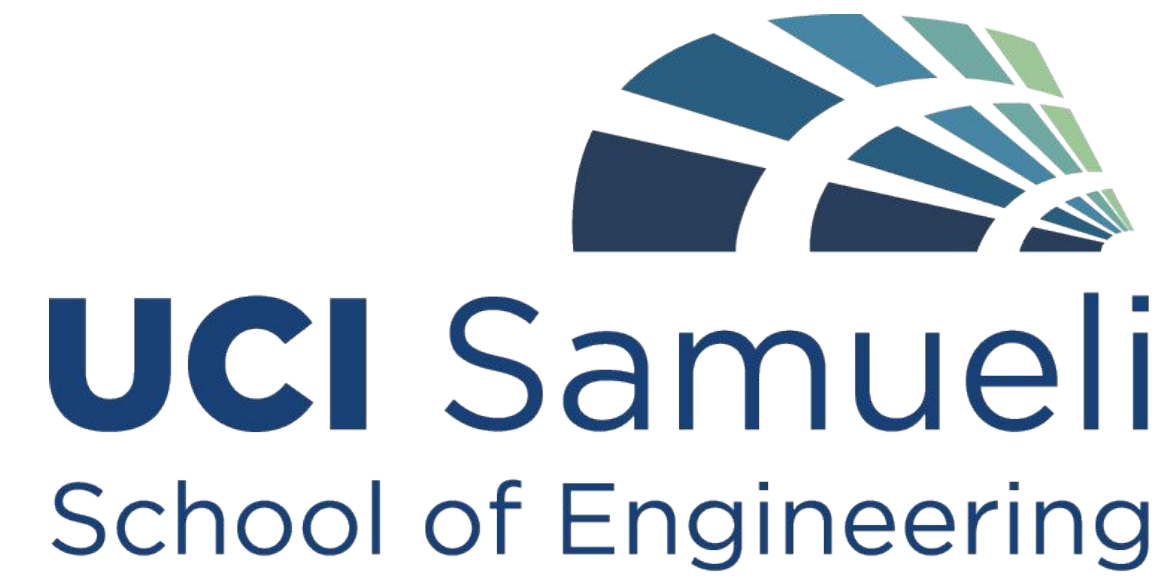


Fuel Cell Battery

Advisor: Professor Yun Wang

Members:



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Background: Why use Proton Exchange Membrane Fuel Cells (PEMFCs)?

1. Only water as a by-product and zero pollutant emissions (NO_x, CO, HC)
2. Fuel cells are more efficient at the same scale; use less fuel and generate more energy
3. Hydrogen is abundant; can be produced from renewable energy
4. Electrolysis using solar energy

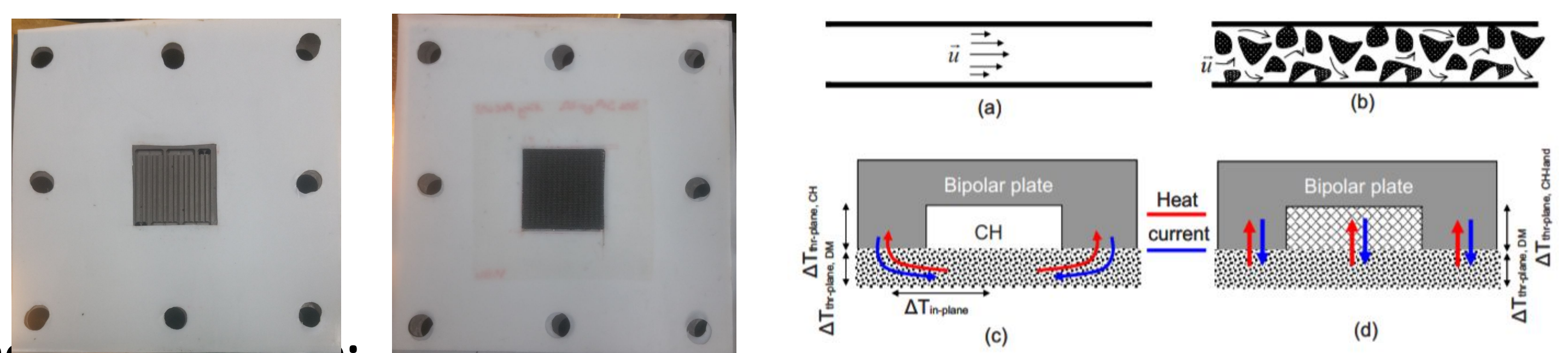
Goals: Improve PEMFC static performance using an inexpensive solution

