Overview
The U.S. Navy’s third largest fleet concentration area is located in the Puget Sound area of Washington State. That area - Navy Region Northwest - hosts an innovative Resource Efficiency Manager (REM) program.

The Department of the Navy (DON) has a federally-imposed mandate to reduce energy use by 35 percent from the FY 1985 baseline by the year 2010, as required by Executive Order 13123. The DON is well on-track to meet the reduction requirements. In keeping with the energy reduction mandates, the Navy Region Northwest has partnered and leveraged resources to save energy and dollars. Based on the FY 2000 annual energy report, the DON had reduced its standard buildings energy consumption per gross square foot by nearly 25 percent, relative to the 1985 baseline. Baseline consumption was 134,338 Btu/Ft² and current consumption (as of 2000 report) was 101,001 Btu/Ft². Navy Region Northwest’s percentage of reduction has nearly tracked the overall Navy total.

The first Navy Northwest Region REM program placed an individual in 1997 at the Naval Air Station on Whidbey Island and the Naval Undersea Warfare Center at Keyport. A second REM was installed within two years, and a third REM by the fourth year.

The REM program began as a result of a partial grant from the Federal Energy Management Program and a three-month contribution of services from the local utility, Puget Sound Energy. The grant was administered through the Washington State University Cooperative Extension Energy Program and relied on agreements between the local utility, Naval Facilities Engineering Command, and Navy Region Northwest.

The Whole REM Picture
As of June 2003, the following locations are receiving support from Resource Efficiency Managers (REMs) on a partial or full-time basis:

**Army**
- Fort Lewis (Washington)
- Fort Bragg (North Carolina)
- Fort Polk (Louisiana)

**Navy Region Northwest**
- Bangor Submarine Base
- NAVSTA Bremerton
- Puget Sound Naval Shipyard
- NAVMAG Indian Island
- NAS Whidbey Island
- NAVSTA Everett
- NUWC Keyport
  (All in Washington)

**Navy Region Southwest**
- Naval Station San Diego
- Naval Base Coronado
- Naval Base Point Loma
- Naval Air Facility El Centro
- Naval Air Station Lemoore
- Naval Base Ventura County
- Naval Weapons Station Seal Beach
- Naval Weapons Station Fallbrook
- Naval Air Station North Island
- Naval Auxiliary Landing Field Imperial Beach
- Camp Warner Springs
- Naval Medical Center San Diego
- Marine Corps Base Camp Pendleton
- Camp Pendleton Air Station
- Submarine Base San Diego
- Anti-Submarine Warfare Training Center
- SPAWAR
- Marine Corps Recruit Depot San Diego
- Marine Corps Air Ground Combat Center
- Twenty Nine Palms
  (All in California)
- Naval Air Station Fallon (Nevada)

**Navy Region Southeast**
- Naval Air Station Jacksonville (Florida)
- Naval Air Station Mayport (Florida)
- Naval Weapons Station Charleston (S.C.)

**Navy Region Hawaii**
- PWC Pearl Harbor

**Air Force**
- Headquarters Pacific Air Forces (Hawaii)
- Andersen AFB (Guam)

**U.S. Postal Service**
- San Diego Service District (California)

REM programs that proved successful but no longer have REMs are:
- NOAA Headquarters (Washington, D.C.)
- U.S. Postal Service – Central Florida District
**REM Objectives**

The primary project goal is the piloting of Resource Efficiency Manager (REM) positions serving multiple naval facilities in a concentrated geographic region. The secondary project goal is to prove the REM concept so other Navy facilities, as well as other federal facilities start REM programs throughout the country.

A Resource Efficiency Manager provides a critical role in spearheading activities that reduce all resource use, thereby creating a revenue stream to essentially allow the position to become self-funded.

The first REM started at two bases but now serves another, too. The second “Regional REM” has the overarching responsibilities of planning and securing alternative and conventional financing of energy projects that benefit all bases within the region. Additionally, the Regional REM (John Grobler) is responsible for seeking funding to add other “site specific” REM’s. Grobler oversees REM tasks at six installations: Bangor Submarine Base, NAVSTA Bremerton, NAVMAG Indian Island, NAS Whidbey Island, NAVSTA Everett, and NUWC Keyport. Total square footage of the six is nearly 9.4 million square feet with an annual utility expenditure of $37 million. The third REM has three bases for which he is responsible. (See REM chart for listing of all REMs)

The Navy Region Northwest REMS are determined to meet the goal of providing better services at lower costs. The regional REM is more focused on coordinating energy efforts among top officials at the installations and less on the day-to-day, hands-on tasks handled by REMs assigned to the individual bases.

