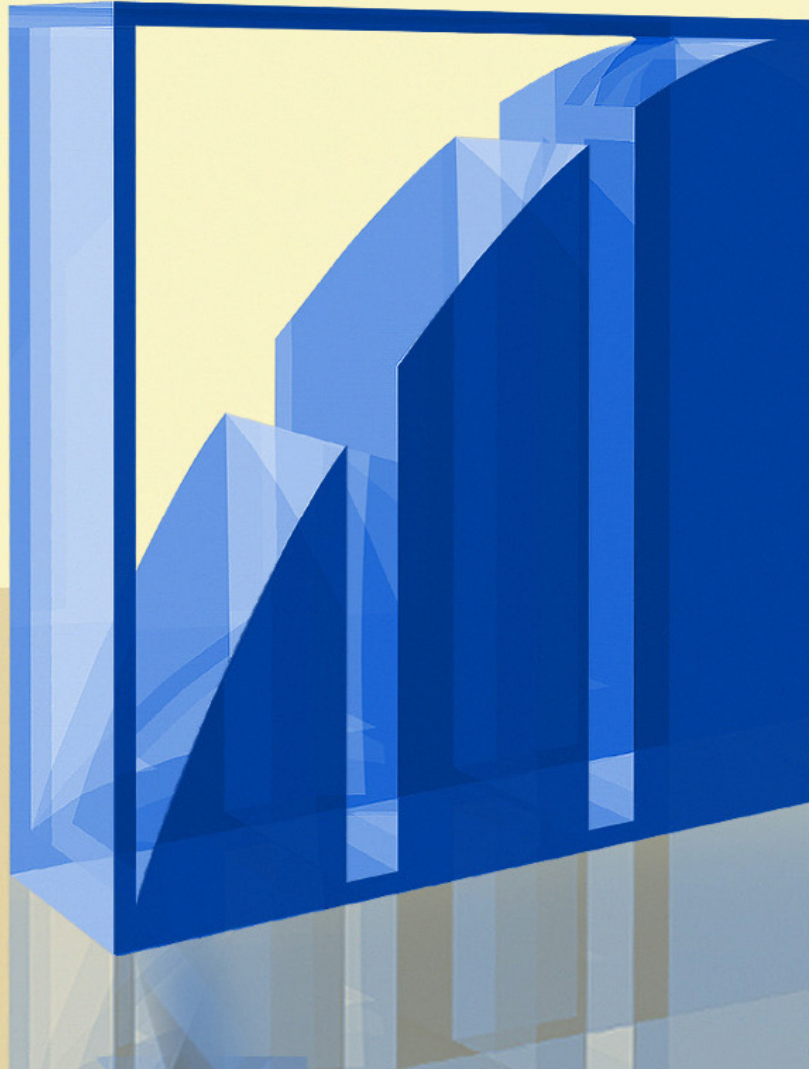


Virtual Power Plant requirements for IEC 61850-7-420



Consulting people

BTC shows the way – you decide

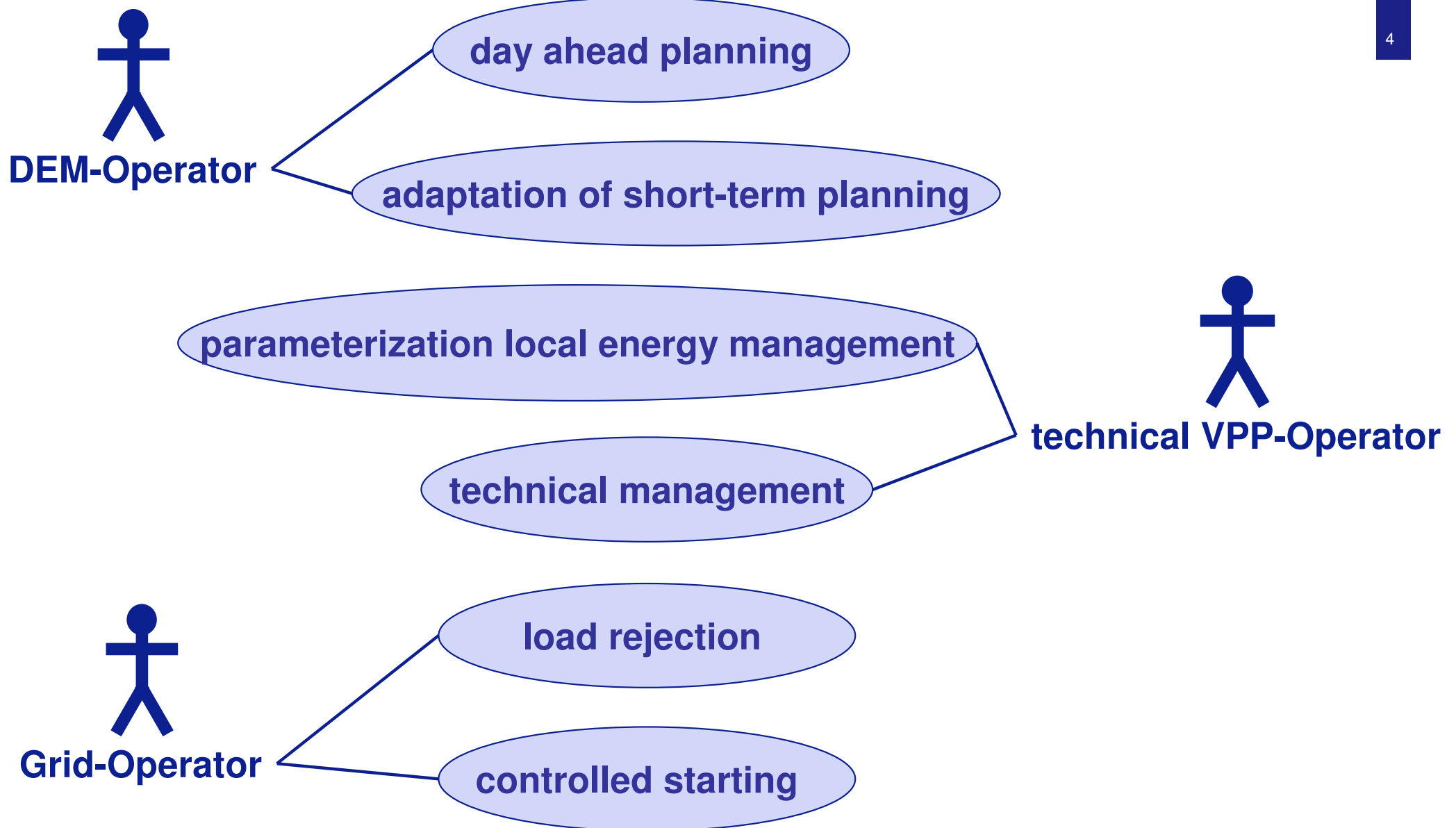


Agenda

- /// the given scenario in DEMS
- /// IEC 61850-7-420 support for DEMS
- /// schedule management
- /// conclusion



Actors and Use Cases in DEMS



/// DER / private VPP

- ◆ one owner
- ◆ connected to the public grid via exactly one point of common coupling

/// Aggregator VPP

- ◆ integrates many DER / private VPPs
- ◆ connected to a public sub-grid via multiple points of common coupling
- ◆ many DER / VPP owner
- ◆ one technical VPP operator