Requirements:

1. Achieve Department of Energy 2020 targets of 0.8V cell potential when outputting 300mA/cm²
2. Achieve a limiting current density of 1.5A/cm² with air as the oxidant

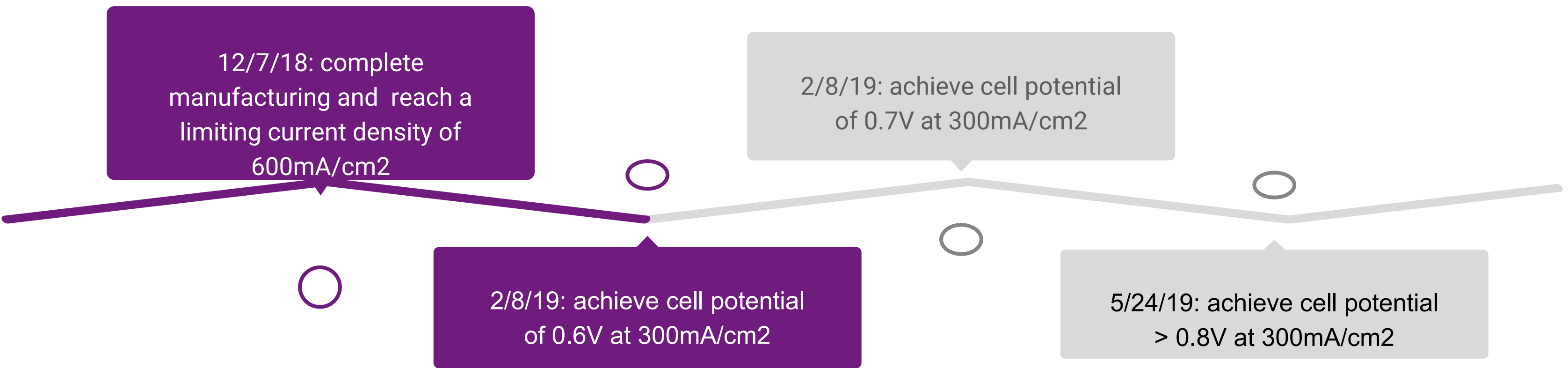
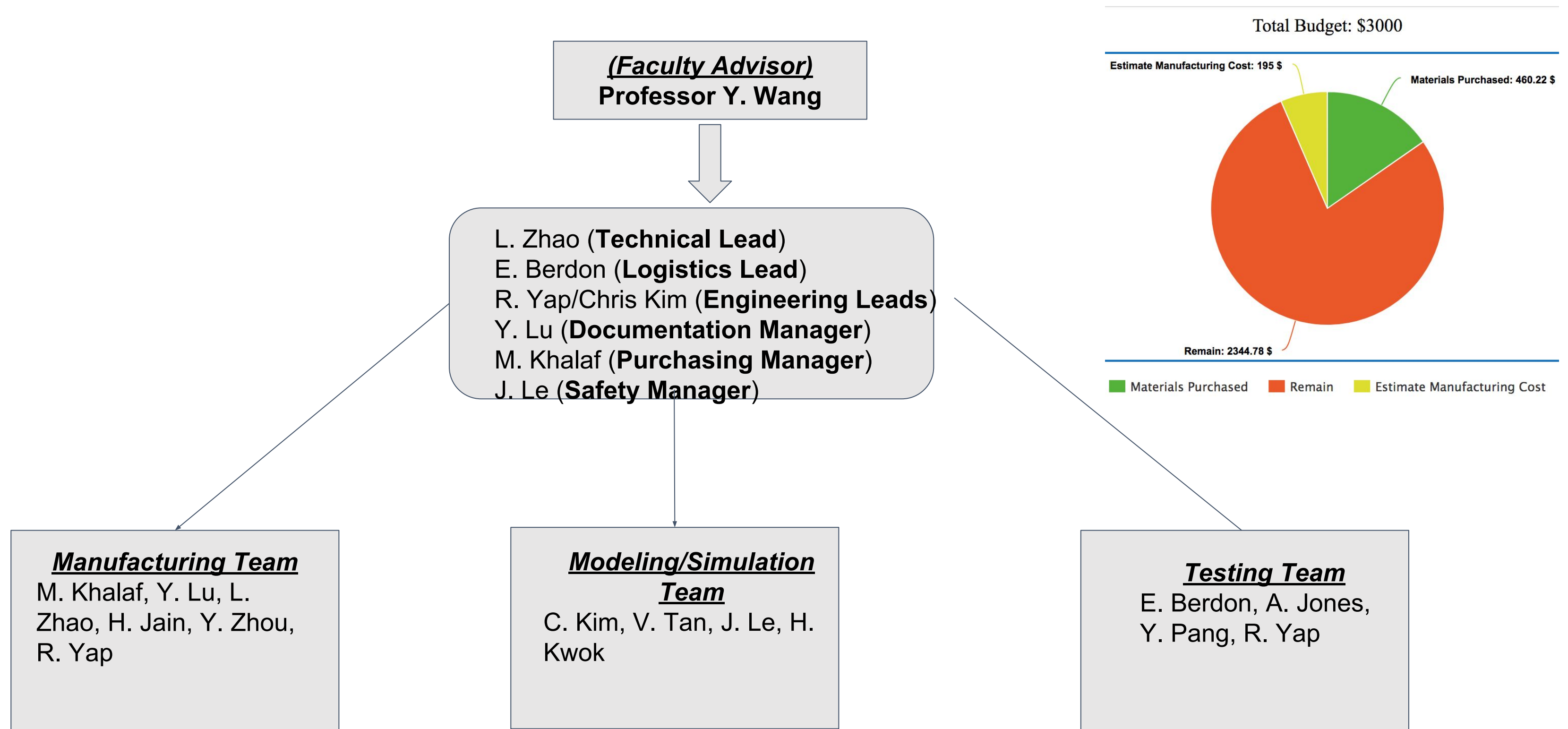
Innovation:

Reactant distribution through porous flow media rather than conventional flow channels for enhanced heat and electron transfer



The bigger picture:

In order to support the transition from unsustainable energy sources to renewable alternatives, Team Fuel Cell Battery strives to improve the capability of PEMFC's through manufacturing, testing, and modelling a Porous Media (PM) PEMFC.



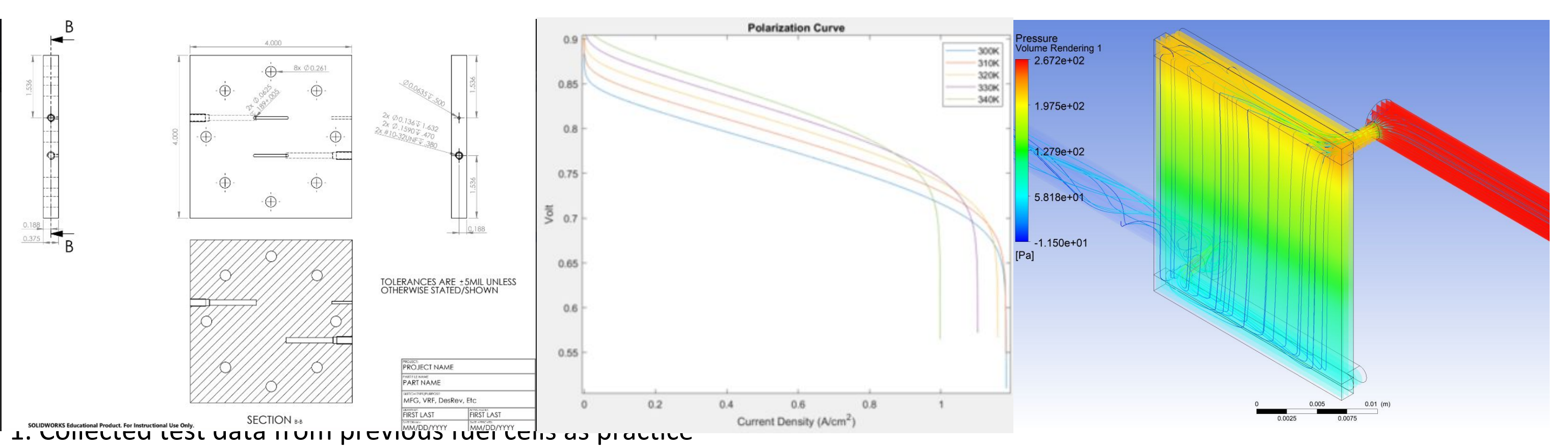
Current Progress:

Manufacturing:

1. Optimized inlets/outlets locations, 2. Revised fastener pattern 3. Added single channels for improved flow field 4. Reduced the thickness of the bipolar plates.

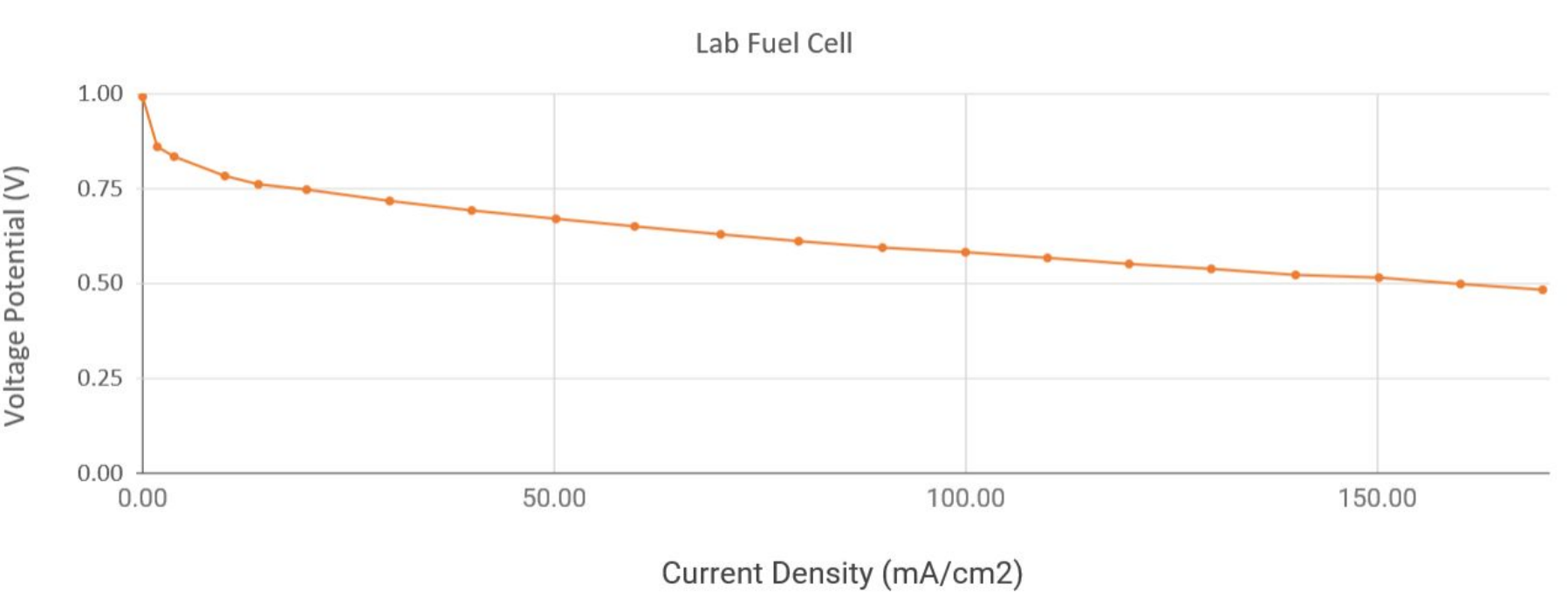
Modelling and Simulation:

1. Predicted polarization curve. 2. Ansys Flow Simulation.



Future Tasks

1. Test manufactured f
2. Generate more accu
3. Troubleshoot, test, and improve current design to achieve project goals and requirements



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