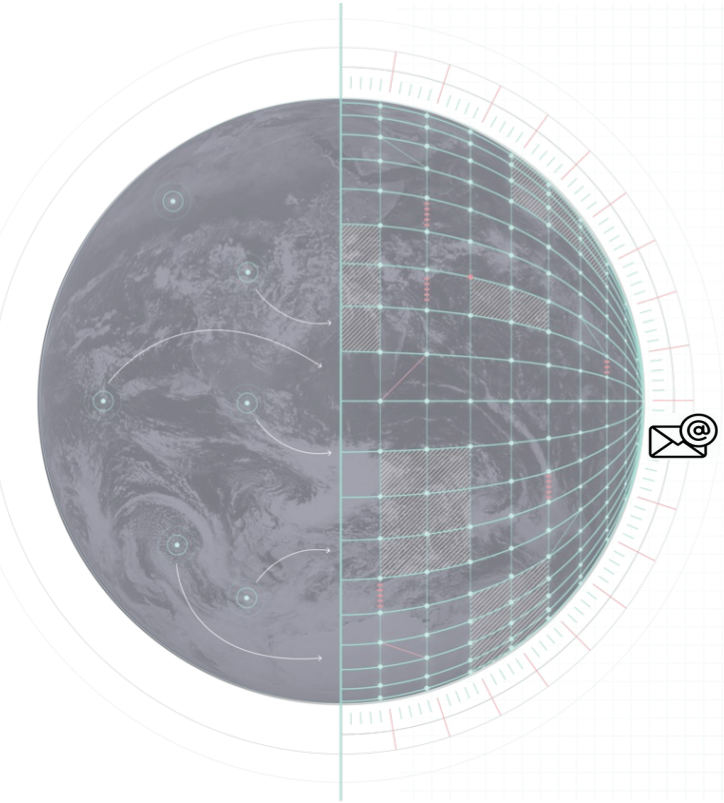
Funded by the European Union
Destination Earth implemented by ECMWF esa EUMETSAT

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Thank you !!

energy-destine@bsc.es