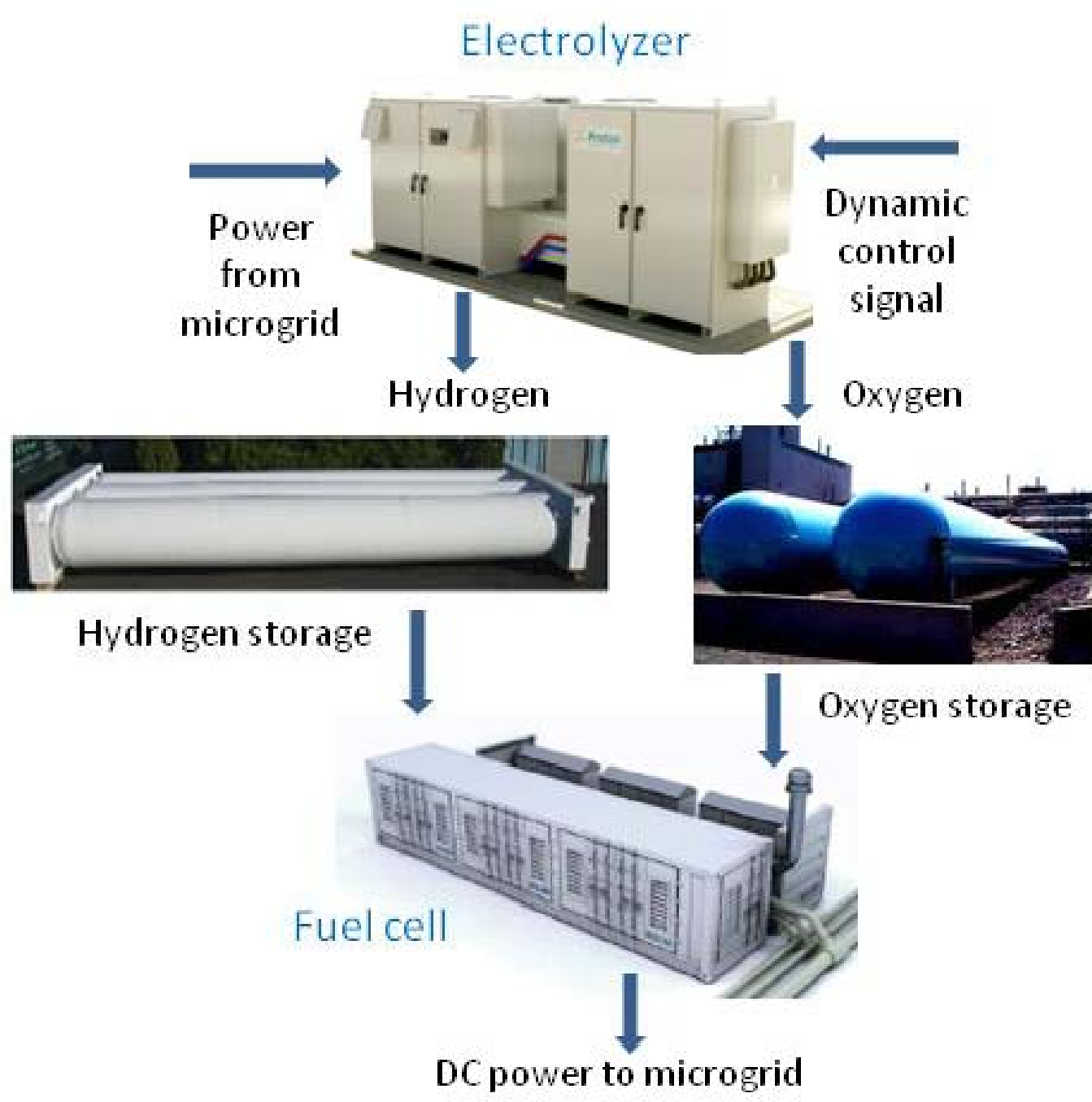


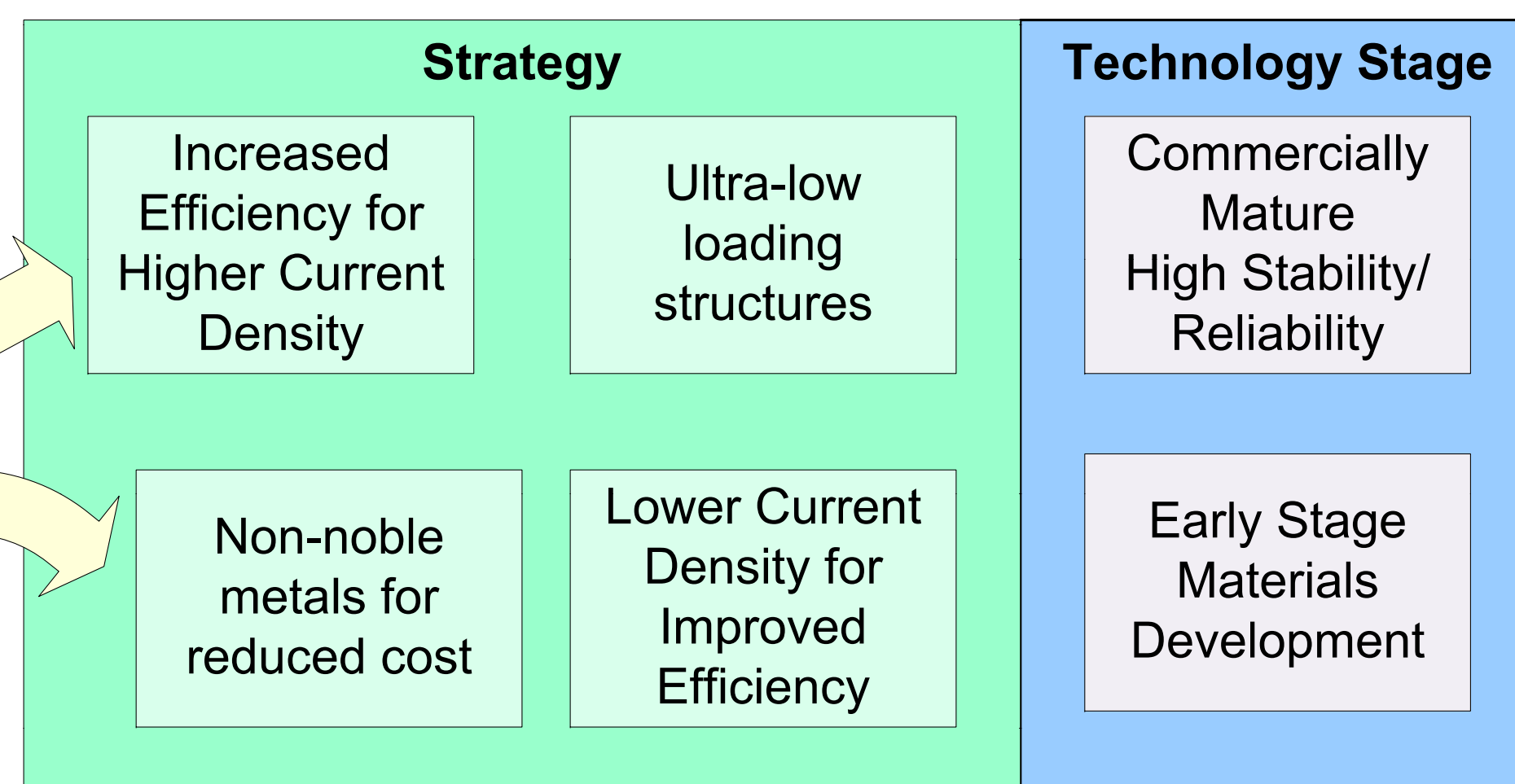
Novel Regenerative Fuel Cells based on Anion Exchange Membranes for Affordable Renewable Energy Storage

