



Environmental Planning, Energy Efficiency and Renewable Energy Initiatives in Newport, Rhode Island



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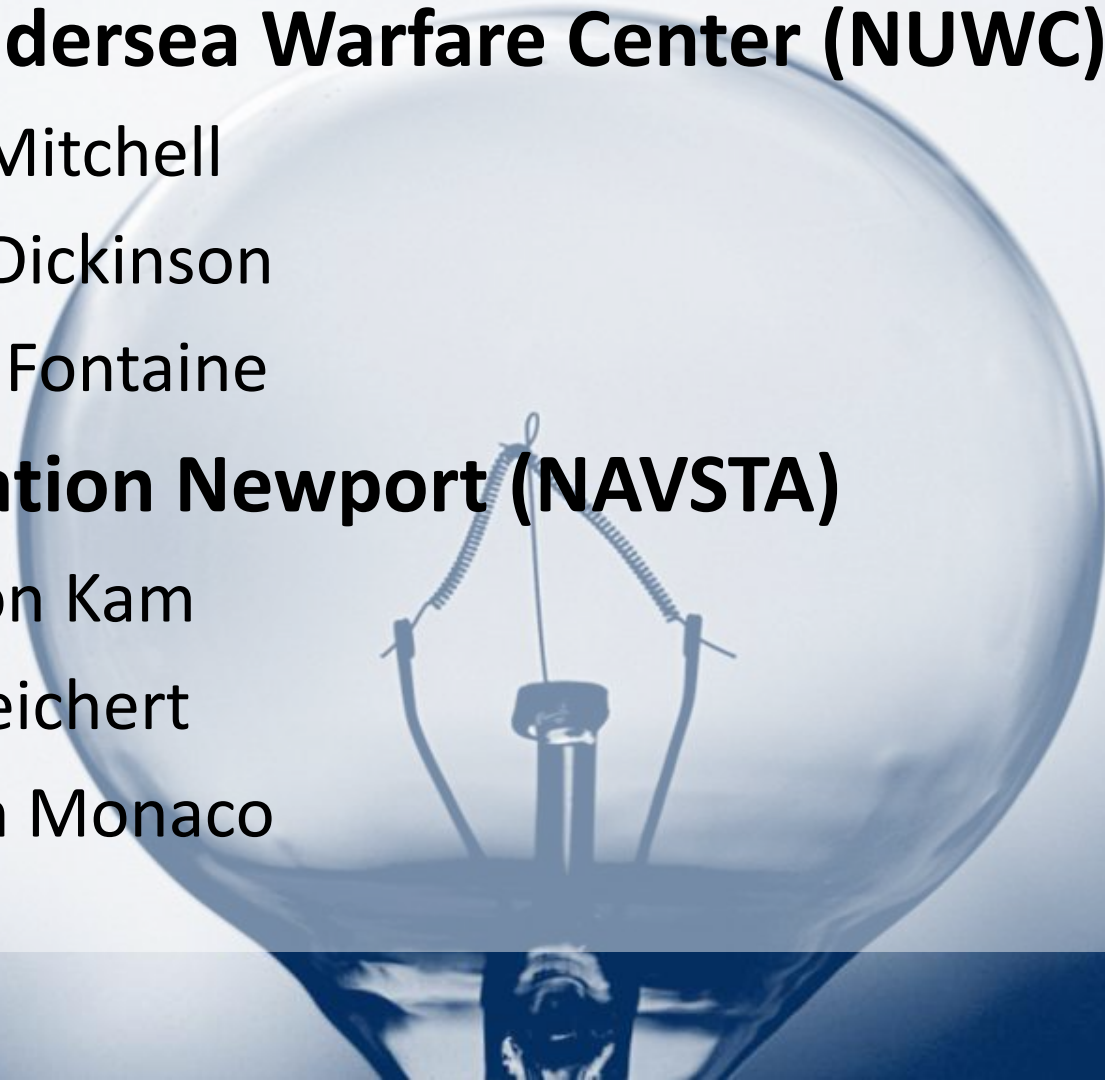
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ENERGY INITIATIVES



- Naval Undersea Warfare Center
 - Conservation Measures
 - Research
 - Renewable Energy
- Naval Station Newport
 - Conservation Measures
 - Renewable Energy
- Environmental Assessment for Wind Energy in Newport, Rhode Island

An aerial photograph of Naval Station Newport, Rhode Island. The station is situated on a peninsula, with a large shipyard and various naval facilities. A long bridge spans the water in the background. In the foreground, there is a large green area, likely a golf course, and some residential or commercial buildings. The water is a deep blue, and the sky is clear.

