POSYCO

Power System Cognification

Das Stromnetz fit für die Zukunft machen

Green Energy Lab Insight Talk, 6th October 2021, Online

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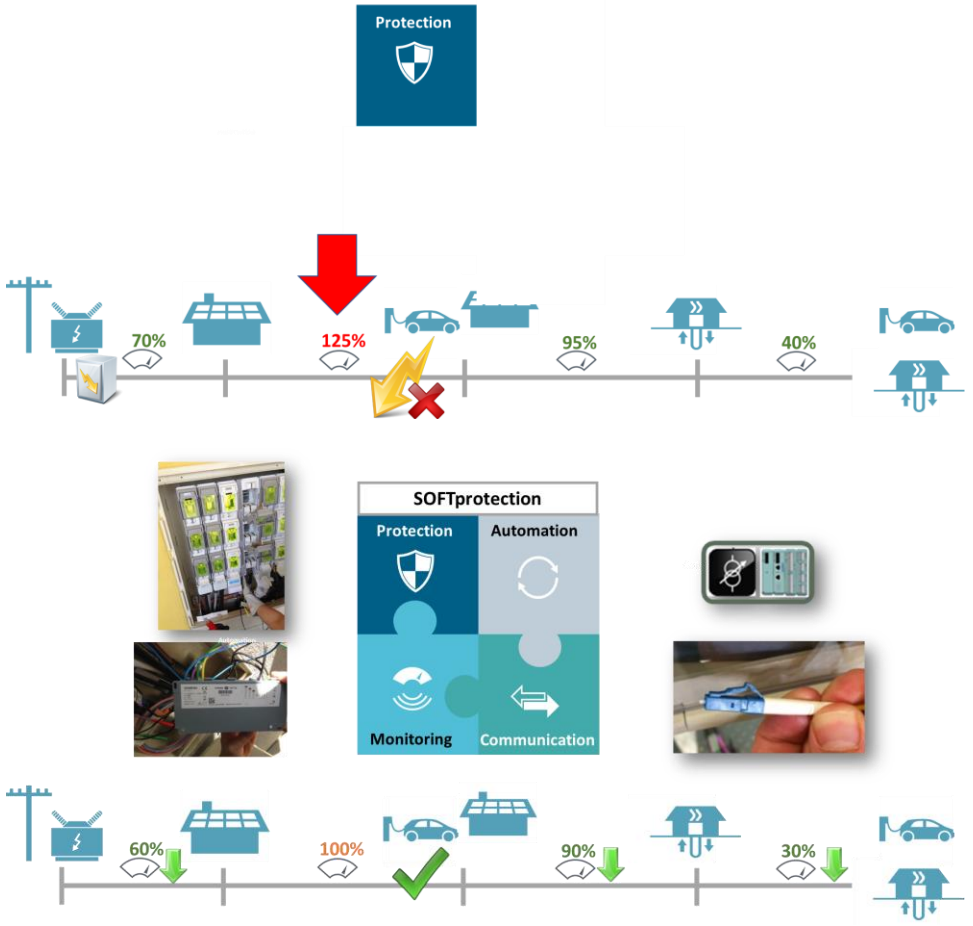
AIT Austrian Institute of Technology – Tomorrow Today · SIEMENS – Ingenuity for life · TU Wien – Technische Universität Wien, Vienna University of Technology, Automation Systems Group, ESEA · TU Graz – Graz University of Technology · Moosmoar Energies OG · Wiener Netze · Wien Energie · ASCR – Aspern Smart City Research

In a Nutshell

- Concept for a **'SOFTprotection'** as add-on for protection and control in low and medium voltage grids - widely autonomous support system
- Solutions for how a distribution system operator (DSO) can **implement an advanced smart grid protection and control functionality** in his technical and organisational framework
- **An ICT (Information and Communication Technology) system** for automated operation
- **Integration into working processes** including the human-to-machine interaction

