



An Energy-Efficiency Workshop and Exposition
Orlando, Florida

Achieving Energy Efficiency with Energy Management Reviews

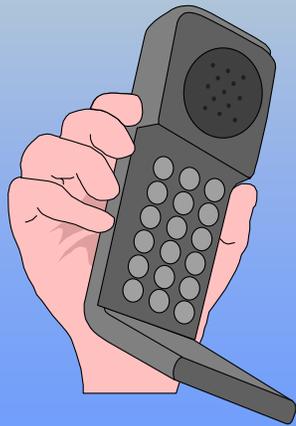
David Guthrie, P.E.

U.S. Fish and Wildlife Service
Energy Coordinator



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Please be courteous to our speakers



*Turn off all cell phones
and
Set pagers to vibrate*



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Energy Overview



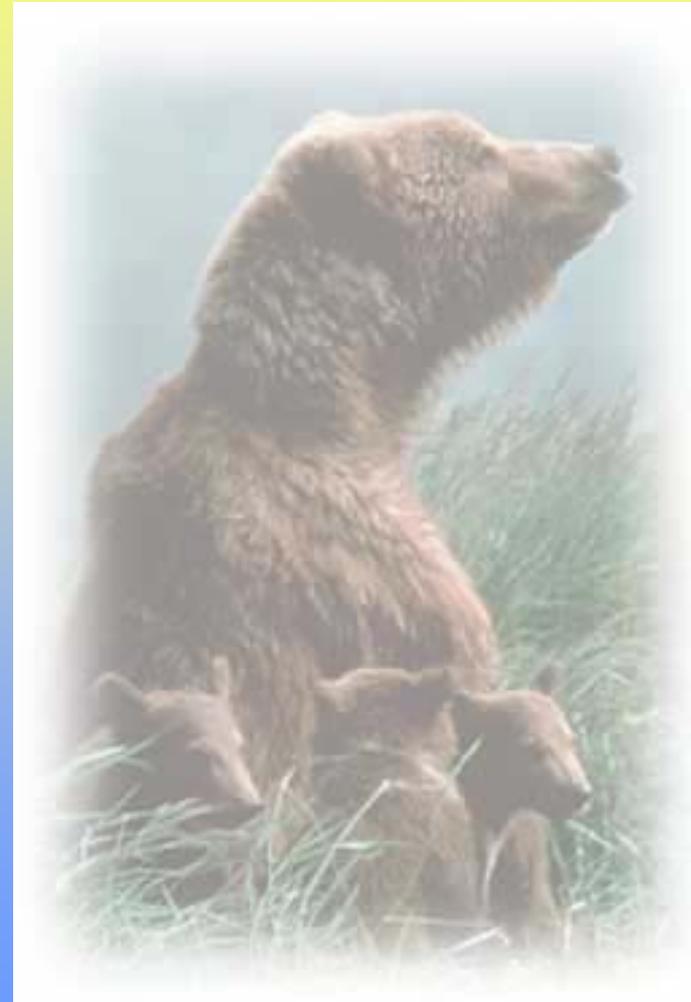
- The Service spent \$8.6 million for energy in FY 2002 for over 6 million energy-using gsf
- Building energy is -50% from 1985
- But total energy use/costs +5% from 2001
- Implemented 43 projects in FY 2002 for \$767,024
- Looking good on paper is not enough!



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Why EMS?

- A good business practice
- Fosters planning instead of reaction
- Achieves cohesive implementation of energy policy and more on-site energy assessments





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Model for Continual Improvement

Do less inspections

Continuous improvement



Plan for Sustainability

Provide tools



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How Does Energy fit in to the EMS?

The  of the Energy Management Review is the Energy Walkthrough





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Ask Questions First

- Has the field station contacted the Regional Energy Manager to discuss potential energy efficiency?
- Has the field station taken steps to educate staff on energy efficiency practices?
- Has an energy audit or renewable energy opportunity assessment been performed?



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More Critical Questions

- Are key procedures written down?
- Are energy files well organized?
- Are responsibilities documented?
- Is everyone trained at the right level?
- Are there goals and objectives for improving energy performance?