Naval Station Newport

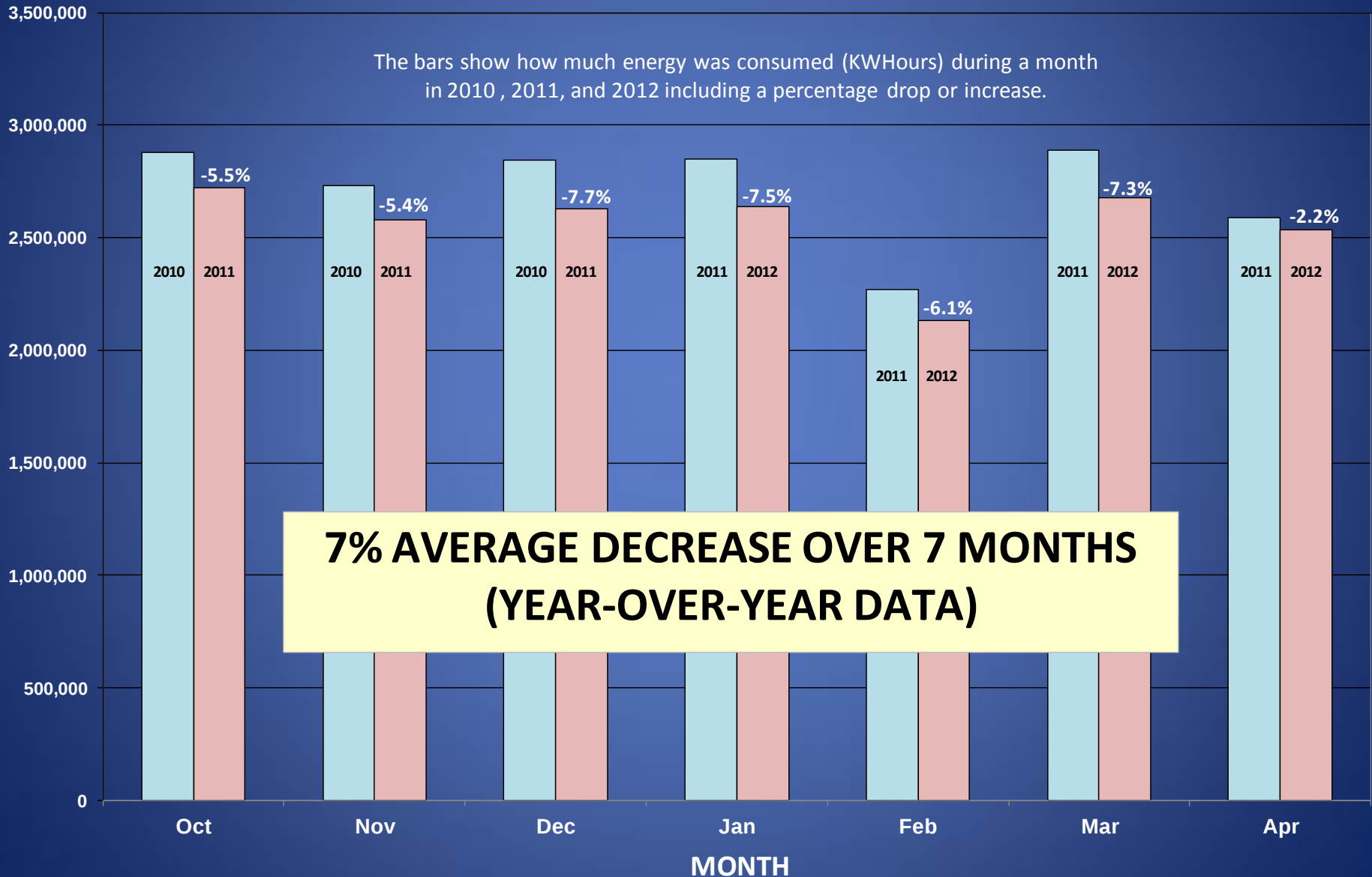
Naval Undersea Warfare Center

Energy Conservation

- Efficient Lighting Upgrades
- Lighting Shutoffs Through Occupancy Sensors
- HVAC/Temperature Setbacks
- Efficient HVAC Equipment
- Power Saving Measures For Personal Computers
- "Lean Lab" Non-essential Equipment Shutoffs
- Power Saving Office Shut-down Procedures
- "Smart" Digital Power Meters - Building Level
- Cultural Change Through Continuous Feedback



MONTHLY POWER CONSUMPTION - NUWCDIVNPT



LEAN LAB



Goal: reduce electrical consumption in RDT&E labs utilizing high power consuming shipboard equipment in temperature controlled laboratories.