/// VPP-SCADA

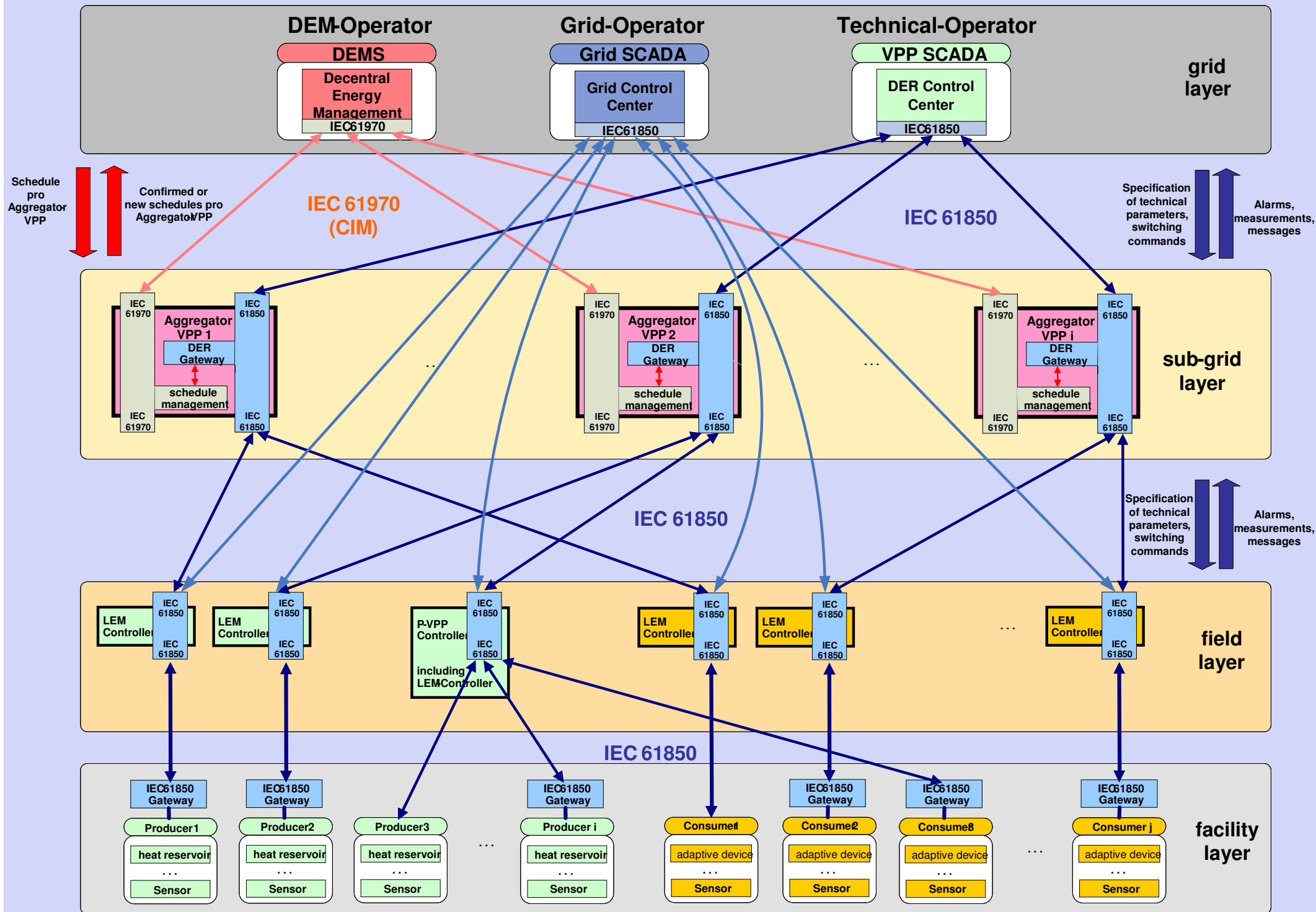
- ◆ control station of the technical VPP-operator
- ◆ establishing overall some kind of distributed VPP
- ◆ multiple points of common coupling (DER, P-VPP or A-VPP) in different sub-grids

