S2S4E
Climate Services for Clean Energy

OUTLOOK

15 December 2020

with

Sub-seasonal forecasts

for the weeks of 14 - 20 December,
21 - 27 December,
28 December 2020 - 3 January 2021,
and 4 - 10 January 2021

&

Seasonal forecasts

for the months of January, February,
and March 2021

The S2S4E Decision Support Tool (DST) v1.6.0 is an operational climate service that integrates, for the first time, sub-seasonal to seasonal climate predictions with renewable energy production and electricity demand.

Find examples of how the DST forecasts can inform the energy sector in the

Case Studies Factsheets

available at:

www.S2S4E.eu

This outlook presents forecasts available on the DST on the 15th of December 2020 for the coming four weeks and next three months. These S2S4E forecasts were made by post-processing the climate prediction systems ECMWF-Ext-ENS (sub-seasonal) and ECMWF SEAS5 (seasonal), following the methodology described in the **advanced help** of the DST.

SUMMARY

Mild December in Europe

This week (14-20 December), temperatures warmer than normal for the season are expected across Europe, with a risk of high extremes. Unusually high temperatures will persist in eastern Europe during the Christmas holidays.

Rainy week in western Europe

Above normal precipitation is expected this week (14-20 December) in western Europe towards the Atlantic, as well as in parts of Scandinavia, with the exception of northern Norway where below normal precipitation is expected.

Below normal wind speed in the next weeks

Wind speed is predicted to be below normal throughout Europe in the week 14-20 December, with a risk of extremes persisting in Scandinavia next week (21-27 December). In addition, seasonal forecasts show that the British Isles and North Sea will see below normal wind speeds in January.

Unusually warm winter in the Mediterranean

Warmer than normal temperatures are expected to persist in the winter months in the Mediterranean and parts of Scandinavia. However, a stormy pattern is forecasted for Sweden and Finland in late winter.

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If you have queries or feedback you can contact us at:

s2s4e@bsc.es

The DST outlooks are released once per month and are available at:

s2s4e.eu/climate-services/outlooks

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This project has received funding from the Horizon 2020 programme under grant agreement n°776787. The content of this report reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

S2S4E Climate Services for Clean Energy

Probability terms

Enhanced : 34% - 49%
High: 50% - 70%:
Very High: Greater than 70%

Temperature forecasts

Legend

Predicted tercile
- Above
- Normal
- Below

Probability range
- 50% to 100%
- 34% to 49%

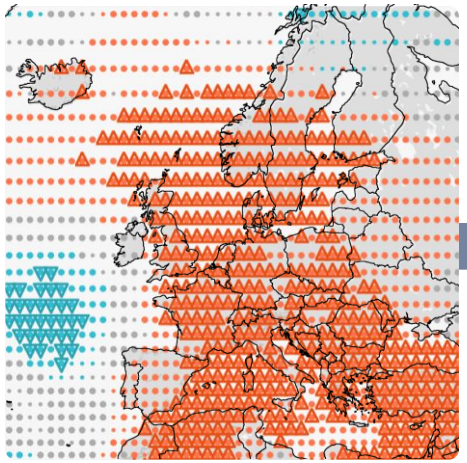
Extremes
- Max (p90)
- Min (p10)

SUB-SEASONAL

Prediction system used: ECMWF-Ext-ENS

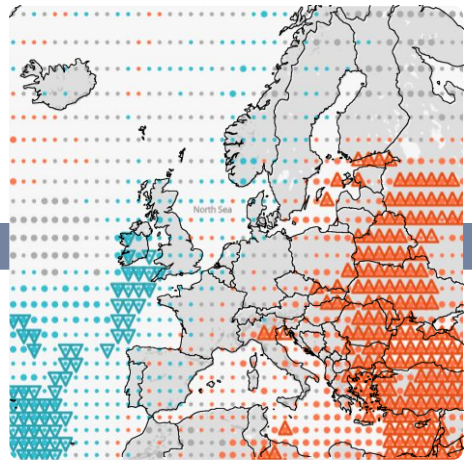
Maps show areas where skill (fRPSS) > 0

14 - 20 December



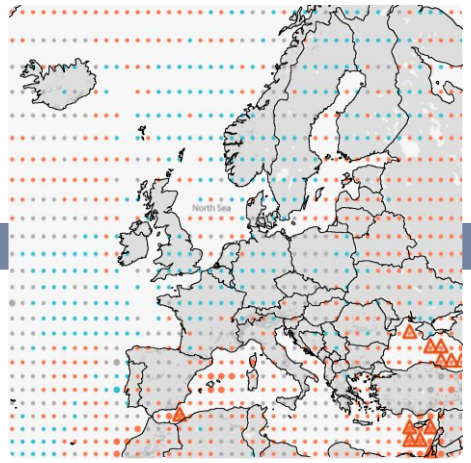
Very high probability of above normal temperatures across Europe, with risk of high extremes (50% skill).