PROCESS

- Formed lean team - representatives from each department
- Inventoried all lab equipment - commercial and military
- Define current state - nameplate power and operational hours
- Define future state - reduced hours of operation
- Execute future state and measure results

ENERGY CONSERVATION



"Smart" Digital Power Meters - Building Level

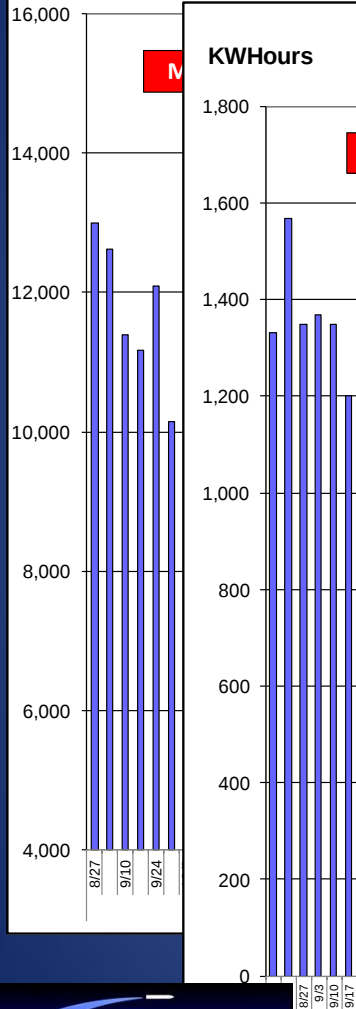
- Collect data weekly from building level "smart" meters
- Analyze data for effectiveness of energy reduction program
- Generate weekend, weekly, and monthly charts for each building
- Distribute charts to each department every week
 - Reinforces positive habits
 - Shows that individual/collective actions do have an impact
 - Provides visibility into building consumption

