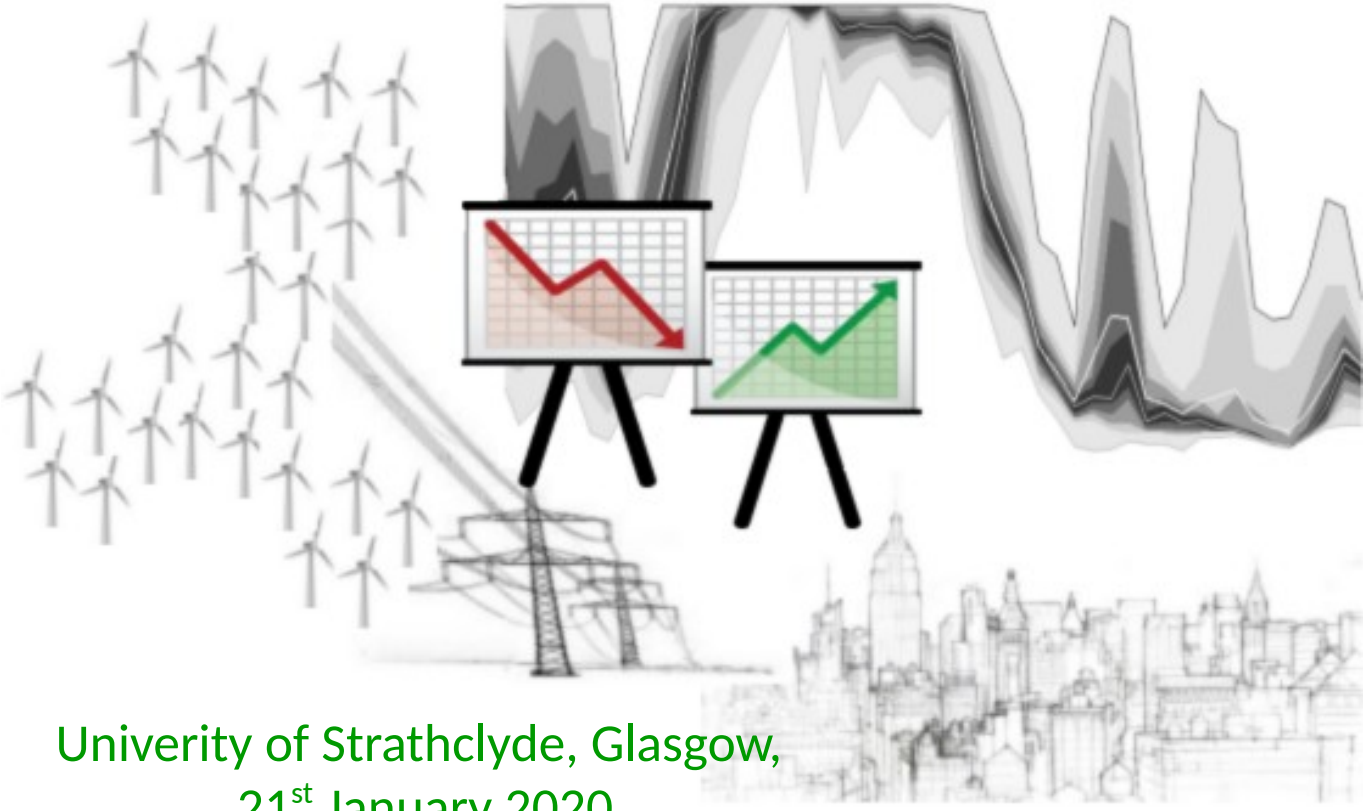
IEA Wind Task 36
"Wind Energy Forecasting" Workshop

Open Space Discussions



Univerity of Strathclyde, Glasgow,
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IEA Task 36 Open Space Workshop on Wind Power Forecasting & System Integration Issues

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Organised by:

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Time	Activity
13:30 - 13:40	Introductory presentation on IEA Wind Task 36 & explanation of workshop format and objectives
13:40 – 14:25	Open Space discussions in 3 groups - participants rotate free among the groups
14:25 – 14:40	Group leaders provide summary of each group to the full group; full group discussion

