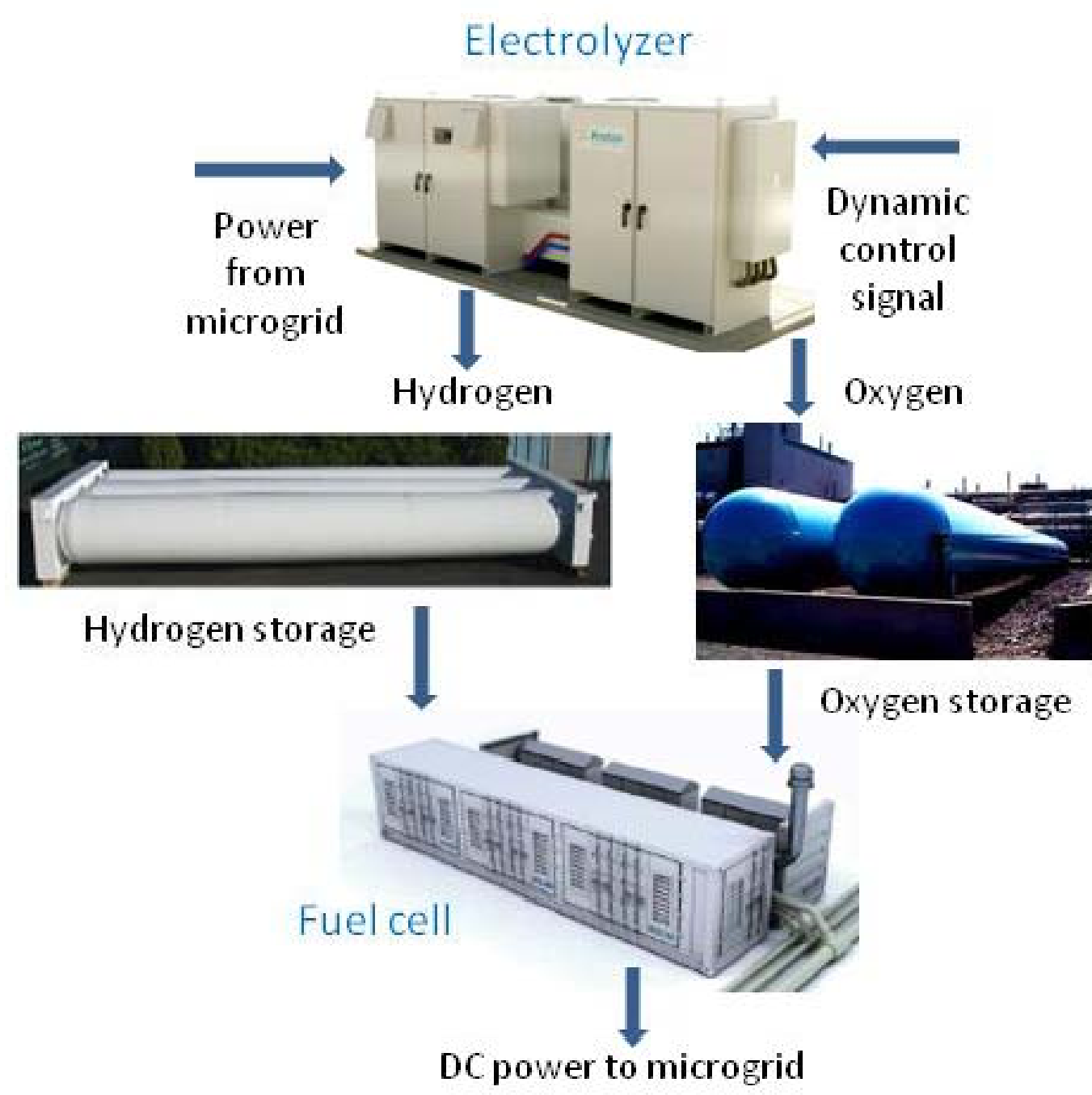


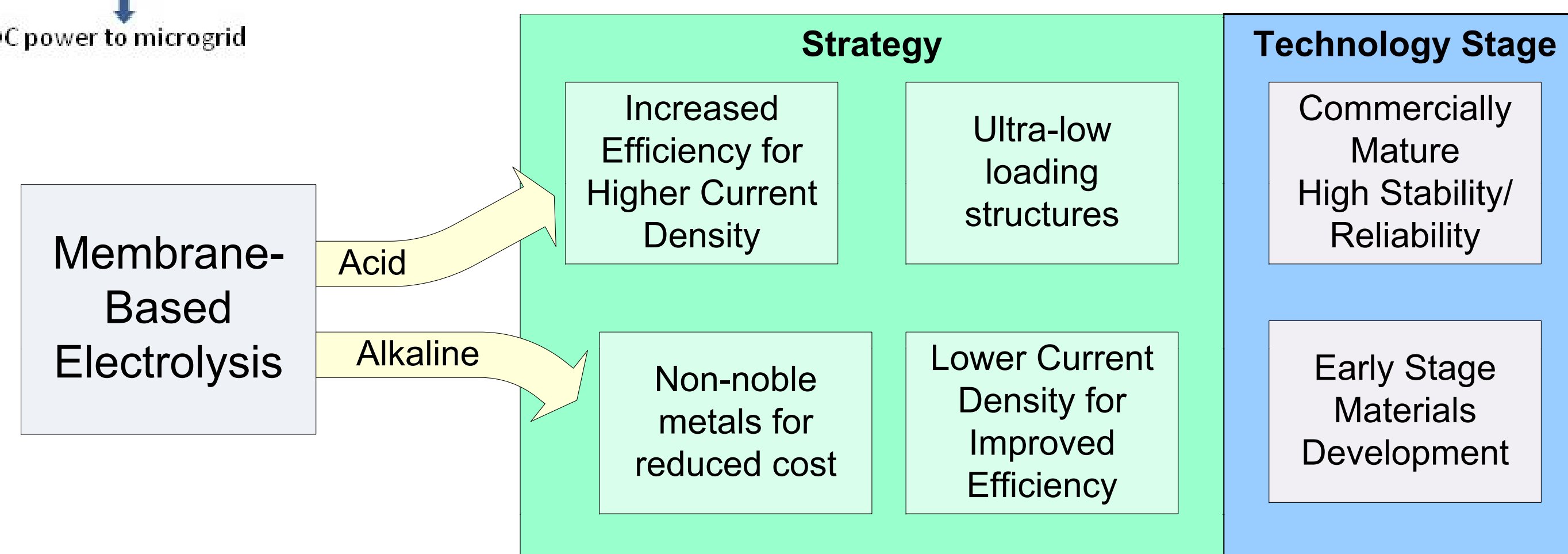
# Novel Regenerative Fuel Cells based on Anion Exchange Membranes for Affordable Renewable Energy Storage

