Efficiency improvements by Lidar assistants

Publieke samenvatting / Public summary

ECN with its partners TU Delft, Avent LiDAR Technologies and XEMC Darwind executed the four-year TKI Wind op Zee project LAWINE (LiDAR Application for WInd Energy Efficiency). In this project the application of LiDAR technology has been developed and validated so that it can be used to improve the operation of offshore wind farms with the goal to further reduce the cost of offshore wind power plants.

The planned deliverables in the project have been met within time and budget requirements. Gathering a project team that includes a variety of competences has resulted in a fruitful cooperation leading to the following interesting project results:

1. It has been verified that ground based LiDAR can be applied for wind resource assessments as well as power and loads assessment campaigns. This way wind turbine performance can be verified without the requirement of expensive masts.
2. Power performance assessments can be performed more accurately by using the wind profile measurements of the LiDAR.
3. Wake characterization by LiDAR measurements has been demonstrated, which will assist the optimization of lay-outs of offshore wind farms.
4. In the project it has been demonstrated that nacelle LiDARs are suitable to be used as basis in power performance assessments.
5. It has been demonstrated that LiDAR measurements in combination with advanced controllers have significant benefits for rotor

Projectinformatie / Project information

Projectnummer / Project number
TKIW01006
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Algemene informatie / General information

Penvoerder / Secretariat
ECN

Publicaties en materialen / Publications and attachments

- **03.12.2018**

  Eindrapport TKIW01006

Links

- Report: LiDAR Application for Wind Energy Efficiency (2016)
- Report: Wind Measurements at Meteorological Mast IJmuiden (2016)

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speed regulation and reduction of fatigue loads.

6. It has been demonstrated that LiDARs can determine yaw misalignment accurately, which is an important aspect to implement the ECN wind farm controllers.
7. ECN developed the LiDAR calibration facility where industry can calibrate its LiDARs in a very effective manner. Such utility is crucial for the successful application of LiDARs in wind resource assessments and power performance verification.

These results have been disseminated with researchers and industry over various conferences and workshops.



De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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