More than 22,000 employees in the U.S.
Celebrated more than 30 years of U.S. Automotive Manufacturing since 1983
$11 billion manufacturing investment since 1981
U.S. production has increased by more than 88% since 2010
More than 300 suppliers in 30 states provide parts and materials to Nissan
$14 billion in U.S. parts and materials purchases in 2016
15 million vehicles, 10 million engines and 90,000 lithium ion battery packs proudly manufactured in the U.S.
Nissan Green Program

- Penetration of Zero-Emission Vehicles
  - 1.5 mil.

- Wider Application of Fuel Efficient Vehicles
  - 35% FE improvement

- Minimize Corporate Carbon Footprint
  - 20% reduction

- Minimize the use of New Natural Resources
  - 25% recycled resource usage
## Energy Commitments

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<td>DOE Better Plants / Superior Energy Performance®</td>
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Energy Treasure Hunts

- Employees from various departments divided into teams.
- 3-day hunt
  - Where, how and how much energy is used by process?
  - How can energy use be reduced?
  - How can energy be used more efficiently?

Four treasure hunts held in 2017 have identified a potential annual savings of $1 million,” Wade Willatt, Senior Energy Engineer.
Nissan Water Reduction Strategy

- Increased awareness within Treasure Hunts
  - Place increased emphasis in researching water saving opportunities during Treasure Hunts

- Increased water treatment contractor ownership for reduction projects
  - Project reviews monthly with Purchasing
  - Contractor attendance in bi-weekly utility meetings

- Research Director level water reduction KPI for individual plants

- Installation of metering is CRITICAL!
Nissan Water Reduction Challenges

- Capital vs Ongoing Expense Justification
- Employee Engagement
- Magnitude of Priorities Of Each Plant (Paint Plant, Trim Plant, Power House)
- Water Is “Cheap”
• Simple addition of flow meter to polymer mix line at industrial paint pretreatment plant resulted in almost $50K annual savings.

• Reduction of 7 million gallons

• .03 yr payback!
Nissan Paint Pretreat Water Reuse

Pre project flow rate
16 m³/hr (70 gpm)

Current flow rate
3 m³/hr (13 gpm)

K Factor Filter Project

This photo visualizes the impact of one K Factor Filter project. This is one of four purchased filters.
Investment: Four Filtration Systems: $640K

Water Savings: 61.5 million gallons annually

Payback periods for individual systems ranged from less than one year to five years.

Combining projects yielded ROI of 1.8 yrs
INITIAL:
Pretreatment Plant seal cooling water on effluent pumps had uncontrolled flow.

INTERIM:
Installed temporary non destruction meter and determined excessive flow of four pumps.

FINAL:
Installed permanent flow meters on all four pumps.
Then an operator asked...

“Why are we using city water?”

That led to a reduced demand for city water in this one treatment plant from 22 million gallons of city water to 1.2 million gallons annually due to using treated waste water.
Nissan Unwanted Results

Less waste water resulted in more concentrated waste water
• Water use is consistently higher per vehicle in one paint plant than the other paint plant.

• Reduction in production definitely impacts water reduction metric results.
Natural Resources

- Wetlands

- Pond
  - Refilled from a well
  - Irrigate 40% of property
  - Chemical free; use grass carp to eat algae for food
  - Installed pressure reducing valve on city water (slower water = less use)
  - Changed irrigation heads to lower gallons per minute
  - Stopped watering mature plants and trees
  - Cost savings of over $5k per year
• 49% reduction of water required to manufacture a vehicle since 2010

• Global sharing between facilities of water reduction projects

• The old saying that you cannot measure what you don’t meter is absolutely true.
THANK YOU!