21 - 27 December



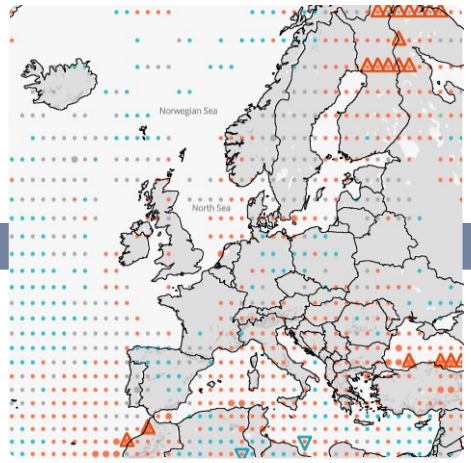
High probability of above normal temperatures in eastern Europe, with risk of extremes (30% skill).

28 December - 3 January



Enhanced probability of above normal temperatures in eastern Europe, and **enhanced** probability of below normal temperatures in central Europe (10-20% skill).

4 - 10 January



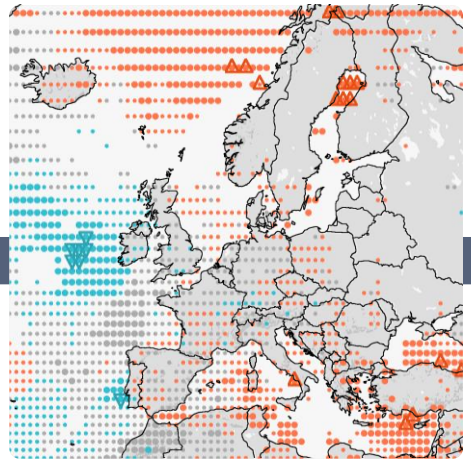
Enhanced probability of above normal temperatures.

SEASONAL

Prediction system used: ECMWF SEAS5

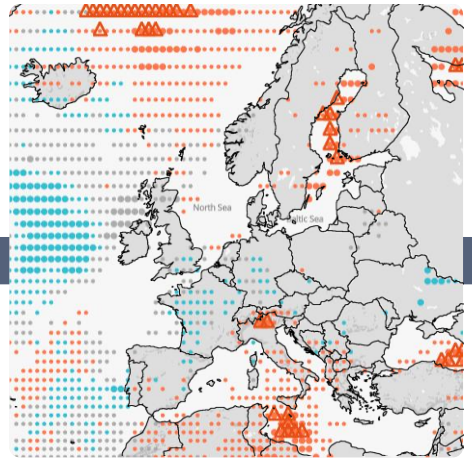
Maps show areas where skill (fRPSS) > 0

January



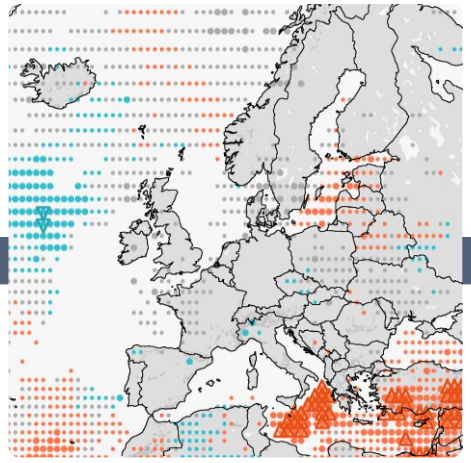
High probability of above normal temperatures across the Mediterranean region and Scandinavia (<5% skill).

February



High probability of above normal temperatures persisting in Scandinavia. **High** probability of above normal temperatures in the Alps (~5% skill).

March



High probability of above normal temperatures in eastern Mediterranean and the Baltic Sea (<10% skill).

