

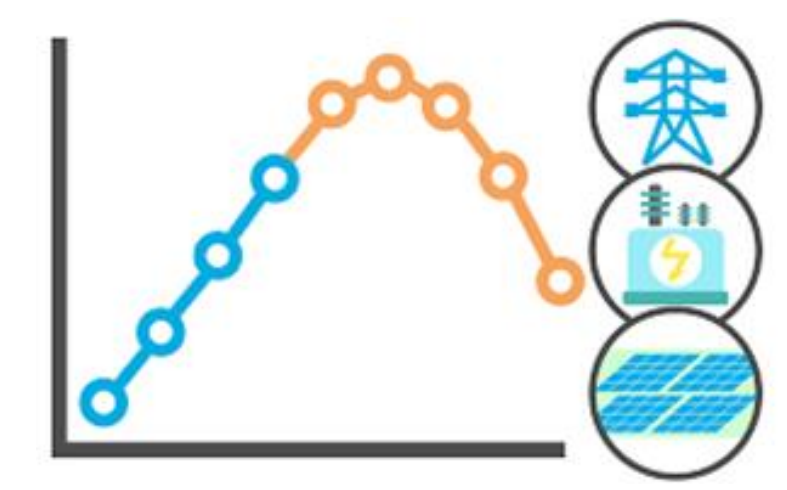
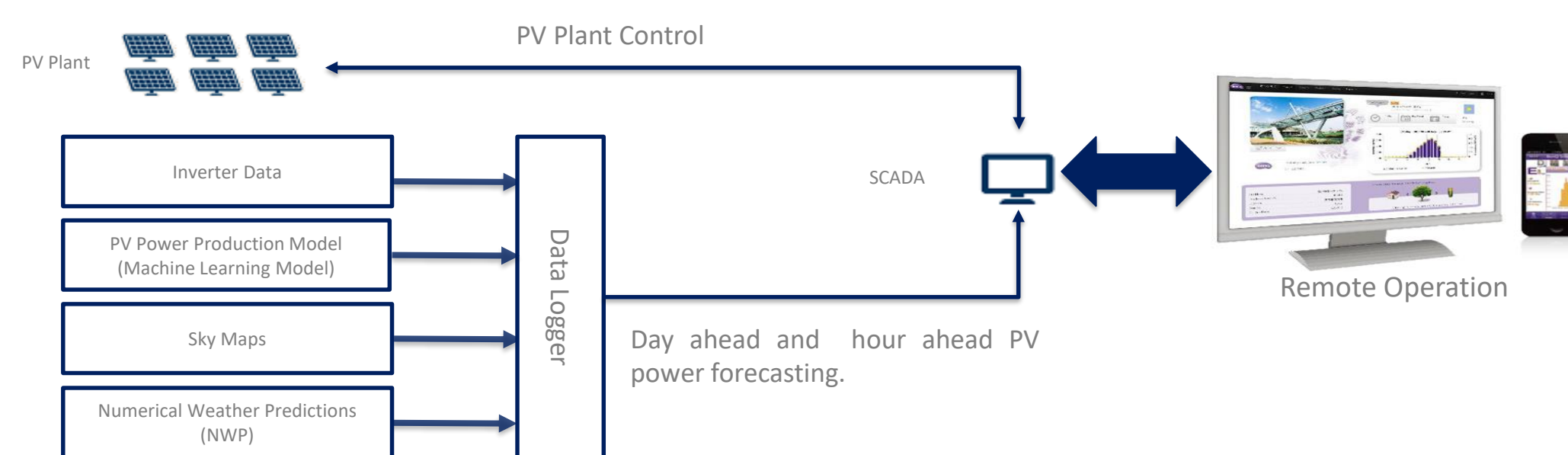