/// DEMS

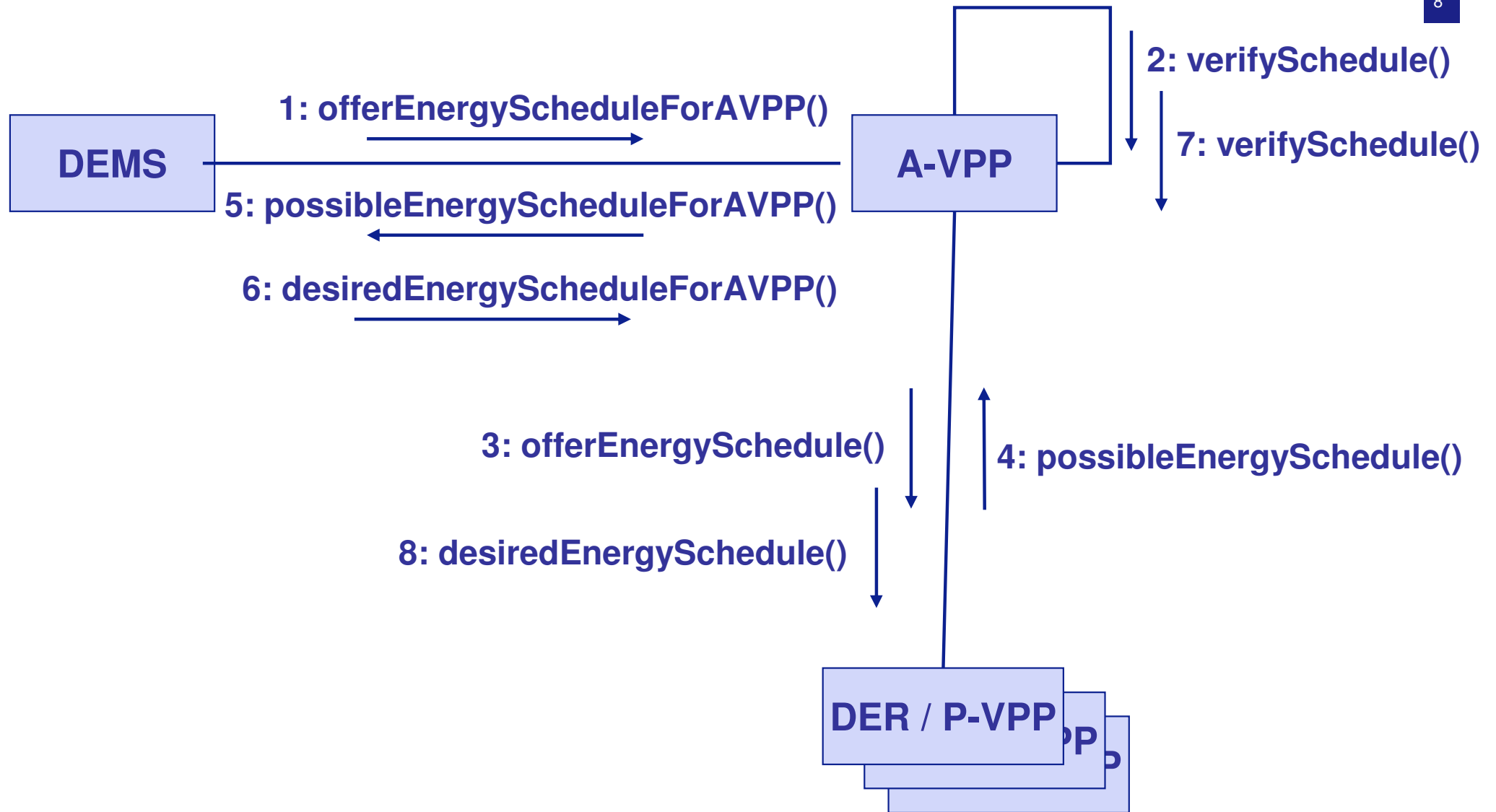
- ◆ common distribution DER-based energy services
- ◆ economical and ecological optimization of DER-utilization

/// Grid-SCADA

- ◆ classical network control station of an energy supply company
- ◆ ensuring a secured mains operation



DEMS requirements for schedule management



Usage of ECP (PCC) Logical Device for day ahead planning

- /// **Each P-VPP/DER disposes of exactly one grid connection point, for this reason the LD ECP (PCC) is predestinated**
- /// **DEMS**
 - ◆ **DOPR: nominal operational values**
 - ◆ **DOPM: specification of an operating mode**
 - e. g. maximum VArS, peak load shaving
 - ◆ **DCCT:**
 - economic dispatch parameters make it possible to include this information during the generation of a schedule
 - particularly with regard to DCCT.WSched
- /// **but ...**
 - ◆ e. g. in DOPM a schedule driven mode is missing
 - ◆ the response of counterproposals or confirmation to an offered schedule is not yet in focus of the standard

/// VPP-SCADA

◆ logical nodes for DER

- technical controlling (DRCT, MMXU)
- remote diagnostics (DGEN, DRAT, MTMP, ..., MMXU)

◆ logical nodes for grid connection points

- controlling the power input (DPST, MMXU)

/// technical operation management

- ◆ Yes, IEC 61850-7-420 covers a large part of the requirements

/// local (P-VPP specific) energy management

- ◆ first approaches in LN: DOPM and DCCT
- ◆ but it must be extended

- /// **controlling the power input**
 - ◆ **MITV – interval revenue metering**
 - ◆ **MMXU – measuring unit**
- /// **fast disconnection from grid**
 - ◆ **CSWI – switch controller**
 - ◆ **XCBR – circuit breaker**
- /// **controlled reconnection of sub-grids with a good deal of DER**
 - ◆ **not yet in focus of standard**

- /// IEC 61850-7-420 covers a large part of the DEMS requirements

- /// There must be support for a schedule driven mode

- /// We will further on delve into this topic
 - ◆ FC4DEMS in fall of this year
 - ◆ Master thesis about the integration of DERs

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