

BANULA

Usage of blockchain for charging-specific electricity
balancing in the energy industry

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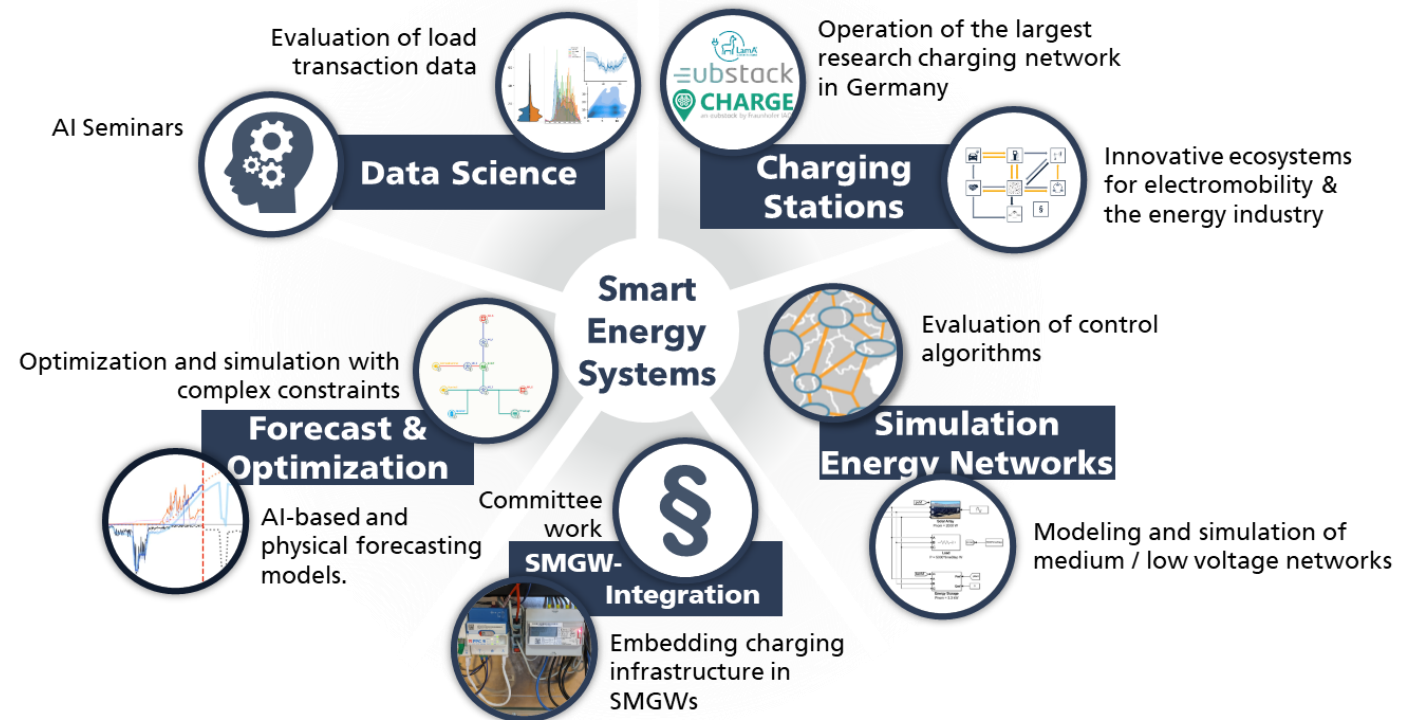
New Energy Systems Forum, Hall 1