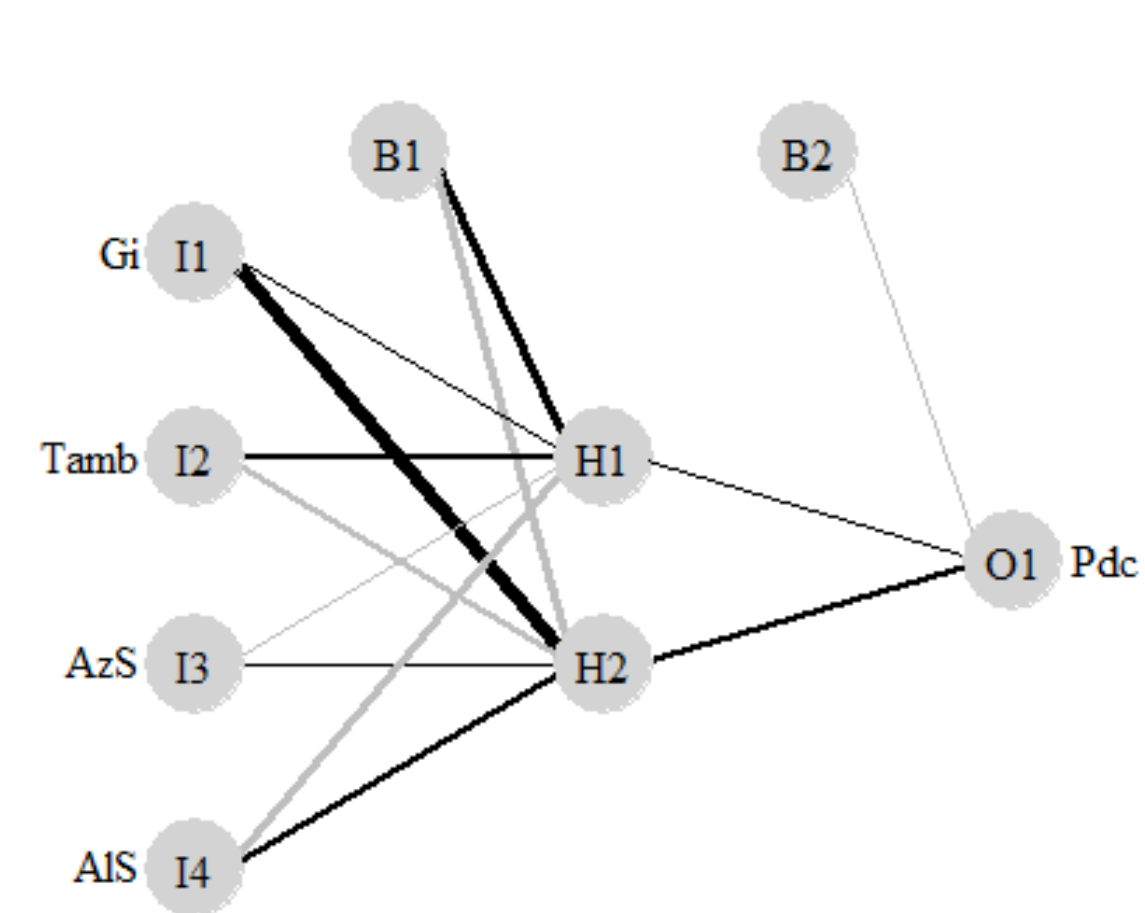
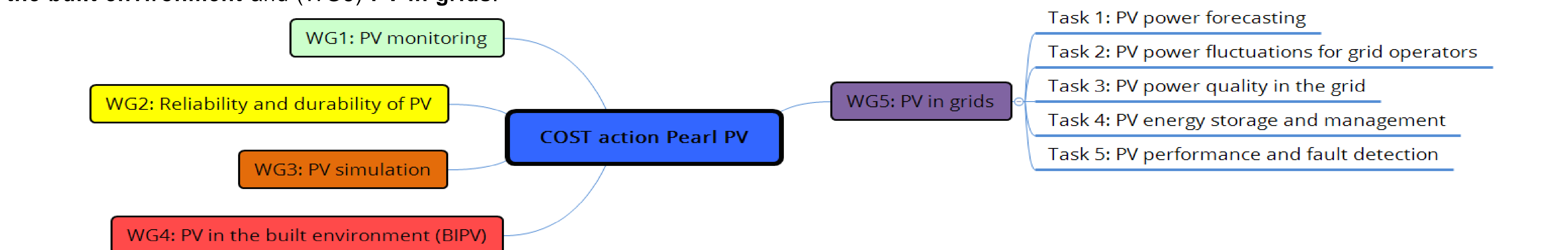
EU COST Action PEARL-PV:

Performance and Reliability of Photovoltaic Systems: Evaluations of Large-Scale Monitoring Data WG5: PV in grids

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Introduction The EU COST Action PEARL-PV was initiated at the end of 2017. PEARL-PV is the abbreviation for "Performance and Reliability of Photovoltaic Systems: Evaluations of Large-Scale Monitoring Data". The Action entails the formation of an inclusive network of PV researchers/experts and the **largest-ever agglomeration of PV systems performance data in Europe** that will be analyzed in order to include more-nuanced evidence-based reliability of PV system evaluation methods, simulation and design tools. To execute the research proposed, 5 Working Groups have been set up that will conduct research using a shared data bank, simulation tools and models in order to analyze and compare these data. The 5 Working Groups are focused on (WG1) **PV monitoring**, (WG2) **PV simulation**, (WG3) **Reliability and durability of PV**, (WG4) **PV in the built environment** and (WG5) **PV in grids**.



WG Objectives

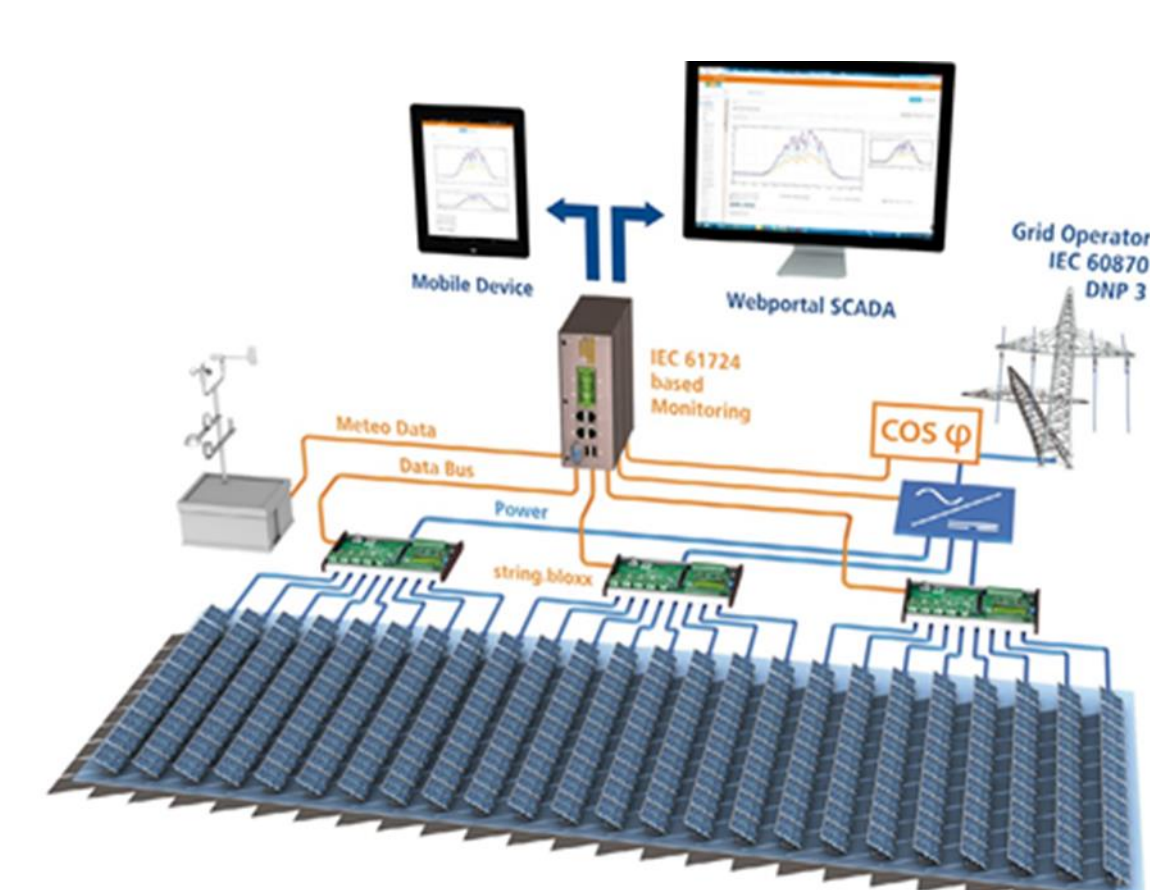
- Improve PV grid integration
- Enhance PV performance
- Understand the behaviour
- Use information from WG1 - WG4

