



European Wind Energy
Technology Platform

Funding grids: the grid integration strand of the European Wind Initiative

*Hannele Holttinen, VTT
TPWind Working Group 3 Chair*



The European Wind Initiative – introduction (I)

- ❑ The EWI is one of the EU Industrial Initiatives of the 2007 Strategic Energy Technology Plan (SET-Plan), an EU blueprint for the development of low-carbon technologies
 - published by the European Commission in 2009 in its Communication on “Investing in the Development of Low Carbon Technologies” (COM(2009) 519) and launched in 2010
- ❑ The EWI is a long-term, large-scale Programme for funding wind power R&D and accelerate its development
- ❑ It will provide the EU wind energy sector with € 6 bn of public and private resources over the 2010 – 2020 period (a 50/50 split will be sought)
 - Public resources will come from both Member States and EU Institutions, although European funds should cover the majority of costs, considering the EU added value and impact of the EWI
 - Public resources have been identified but still have to be secured: public authorities are already funding the EWI but have yet to commit to a specific, dedicated funding envelope

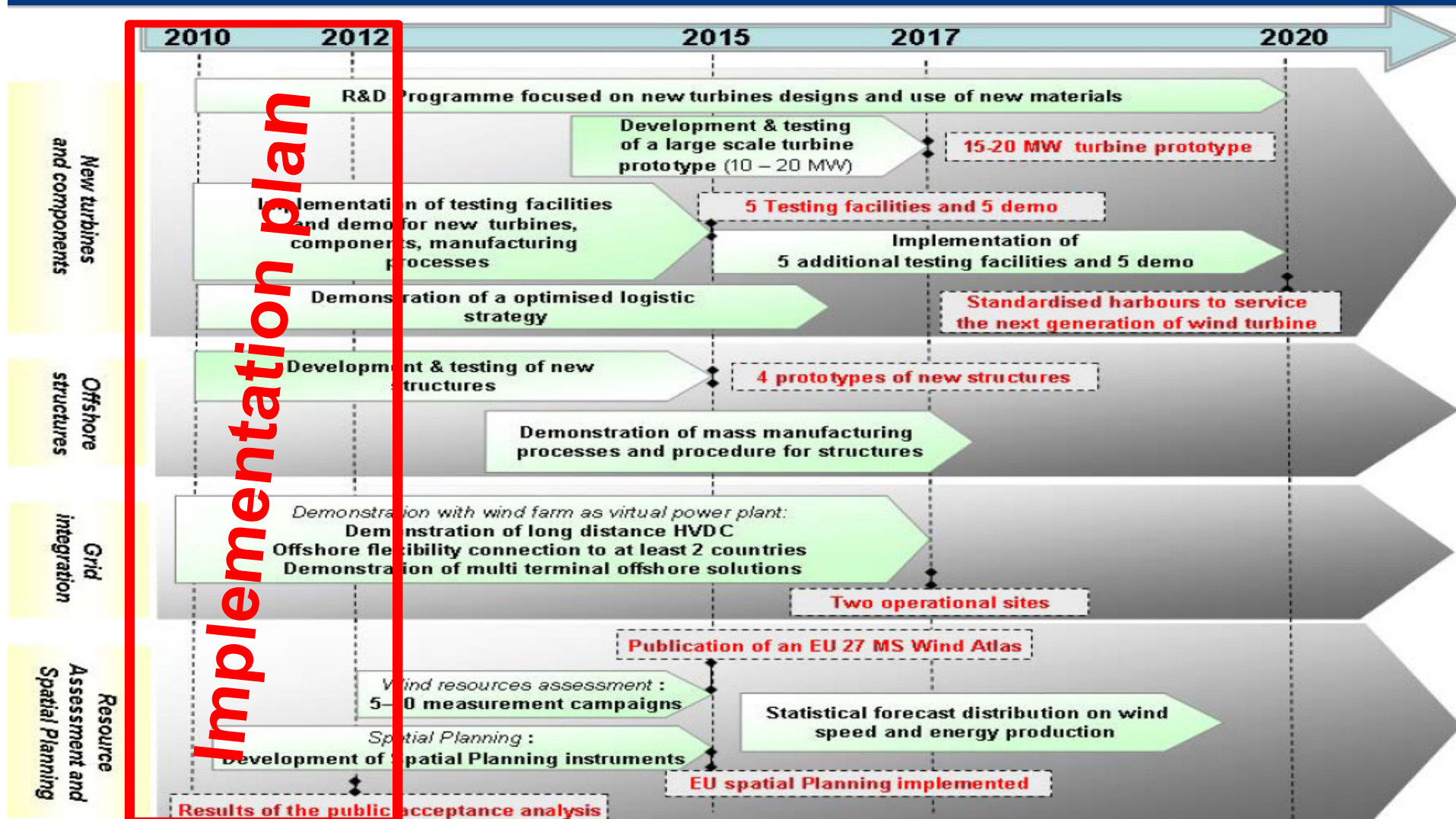


The European Wind Initiative – introduction (II)

- ❑ The EWI was developed by TPWind in cooperation with the European Commission and Member States
 - the result of a transparent and shared process, in which all relevant stakeholders have been involved
- ❑ Wind European Industrial Initiative Team (Wind EII Team)
 - composed of EU, national and TPWind representatives
 - translates the EWI into annual funding recommendations for EU and national authorities
- ❑ The implementation of the EWI will:
 - Speed up the development of wind power
 - Help Europe to maintain its global technological leadership
 - Contribute to the achievement of the EU 2020 binding targets
 - Contribute to de-carbonize the EU economy and fight climate change
 - Increase security of energy supply
 - Create new jobs



The EWI published by the EC





The current Grid Integration strand of the EWI

- ❑ The EWI was developed to include all the actions needed to ensure a proper development and deployment of wind power (including grid integration activities)
