
De-Carbonizing the Campus: Planning, Tools & Technologies
CampusEnergy2023
February 27 – March 2, 2023
Gaylord Texan Resort & Convention Center | Grapevine, Texas
INTERNATIONAL
DISTRICT ENERGY
ASSOCIATION

Hydrogen CHP: The Lowest Cost, Least Risk Way to Net-Zero

Emily Robertson
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2G® Hydrogen CHP

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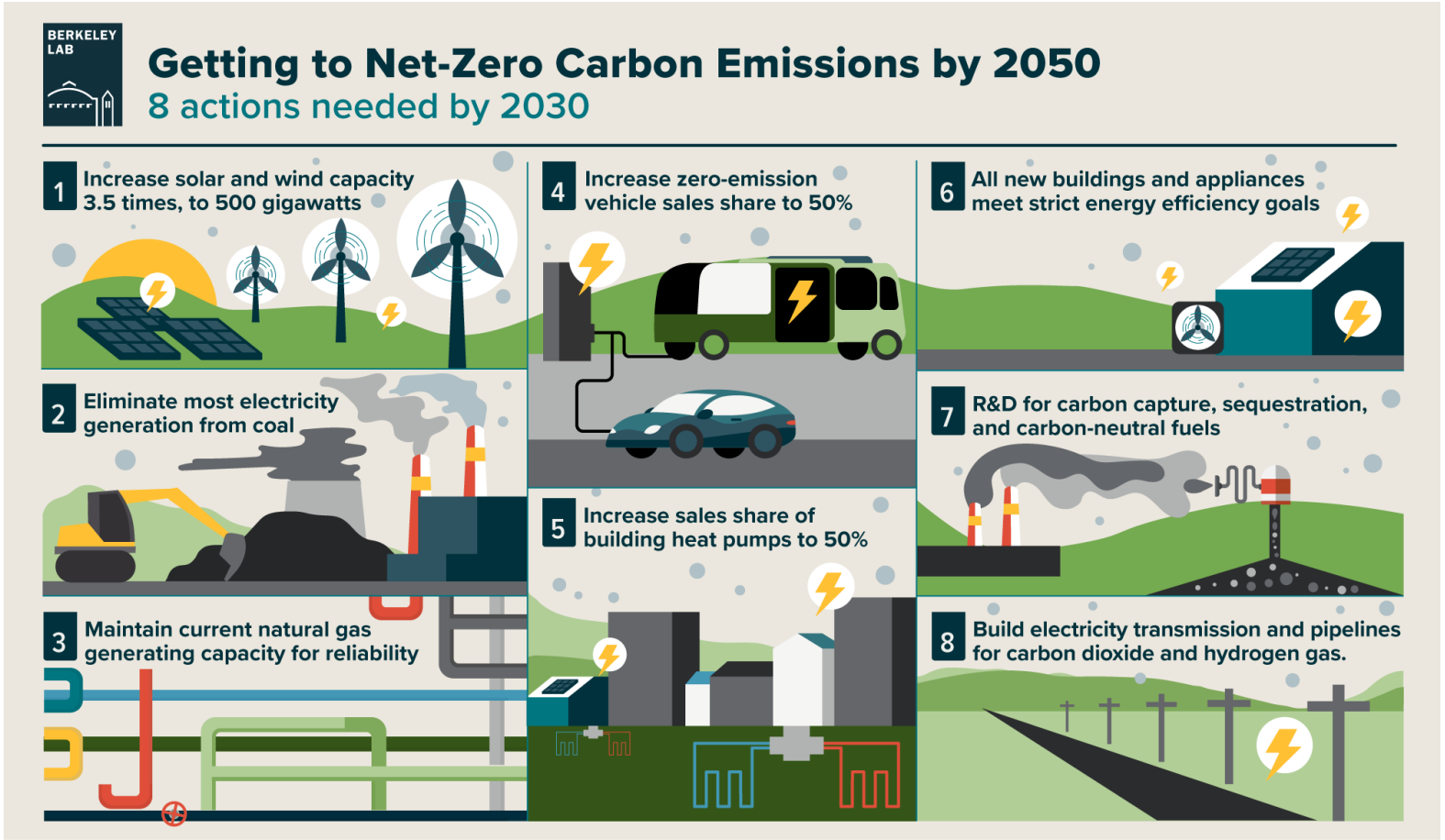
Enabling Net-Zero in the USA: How do we get there?