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*Use a systems approach to avoid
secondary effects*

- Switching to energy-efficient lighting may reduce cooling loads in a building
- Switching to water-conserving showerheads may reduce water heating requirements and heating costs
- Environmentally preferable renewable and alternative fuel energy sources may not be economically feasible

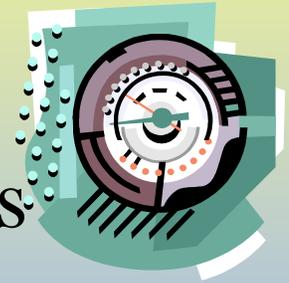




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Identify less glamorous, no-capital operational changes

- Tune up and maintain equipment
- Adjust thermostat settings, reduce unnecessary lighting, caulk windows and doors, educate employees
- Fix plumbing and equipment leaks





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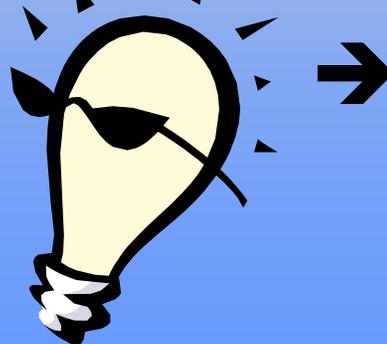
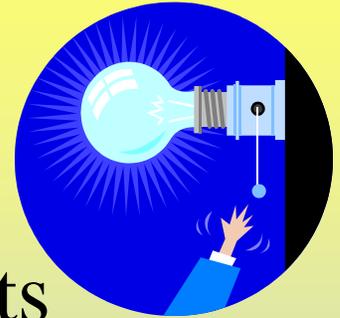
*Office Equipment, Computers,
Appliances*

- Turn off/shut off
- Power saver mode
- Purchase Energy Star equipment



Lighting

- Turn off lights/remove excess lights
- Use Task lights
- LED Exit lights
- Motion detectors
- Replace incandescents with CFL's
- Daylighting!





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HVAC

- Maintenance/tune-ups
- Seal leaks
- Upgrade systems with Energy Star
- Use outside air
- Chill water off-peak
- Switch fuels

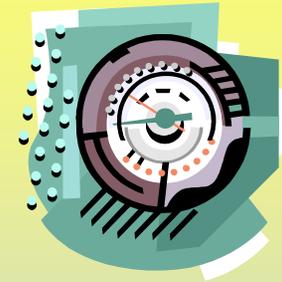




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Buildings

- Install programmable thermostats
- Adjust thermostats to 72°F as reasonable and customary per location
- Seal leaks/caulking
- Insulation: attics, windows, doors
- Install blinds and window treatments
- Replace single-paned windows/use film





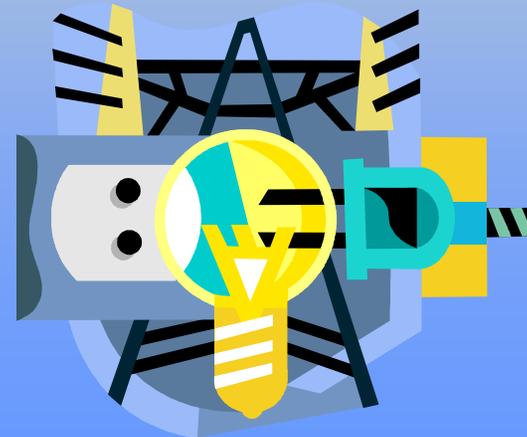
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Utilities

- Review “Demand Side Energy Management Guidelines”



- Call the utility to arrange a free audit
- Determine if rebates are available





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MMS

- No benefit in installing advanced or renewable energy technologies in energy-inefficient buildings!
- Only energy-related deferred maintenance projects in the MMS will be funded

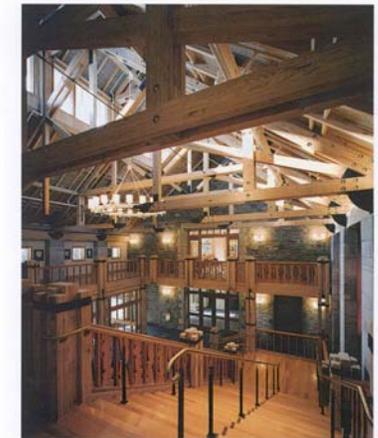
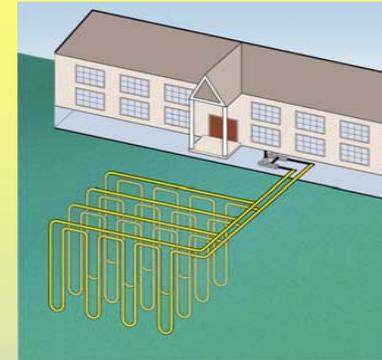




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Renewable Energy

- Geothermal →
- Solar outdoor lighting (Merritt Island NWR)
- Solar PV (Farallon) →
- Passive solar energy (NCTC) →
- Wind energy (Eastern Neck NWR) →





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Drive Green



- New internal Service web site
- Combine trips/car pool (don't need the 4x4 to go to town!)
- Good Maintenance
- Acquire AFV's/
hybrids