Continuous Feedback Using "Smart" Meter Data

BLDG 1371 - WEEKEND POWER CONSUMPTION

Fri 4:30 pm to Mon 7:30 am

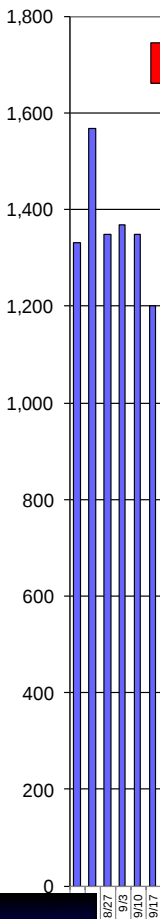
KWHours



BLDG 679 - WEEKEND POWER CONSUMPTION

Fri 4:30 pm to Mon 7:30 am

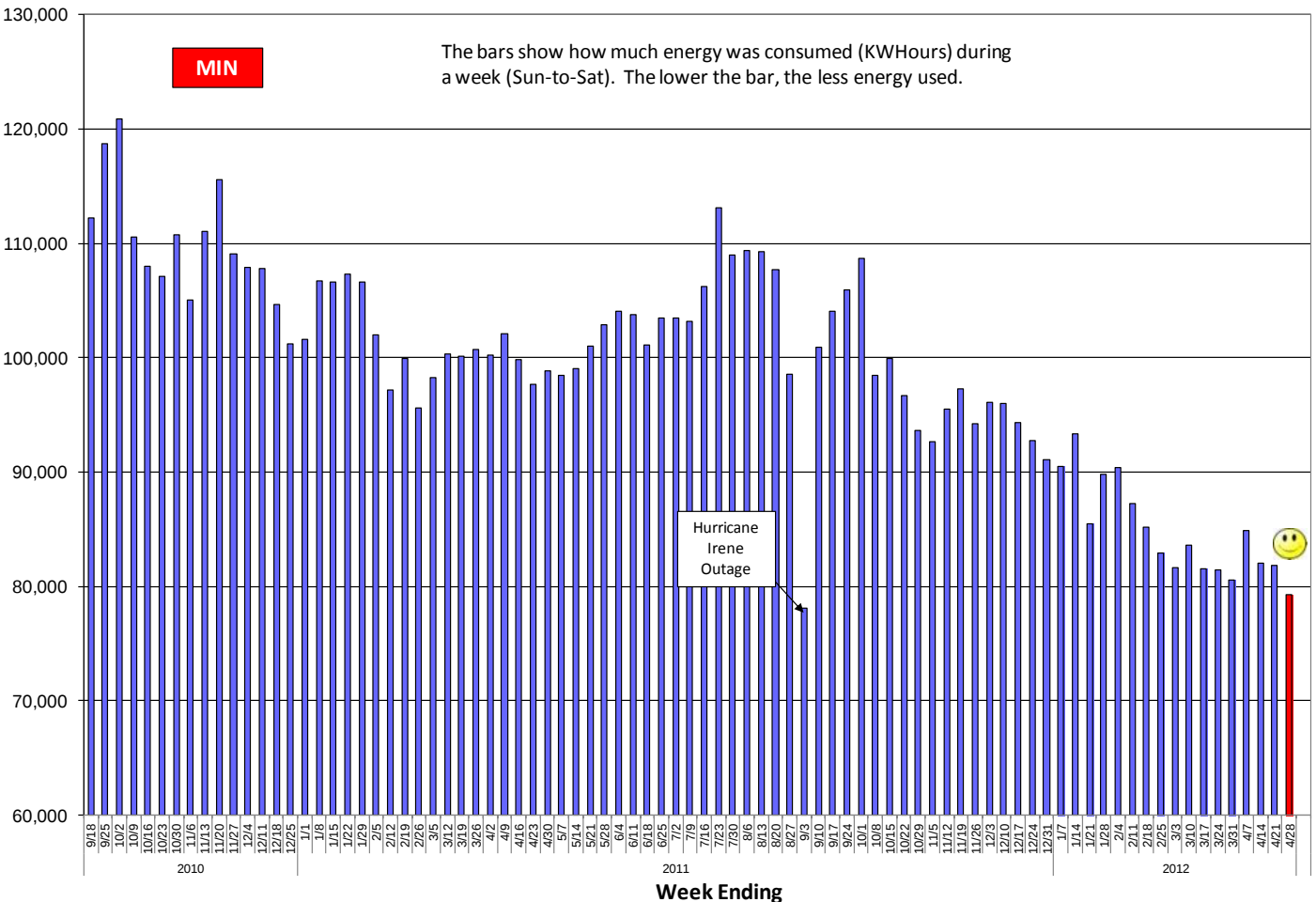
KWHours



BLDG 1258 - WEEKLY POWER CONSUMPTION

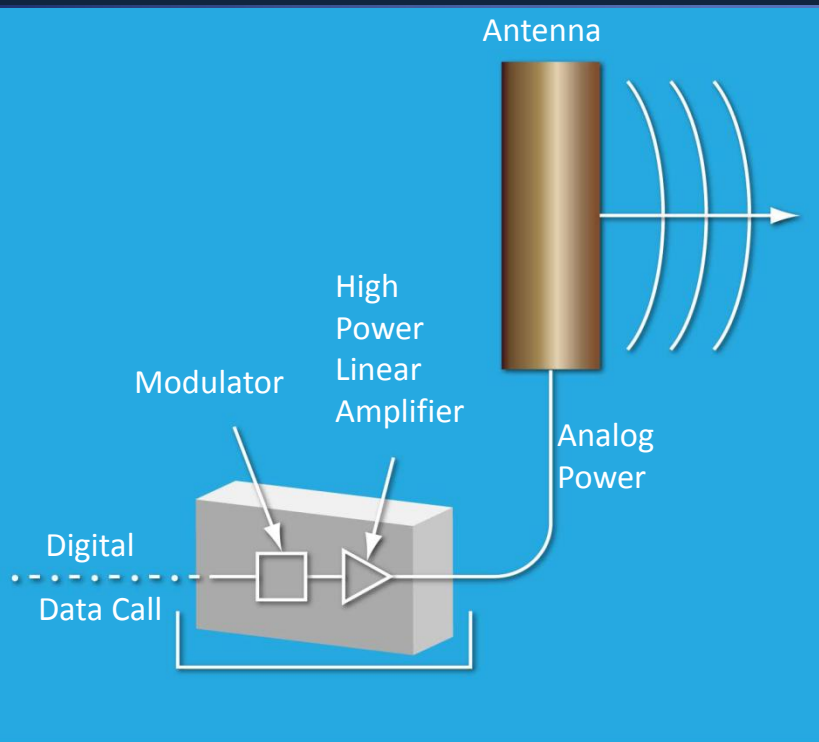
Sun 12:00 am to Sat 11:45 pm

KWHours

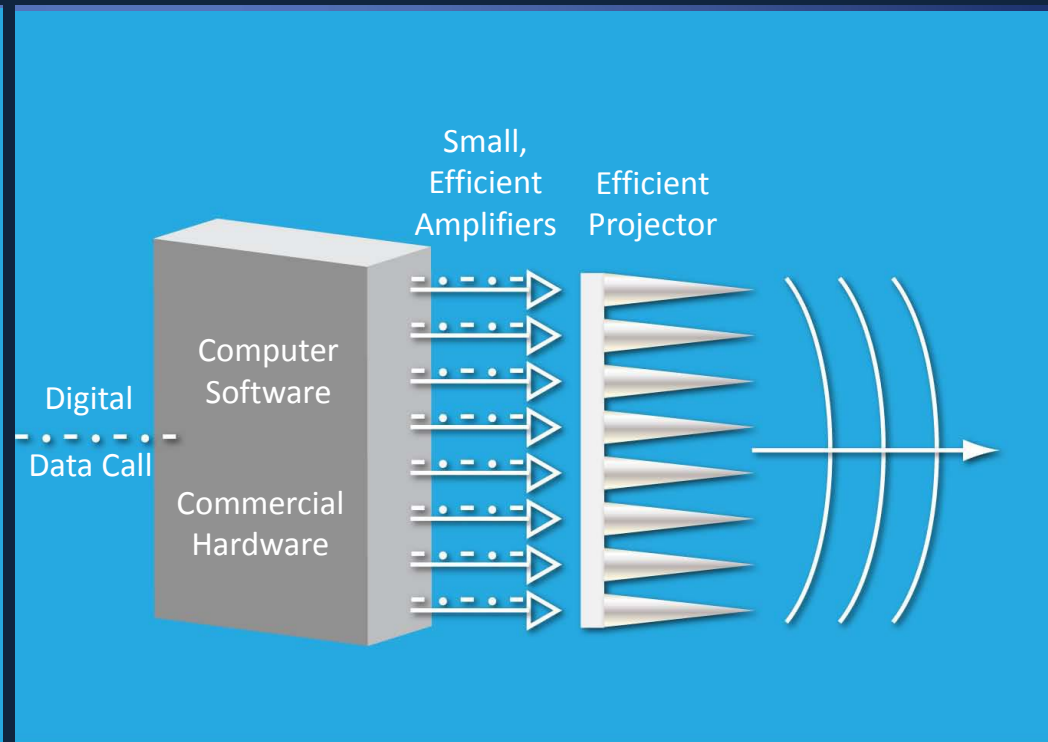


WHITE NAIL RESEARCH

Cellular Transmitter



White Nail Transmitter



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Renewable Energy

- Solar thermal panels – 25 years
- Solar Trombe wall
- Electric vehicles
- AUTECH Wind Turbine
- AUTECH Direct Solar Hot Water System



AUTEC WIND TURBINE

A \$5.6 million wind turbine has been funded by the Energy Conservation Investment Program (ECIP) for AUTEC on Andros Island in the Bahamas.

Preliminary study indicates installation at Site 1 is feasible:

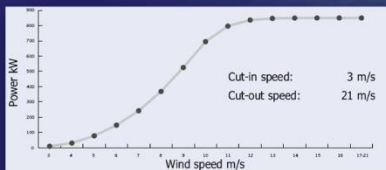
- Without significant impact on operations
- 213 ft hub height

Benefits:

- Annual savings of \$400,000 after accounting for maintenance costs
- Typically powers 335 homes
- Anticipating fossil fuel consumption reduction of up to 30% with a corresponding reduction in greenhouse gas emissions
- Promotes green energy without degrading mission effectiveness or quality of life

Design Phase: April 2010

Wind Turbine Installation: FY12



Typical Power Curve



**AUTEC Site 1
Andros Island**



Supports AUTEC's goal of becoming a net-zero-energy installation



AUTEC DIRECT SOLAR HOT WATER SYSTEM



Rooftop Solar Collector

Current Situation:

- Constantly increasing fuel prices have translated into higher utility costs.
- Always moving toward compliance with federal energy goals and mandates.
- Site 1 power plant average diesel burning rate of 1.3 million gallons/year costs roughly \$3 million.