Browse the global forecasts in the DST:

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S2S4E Climate Services for Clean Energy

Probability terms

Enhanced : 34% - 49%
High: 50% - 70%:
Very High: Greater than 70%

Wind speed forecasts

Legend

Predicted tercile
- Above
- Normal
- Below

Probability range
- 50% to 100%
- 34% to 49%

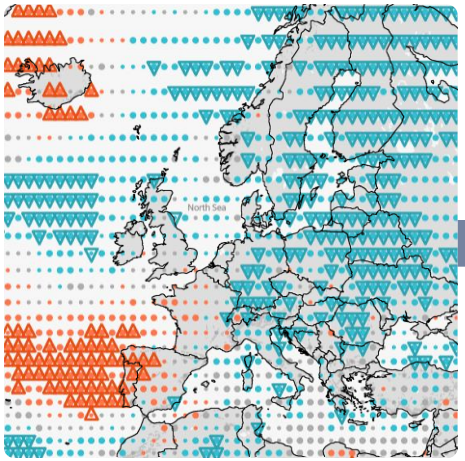
Extremes
- Max (p90)
- Min (p10)

SUB-SEASONAL

Prediction system used: ECMWF-Ext-ENS

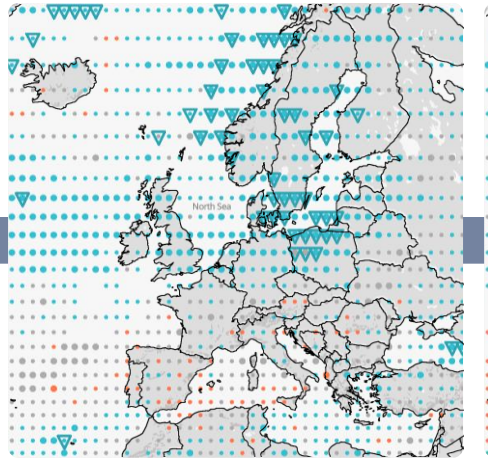
Maps show areas where skill (fRPSS) > 0

14 - 20 December



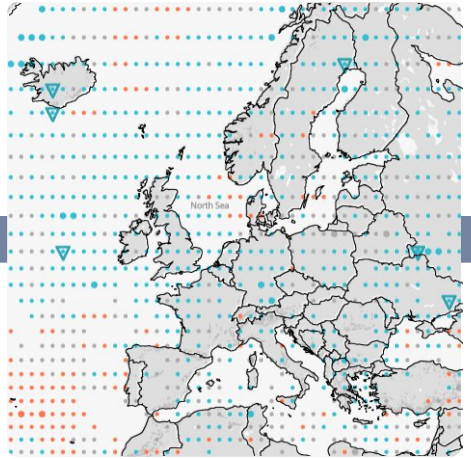
Very high probability of below normal winds in northeastern Europe and Scandinavia, with a risk of low extremes. **High** probability of above normal wind speed in Portugal, western Spain and French Atlantic coast (30% skill) .

21 - 27 December



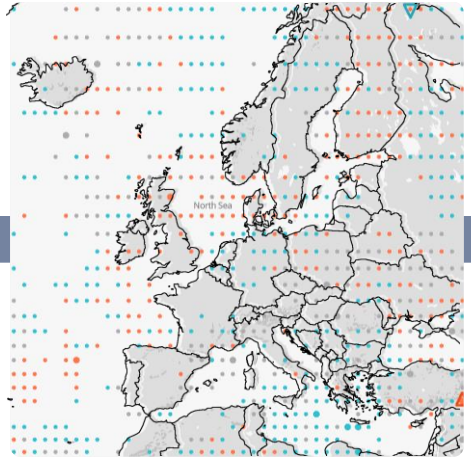
Very high probability of below normal wind speeds in northern Europe and Scandinavia (<10% skill).

28 December - 3 January



Generally **enhanced** probability of below normal wind speeds across Europe (<5% skill).

4 - 10 January



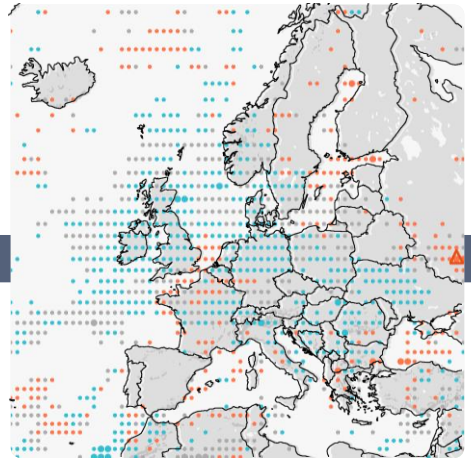
Forecasts show no clear signals.

