

# Improved Integration of Electrolyzers by Grid-forming Battery Systems in Weak Grids

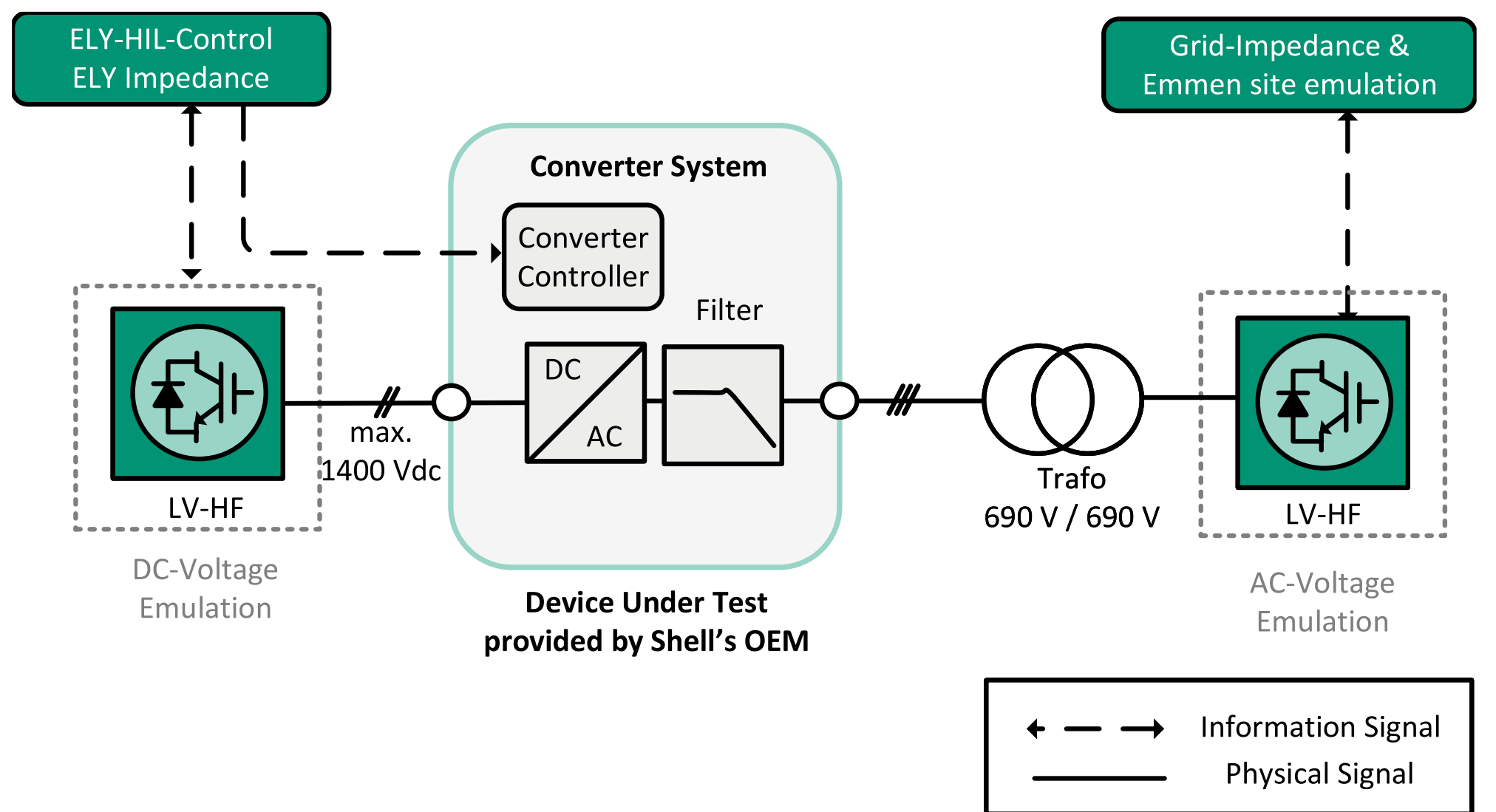
## Advanced Grid Interface for Innovative Storage Integration (AGISTIN) Project

- Enabling industrial grid users to rapidly deploy renewables through advanced integration of innovative energy storage technologies at the interface with the grid.
- Horizon Europe project with 13 partners running for 4 years
- 2 field demonstrations, 3 tests at laboratories

## WP5: Green Hydrogen as a Use Case

- Slow grid expansions and congested grids limit the growth of renewables and the deployment of hydrogen
- Fees for grid connection in weak grids due to power quality compensation poses a challenge for cost-effective hydrogen production
- System operators may impose only drawing (active) power from the grid
- Objective: Use a grid-forming battery to ensure a stable operation of the electrolyzers powered by a PV plant while reducing the grid connection