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## Approach



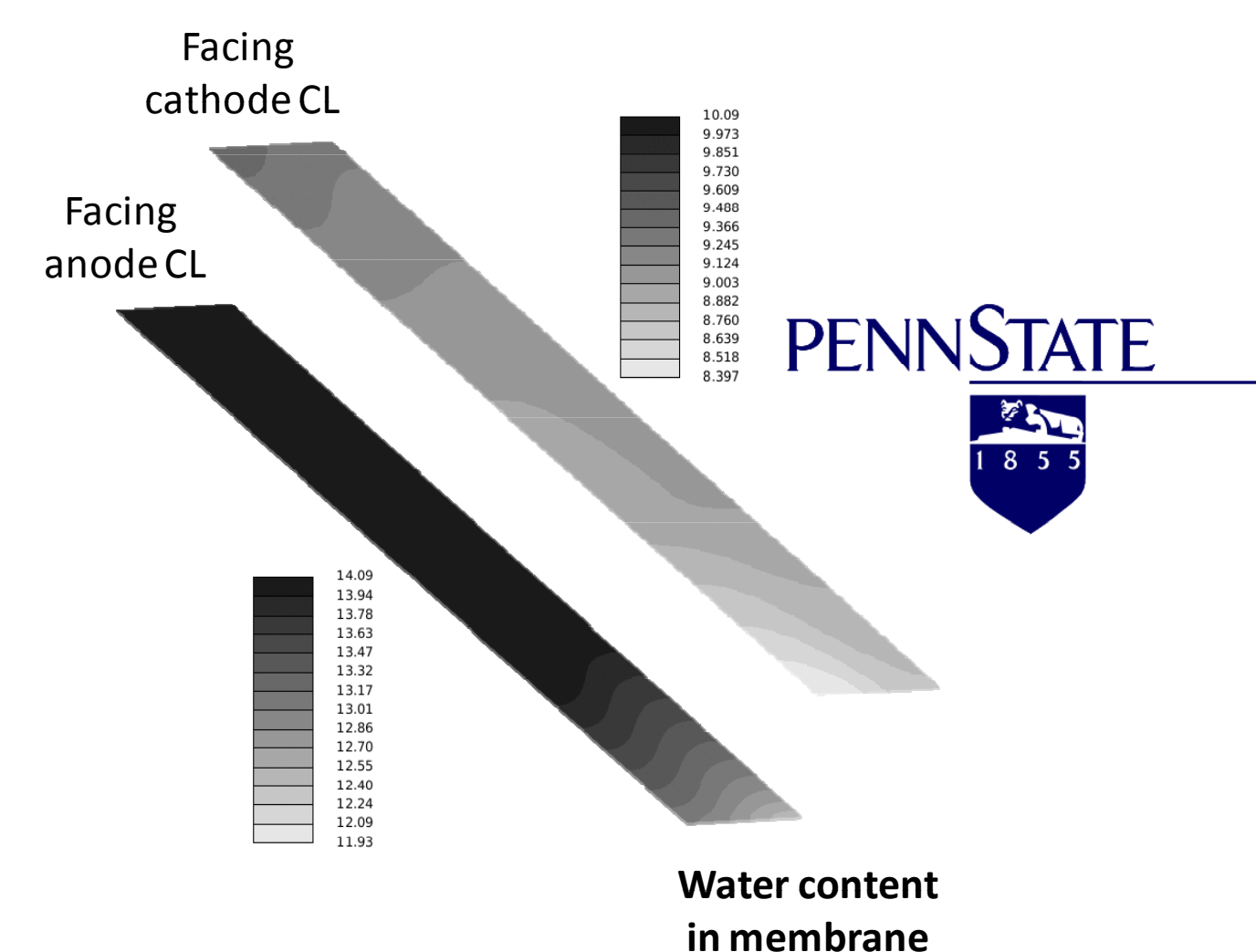
- Leverage Proton experience in large scale electrolysis and regenerative fuel cells for energy storage
- New membrane chemistry to eliminate PGM and semi-precious metals
