MEMORANDUM

TO: Louis Daniel
    Dee Lupton

FROM: Angie Tate

DATE: July 23, 2010

RE: Energy Committee Report

The NC Division of Marine Fisheries (NCDMF) Energy Committee met three times this spring to discuss a range of potential energy efficiency improvements for NCDMF offices. Several attachments are included behind the "Energy Committee Proposal List" that provide additional information regarding most of the suggested improvements (additional detail available if desired). While the team was unable to compile complete cost/benefit information for all items on the proposal list, several of the suggested improvements will obviously require a higher up-front cost than others (e.g., putting light sensors in bathrooms vs. setting printers in sleep mode).

Several of the suggested improvements are behavioral changes that could prove challenging to implement and/or quantify. We have provided information to illustrate the potential cost savings of these improvements wherever possible. It is also important to note that DENR may also choose to require certain behavioral changes that are proposed here (e.g., use of personal appliances in the office). Whatever proposals are implemented, it will be essential to communicate to employees the justification for these changes – cost savings, safety, etc.

Please do not hesitate to contact me should you have questions regarding the proposal list or the supporting information, or should you require additional details or research.
Energy Committee Proposal List

- Propose thermostat settings to be set at 70° in the winter months and 78° in the summer months.

- Propose areas to put light sensors in
  - All Bathrooms
  - Decide which offices would want and benefit from.
  - What type of light sensors-15 minutes delay for off/on by motion?
  - De-lamping where possible

- Propose to turn off the main lights on the second floor old section at all times with the exception of daylight savings in the fall when it is dark early on. The hallway has the center light fixture on in the center of each hall when the main lights are turned off.

- Propose to adhere to DENR’s upcoming sustainable policies that apply to personal appliances in the workplace.

- Propose to set up printers in sleep mode (HP default is 15 minutes)

- Propose recommendation that all staff shut down their computer AND monitor at the end of the working day and over weekends.

- Propose signage at the loading docks to state vehicles be turned off while parked at the dock. (Fumes also get sucked into the ventilation of the building)

- Propose possible cistern for use to wash down boats and trailers after loading at the docks. (This is included in the DMF Low Impact Development master storm water plan.)

- Propose State Energy Office Audit again for savings ideas. Brady services might be able to offer an audit. (FCAP inspections are done every 3 years on state facilities to help with suggested improvements)
Where do you use the most energy?

- Lighting: 29%
- HVAC: 40%
- Equipment: 15%
- Hot Water Use: 9%
- Food Prep: 5%
- Misc: 2%
Get Started NOW!

Twenty Ways to Help Your Plant Save Energy Now
No Cost/Low Cost Energy Savings Tips for Industry
Self-Assessment Guide for Energy Saving Opportunities
  ● Best Energy Management Practices
  ● Conversion Factors
  ● Estimated Savings Potential

Energy Savings Opportunities
Administration & Communications
Buildings Efficiency
Compressed Air
Electric Motors
Energy Management
HVAC
Lighting

Additional Resources
Advanced Energy
Energy Information Administration - State Energy Profiles
Energy Star Online Training
Links
Manuals
N.C. DPPEA
N.C. State University IES
TIAP Business Incentives
U.S. Department of Energy Savings Assessments
U.S. EPA Clean Energy Environment Municipal Network
Waste Reduction Partners

This site is a joint effort between the State Energy Office and the N.C. DPPEA.

http://www.p2pays.org/energy/
- Temperature control

- In winter, set office thermostat offices between 65 and 68 during the day/business hours, and 60 to 65 degrees during unoccupied times.
- In summer, set thermostats between 78 and 80 degrees during the day/business hours, and above 80 degrees during unoccupied hours.
- Adjust thermostats higher when cooling and lower when heating an occupied building or unoccupied areas within a building, e.g., during weekends and non-working hours.
- During summer months, adjusting your thermostat setting up one degree typically can save 2-3% on cooling costs.
- Consider installing locking devices on thermostats to maintain desired temperature settings.
- Install programmable thermostats that automatically adjust temperature settings based on the time of day and day of the week. If you have multiple HVAC units, set your thermostats to return to the occupied temperature a half an hour apart.
- In larger facilities with energy management systems (EMS), verify that temperature set points and operating schedules are correct for the controlled equipment. For EMS systems that no longer operate as initially designed, consider a retro-commissioning project to restore the system's functionality.
Replace incandescent lamps with CFLs.
- Selection, less heat, & elimination of hum.
- T8 lamps offer better performance, more.
- Replace T-12 with T-8 lamps.

