Go Further

Ford's Energy Strategy

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Ford Energy Strategy – Sustainability

Go Further

Our vision for the 21st century is to provide SUSTAINABLE transportation that is affordable in every sense of the word:

Environmentally,
Socially & Economically

"Improved sustainable performance is not just a requirement, but a tremendous business opportunity."

- Bill Ford

Ford Energy Strategy
Strong Michigan Presence

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- Michigan is the hub of Ford's global manufacturing operations
  - Virtually every Ford vehicle on the road today has a connection to Michigan
- Ford employs more than 45,000 people in Michigan
- 13 major manufacturing facilities in Michigan
- Home to Ford's product development center, research & engineering, safety & emissions labs, and 2 test tracks
- In 2014, purchased over $15 billion worth of goods and services from Michigan-based suppliers

Ford Energy Strategy – Supplier Locations

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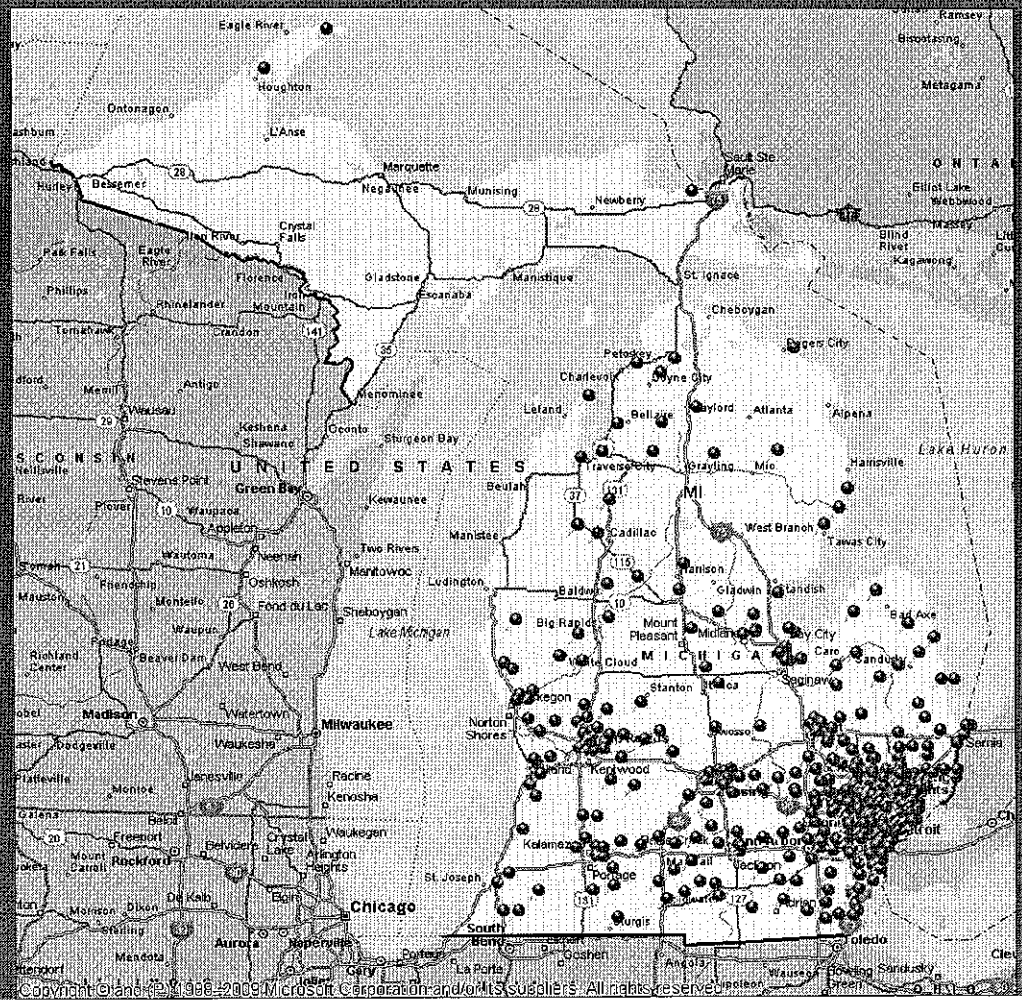
Ford Supplier Locations in Michigan