Task 1: PV power forecasting

- Short- and long- term forecasting of PV power generation
- Numerical weather predictions, satellite and sky images
- Machine learning techniques
- Application to different climates

Task 2: PV power fluctuations for grid operators

- Feeding distributed PV power into grids under variable conditions
- Impact of PV power fluctuations
- Correlation of PV fluctuations between neighbouring installations

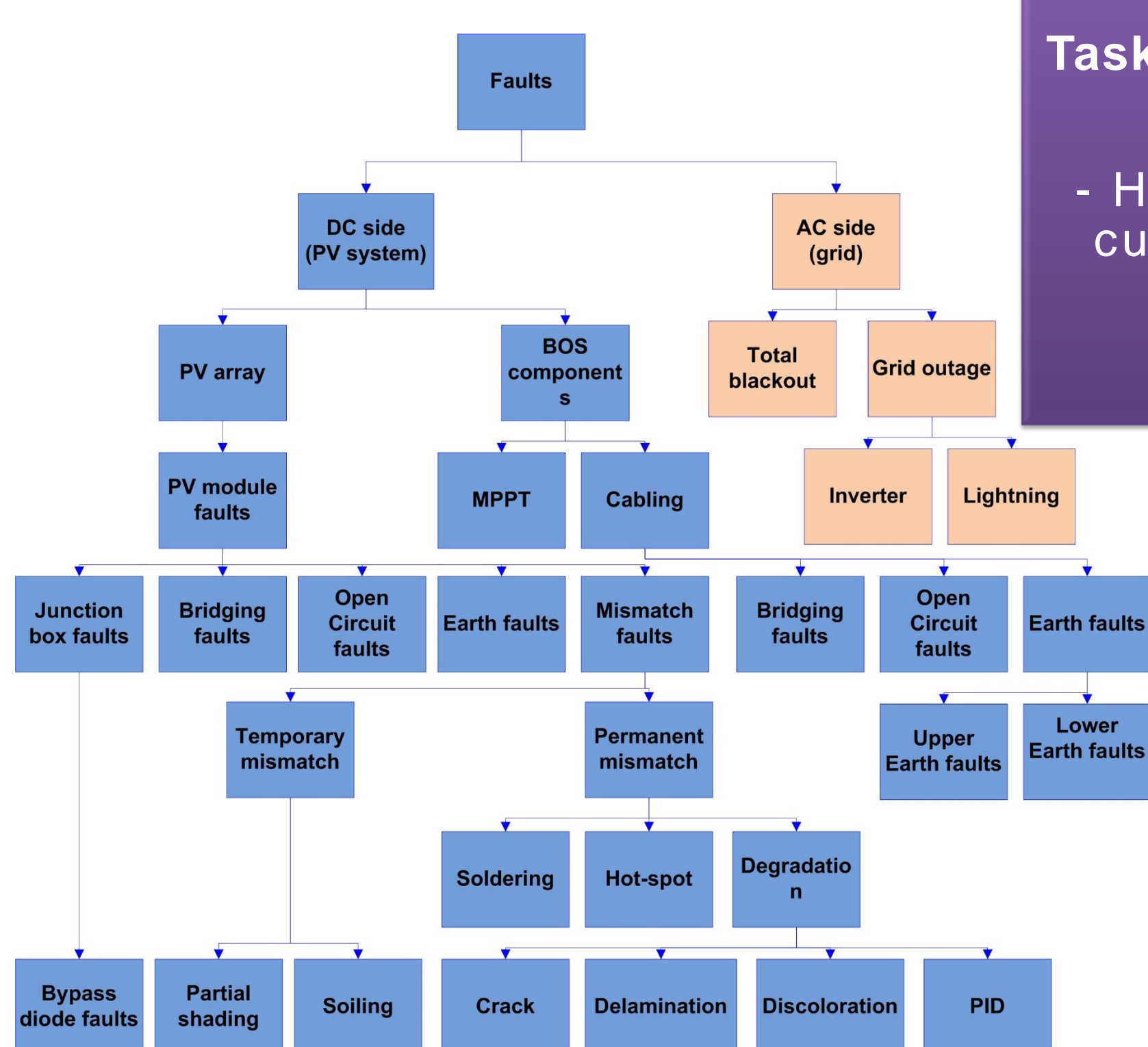
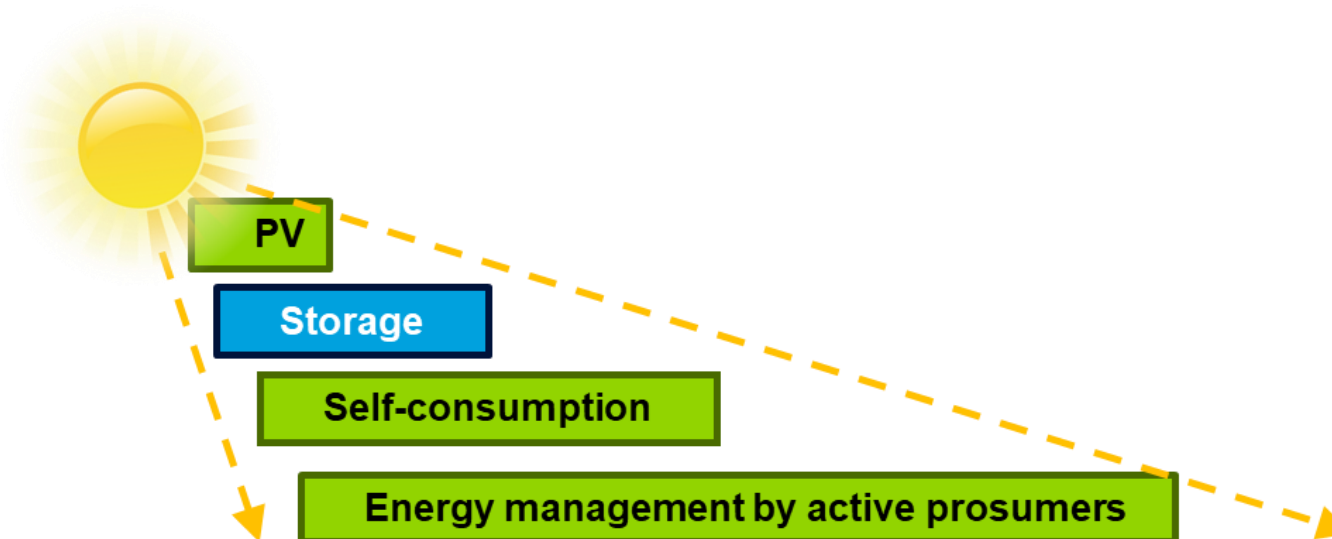


Task 3: PV power quality in the grid

- Power quality indicators
- Harmonics, frequency, voltage, current intensity, power factors

Task 4: PV energy storage and management

- Matching electricity demand with supply
- Electric vehicles and other storage solutions



Task 5: PV performance and fault detection

- Failure detection and classification techniques
- Micro- to macro-scale failure detection
- Machine learning techniques
- Peer-to-peer approach
- Bulk data handling of real applications installed in EU



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