SEASONAL

Prediction system used: ECMWF SEAS5

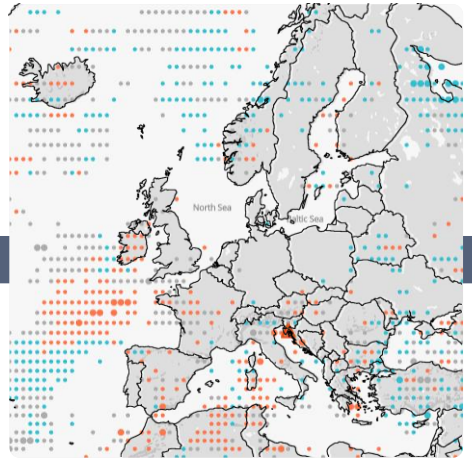
Maps show areas where skill (fRPSS) > 0

January



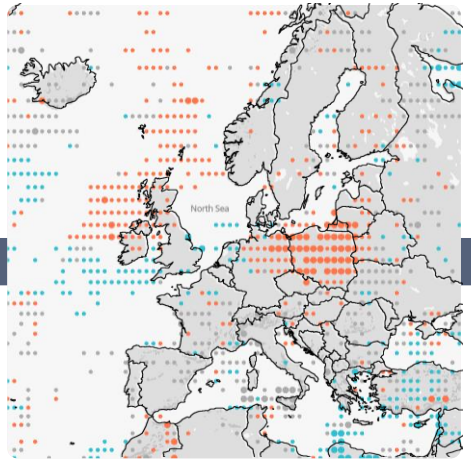
Enhanced probability of below normal wind speeds in the British Isles, the North Sea, northern Germany and southern Scandinavia (~15% skill).

February



Enhanced probability of above normal wind speeds in western and southwestern Europe, as well as parts of the Mediterranean.

March



High probability of above normal wind speeds in Poland and western Germany (<10% skill). **Enhanced** probability of above normal wind speeds in the north of the British Isles.

Browse the global forecasts in the DST:

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S2S4E Climate Services for Clean Energy

Probability terms

Enhanced : 34% - 49%
High: 50% - 70%:
Very High: Greater than 70%

Precipitation forecasts

Legend

Predicted tercile
- Above
- Normal
- Below

Probability range
- 50% to 100%
- 34% to 49%

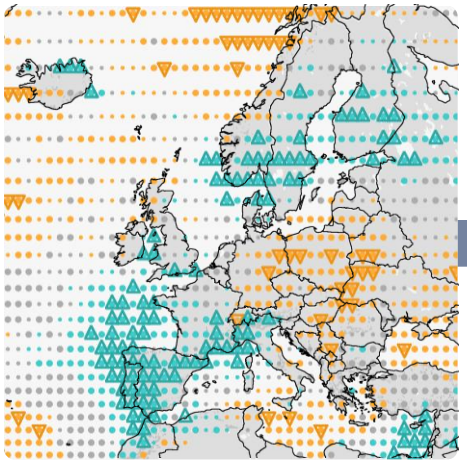
Extremes
- Max (p90)
- Min (p10)

