Paris Session 2022

Dealing with large numbers of system participants

C6
PS2, Q2.1

Are there any challenges or issues related to DER integration and operation on the actual power system, which are not only technology related but also others, such as political, regulatory, business or economic matters?
Is there any unexpected or unusual behaviour of the DER or phenomena affecting the power grid due to RES/DER integration?
Does the level of DER penetration affect such behaviour?

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Group Discussion Meeting

Motivation

- Number of active system participants will rise exponentially
- Market design is not suited to manage large numbers of system participants
- Power system operation gets increasingly challenging as – as of now – behavior of new active system participants

Proposed solutions

- Refinement of existing processes
  - “Smarter” Redispatch
- Additional processes (incremental) to enhance existing structure
  - Local energy or flexibility markets, often as sequential add-on
- New innovative processes (disruptive)
  - Microgrids and Energy Communities

Recommended Solution

- Wholistic organization structure
  - “Web of Cells”, “Cellular Energy System”
  - Based on system levels and geographical extent
  - Hierarchically ordered
  - Decomposition of large system is possible
- Amount of data exchange is reduced in each system, as only communication with neighbor required.
- Execution of market power is prevented as one single market clearing process is applied.
- Use of both local and remote flexibilities is incentivised by adequate pricing scheme.