

The needs of investors for confidence in wind farms to operate as expected

EWEA Workshop

Analysis of Operating Wind Farms:
Learning the Lessons from Operational Sites

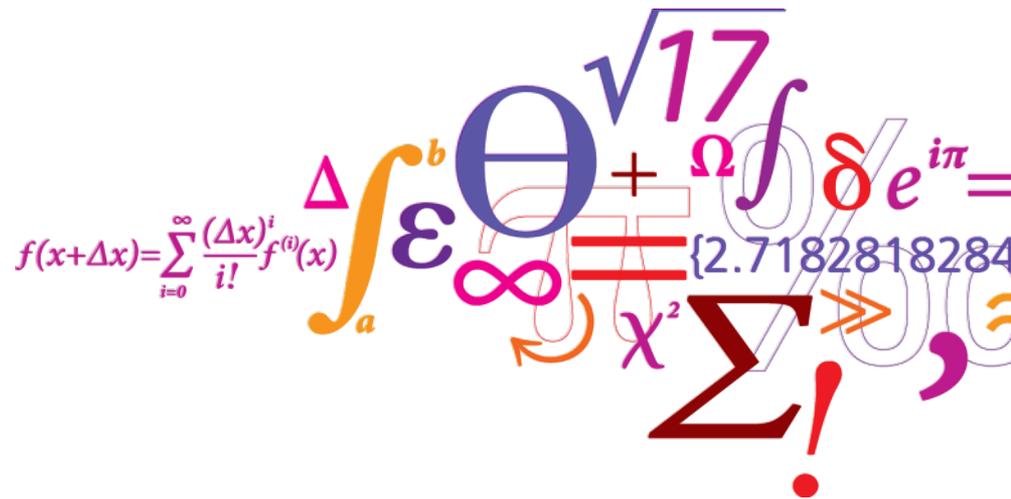
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Overview

Introduction & background

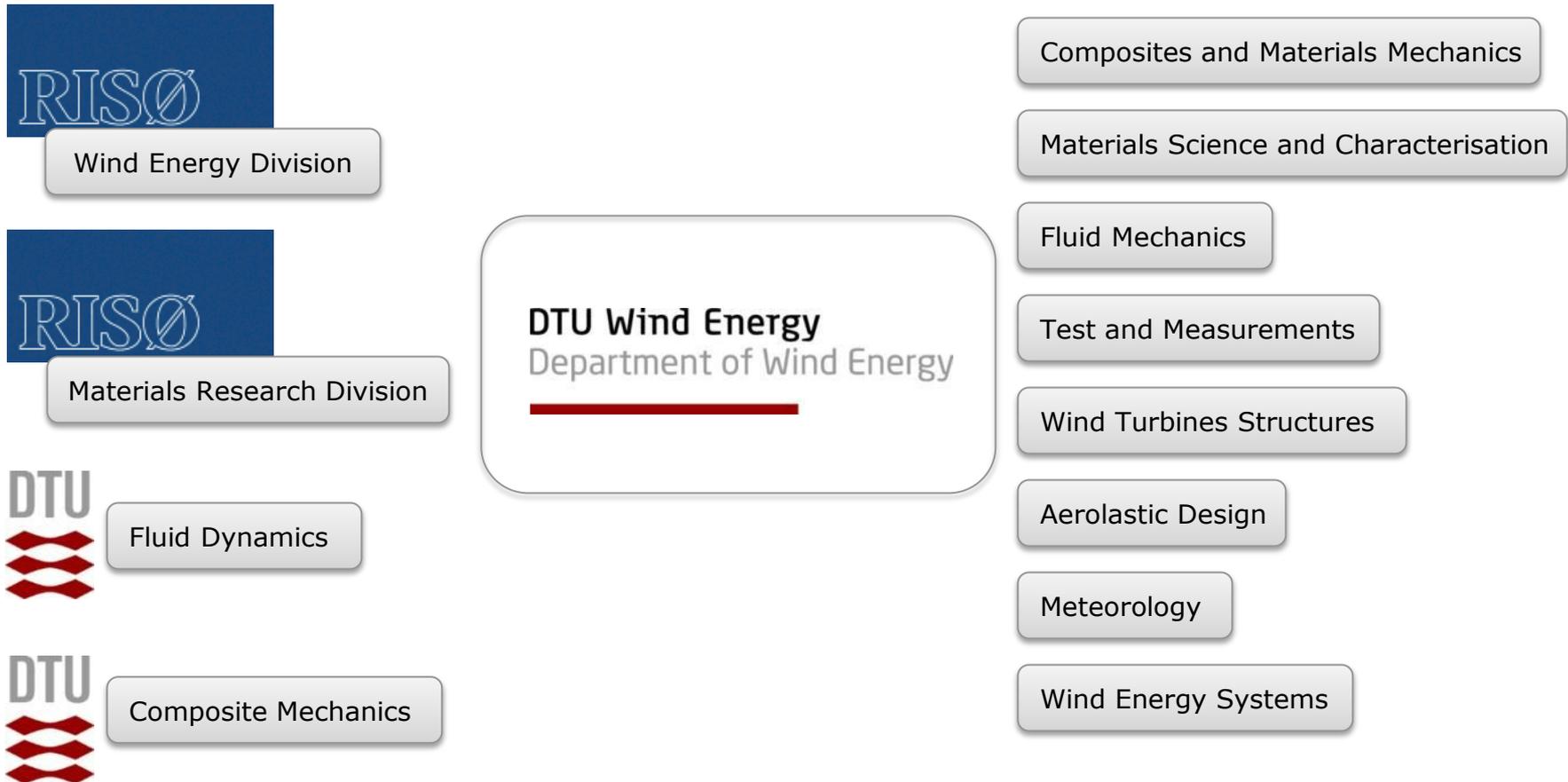
Part 1: Trend in investor confidence vs. wind farm operation

