

ENERGY 2002

Greening Government Operations

June 2002

Alan Hurt, U.S. Navy



Federal Network for Sustainability



**Demonstrating
Federal Leadership in the Western
United States**

Why 'Sustainability?'



- ☛ Creates a **Long Term Approach** to environmental protection and process improvements
- ☛ **Prevents Pollution** from the start
- ☛ Calls for **Systems Thinking**, (e.g. the interconnectedness of the economy, environment, social and national security concerns).
- ☛ Helps identify a **Strategy or Framework**
- ☛ **Leverages Scarce Resource\$**

Purpose of the Federal Network for Sustainability

- ☛ Leadership!
- ☛ Develop and Coordinate Network
- ☛ Create and Manage an information-sharing clearinghouse
- ☛ Develop and Deliver training for network members



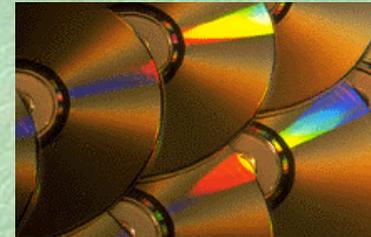
Purpose of the Federal Network for Sustainability, Cont.

- ☛ Communicate Ideas through conferences and meetings
- ☛ Seek Linkages and Partnerships
- ☛ Develop and Showcase Sustainable Programs
- ☛ Act as a Catalyst for Change



■ FNS Members Tim Scanlon (BPA), Steve Butterworth (NPS), & Curtis Framel (DOE) at the Lake Mead Entrance Station

Primary Area of Focus



☛ Using the Power of Government as Consumer!

The United States government is the world's **largest** purchaser of consumer products and services.

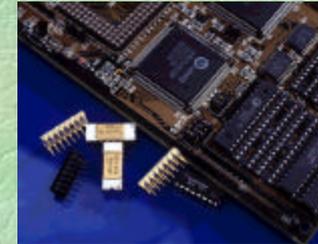


Five Initiatives of FNS....

- Copy Paper



- Electronics Stewardship



- Use of EMS Plans



- Green Buildings

- Purchasing Green Energy & Alternate Fuels



Environmental Benefits

🌿 *Water Conservation*

Drought tolerant and native plants, efficient irrigation, and minimization of high-water use landscape areas conserve approximately 50 percent of landscaping water.

🌿 *Pollution Prevention*

Hearty native plants require less water and fertilizer, reducing the risk of polluted runoff entering local waterways and the ocean.

Environmental Benefits

☘ *Energy Savings*

Energy efficient outdoor lighting uses 90 percent less electricity than traditional lights. Strategically planted shade trees reduce the "heat island" effect caused by large asphalt parking areas, and minimize cooling requirements of the building and sun damage to parked vehicles.

☘ *Reduced Waste*

Replacing lawn areas with plants that require less pruning reduces green waste, and the use of recycled products such as mulch, recycled plastic lumber, and rubberized asphalt enhances markets for recycled materials.

Economic Benefits

☘ *Lower Energy Bills*

Energy-efficient lighting and reduced demand on building cooling systems can save thousands of dollars in annual electric bills.

☘ *Reduced Fuel Costs*

Energy-hungry lawn mowers and noisy leaf blowers have been exchanged for simple pruning shears and hand rakes, thereby reducing fuel costs. This will help to conserve our limited supply of fossil fuels and improve air quality.

☘ *Reduced Waste Disposal Costs*

Landscaped areas that produce less green waste reduce waste hauling and disposal fees, trips to the landfill, and the many associated costs of landfill operations and maintenance.

Social Benefits

☘ *Improved Work Environment*

Flowering plants, pathways, fountains and other natural and architectural features greatly improve the building aesthetics, providing a beautiful setting for employees and visitors to enjoy.

☘ *Educational Opportunities*

Educational signage offers information on environmentally friendly landscape design, water conservation, plant varieties, and waste reduction. Seating for educational workshops is provided in several areas around the building.

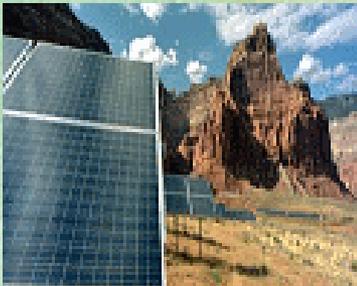
☘ *Stress Reduction Areas*

The sound of running water has long been considered a stress reliever. Recirculating fountains and landscaping at the outdoor seating areas provide employees and visitors with a relaxing place to unwind.

Green Power & Alternative Fuels Initiative



- Purchasing electricity and fuels generated from renewable resources, including solar, wind, geothermal, biomass/biodiesel, and landfill gas.
 - New initiative underway to aggregate federal demand and facilitate purchases of “green tags” or Renewable Energy Credits
 - New initiative under development to promote the purchase of Alternative Fueled Vehicles



Green Power & Alternative Fuels, Cont.