Physical Dimension **ICT Dimension** **Process Dimension**



Use Cases

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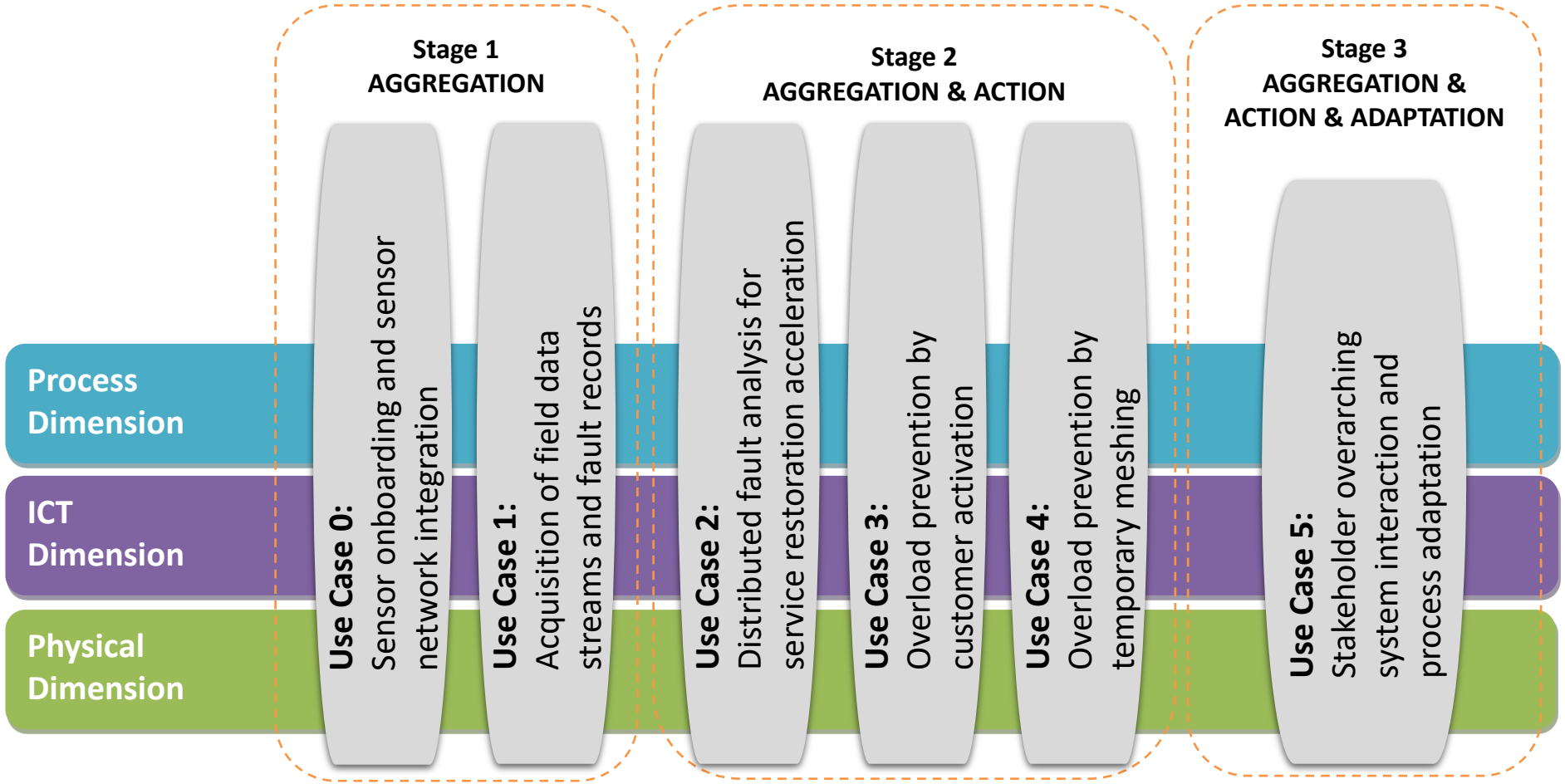
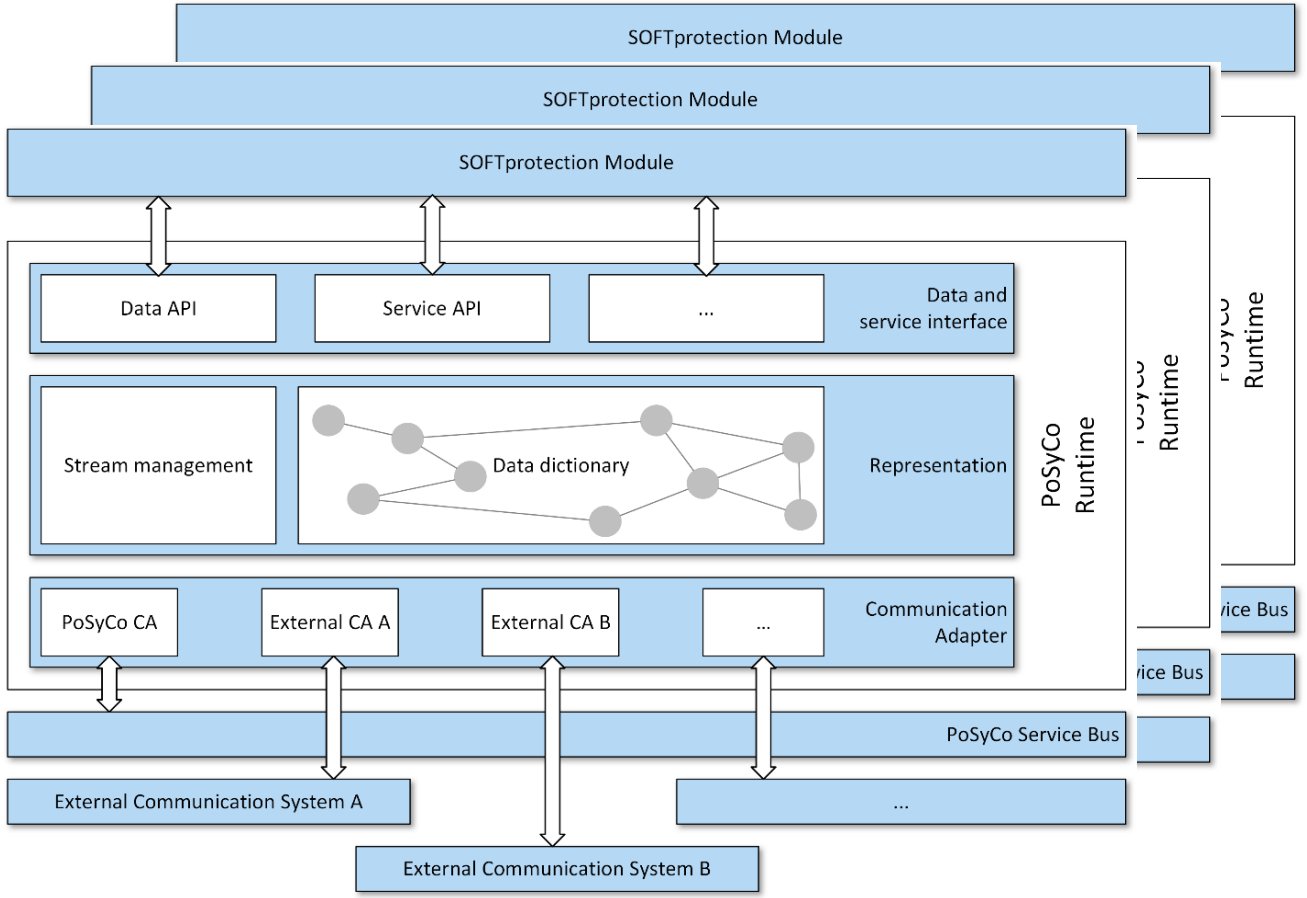