- Lower current density for improved efficiency



## Key Challenges and Progress

### Fuel Cell Durability:

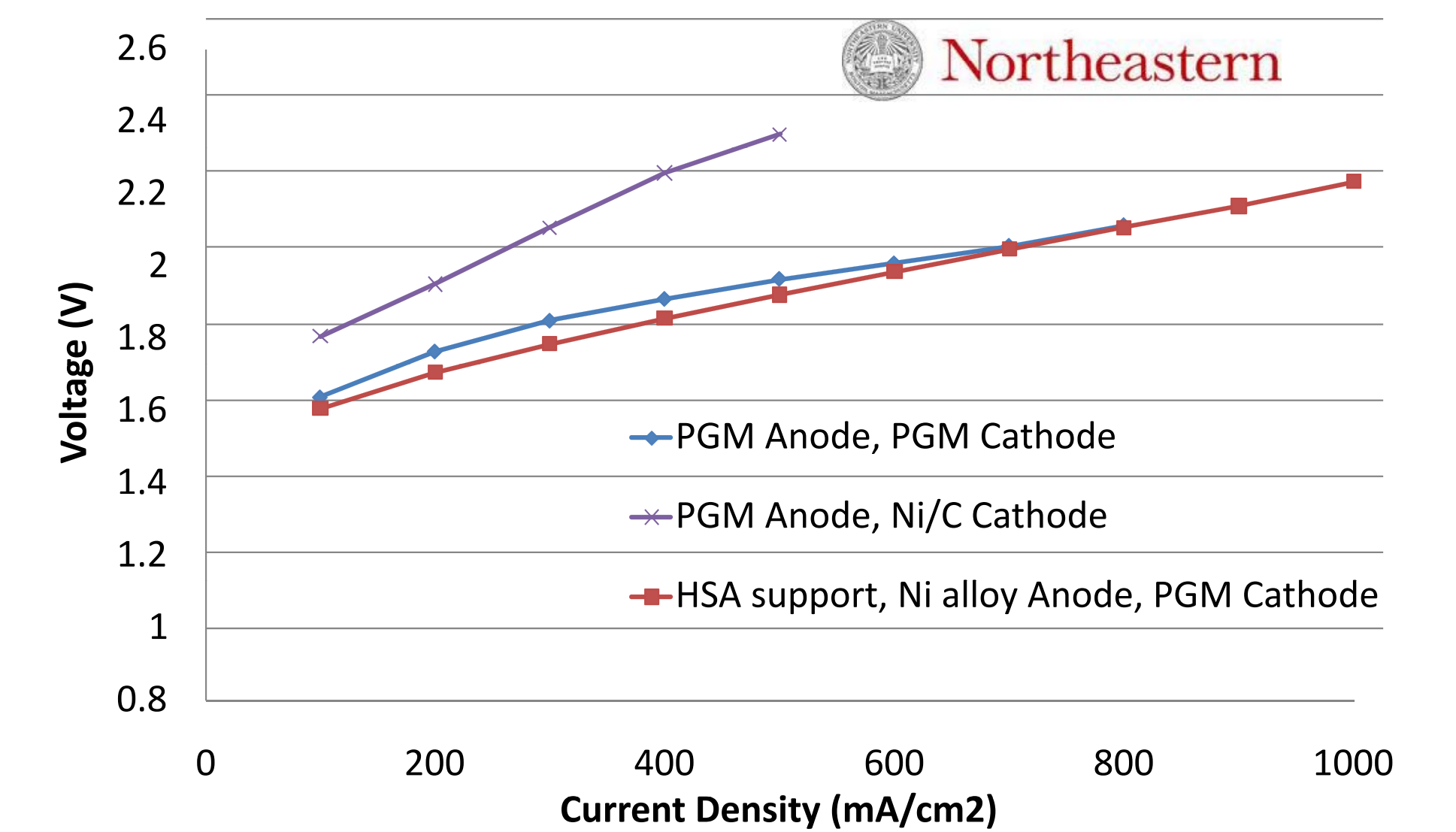
- Anode flooding and cathode dehydration due to reactions and slow membrane water transport
- Examining GDL parameters, ionomer chemistry, and flow rates