- FNS has a three-pronged approach to green power:
 - On-site development of renewable energy technologies
 - Procurement of green power
 - Procurement of green tags or “renewable energy credits”

Central Station Wind Facility



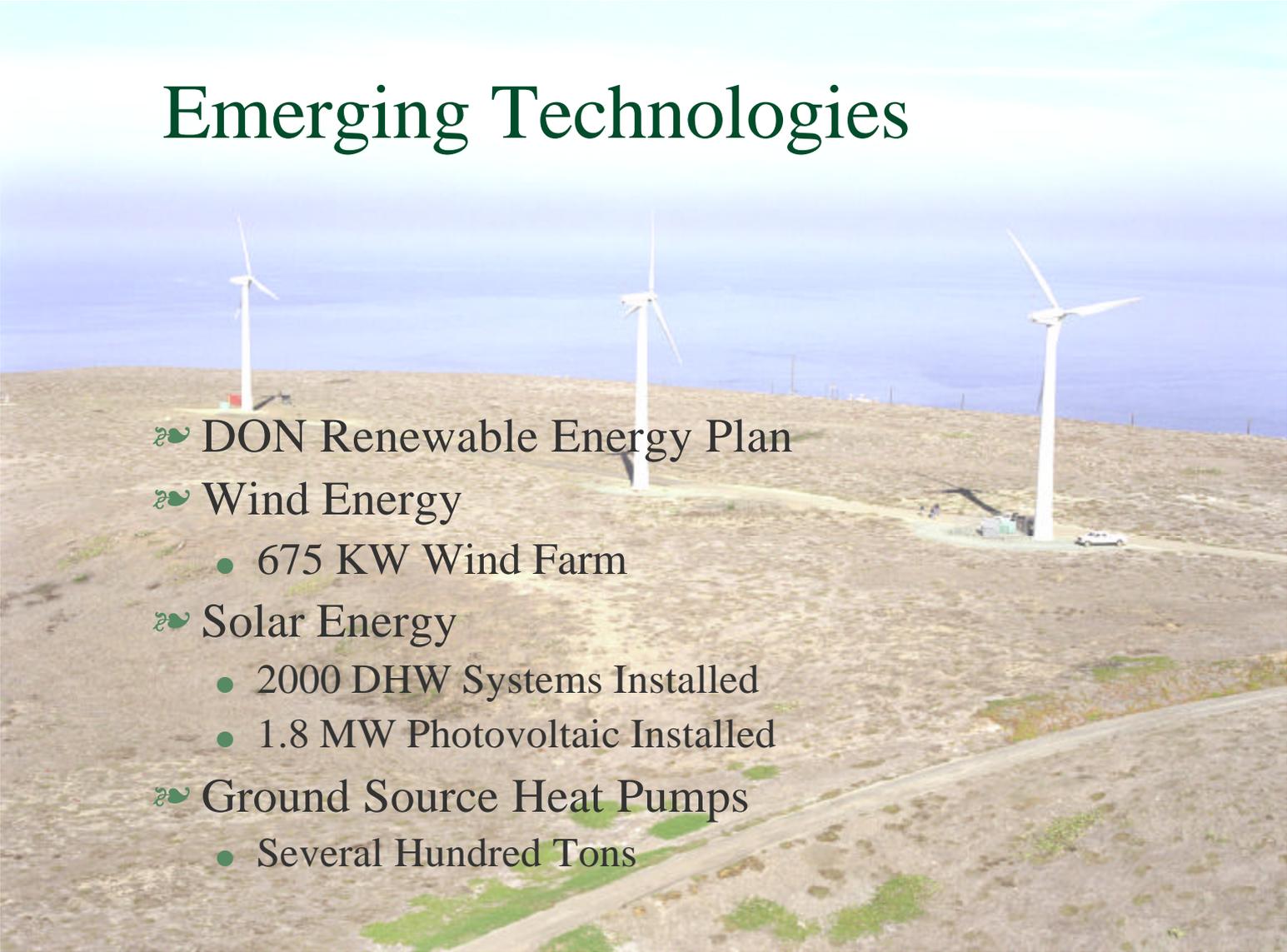
Warming, Wind Energy

Geothermal Energy Plant



Next Gen Fuel Facility, California

Emerging Technologies



- ☞ DON Renewable Energy Plan
- ☞ Wind Energy
 - 675 KW Wind Farm
- ☞ Solar Energy
 - 2000 DHW Systems Installed
 - 1.8 MW Photovoltaic Installed
- ☞ Ground Source Heat Pumps
 - Several Hundred Tons

750 kW Photovoltaic System

- ☛ **NAS North Island**
- ☛ **One of Largest PV in U.S**
- ☛ **1,200 Mwh/yr Energy Savings**
- ☛ **205 Metric Tons Carbon/yr Avoided**



Two 60 kW Microturbines at Naval Amphibious Base

- \$ 80,000 annual savings
- 970,000 kWh/yr. generation
- 5,800 MBTU/yr. thermal recovery
- Simple payback = 3.6 years after incentive awards



**Two 60kW microturbines at NAB
Bldg. 299HTHW Boiler Plant**



FNS Member Showcase: Navy Bio-Diesel Generation From Waste Oils

Opportunity:

Field demonstrate the bio-diesel production process to efficiently recycle used vegetable oils to produce biodiesel fuel. Verify reduced air emissions from using bio-diesel versus diesel fuels.

