The Joint Project for Hydrogen Mobility in North Frisia
A practical use of renewable energy for emissions-free mobility.

eFarm - Green Hydrogen Society in Wind Regions.
André Steinau, GP JOULE GmbH
Berlin, 25th of September 2019
Company.
Unique all-round.

GP JOULE is the universal, innovative, authentic and successful partner in the renewable energy sector.

GP JOULE’s goal is to ensure that *100% of the energy consumed* around our planet in the future is *produced from renewable sources*. 
To the point.

Facts about GP JOULE.

- Founded in 2009
- Employees: 240
- Installed generation capacity since 2003: 600+ MW
- Divisions: Projects, Think, IPP, Service, Connect
- Germany: headquarters and 4 offices
- North America: 2 offices
To the point II.
Facts about H-TEC SYSTEMS.

- **Founded in 1997**
- **Acquired by GP JOULE:** 2010
- **Employees:** 25
- **Business Divisions**
  - Stack manufacturing
  - Elektrolysis systems

- 0.14 – 4,500 kg/d H₂-production
- Load range: 0.26 kW-10,000 kW
- Compact Design
- High power density
Hydrogen - the golden key.
Crucial Challenges.

- Climate Goals
- Creating "Regional" Value Through Renewables
- DeFossilization
- Energy-Grid Bottlenecks
- NOx
- Decarbonization
- Acceptance of Renewables
A refinement of renewable energy.

Best opportunities for the future.

The missing link in the chain: electrolysis technology bridges the gap between oversupply of power and growing demand for hydrogen.
Targets and Ideas.

- **Popular acceptance** will be increased by using locally generated electricity and **additional markets and value** will be created.

- Electrolysis will convert electrical energy into **GREEN HYDROGEN** and make it useful for industry, heating and mobility.

- The emission-free value to the region will be made highly visible in the form of clean public transport.

- Joint experience for production, logistics and distribution of **GREEN HYDROGEN** will be gained by joint partners,
The eFarm-concept as Joint Project.
Connecting production and consumption for public transport.

- **GENERATING** GREEN HYDROGEN at wind farms with 5 × 225 kW electrolysis systems,

- **TRANSPORTING** GREEN HYDROGEN with swap bodys at 30 Mpa,

- **PROCESSING** GREEN HYDROGEN at 2 HRS at 35/70 Mpa each and

- **USING/CONSUMING** GREEN HYDROGEN with own 2 local public transportation fuel cell buses.
Joint local partnership.
Organisation of the cooperation..

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<th>Joint project shareholders</th>
<th>engage in self investment</th>
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<td>GP JOULE</td>
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Creating the local value chain.

225 kW electrolysis system.

Hydrogen swap body concept (Kessels, 2019).

Hydrogen refilling station (Linde AG, 2018).

Fuel cell bus (Solaris, 2018).
Upcoming value chain drivers.

Mercedes GLC F-CELL
Hyundai Nexo
Toyota Mirai 2nd Gen
FAUN garbage truck
Mercedes FC truck
Nikola Tre
Green Hydrogen market.
Average daily sales.
Update.
Status quo, timeline.

- Two subsidy notices of NIP2-programme of BMVI (National ministry of transportation and digital infrastructure) received by end of 2018.

  → **National Funding of 7,979,759,00 € secured.**
  (project volume is €16m).

- Biggest project for green hydrogen mobility nationwide.

- Project in realization phase.

- Commissioning planned by beginning Q2/2020.
Outlook.

- The joint project bridges different sectors to demonstrate a new path to value for renewable energy via power-to-gas.

- It **adds value to the region** by showing how renewable energy resources can be refined into a portable energy carrier: hydrogen.

- The focus of this project is **to drive acceptance of renewable energy infrastructures**.

- And best of all, it **can be scaled up and introduced to other regions**.
Thank you for your attention!

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