Fresh Eyes: Peer-Based Energy Efficiency

Tuesday, May 16
3:45-5:00 pm
Panelists

- Brett Rasmussen, Nissan, and Kevin Bell, Toyota
- Uli Schildt, Darigold
- Karen Flack, U.S. Naval Academy
- Eli Levine, U.S. Department of Energy (Moderator)
U.S. FOOTPRINT

More than 22,000 employees in the U.S.

Nissan North America Headquarters (Franklin, Tenn.)
Vehicle Assembly Plant (Canton, Miss.)
Vehicle Assembly Plant (Smyrna, Tenn.)
Nissan Technical Center (Farmington Hills, Mich.)
Powertrain Plant (Decherd, Tenn.)
Nissan Design America (San Diego, Calif.)
Nissan Motor Acceptance Corporation (Dallas, Texas)
Arizona Technical Center (Chandler, Ariz.)
Advanced Research Center (Silicon Valley, Calif.)
U.S. MANUFACTURING & INVESTMENT

Nissan Smyrna Vehicle Assembly Plant and Battery Plant
Employees: 8,400  Production: 642,000
Our vehicle production plant in Smyrna, Tenn. is the largest not only in the U.S. but in the Americas.

Nissan has 4 U.S. manufacturing facilities capable of producing 1.14 million vehicles, 1.5 million engines, 1.4 million forgings and 475,000 castings annually.

- Nissan Canton Vehicle Assembly Plant
  Employees: 6,400
  Production: 450,000
  Canton, Miss.

- Nissan and Infiniti Decherd Powertrain Plant
  Employees: 1,900
  Production: 1.5 million engines
  Decherd, Tenn.

More than 22,000 U.S. employees including 16,000 manufacturing jobs

15 million vehicles proudly manufactured in the U.S. since 1983

10 million engines proudly manufactured in the U.S. since 1997

$14 billion spent with 300 suppliers in 30 states in U.S. in 2016

$11 billion investment in manufacturing in the U.S. since 1981
U.S. MANUFACTURING

NISSAN GROUP OF NORTH AMERICA

MISSISSIPPI
CANTON VEHICLE ASSEMBLY PLANT

TENNESSEE
SMYRNA VEHICLE ASSEMBLY PLANT

Franklin, TN
Americas HQs

Smyrna, TN
Vehicles

Decherd, TN
Engines

Canton, MS
Vehicles
DOE Recognizes Canton for ISO 50001

Canton Vehicle Plant
Nissan North America Inc.

Recognized by the U.S. Department of Energy for implementing ISO 50001 and Superior Energy Performance program standards, and improving energy performance by 20.9% over 3 years.
Nissan Hosts Energy Assessment Workshop at Canton Plant
Joint Supplier Nissan Toyota Energy Treasure Hunt

TOYOTA

NISSAN

Bench Marking
Nissan Toyota Team Treasure Hunt at Decherd
An Energy Treasure Hunt Exchange is a 3-day event focused on identifying savings opportunities with a focus on **No Cost / Low Cost** implementation.

Each opportunity is quantified with a standard calculation using the plant’s energy cost.

3 teams were formed focusing on specific energy resources.
Teams

Facilities

Nathan Payne – Team Leader
Ron Jones – TEMA
Kenley Allen – Nissan
Bruce Eakin – Nissan
Terry Neal – Nissan
Carlos Colon – Nissan
Merle Kilgore – Nissan
Dan Cooper - TEMA

Production

Richard Russel– Team Leader
Kevin Bell – TEMA
Eddy Kiggen – TMMAL
Claude Hale – Nissan
Mike Livingston - Nissan

Chillers

Randy Cook– Team Leader
Brett Rasmussen - Nissan
Daryl Cox – ORNL
Nick Barhorst – TEMA
John Bedford - Nissan
# Facilities – All opportunities