**Still, all are dedicated to a mission that:**

- Implements measures and innovations that reduce energy and water consumption and costs.
- Increases reliability of electricity and natural gas systems.
- Elevates energy consciousness throughout the Navy installations.

**Major Accomplishments**

At no up-front cost to the Navy, a highly visible Resource Efficiency Manager program was initiated at the Navy Region Northwest naval bases. This program features three full-time professionals. Energy savings and program revenue have enabled these positions to be renewed annually with no additional financial burden placed on Navy Region Northwest.

Navy Region Northwest prioritized the formation of a well working team of Resource Efficiency Managers led by a regional REM coordinator. The team works extensively with a number of other groups: Housing, Public Works, Maintenance Operations, Subcontractors, Environmental Coordinators, and Building Energy Monitors.

The REM goes beyond simply reducing utility bills. It has been demonstrated that another core function of the REM position is to leverage funds to continually increase the REM program capability. Analysis has shown that, in certain situations, the leveraging of funds or alternative financing for projects often exceeds the energy savings captured by the REM. For instance an $847,000 lighting/HVAC project was implemented at Naval Station Everett in September of 2001. The REM secured $618,000 in Supplemental Appropriations funding and utility incentive funding of $229,000. The annual energy dollar savings is $142,759. The REM finds and administers these types of alternative funds, which are essential to overall success.

**Project Assessment**

**Goal #1: Generate Energy Savings**

The first REM started in 1997 with the assignment: Identify projects to offset the program costs of $111,700. This REM was responsible for two naval bases. The timetable to identify energy savings was only six months. Before the end of the trial period more than $300,000 worth of energy projects were identified and the position was renewed for a full year. All subsequent years have been renewed based on sound economic justification of the avoided energy costs. The second and third REMs became self-sustaining with regard to funding after the first year of operation, too.
# Case Study

## Table of REM project accomplishments 1997-2001

<table>
<thead>
<tr>
<th>Project</th>
<th>Annual savings</th>
<th>Cost</th>
<th>Payback</th>
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</thead>
<tbody>
<tr>
<td>HVAC and electrical systems improvements</td>
<td>$44,864 FY98</td>
<td>$288,442</td>
<td>6.4 years</td>
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<tr>
<td>Energy Conservation at NAS Whidbey &amp; NUWC Keyport</td>
<td>$22,104 FY99</td>
<td>$51,000</td>
<td>2.3 years</td>
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<tr>
<td>Lighting Retrofit at NAS Whidbey, Phase I</td>
<td>$222,000 FY00</td>
<td>$1.6 million</td>
<td>8 years</td>
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<tr>
<td>Resource Efficiency Manager</td>
<td>$22,104 FY01</td>
<td>$51,000</td>
<td>2.3 years</td>
</tr>
<tr>
<td>Add air boundary curtains to high-bay building</td>
<td>$400 FY01</td>
<td>$4,000</td>
<td>10 years</td>
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<tr>
<td>Lighting retrofit in Bldgs 514 &amp; 894</td>
<td>$19,331 FY01</td>
<td>$91,269</td>
<td>5 years</td>
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<tr>
<td>Install fixed capacitor bank</td>
<td>$33,690 FY01</td>
<td>$33,690</td>
<td>1 year</td>
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<tr>
<td>Exit sign upgrade</td>
<td>$4,410 (FY01)</td>
<td>$28,000</td>
<td>7 years</td>
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<tr>
<td>Replace incandesc with CFLs</td>
<td>$320 FY01</td>
<td>$450</td>
<td>1.5 years</td>
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<tr>
<td>Lighting upgrade Bldg 73</td>
<td>$1,895 FY01</td>
<td>$6,300</td>
<td>3.5 years</td>
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<tr>
<td>Add submetering</td>
<td>$10,000 (FY01)</td>
<td>$140,000</td>
<td>14 years</td>
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<tr>
<td>Lighting upgrade Bldg 893</td>
<td>$2,180 FY01</td>
<td>$18,380</td>
<td>9 years</td>
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<tr>
<td>Install HP air and A/C chiller</td>
<td>$41,902 FY01</td>
<td>$323,248</td>
<td>8 years</td>
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<tr>
<td>Lighting Retrofit at NAS Whidbey, Phase II</td>
<td>$86,000 FY02</td>
<td>$724,000</td>
<td>8.5 years</td>
</tr>
</tbody>
</table>

## Goal #2: OPM (Other People’s Money) Sought Funds

(Funds Used For Alternative Financing for Energy Projects and Additional REM Programs)

The ability for a host facility to leverage an array of funds for projects is critically important to accomplish energy reduction goals. The ultimate value of the REM program is compounded many fold with direct access to OPM.