- ❑ The EWI has four main strands
- ❑ The Grid Integration one is one of the most important, as indicated by the EWI budget below:

EWI strand	Total budget (€ m)	2010 – 2012 budget (€ m)	Budget intensity
1. New turbines and components	2,500	763	30%
2. Offshore technology	1,200	315	26%
3. Grid integration	2,100	337.33	16%
4. Resource assessment and spatial planning	200	36	18%
Total (including EEPR funds)	6,000	1,451.33	24%



EWI – EEGI interaction

- ❑ The EWI was developed before the European Electricity Grid Initiative (EEGI), i.e. the SET-Plan Initiative developed by grid operators
- ❑ The EEGI was launched in 2010 together with the EWI – however, there was no coordination or exchange of information between the two of them
- ❑ In order to avoid duplication of R&D activities, synergies have to be developed
- ❑ The SET-Plan, European Industrial Initiatives (EII) – like the EWI and the EEGI) and projects have specific roles as follows:
 - The SET-Plan represents the strategic level
 - EII represent the programme level
 - Projects are the implementing mechanisms. Cooperation between wind and grid operators is already taking place at project level (e.g. the FP7 TWENTIES project)



EWI WG3 Wind integration

- ❑ Grid connection of wind plants
 - *Connection of offshore wind farms AC or DC, to 2 countries*
 - *Multiterminal HVDC*
 - Collection grid and design of connection
- ❑ WTCapabilities for system support
 - Generic models
 - *Needs* and options for system services, AC and DC , HV/MV grids
 - Testing of WT system support
 - Control, new VPP concepts
- ❑ Balancing and market operation
 - *Increasing flexibility*
 - *Tools for probabilistic planning and operation*
 - *European wide markets and forecasts, impact of wind on markets*

EEGI Grid Initiative

- ❑ Transmission:
 - Grid Architecture (*offshore*)
 - Demos for technologies
 - Tools: operation, reliability, observability
 - *Market tools: balancing markets, congestions, RES integration, active demand*
- ❑ Distribution
 - Metering
 - Integration of RES,..
 - Monitoring and control
- ❑ Joint
 - *Tools: system observability, forecasts,..*
 - DSM, DER, storage in system operation
 - Restoration plans

