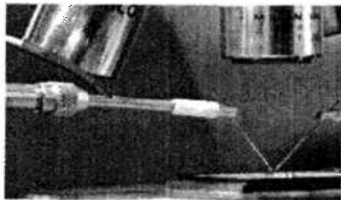


MICHIGAN
ECONOMIC DEVELOPMENT CORPORATION
THE UPPER HAND



Michigan Energy Storage Strategic Attraction/Growth Strategy

House New Economy & Quality of
Life Committee
The Honorable Ed Clemente, Chair

October 28, 2009


Strategy:

Cluster Based Economic Development

- 2 year research program to identify industry diversification opportunities leveraging MI competitive advantages
 - International/Federal/State trends
 - Market Analysis (size, trajectory, etc.)
 - Partner input
- Worldwide best practice review in industry acceleration programs (Swedish Triple Helix, Cluster Approach)
- Included targeted industry clusters in MEDC 2008 Strategic Plan
- Implementation of Cluster teams (advanced biofuels, wind, water, solar, advanced energy storage) to guide strategy
- Passage of key legislation for targeted incentives to grow clusters

Strategy:

Targeted Industry Clusters

- Targeted industries
 - Potential for significant growth
 - Leverage state strengths
 - Generally not mature
 - Gap exists – requires economic assistance
- 
- 1. Advanced Biofuels**
 - 2. Advanced Energy Storage**
 - 3. Wind Turbine Mfg.**
 - 4. Solar/Photovoltaic**
 - 5. Water Technology**
 - 6. Carbon Capture / Sequestration**