SUB-SEASONAL

Prediction system used: ECMWF-Ext-ENS

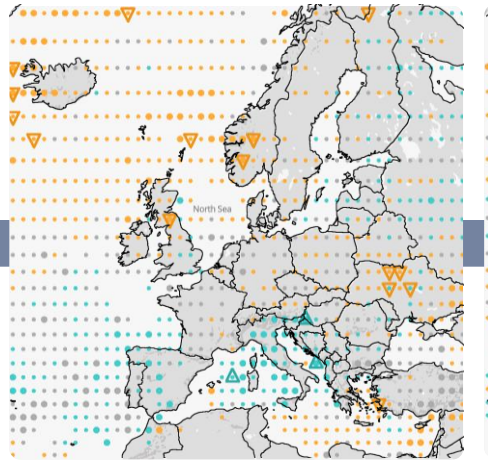
Maps show areas where skill (fRPSS) > 0

14 - 20 December



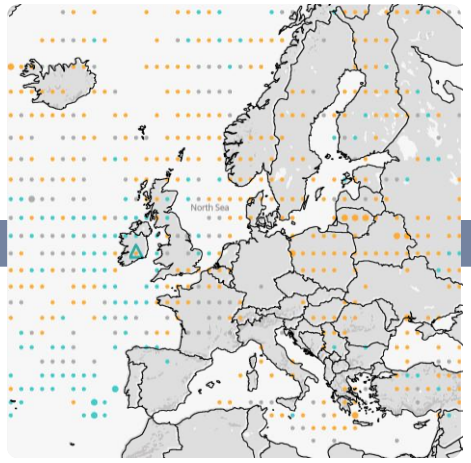
Very high probability of above normal precipitation in the Iberian Peninsula, parts of France, Sweden and Finland, with a risk of extremes. **Very high** probability of below normal precipitation in eastern Europe (20% skill).

21 - 27 December



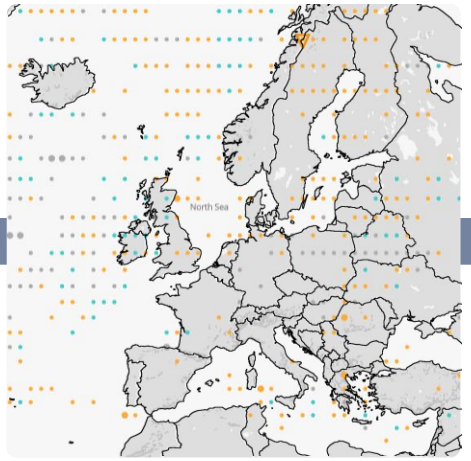
High probability of above normal precipitation in Italy, Spain and Greece (<10% skill).

28 December - 3 January



Generally **enhanced** probability of below normal precipitation across Europe (<5% skill).

4 - 10 January



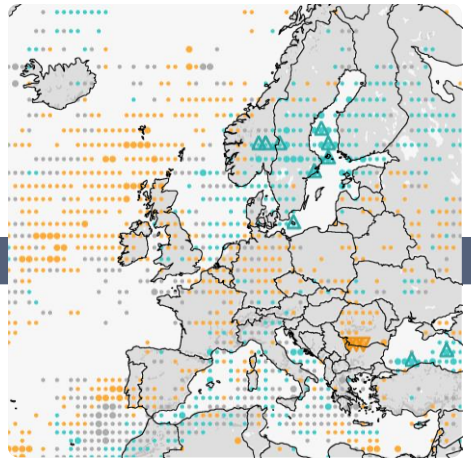
Generally **enhanced** probability of below normal precipitation across Europe (<5% skill).

SEASONAL

Prediction system used: ECMWF SEAS5

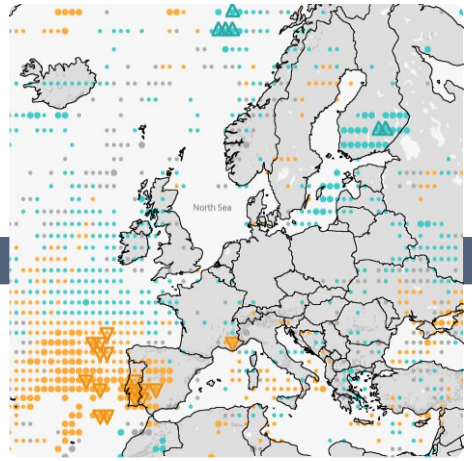
Maps show areas where skill (fRPSS) > 0

January



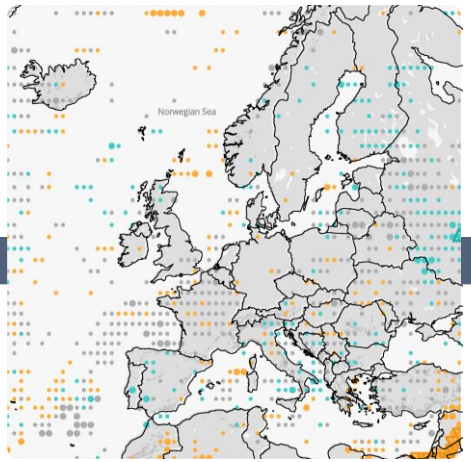
High probability of above normal precipitation in Sweden and Finland (<10% skill).