Description:

The proprietary Modular process is a semi-continuous process that converts used cooking and vegetable oils to bio-diesel using a chemical process. Use bio-diesel fuel in Navy engines to verify reduced air emissions

Benefits:

- Recycles used cooking and vegetable oils.
- Produces biodiesel as a fuel for Navy use.
- Reduces diesel particulate and other emissions using bio-diesel in Navy diesel engines.
- Reduces solid waste disposal costs and diesel fuel procurement costs

Status:

CRADA signed and in place with NAS Point Mugu/Vendor/NFESC



Field Demonstration of the “Modular” Biodiesel Production Process and Validation of Emissions Reduction



FNS Member Green Power Purchases

<u>Federal Agency</u>	<u>Location</u>	<u>Amount</u>	<u>Resource</u>
EPA	Manchester, WA	3.3 million kWh	Wind (green tags)
EPA	Richmond, CA	1.8 million kWh	Landfill Gas/Geothermal (tags)
US Postal Service	California	30 million kWh	Geothermal/Biomass/Small Hydro
Bonneville Power	Portland, OR	0.55 million kWh	Wind

FNS Member Purchases Support E.O. 13123

“Greening the Government Through Efficient Energy Management”

☞ Section 404 Electricity Use

- Include green power provisions in RFP’s “whenever procuring electricity”
- Can use energy efficiency savings to pay premium

☞ Renewables Goal: 2.5% by 2005

- “Renewable energy” means energy produced by solar, wind, geothermal, and biomass power
- Credit towards EE goals

Alternative Fuel Vehicles and Hybrids Purchases

☛ **FNS is currently developing an initiative to support the purchase of AFV's and Hybrids**

- Solidifying partnerships with state and local governments in the west to leverage the buying power of government entities and bring down the cost of AFV's



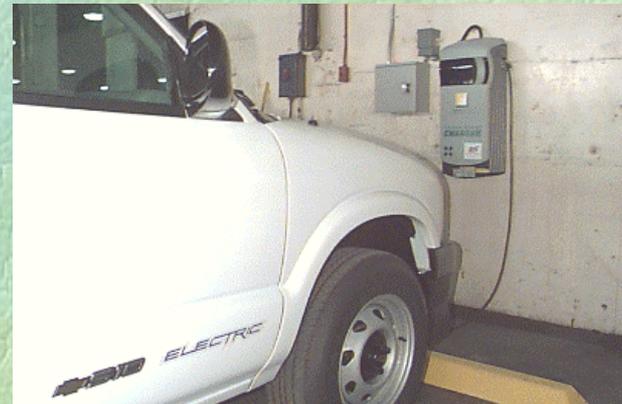
DoD / Navy ZEV Program

☛ DoD/SECNAV ZEV Program

- 68 GM S-10 electric pickups
- 5 Dodge electric Minivans
- West Coast: Port Hueneme, San Diego (34 pickups, 5 minivans)