Replace Exit signs with LED's.

Occupancy sensors.

Lighting CFL (compact fluorescent lamp).
- Lower room light levels and use task.
- De-lamp.
- Clean fixtures and bulbs periodically.

Low cost opportunities.

Lighting.
310,119 to 571,747 kWh per year
$15,497 to $28,594 in electricity per year

Total Savings:

<table>
<thead>
<tr>
<th>Location</th>
<th>Annual Savings</th>
<th>Savings Amount</th>
<th>Amount</th>
<th>Average Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam Room</td>
<td>121</td>
<td>$6.57 - $13.14</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Waiting Room</td>
<td>50</td>
<td>$26.28 - $52.56</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Lounge/Kitchen</td>
<td>90</td>
<td>$13.80 - $22.70</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Storage Areas</td>
<td>264</td>
<td>$7.88 - $15.77</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Restrooms</td>
<td>121</td>
<td>$35.50 - $59.13</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>Conference Rooms</td>
<td>62</td>
<td>$10.29 - $20.58</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>Classrooms</td>
<td>35</td>
<td>$18.40 - $49.06</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Private Offices</td>
<td>600</td>
<td>$7.59 - $12.56</td>
<td>35%</td>
<td></td>
</tr>
</tbody>
</table>

**Occupancy Sensors**

(For illustrative purposes only - scale building. An example.)

*Note: This is...
Have your distributor disconnect the lights
Vending Machines
Decorative Lighting – Is it worth the price?
Outdoor Lighting
Make use of dual switching
Reduce Lighting
Optimize use of day lighting

When you leave the room

TURN THEM OFF

No Cost Opportunities

Lighting
WASTE REDUCTION, REUSE AND RECYCLING
All Employees must recycle all recyclable items. Bins available for recycling include: Paper, Aluminum, Glass, Plastic, Newspaper and Cardboard.

WORKPLACE DECORATIONS
Personal work area decorations are not to consume electricity, and shall not obstruct natural lighting.

AUDIO VISUAL TECHNOLOGY
Audio/visual technologies (such as, computer projectors, DVD Players, Televisions, audio recording, and video recording equipment) should be placed on the lowest power settings as specified by the manufacturer at all times, and powered off when not in use.

DESKTOP POWER MANAGEMENT
Computer equipment should be set to minimize energy use and cut off when not in use, unless required for emergency purpose or mission critical functions.

EQUIPMENT/MATERIAL VALIDATION
An equipment/material needs assessment shall be performed prior to the purchase of new equipment. Where standards are applicable, the number of equipment/materials shall not exceed the standard per employee amount.

FACILITY LIGHTING
All lights not controlled by an automatic control are to be shut off when not in use, unless required for emergency purpose or mission critical functions.

FACILITY TEMPERATURE
Facility temperature should be managed by the facility manager. Requests regarding temperature changes should be made to the facility manager.

GREEN EVENTS PLANNING
All lights not controlled by an automatic control are to be shut off when not in use.

GREEN PURCHASING
Each division responsible for making purchases shall ensure a green option is purchased when that item exists and is within budget that they consider its purchase.

TELEWORKING
All positions should be analyzed to determine eligibility for DENR’s current Teleworking Policy (see Teleworking, including Home Duty Station policy).

TRAVEL AND VEHICLE USE
All travel is to be kept to a minimum. Employees must carpool when possible and select the most fuel efficient vehicle to suit the task. (See also statewide “Vehicle policy”).

PERSONAL LIGHTING
If additional personal lighting is required an exception form must be approved by the facility manager. At a minimum the additional personal lighting should be LED. All lighting must be turned off when not in use.

PERSONAL HEATING/AC UNITS
Employees may not have personal heating/ac units.

PERSONAL KITCHEN EQUIPMENT
Kitchen style equipment is to be housed within break rooms only. Employees may not have kitchen equipment within their work areas. Kitchen equipment includes, but is not limited to: coffee pots, mini-fridges, toaster ovens, microwaves, hot pots, etc.