February



High probability of above normal precipitation persists in Finland and the Baltic Sea region. **Enhanced** probability of above normal precipitation in the Atlantic facade, except for the Iberian Peninsula.

March



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S2S4E Climate Services for Clean Energy

Probability terms

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High: 50% - 70%:
Very High: Greater than 70%

Solar radiation forecasts

Legend

Predicted tercile
- Above
- Normal
- Below

Probability range
- 50% to 100%
- 34% to 49%

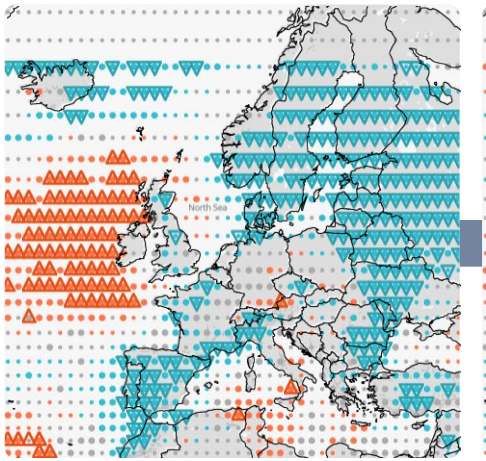
Extremes
- Max (p90)
- Min (p10)

SUB-SEASONAL

Prediction system used: ECMWF-Ext-ENS

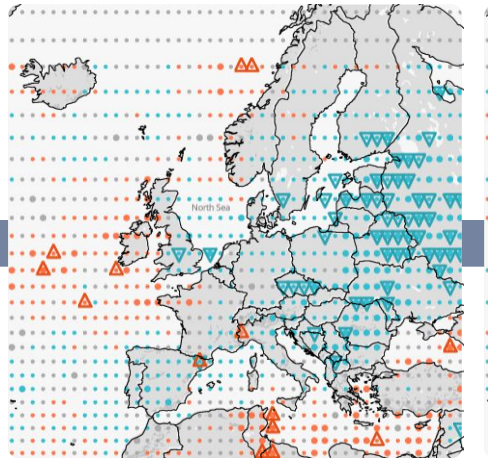
Maps show areas where skill (fRPSS) > 0

14 - 20 December



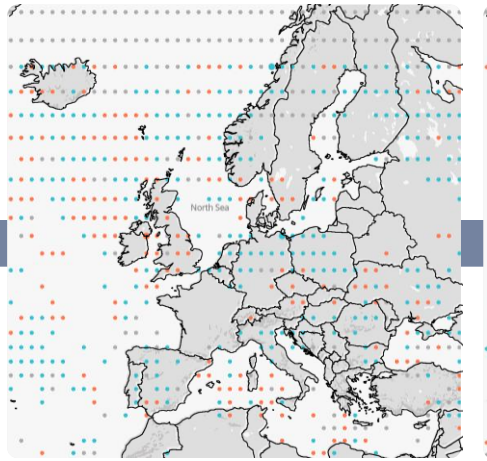
Very high probability of below normal solar radiation in the Iberian Peninsula, parts of France and eastern Europe (30% skill).

21 - 27 December



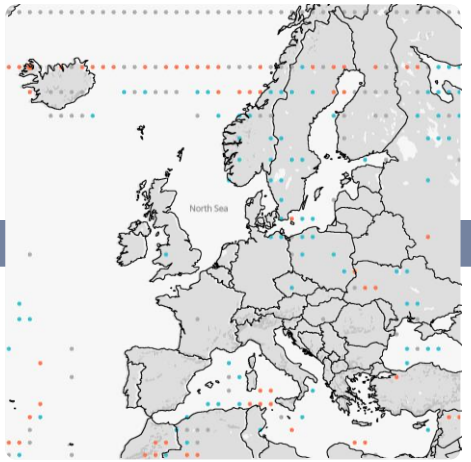
Very high probability of below normal solar radiation in eastern Europe (15% skill).

28 December - 3 January



Forecasts show no clear signals.