☛ North Island: 10 electric pickups

- 10 charging stations installed July 97
- All 10 trucks deployed



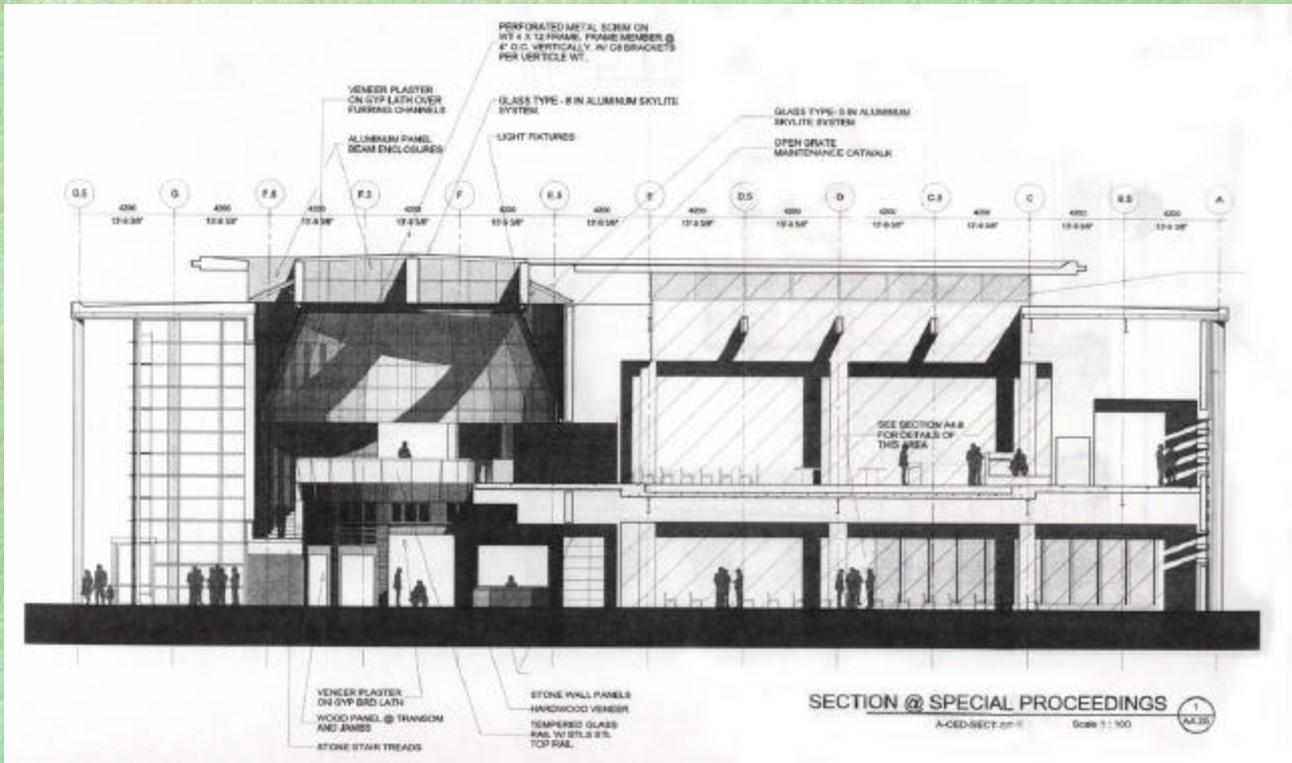
S-10 Being Charged
at NAS North Island

Green Buildings - Purpose

- ☛ To fully support Executive Orders
- ☛ Provide education and training on green building principles
- ☛ Share information among federal agencies on experiences learned



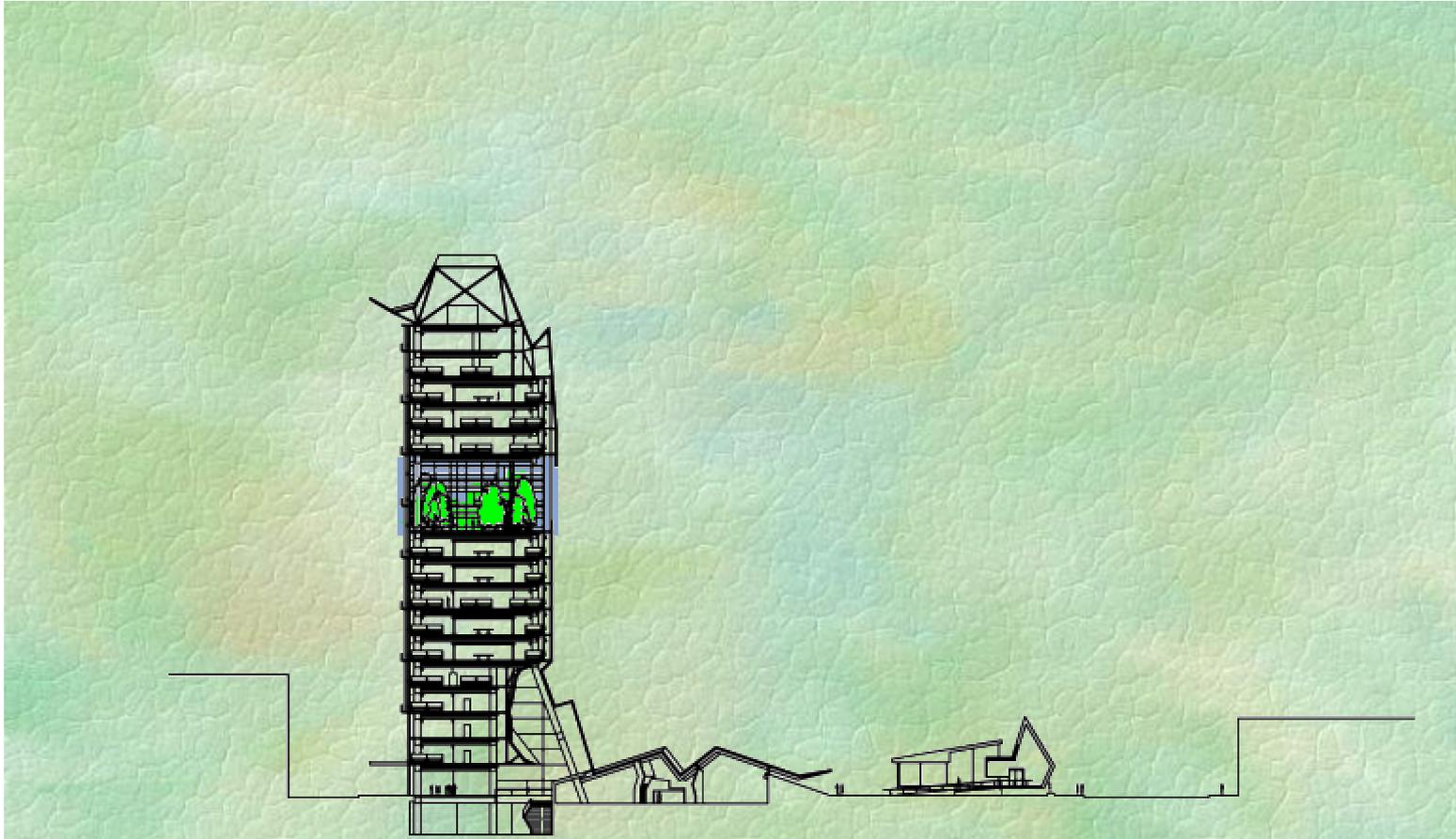
Alfred A. Arraj U.S. Courthouse
Denver, CO