Water Conservation

■ Best Management Practices

■ 1.6 gallon toilets

■ 2.5 gpm shower



heads

■ Faucet aerators and in-flow restrictors

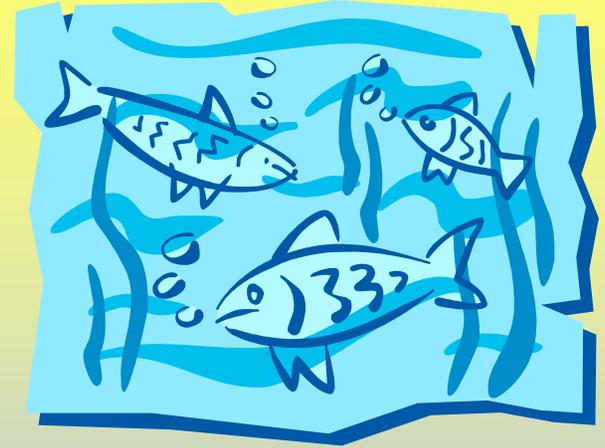
■ Maintenance/fix leaks/adjust valves

■ Irrigation/xeriscaping



Fish Hatcheries

- Repair/replace pumps with variable-speed drive pumps



- Minimize



waste of pumped water

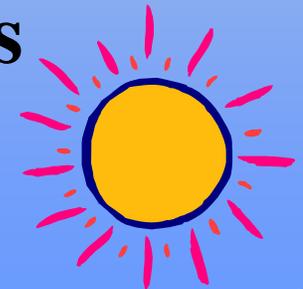
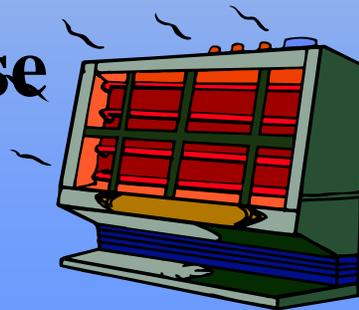
- Maintain

water heating systems

- Evaluate

solar mats to heat H₂O

- Use **infrared local heaters**





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Reporting

- Has the station provided an annual energy report via the web-enabled database?
- Included information about projects?
- Updated the Facility Energy Strategic Plan (in the EMP)?

FileMaker Pro - [FWSEnergy]

File Edit View Insert Format Records Scripts Window Help

Find Find Sort Export New Print Quit Profile Duplicate Omit US Fish and Wildlife Service
Instructions Switch View The National Wildlife Refuge System

Washington Office Form

Records: 603
Number: 7
Found: 8
Status: Sorted

Adjust Electricity to = 6%
Adjust Electricity to = 80%
Check Data

View Forms
Go to List View
Go to Data Entry
Go to Summary
Go to DOE Report
Go to Energy Project 1
Go to Energy Project 2
Go to Energy Project 3
Go to Unit Cost Station
Go to Unit Cost Servicewide
Go to Annual BTU/GSE Data
Go to Servicewide Annual Data
Go to Energy Project Summary
Go to Facility Energy Strategic Plan
FEOS Analysis
Replace Data Form

ORGCODE STATION REGION 5 QUARTER 4 FY 2002
51590 Eastern Neck NWR STATE MD
STATION TYPE W DATA ENTERED DATE: 10/21/2002
(noAdd/yyyy)

Energy Usage GSE 8,240 BTU/GSE 58,859 New Initiatives Yes
Energy Projects Yes

	BUILDING DATA		PROCESS DATA	
	UNITS	COST	UNITS	COST
ELECTRIC (KWH)	50,971	5,873	12,843	1,418
FUEL OIL (GAL)	2,225	2,886	0	0
NATURAL GAS (CF) (CF = THERMS x 97)	0	0	0	0
LPG/PROPANE (GAL)	20	35	0	0
WOOD (CORD)	0	0		
GASOLINE (GAL)			243	296
DIESEL (GAL)			1,119	1,172
AMATION GAS (GAL)			0	0
JET FUEL (GAL)			0	0
(See instructions)				
WATER (GAL)	0	0		

COMMENT

100% [Zoom] [Browse]

For Help, press F1

Did you implement any energy studies and for projects this fiscal year? If yes, Click on Go to Energy Project 1 or Go to Energy Project 2 or Go to Energy Project 3 on the left side of this screen

Process Electric Use 20 %
Process Energy Use 8 %

NOTE: Refuges and offices should have at least 5%, and hatcheries should have at least 80% process electricity use. Verify/review data when done!



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Recommendations

Implement energy and water conservation measures within an EMS that cost-effectively addresses:

- What can be done?
- When it should be done?
- How it will be funded?