



Distributed Wind Market Status

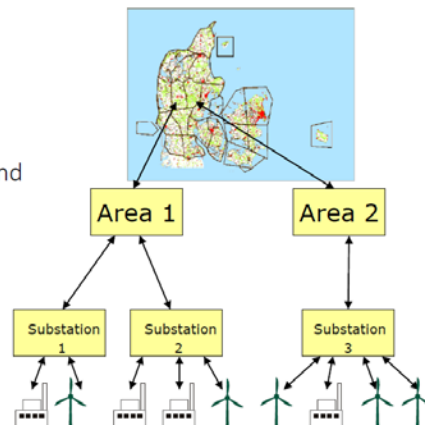
- *Small wind turbines in DK mostly >20 years old*
- *There is some renewed interest in distributed wind*
- *Research needed for distributed wind to be successful in DK (focus on small wind):*
 - *power-curve verification for different conditions (TI, flow-angle)*
 - *or recommendations to re-calculate possible yields for consumers*
 - *siting guidelines / dissemination of info about such*
 - *myWindTurbine.dk : visibility, improvement of its modelling*
 - *power curves/modelling for typical turbulent conditions w/obstacles*
 - *maintenance cost/options*
 - *expected lifetime for costing*

DISTRIBUTED GENERATION MANAGEMENT SYSTEM

- 6400 generators on 4600 'plants'
- 18 Balance Responsible Parties for Production (PBR)
- 75 plants with individual schedules and 4525 plants without!

Data management for

- Generation forecast
- Load flow analysis



Distributed Wind Turbine Manufacturers and Project Developers Active in Your Country

- *Nordic Folkecenter*
- *Thy WindPower*
- *Solid Wind Power*
- *Viking Wind*
- *(KVA-Diesel as seller)*
- *European Energy A/S*
- *Norwin Wind Turbine*
- *Solid Group*
- *Better Energy*
- *NRGi*
- *Thy Møllen*
- *Europe Wind*

Denmark, DTU



Current & Future Funded Research

- *WAsP development (internal DTU)*
- *More detailed combination of mesoscale and microscale wind data*
- *Impact of climate change on wind power*
- *Beyond LCOE assessment of wind power plants*
- *Wind power plant support for weather dependent active distribution networks (PhD project)*
- *Energy Management System for Isolated Hybrid Power Systems (PhD project)*

How can Task 41 members contribute to this research?

- *Connect to government, disseminate*
 - *2015 changes/tax scheme hurt Danish small wind*
- *Collaborate/share in research on*
 - *obstacles turbulent environment*
 - *small-turbine power curves in this environment*
 - *simplification/adaptation of standards for certification*
 - *[see Task41/DTU report E-0219, Kelly et al (2021)]*
 - *Benchmark model of DN with large share of RES – with and without uncertainties in generation and load profiles*
 - *Dynamic models and control of wind turbines and wind farms*
 - *Coordination strategy between TSO and DSO to effectly utilize a large share of RES in the system*
 - *Use of WPPs capabilities to reduce line losses in DS*
 - *Coordination between WPPs and different assests (VRs, SCs, OLTCs) for optimal operation of DN*