Benefits to AUTEC:

- Annual electric power reduction of 2,994 KWH (61%) on the electric hot water heaters.
- Annual savings of \$778.55 per housing unit. Initial purchase and installation cost \$5,150 per system.
- Return on investment of 6.61 years.



NAVAL STATION UTILITIES

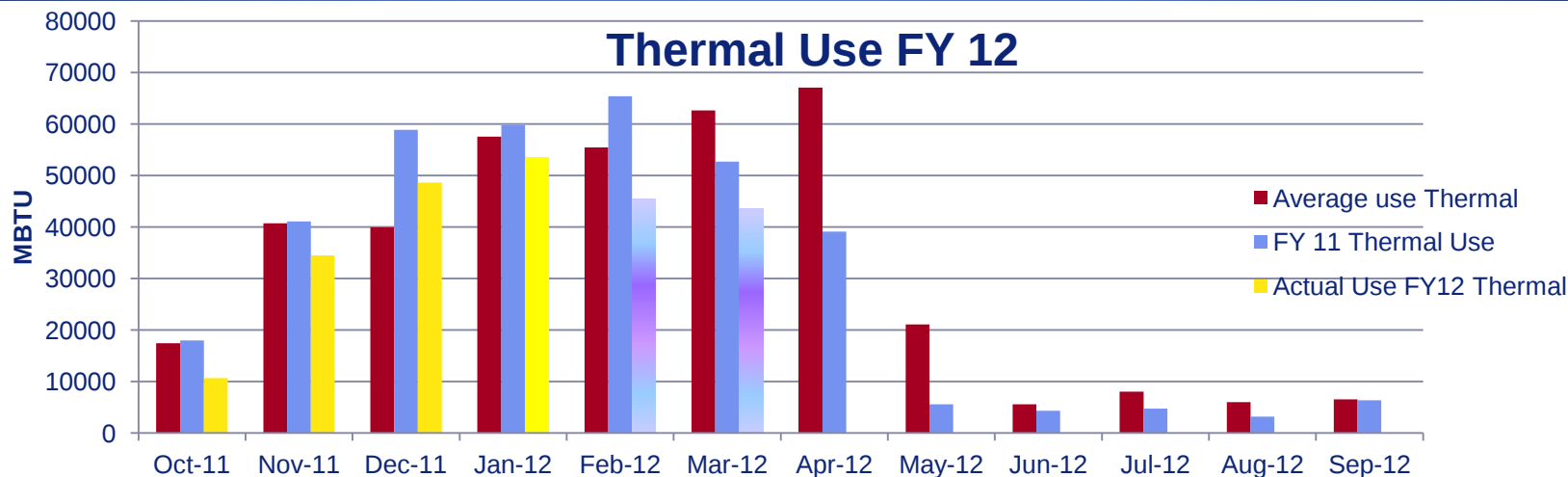
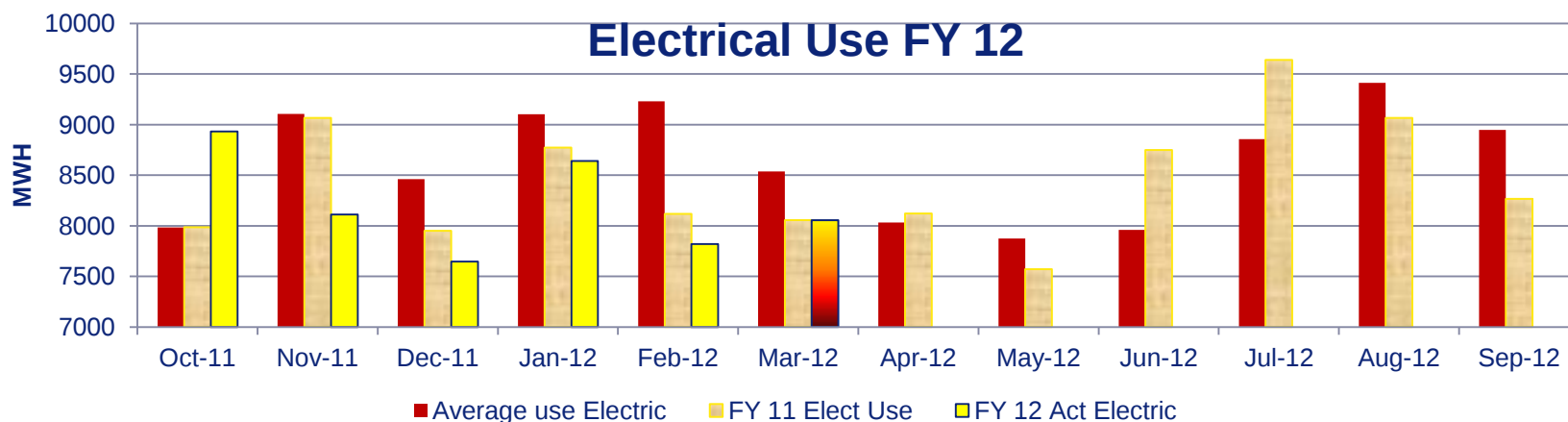
Awareness – includes knowing consumption data, understanding tendencies, & defining places to begin “low hanging fruit”