PI: Dr. Katherine Ayers, Proton Energy Systems, kayers@protononsite.com

Approach



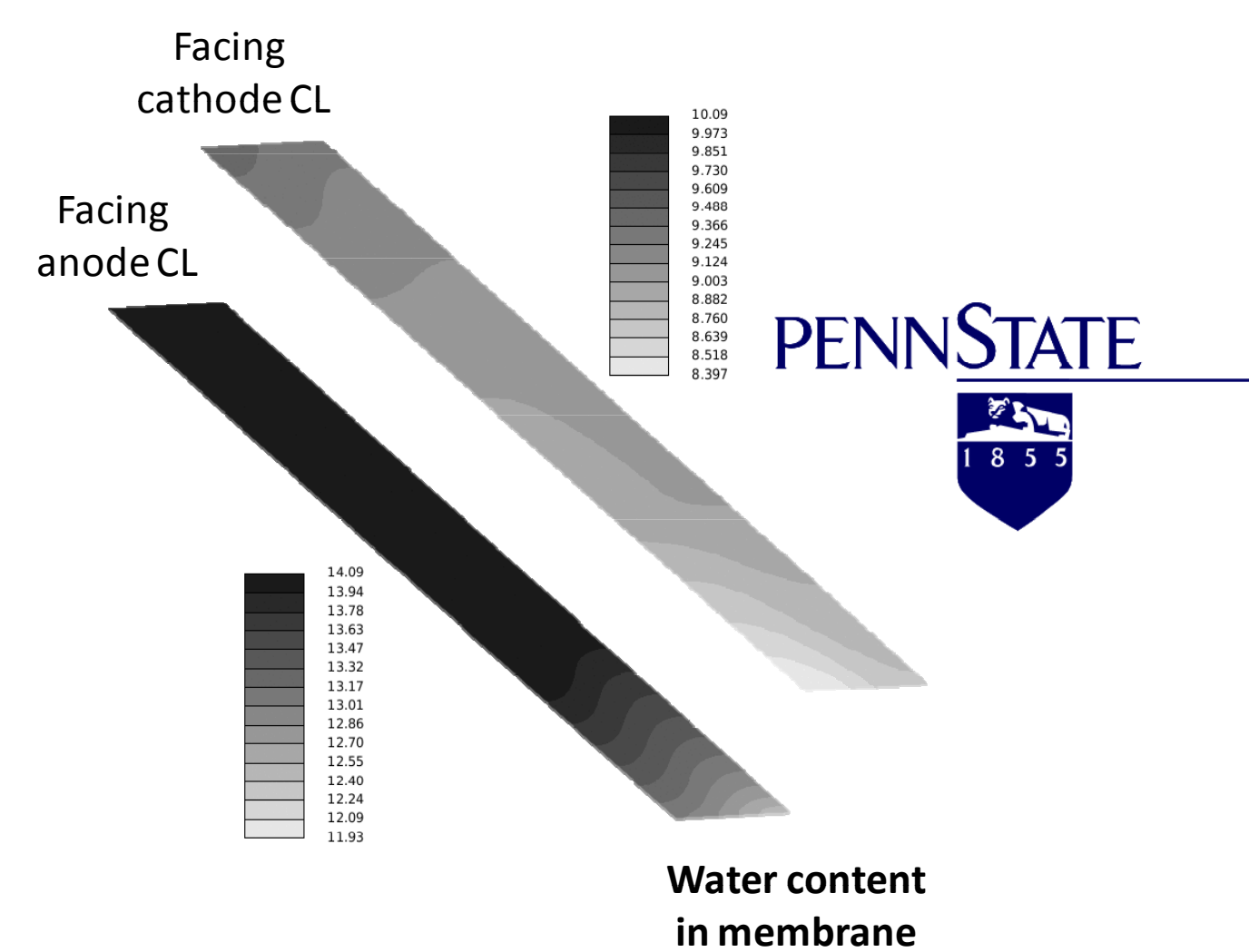
- Leverage Proton experience in large scale electrolysis and regenerative fuel cells for energy storage
- New membrane chemistry to eliminate PGM and semi-precious metals
- Lower current density for improved efficiency



