

Over-capacity, diversification or storage: Where are the thresholds that maximise flexibility in RES-based systems?

Interactive discussion among IEA TCPs and outstanding projects
web meeting – 11/03/2021 09.00 - 12.15 Central European Time

Framework

This web meeting is organized in the frame of the Integrated Electricity System Coordination Group (IESCG) of the End-Use Working Party (EUWP) of the IEA. The Coordination Group supervises the activities of the three electricity-related TCPs to foster collaboration, interaction and outreach. Although essential for decarbonizing the energy system, the electricity system must progressively increase its level of interaction with all other technologies and vectors. For this reason, the IESCG has started a pathway of discussion with TCPs in other sectors to foster debate and highlight collaboration and mutual knowledge exchange.

Discussion background

Electricity is a fundamental energy vector in the decarbonized RES-based energy system, but the intrinsic variability of renewables causes frequent and deep mismatches between the local generation and load, calling for flexibility measures, system adaptation and integration with other energy vectors (i.e. gas, heat, hydrogen etc.). Most of the mechanisms for variable renewables integration have both supply and demand side components, with storage and vector coupling as a useful buffer.

The discussion aims at addressing a very delicate trilemma for policy makers and system developers and operators: i.e. overcapacity, diversification or storage.

- Overcapacity is a development path where the system increases its intrinsic physical safety margins: building more generation to ensure capacity in all situations, building more dispatchable/interruptible demand, to ensure reaction towards supply variation. This option has financial implication and adequate economic models need to be adopted to ensure sustainability
- Diversification means leveraging multiple energy sources and demand, diversified across geographic locations, conversion technologies (both for generation: solar, wind, and for demand: electricity, heat, water etc.), considered holistically to match local variability. This option requires adequate energy networks, smart energy systems and market rules.
- Storage is the decoupling option leveraging multiple energies (electrical, thermal, chemical, kinetic), at multiple scales (inter-seasonal thermal stores, through pumped hydro to grid scale batteries), multiple locations, dynamics (charge/discharge rates) and flexible scheduling of energy service demand. This option rises issues of financing and ownership.

All options rely heavily on the capacity to predict generation and demand over extended timescales (from seconds to seasons) and geographical regions (characteristics of the distribution of generation and load and its variance/covariance across energy types).

Objectives of the meeting and discussion paths:

The meeting aims at exchanging experiences among TCPs about the above trilemma, to identify the contribution that the different technological options can offer to enhance the flexibility of the integrated system, in order to unleash the potential for variable RES integration and system decarbonisation. Starting from a scene setter about the potential alternative/complementary development paths of the integrated energy system, the discussion will involve 6 TCPs to debate, based on their respective specific experiences and workpaths, about the different perspectives of the trilemma, identifying the pros and cons, the thresholds for one option vs the others, the technological, regulatory and market barriers to foster and unleash the integration of variable renewables towards a the future decarbonized energy system.

Living experience from projects will also be discussed from Europe, Australia and Japan. A keynote speech will be delivered by the European Technology and Innovation Platform on integrated energy system (ETIP SNET), i.e the widest European stakeholders and experts forum in Europe on the intergrated energy system (www.etip-snet.eu).

Programme

THURSDAY 11 MARCH 2021
9.00 – 12.15 CENTRAL EUROPEAN TIME
WEB PLATFORM

09.00 – 9.10	Introduction and workshop objectives <ul style="list-style-type: none"> • Michele de Nigris – EUWP VC
09.10 – 09.30	Keynote speech: <ul style="list-style-type: none"> • ETIP SNET - Jan Okko Ziegler - ETIP SNET Chair
09.30 - 09.45	Scenario setting: <ul style="list-style-type: none"> • ETSAP TCP – Brian O’Gallachoir – TCP Chair
09.45 – 11.15	Round table discussion among IEA TCPs: <ul style="list-style-type: none"> • Wind – TCP – Task 25 – Grid integration - Hannele Holttinen • ISGAN – TCP – Luciano Martini – TCP Chair • ECES – TCP – Teun Bockhoven – TCP Chair • Hydrogen – TCP – Paul Lucchese – TCP Chair • Users – TCP – David Shipworth – TCP Chair • IETS – TCP – Per-Åke Franck – TCP Secretariat, Jonathan Moncada Botero - TNO
11. 15 – 12.00	The experience from ongoing projects: <ul style="list-style-type: none"> • Experience from Australia – Scott Ferraro (Monarch University – Melbourne) • Experience from Japan - Takeshi Maeno (NEDO – Japan) • European project EUSysflex - John Lawrie (EirGrid); FlexPlan – Gianluigi Migliavacca (RSE)
12.00 – 12.15	Key lessons learned and impact

- Registrations:
 To register for the event please fill in the form at the following link:
<https://forms.gle/P5cJ7x1iqB9Cb39J9>
 all registered persons will receive a link to the webinar platform some days prior to the event