4 - 10 January



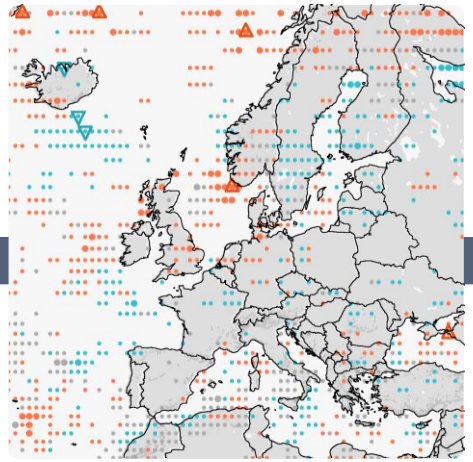
Forecasts show no clear signals.

SEASONAL

Prediction system used: ECMWF SEAS5

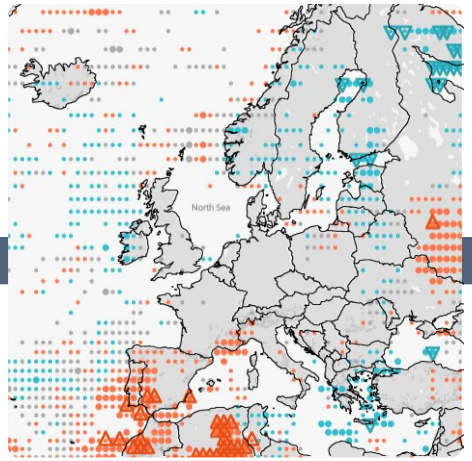
Maps show areas where skill (fRPSS) > 0

January



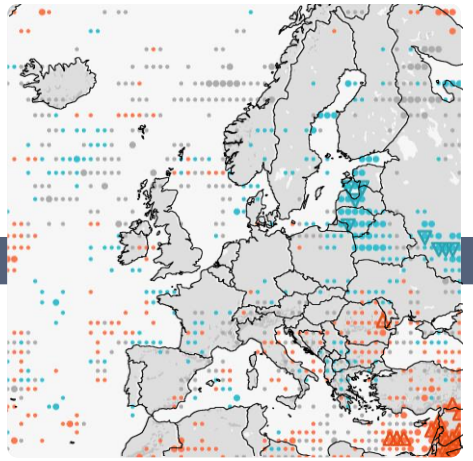
Enhanced to high probability of above normal solar radiation in the British Isles, North Sea and parts of Germany (<5% skill).

February



High probability of above normal solar radiation in the Iberian Peninsula, southern France and Italy. **Enhanced to high** probability of below normal solar radiation in Scandinavia.

March



Enhanced to high probability of below normal solar radiation to persist in Scandinavia, moving southward to the Baltic region and other parts of eastern Europe (<10% skill).

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USER GUIDE

PREDICTED TERCILE

- Above
- Normal
- Below

The forecast information provided is probabilistic. Instead of one single model realisation, several realisations are considered (ensemble members), providing a set of several possible outcomes (51 for both ECMWF-Ext-ENS and ECMWF SEAS5). This information is summarised and transmitted in the form of probabilities. Three equiprobable categories (terciles) have been used: below normal, normal and above normal. Each one of these tercile categories contains one third (33.3%) of the events over the reference period. The forecasted probability corresponds to the percentage of ensemble members predicting below normal, normal or above normal conditions, based on the past climatology.

PROBABILITY RANGE

- 50% to 100%
- 34% to 49%

As seen in the DST, regions where the predicted probability of the most likely tercile equals or is higher than 50% are represented with a bigger symbol, to highlight areas of larger probability. Users can customise the exact percentage of predicted probability (from 0 to 100%) in the DST.

EXTREMES

- Max (p90)
- Min (p10)

To provide information about the probability of having very high or very low climate conditions, the DST displays the percentage of members under the 10th percentile and the percentage of members exceeding the 90th percentile. These 10th and 90th percentiles have been computed from the climatological period. Extreme events are shown with a triangle symbol when the probability of an extreme event occurring is over 25%.

SKILL SCORES

Fair	>0% to <15%
Good	15-30%
Very good	>30%

In the maps presented in this outlook, only regions with positive skill are shown. Skill scores below 0 are defined as unskilful, those equal to 0 are equal to the climatology forecast, and anything above 0 is an improvement upon climatology, up to 1, which indicates a ''perfect'' forecast. In the DST, these values have been expressed as percentages, where a skill of 1 would equal to 100% skill. FairRPSS for terciles and Brier Skill Scores for extremes are used.

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