Part 2: What can be done about it?

Part 3: How can operational data help?

DTU Wind Energy

Tom Cronin, Wind Energy Systems, DTU Wind Energy



What do we do & why?

- Prediction software: WAsP, WAsP Engineering, WAsP CFD, WAT...
- Energy yield assessments
- Due diligence studies
- Operational wind farm monitoring
- ...and a whole lot of research activities...



Wind Programme co-ordinator: DTU

- Obligation to make research impact on society
- “Investor” is a broad term...society is an investor
- The world’s largest wind energy research institute/university dept

Part 1: Trend in investor confidence

- Investors are always appear keen to be wiser about energy yields

But

- Tend not to use 'best estimate' P50 figure but rather P90 or higher...
- ...and then maybe add a margin...
- It's matter of confidence – even with independent expert analysis.
- Not helped by the project-by-project, company-by-company approach
- Knowledge learning is not optimal across the sector
- Improvement in investor confidence, and therefore development, is slow

Part 1: Trend in wind farm operation

Meanwhile...

- Developers and owners have improved their procedures greatly over recent years
- Wind farm project development is mainstream onshore
- Operations & maintenance is really being studied and understood

Result:

- Developers are saying that wind farms are now performing as expected and investors are being too conservative.

Part 2: What can be done about it?

For Investors:

- Understand more about the industry's best practice
- Broaden the knowledge out from 'the usual consultants'
- But...what information is key for investors to know?

For Developer/Owners

- Reduce uncertainty: move the P90 towards P50
- Demonstrate that wind farms are performing

Guidelines and recommendations for project assessment
for investors & whole financial sector based on science

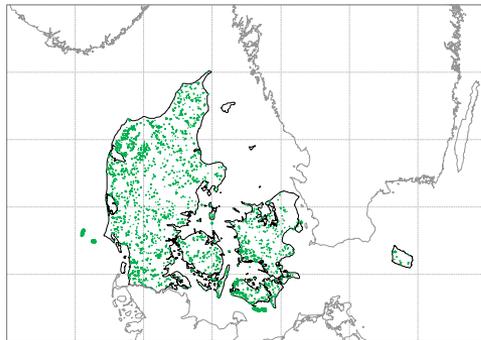
Part 2: The benefits of guidelines

- De-mystify the process of project assessment
- Open up for competition on a more transparent basis
- Speed up the process of gaining investment
 - Badly needed to reach the EU targets
- A platform for handling up and coming challenges...
- How to achieve this without threatening commercial confidentiality?
- There are good examples of industry cooperation
- Standardisation IEC, Technology Platform
 - but too little contact with investors

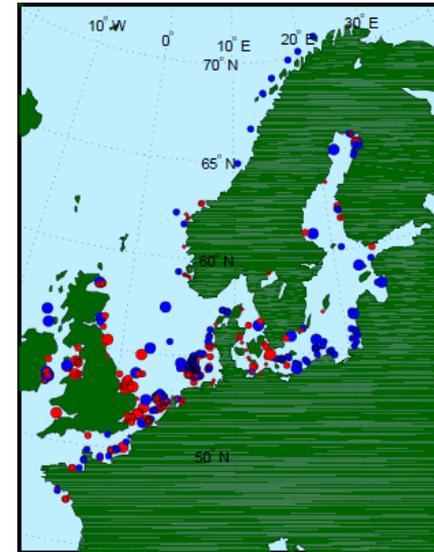


Part 2: Future challenges for guidelines – some examples

- How to best handle a variable revenue stream
- How can investors deal with the impact of other wind farms



From large scale onshore
to massive scale offshore



- Grid curtailment of production
- Revenue from provision of other services than energy
- Assessment of technology is always out of date

Part 3: How can operational data help?