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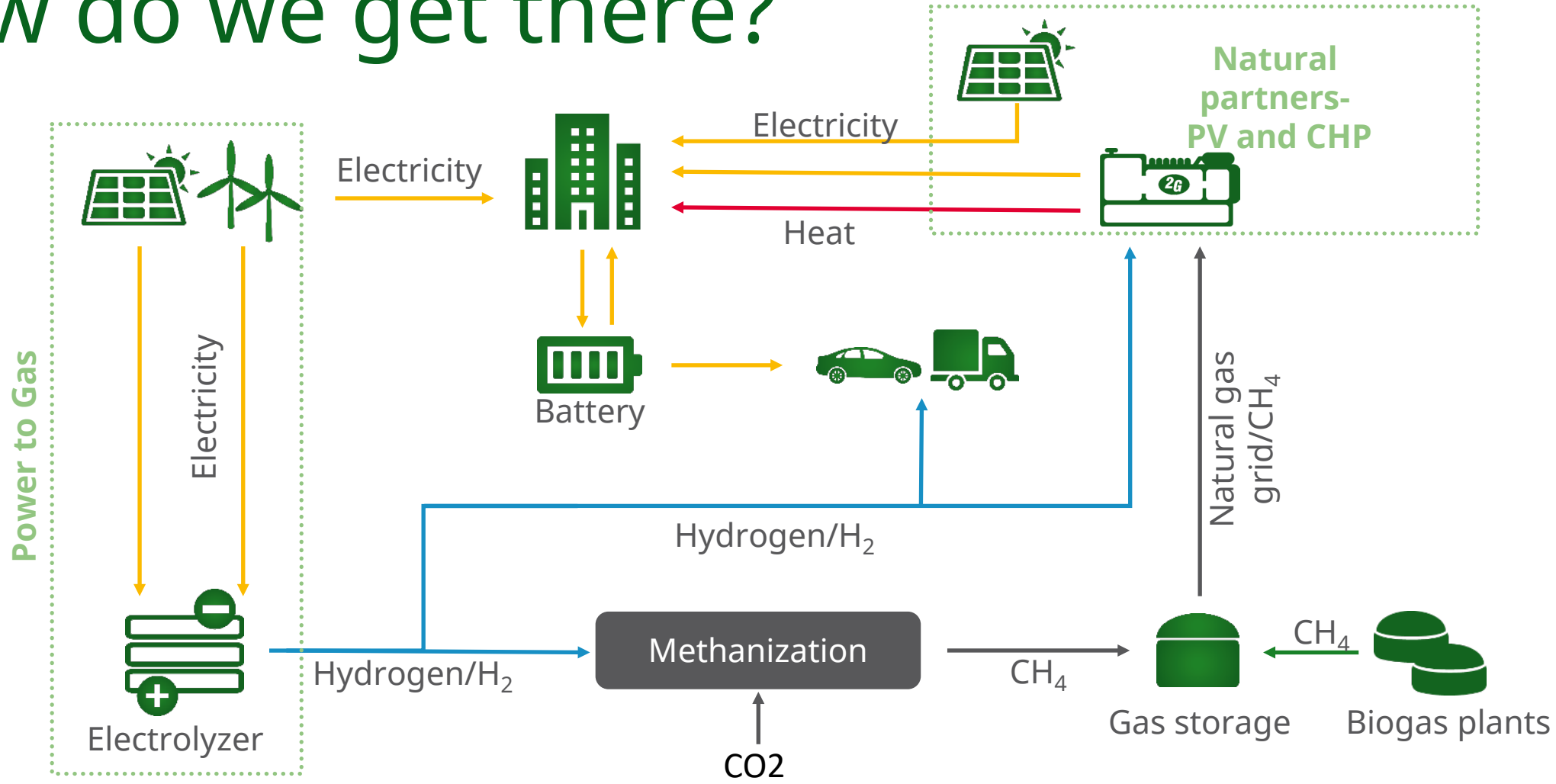
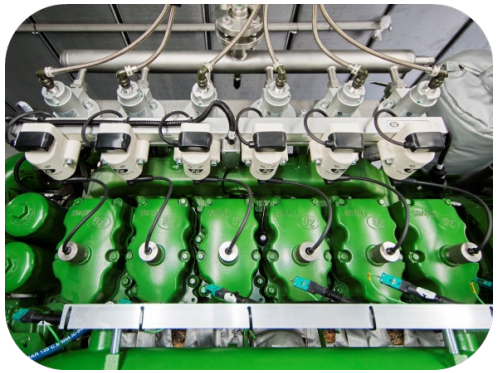