## Grid Emulator for Electrolyzer Converter Testing



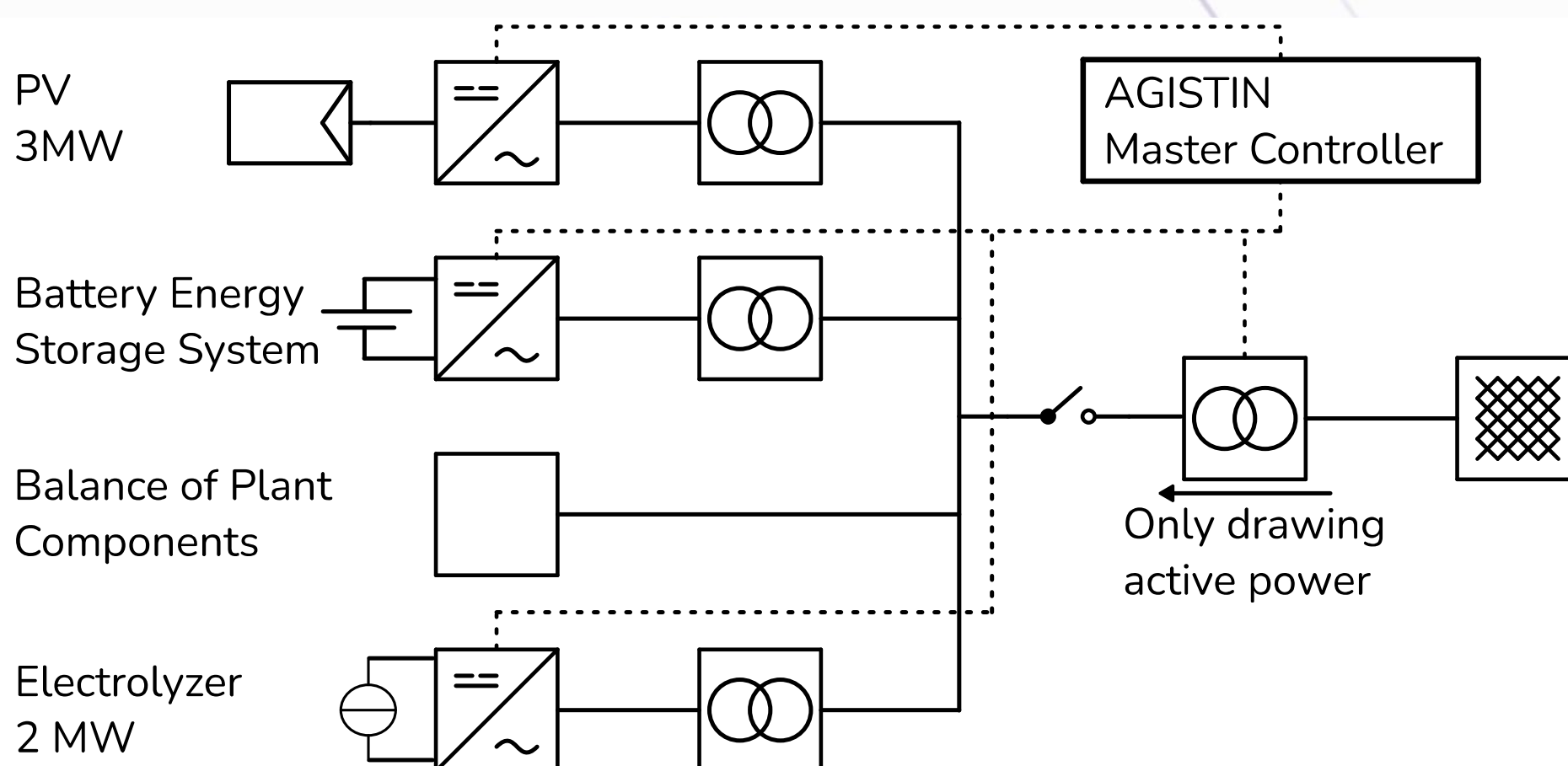
## Open Questions

- How small can the grid connection be?
- How does the grid condition, e.g., different short circuit ratios, influence the plant design, e.g., the type of converter?
- How to size the battery energy storage?
- How can a central master controller improve the operational efficiency of the electrolyzer?
- How can the grid code treat local energy systems to provide system services as an aggregated plant?

## Expected results

- Self-sustained production of green hydrogen, possibly in island mode
- Guidelines for the sizing the battery and the potentially required grid connection, possibly under economical considerations
- Improving coordination between the PV plant, the electrolyzer, and the battery energy storage system in weak grid conditions

## Green Hydrogen Plant Layout



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## AGISTIN Partners involved



Lead



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