EWI – EEGI interaction : main conclusions of the MoU

- ❑ EWI and EEGI representatives held a series of meetings resulting in a Memorandum of Understanding (MoU) that will guide the future developments of the EWI and EEGI in order to avoid overlaps
- ❑ Grid R&D issues should be split between the EWI and the EEGI according to the following guidelines:
 - The EEGI is the EII dealing with grid issues
 - The EWI however deals with grid related R&D activities that are wind-specific (e.g. short term wind forecast, design of wind power plants to develop virtual power plants and so on)



New Grid Integration strand of the EWI - OBJECTIVES

- ❑ Grid integration techniques enabling secure and cost-effective integration of high penetration levels of wind power
- ❑ To develop and demonstrate optimal solutions for connecting wind farms and clusters to future networks, particularly offshore;
- ❑ To develop and demonstrate methods for wind power management providing system support services with regard to market integration and combined operation with other power plant.



New Grid Integration strand of the EWI - ACTIONS

- Grid integration techniques enabling secure and cost-effective integration of high penetration levels of wind power:
 - R&D into and demonstration of connection techniques for wind farms to AC and DC networks (including HV DC meshed grids and network topology)
 - R&D into wind power capabilities for system support and Virtual Power Plant* operation
 - R&D into wind power forecasting and contribution to power and ancillary services markets.
 - A large test facility for 10 MW+ AC and DC connected wind turbines

*Virtual Power Plant refers to the ability to aggregate power production and ancillary services from a cluster of grid-connected distributed generation (DG) sources by a centralized controller and then harmonize this generation with demand side load profiles, with other generators, and where applicable with energy storage

EWI – EEGI interaction – for the rest of 2011 and 2012

- ❑ By the end of 2011, TPWind will deliver:
 - The new EWI grid integration strand
 - A list of R&D actions to be moved to the EEGI, to ensure that all R&D grid integration issues will be tackled by either the EWI or the EEGI
- ❑ EWI and EEGI representatives will meet to revise and approve them. Up to that point, TPWind will continue to implement the EWI in the way it was published by the EC in 2009
- ❑ EWI and EEGI representatives will then negotiate the new budgets of both EIs, reflecting the changes implemented (in 2012)
- ❑ Once approved, the European Commission will be asked to publish these documents as annexes to both the EWI and the EEGI (in 2012)

EWI Implementation plan – R&D and demo topics

- ❑ Grid connection of wind power plants (WPP)
 - Optimised connection (collection grids, turbines, transformers), solutions for connection to HVDC, connection to multiterminal/meshed offshore grids
- ❑ Wind turbine capabilities
 - Ancillary services from WPP – needs and options
 - WPP models for system studies
 - Technology development for providing system services
 - Testing facility and testing methods/procedures



EWI Implementation plan – R&D and demo topics

- Forecasting and balancing market operation
 - Development in forecasting techniques
 - Market operation of wind power plants –trading in all markets (day-ahead....ancillary services), market rules/design enabling wind power plants in the markets
 - Impact of wind power in the markets

Wind integration topics to EEGI

- ❑ Offshore grids
 - architecture, development of multiterminal DC, control of meshed DC grid interconnecting countries
- ❑ System studies with high penetration of wind power (and other variable RES)
 - needs for ancillary services, grid code requirements,
 - Energy management and balancing , system operation, reserve allocation, market integration, balancing technologies (like storage)



EWI – EEGI interaction – conclusions

- ❑ Wind-specific activities will remain within the EWI, also in view of their strategic importance for the development of wind power
- ❑ Regardless of the final distribution of tasks, the vast majority of grid activities outlined in the two EIs will require close cooperation between wind industry and grid operators in order to be implemented - i.e. cooperation at project level

Thank you for your attention!



European Wind Energy
Technology Platform

<http://www.windplatform.eu/>

secretariat@windplatform.eu