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The S2S4E Decision Support Tool - Operational sub-seasonal and seasonal forecasts for Renewable Energy

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INTRODUCTION

Renewable energy sources have been acknowledged by the IPCC as one of the key targets to fight against climate change. However, their dependence on climate and its intrinsic variability has been often regarded as their weakest point. Energy producers, traders and transmission system operators need a clear decision-making horizon to schedule operations or anticipate energy gaps between renewable and traditional sources. For the financial teams running the business, having an estimate of the energy they will produce in the coming months is of crucial importance to anticipate cash flow.

To tackle this issue, the analysis of past climatology and the rationale that future variability will follow the same course, have been the golden rule for a long time. Nevertheless, current climate prediction systems that simulate the physics of the whole climate system have proven that probabilistic forecasting can improve upon climatology at some spatial and temporal scales and can be used to make better decisions. Despite the potential value, climate predictions need to be bias adjusted and calibrated in order to be useful. The complexity of these processes, plus the probabilistic nature of the outputs, may set a limit to their ability to effectively reach users.

S2S4E DECISION SUPPORT TOOL

To help narrow this gap, in S2S4E - an H2020 EU-funded project - industrial and research partners are co-developing together a fully-operational decision support tool (DST). This tool will provide probabilistic climate forecasts for the main climate variables and climate indicators in the sub-seasonal to seasonal timescales. To our knowledge, this is the first time sub-seasonal and seasonal predictions are integrated in the same platform in a seamless way. The tool, in the framework of the RESILIENCE prototype, will be fed with high-quality bias corrected predictions from state-of-the-art systems to obtain reliable forecasts.

The final product, to be launched in June 2019, has been tailored to the specific needs of the renewable energy sector, with a robust yet clear user interface that implements the latest user experience guidelines. With the final users always in mind, the multidisciplinary team at S2S4E is designing the DST for both the lay user and the advanced technician, displaying both basic and intuitive information for skill, the probability of extreme events and general climatology, as well as highly technical features when needed.

CONCLUSION

The DST co-produced by S2S4E is the evolution of previous proof-of-concept efforts, like Project Ukko, from EUPORIAS project and RESILIENCE. Once fully-operational, renewable energy decision-makers will have a powerful tool, tailored to their needs, that offers relevant climate information in the most usable format.