PRINTERS/COPIERS
All printers/copiers that do not have a “sleep mode” or equivalent must be shut down at night where not prohibited.

PRINTING
All printers that are capable of printing two sided documents are to be used at all times except where prohibited. All non-official use printing must be done in black and white. The use of eco-font for internal printing is recommended.

TELEPHONE/WEB CONFERENCING
Web conferencing should be used whenever possible. Meeting plans should always consider telephone/web conferencing as a first option when initial meeting plans are made involving parties requiring travel.
HOW MANY WATTS DO YOU NEED?

To Select an Inverter from DonRowe.com that has enough power for your application, add the watts for items you may want to run at the same time. Use the total wattage, plus 10% to 20%, as your minimum power requirement.

Note: The wattages given below are estimates. The actual wattage required for your appliances may differ from those listed. Check the nameplate on the appliance to determine the actual wattage required.

* Appliances and tools with induction motors (marked * in tables) may require from 3 to 7 times the listed wattage when starting. The start-up load of the appliance or tool determines whether an inverter has the capability to power it. Be sure to check the specific wattage requirements and operating instructions for appliances / tools to be used.

F.Y.I. ..... (conversion formula: Watts ÷ 120 = Amps ......... Amps x 120 = Watts)

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Est. Watts</th>
<th>Appliance</th>
<th>Est. Watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee pot (10 cup)</td>
<td>1200</td>
<td>VCR</td>
<td>40-60</td>
</tr>
<tr>
<td>Coffee pot (4 cup)</td>
<td>650</td>
<td>CD or DVD Player</td>
<td>35</td>
</tr>
<tr>
<td>Toaster</td>
<td>800-1500</td>
<td>Stereo</td>
<td>30-100</td>
</tr>
<tr>
<td>Cappuccino Maker</td>
<td>1250</td>
<td>Clock Radio</td>
<td>50</td>
</tr>
<tr>
<td>Coffee Grinder</td>
<td>100</td>
<td>AM/FM car cassette</td>
<td>8+</td>
</tr>
<tr>
<td>Blender</td>
<td>300</td>
<td>Satellite dish</td>
<td>30+</td>
</tr>
<tr>
<td>Microwave (600 to 1000 W cooking power)</td>
<td>1100-2000W (elec. consumption)</td>
<td>Vacuum cleaner</td>
<td>300-1100</td>
</tr>
<tr>
<td>Waffle iron</td>
<td>1200</td>
<td>Mini Christmas lights (50)</td>
<td>25</td>
</tr>
<tr>
<td>Hot plate</td>
<td>1200</td>
<td>Space Heater</td>
<td>1000-1500</td>
</tr>
<tr>
<td>Frying pan</td>
<td>1200</td>
<td>Iron</td>
<td>1000</td>
</tr>
<tr>
<td>Toaster Oven</td>
<td>1200</td>
<td>Washing machine</td>
<td>920</td>
</tr>
<tr>
<td>Blow dryer</td>
<td>900-1500</td>
<td>12&quot; 3 speed table fan</td>
<td>230</td>
</tr>
<tr>
<td>Computer - laptop</td>
<td>50-75</td>
<td>TV - 25&quot; color</td>
<td>300</td>
</tr>
<tr>
<td>- pc &amp; monitor</td>
<td>200-400</td>
<td>- 19&quot; color TV or monitor</td>
<td>160</td>
</tr>
<tr>
<td>- printer-inkjet</td>
<td>60-75</td>
<td>- 12&quot; b&amp;w</td>
<td>30</td>
</tr>
<tr>
<td>*Refrigerator/Freezer</td>
<td>600</td>
<td>13&quot; color TV/VCR Combo</td>
<td>230</td>
</tr>
<tr>
<td>*Freezer</td>
<td>500-800</td>
<td>Game Console (X-Box)</td>
<td>100</td>
</tr>
</tbody>
</table>

Common Tools

http://www.donrowe.com/inverters/usage_chart.html 7/22/2010
Q&A: Are compact refrigerators an energy-efficient alternative to full-size ones?

We're considering getting a compact refrigerator for our finished basement. How energy efficient are these small fridges?