ICT Dimension

- Soft Protection Communication Framework
  - Use of a **message oriented middleware**
  - **Data dictionary** allows and resolves abstract requests to resources
  - Tailored **data and service interface** for application module integration
- Soft Protection Information Framework
  - Information model (**ontology**) for grid topology, equipment and measurements
  - Designed in alignment with IEC 61970 – **Common Information Model**



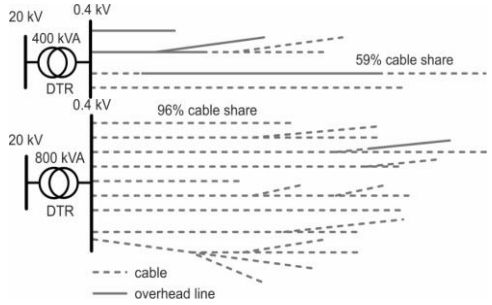
Physical Dimension

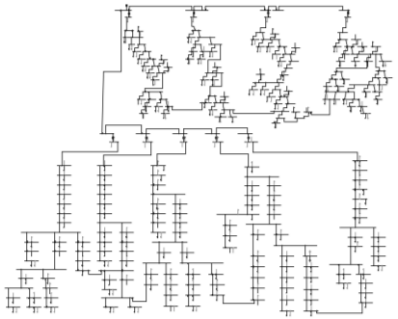
- Utilisation and enhancement of development environments

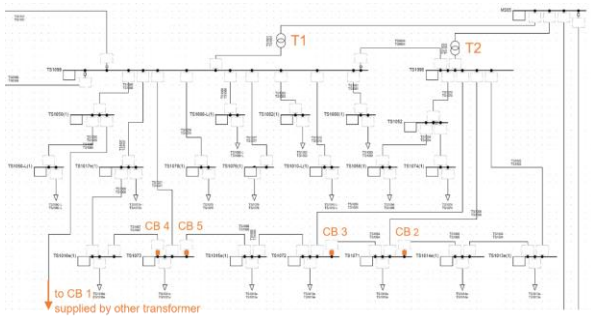
MATLAB → PSS®SINCAL → MATLAB

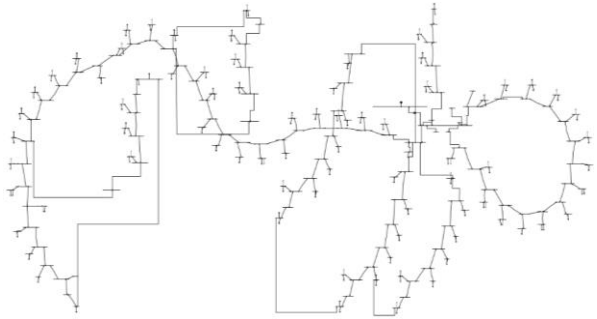
python → SILENT PowerFactory → MATLAB

- Selection of representative grid topologies and prosumer models
- Development and validation of Use Case specific algorithms
- Simulation based tests of functionalities and performance