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Ford Energy Strategy – Sustainability - Focus on Energy Waste Reduction

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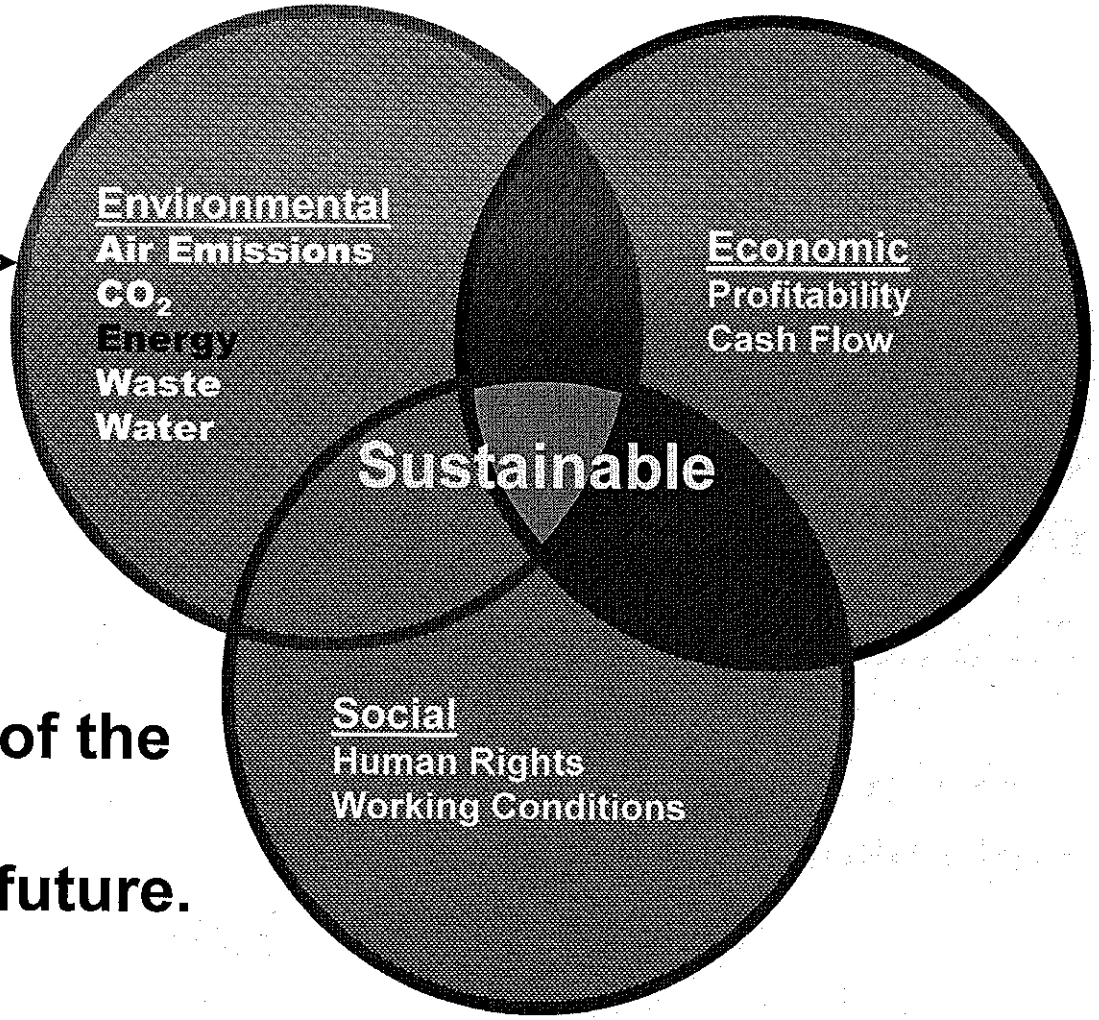
Product
Process
- MANUFACTURING
- DEALERS



Meeting the needs of the present without compromising the future.