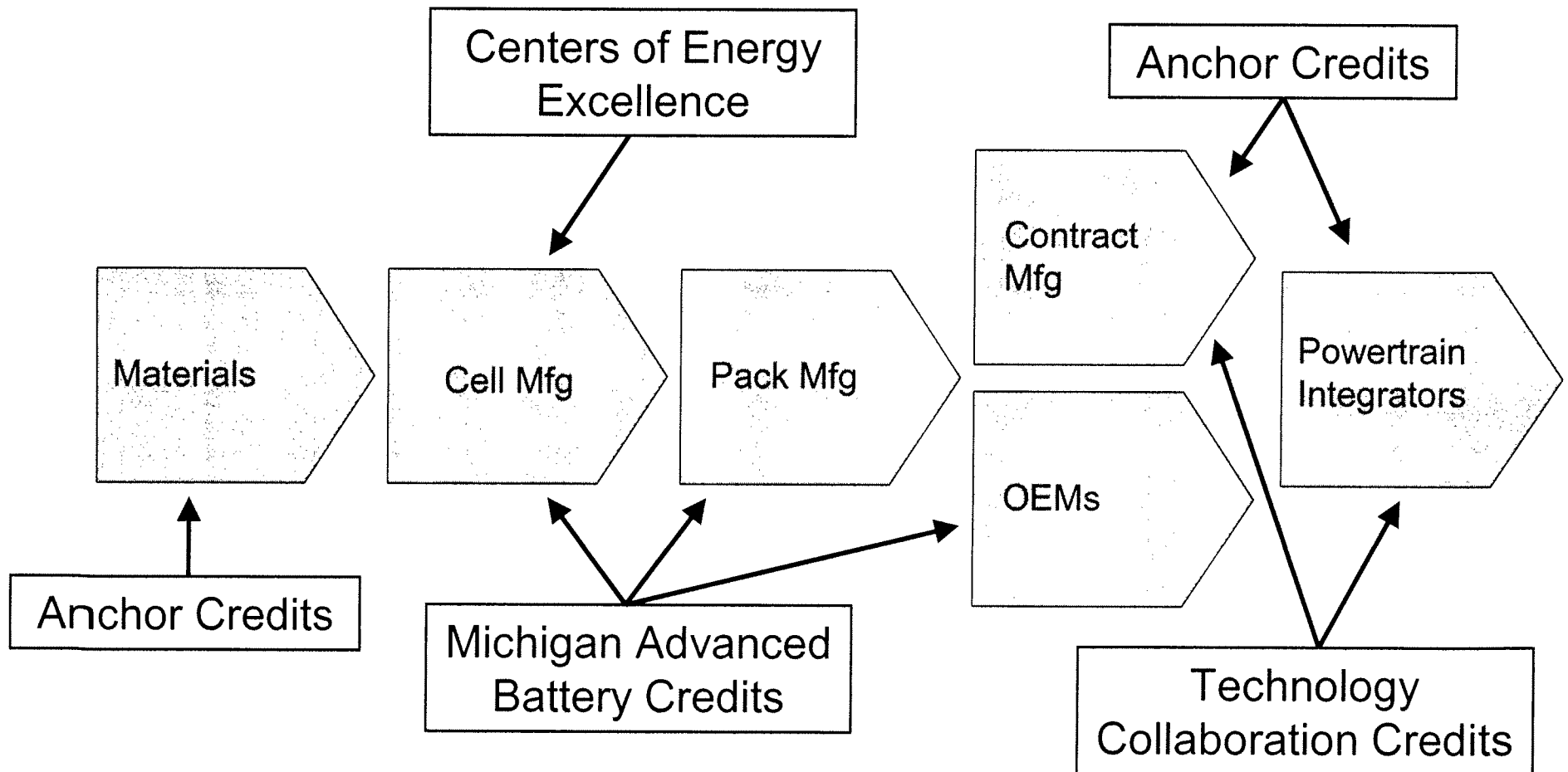
Why Energy Storage in MI

- Projected \$20 Billion marketplace in North America by 2020
- Projected applications in transportation, grid stability, renewable storage and defense
- Diversification within auto industry sector – chance for OEMs to ‘take the lead’
- Auto R&D in MI – this is the new ‘powertrain’
- Advanced manufacturing workforce

Strategy

- Seed MI marketplace with key battery technology players (Centers of Energy Excellence) – be first to market in projected \$20 Billion North American marketplace by 2020.
- Develop incentives to attract key anchor/magnet companies to spur value chain growth (Battery Cell/Pack/R&D Credits)
- Develop tools to provide incentives for anchor companies to assist in growing the entire value chain in MI (Anchor Credits)
- Develop incentives that the DOE would recognize as cost share in Federal funding opportunities
- Assist OEMs in offsetting the incremental cost of vehicle electrification to minimize consumer impact and ‘dovetail’ IRC 30D credits
- Expose battery companies to market opportunities in grid stability, defense and renewable energy sectors (Alliance Model)

Focus: Value Chain



Centers of Energy Excellence

- 2008 SB 1380 / PA 175 was signed into law July 8, 2008.
- Authorized **\$45 Million** grant program, awards made by the **Michigan Strategic Fund**.
- Objective was to partner private sector, universities, and government to commercialize innovative energy technologies - where Michigan has competitive advantages in such areas as:
 - Workforce
 - Intellectual Property
 - Natural Resources
- Assigned to areas where there are technical or supply chain issues that prevent commercialization.
- Focused on areas which have impact on Michigan's:
 - Energy security
 - Environmental profile
- Potential for significant economic impact.
- Potential to leverage **significant federal dollars**.