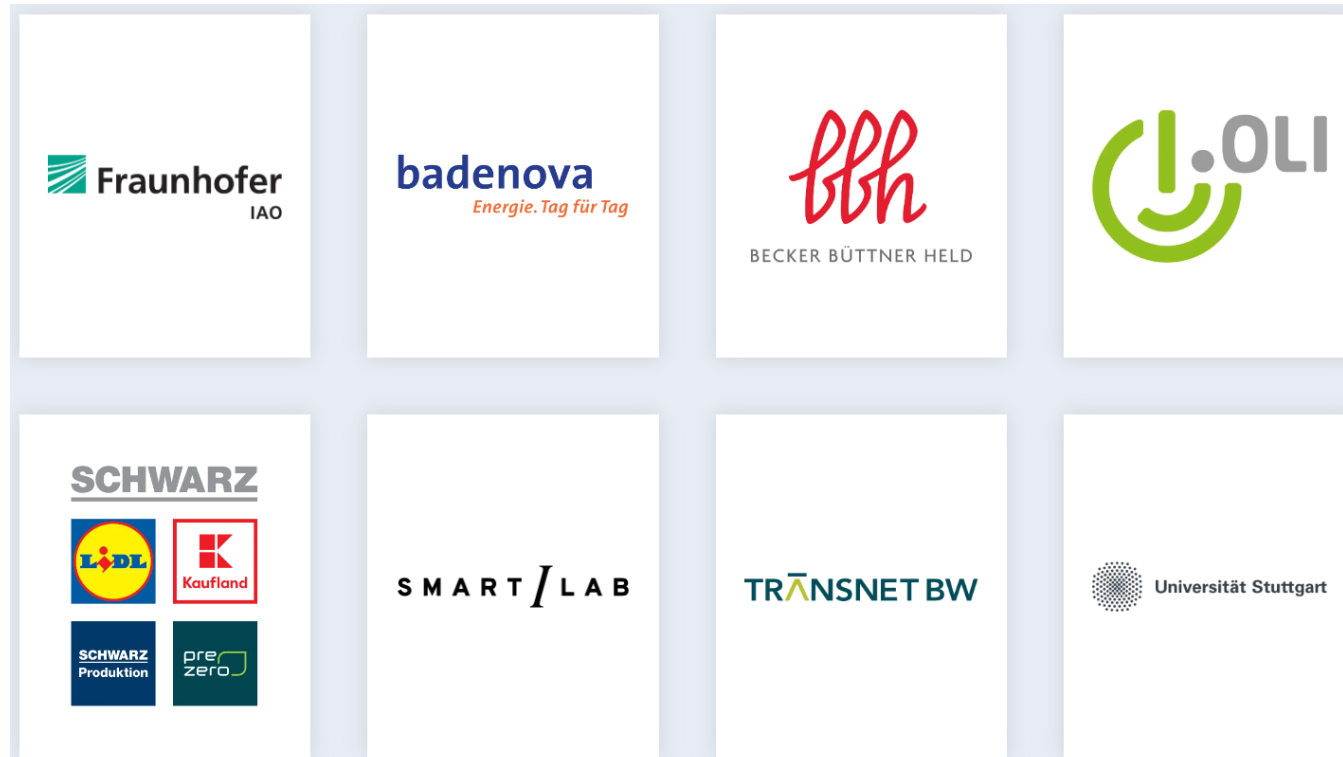
Shaping the future of work
- for the benefit of people

- We are the leading competence partner for **solving applied research tasks** in the fields of work design and technology management.
- We take a holistic view of the **interaction between work and technology** and thus create practical solutions for our customers.
- We take our **responsibility towards society and the environment** seriously and advocate **sustainability**.



- Research Project **BANULA**
- **Motivation** - Challenges of the energy industry
- **Project Goals**

- Duration: 10/2021 – 09/2025
- Eight core partners:



Gefördert durch:



aufgrund eines Beschlusses
des Deutschen Bundestages

- **Non-discriminatory** and **transparent** access for customers of **any** electromobility provider to any charging infrastructure and thus complete **price transparency** for the customer
- **Added value** and **new business models** for any market role and thus the participants in our ecosystem
- Permanent assurance of **system and network stability** as well as **proper balancing** of charging processes in real time
- Implementation of **pilot projects** with a test period of 12 months involving the charging infrastructure and a research fleet
- Demonstrating the suitability of **blockchain technology** for data exchange in the e-mobility ecosystem
- Contribution to **sustainability** and **decarbonization** through the transformation of mobility in Germany and in Europe

Key factors & megatrends in the power sector up to 2030

- **Distributed flexibilities** with close TSO & DSO cooperation
 - EMP are empowered to become regional flex providers
- **Markets and Physics** seamlessly integrated
 - Platform as hub for energy balancing and physical load
- **Energy Systems Integration**, beyond power
 - Mobility turnaround accelerated by dismantling barriers
- **Mastering operational challenges** - resilience, forecast, automation, artificial intelligence
 - Authentication and allocation of loading quantities is automated