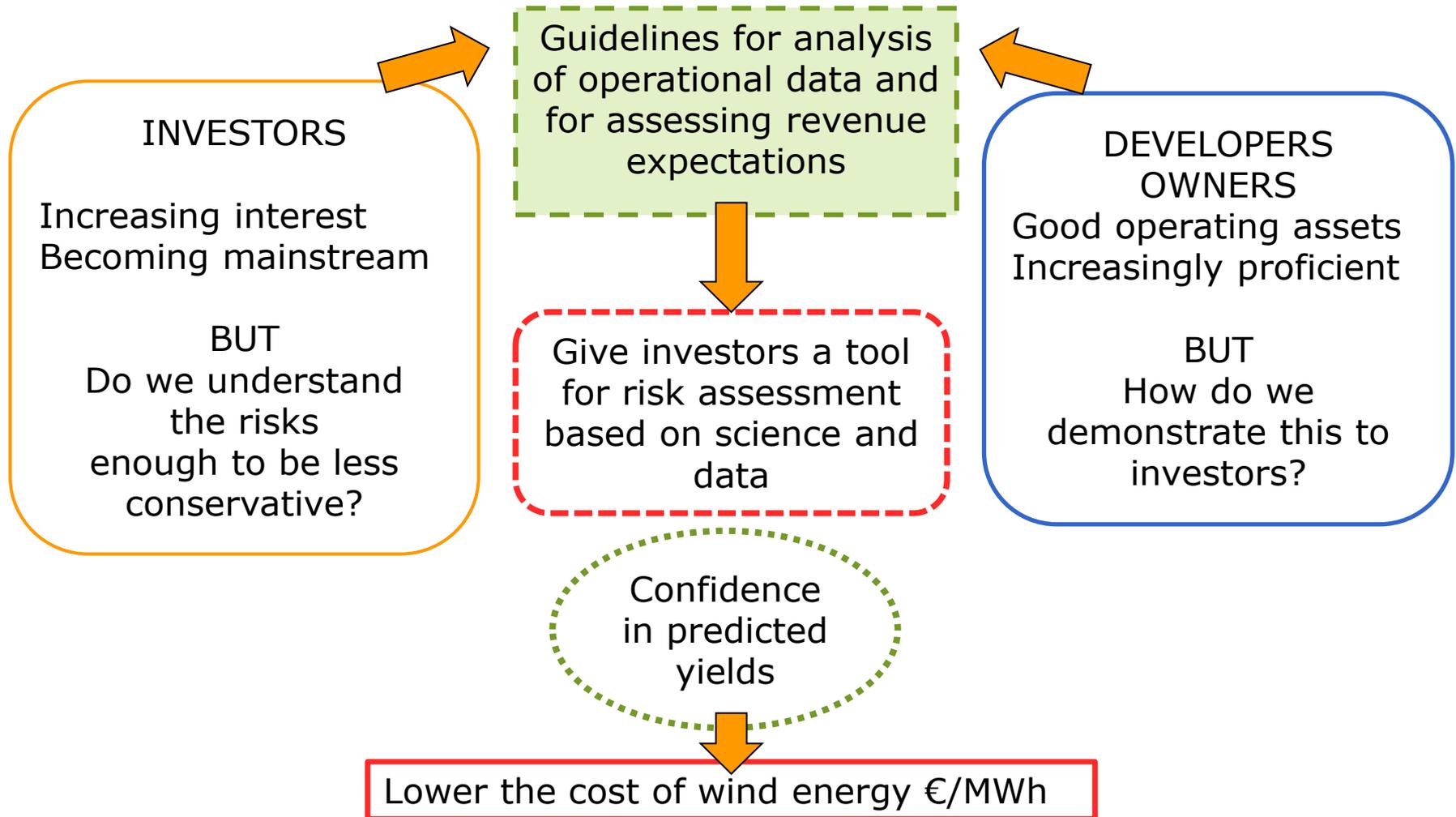
Two obvious answers:

- Operational data can help a wind farm owner understand the asset and how to maintain performance
- Reassure investors that their investment is performing

However, an under-utilised answer:

- Use it to improve practices and to build confidence for future investments
- Close the feedback loop:
 - Predict, construct, operate, measure, analyse, improve, predict

The whole picture



A photograph of a wind turbine and a tall tower on a foggy sea at sunset. The wind turbine is on the left, and the tower is on the right. The sky is blue with some clouds, and the sea is covered in a thick layer of white fog. The sun is low on the horizon, creating a warm glow.

Thank you for your attention

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