Michigan Incentives: Centers of Energy Excellence

- Bold initiative to help develop, grow and sustain alternative energy clusters
- Matches private sector with universities, national labs, and the state to accelerate the commercialization of innovative energy technologies
- \$43 Million awarded to Six Centers of Energy Excellence in 2008:

A123
SYSTEMS

Sakti3

Advanced Batteries:
\$13 Million

**AMERICAN
PROCESS**

 **MASCOMA**

Working Bugs™


Swedish Biogas
INTERNATIONAL

BioEconomy:
\$30 Million

Michigan Advanced Battery Credits: \$800 Million in Refundable Credits

		Status
Pack Manufacturing Credit for manufacture of plug-in traction battery packs	\$135 Million	\$115M GM \$20M Available
Vehicle Engineering Credit to support battery integration, prototyping, launch expenses	\$135 Million	\$45M GM \$45M Ford \$45M Chrysler
Advanced Battery Technologies Engineering Credit to support engineering activities	\$30 Million	\$30M Ford
Cell Manufacturing Credit up to 50% capital investment for cell manufacturing facility	\$500 Million	\$100M JCS \$100M KDABG \$100M A123Systems \$100M LGChem \$100M Xtreme Power

Michigan Energy Storage Strategic Attraction/Growth Strategy

		<i>Strategic Focus</i> ↓		<i>Strategic Focus</i> ↓		<i>Strategic Focus</i> ↓
Value Chain:	Materials	Cell Mfg.	GEN II Cell Mfg. Pilots	Pack Mfg.	Vehicle Mfg. – Contract/Integrators	OEMs
MI Incentives:	Anchor Credits	COEE, Cell Mfg. Credits	COEE, Cell Mfg. Credits	Pack Mfg. Credits	Anchor Credits, Tech. Collaboration Credits	R&D Credits


Michigan Advanced Battery Credits

- 2008 HB 6611 / PA 580 was signed into law January 14, 2009. It was amended by SB 319 / HB 4515, and later by SB 777.
- Total value of credits: **\$800 Million**.
- Provides **refundable credits** on the Michigan Business Tax for battery cell manufacturing, vehicle battery pack assembly, and advanced battery engineering, designed to make Michigan the battery capitol of North America.
- The **Michigan Economic Growth Authority** is responsible for entering into agreements for tax credits available through this program.
- Potential to leverage **significant federal dollars**.

Michigan's Stimulus for Advanced Batteries \$800 Million Program


Cell Manufacturing

Johnson Controls  **SAFT**
\$100 Million

 **LG Chem** | **cpi**
compact power, inc.
\$100 Million

A123
SYSTEMS
\$100 Million

DOW  KOKAM
\$100 Million


\$100 Million

Pack Manufacturing


\$115 Million

Battery & Vehicle Engineering


\$45 Million




\$75 Million

 **CHRYSLER**
\$45 Million

Federal Stimulus for Advanced Batteries \$1.3 Billion Awarded to Michigan! (August 5, 2009)

Cells, Batteries, & Materials Manufacturing

Johnson Controls  **SAFT**
\$299 Million



 **LG Chem**  **cpi**
compact power, inc.
\$151 Million

 **A123**
SYSTEMS
\$249 Million

DOW  **KOKAM**
\$161 Million


\$106 Million

Electric Drive Component Manufacturing

 **GM** 
\$105 Million \$63 Million

Transportation Electrification

 **CHRYSLER**
\$70 Million

Michigan Energy Storage Strategic Attraction/Growth Strategy

Value Chain:	Materials	Cell Mfg.	GEN II Cell Mfg. Pilots	Pack Mfg.	Vehicle Mfg. – Contract/Integrators	OEMs	
MI Incentives:	Anchor Credits	Cell Mfg. Credits	COEE, Cell Mfg. Credits	Pack Mfg. Credits	Anchor Credits, Tech. Collaboration Credits	R&D Credits	
Confirmed Projects		JCS, A123, Dow Kokam, LG Chem	Sakti3	GM Pack Mfg.		Ford, Chrysler Component Mfg, GM	
Confirmed Total Investment		\$2,300,000,000	\$30,000,000	\$210,000,000		\$476,000,000	\$3,016,000,000