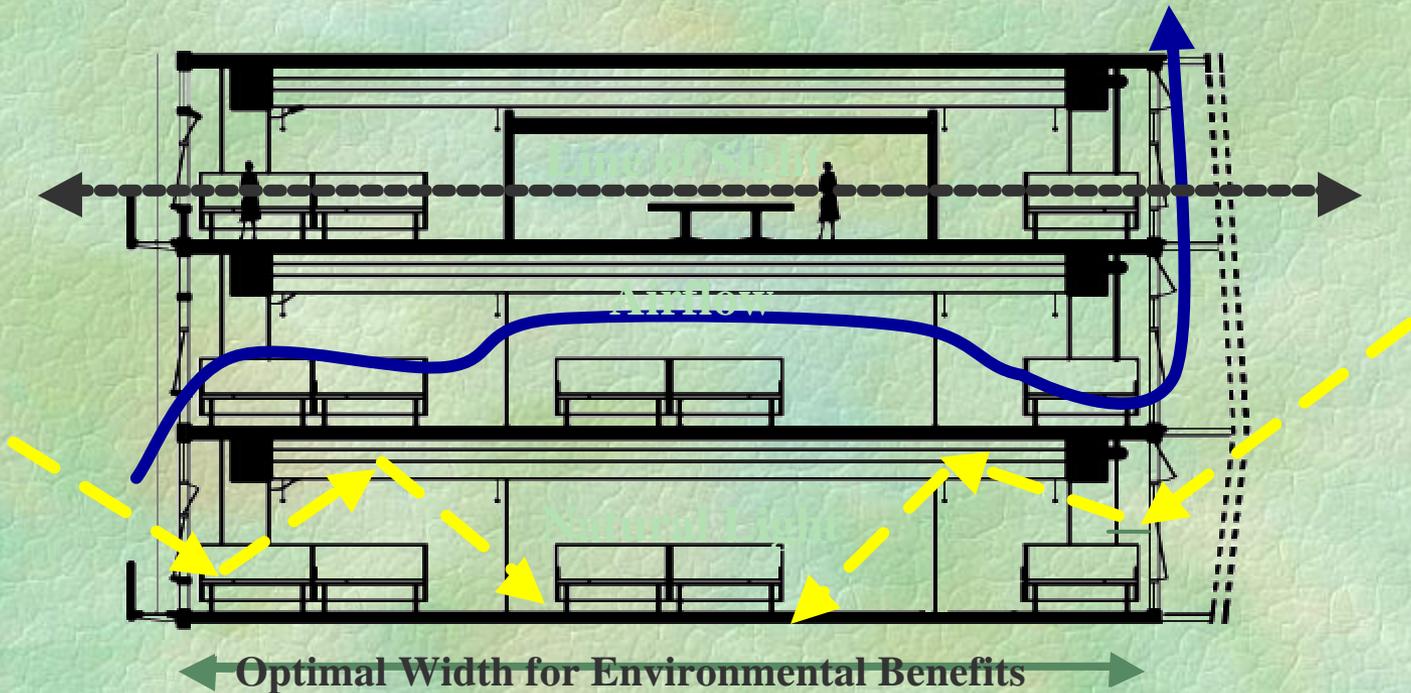
U.S. Courthouse, Denver, CO



Federal Building, San Francisco, CA



Federal Building, San Francisco, CA



Federal Building, San Francisco, CA

“Greening” of the Pentagon Summary of Initiatives



- *New Heating & Refrigeration Plant and utility distribution system*
- *State-of-the-art climate control system, tighter thermal building envelope*
- *Open bay environment improves energy efficiency: air flow, lighting*
- *Use of environmentally safe materials*
- *Improvements to pedestrian/vehicular traffic flow*
- *Greater flexibility for future changes*
- *Investments in new technology and alternative sources of energy*