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPS Blow Off Valves</td>
<td>$ 7,063</td>
</tr>
<tr>
<td>Shutdown timer during non production</td>
<td>$ 8,965</td>
</tr>
<tr>
<td>Reduce Compressed Air Pressure</td>
<td>$ 75,842</td>
</tr>
<tr>
<td>Reduce Weekend Compressed Air Pressure</td>
<td>$ 16,686</td>
</tr>
<tr>
<td>Chemical Storage Building Overhead Lights</td>
<td>$ 1,481</td>
</tr>
<tr>
<td>CAPS Cooling Tower VFD</td>
<td>$ 9,244</td>
</tr>
<tr>
<td>Wastewater and Chilller Room Overhead Lights</td>
<td>$ 4,258</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$123,500</strong></td>
</tr>
</tbody>
</table>
### Production All Opportunities

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair Air Leak</td>
<td>$7,932</td>
</tr>
<tr>
<td>Lighting</td>
<td>$1,502</td>
</tr>
<tr>
<td>Column F32 Flourescent light change to LED</td>
<td>$881</td>
</tr>
<tr>
<td>Turn Off Block Curing Heaters On Down Time</td>
<td>$3,456</td>
</tr>
<tr>
<td>E Motor Break Area</td>
<td>$386</td>
</tr>
<tr>
<td>E Motor Hi-Bay Lighting</td>
<td>$4,123</td>
</tr>
<tr>
<td>Eliminate 13 T8 Fixtures On the South Wall Of Machining Plant</td>
<td>$1300</td>
</tr>
<tr>
<td>FANS</td>
<td>$65</td>
</tr>
<tr>
<td>FANS</td>
<td>$2,324</td>
</tr>
<tr>
<td>Harvesting Daylight for A Aisle</td>
<td>$2,191</td>
</tr>
<tr>
<td>Plant Hi Bay Lighting Sodium</td>
<td>$3,821</td>
</tr>
<tr>
<td>Lighting</td>
<td>$237</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$28,300</strong></td>
</tr>
</tbody>
</table>
# All Opportunities Chillers

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser Cooling Pumps 200 HP VFD</td>
<td>$81,865</td>
</tr>
<tr>
<td>Air Compressor Cooling Tower</td>
<td>$27,288</td>
</tr>
<tr>
<td>Chiller Insulation</td>
<td>$6,046</td>
</tr>
<tr>
<td>Engine Test</td>
<td>$8,186</td>
</tr>
<tr>
<td>Induction heater Cold Water Pumps</td>
<td>$8,186</td>
</tr>
<tr>
<td>Shut down pump for Air Compressor</td>
<td>$4,466</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$136,000</strong></td>
</tr>
</tbody>
</table>
Treasure Hunt Savings Identified

Utility Expenditures

3% Spending Reduction

Current, $10,600,000

Kaizen savings, $283,706
Questions / Comments

Thank You!
Fresh Eyes
Developing an Integrated Energy Management Program

Some of our Partners
DOE INPLT Training

- Sunnyside, WA
- November 15 – 17, 2016
- 18 plant participants (mostly from production floor)
- Representatives from other Darigold Locations (Spokane, Portland & Caldwell)
- Invited guests
  JR Simplot Co., Shields Bag & Printing
- System experts
  - Wayne Perry – Kaeser (Compressed Air)
  - Richard deFay – Copper Alliance (Electric Motors)
  - Nick Westerberg – Westerberg & Assoc. (Steam)
- Training was provided by each System Expert
Four Teams

- Compressed Air
- Electric Motors
- Steam
- Water

Teams were established ahead of time and leaders designated.

A plant-walk with all participants started the event.

The group then split into their teams and proceeded with the Treasure Hunt.
Compressed Air Team Discusses Findings
Steam-System Training Session
Result:

• Each team identified numerous opportunities
• Several low cost / no cost items have already been implemented
• Created heightened awareness among plant employees
• Several participants joined the Plant Energy Team
• System Experts, employees from other Darigold locations and the invited guests provided Fresh Eyes and an unbiased view
“I truly believe this Energy Treasure Hunt was enlightening. Not only for the plant but for everyone that attended.

I witnessed people change their ways of thinking and actually become excited to reduce energy usage. Employees also became very proud of their job and Darigold. Becoming aware of your surroundings and keeping an eye out for ways to save energy.

