



Low Cost, Structurally Advanced Novel Electrode and Cell Manufacturing

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Project ID#
ES245

Timeline

- Project start date:
 - October 1, 2014
- Project end date:
 - September 30, 2016
- Percent complete: 25%

Budget

- Total project funding
 - DOE share: \$1,945,770
 - 24M share: \$648,880
- FY14 funding
 - DOE share: \$170,348
 - 24M share: \$77,481
- Funding for FY15
 - DOE share: \$223,472
 - 24M share: \$76,451

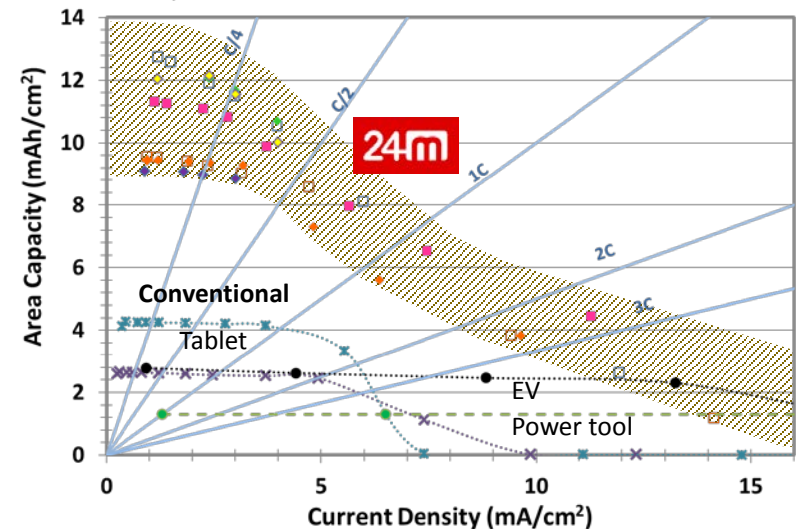
Barriers

- Cost – current costs are three times to high on a kWh basis
- Performance – High energy dense battery systems are needed to meet both volume and weight targets
- Abuse tolerance, reliability, ruggedness – many Li-ion batteries are not intrinsically tolerant to abusive conditions

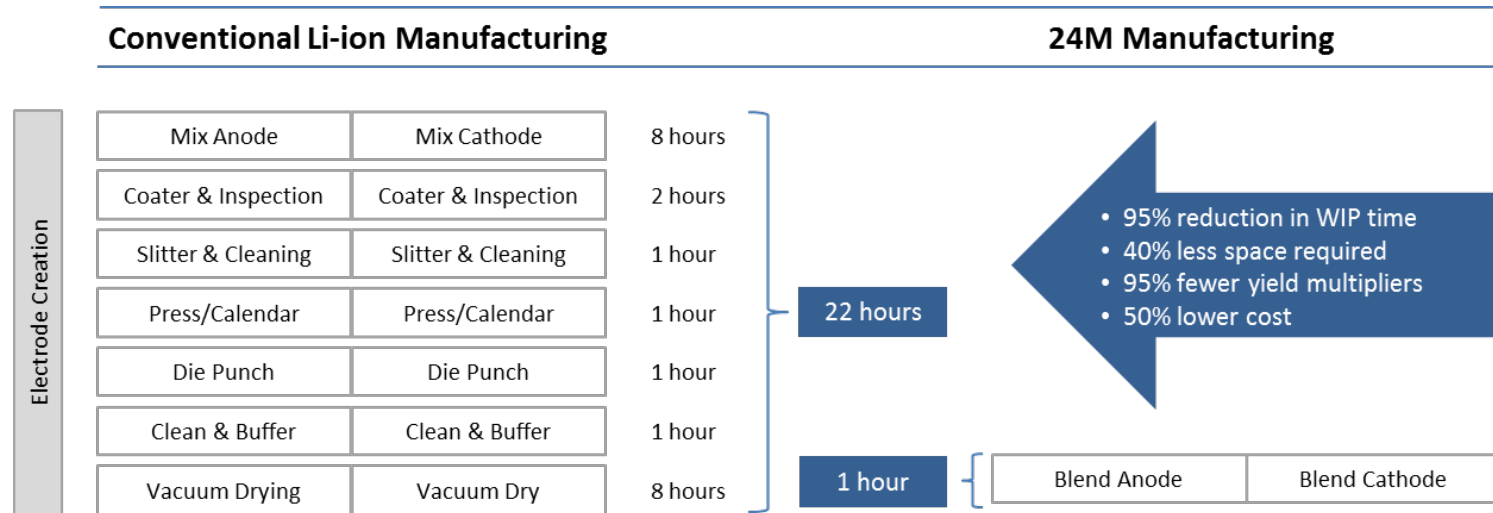
Partners

- 24M Technologies - LEAD

- Overall Objective: Re-invent the Li-ion battery from electrode design through high volume manufacturing
 - Demonstrate that 24M's novel electrode and manufacturing approach can be scaled to mass production suitable for automotive applications.
 - Novel electrode architecture that enables abuse tolerant battery systems.
 - Reduction of inactive materials that translates to higher energy density battery systems with a simpler architecture