Improve Energy Performance With Improved Contracting Methods



- Hire better contractors
- Give them incentives to achieve your goals
- Set clear goals
- Operate as a team
- Measure progress against goals
- Reward Achievement

Hire Better Contractors

Improve Acquisition Strategy

Traditional Strategy

- Low bid
 - Drives away top performers
 - Bids below reasonable cost
 - Liar's contest
- Design-Bid-Build
- Government caught between designer and constructor



PenRen Strategy

- Best-value
- Design-Build
- Multi-phase source selection
- Stipends for design
- Most probable cost
- Performance specifications



Hire Better Contractors

Improve Acquisition Strategy

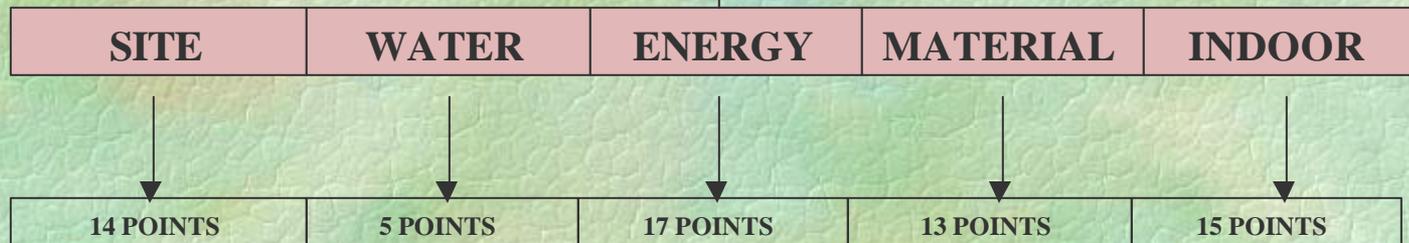
- **Phased source selection:**
 - **Phase 1 (Initial down-select)**
 - Typically 2-3 teams selected
 - Selection based on past performance
 - Fast decision, minimum cost to offerors
 - **Phase 2 (Final Selection)**
 - Competition between teams from Phase 1
 - Results in conceptual design
 - Best value...cost, design, team, IMP/IMS
 - “Build to budget”
 - Stipend to offerors



Pentagon Renovation Program Initiatives

- The US Green Building Council (USGBC) LEED 2.0 system (LEED for New Buildings) is organized according to environmental areas of concentration. It is a rating system that consists of four levels, with points being given for meeting requirements within each of the five areas of concentration
 - A total of 69 points are available, with point breakdown as follows:
 - LEED certification - basic - 26-32 points
 - Silver certification - 33-38 points
 - Gold certification - 39-51 points
 - Platinum certification - 52 + points

LEED RATING SYSTEM



+

LEED ACCREDITED PROJECT MEMBER - 1 POINT

4 POINTS - INNOVATION CREDITS

EXAMPLE OF LEED POINT CRITERIA

MATERIALS AND RESOURCES

CREDIT 2.1: Construction Waste Management, Salvage/Recycle 50%

Intent: Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable materials back to the manufacturing process

Requirement: Develop and implement a waste management plan, quantifying material diversion by weight. Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste

Submittals: Provide a copy of the Waste Management Plan for the project highlighting recycling and salvage requirements. Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes are recycled or salvaged

1 LEED point

Pentagon Renovation Program Initiatives

- PenRen is incorporating LEED into all projects
- LEED certification process ongoing in 2 projects
- Remote Delivery Facility (RDF) - LEED certification process started after design phase
 - Application made under LEED 1.0 - anticipate Bronze certification. Difficulty encountered in documentation - chronicling past efforts

Remote Delivery Facility

- Secure, consolidated screening facility apart from Pentagon
- 250 vehicles daily
- 250,000 square feet
- First design-build contract for PenRen



Pentagon Renovation Program Initiatives

🐦 Metro Entrance Facility (MEF) - LEED certification process started at approximately 70% design

- Application made under LEED 2.0 - striving for Silver certification (LEED certified replaced Bronze under version 2.0). Difficulty encountered due to fast-paced construction schedule. Stage of design allowed for few design changes
- projects include energy modeling, irrigation well, electric car outlet
- MEF Sustainable design group meets on a regular basis to strategize LEED requirements and points to be achieved. Action items assigned via matrix, with status categories



Pentagon Renovation Program Initiatives

- **USGBC is introducing LEED for Existing Buildings. We are applying for “pilot” status for the Wedges 2-5 project**
- **USGBC very interested in Pentagon Wedges 2-5 being in the pilot program for LEED for Existing Buildings**
- **Proactive timing would allow LEED certification process to begin at start of design process, and would enable better chance of higher LEED rating**
 - **Would also enable PenRen to participate in drafting the final LEED standard for existing buildings**
 - **Would enable government-contractor teaming on sustainable construction from the start of contract award**