This program cultivates an energy-saving mindset and opens the door for discussions throughout the plant. .....”
Portland Dari-Gold-Dig
January 31, 2017

- One-Day event
- Energy Trust of Oregon
- 3 Teams
- Identified numerous opportunities in short time
- Sorted opportunities
- Created hit-list

“There is wasted energy in them thar plant”
Verifying Temperature Control Set-Points
Team Decides on Energy Savings Opportunity Finding Priorities
Sorting energy saving opportunities
Top 5 Energy Quick-Hits/GBs

1. Standardize Refrigeration Operating Procedures/Setpoints
   - Est. monthly $P/H
   - Owner: Dan
   - Next step: Establish setpoints/procedures

2. Calibrate Refrigeration System Sensors
   - Owner: Alex
   - Next step: Buy calibration gauge

3. LP Light Shutdown
   - Owner: Peter
   - Next step: Research remote wireless switch

4. Fix leaks (water, air, steam)
   - Owner: Paul
   - Next step: Submit work requests

5. De-lump Maintenance Shop
   - Owner: Ben
   - Next step: Take light measurements
Main Takeaways:

• Both, the 3-day Treasure Hunt and 1-day Dari-Gold-Dig seem to be effective
• Employee engagement was excellent at both events
• Even in plants with effective Energy Teams, the events created additional focus and revealed new opportunities
Energy savings are small, .... message is HUGE!
Saving Energy Is Everybody’s Responsibility

Thank You

uli.schildt@darigold.com  (206) 795-3731
Karen A. Flack
Department of Mechanical Engineering
United States Naval Academy

Fresh Eyes: Peer-Assessed Energy Efficiency
Better Buildings Summit
18 May 2017 Washington, DC
Sister Institutions

• Similarities
  – Mission
  – Funding structure
  – Historic building status

• Differences
  – Environmental climate
  – Age of buildings
  – Uniforms

• Healthy competition
Engage Leadership

Miranda A Ballentine
Assistant Secretary of the Air Force, Installations and Energy

Dennis V. McGinn
Assistant Secretary of the Navy, Installations and Energy

LTGEN Michelle D. Johnson
Superintendent, United States Air Force Academy

VADM W. Ted Carter
Superintendent, United States Naval Academy
Feeding 4000 in 30 minutes...

USAFA Mitcher Hall

USNA King Hall
Can be wasteful

Transportation, refrigeration, preparation and disposal of extra food is very energy intensive

**USAFA**
- Excessive packaging
- Plastics recycled
- Food waste trucked to pig farm

**USNA**
- Salad bar and dessert bar to limit waste
- Limited recycling
- Food waste sent to biodigester
Prototype Biodigestor Funded
Each module has one weeks worth of food waste
3000 lbs of food waste per day
Process takes 3-5 weeks
60Mw-hrs/month (estimated)
$7000 savings per month
High quality compost as bi-product
It’s sunny in Colorado Springs

USAFA Rooftop Solar
Lightweight
Flexible
Inexpensive
Not visible at ground level

Additional ground based array (6 MW)
Progress at USNA

USNA Solar Plans
PV rooftop array at boat repair facility
Solar thermal at laundry facility
More in planning stages
Re-lamping can have big dividends
Progress at USNA

USNA lighting projects
Historic buildings
Indoor athletic facilities
Outdoor athletic facilities
~ 4 year payback
9 additional facilities scheduled
Big Academic Buildings

USAFA Fairchild Hall
Home to all academic classes and laboratories

Issues
Single Pane Windows
Aluminum structure
Tremendous heat load
Too big to tackle as one project
Big Academic Buildings

USNA Rickover Hall
Home to four engineering majors and laboratories

Issues
Outdated HVAC
Mold
Condensation
Uneven use of window shades
Progress at USNA

USNA Rickover Hall
All windows replaced – one quadrant at a time
$60M HVAC renovation scheduled to start June 2018
Fresh Perspective

• Understanding core mission is important
• Behavior change matters
• It is easy to overlook the obvious
• Both sides benefit
• Healthy competition can influence decision makers
• Follow through required to assure systems and changes continue to provide intended results
Thank You

Provide feedback on this session in the new Summit App!

Download the app to your mobile device or go to bbsummit.pathable.com