ETIP SNET + JRC
Outcome of the South Eastern + Islands Workshops

Nicosia Regional Workshop

November 24th 2017

What did we learn? What else?

- Overarching objectives;
- The main lessons learned and barriers to innovation deployment;
- Needs for future R&I activities coming out of the projects;
- Deployment prospects of the most promising solutions;
- Identify needs for test platforms (interoperability etc);
- To what degree use/need is for inter-regional cooperation?

Wrap-up discussion: main messages from workshop

→ **Introductory session:**

- Interoperability for digitalization of the energy system is a key issue. More research is needed for understanding how to deal with a system in constant evolution and different lifetimes of technologies (electrical/electronic/ICT equipment).

→ **Sessions 1 (islands)**

- Spatial and temporal modelling of generation/demand is key to assess real resilience of future energy systems
- Planning should include dynamic security constraints while considering all flexibility means.
- Planning studies for HV systems (transmission) should include well suited models of the distribution systems so as to carry out coupled transmission-distribution simulations.
- 100% renewable penetration on islands today would be very expensive to achieve (non-linear cost- RES penetration relation). Regulations should evolve so as to favor high-RES penetration (electricity prices should not be based on marginal cost approaches).

Wrap-up discussion: main messages from workshop

→ Sessions 1 (islands, continued)

- Storage should be located at every level of the energy system to maximize impact and social welfare: location is important, i.e. where the service is needed. Further research is need to optimize the spatial distribution as a function of the local system condition.
- Few (at least 3) time-of-use (ToU) tariff slots per day help to flatten the load curve and improve penetration of RES generation. Difference between the different ToU slots should be at least 20% to create interest.
- ToU tariffs have to evolve with the energy mix so as to maximize the use of the generation assets (including storage) and to be cost reflective.
- Demand response from water treatment plants (desalination) should be considered as a mean to flatten the load curve
- Islands are a test bed for developing smart energy systems. However, energy systems as a whole cannot be fully tested since not all energy vectors are available on most islands. Further research is needed to go beyond the hybrid generation concept being planned on Greek islands.
- When considering decentralized energy storage, EVs with V2G capability present a huge potential to provide system services

Wrap-up discussion: main messages from workshop

→ **Sessions 2 (WG1)**

- Use of Smart metering as an enabler for new services, new solution needed for smart meters.
- Integrate solutions for flexibility, balancing market operation, RES curtailment mitigation and EV integration.
- Use Virtual Power Plant Systems for an optimal pan-European (cross-border) intelligent Balancing mechanism
- Real-time forecast and advance dispatching as solutions for managing the transition from energy to balancing markets.
- Add R&I attention on resilience by smart means e.g prosumers, microgrids and smart communities / smart cities.

Wrap-up discussion: main messages from workshop

→ **Sessions 3 (WG2 and WG3):**

- Efficiency and lifetime of BESS strongly depend on the use profile cycling and the technologies.
- There is still a need for focused demonstration projects (with a set of specific applications and technology) so as to understand how storage can be used in the power system.
- Multiservice business models for storage integration is the solution for profitability provided that the system services brought by storage are fairly valued (regulations and market mechanisms) and that the devices are designed for these applications.
- Need for new duty cycle standards so as to give undisputed performance certifications (link with ongoing standard activities, e.g. IEC) for storage systems.
- There is a wide portfolio of storage technologies which fulfill different functionalities. Hybrid systems (e.g. flywheel-BESS-supercap) could help to cover a wide range of functionalities.

Wrap-up discussion: main messages from workshop

→ **Sessions 3 (WG2 and WG3, continued):**

- When performing numerical simulations of power system components, accurate models that fully cover the physics is still an issue.
- Devices that utilize both photonic and thermal processes for energy conversion could prove to be a complementary dispatchable solar generation solution when coupled to specifically designed thermal cycle and/or (thermal) storage systems.
- CST technologies are already mature and can be combined with conventional power blocks to provide low carbon forecastable electricity generation.

WG4 outcome

- Opensource and opendata initiatives should be encouraged.
- Full digitalization in both **transmission and distribution networks is a need.**
- Ensure **physical and cyber-security** in energy system.
- Leverage knowledge of **consumer data while respecting privacy and data protection.**
- **End-user involvement** in the development and operation of the energy system.
- Web Application that supports multiple Users and Roles.
- Using external antenna for data collection meets minimal resistance from consumers, but the system is not interoperable.
- More flexibility towards power users - telco services for power distribution network providers, water and gas – 5G required.
- Consider more involvement of social aspects in projects to be more effective with end users. Maybe include social scientists to achieve simplicity and clarity.

ETIP SNET
EUROPEAN TECHNOLOGY AND INNOVATION PLATFORM
SMART NETWORKS FOR ENERGY TRANSITION

S3 SMART SPECIALISATION PLATFORM

Thank you!

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