Facilitating energy storage to allow high penetration of intermittent renewable energy

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InnoGrid2020+: The Transmission and Distribution R&D seminar

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stoRE: Main Facts

- From May 2011 to April 2014
- **Aim:** facilitate the high penetration of intermittent renewable energies in the European grid by unblocking the potential for energy storage infrastructure
- **Overall objective:** help creating the regulatory and market conditions that will give incentives for development of the necessary storage infrastructure

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Market Design

- Spread between peak and off-peak prices decreasing, changing the business model of energy storage and making its viability marginal. Uncertainties in the ancillary services markets and double grid fees putting more pressure
- IEM seems to rely on market signals for the delivery of balancing and ancillary services to deal with intermittency and system stability in addition to the TYNDP
- Do the current market signals mean that we do not need large scale storage?

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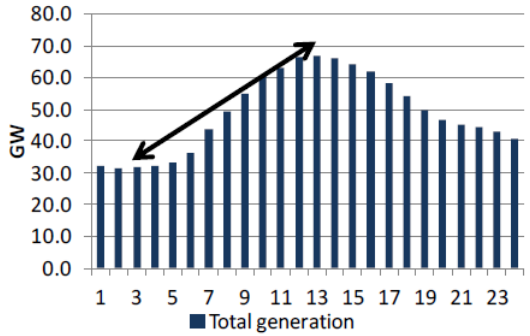
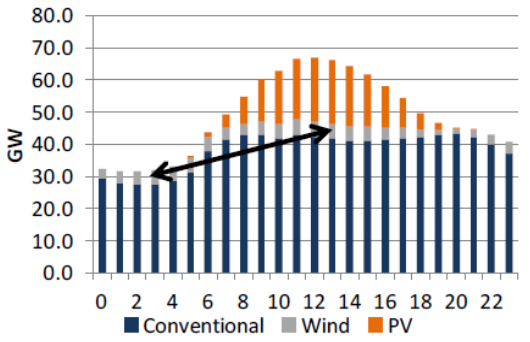
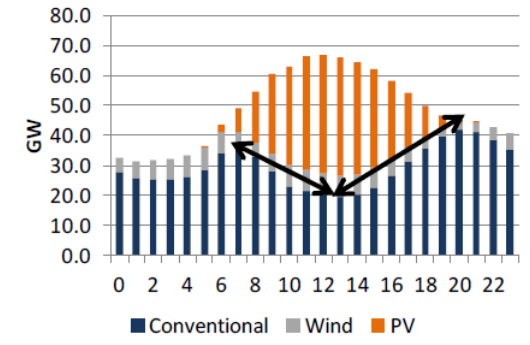
Market Failure?







Source	Installed Solar Capacity by 2030 (MWe)
Energy Roadmap 2050 (Reference Scenario)	91,599
Energy Roadmap 2050 (High RES Scenario)	195,255
Eurelectric's Power Choices	65,000
EPIA (Paradigm Shift Scenario– refers only to PV)	768,500

- Market solution or market intervention?
- Intervention: The energy infrastructure package foresees support for energy storage under strict conditions, but explicitly excluding PHES
- PHES development times of over 10 years
- Market: RE distortions –Improved Ancillary Services Market designs - Cross border balancing markets?

Source: Simon Mueller, IEA, Future Design of RE Markets, EUFORES Parliamentary Dinner Debate, 4 December 2012, Brussels

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Regulatory Uncertainties

Electricity Directive: Electricity generation not controlled by TSOs + Storage is treated as generation = **TSOs cannot have any control over storage**

- **ENTSO-E** in the latest TYNDP: "*In terms of regulatory issues, open questions are related to which players (private market operators contributing to system optimization or regulated operators) shall own and manage storage facilities*"
- **Regulatory certainty needed to allow storage development.** Official definition of storage would help clarity and allow further development also on distribution level
- But which way shall it go for optimal results on system level? There will always be cases where transmission vs storage will be challenging to evaluate – case by case?

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