



## Dow Kokam Cell/Pack 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



**Reduced Dependence on Foreign Oil**

**Job Creation**

**Reduced Carbon Impact**

**Clean Energy**

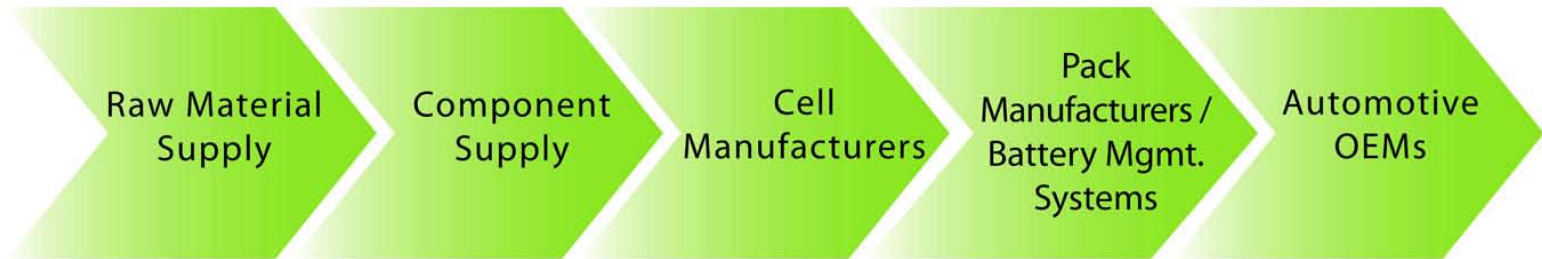
**National Security**

**Great Lakes Bay Region™**  
*Midland • Bay • Saginaw*

**Where Innovation Flows**

# Strategic Investment Throughout the Value Chain

## Advanced Energy Storage



### **Dow Energy Storage Solutions**

- Separators
- Electrolytes
- Cathodes

### **Dow Kokam Joint Venture**

- Lithium polymer battery technology
- Proven manufacturing process

### **Dow Kokam Strategic Alliance**

- Dassault SVE
- Other pack and systems production

### **Dow Kokam Strategic Alliances**

- Smith Electric Vehicles
- Others TBA

# Program Overview

## Timeline

- Project Start: Dec 9, 2009
- Project End: Dec 8, 2012
- 22% Complete



## Barriers/Risks

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

## Budget

### Total Project Funding

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



## Partners

- DOE (National Labs)
- DOD (TARDEC)
- Kansas City Power and Light
- Dow (Materials and Components)
- EV Partners (PVI, Smith)
- 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)*
- *Phase II (Procurement, Construction & Equipment Startup)*
- *Phase III (Operations & Maintenance)*

# 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 after completion

# 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



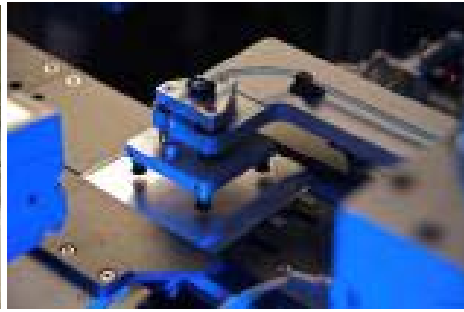
Site Plan  
Scale: 1" = 100' @  
12.21.20



## *Phase II*

# *(Procurement, Construction & Equipment Startup)*

1. Prepare site for construction
2. Procure manufacturing equipment
3. Construct the manufacturing plant
4. Install all manufacturing process equipment
5. Hire staff plant operations and maintenance
6. Commission manufacturing process





## *Phase III* *(Operations & Maintenance)*

- Train operators and maintenance staff
- Manufacture cells and batteries in accordance with OEM specifications
- Continuously improve upon battery and manufacturing processes



# Dow Kokam Milestones

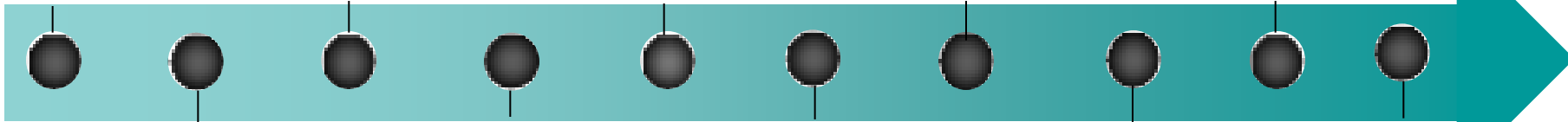
**April 2009:** MEGA board approved \$145 million in tax credits for the Dow Kokam joint venture to locate in Michigan.

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

**November 2009:** Executive management team named

**March 2010:** NEPA approval granted

**Late 2011:** Permanent hiring for Midland manufacturing facility begins



**May 2009:** Dow and Kokam America jointly announce that their first battery production facility and corporate headquarters will be based in Midland, Michigan.

**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

**Mid 2012:** Production at Midland manufacturing facility begins



# Collaborations / Partnerships

- DOE (National Labs) –
  - ORNL - Next Generation Cathode Technology
  - ANL - Battery Performance
- DOD (TARDEC)
  - Tactical / Non-tactical vehicles development
  - B3590 – Soldier Communication Pack
  - JSF35
- Kansas City Power and Light – ARRA funded Smart Grid demonstration
- Dow (Materials and Components) –
  - Localizing electrode material manufacturing
  - Development of advanced materials
- EV Partners
  - PVI - Heavy Duty trucks and buses
  - Smith - Light and medium duty commercial vehicles
- State of Michigan – Supporting project financially and create a positive business environment



# Future Work

- Equipment fully designed and ordered
- Break ground for building construction - Tentatively scheduled for May 2010
- Key personnel hired
- Technology transfer/integration



# Summary

- Midland Battery Park program is off to a good start
- ARRA funding awarded in December of 2009
- NEPA FONSI was confirmed in March of 2010
- Local construction contractors are gearing to help support the Midland Battery Park construction project
- State of Michigan stand ready to aide with training support and tax incentives