Efficiency, Emissions and Energy Choices for Ohio

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Honda North America Services, LLC
Honda in North America

North American Locations

American Honda Motor Co., Inc. (1959)
- Sales & Distribution
  - Torrance, California; Duluth, Georgia

Honda Canada, Inc. (1969)
- Sales & Distribution
  - Scarborough, Ontario

Honda Trading America Corporation (1972)
- Torrance, California; Marysville, Ohio;
- Lincoln, Alabama & Timmonsville, S.C.

Honda R&D Americas, Inc. (1975)
- California, Florida; North Carolina, Ohio

Honda of America Mfg., Inc. (1979)
- Automobile and Engine Production
  - Anna, East Liberty, & Marysville, Ohio

Honda Power Equipment Mfg., Inc. (1984)
- Power Equipment and Engine Production
  - Swepsonville, North Carolina

Honda de Mexico, S.A. de C.V. (1985)
- Automobile, Motorcycle & Parts Production
  - El Salto, Estado de Jalisco, Mexico

Honda of Canada Mfg. (1986)
- Automobile and Engine Production
  - Alliston, Ontario

Honda North America, Inc. (1987)
- California, Georgia, Michigan, New York, Ohio, Washington, D.C.

Honda Engineering North America, Inc. (1988)
- Alabama, Indiana, Ohio, Ontario

Honda Transmission Mfg., Inc. (1997)
- Automatic Transmissions, 4-Wheel Drive Systems
  - Russellville, Ohio

Honda of South Carolina Mfg., Inc. (1998)
- ATV and Engine Production
  - Timmonsville, South Carolina

Honda Manufacturing of Alabama, LLC (2001)
- Minivan, SUV, Light-Truck and Engine Production
  - Lincoln, Alabama

Honda Aero, Inc. (2004)
- Aviation Engine Business
  - Burlington, N.C.

Honda Aircraft Company, LLC (2006)
- Development, Sales and Production of the HondaJet
  - Greensboro, North Carolina

Honda Precision Parts of Georgia, LLC (2006)
- Automatic Transmissions
  - Tallapoosa, Georgia

Honda Manufacturing of Indiana, LLC (2008)
- Automobile Production
  - Greensburg, Indiana

Honda North America Services, LLC (2013)
- California, Ohio
Honda in North America

Products and Production

Honda Mfg. of Indiana
- Civic Sedan
- Acura ILX

Honda Power Equipment
- Lawnmowers
- Engines

Honda of South Carolina
- Rincon
- Foreman
- Rancher

Honda of Canada Mfg.
- CR-V
- Civic Coupe
- Civic Sedan
- L-4 Engines

Honda of America Mfg.
- CR-V
- Acura RDX
- Accord Coupe
- 4cyl. & V6 Engines
- Acura TL
- Crosstour
- Accord Sedan

Honda de Mexico
- CR-V
- Big Red
- Beat 100
- 4cyl. Engines

Honda Mfg. of Alabama
- Pilot
- Odyssey
- Ridgeline
- V6 Engines
- Acura MDX

Honda Aero/Aircraft Co.
- Jet Engines
- HondaJet
Driving toward zero waste

IDEAL IMAGE: **Zero waste** - “Eliminate material loss in manufacturing operations to reduce total cost”

**Zero Waste Strategy**

“6R” Approach
- Redesign
- Reduce
- Remanufacture
- Recycle
- Reuse
- Recover

**Zero Waste Themes**

- Total waste assessment/tracking
- Total cost analysis for >75% of manufacturing waste generated
- Packaging waste SA
- Associate awareness

- Reduction of process material consumption
- New “valuable” waste opportunities identified
- Packaging waste reduction initiatives
  - Design for recycling
  - Packaging reduction
  - Light-weighting

2010 Goal/Target: Mindset change: Recycling to Redesign
2020: 25% improvement in material use efficiency
New generation of powertrains

2.4L DI i-VTEC

CVT

3.5L i-VTEC
Two-Motor Hybrid System

49 MPG (preliminary)
Driving toward zero waste
Creating an Effective Greenhouse Gas Management Program

Energy management

Keys to an effective energy management program

- Understand how you are using energy - Audit
- Eliminate wasted energy - Inefficiencies
**Theme: Reduce wasted energy of welding robot fans**

**Old system**

Fan Direct Power 24/7

933 fans operating 24/7
Energy use = 41,000 kwh $21,600/year

**New system**

Fans operate only as needed – 55% reduction
Energy savings = 22,500 kwh $11,800/year
+ reduced maintenance/fan replacement $24,000/yr
Payback = 1.7 months

**Electricity Use**

Before C/M

<table>
<thead>
<tr>
<th>Electricity Use Kw</th>
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<tbody>
<tr>
<td>Production Day (time)</td>
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After C/M

<table>
<thead>
<tr>
<th>Electricity Use Kw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Day (time)</td>
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</table>
Energy management

Go to the production floor late on Saturday night – what do you sense?

See

• Lights on?
• Computer screens on?
• Equipment running?

Hear

• Hissing?
• Fans running?
• Conveyors?

Attack non-production energy use

Step 1:
Achieve lowest level for all holidays when no work is occurring

Step 2:
Reduce energy use during “off-shift”

Step 3:
Reduce “fixed” energy use

ASK

① What operations are running on holiday and non-production time?
② Why is the operation running?
③ What is needed to change to allow operation to shutdown?
Three challenges to:

*Achieving energy efficiency*

1. Maintain the highest operating efficiency
   - Set baseline
   - Demonstrate to associates they are making a difference
Energy management

Auto-Max railcars

• Hold up to 22 vehicles
• Can hold both trucks and cars
• Less fuel usage per vehicle shipped and no compromise to quality.
Energy management

Three challenges to:

*Achieving energy efficiency*

1. Maintain the highest operating efficiency
   - Set baseline
   - Demonstrate to associates they are making a difference

2. Examined process
Paint by Numbers
Energy management

Three challenges to:

*Achieving energy efficiency*

1. Maintain the highest operating efficiency
   - Set baseline
   - Demonstrate to associates they are making a difference
2. Examined process
3. Ensure energy characteristics are key evaluation points
Decision guidelines

Green Factory Cost Decision Guideline Proposal

Considerations
- Initial construction is lowest cost time for Green Factory improvement
- Building energy is “fixed” and should be optimized.
- It is often difficult or impossible and costs more to retrofit efficiency into buildings and major equipment
- Higher efficiency usually has premium initial cost, but lower operating costs immediately

Image of Approach

Proposed Green Factory Cost Guideline

- Install
  - Plant Investment
  - Prioritization
  - Short-term P/I
  - Energy Efficiency/CO₂ reduction becomes only cost decision. No recognition of Honda Motor direction.

- Building/Equipment Life (years)
  - 50% of equipment life
  - Balances business benefit with HM direction for long-term CO₂ reduction.
  + CPU positive impact from start-up

- End of Life
  - “Life Cycle” Costing
  - P/I by end of life
  - Energy Efficiency/CO₂ reduction becomes only GF decision. No cost down.
Creating an Effective Greenhouse Gas Management Program