A survey among 120 international experts identifies O&M as a high priority sector for digitalisation.

**Task 43 Report 2019**

**Digitalisation of Wind Energy**

The wind energy sector is data intensive due to large commercial fleets of decentrally distributed turbines, dynamically changing ambient conditions, continuous interaction with the grid, and real-time processing of data from all systems. Increasing volumes of diverse data are accumulated for a variety of purposes throughout turbine design, planning and construction, operation and maintenance, and decommissioning.

Jason Fields, National Renewable Energy Laboratory and Berthold Hahn, Fraunhofer IEE

This evolving complexity demands highly scalable data infrastructure, efficient interoperability across sector participants and innovative analytical methods to ensure continued competitiveness.
The key activities of IEA Wind Task 43 are:

- Work Package 1: Wind Energy Digitalisation Roadmap
- Task Area 2: Data Standards
- Task Area 3: Data Science
- Work Package 4: Digital Resource Assessment
- Work Package 5: Digital O&M
- Work Package 6: Digital Life Assessment

### Progress and Achievements

The task started late in 2019 with a kick-off meeting in November 2020 at the Colorado University Boulder east campus. Thirty-nine experts from eight countries met to discuss and draft overall aims and work package structure. Additionally, three keynote talks on state of the art and future opportunities of artificial intelligence, as well as on experience from other industries with standards, helped set the background.

The main part of the kick-off meeting consisted of a series of parallel workshops, which drafted aims and plans and set up working groups for the four planned work packages. In addition, the two crosscutting

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technical areas established preliminary working groups. The structure of work packages is given in the diagram.

**Highlights**
Task 43 formally approved and launched
Task 43 Digitalisation Survey completed

**Outcomes and Significance**
The main outcomes so far regard the organisation of work and the establishment of communication. Regular organising committee meetings are under way with guest sessions by key researchers and industry experts. Core teams have been established on all work packages and have started regular communication. Also Inter-group collaboration opportunities have been identified. Preparations for a virtual workshop in Spring 2020 are in progress.

**Next Steps**
Digitalisation is an ongoing process in all life cycle phases of a wind farm and in all value chains. In this context, Task 43 is intending to provide an overall picture of digitalisation opportunities as well as barriers and possibilities to overcome.

To ensure a direct link to the findings from all relevant areas, as one of the first steps Task 43 members will establish communication with other working groups. First contact already established with to IEA Wind TCP tasks 36 “Forecasting” and 42 “Life time extension”. Furthermore, an exchange with external committees, such as IEC working groups or WindEurope task forces is part of the plan.

Specific steps include:
- Refining priorities and scope following the May online workshop.
- Extending participation from industry and academia.
- Identifying Use Cases and industry cases studies as vehicles to explore and quantify digitalisation opportunities.

**References**

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