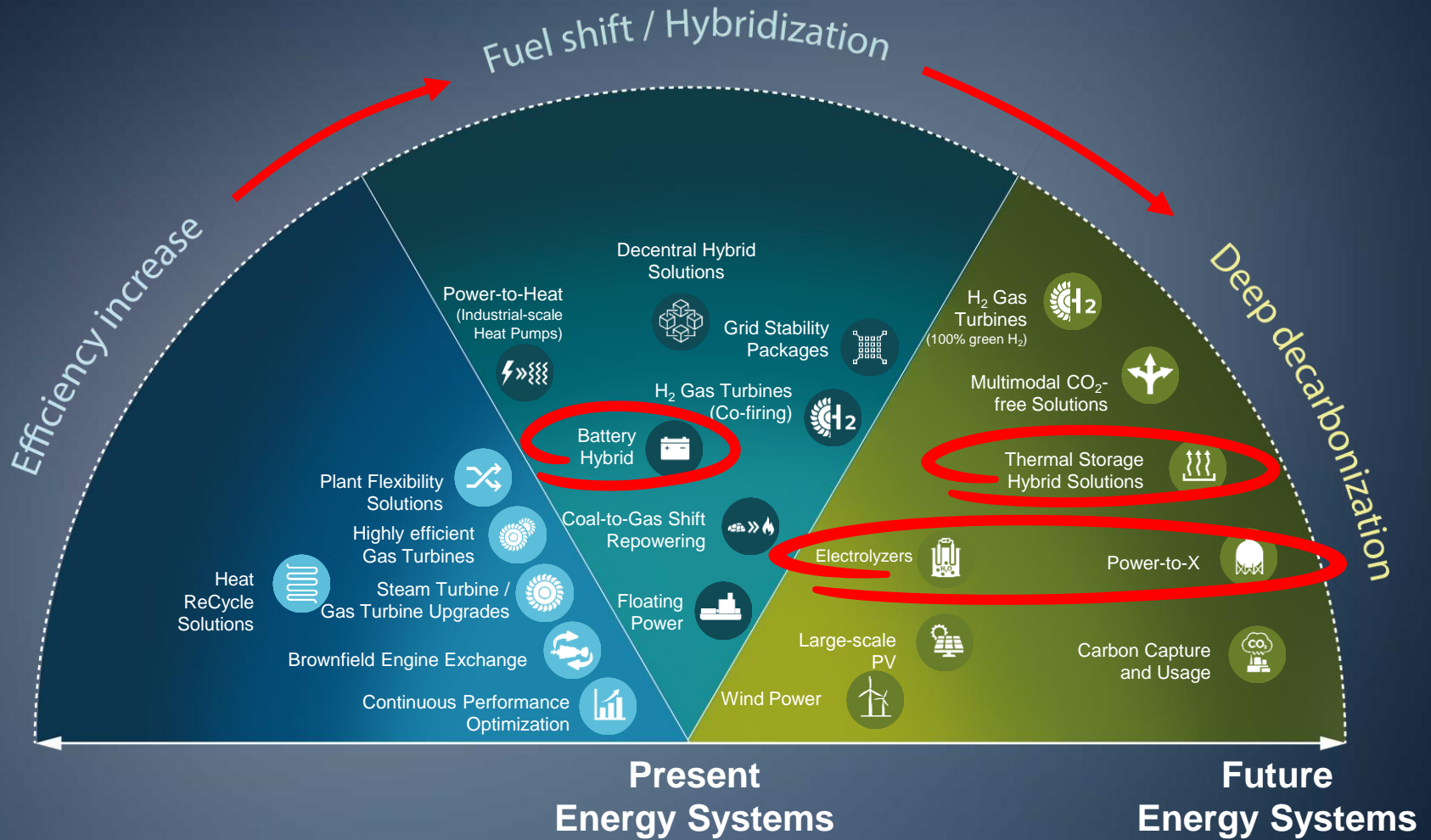


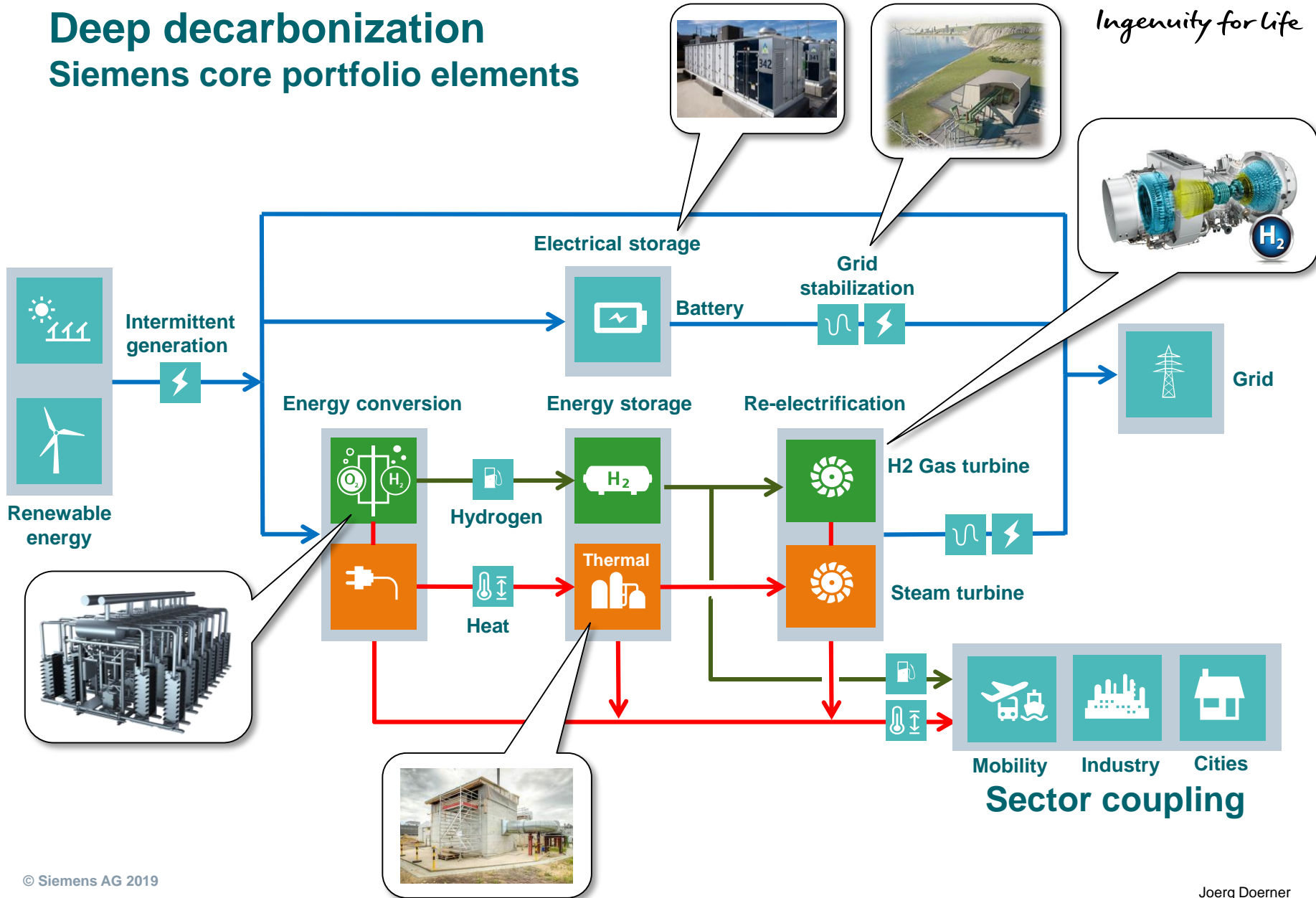


Making Energy Greener



Deep decarbonization