### FY 01 REM Secured OPM (Other People’s Money)

<table>
<thead>
<tr>
<th>Source</th>
<th>Base ID</th>
<th>Project</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoD Suppemental</td>
<td>Subbase Bangor</td>
<td>Lighting/HVAC upgrade ($4,327,000)</td>
<td>$1,047,000</td>
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<tr>
<td>Puget Sound Energy</td>
<td>Naval Air Station Whidbey Island</td>
<td>Phase II Lighting</td>
<td>$200,000</td>
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<tr>
<td>DoD Suppemental</td>
<td>Naval Air Station Whidbey Island</td>
<td>Supplemental Funding for Phase II Lighting</td>
<td>$217,000</td>
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<tr>
<td>DoD Suppemental</td>
<td>Naval Station Everett</td>
<td>Lighting upgrades</td>
<td>$618,000</td>
</tr>
<tr>
<td>Utility Incentives</td>
<td>All</td>
<td>Install Vending Misers</td>
<td>$68,000</td>
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</table>

**Total FY01 REM Secured Funding**

$2,150,000

### In works for FY02

<table>
<thead>
<tr>
<th>Source</th>
<th>Base ID</th>
<th>Project</th>
<th>Amount</th>
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<tbody>
<tr>
<td>ECIP</td>
<td>Naval Station Bremerton</td>
<td>Lighting upgrades</td>
<td>$400,000</td>
</tr>
<tr>
<td>BPA</td>
<td>Subbase Bangor Housing</td>
<td>CFL’s</td>
<td>$100,000</td>
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<tr>
<td>BPA</td>
<td>NAVST Bremerton</td>
<td>Incandescent to CFL</td>
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<tr>
<td>BPA</td>
<td>Puget Sound Naval Shipyard</td>
<td>Engineering Building Lighting</td>
<td>$73,000</td>
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<tr>
<td>Puget Sound Energy</td>
<td>Naval Air Station Whidbey Island</td>
<td>Vending Miser</td>
<td>$15,000</td>
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<tr>
<td>BPA</td>
<td>Puget Sound Naval Shipyard</td>
<td>Lighting retrofits of 111 buildings</td>
<td>$618,000</td>
</tr>
<tr>
<td>BPA</td>
<td>Subbase Bangor</td>
<td>Lighting retrofits</td>
<td>$1,000,000</td>
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<tr>
<td>Congressional/ environmental</td>
<td>Subbase Bangor</td>
<td>Forced air electric to GeoExchq Heat Pump</td>
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<tr>
<td>Congressional/ environmental</td>
<td>Subbase Bangor</td>
<td>Submetering pilot project</td>
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</table>
**Goal #3: Program Continuation and Replication**

The project goal of continuing the program beyond the grant period was realized with the collection of several sources of information. A single REM grew to a force of three individuals in four years. There are a number of events that lead to this type of “multiple” effect.

First, the two original REM’s needed to meet a majority of evaluation criteria in the areas of program tasks, awareness tasks and resource savings. These criteria were incorporated in a memorandum of understanding. Additionally, other “unofficial” criteria were used to get local Navy leadership to a decision point on whether to continue the REM program tasks or terminate the entire program. The unofficial criteria were: acceptance by other staff, presentations and informal reports, and overall visibility to top decision makers in the organization. It appears that the “unofficial” criteria more greatly influenced the decision to renew the position than the earlier methods formulated in the memorandum of understanding between various parties. It has been shown that the REM needs to get in front of as many high level decision makers, boards or committees as possible in order to foster support of managers at multiple levels.

**Evaluation**

A number of strategies proved to be very effective for the Navy Region Northwest.

The first was to hire Naval “insiders” to fill the outside contractor REM positions. Often, the REM works with a base appointed Energy Manager in three areas of concentration: projects, training, and awareness. Examples of such efforts include hosting FEMP’s TeleFEMP satellite broadcasts and the quarterly Navy Facility Energy Manager Course, taught by the Civil Engineering Corps Officer School. At Whidbey Island, the REM contributes a weekly column in the Base newspaper and teaches the energy program portion of the monthly Base orientation to newly transferred sailors. The first REM was a retired Fleet Reserve Master Chief Petty Officer who was retained by Puget Sound Energy. The second and third REM’s were former civilian government service employees who previously worked at the facilities. WSU’s Cooperative Extension Energy Program and the Bonneville Power Administration employ these individuals, respectively.