Open Space Workshop: How We Run It…

Principle	Meaning
Whoever comes is the right people	CHANGE group whenever you think you have said what you wanted or you are no longer interested in the discussion
Law of two feet	You can contribute on any discussion, use this opportunity!
When it's over, it's over	We stop after 30 minutes…use the time to tell about your ideas!
Whenever it starts it starts	Whenever you come to a discussion it is OK to engage and participate
Whatever happens is the only thing that could have happened	No matter who and what is discussed regarding the topic, it's good. Leave if you no longer like the discussion!

Introduction to the Open Space Topics

Topic #	Title
1	**Meteorological Measurements and Instrumentation** - Standardization for Integration into Grid Codes of system operators - Measurement Networks in conjunction with the Met Society (WMO, national met centers) or Line Monitoring
2	**Recommended Practices** - Questions to the RP documents - First experience exchange with the documents or parts thereof
3	**Application of Probabilistic Forecasts in the Power Industry** - which applications are known that use probabilistic forecasts - for which applications would probabilistic forecasts be useful - to which other applications than renewable forecasting should the underlying probabilistic meteorological forecasts be applicable

Summary of the OpenSpcae Discussions

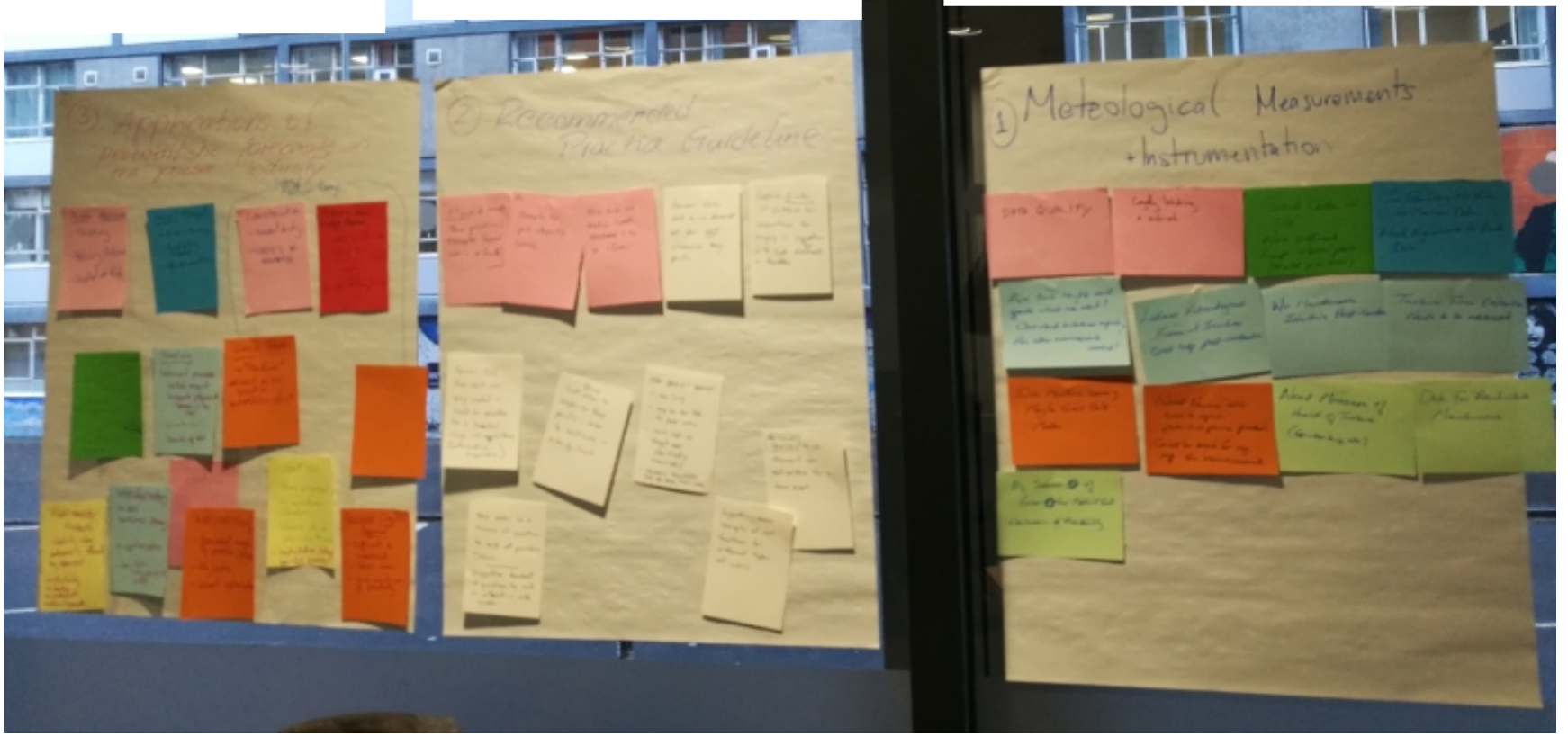
Topic #1:

