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1st Renewable Energy Forecasting Industry Guideline: IEA Wind Recommended Practice for the Implementation of Renewable Energy Forecasting Solutions

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Abstract

This poster presents an introduction to the 1st renewable energy forecasting industry guideline, the *IEA Wind Recommended Practice for the Implementation of Renewable Energy Forecasting Solutions* (short IEA-RP) [1]. The purpose of the IEA-RP is to encourage both end-users and forecast service providers to standardize practices and components that are common to all forecasting solutions in order to achieve optimal forecast benefit for user's applications. The guideline is also intended to serve as a reference on state-of-the-art industry practices for forecast service providers new to the market or those wanting to evolve to a new level of service.
Example evaluation tools are also made available under open source licenses for testing and further development of forecast solution evaluation.

Objectives

The objective of this IEA Wind Recommended Practice is to provide industry guidelines to a mature community that has so far been too small to develop a standard. The IEA-RP is filling that gap and enables the forecasting community to be prepared for the massive increase in wind energy deployment and power generation in the electric grids due to the current energy crisis.
Once these recommendations are fully adopted by industry, business processes on a global basis can be streamlined for:

- Decision-makers
- System operators
- Traders & balance responsible parties
- Wind farm operators

For any industry, it is important to establish standards and recommended best practices in order to streamline processes, but also to ensure security of supply with a healthy competition structure.

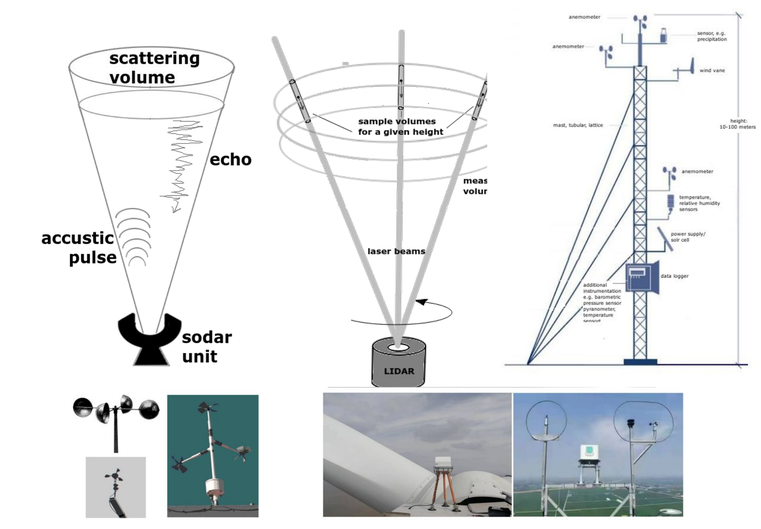


Figure 1: Part 4 provides recommendations for setup, operation, quality control and assessment of typical instrumentation for wind energy projects

Methods

This first industry guideline provides an overview of state-of-the-art practices that have been carefully collected by forecasting experts and users and subsequently reviewed and accepted by the IEA Wind executive committee.

Part 1: Provision of a decision-support tool for the selection or update of forecasting solutions with best practices examples for data formats, communication and IT requirements.

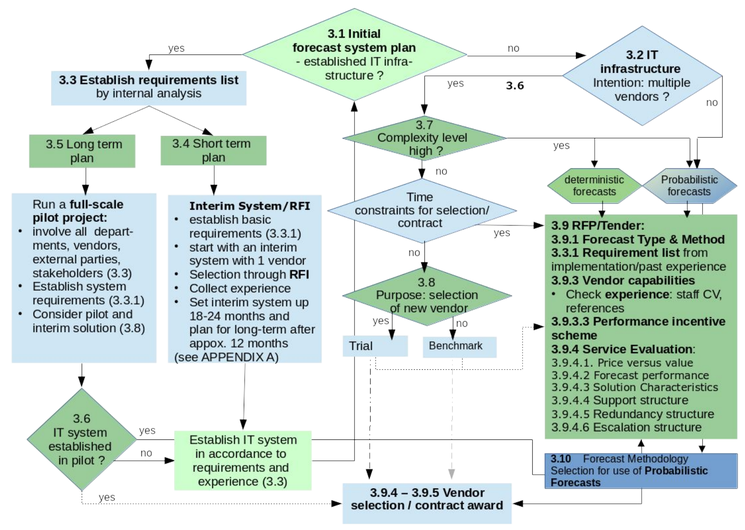


Figure 2: Decision Support Tool to help business processes to become streamlined

Part 2: Guidelines, including pitfall checklists for optimal execution and evaluation of benchmarks and trials