Key Challenges and Progress

Fuel Cell Durability:

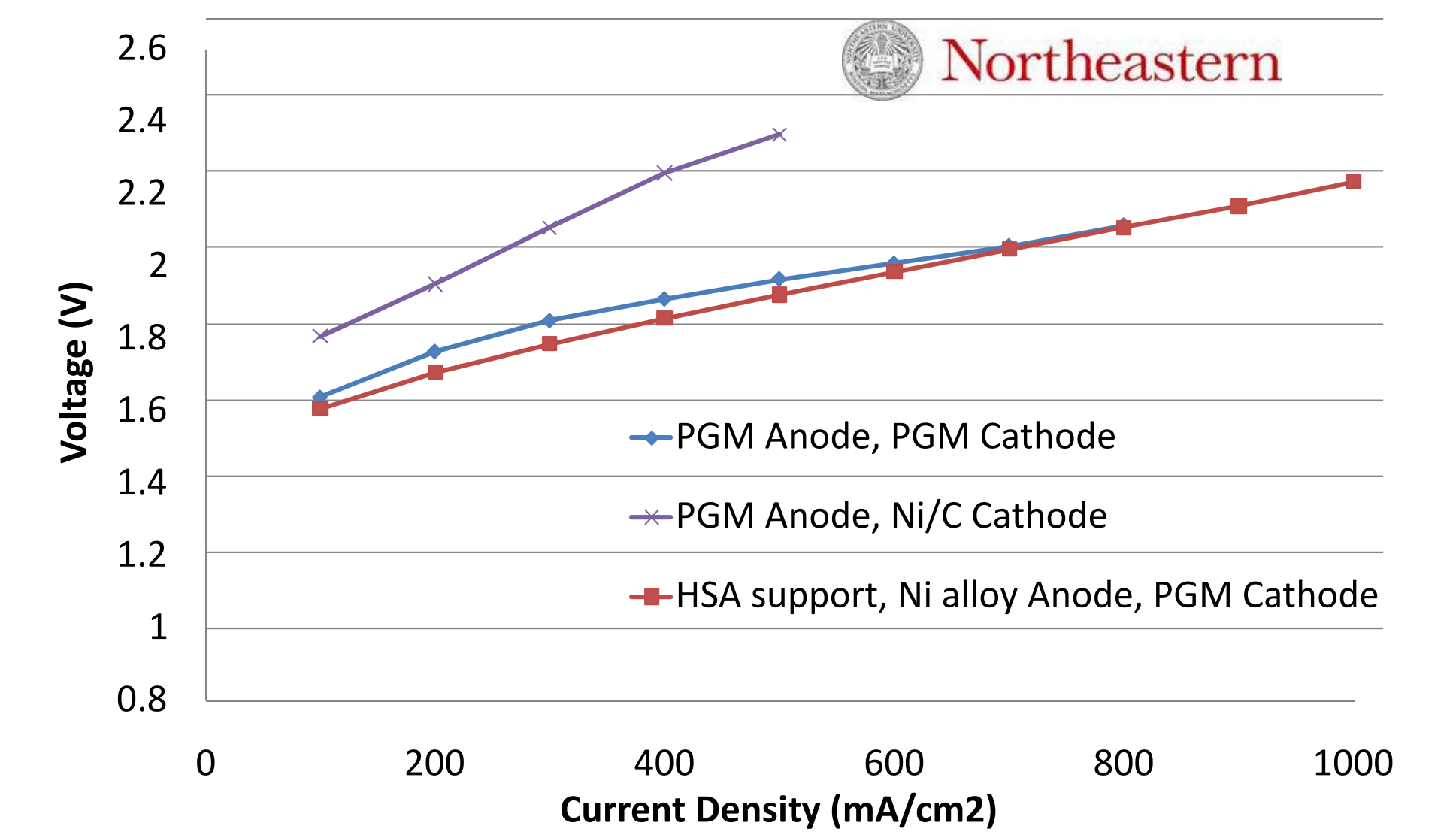
- Anode flooding and cathode dehydration due to reactions and slow membrane water transport
- Examining GDL parameters, ionomer chemistry, and flow rates