Ford Energy Strategy
Strategic Processes

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- Ford Globally is on track to meet the objective to reduce energy consumption per vehicle produced by 25% from 2011 to 2015
- Every facility is required to have a Plant Energy Team and develop/maintain an Energy Roadmap to help achieve the objective
- Ford has developed a comprehensive Energy Management Operating System (EMOS) to help drive this objective through continuous improvements in processes, designs and culture

Ford Energy Strategy – EMOS – Energy Management Operating System

A Standardized, Proactive and Disciplined Operating System that drives reductions in energy consumption per unit produced through continuous improvements in processes, designs and culture.

1. *Facility Modernization*
2. *Embed Energy Efficiency in Facility and Process Specifications*
3. *Engineering, Feasibility Studies & Evaluations*

FACILITY CHANGES 2

1. *Collection & Storage*
   - *Record & Interval Data*
2. *Standard Reporting*
   - *Monthly - Normalized Energy Efficiency Report*
   - *Weekly - Shutdown Report*
   - *Daily - Energy Report*
3. *Analytics and Benchmarking*

DATA MANAGE-MENT 3

1. *Reliability / Quality*
2. *Bidding/Contracting Process*
3. *Risk Management*
4. *Tariff Intervention*

ENERGY SUPPLY AND QUALITY 4

1. *Energy Health Assessment Process*
2. *Shutdown & Startup Processes*
   - *Non-Production*
   - *Demand Response*
   - *Emergency*
3. *Energy Roadmap / POR Process*

PLANT ENERGY TEAM 1

GOAL

Functions support Energy Team Actions

Energy Team responsibility is to drive plant performance to Best in World

Ford Energy Strategy – Renewable Energy Footprint

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Ford's Global electric supply is 19% renewable using direct and indirect sources

Global Solar PV Installations

- 4 MW total installed capacity in Europe and North America
  - Michigan's largest Solar PV facility is at Ford's WHQ