Strategic Focus

Strategic Focus

Strategic Focus

Michigan Energy Storage Strategic Attraction/Growth Strategy

Value Chain:	Materials	Cell Mfg.	GEN II Cell Mfg. Pilots	Pack Mfg.	Vehicle Mfg. – Contract/Integrators	OEMs	
MI Incentives:	Anchor Credits	Cell Mfg. Credits	COEE, Cell Mfg. Credits	Pack Mfg. Credits	Anchor Credits, Tech. Collaboration Credits	R&D Credits	
Confirmed Projects		JCS, A123, Dow Kokam, LG Chem	Sakti3	GM Pack Mfg.		Ford, Chrysler Component Mfg, GM	
Confirmed Total Investment		\$2,300,000,000	\$30,000,000	\$210,000,000		\$476,000,000	\$3,016,000,000
Pending DOE Approval		\$650,000,000					\$650,000,000

Strategic Focus

Strategic Focus

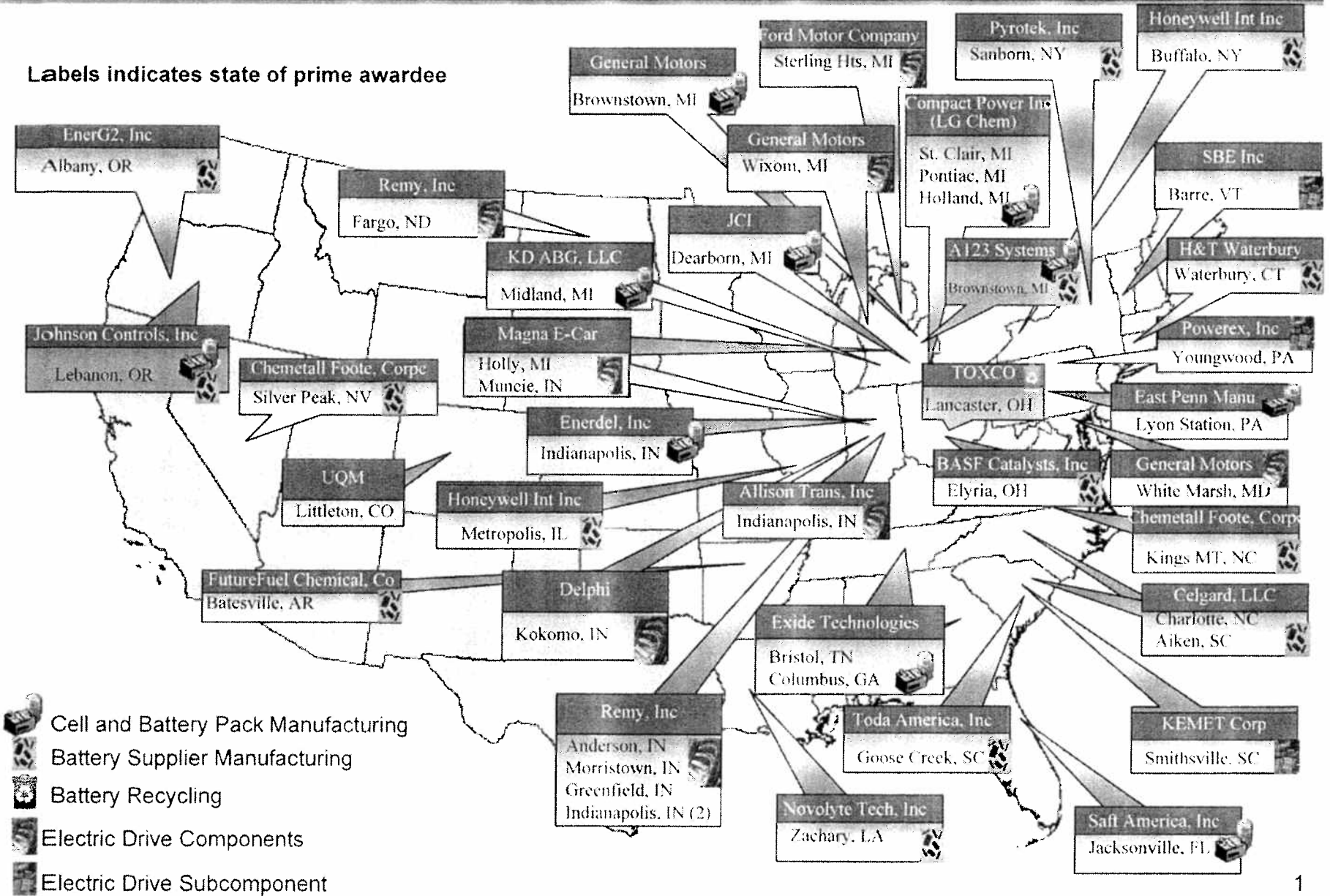
Strategic Focus

Michigan Energy Storage Strategic Attraction/Growth Strategy

Value Chain:	Materials	Cell Mfg. <i>Strategic Focus</i>	GEN II Cell Mfg. Pilots	Pack Mfg. <i>Strategic Focus</i>	Vehicle Mfg. – Contract/Integrators	OEMs <i>Strategic Focus</i>	
MI Incentives:	Anchor Credits	Cell Mfg. Credits	COEE, Cell Mfg. Credits	Pack Mfg. Credits	Anchor Credits, Tech. Collaboration Credits	R&D Credits	
Confirmed Projects		JCS, A123, Dow Kokam, LG Chem	Sakti3	GM Pack Mfg.		Ford, Chrysler Component Mfg, GM	
Confirmed Total Investment		\$2,300,000,000	\$30,000,000	\$210,000,000		\$476,000,000	\$3,016,000,000
Pending DOE Approval		\$650,000,000					\$650,000,000
Current Pipeline Opportunities	\$120,000,000		\$650,000,000	\$450,000,000	\$100,000,000		\$1,320,000,000

Battery and Electric Drive Manufacturing Distribution

Labels indicates state of prime awardee



Michigan Energy Storage Strategic Attraction/Growth Strategy

Value Chain:	Materials	Cell Mfg.	GEN II Cell Mfg. Pilots	Pack Mfg.	Vehicle Mfg. – Contract/Integrators	OEMs	