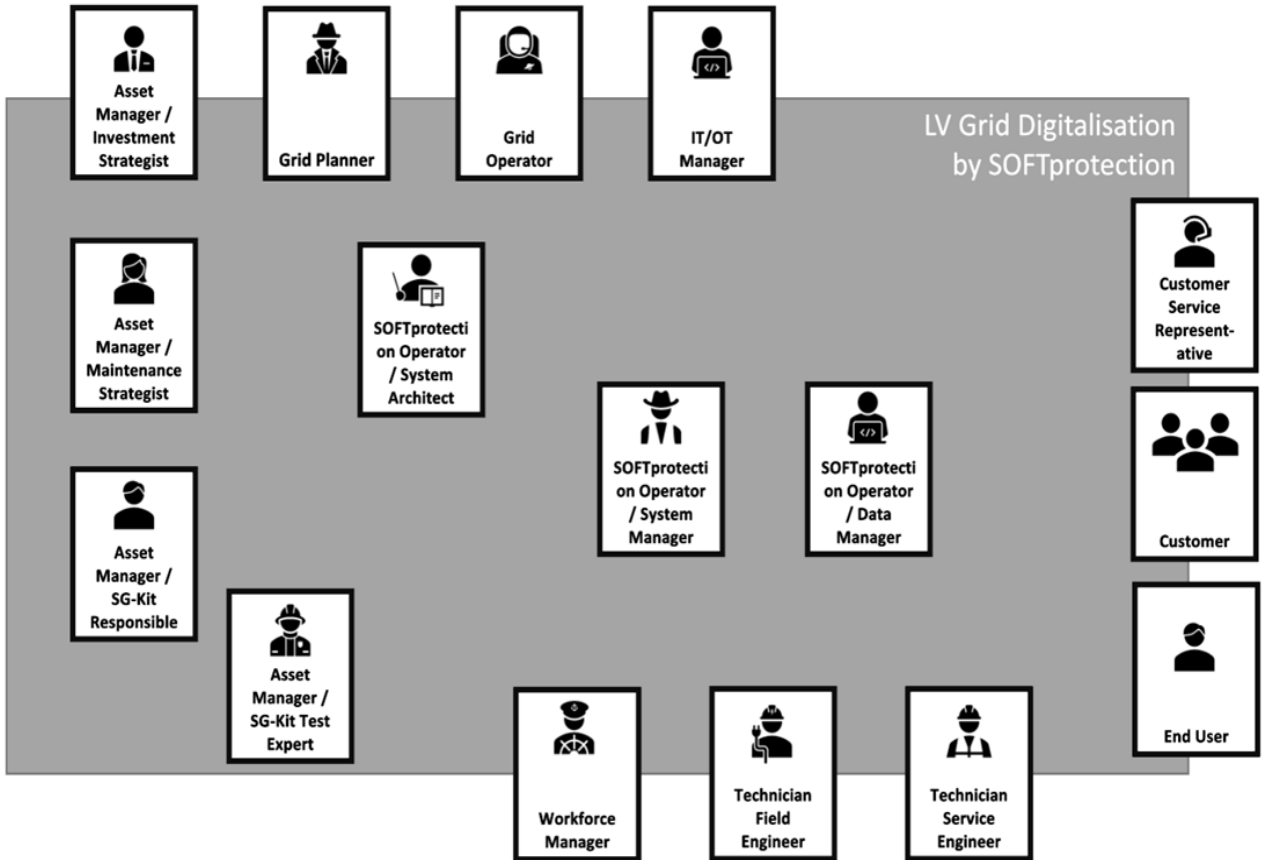




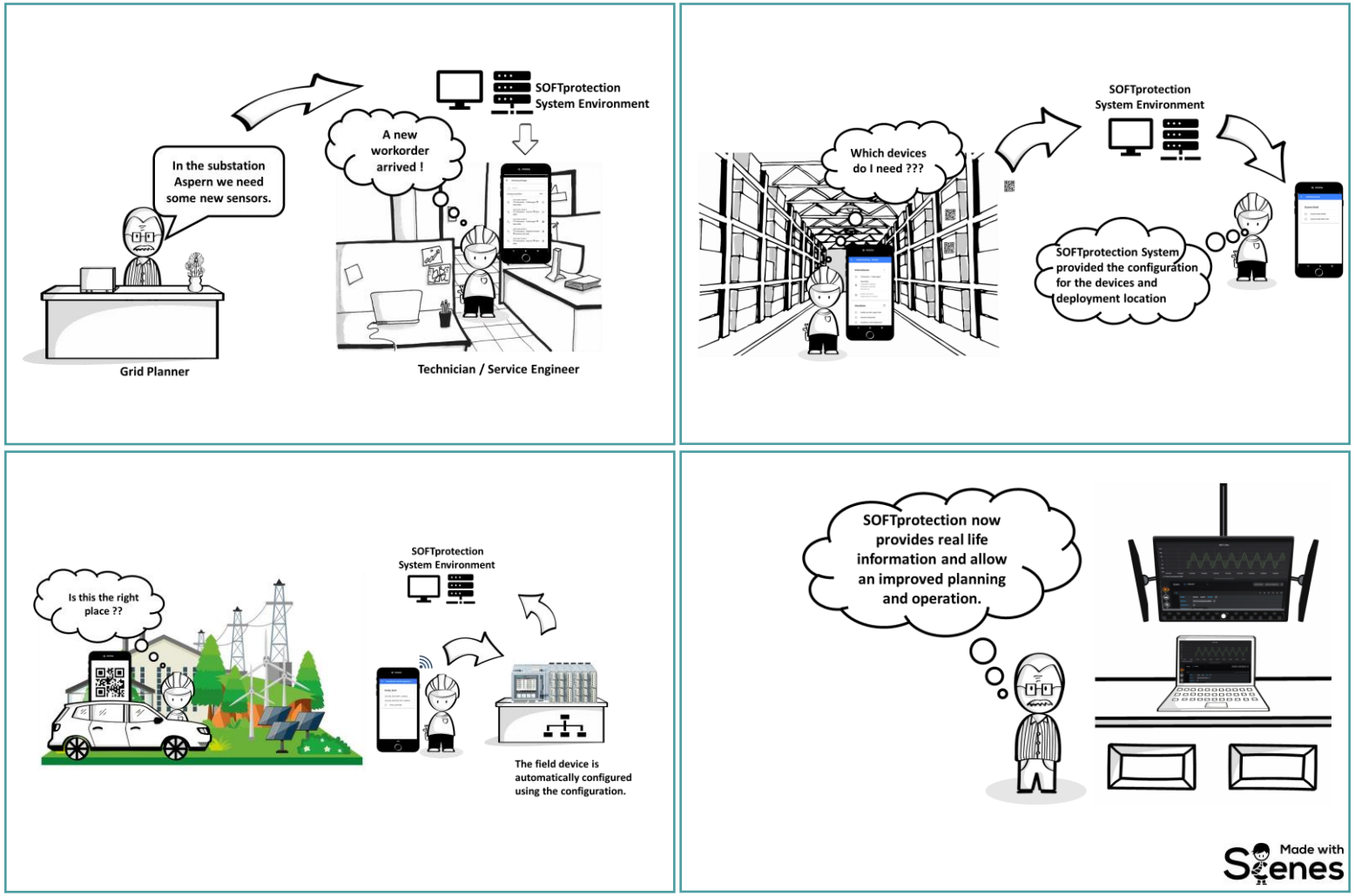


Process Dimension

- In several online and bilateral meetings, existing processes and interfaces were identified within DSO environments.
- For each Use Case of the PoSyCo project, corresponding roles (also new roles) and workflows (incl. new workflows) were identified.
- Roles and workflows are merged in special Show Cases, which will be analysed in depth (process optimisation and cost-benefit analysis) in the last project period.



Process Dimension



- Optimise the implementation of processes, interfaces and roles within DSO environments by using and extending BIFROST
- Corresponding user stories based on workflow descriptions
- Emulation of a wide range of possible scenarios with corresponding dependencies.
- Scenes represent workflow “sensor roll-out”

Work created with Scenes™ by SAP AppHaus (https://experience.sap.com/designservices/scenes)

Conclusio

- Functionalities and related algorithms alone will not fully prepare grids for the future
- Supporting ICT and communication frameworks need to be provided and integrated in DSOs infrastructure
- New roles need to be established and integrated in DSOs working processes

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Dieses Projekt wird aus Mitteln des Klima- und Energiefonds gefördert und im Rahmen des Energieforschungsprogramms 2017 durchgeführt

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