FNS Member Showcase: Navy Energy and Sustainable Design Demonstration Facility

- ☛ **NBVC established as Navy Energy Showcase Base, 1995**
- ☛ **Various projects reducing energy use by 30% from 1985 baseline**
- ☛ **Completed Navy's Energy and Sustainable Design Demonstration Facility:**
- ☛ **Envisioned as the showcase program centerpiece to:**
 - **Change the way we approach design and construction**
 - **Highlight the Navy's leadership in the energy field**
 - **Demonstrate innovative and environmentally responsible design practices**
- ☛ **Facility features nearly zero net energy use, utilizing:**
 - **Renewable technologies: 100% natural daylighting, photovoltaics, solar heating**
 - **Energy efficient technologies: lights, HVAC, DDC, bldg. envelope**
 - **Environmentally sustainable features: recycled and environmentally friendly materials, sustainable landscaping, sustainable construction practices**



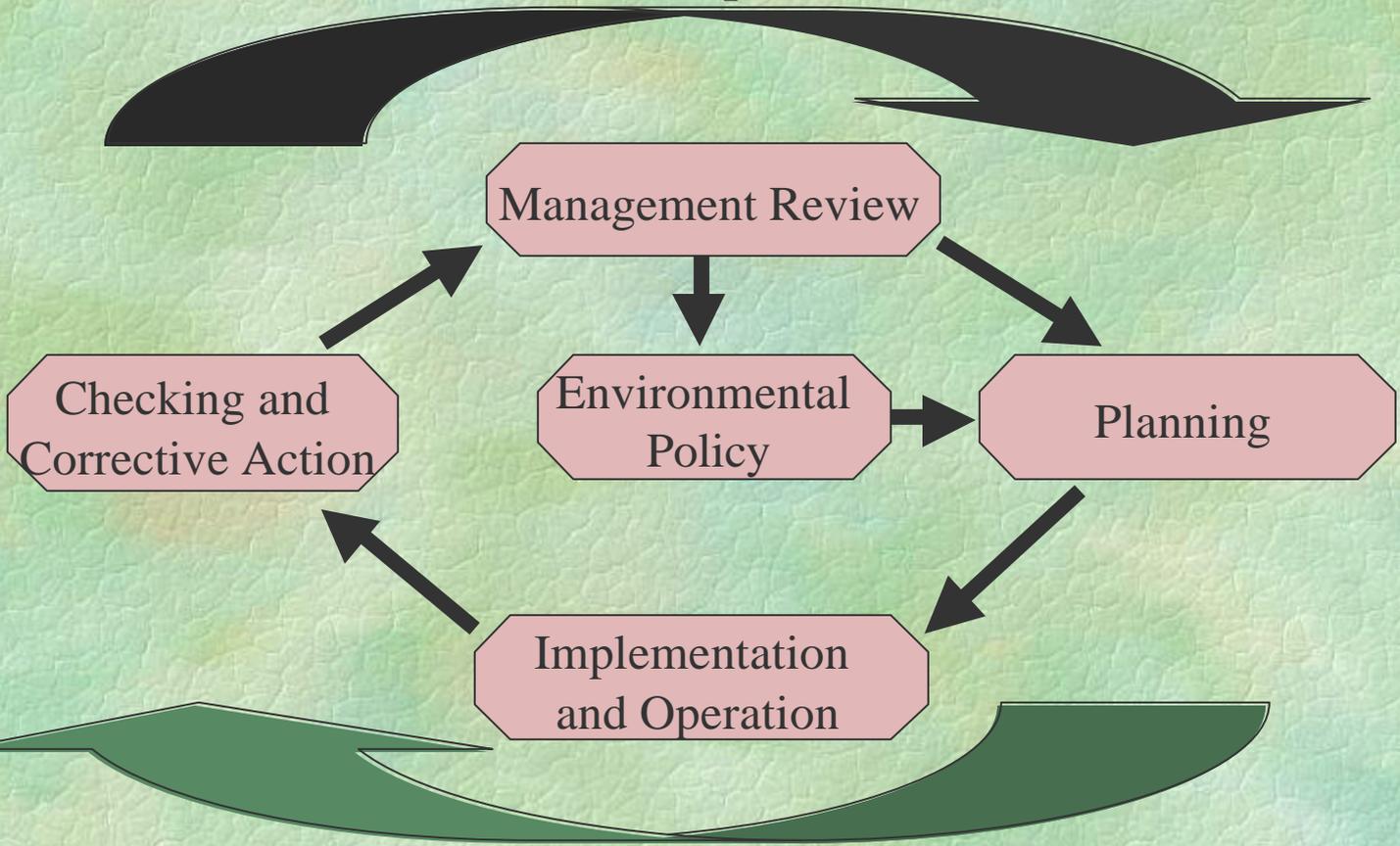
Environmental Management Systems Initiative - Purpose

- ☛ To fully support Executive Orders
- ☛ Provide Education and Training on EMS principles
- ☛ Share information among federal agencies on experiences learned
- ☛ Promote implementation of EMSs at member agencies

