Smart Gridding to Smart Cruising

Paul Molitor
Senior Industry Director, Smart Grid
NEMA
No, unfortunately...

- 21 Major League Seasons
  - Milwaukee, Toronto, Minnesota
- 7 Time All Star
- 3,319 Hits = 9th All Time
  - 10th in Singles
  - 11th in Doubles
  - 18th in Runs Scored
  - 36th in Stolen Bases
- Hall of Fame Class of 2004
What the NEMA?

- National Electrical Manufacturers Association

- Approximately 450 member companies
  - products used in the generation, transmission and distribution, control, and end-use of electricity

- NEMA provides a forum for
  - development of technical standards
  - advocacy of industry policies on legislative and regulatory matters
  - collection, analysis, and dissemination of industry data

- Organizations NEMA collaborates with
  - DOE, EPA, DOT, DOD, DOC, NIST, FERC, Congress

ANSI-NEMA 5-15R
Wall Outlet and 5-15P Plug Type
What is the Smart Grid?


It is the policy of the United States to support the modernization of the Nation's electricity transmission and distribution system to maintain a reliable and secure electricity infrastructure that can meet future demand growth and to achieve each of the following, which together characterize a Smart Grid:

1. Increase use of digital controls
2. Dynamic optimization
3. Integrate distributed resources
4. Demand Response
5. "Smart" metering
6. "Smart" appliances
7. Storage and peak shaving
8. Customer control
9. Communication Standards
10. Reduce market barriers

Two-Way Flow of Electricity and Information
What does Smart Grid look like?
What is Port Electrification?

- Shorepower / Cold Ironing
- Integration of Renewables
  - Solar, Wind, Marine Power
- Electrification of cargo and materials handling
sustainable shipping

Vancouver port wins award for shore power installation

1st November 2010 22:15 GMT

Port Metro Vancouver has won the 2010 Environmental Award of Excellence from the Association of Professional Engineers and Geoscientists of BC (APEGBC) in recognition of its shore power installation at Canada Place.

In 2009, Port Metro Vancouver became the first port in Canada to install shore power for cruise ships. Shore power, also known as cold ironing, allows docked ships to shut down their engines and plug into the city’s electrical grid to run all onboard services.

The port said that following its installation, it saw an “immediate and dramatic” reduction in emissions. Ships have so far saved 17,000 litres of diesel fuel, and have been able to cut emissions in half during a normal 10-hour period of usage.

“It’s no longer acceptable to have a ship at dock with smoke flying out of its stack,” commented Barry McCormack, lead project engineer at Port Metro Vancouver.

During the first year, 11 ships took advantage of being able to cold iron. On average, 200 cruise ships a year visit Vancouver. The port is hoping more ships will take advantage of being able to reduce fuel and eliminate diesel emissions.

“This is good for the environment and the local community. It is a win-win situation,” commented McCormack.
“Smart” Ship

1. Primary metering equipment
2. Primary equipment
3. Transformer
4. Secondary equipment
5. Capacitor
6. Cable Positioning Device (CPD)
7. Ship cables
USN and USMC rely too much on petroleum
  ▪ Degrades the strategic position and tactical performance of U.S. forces

5 Strategic Goals:
  ▪ Mandatory evaluation of energy factors in the acquisition process
  ▪ “Green Fleet” Objectives
    • Establish Green Strike Group local operations by 2012
    • Green Strike Group under sail by 2016
  ▪ Reduce non-tactical petroleum use 50% by 2015
  ▪ Shore-Based Alternative Energy
    • 50% Renewables by 2020
    • 50% Installations @ net-zero
  ▪ Half of total USN energy consumption from alternative sources by 2020

Other examples

**Non-departmental Executive**
- White House Office of Science & Technology Policy (OSTP)
- Environmental Protection Agency (EPA)
- Federal Maritime Commission (FMC)
- Federal Energy Regulatory Commission (FERC)

**Executive**
- Dept. of Homeland Security (DHS)
  - U.S. Coast Guard
- Dept. of Commerce (DOC)
  - National Institute of Standards and Technology (NIST)
  - National Oceanic and Atmospheric Administration (NOAA)
- Dept. of Defense (DOD)
  - U.S. Navy
  - U.S. Army Corps of Engineers
- Dept. of Energy (DOE)
  - Office of Electricity Delivery and Energy Reliability
- Dept. of Interior (DOI)
  - Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)
- Dept. of Transportation (DOT)
  - Maritime Administration (MARAD)
  - Saint Lawrence Seaway Development Corporation (SLSDC)
  - Research, Innovation and Technology Admin (RITA)

*If you’re not convinced, let us know...we have a 20-page reference document*
How is govt reacting?

Implementing policies and objectives that promote:

- Clean energy
- National security
- Innovation
- Economic development
- Jobs
Why should I care?
Where are we seeing this?

- **Federal Agencies/Organizations**
  - Increase in regulations
  - Strategic Plans focus on sustainability

- **State & Local Govts**
  - Job creation goals
  - Environmental protection → Industry

- **Ports**
  - CAAPs, Air Emissions Inventory, Environmental Reports

- **Cruise Industry**
  - Early adopter of shorepower
  - CLIA at 35: “Steering a Sustainable Course”
How?

National Conference for Ports

- **Mission:**
  To create a federal roadmap, developed by all vested parties, that holistically addresses what needs to be done to develop and support a sustainable and prosperous U.S. marine transportation system

- **Outcome:**
  “EnergySTAR” for Ports
  This roadmap would establish environmental and efficiency benchmarks that federal and state agencies would use to establish incentives programs, rewarding ports and industry that achieve these standards
Examples of efficiency/environmental benchmarks & incentives

### Technologies

**Port**
- Integrate distributed resources
- Demand response
- "Smart" Metering
- Optimized port design

**Cruise**
- Shorepower
- Waste management
- Low-sulfur fuels

### Incentives

**Port**
- Federal tax deduction
- State incentives for upgrading electrical infrastructure
- Local utility rebates

**Cruise**
- Reduced electricity rate
- Lower fuel taxes
- Tiered harbor dues
What can I do?
National Conference for Ports Agenda

Ship
- Classification Society
- Cost Considerations
- Plug Type(s)

Port
- AAPA
- Cost Considerations
- Architecture Concerns
- Environmental

Utility
- Edison Electric Institute (EEI)
- Cost Considerations
- Infrastructure Requirements

Legislation
- NASA JPL
- National Objectives
- Climate Incentives
- State & Local Responsibilities

Regulation
- NEMA
- Federal Influence
- Enforcement Policy
- Integration

Standards
- NIST
- Ships
- Ports
- Utilities
Questions

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