A second strategy was to provide the REM with formal and informal training and access to energy experts internal and external to the Navy. In these particular cases, the back up support came from the organizations mentioned previously that also supported these REM efforts. Government service engineers working at the respective sites provided internal engineering support. Some individual bases in the region, such as the Naval Undersea Warfare Center have an aggressive approach to energy project development through Basic Ordering Agreement mechanisms utilized through their serving utility, Puget Sound Energy. The REM worked closely with numerous other site groups. The REM’s went to Building Operator Certification training sponsored by the Northwest Energy Efficiency Council.

A third strategy was to contract out energy duties and connect the annual renewal to performance. The result? Evidence shows that this strategy keeps the REM’s more focused on workload. This is a benefit when you consider that the service energy managers often get numerous other collaborative duties that have little to do with saving energy or developing energy projects.

**Conclusions**

The U.S. Navy is operating a mission to reduce energy costs, petroleum fuel usage, and increase use of renewable energy. Its objective is to reduce energy consumption per square foot by 35 percent by the year 2010 (relative to 1985) without compromising military readiness, sustainability, quality of life, and safety. The Navy’s actions are following policies established by the Navy Energy Policy Council.

The Navy Northwest Region is helping lead the way by taking advantage of the latest energy innovations and adapting new technologies and business practices to get the job done.

An integral part of that effort is the Navy Northwest Region’s REM program. The REM program has demonstrated its value in a short time and the effort needs to be continued and expanded, given the increasing energy demands for the nation’s federal facilities. The REMs act much like detectives in ferreting out savings.

The future of the Navy REM is bright. Resource efficiency management is a win-win solution for all and a proven success.
Lessons Learned
Navy Region Northwest REM John Grobler offered his insights in this interview.

Q. What have you learned?
A. Be aware that there is a learning curve. Realize that you need to get comfortable talking to people, familiarizing yourself with the installations, and gaining knowledge of more than just energy. You’ll find out you need to reach as high up in the organization as possible.

Q. Is there a lot of trial and error going on?
A. No. You put a plan together. You look at what’s gone before. It’s all been done before. You should know what gets the biggest bang for the buck.

Q. What is your role?
A. I’m responsible for putting a plan together, enacting the plan, building teamwork, overseeing everything. The Navy has existing procedures and policies to use as guidelines.

Q. Is it hard to come up with an agenda?
A. No. If there are energy people already at an installation or facilities, you get them to help you put it together. While a lot depends on you, there are others to get the work done.

Q. How does the REM influence decisions?
A. The REM gets the money for projects, particularly leveraging other people’s money wherever possible. The REM supports people so projects don’t fall into a dead end.

Q. What are the keys to success?
A. Have a plan. Have objectives and goals. Enlist upper management support for the plan. Brief management as often as possible. Get energy work started and manage it, using others to do the work. Be positive and talk energy ALWAYS.

Q. How do you deal with top brass?
A. You present information about the plan and move ahead on projects they support. You walk away from those they don’t. You stress that you’re attempting to meet your goal as defined in the plan, and explain that the suggested projects will accomplish that.

Q. What has worked best so far?
A. There’s not one that stands out over others. All have been pretty good. Projects boost energy awareness, people say.

Q. What has not worked as well as expected?
A. I don’t have one that comes to mind. But energy awareness is something that might not work as well is it could because it depends so much upon someone constantly pushing it. With continuing employee turnover and military transfers, the job of energy awareness is very difficult. On the other hand, projects generally are permanent fixes and reduce consumption by the numbers.

Q. What is your advice to other REMs?
A. Make sure you have a good plan. I cannot emphasize that enough. Network with peers, utilities, business managers. Keep focused on the scope of projects. Work the plan. Work the plan. Work the plan.
### Resource Efficiency Management in Washington State

<table>
<thead>
<tr>
<th>REM Name</th>
<th>Start Year</th>
<th>Employer</th>
<th>Bases</th>
<th>Startup Funds</th>
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</thead>
<tbody>
<tr>
<td>Kevin Evans</td>
<td>Feb-99</td>
<td>PSE</td>
<td>NUWC Keyport</td>
<td>Navy Region</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Naval Air Station (NAS)</td>
<td>Northwest</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Whidbey Island</td>
<td></td>
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<tr>
<td>Jim Sura</td>
<td>Jul-01</td>
<td>BPA</td>
<td>Subase</td>
<td>25% BPA</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Naval Station Bremerton</td>
<td>75% Navy</td>
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<tr>
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<td>Puget Sound Naval Shipyard</td>
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<tr>
<td>John Grobler</td>
<td>Aug-00</td>
<td>WSU</td>
<td>Naval Station Everett</td>
<td>100% FEMP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jim Creek</td>
<td></td>
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<tr>
<td></td>
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<td>NAS Whidbey Island</td>
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<td></td>
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<td>Naval Magazine Indian Island</td>
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</table>

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