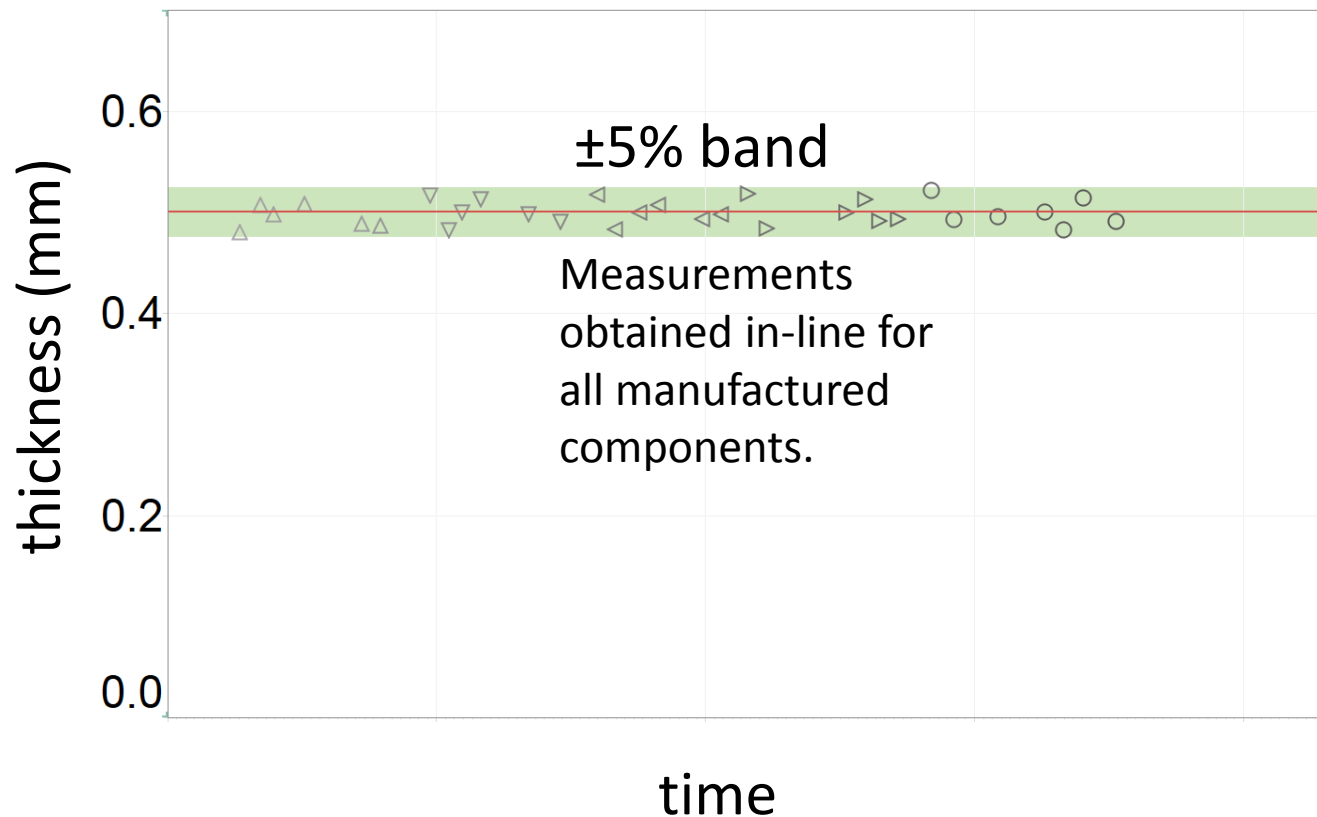


Stacks with 3x the Area Capacity of Li-ion Minimizes Inactive Materials, Enables New Product Designs