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

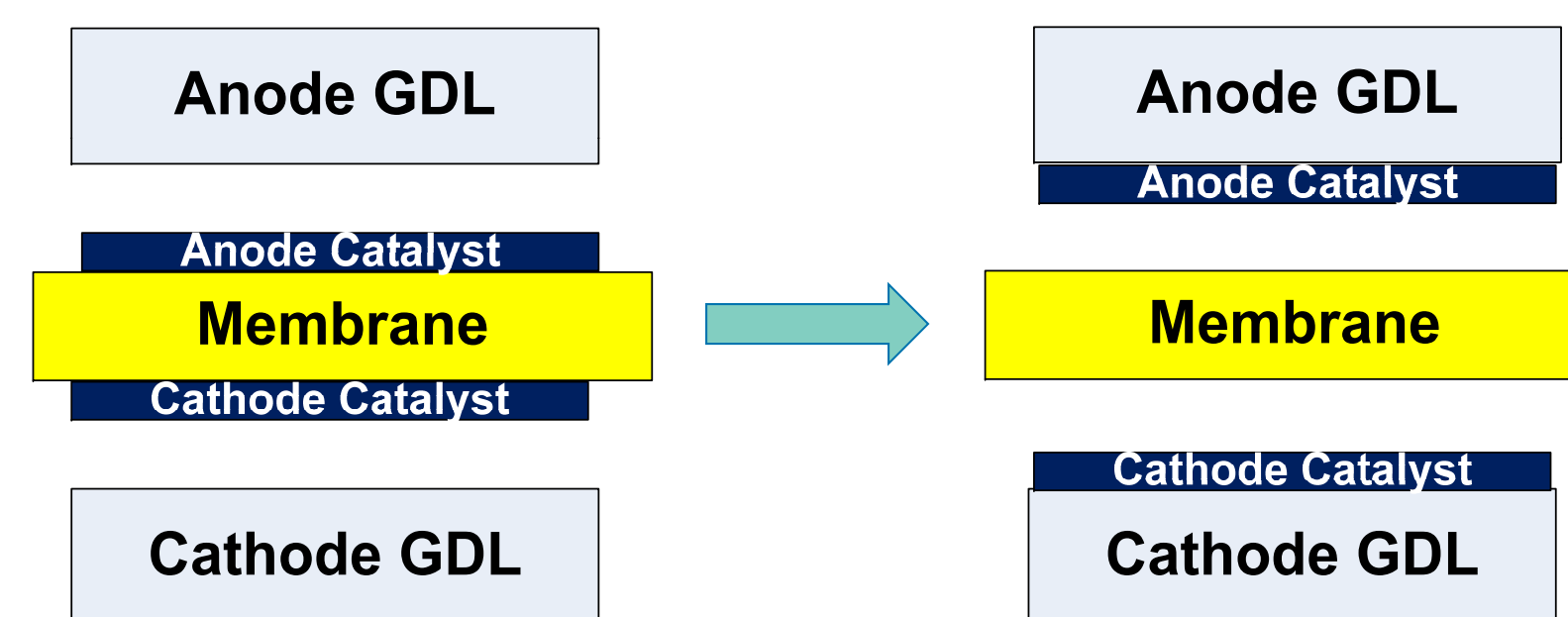
## Key Supporting Advances, 2012



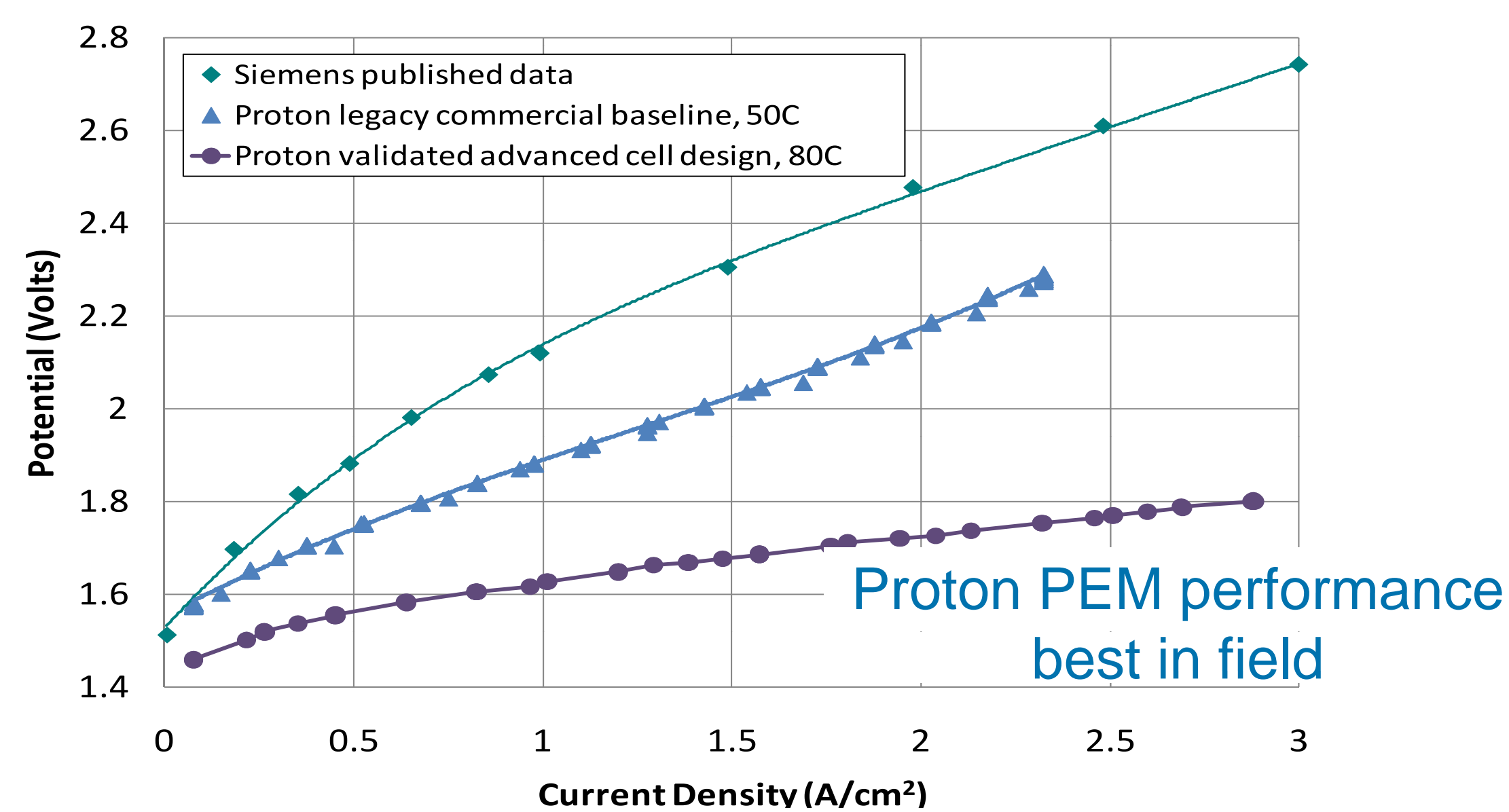