Utilities - Current Uses

Electrical	103,500 MWH	\$9.8 Million
Thermal	388 MBTU	\$5.8 Million
Water	271 Kgal	\$1.4 Million
Sewer	400 Kgal	\$1.6 Million
Fuel	71 MBTU	\$1.2 Million
Total		\$19.8 Million



TRENDS OF USAGE

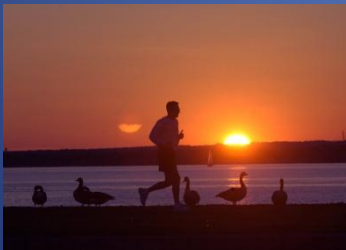




Energy Conservation

High energy usages may be because of:

- Mission
 - Climate control requirements
 - Operations
- Facility Size
- Poor Housekeeping



FY 11 Top 10 Consumers

Buildings	Total Annual Cost
NUWC 1320-CC	\$817,786
NUWC-1259-CC	\$687,720
NUWC-1258-CC	\$605,475
NWC-27-CHI	\$570,607
NUWC-1171-CC	\$524,875
NETC-197-CP	\$425,411
NSNPT-68-Total	\$421,626
NETC-440-CP	\$416,135
NETC-291-CP	\$394,815
NWC-991-CHI	\$364,498



ENERGY EFFICIENCY

- **Conservation**
 - LED lights - Used in the REC center
 - Induction lighting - Used at Gate 17
 - Reducing hallway lighting
- **Demand Reduction**
 - Sensors & controls that adjust ventilation
 - Focus on conference rooms, classrooms, & auditoriums
 - Honeywell ESPC project completed in 440CP Perry Hall
 - Automatic water shutoffs
- **Improved Command Energy Management**
 - Understanding peak demands relate to air condition loads
 - Advanced Metering Infrastructure (AMI)



RENEWABLE ENERGY

- **Renewable Projects**
 - Solar Thermal Collectors
 - Solar Vent Preheat (Solar wall)
 - Photovoltaic Installation
 - Building Level Wind Turbines
- **Alternate Fuels**
 - Using fuels that are renewable and sustainable
 - Newport uses 22 electric and 3 hybrids cars
- **LEED**
 - Eifs (Stucco) System with high insulating value
 - Using insulated concrete form wall construction to increase R values, low E windows, bike racks, etc.





RENEWABLE ENERGY

- Wind Turbine Proposal
 - 9MW project at up to 12 sites
 - Estimated >\$20M savings over project life cycle
- Environmental Assessment





PURPOSE AND NEED

- EPAAct 2005
- EO 13423
- NDAA 2010
- NAVSTA is one of the largest electrical users in RI
- Spending \$12 million annually for electricity
- Current estimates
 - 26% of current annual electrical consumption
 - \$3 million in annual savings.

PROJECT HISTORY



- Initial project envisioned in 2006
- Limitations investigated in July 2009 (set backs, sound, flicker, FAA [height], ice throw, etc)
- 20 initial sites selected
- Wind measurement study in May 2010
- Environmental Assessment under National Environmental Policy Act (NEPA) was initiated in August 2010