Application of Probabilistic Forecasts in the Power Industry

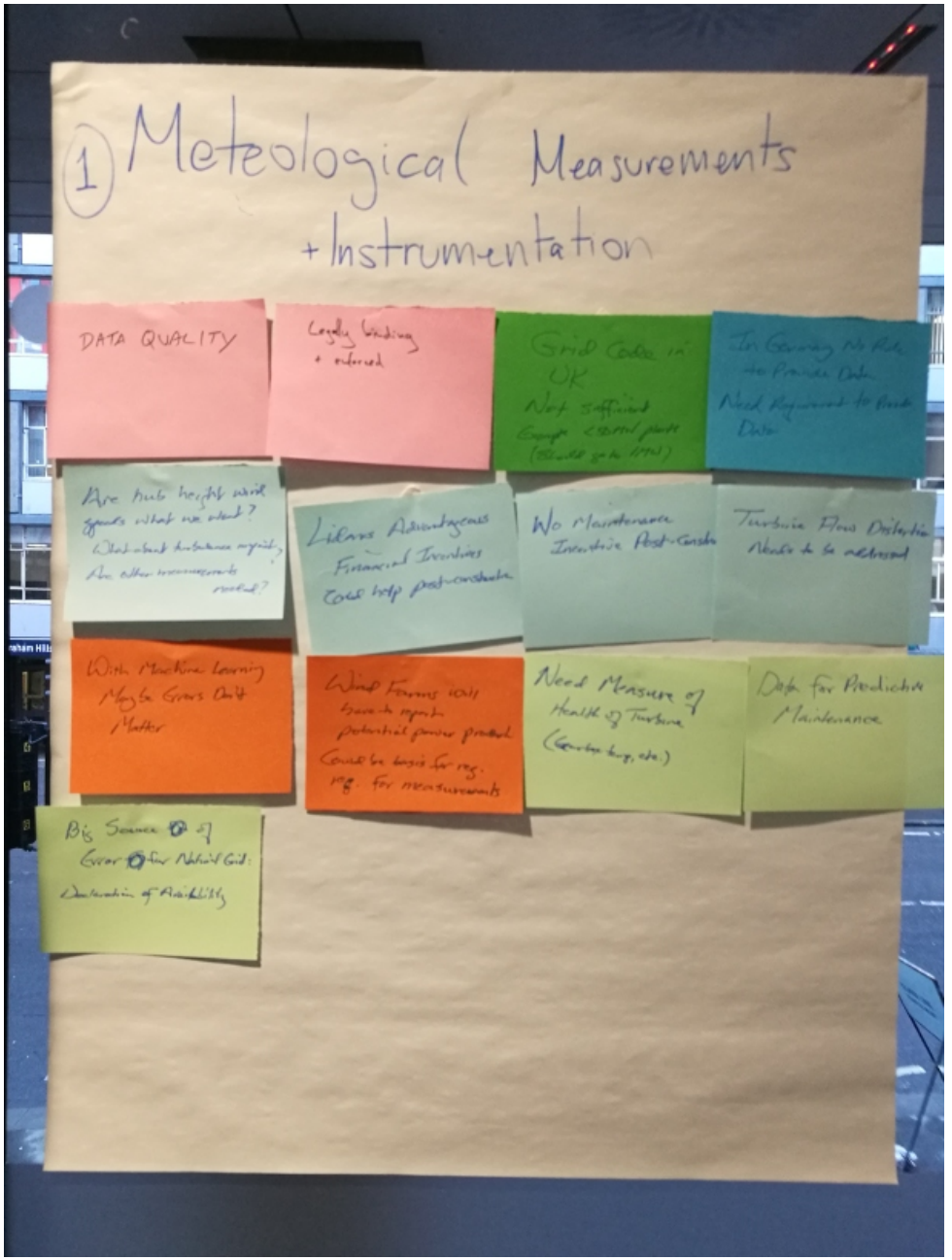
Topic #2:

