**Short Description of Project:**

BreakingWind offers a web app based service to wind farm companies:

* Real-time overview and consultation of the farm
* Predicting energy production and linking it with energy market data

**Problem:**

Wind farm companies make decisions on how to fine tune the farm, plan maintenance and predict the amount of energy they can sell. These decisions significantly affect profit. The main problems is a lack of solutions to help fine tune wind farms in real time (in the changing weather) and the power output prediction for the next day varies approximately ±20% from reality. Furthermore, there is a need to plan maintenance based on turbine degradation.

**Target User:**

Target users are wind farm companies and the product is scalable to solar farms. In 2015 42% (14.1x106 MWH) of energy used in Denmark is wind energy, which translates to a 325 million euro market.

**Solution**

BreakingWind offers a multi-platform web app which translates complex big data into visuals, predictions and recommendations. The interactive platform enables wind farmers to make smart decisions for real time tuning, maintenance and sale volume.

With a team of experienced engineers, BreakingWind has the competence to develop a system which treats the wind farm as an interconnected organism. Combining Computational Fluid Dynamics and Machine Learning tools enables translation of big data (weather, turbines, market) to smart decisions. Even small improvements of inaccuracy result in a large sum of gained revenue in the electric energy market.

**How is your concept feasible?**

Competition on the market boils down to having a better model accuracy and data presentation. BreakingWind puts emphasis on developing power curve analysis - e.g position in wind farm and decay over time. Using dynamic machine learning models for the turbines, better management and power prediction can be performed in real time. The data shows that we can reduce the standard deviation of the power estimation by 33% .

**Four unique value propositions:**

* Interactive web app clarifies big data = smarter decisions
* Real-time analysis of the farm as a complex organism = higher productivity
* Predictions based on unique variables based power curves = more revenue
* Decay & repair analysed in scope of ROI = smarter maintenance

**Business model**

BreakingWind offers project based and real time consultation to wind farm companies. Revenue is created by receiving project and subscription based payments from our customers in return for the services.

**Links for more information:**

* (<http://energinet.dk/>)
* (<http://www.vtt.fi/inf/pdf/technology/2013/T95.pdf>)  
  (<https://str.llnl.gov/content/pages/april-2014/pdf/04.14.1.pdf>)
* (<https://uwaterloo.ca/power-energy-systems-group/sites/ca.power-energy-systems-group/files/uploads/files/el-foulythesis.pdf>)

**Motivation:**

The aim is to make renewable energies more attractive from a business standpoint by overcoming the higher uncertainty that they present. The developed real-time management system of the wind farm allows better control and prediction of power output and maintenance planning which will translate into higher and more secure revenues.

**Group Members:**