Modeling providing important insights in water transport

Non-PGM catalysts (electrolyzer)

- Translation from RDE to cell results requires MEA process understanding
- Challenge in synthesis of non-carbon supports with desired particle size range



Non-PGM catalysts approaching performance target on anode, still working on cathode

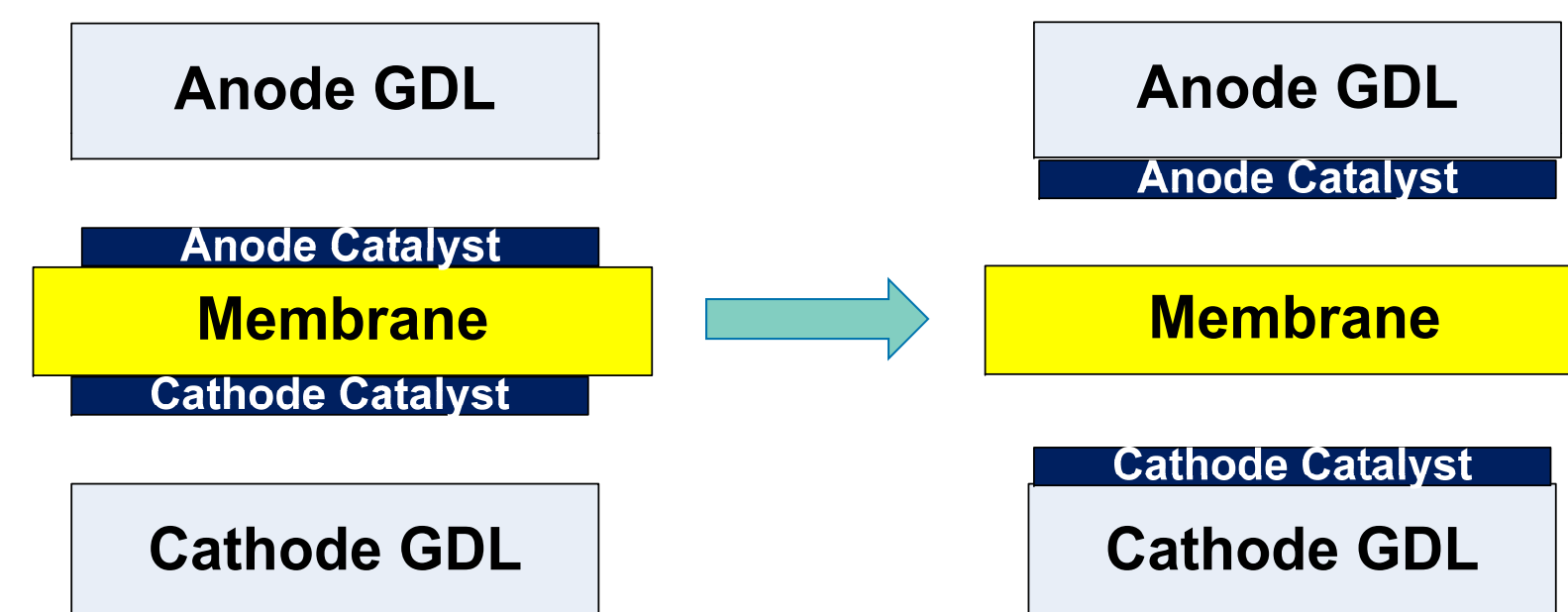
Key Supporting Advances, 2012



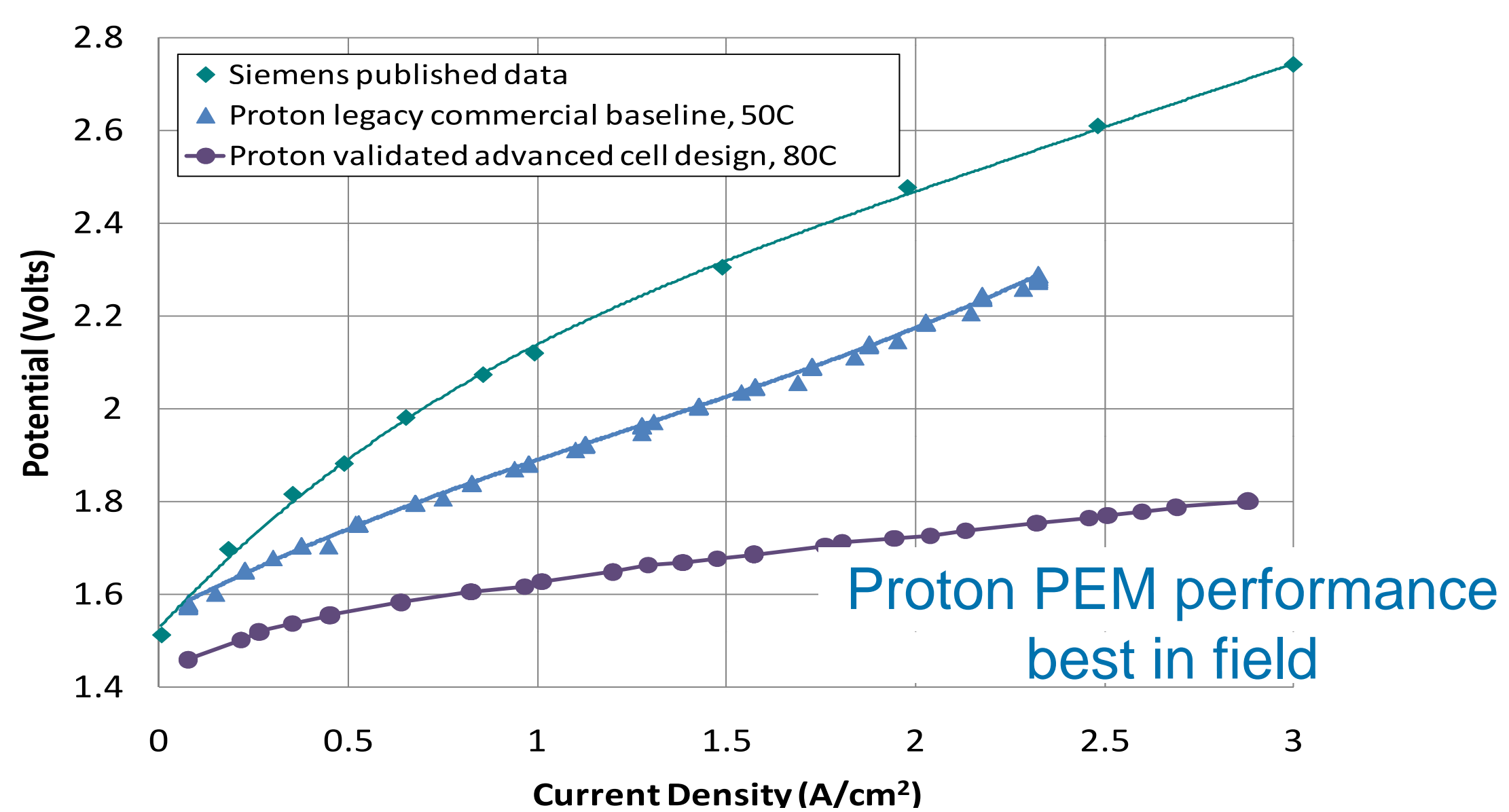