5000 psi Operational Prototype



40% Cost Reduced Stack Platform

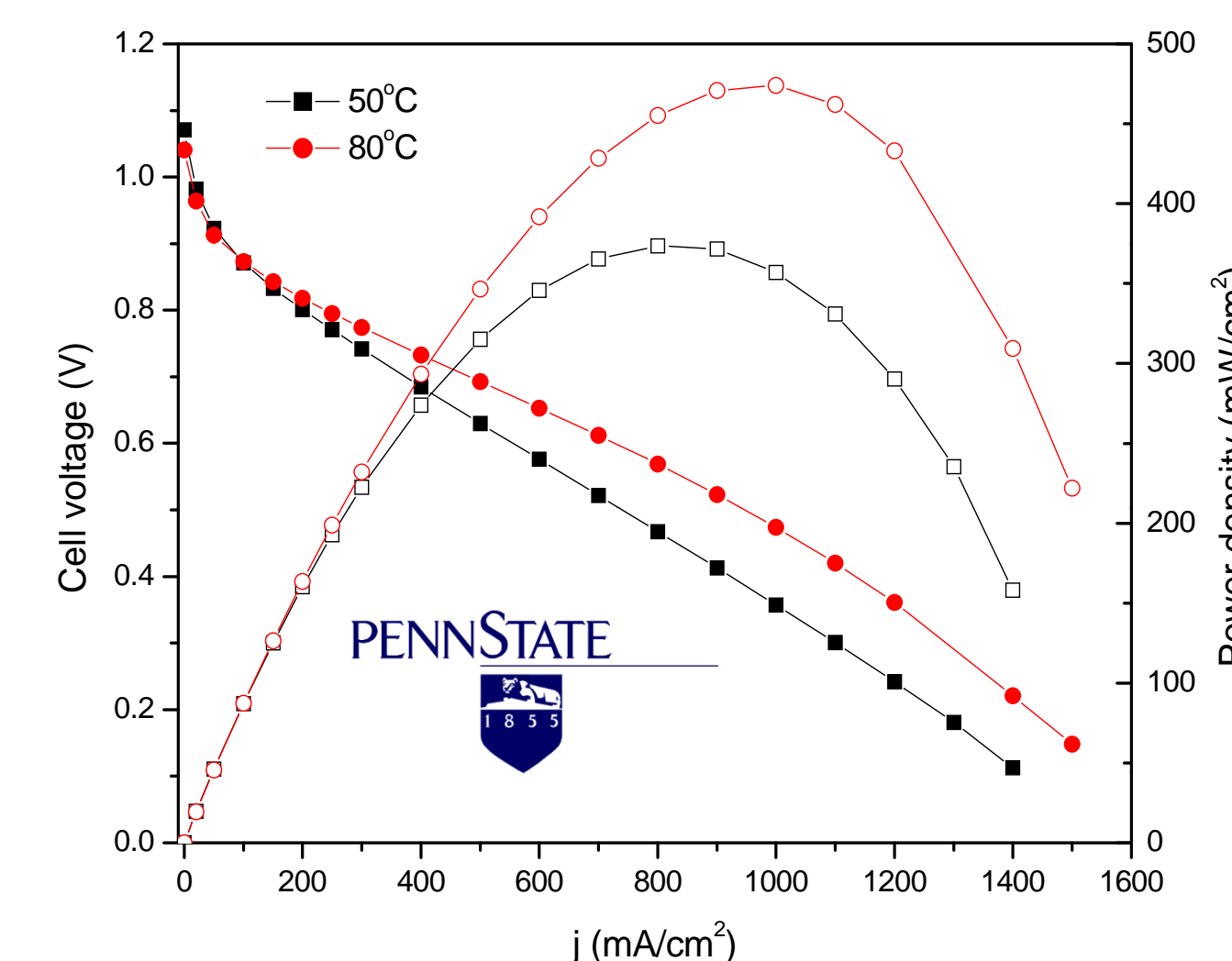


GDE Approach for Milder Membrane Processing

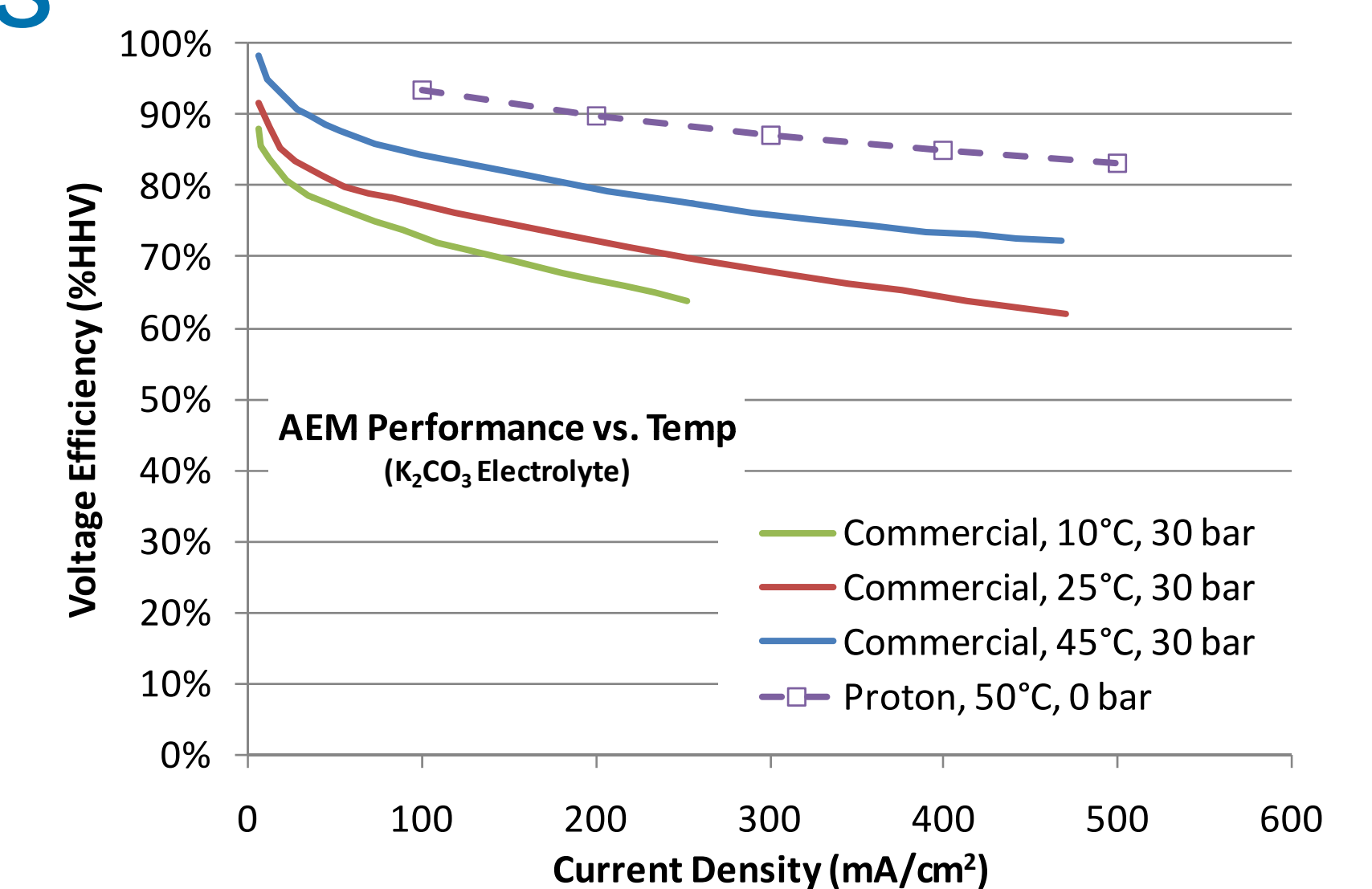


Stack Development for MW Electrolyzer

## Results



Fuel Cell Approaching Targets



Electrolysis Cell Outperforming Commercial AEM



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