H2 Enabled CHP is the Lowest Cost & Least Risk Carbon Reducing Technology

- Lowest cost per kWh (low capital, high efficiency)
- Full range of mixtures and widest fuel optionality
- Proven global performance on 0-100% RNG and/or H2
- Turn up and turn down - start and stop- load follow – black start-island
- Rapid project delivery
- Guaranteed long-term resilience

Minimizing Risks with Fuel Flexibility

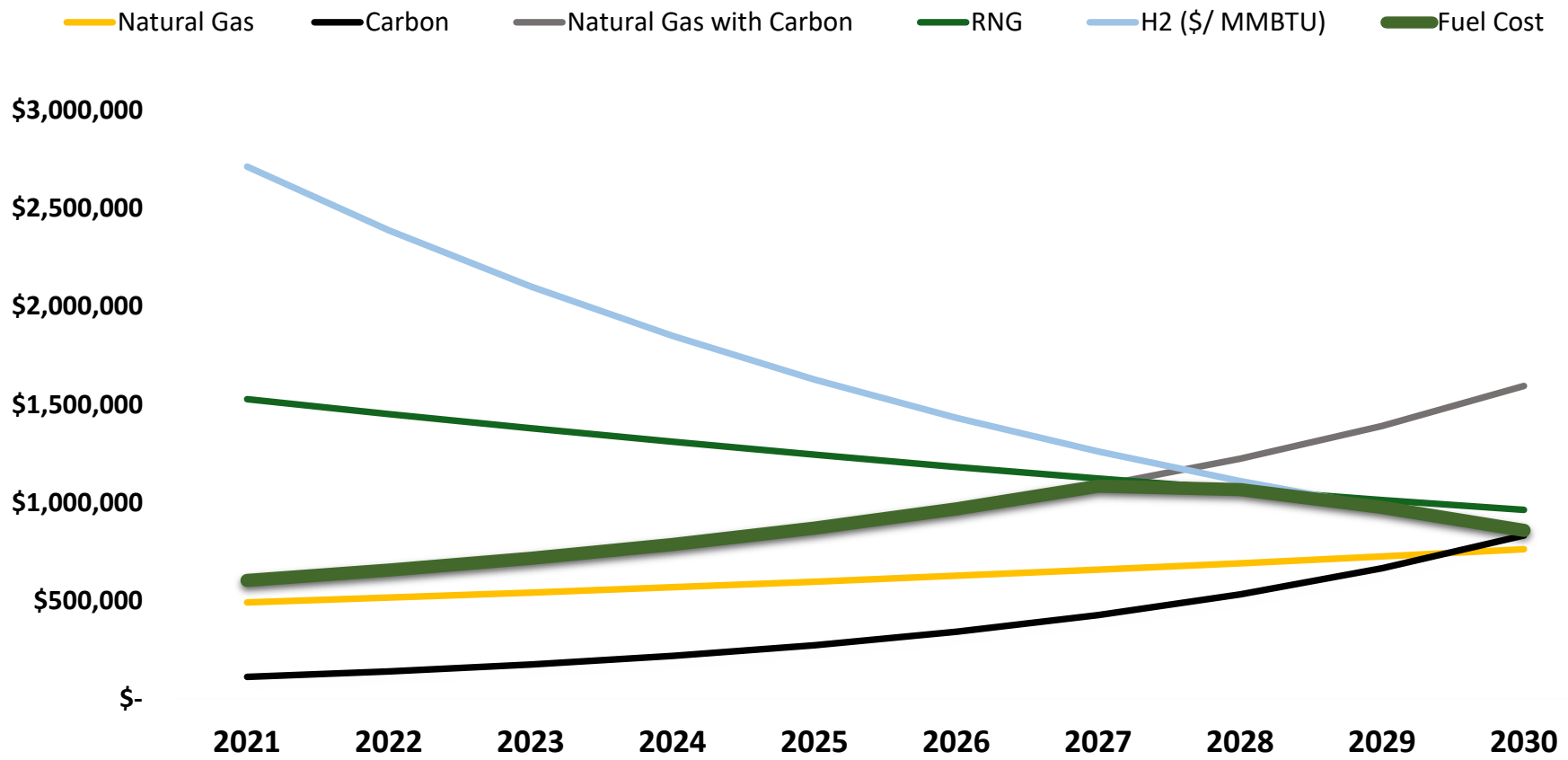
Natural Gas



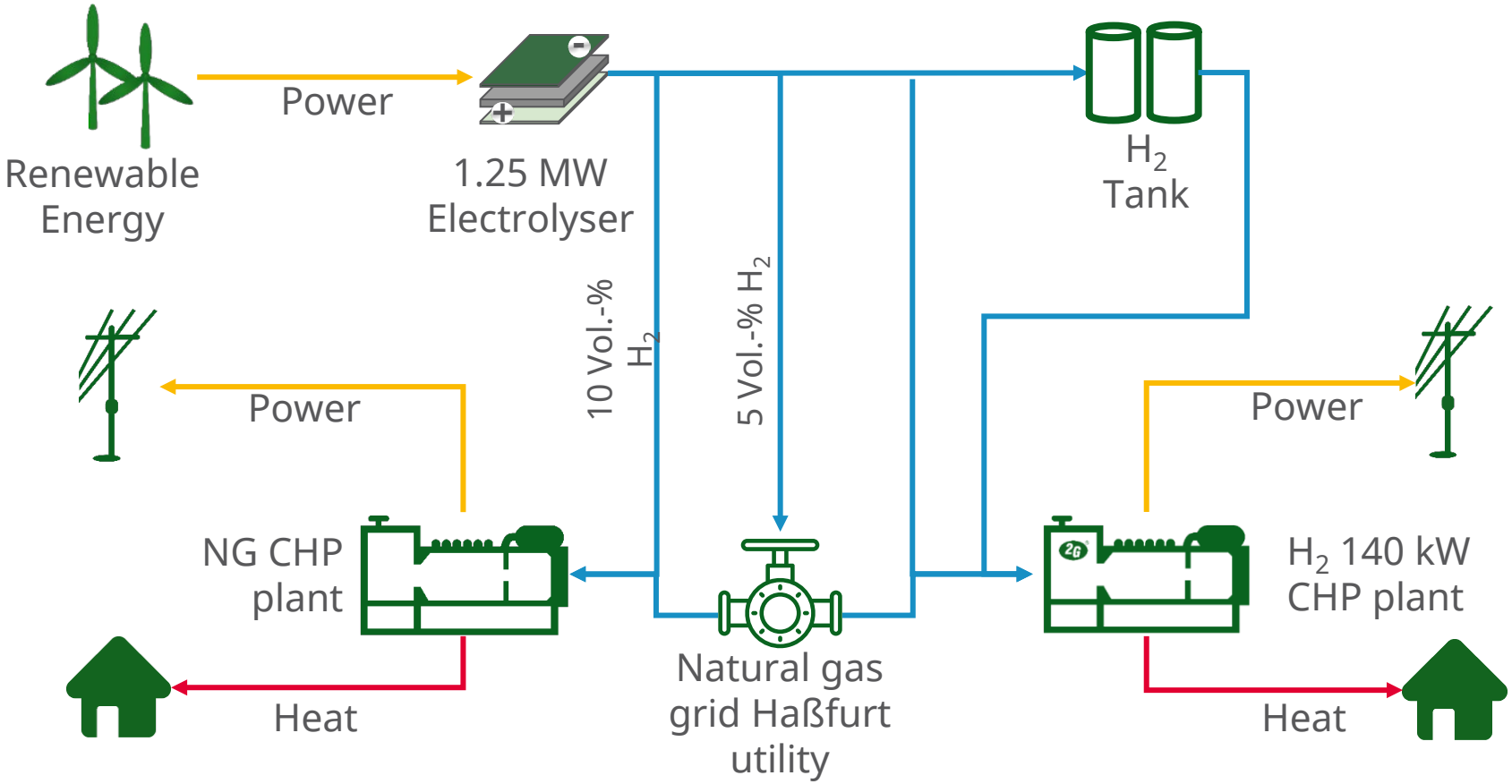
Hydrogen

- Simple field retrofit
- **Full range (0-100%) of carbon free flexiblity**: H2, RNG, Syngas or Biogas
- Plug and Play Installation - Microgrid Ready
- Turn up and turn down - start and stop - load following – black start-island mode

