



HyFlow – The best of two worlds

hybrid | *sustainable* | *cost effective* | *highly flexible*

February 14th, 2023

Prof. Dr. Karl-Heinz Pettinger,

Scientific Director | Project Coordinator HyFlow

University of Applied Sciences Landshut | Technology Centre Energy

Technology Centre Energy – A research institution of the Landshut University of Applied Sciences



- **Facts:** CEO | Scientific Director | 6 professors | 20 staff members | 5 research assistants | 10 - 15 projects
- **Research Areas:**
 - Electrochemical storage
 - Chemical storage
- **Since 2017:** Platform for Future Storage Technologies – FSTORE
- **Relation to HyFlow:** Coordinator | WP Leader

- **HyFlow Team:**



*Prof. Karl-Heinz Pettinger
HyFlow Project Coordinator*



*M.Eng Christina Zugschwert
HyFlow Project Manager*



A short History of HyFlow...



Project Motivation



- Main motivators – **Carbon neutrality** and **climate resilience**.
- **Affordable and clean energy** systems need efficiency improvements and a higher penetration of renewable energies.
- **Batteries and innovative solutions** for energy systems will play an outstanding role in the current and future energy supply.





■ HyFlow...

- ...creates a **modern and sustainable energy storage system** following the European Union goal to decrease the global environmental impact.
- ...focusses on technological and ecological **improvements** of the **components, their management systems and their interaction through the complete supply chain.**
- ...enhances components for **optimal hybridization**, by improved material utilization and cell design, and develop high-level control algorithms.
- By bringing the best of both worlds – this solution can unlock different applications in the grid, **boosting the stability** while **decreasing the dependency on fossil fuels.**

HyFlow Key Facts



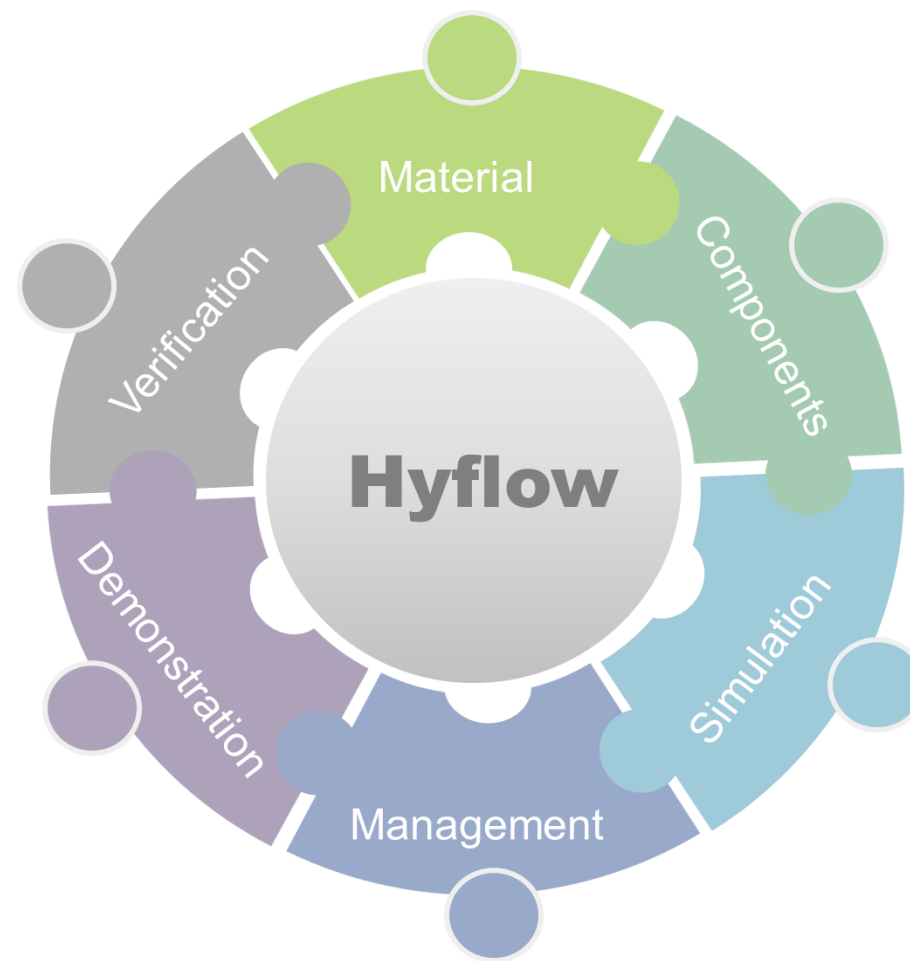
- Key Facts:

- 11 Partner
- 7 countries
- Project duration: 36 month
- Project start: 01.11.2020

- Highlights:

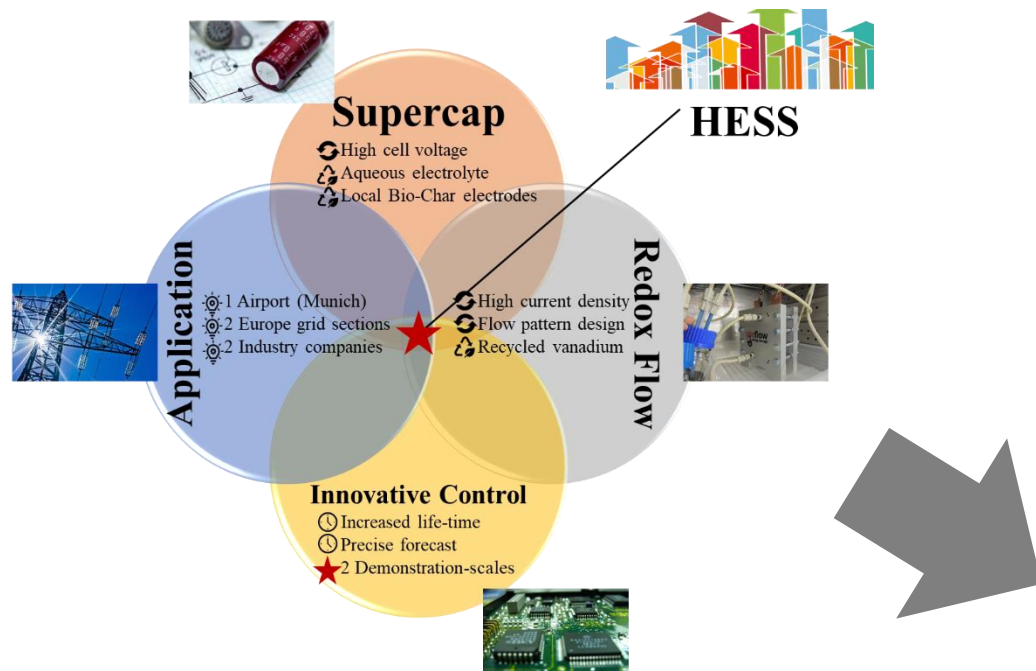
- Operating along the entire component portfolio and supply chain.
- Combining interdisciplinary knowledge and experience of eleven partners.
- Supported by industrial partners