MI Incentives:	Anchor Credits	Cell Mfg. Credits	COEE, Cell Mfg. Credits	Pack Mfg. Credits	Anchor Credits, Tech. Collaboration Credits	R&D Credits	
Confirmed Projects		JCS, A123, Dow Kokam, LG Chem	Sakti3	GM Pack Mfg.		Ford, Chrysler Component Mfg, GM	
Confirmed Total Investment		\$2,300,000,000	\$30,000,000	\$210,000,000		\$476,000,000	\$3,016,000,000
Pending DOE Approval		\$650,000,000					\$650,000,000
Current Pipeline Opportunities	\$120,000,000		\$650,000,000	\$450,000,000	\$100,000,000		\$1,320,000,000
Affiliated Investments						\$850,000,000	\$850,000,000

Michigan Energy Storage Strategic Attraction/Growth Strategy

Value Chain:	Materials	Cell Mfg. <i>Strategic Focus</i>	GEN II Cell Mfg. Pilots	Pack Mfg. <i>Strategic Focus</i>	Vehicle Mfg. – Contract/Integrators	OEMs <i>Strategic Focus</i>	
MI Incentives:	Anchor Credits	Cell Mfg. Credits	COEE, Cell Mfg. Credits	Pack Mfg. Credits	Anchor Credits, Tech. Collaboration Credits	R&D Credits	
Confirmed Projects		JCS, A123, Dow Kokam, LG Chem	Sakti3	GM Pack Mfg.		Ford, Chrysler Component Mfg, GM	
Confirmed Total Investment		\$2,300,000,000	\$30,000,000	\$210,000,000		\$476,000,000	\$3,016,000,000
Pending DOE Approval		\$650,000,000					\$650,000,000
Current Pipeline Opportunities	\$120,000,000		\$650,000,000	\$450,000,000	\$100,000,000		\$1,320,000,000
Affiliated Investments						\$850,000,000	\$850,000,000
Total =							\$5,836,000,000



State and Fiscal Impact of State Investment in Michigan's Advanced Battery Manufacturing Industry

Steven Miller
Center for economic Analysis
Michigan State University

Summary of Findings

Because the state stimulus piggybacks on federal stimulus expenditures, state investment in Michigan EV battery manufacturing will propel statewide economic impacts.