5000 psi Operational Prototype



40% Cost Reduced Stack Platform

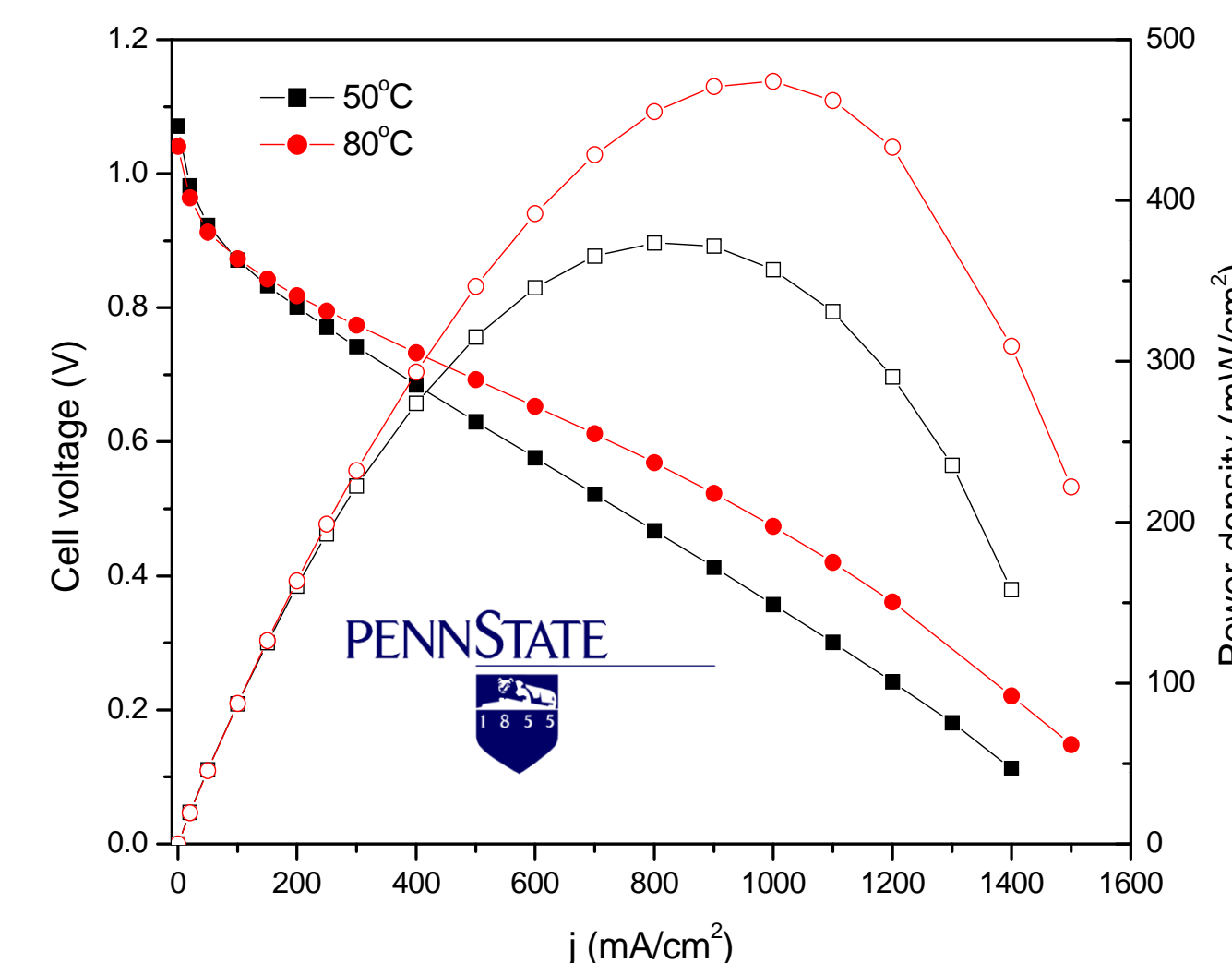


GDE Approach for Milder Membrane Processing



Stack Development for MW Electrolyzer

