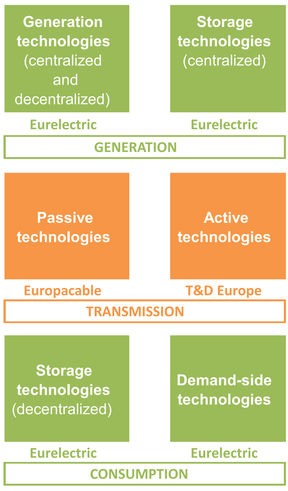
e-Highway 2050

Modular Development Plan of the pan-European Transmission System for 2050

First interim results - A cost and performance database with major power system technologies (generation, storage, transmission, demand) that will:

- Support the power system modeling and simulation activities performed in e-Highway2050 with detailed information on technology costs and performances up to 2050
- Provide stakeholders with structured information on the selected technologies, to be possibly used as a reference database in future planning activities beyond the e-Highway2050 project



Selected technology families

Data type	variable	unit	Time horizon			
			2013	2020	2030	2050
Technology performance characteristics						
	rated power	MW	3.8 - 4	5 - 6.0	5 - 8.0	7.5 - 8.0
	diameter	m	120	150	160	170
	cut-in wind speed	m/s	4	4	4	4
	nominal wind speed	m/s	14	14	13	13
	cut-out wind speed	m/s	25	25	25	25
Costs						
	investment costs (close to shore)	€/kW	3500-3740	2731-2900	1965-2700	1487-2300
	O&M costs (close to shore)	€/kWh	0.035-0.04	0,03	0.02 -0.25	0,01-0,02
	investment costs (far from shore)	€/kW	4301	3141	2260	1710 - 2500
	O&M costs (far from shore)	€/kWh	0,05	0,04	0,03	0,01-0,03
	capacity factor	%	41% - 45%	42,3%	42,8%	43.8% - 55%
	distance to shore	km	29	40	60	93,8
	lifespan	year	20	25	30	30

Offshore wind power: key technical and costs data estimates up to 2050

Selection of technologies

- Portfolio of technologies (generation, storage, transmission, demand) selected according to their impact on transmission networks with regard to planning issues by 2050;
- A dedicated approach developed to identify the demand-side technologies with a major impact on electricity demand at 2050 (i.e. electric vehicles, heat pumps and lighting -LED/OLED- technologies).

Architecture of the technology database

- Organised per technology and sub-technology when relevant;
- Different data types (technical performance characteristics, costs, etc.) described according to quantitative and/or qualitative variables (i.e. for offshore wind power, rated power of wind turbines-technical performance characteristics- and investment costs close to shore-costs-).

Key features of the database construction process

- *Collective construction process* with key stakeholders of the electricity value chain. Data gathering, modelling and calculations ensured by: EURELECTRIC (generation and storage), EWEA (wind power), T&D Europe (active transmission technologies), Europacable (passive transmission technologies: cables), a TSO pool (passive transmission technologies: overhead lines) and TECHNOFI (demand). Data validation is ensured by a Quality Pool of experts as well as by internal workshops and a dedicated workshop with external stakeholders.
- *Uncertainty management and contextualization:* extreme values, both quantitative (min/max) and qualitative (high/low), for each selected variable, are provided to forecast possible evolutions over time. Moreover, data are contextualized, i.e. the typical uncertainty ranges of the data are fined-tuned according to the five e-Highway2050 scenarios covering the 2020-2050 time period.

Don't miss the Power System Technologies 2050 Workshop, Brussels, 15 April 2014

- A unique opportunity to debate on the assumptions underlying the construction of the database
- Who should attend? Specialists in prospective energy technology roadmaps and energy scenarios, TSOs, DSOs, industry associations, research institutes
- Registrations open until 8 April 2014

Partners contributing to the database

Project coordinator: RTE
Work Package leader: TECHNOFI

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