Recommended Practice Guideline

Topic #3: Application of Probabilistic Forecasts in the Power Industry



Summary of Topic #1 Discussion
Meteorological Measurements and Instrumentation



Current barriers:

- Data Quality
- Data provision needs to be legally binding and enforcable
- Grid code often not sufficient
  - → UK < 50MW, should be 1MW
  - → DE: no rules, need of requirement
- No maintenance incentive post construction
- Missing Declaration of availability is a source of forecast error
- Wind farms will have to report potential power - could be basis for requirements for measurements
- Turbine flow distribution need to be addressed
- Are hub height wind speeds what we want/need ?

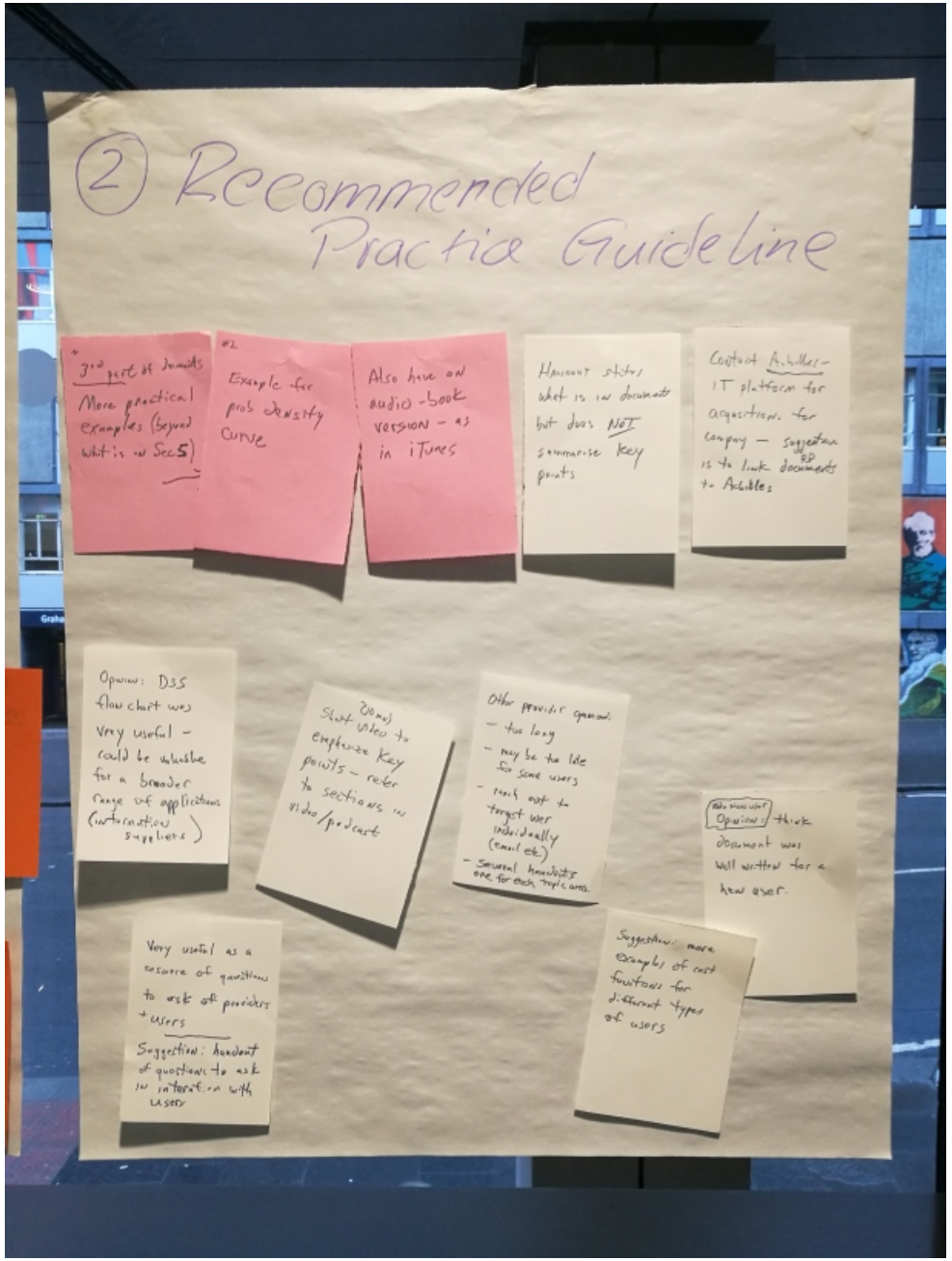
Summary of Topic #1 Discussion
Meteorological Measurements and Instrumentation