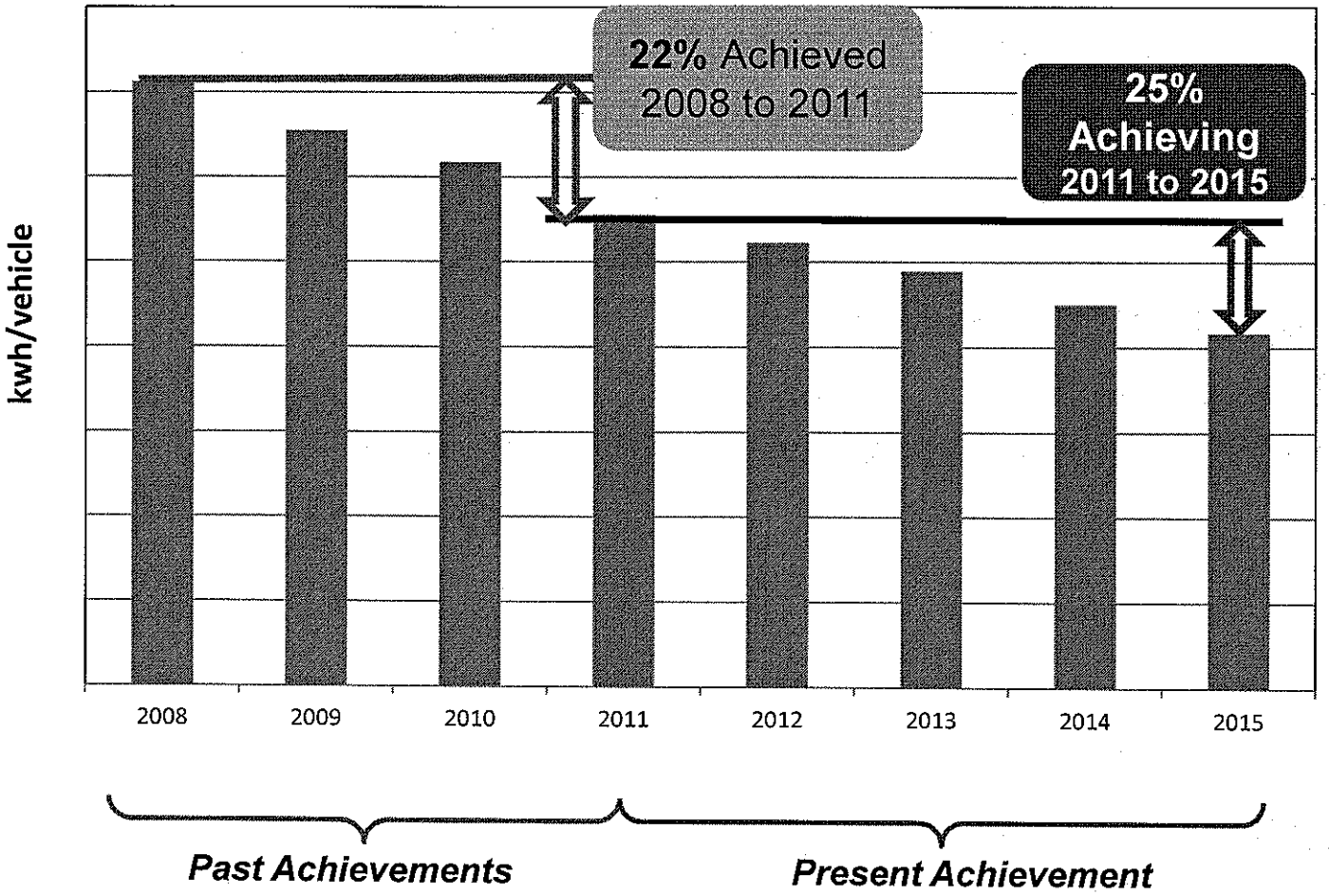
Global Wind Installations

- 10 MW total installed capacity in Europe

Global Geothermal Installations

- 1 MW total installed capacity in North America

Ford Energy Strategy – Performance – Energy Waste Elimination



Ford Energy Strategy – Reliable and Affordable electricity

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- Reliability
  - High tech manufacturing needs good Power Quality (PQ)
  - 30% Voltage sag has same affect as an outage
  - Recovery can take several hours
    - Damaged machining tools and welders
    - Ruined painted vehicles
    - Scrapped parts
    - Lost Revenue associated with ~ 50-60 vehicles/hour