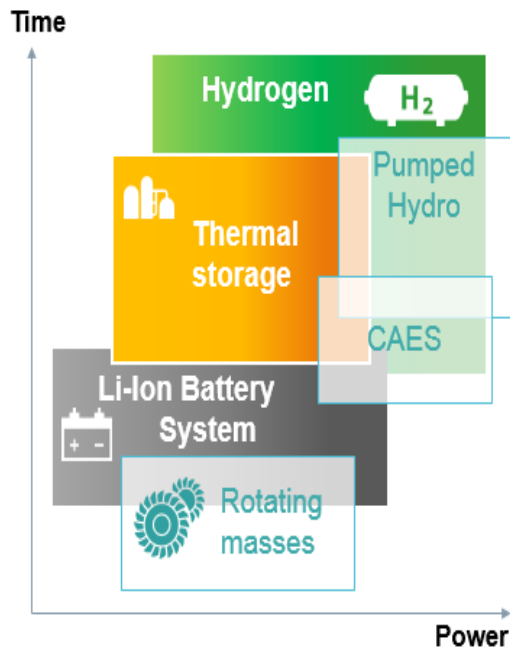
Siemens core portfolio elements



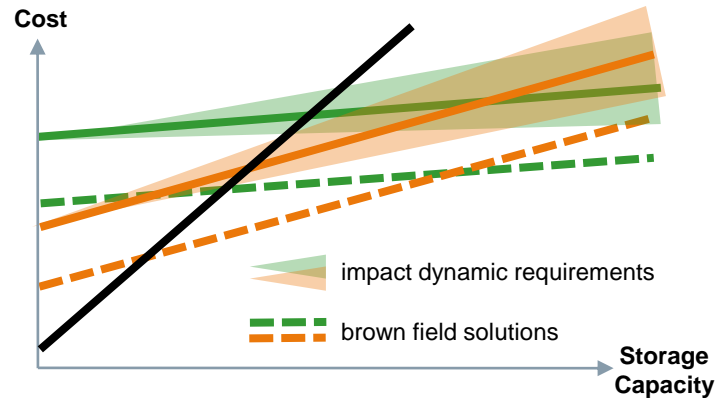
Storage & re-electrification technologies

