Sustainable Manufacturing Practices and Business Strategies

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Sustainable Business Strategies
Ford Motor Company

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Overview

- Sustainability at Ford Motor Company
  - Definition, Scope & Governance
  - Drivers, Enablers, and Reporting
- Climate Change Implications
- Sustainable Manufacturing
  - Metrics and Measurement Systems
  - Initiatives, Innovations, Barriers
  - Supply Chain Framework (human rights)
Ford Sustainability: Definition

A business model that creates value consistent with the long term preservation and enhancement of environmental, social, and financial capital.

- Meeting the needs of the present without compromising the future

“The companies that make the high-quality products and services that consumers really value – and do so in ways that limit harm to the environment and maximize benefits to society – will be preferred in the market place”
Ford Sustainability: Scope

Financial
- Cost Effective
- Profitability

Social
- Mobility in Emerging Markets
- Energy Security
- Human Rights

Environmental
- Product CO₂/Fuel Economy
- Sustainable Materials
- Manufacturing
Corporate Governance

GOVERNANCE AND MANAGEMENT STRUCTURES

BOARD-LEVEL GOVERNANCE

BOARD OF DIRECTORS

William Clay Ford, Jr.
Executive Chairman

John R.H. Bond
Stephen G. Butler
Kimberly A. Casiano
Edest B. Ford II
Irvine C. Hockaday, Jr.
Richard A. Mannogian
Ellen R. Maram

* Corporate Governance Director

Alan Mulally
President and CEO

Homer A. Neal
Jorma Ollila
Gerald L. Sh惟
John L. Thornton

* Chairman of the Board

BOARD COMMITTEES

Audit
Compensation
Nominating and Governance

Environmental and Public Policy
Finance

SUSTAINABILITY MANAGEMENT

Group VP Sustainability, Environmental and Safety Engineering

Global Manufacturing
Global Product Development
Global Marketing

Sustainable Mobility Governance

KEY BUSINESS PROCESSES

Business Plan Review
Special Attention Review
ISO 14001 Certification

Global Product Development System
Ford Production System
Order-to-Delivery

POLICY DOCUMENTS

Corporate Governance Principles
Committee Charters
Code of Ethics for Board of Directors

Code of Conduct Handbook
Code of Ethics for Senior Financial Personnel
Policy letters and directives
Sustainability at Ford: Drivers, Enablers & Reporting

• Key business driver
  – Integrated throughout organization
  – Delivered Through Quality Products

• Leverage alliances with universities, NGOs, and government organizations

• Constructive partner in policy development
  – US Comprehensive Climate Change Policy – USCAP
    • Upstream, economy-wide Cap & Trade System
    • Low Carbon Fuels Standard
    • Vehicle Fuel Economy Standard

• Annual Sustainability Report
  – Measure & Track Status and progress
  – Global Reporting Initiative (GRI) G3 Sustainability Reporting Guidelines, at an application level of A
Sustainability: Business Climate Change Implications

- Emerging Markets & Shifting Segmentation
- Increasingly Complex and Stringent Regulations & Regional/State/Local Programs
- Emerging Policy Frameworks
- Emissions Trading Schemes and Registries
- Manufacturing
  - Approach
  - Measurement and Metrics
  - Initiatives and Innovations
  - Supply Base
Sustainability: Manufacturing

Financial
- Cost Effective
- Profitability

Social
- Mobility in Emerging Markets
- Energy Security
- Human Rights

Environmental
- Product CO₂ / Fuel Economy
- Sustainable Materials
- Manufacturing
Manufacturing Environmental Initiatives

- Consistent strategy, holistic approach, life-cycle focus
- Innovative data management to identify footprint and track progress
- Facility Energy Use / CO2 initiatives and innovations
- Renewable Energy Use
- Paint Processes / VOC and CO2 reductions
- Waste elimination and Water conservation
- Ford Rouge Center Innovations

Pilots and Replication of Innovative Solutions

Barriers to Implementation
Life-Cycle Analyses

- Life Cycle Analyses
  - Solvent-borne Paint Strategy
  - Sustainable Electrical & Electronic Systems Project

- If not considered -- Potential for Regulatory Distortion
  - Require actions rather than results

- Materials
  - Bio-materials and recycled content
Sustainable Materials

Soy Foam Seating
• Standard on Escape, Escape Hybrid, Mustang, F-150, Navigator, Expedition

Sustainable Fabric
• Produced from 100% post Industrial recycled materials
• Material includes plastic intended for pop bottles and un-dyed polyester fibers
Facility GHG Regulations and initiatives Worldwide