Long term fuel cost/carbon hedge
Lowest Cost – Least Risk



EU's First H2 Smart Grid



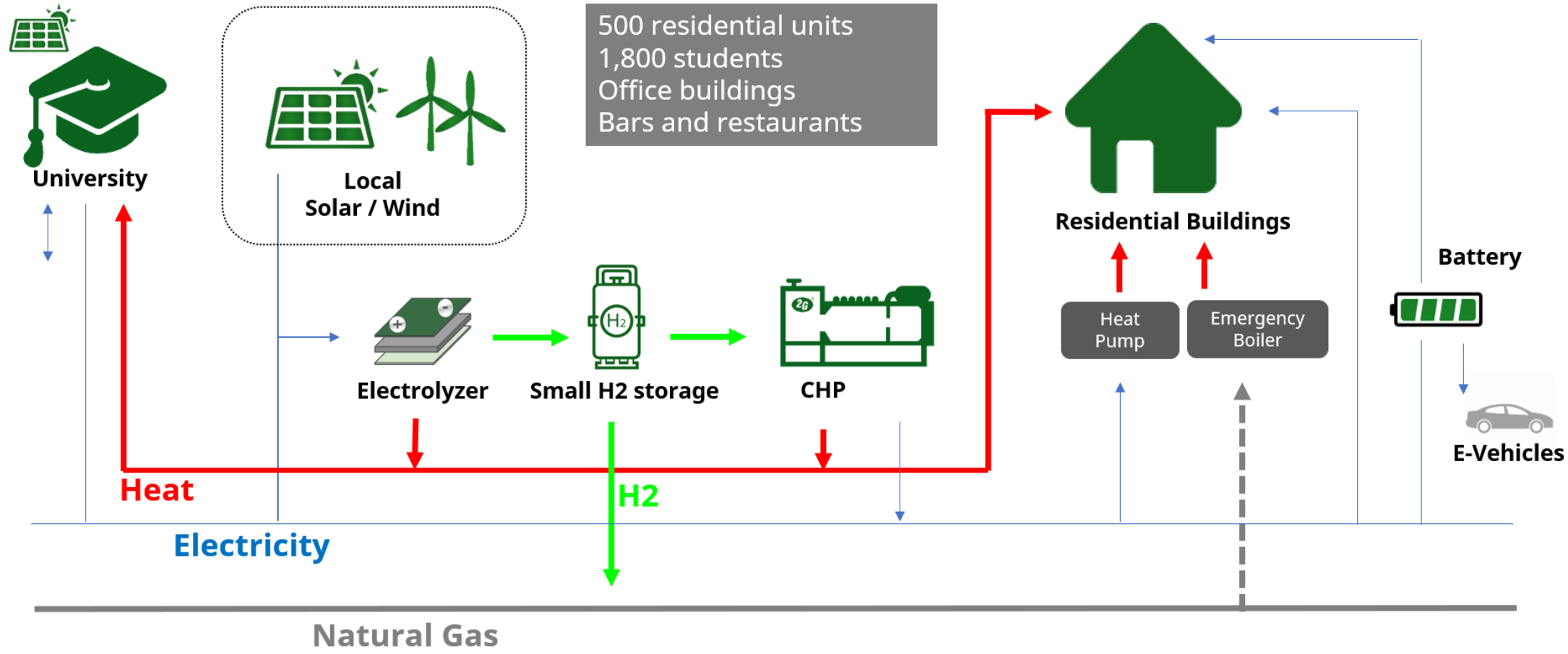
EU's First H2 Smart Grid

- The system at a utility in Germany can run on 100 percent pure hydrogen without any integration of fossil fuels.
- Production capacity of 140 kW when fueled with hydrogen and 200 kW with natural gas.
- The plant supplies heat and electricity to utility customers in the region.
- First carbon-free, renewable hydrogen use for generating electricity from CHP in a municipal installation.
- Local wind and solar power generation converte to hydrogen on-site at the utility by electrolysis.
- The hydrogen is then stored in pressure vessels as fuel for the CHP plant.
- The hydrogen storage system allows for continuous operation at the facility, significantly increasing the flexibility of the overall energy system.

Community Wide Carbon Free Resiliency Esslingen, Germany

- This district in Southern Germany is home to 500 apartments, office and commercial space as well as a building for the local university
- Less than 1 ton of carbon dioxide emissions per resident per year for housing and transportation
- CHP system supplies heat to the local heating network.
- The CHP unit can work with a hydrogen-green gas mixture or pure green gas, so CHP operation is possible even if the electrolyzer fails.

Community Wide Carbon Free Resiliency Esslingen, Germany



Questions?

Thank You!

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