A small refrigerator, say a model with a capacity of about 2 cubic feet, could be a good fit for a your basement or home office or a dorm room (most are bought for dorms). And the low price—some models cost as little as $70—might be appealing. But these Lilliputian appliances are surprisingly inefficient when it comes to electricity consumption. The most-efficient compact refrigerator we recently tested consumes about 280 kilowatt-hours per year, compared with roughly 390 kWh for an energy-efficient 18-cubic-foot top-freezer refrigerator.

That means the mini-fridge offers only about a tenth of the storage space but uses almost 72 percent of the energy the full-size model consumes. In other words, you're not getting a lot of storage bang for your fridge buck. For more on compact refrigerators, read our brand-new ratings-based buying guide.

Whenever you shop for a refrigerator or other appliance, refer to the yellow EnergyGuide label to find out how much electricity it's likely to use. And read "Refrigerator Capacity Claims Don't Add Up" to find out which regular-size models offer the most usable storage space.

For complete Ratings and recommendations on appliances, cars & trucks, electronic gear, and much more, subscribe today and have access to all of ConsumerReports.org.
Types of Power Management

There are 4 basic types of computer power management or "sleep" features on Windows PCs:

1. "System standby"
   Drops monitor and computer power use down to 1–3 watts each
   Wakes up in seconds
   Saves $25–75 per PC annually

2. "System hibernates"
   Drops monitor and computer power use down to 1–3 watts each
   Wakes up in 20+ seconds
   Saves work in the event of power loss
   Saves $25–75 per PC annually

3. "Turn off monitor"
   Drops monitor power use down to 1–3 W
   Wakes in seconds or less
   Saves half as much as system standby or hibernate: about $10–40

4. "Turn off hard disks"
   Saves very little energy

Advantages

Activating Power management features provide many benefits including:

1. Cutting the electricity used by PCs roughly in half, saving $25–75 per PC annually.
2. Enhancing data security by reducing the chance that valuable personal information is displayed on an unattended PC.
3. Saving time by eliminating the daily wait for computers to boot up.

Recommendations

The recommendation from IT is to follow EPA best practices and activate the following power management settings:

- Computers will be set to enter system standby after 30 minutes of inactivity. This reduces power consumption from as much as 250 watts to less than 2 watts.
- LCD monitors will be set to enter sleep mode after 15 minutes of inactivity. This reduces power consumption from 35 watts to less than 2 watts.

The most efficient way to activate these settings is to implement a policy in Active Directory. You can also activate these settings manually. Instructions are available at Please note that when these settings are enabled, you will be unable to access your computer from a remote location.
Idling reduction makes business sense

Engine idling costs businesses money in wasted fuel and engine wear, and needlessly pollutes loading docks and other work sites with tailpipe exhaust.

The trucking industry has analyzed the impact of idling on engines, both in terms of maintenance and engine wear costs. According to industry estimates, idling costs the truck owner the price of almost one gallon of fuel each hour.¹

Thus, implementing an idling reduction program with your fleet will not only affect air quality, but can improve your bottom line as well. The benefits of idling reduction include:

- Overall fuel savings
- Longer engine life
- Longer time between oil and filter changes
- Improved air quality
- Less noise
- Healthier work environment (loading docks, work bays, etc.)

Make your worksite a No Idle Zone

Idling reduction can occur through behavior, such as implementing fleet policies and conducting driver education campaigns, as well as through technology, which could include truck stop electrification and when feasible, installation of onboard idle governors.

To get free “No Idle Zone” signs for a worksite location, the Puget Sound Clean Air Agency considers:

- Your proposed site (such as fleet yards, loading docks, etc.) for effectiveness, impact
- Your commitment to post and maintain signage and conduct staff/driver education about idling reduction

To request sign(s) or discuss implementing a work-place idling reduction program, e-mail Amy Warren.

And annually

- Consumes over one billion gallons of fuel
- Costs over $2 billion

Idling impacts

Long-duration truck idling

- Causes more oil and oil filter deterioration
- Increases the need for more oil and filter changes
- Lessens engine lifespan and hastens the need for engine rebuild

Annually emits

- 11 million tons of carbon dioxide
- 180,000 tons of nitrogen oxides
- 5,000 tons of particulate matter