Mitigation:

- Data (format) standardisation for operational consideration, meta data
- Financial incentives may help
- Incentives for wind farm operators:
  - → Data useful for maintenance planning forcast
  - → Heath of turbine needs measure (e.g. gearbox temperature etc.)
- With Machine Learning techniques errors in measurements may not matter

Summary of Topic #2 Discussion

Recommended Practices for Forecast Solution Selection



More practical examples

→ Example of a probability density function

→ more examples of cost functions for different type of users

Additional promotional material

→ Generate short videos of key sections

→ Generation of an Audio book

→ Reach out to users individually (by email)

→ Generate handouts

→ key points

→ questions in iteration with providers

Communication

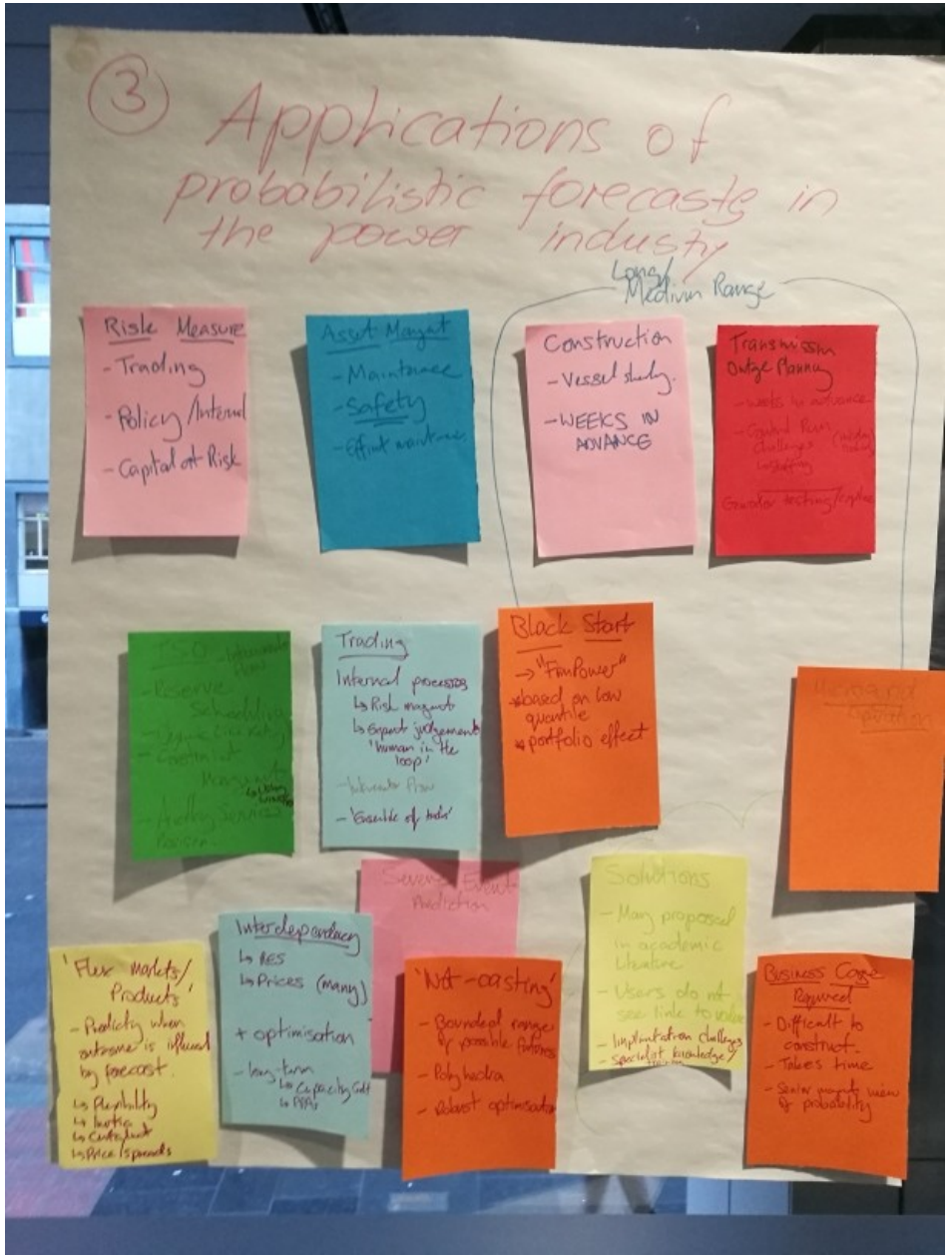
Summarise key points instead of document descriptions

Contact/Link up to procurement platforms:

→ Achilles IT platform for acquisitions of services for companies

Summary of Topic #3 Discussion

Application of Probabilistic Forecasts in the Power Industry



Applications as Risk Measure:

- Trading
  - → Internal Processes
    - Risk management
    - Expert Judgement "human in the loop"
    - Interconnector Flow
- Policy/internal risk management
- Capital of Risk
- Severe Event Prediction

Asset Management

- Maintenance
- Safety

System Operation:

- Interconnector flow
- Reserve Scheduling