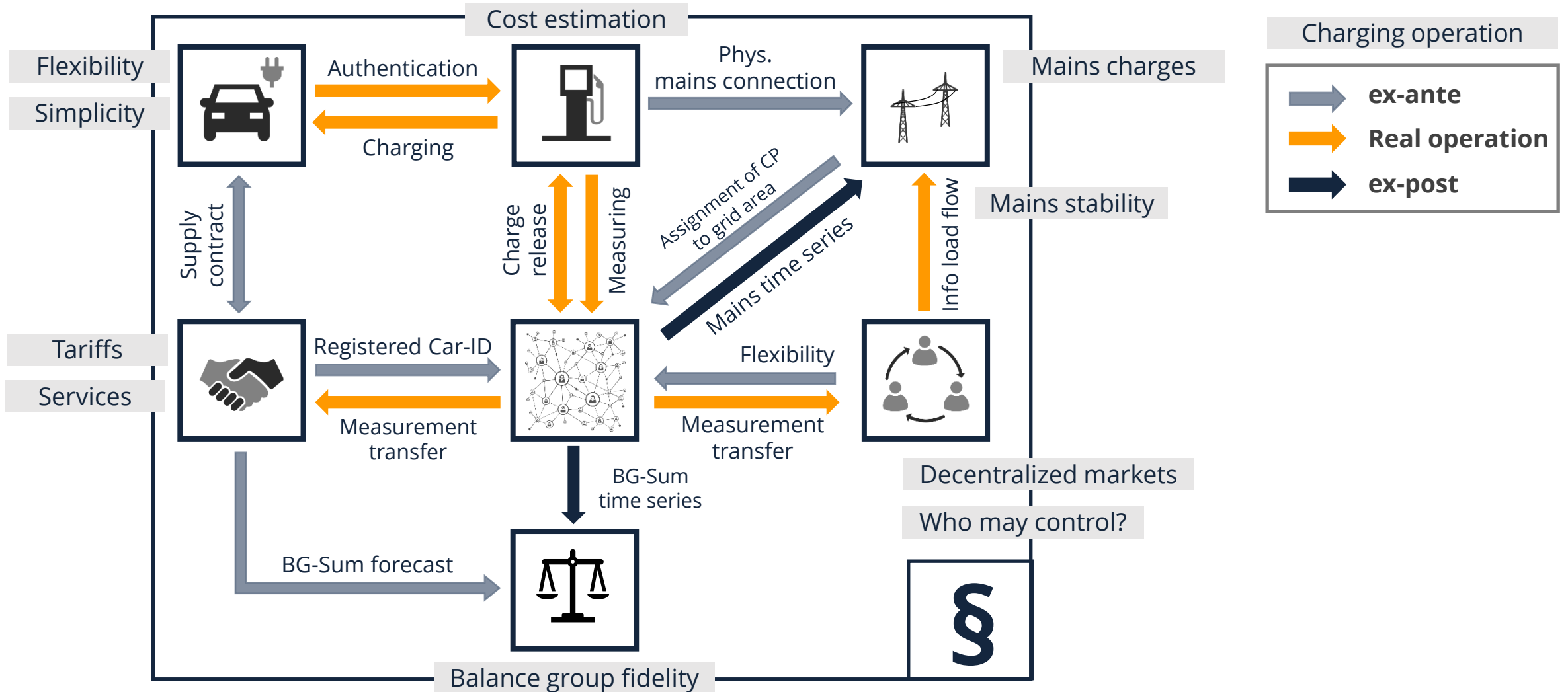
**BANULA addresses four of the six headings
of the 2030 energy system**

➔ **Virtual network area** is our data infrastructure layer and solution approach



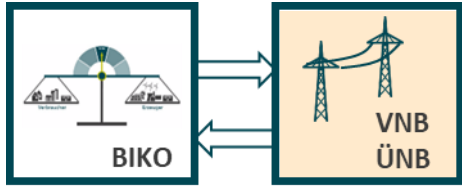
Source: <https://vision2030.entsoe.eu/>

E-vehicle charging in a complex network



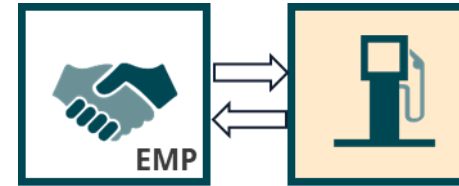
Challenges

Our User Stories



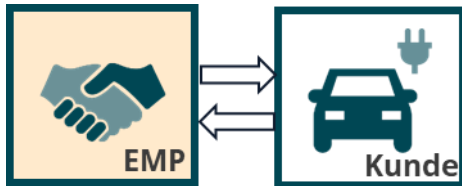
From the perspective of **network operators**

- Charging stations are forecast with standard profile
- Rising deviations in network operators' balancing groups
- Network operators have no transparency with regard to charging loads in real time



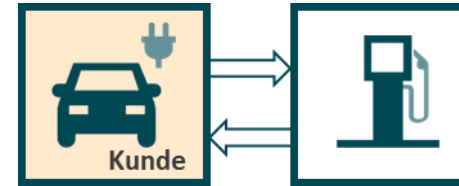
From the perspective of **charging infrastructure operators**

- Passing on the costs of infrastructure and network charges
- Allocation of costs in line with the polluter pays principle
- Creation of transparency for the availability of measurement and billing data in real time



From the perspective of **EMP**

- Access to any charging infrastructure under transparent and simple conditions
- Introduction of a central energy balancing group forecast for all customers



From the perspective of **electromobilists**

- Price transparency needs improvement, access not always guaranteed
- Self-generated electricity cannot be "carried along"

What does the concept look like?

- Connection of **energy management processes** within the scope of electricity balancing with the **commercial processes** around roaming and the supply of charging electromobilists
- **Correct separation** of the roles of distribution network operator, charging infrastructure operator and mobility provider

- **Charging infrastructure operators** provide their infrastructure without being responsible for procuring the charging current
- **Distribution system operators** gain transparent insight into the load within their network
- **Mobility providers** procure and forecast their procurement of charging energy nationwide as an electricity supplier

- To implement this, **blockchain technology** is used to build a data architecture that all participants in the ecosystem can use on an equal footing
- Trustworthy data with the highest integrity can be exchanged on this decentralized medium
- The energy industry embedding takes place through the creation of a **virtual grid area**

Contact



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