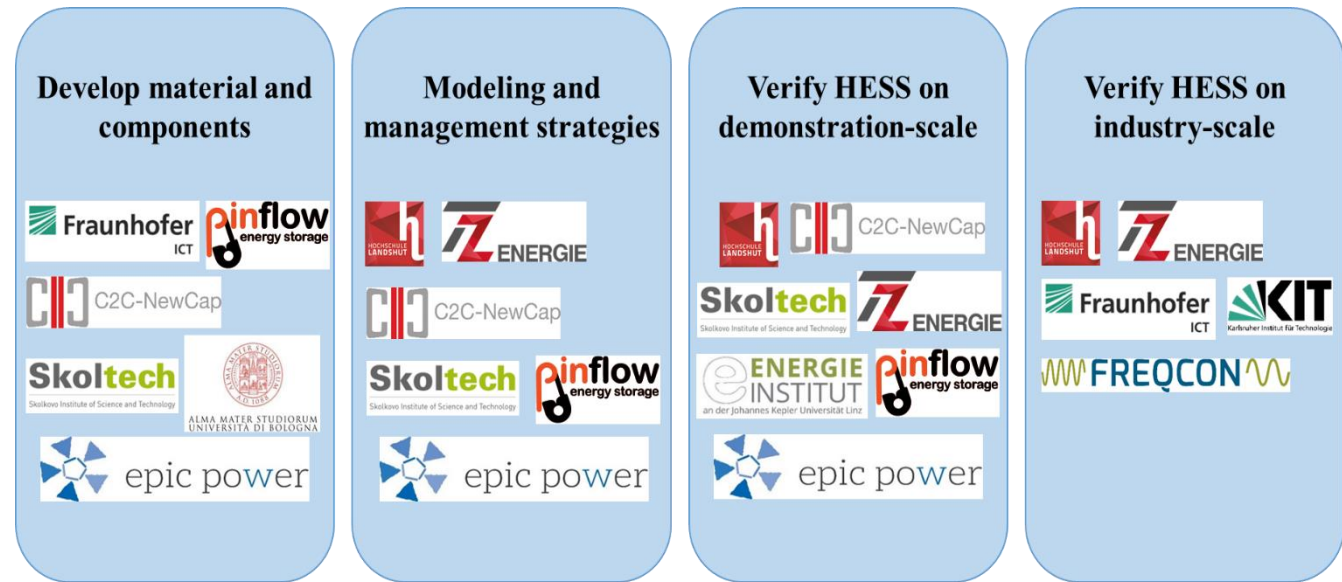
Project structure

Optimize Power and Energy by Hybridization



TRL4

TRL6



Supply chain

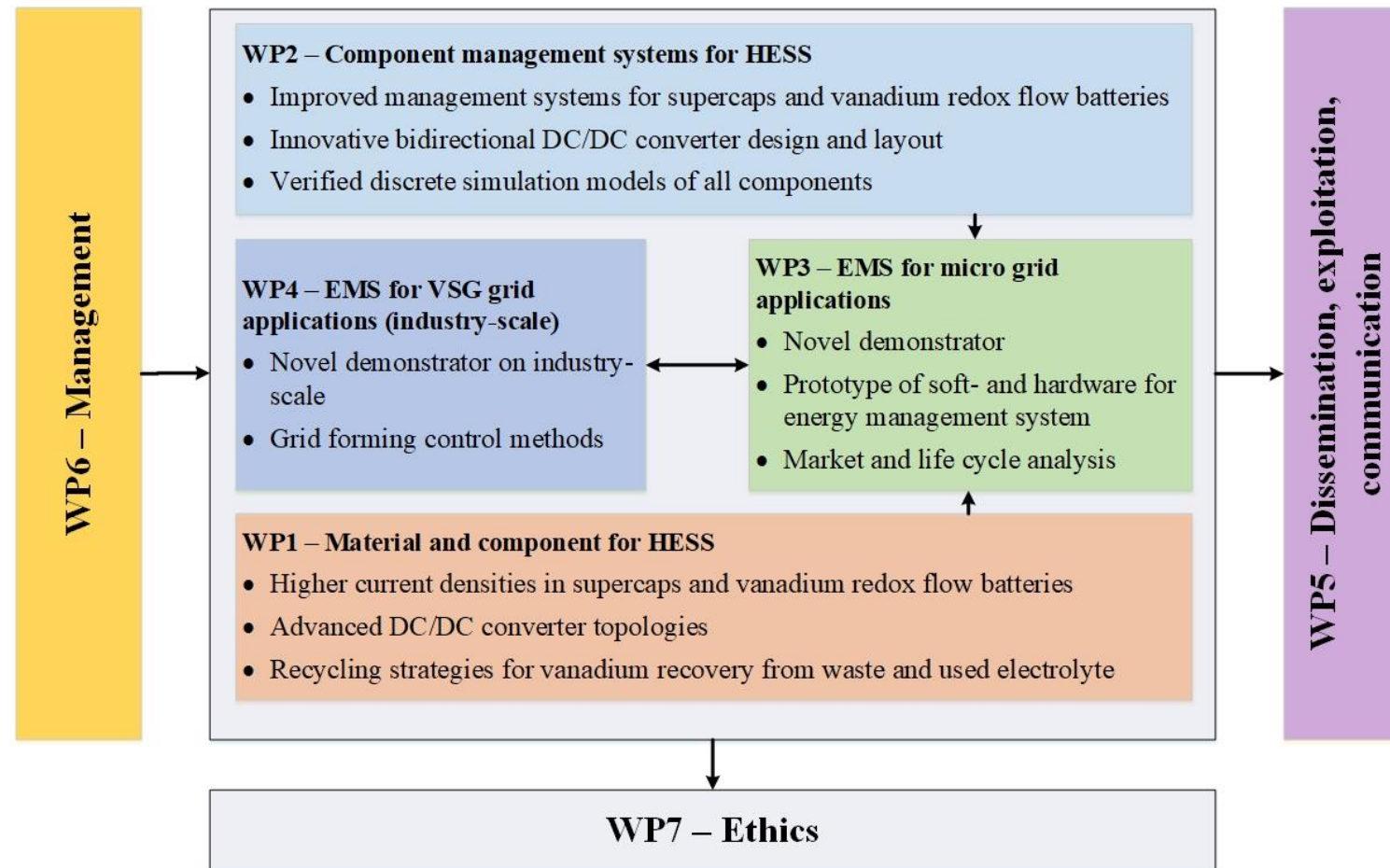
HyFlow Project Objectives



- **Objective 1:** Develop high-power vanadium redox flow batteries
- **Objective 2:** Develop green aqueous based supercapacitors with increased cell voltage
- **Objective 3:** Develop advanced component management systems for HESS
- **Objective 4:** Develop discrete and optimized simulation models for each of the HESS components
- **Objective 5:** Demonstrate of an adaptable EMS for at least four different application scenarios
- **Objective 6:** Improve ecologic sustainability of the HESS



Work Package Structure



Project Application – Key Factors for Success



- **Brilliant idea and scientific enthusiasm!**
- Establish a team leader and get professional support (Research Office HAW, BayFor).
- Clarify call specifications for proposal application (each key word has to be strictly addressed) and use templates to address all parts e.g. Impact of the project.
- Verify consortium and check if the supply chain is completed (include new partners if necessary).
- Establish scientific enthusiasm and collaborative thinking among the consortium.
- Conclude the proposal with a comprehensive management structure (e.g. Executive Board, Data Management Panel, Innovation Manager, Dissemination Manager, Advisory Board, etc.).
- University of Applied Sciences is able manage European proposals with professional support.

Thank you for your attention!



University of Applied Sciences Landshut
Technology Centre for Energy
Wiesenweg 1
D-94099 Ruhstorf
Tel. +49 (0)8531 – 914044 0
info@tz-energie.de

Homepage:



The Project HyFlow has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 963550.