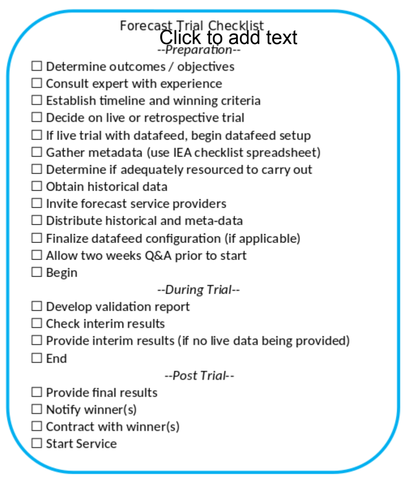


Figure 3: Checklist for optimal execution of a forecast trial

Part 3: Guidance and example code for the establishment of an evaluation framework, incentivisation of forecast vendors and general evaluation of forecast solutions

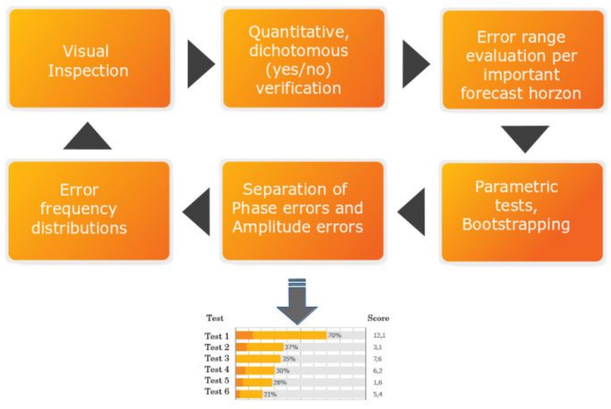


Figure 4: Example for the development of an evaluation framework

Part 4: Guidelines for setup, quality-control and use of meteorological and power measurements required to optimise real-time renewable energy forecasting applications

Results

The IEA-RP guideline comprises four parts:
Part 1, *Forecast Solution Selection Process*, addresses the design of a customised process to select an optimal forecast solution for a user's specific situation and application.
Part 2, *Design and Execution of Benchmarks and Trials*, provides guidance on the design, execution and analysis of customised forecasting bench-marks and trials.
Part 3, *Forecast Solution Evaluation methods* provides guidelines for meaningful evaluation of forecasts and entire forecast solutions. It also contains two accessible verification tools as example verification and validation frameworks in Appendix G - Validation and verification code examples.
Part 4, *Meteorological and Power Data Requirements for real-time forecasting Applications*, provides guidance for the selection, deployment and maintenance of meteorological sensors, power measurements and associated data quality control relevant to real-time fore-casting is provided.

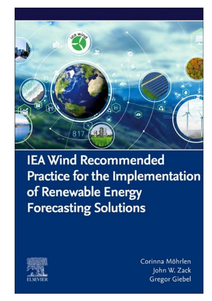
Conclusions

The key element of this effort is to provide basic elements of decision support and thereby encourage end-users to analyse their own situation and use this analysis to design and request forecasting solutions that fit their own purpose, rather than applying a ``doing what everybody else is doing'' strategy.
Today's unprecedented times call for unprecedented solutions – this also applies for the integration of renewables into the power system. There is no "one size fits all", not for system operators nor for traders, balance responsible parties or utilities. The IEA-RP provides guidance through-out the entire process from solution development and selection to operation and advice on how to build and keep a forecast solution future compatible.

References

1. Corinna Möhrlen, John Zack and Gregor Giebel: IEA Wind Recommended Practice for the Implementation of Renewable Energy Forecasting Solutions. 270 pp. Elsevier Academic Press, November 1, 2022. ISBN: 9780443186813.

2.Book at Elsevier:



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