Met Tower



NEPA

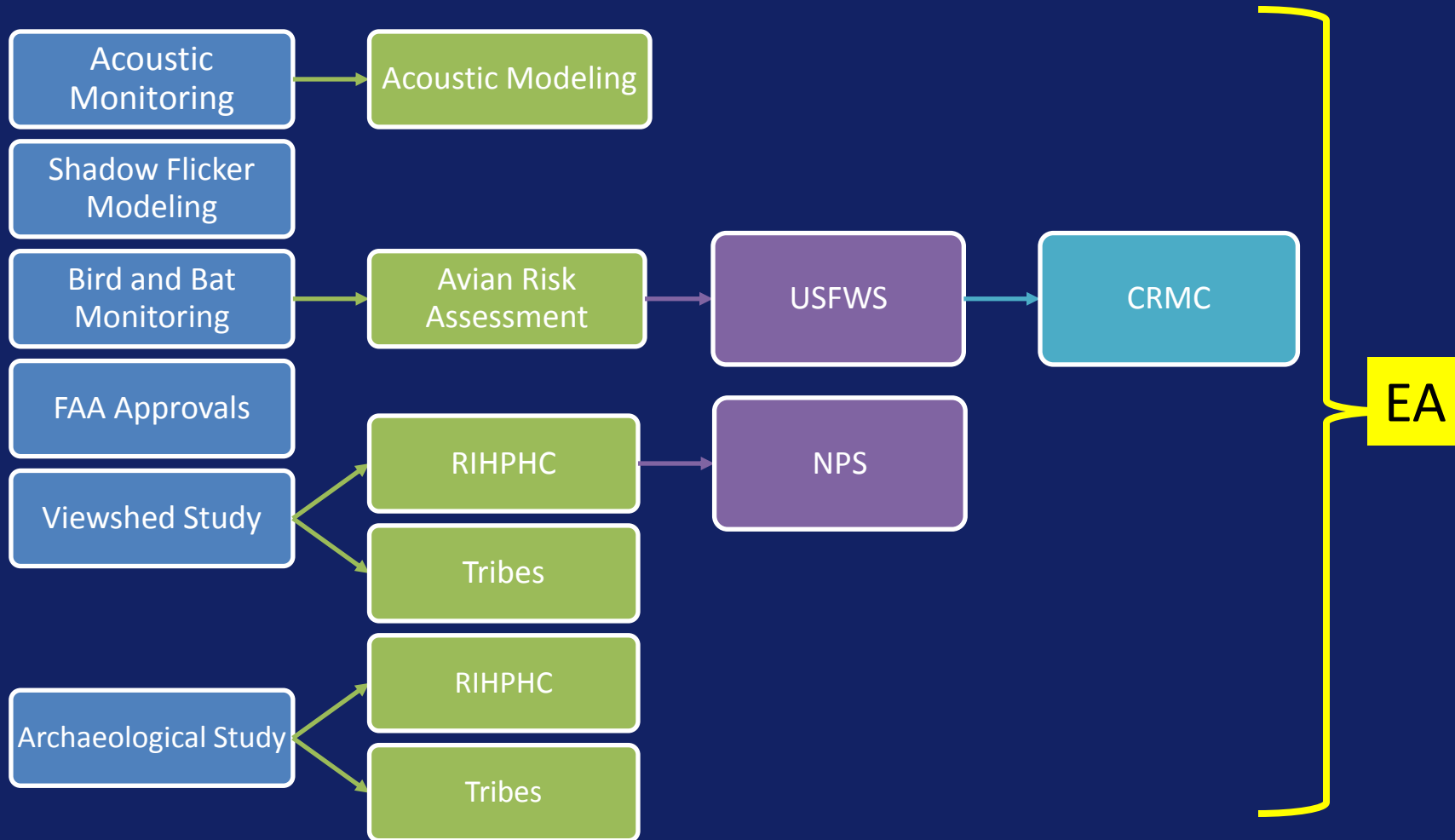


- Background Studies for Environmental Assessment
 - Avian Radar Analysis
 - Viewshed Study
 - Noise Analysis
 - Shadow Flicker Analysis
 - Public Meeting
 - Marine Mammal Study and Technical Report
 - Phase 1 Archaeology investigation of potential sites
- External Consultations





EXTERNAL CONSULTATIONS



PROJECT PROGRESS

- Repowering America - Oct 2009
- Federal Aviation Administration Obstruction Evaluation - Dec 2009
Renewed Jan 2012
- Business Case Analysis - Feb 2011
- Wind Energy Study - Aug 2011
- Interconnection Study - Feb 2012
- Environmental Assessment (FONSI) - August 2012
- Soil Boring – August 2012



FAA Analysis Map

PROJECTED TIMELINE



Step 1 - NEPA

June 2010 – August 2012

Step 2 - Develop and solicit Power Purchase Agreement (PPA) Contract

Aug 2011– Jan 2013

Step 3 - Final Reviews and Award

Feb 2013 – June 2013

Step 4 - Design and Construction

June 2013 – Dec 2014





THANK YOU

