Indonesia Smart Grid Workshop

European utilities efforts to increase the smartness of their Power System

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Elia Group = At the heart of the energy transition



Elia Group = A European top 5 company





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The grid we manage in Belgium - today





transmission towers



Total load – Belgian Consumption



Elia is the Belgian Transmission System Operator (30 kV - 380 kV) managing over 8.400 km lines and underground cables.



The grid we manage in 2030





Fast-paced trends impacting the electricity sector

Decarbonisation of the energy sector

Decentralised generation & new players

Supranational coordination

Digital transformation









New demands from society require a holistic approach



Generation follows consumption

Demand will follow generation

Smart grids is much more than a story of assets, it's also (and maybe even more important) about smart market design, methodologies, state of the art forecasting and algorithms, operational procedures supported by digital technologies

Forward looking: Internet of energy <u>io.</u>E: 3 building blocks to realise a consumer-centric system



Vitit <u>https://www.ioenergy.eu/</u> for more information

Rise of the Renewables - Share in total load



Peak production The largest share of total load covered by all renewables combined was: 68% of total load (20/04/2020 14:30)

Installed base

	Solar	Offshore	Onshore
2018	3369 MW	1178 MW	1978 MW
2019:	3886 MW	1548 MW	2248 MW
2020	4787 MW	2254 MW	2416 MW





Despite higher RES penetrations we achieve a better system balance thanks to improvements in balancing market design



Single Marginal Pricing •

Anticipating issues with security of supply requires state of the art forecasting tools (total load, generation, ...)





Forecasts are published on internet to facilitate markets



elia

Day-ahead forecast errors

- Installed capacity
- Absolute P99 error (%)
- Relative P99 error (MW)

Rel. error is almost flat, forecast quality is constant. Offshore wind has highest relative errors, high grid impact!





Line ratings of existing assets can be maximized using dynamic line rating technologies