Canada
- Chicago Climate Exchange (CCX)
- Mandatory emissions intensity targets with emissions trading to cover shortfalls
- Mandatory GHG emissions reporting

United States
- Chicago Climate Exchange (CCX)
- Dept. of Energy 1605(b) Reporting - revised 1605(b) rules to include all facilities
- Alliance of Automobile Manufacturers Climate VISION commitment
- State emissions registries

United Kingdom
- U.K. Emissions Trading Scheme
- Climate Change Levy Agreement
- EU Emissions Trading Scheme

Sweden
- EU Trading Scheme

Germany
- EU Trading Scheme

Belgium
- EU Trading Scheme

Spain
- EU Trading Scheme

France
- Ford facilities currently excluded from EU Emissions Trading Scheme

Japan
- Mandatory GHG emissions reporting

Mexico
- Chicago Climate Exchange (CCX)
- Mexican GHG Reporting

Australia
- Australian Greenhouse Gas Challenge
- Australia Proposed States CO2 trading
Identify and Improve Manufacturing Footprint

• Ford global emissions database standardizes reporting and management of manufacturing emissions and resource use.
  – GHG emissions,
  – Other emissions (e.g. VOCs)
  – Water use,
  – Waste reduction,
  – Waste to landfill
  – Environmental regulations

• Clearly defined, transparent, consistent metrics
Identify and Improve Manufacturing Footprint

- Initially focused on carbon emissions
- Extended to include comprehensive environmental metrics, replacing multiple existing databases
- A regulatory module was later added to store local, national and international environmental regulations
- Enables plants to track their performance on key environmental metrics
- Data is rolled up for regular reporting to senior management
- Clearly defined, transparent, consistent metrics
Energy Use / CO2 Reduction

- Example Projects & Programs (Pilot & Replicate)
  - Lighting Upgrades/Controls
  - Air Compressor Controls
  - Stamping Business Units
  - Energy Star (educate and share knowledge)
Paint Strategy

• Reduced energy, CO2, and VOCs:
• VOC paint process emissions down 25% in NA
  • Reduced Booth Air Humidity
  • Booth Air Handling
  • Three Wet Paint
  • Fumes to Fuel
Renewable Energy Use

3% of Global Energy Use is Renewable:

– Ford Rouge:
  • Photovoltaics
  • Solar Thermal Collector

– Lima Engine Plant: Geothermal System

– UK Dagenham Diesel Centre: Wind turbines

– Cologne Plant: Renewables covering full electric power demand
Ford Rouge Center: Original Sustainability Model

- Demonstrate leadership in environmental sustainability.

- Transform the Rouge into a sustainable manufacturing center.

- Pilot sustainability projects at the Ford Rouge Center. Replicate successes at other Ford facilities.

- Bill Ford’s vision is a “back to the future” approach using many of Henry Ford’s original design principles.
Sustainable Elements

- Living Roof
- Vertical Landscaping
- Fumes to Fuel
- Daylight System
- “BigFoot” HVAC
- Lighting Control
- Solar Thermal Storage
Living Roof

• Living roof – 10.4 acres
• Comprised of sedum, a drought-resistant perennial groundcover planted in a specially layered bed
• Part of storm water management system.
• Double life of traditional roof system.
• Insulating factor. Reduces cooling demand up to 5%.
- Landscaping designed to reduce heat islands
- 30 percent reduction in water use
- ENERGY STAR roofing
- Elimination of HCFC Refrigerant R-22
- Low emitting materials used for paint, carpet and wood
- LEED certified at NO extra cost
Rouge Visitor Center
LEED 2.1 Gold Certified • Dearborn, Michigan

- Vertical Landscaping
- Grey Water System
  - 12,500 gallon cistern
- Solar Thermal Array
- Photovoltaic Array
- Fumes to Fuel Education
Barriers to Innovative Programs

- Regulatory Proliferation
- Regulatory Disincentives
- Lack of incentives
- Cost premiums
- Product selection limitations
- Operational complexity
- Prove-out & Durability of new technologies
- Retrofit Cost

- Construction and retooling schedules
- Geographic Location
- Site Location
- Difficulty in quantified true cost or savings
- Incremental construction costs
- Construction timing/production disruption
- Increased maintenance
Supply Chain Framework: Human Rights

- Supply Chain: Thousands of Global Suppliers
- Human Rights at Ford:
  - Code of Basic Working Conditions (CBWC)
  - UN Global Compact
- Supply Base Initiatives:
  - Assessments
  - Global Terms and Condition Contract
  - Capability Building
  - Automotive Industry Action Group
Manufacturing: Environmental Innovation