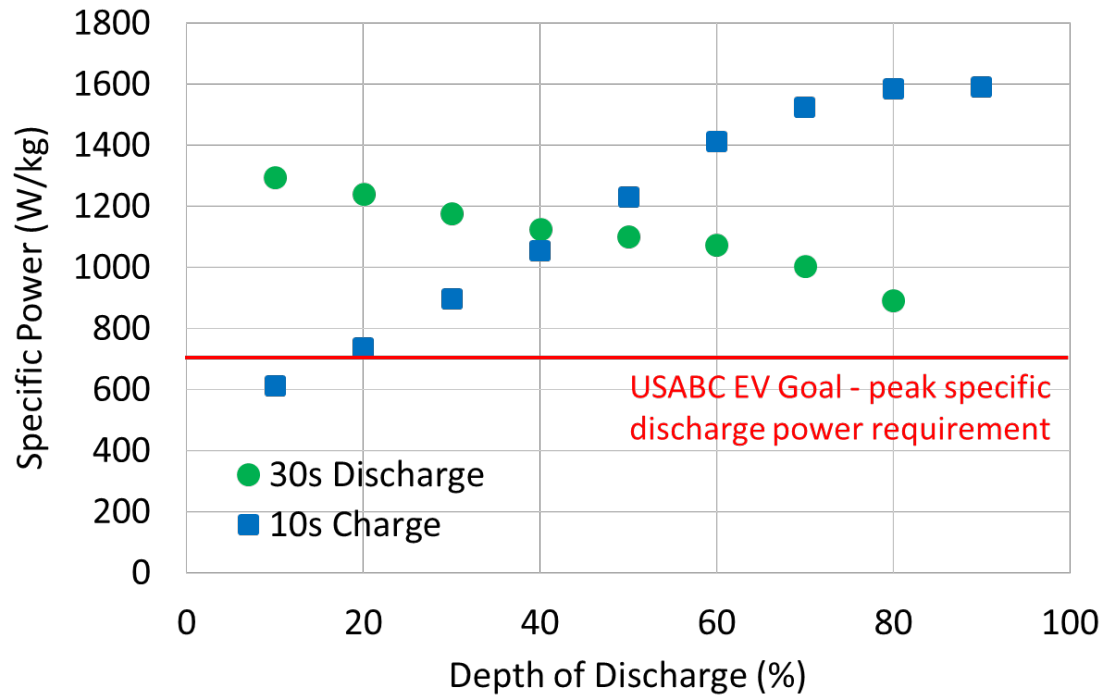


- Fewer unit operations
- 1/3rd the capex of conventional Li-ion
- Ability to reach economies of scale without requiring ~\$500M capital investment

- Pilot scale manufacturing equipment demonstrating process capabilities required for high volume battery manufacturing.

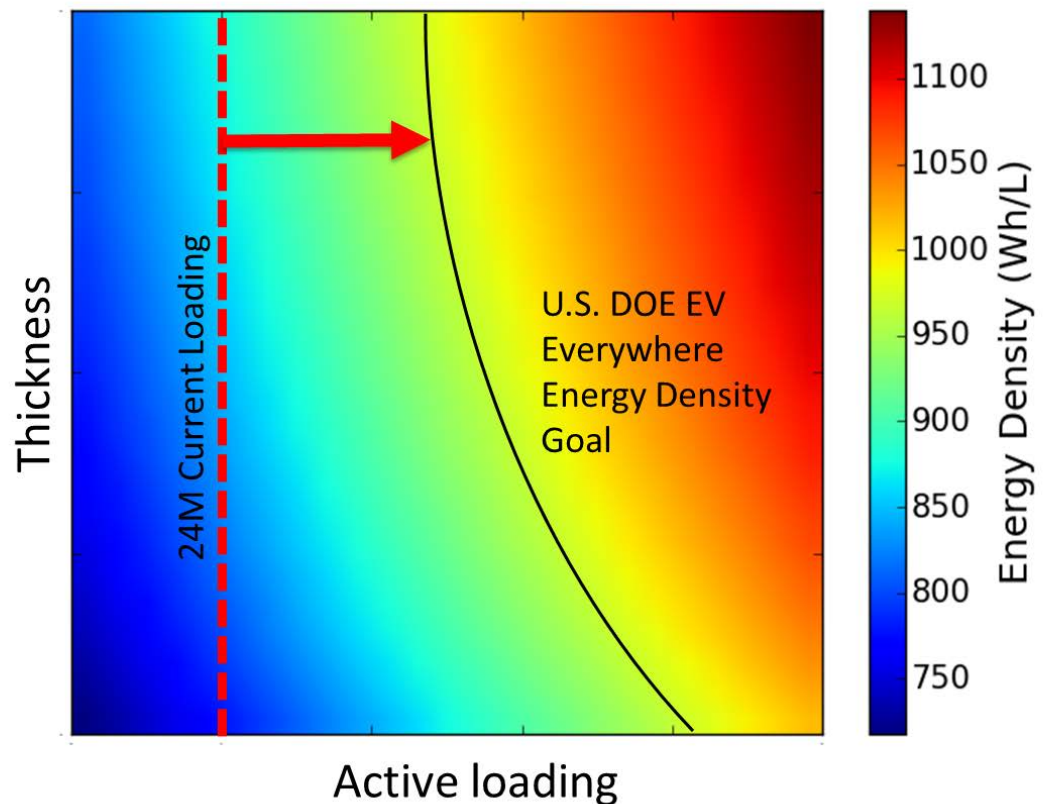


Technical Accomplishments



- Hybrid pulse power capability testing
- Architecture demonstrates electric vehicle level performance characteristics

- Continue to increase the energy density of the battery systems
- Continue the scale-up of manufacturing equipment and processes.
 - Demonstrate quality metrics consistent with high volume manufacturing.



- 24M has continued to meet its milestones for increasing energy density of its battery systems by increasing the active loadings of its cathode and anode materials.
- Scale-up for manufacturing processes is in progress with manufacturing equipment installed in its facility.
 - Current manufacturing processes are meeting target quality metrics for production quality.