ISO 14001 Definition of EMS

☞ “that part of the overall management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy”

Continual Improvement



Continual Improvement

Foundation for Elements of an EMS

- ☛ The foundation lies with the environmental policy of an organization
- ☛ Each component of an EMS is dependent on and supported by the others
- ☛ As part of the commitment to continual improvement, organizations measure, monitor, and evaluate their environmental performance, looking at their need for change in the environmental policy
- ☛ **The underlying component of an EMS is its continual improvement**

FNS Member Showcase: NASA Environmental Management System

- ☛ NASA's EMS Development Team was awarded the "White House Closing the Circle the Award".
- ☛ NASA's EMS is based upon benchmarking industry processes and the international ISO 14001 standard.
- ☛ When fully implemented, NASA's EMS will provide an overarching approach to management of environmental activities that will increase efficiencies and save costs.



FNS Member Showcase: NASA Integrated Vegetation Management Program

☛ NASA Ames Research Center developed an Integrated Vegetative Management Program comprised of:

- utilizing native vegetation
- utilizing goats to control “stubborn vegetation”
- adjusting the timing and height of turf and mowings
- utilizing the least toxic herbicides which are biodegradable

☛ The IVM program has reduced pesticide and herbicide use at the facility by 97%





FNS Member Showcase: Ft. Lewis Installation Sustainability Program

- ☛ **The Objective** — A Sustainable Installation that Supports Sustainable Operations
- ☛ **The Approach:**
 - Begin with Environmental Issues
 - Establish Environmental Baseline Document
 - Host Environmental Sustainability Workshop (Feb 2002)
 - Involve Stakeholders
 - Establish 25-year goals
 - Develop 5-year implementation plans
 - Establish Installation Sustainability Board



FNS Member Showcase: Ft. Lewis Installation Sustainability Program, cont.

PROGRAM GOALS

1. Reduce traffic congestion and **air emissions by 85%** by 2025.
2. Reduce air pollutants from training without a reduction in training activity
3. Reduce stationary source **air emissions by 85%** by 2025.
4. Sustain **all activities** on post **using renewable energy** sources and generate all electricity on post by 2025.
5. **All** facilities adhere to the **SPiRiT Platinum standard** for sustainable facilities by 2025.
6. Cycle all material use to achieve **ZERO net waste** by 2025.
7. Obtain healthy, resilient Fort Lewis and regional lands that support training, ecosystem, cultural, and economic values by 2025.
8. Recover **all listed and candidate federal species** in South Puget Sound Region by 2017.
9. Cascade water use to achieve **ZERO discharge of wastewaters** by 2025.
10. Reduce Fort Lewis **potable water consumption by 75%** by 2025.
11. Fort Lewis contributes **no pollutants to groundwater** and has remediated all contaminated groundwater by 2025.
12. Develop an effective **regional aquifer and watershed management** program by 2012.

Why are We Doing These Things?

- ☛ RCRA Section 6002
- ☛ Pollution Prevention Act of 1990
- ☛ Energy Policy Act of 1992
- ☛ Federal Acquisition Regulations (FAR)
- ☛ Executive Orders
- ☛ Individual Agency/Departmental policies
- ☛ Cost savings
- ☛ It's the Right Thing To Do!

FNS Sponsored and Co-Sponsored Events

- ☛ *Green Power Summits* - Sept. 2000 (Seattle, San Diego)
- ☛ *Affirmative Procurement Training* - Dec. 2000
- ☛ *Peer Matches with Other Federal Agencies* (DOE, EPA, BPA, NPS, HUD, Navy, Army) - ongoing
- ☛ *Forum 2001: Update on Brightfield Initiative to Federal Renewable Working Group* - April 2001 (Washington DC)
- ☛ *Energy Strategies for Alaska Facilities* - May 2001 (Anchorage)
- ☛ *Environmental Management Systems Training* - Aug. 2001 (Seattle)

Benefits of Participation in FNS Activities....

- ☞ Leadership and Peer Recognition
- ☞ Direct Cost Saving\$ -- Often with Superior Performance
- ☞ Sharing and Networking
- ☞ Progress Towards Implementation of Executive Orders
- ☞ Reduced Bureaucracy by leveraging resource\$
- ☞ Access to Existing Expertise
- ☞ Shared Training and Coordination with Federal Agencies
- ☞ Increased Employee Enthusiasm and Support

How to Get Involved

- ☛ Contact [Al Hurt](#), FNS Chairman, US Navy at (619) 524-6253, Hurt.Alan.C@asw.cnrsw.navy.mil
- ☛ Attend FNS supported Conferences, Meetings and Trainings
- ☛ Sign the Statement of Unity
- ☛ Join our email listserv
- ☛ Tell us your success stories, and we'll help you get the word out to others!

www.FederalSustainability.org

“As public entities working to advance the public interest, Federal Agencies through leadership and example can inspire all of society to advance an agenda for sustainability.”