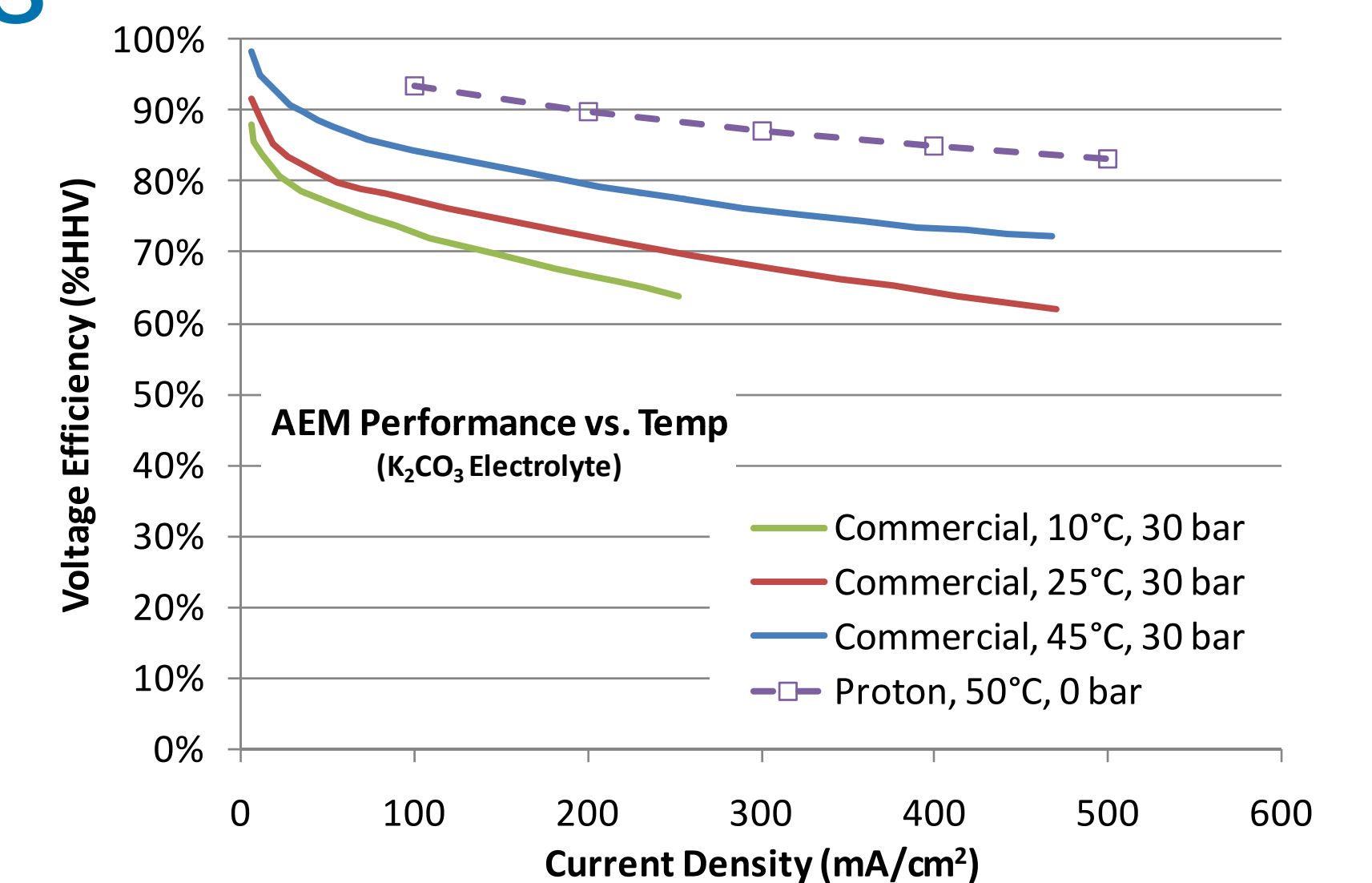
Results



Fuel Cell Approaching Targets



Components arriving for system build (Previously demonstrated RFC system of similar size shown)



Electrolysis Cell Outperforming Commercial AEM