Ford Energy Strategy – Reliable and Affordable electricity

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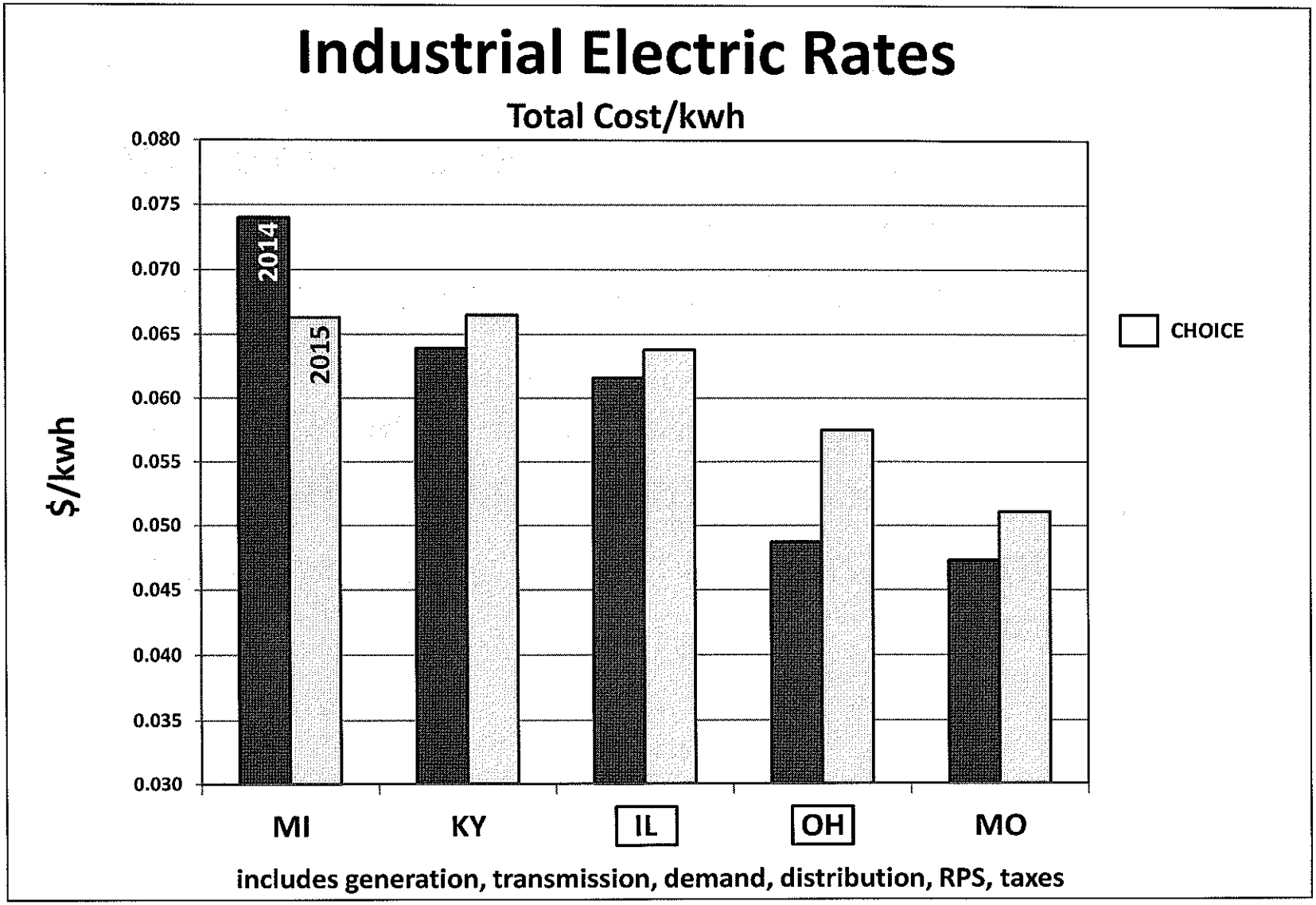
- Affordability
  - High energy costs factor into decisions to source business into Michigan
  - Ford spends over $120 million per year on MI electricity
  - High energy cost impacts entire MI supply base
  - Need stable pricing for business decisions
  - Regulated vs Choice is not the goal, lower cost is the goal

Ford Energy Strategy – Electricity Rates

Go Further



Ford Energy Strategy –
Proposed IRP Legislation is good for Michigan

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- Reliability, affordability and sustainability goals require a comprehensive energy policy

- Proposed key drivers to promote flexibility and innovation to achieve stated objectives include:
  - Energy Waste Reduction is a valid IRP resource
    - Reduces Cost – every day – every month
    - Reduces GHG - the most cost effective GHG action
    - Reduces Pollution, Grid Stress & Generation Needs
  - Comprehensive review of clean energy and renewable alternatives
  - Demand Response options to encourage full utilization of generation resources
  - New or Alternative Generation sourcing to fill the gaps

Ford Energy Strategy –
Recognize Infrastructure improvements as valid IRP resources

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- Promote Utility / Customer partnerships to develop cost effective actions to meet business, legislative and regulatory objectives
  - Example projects include
    - Combined Heat & Power
    - District or Campus Geothermal
    - Heat Recovery
- Expand Energy Waste Reduction actions to recognize specific strategic technology improvements as a generation resource to mitigate ongoing load growth
  - Examples include
    - LED lighting technologies
    - Central Steam elimination
    - Hi Efficiency Motors and Pumps
    - Demand management / response
    - Load shifting

Ford Energy Strategy – Summary

Go Further

- Reliability & Sustainability:
  - Power Quality and reliability are THE requirement
  - Sustainability Must Do's: Environmental, Social & Economics
- Energy Cost Impacts:
  - Direct Impact to Corporate Bottom Line
  - Multi-cost Effect to Suppliers – passed on to Ford
  - High Energy Costs Drive Business Away From MI

- SB 437 is a good start - Ford is committed to working with the Governor and legislature to develop a sustainable long term energy strategy