Conservative estimates of capital investment and the demand for Michigan-produced advanced battery packs are used in this analysis. Between 2010 and 2020, \$3 billion will be invested in capital infrastructure. Furthermore, state production of battery pack assemblies will total 1.5 million units annually by 2020 at the minimum, but will most likely reach annual production of 3 million units.

Execution of this plan will result in a minimum of 20,167 direct jobs by 2020 under the low impact scenario and 39,087 for the most-likely case.

Gross regional product will reach \$9.40 billion annually in 2020 under the lowest-likely scenario, and reach \$18.12 billion under the most-likely scenario.

A rate of return on investment calculation is not possible because state investment is deferred to start in 2012.

Another measure of the fiscal return is the benefit-cost ratio that ranges from 4.90 under the most pessimistic estimate to \$8.07 under the most-likely estimate. This implies that at the very minimum, \$3.90 in tax revenue will be generated for every state dollar invested in this stimulus. However, the actual expected fiscal return is \$7.07 for every dollar.

Total output and employment multipliers are calculated based on these results. Under the low impact scenario, employment and output multipliers are 2.28 and 2.14 respectively. Under the most likely scenario, they are 2.24 and 2.08 respectively.



State and Fiscal Impact of State Investment in Michigan's Advanced Battery Manufacturing Industry

Steven Miller
Center for economic Analysis
Michigan State University

Summary of Findings

Because the state stimulus piggybacks on federal stimulus expenditures, state investment in Michigan EV battery manufacturing will propel statewide economic impacts.

Conservative estimates of capital investment and the demand for Michigan-produced advanced battery packs are used in this analysis. **Between 2010 and 2020, \$3 billion will be invested in capital infrastructure.** Furthermore, state production of battery pack assemblies will total 1.5 million units annually by 2020 at the minimum, but will most likely reach annual production of 3 million units.

Execution of this plan will result in a minimum of 20,167 direct jobs by 2020 under the low impact scenario and 39,087 for the most-likely case.

Gross regional product will reach \$9.40 billion annually in 2020 under the lowest-likely scenario, and reach \$18.12 billion under the most-likely scenario.

A rate of return on investment calculation is not possible because state investment is deferred to start in 2012.

Another measure of the fiscal return is the benefit-cost ratio that ranges from 4.90 under the most pessimistic estimate to \$8.07 under the most-likely estimate. **This implies that at the very minimum, \$3.90 in tax revenue will be generated for every state dollar invested in this stimulus. However, the actual expected fiscal return is \$7.07 for every dollar.**

Total output and employment multipliers are calculated based on these results. Under the low impact scenario, employment and output multipliers are 2.28 and 2.14 respectively. Under the most likely scenario, they are 2.24 and 2.08 respectively.

Next Steps

- Recommend additional Pack Manufacturing Credits:
 - Level the playing field for MI cell/pack manufacturers
 - Solicit significant additional investment (2nd plants, significant joint ventures, etc.)
 - Create ‘high’ barriers to entry to additional competitors entering North American market.
- Leverage Alliance (TARDEC, DOE, Oak Ridge National Lab) to expose MI Battery companies to new markets.

Thank You

Michigan Economic Development Corporation
Doug Parks | SVP, Business Development & Attraction
parksd1@michigan.org

Jim McBryde | VP, Governmental Affairs
mcbbrdej@michigan.org