Customer boundaries/requirements will determine preferred technology

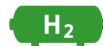
Fundament technology characteristics



Principal comparison of required investment costs



High invest for large storage capacities



Relative low cost for storage capacity, high invest for electrolysis and turbine package



Relative low cost for storage capacity, high invest for charging and re-electri. equipment

Considerations for technology selection

Technology:

- Efficiency

Dynamics:

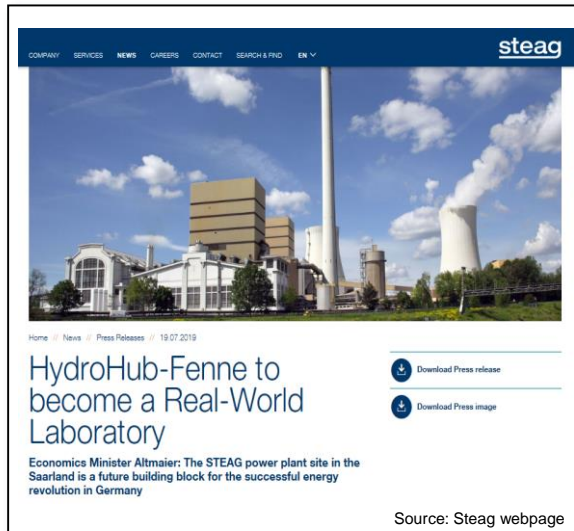
- Storage capacity
- Storage duration
- Charging/dis-charging cycles

Local:

- Regulations
- Existing assets
 - Grid connection
 - Turbine
 - ...
- Sector coupling opportunities
- Setup (space/arrangement)

German “Reallabor” project examples with Siemens involvement

HydroHub Fenne



- H2 production & storage
- Sector coupling
- H2 re-electrification
- Waste heat recovery
- Digitalization (artificial intelligence)

Reference Plant Lausitz



- H2 production & storage
- Sector coupling & e-fuels (synthesis)
- H2 re-electrification
- Waste heat recovery
- Battery

GreenHydroChem Leuna



- H2 production & storage
- Sector coupling & e-fuels (synthesis)
- Plastic recycling

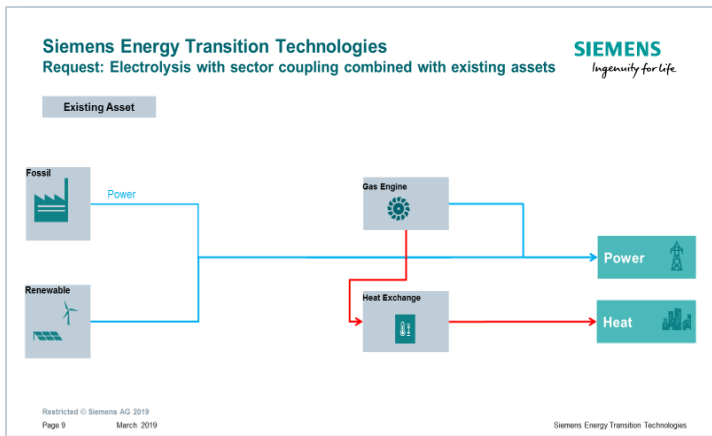
Joint concept development and optimization

Customized energy system solutions

Customer's
existing assets

Co-creation

Concept
(multi-modal energy system design)

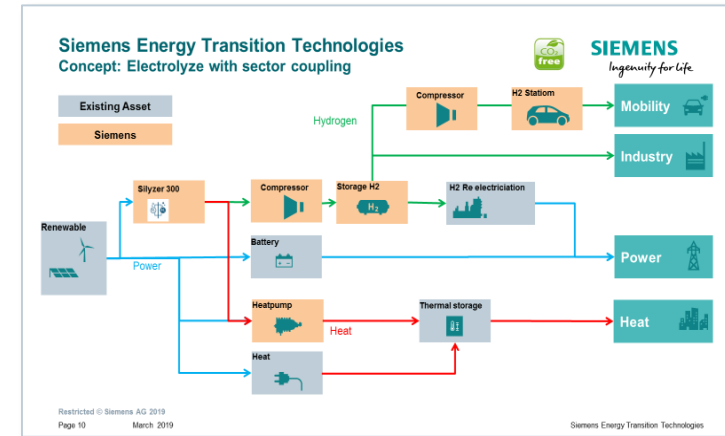


Definition of:

- Target functions



- Load profiles
- Weather data
- ...



- Technology recommendations
- Optimization of operational regimes
- Economical analysis