



Dow Kokam

Lithium Ion Battery Production Facilities

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Dow Kokam

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Move the Needle
on Advanced Battery Systems

Project ID: ARRAVT006

The Future is Here



CLAYCO
THE ART & SCIENCE OF BUILDING

Midland Battery Park

FORUM

Program Overview

Timeline

- Project Start: Dec 9, 2009
- Project End: Dec 8, 2012
- 40% Complete



Barriers/Risks

- Volume Effect on Cost Down
- Schedule Delays
- EV Demand Uncertainty
- Raw Material Volatility and Availability
- Lack of Standardization

Budget

Total Project Funding

- DOE : \$160,971,404
- Dow Kokam: \$161,000,000

Funding Received in FY 2010

- \$35,530,469



Partners

- DOE (National Labs)
- DOD
- KCP&L, SDTC
- Dow (Materials and Components)
- EV Partners (PVI, Motiv, Corvus, Zero Truck)
- State of Michigan



Program Objectives



- The Project objectives are:
 - to design, construct, and commission a facility in Michigan to manufacture cells and batteries to power electric and/or hybrid electric vehicles
 - to advance the battery manufacturing and development processes to make the battery affordable, safer, more reliable, and longer lasting, and
 - to support the Nation's goal of promoting less dependence on foreign oil for the transition to petroleum or emission free vehicles.

To accomplish the Project objectives above, the Recipient will execute a three phased approach. The three phases and their objectives are:

- *Phase I (Design, Engineering & Planning) Complete*
- *Phase II (Procurement, Construction & Equipment Startup) In Progress*
- *Phase III (Operations & Maintenance) 1H 2012*

Relevance/Impact



- Establishing traction battery manufacturing in the United States which enables mass adoption of EVs and reduces dependence on foreign oil and emission of green house gas
- Mass adoption of EVs triggers investments along the value chain and enables cost efficiency through scale
- Dow Kokam's Midland Battery Park will anticipate to employ as much as 1000 jobs during construction and upwards of 400 permanent jobs at capacity

Approach - Phase I (Design, Engineering & Planning)



1. Identify appropriate site and secure rights to construct facility
2. Design a facility and manufacturing process that will manufacture cells and batteries to power electric or hybrid electric vehicles
3. Complete the detailed construction drawings
4. Obtain all required related permits sufficient to begin construction



Approach - Phase II

(Procurement, Construction & Equipment Startup)



1. Prepare site for construction
2. Procure manufacturing equipment
3. Construct the manufacturing plant - *In Progress*
4. Install all manufacturing process equipment - *2H 2011*
5. Hire staff plant operations and maintenance - *In Progress*
6. Commission manufacturing process - *1H 2012*



Approach - Phase III

(Operations & Maintenance)

- Train operators and maintenance staff – *In Progress*
- Manufacture cells and batteries in accordance with OEM specifications - *2012*
- Continuously improve upon battery and manufacturing processes – *On Going*



Milestones



July 2009: Dow Kokam joint venture receives a \$161 million matching grant from the U.S. DOE to build the Midland manufacturing facility.

November 2009: Executive management team named

March 2010: NEPA and Air Permit approval granted

November 2010: All major mfg. equipment designed and on order.

April 2011: FAST START Training with local college for candidates for permanent hiring for Midland facility begins



September 2009: Official formation of Dow Kokam LLC

January 2010: Midland City Council vote on resolution supporting MSF Designated Ren Zone

June 2010: Ground breaking /construction to begin on Midland manufacturing facility

December 2010: Michigan Plant enclosed with roof and walls

Mid 2012: Full production at Midland manufacturing facility begins



Collaborations / Partnerships



- DOE (National Labs)
 - ORNL - Next Generation Cathode Technology
 - ANL - Battery Performance
- DOD
 - Tactical / Non-tactical vehicles development
 - B3590 – Soldier Communication Pack
 - US Air Force - JSF35
 - US Army - Kiowa Warrior helicopter
- Utilities / Grid
 - Kansas City Power and Light - ARRA funded Smart Grid demonstration
 - SDTC (Sustainment Development Technology of Canada)/Ontario Utility - Community smart grid energy storage



Collaborations / Partnerships



- Dow (Materials and Components) –
 - Localizing electrode material manufacturing
 - Development of advanced materials
- EV Partners
 - PVI - Heavy Duty trucks and buses
 - Motiv Power Systems - Power Control Systems which enable electric-drive commercial vehicles
 - Corvus Energy – Marine, Solar, Wind, Trucking, Commercial, Submersibles
 - Zero Trucks – Zero emission full electric medium duty truck
- State of Michigan – Supporting project financially and create a positive business environment



Future Work

- Hire and train operators
- Take delivery of equipment and install
- Start-up and qualify
- Technology transfer/integration
- Seeding the market and build demand



Summary



- Midland Battery Park program is well underway
- ARRA funding awarded in December of 2009 and is projected to be 40% completed by May 2011
- NEPA FONSI was confirmed in March of 2010
- Project to date has accumulated 145,000 contractor hours on site. Total number of construction jobs for the project is approximately 1000
- Dow Kokam is working actively with State of Michigan on the Fast Start training

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