- Dynamic Line Rating
- Constraint Management
- Ancillary Services Provision

Summary of Topic #3 Discussion

Application of Probabilistic Forecasts in the Power Industry

Long/Medium Range Applications:

→ Construction planning:
- weeks in advance
- vessel

→ Transmission Outage planning:
→ weeks in advance
→ Control run challenges
- Staff
- Bank Holidays

Flexible Market Products:

- Predicting when outcome is influenced by weather (forecast)
- Flexibility
- Inertia
- Curtailment
- Price spread

Interdependency Forecasting:

- RES ↔ Prices: Optimisation
- Long-term: Capacity credits, PPAs

Not-Casting:

- Bounded ranges of possible futures
- Polyhedra
- Robust Optimisation

Microgrid Operation
Generator Testing
Black Start

Challenges/Barriers

Missing Business Cases

- Difficult to construct
- Time Requirements
- Specialist knowledge/Training required
- Many solutions in academic literature but not in practice
- Link to value is missing
- Implementation challenges

ADDITIONAL INFORMATION & CONTACT

Follow us:

Project webpage

http://www.ieawindforecasting.dk/

Task-page:

http://www.ieawindforecasting.dk/topics/workpackage-3/task-3-1

http://www.ieawindforecasting.dk/topics/workpackage-3/task-3-5

Recommended Praactice Guideline:

https://www.ieawindforecasting.dk/Publications/RecommendedPractice

Publications:

http://www.ieawindforecasting.dk/publications.html

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