Revision 1

Revised Handbook for

Promoting Behavior-Based Energy Efficiency in Military Housing

Prepared for the
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Federal Energy Management Program

Prepared by
Pacific Northwest National Laboratory
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March 2000

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Preface

The mission of the U.S. Department of Energy's Federal Energy Management Program (FEMP) is to reduce the cost of government by advancing energy efficiency, water conservation, and the use of solar and other renewable technologies. This is accomplished by creating partnerships, leveraging resources, transferring technology, and providing training and technical guidance and assistance to agencies. These activities support requirements stated in the Energy Policy Act of 1992 and goals established in the June 1999 Executive Order 13123.

To bolster energy awareness across the federal government, FEMP launched a communications campaign entitled "You Have the Power" in 1997. This campaign assists federal energy managers by spreading the word about energy-efficient practices and products, as well as facilitating partnerships with energy-related organizations in the private sector. The campaign is intended to instill energy efficiency as a basic value among federal workers and the public.

The Pacific Northwest National Laboratory (PNNL) supports the FEMP mission in all activity areas, including the "You Have the Power" campaign. Specifically, PNNL is working with FEMP to develop methods for promoting energy efficiency in federal facilities. In doing so, the cost of government can be further decreased.

This handbook suggests ways federal energy managers can take the "You Have the Power" campaign one step further: to develop site-specific activities that encourage residents of military family housing to use energy more efficiently. The approach and examples provided in the handbook are based on two campaigns conducted for FEMP—one at the Fort Lewis Army Installation in Washington State and the other at the Marine Corps Air Station in Yuma, Arizona. This revised handbook reflects insights from the final energy data and resident survey results from the two campaigns.

Acknowledgments

This handbook benefits greatly from lessons learned from energy-efficiency campaigns conducted at Fort Lewis Army Installation, near Tacoma, Washington, and the Marine Corps Air Station, Yuma, Arizona, in 1998 and 1999. The campaigns were a cooperative effort between the U.S. Department of Energy's Federal Energy Management Program (FEMP), Fort Lewis, and the Yuma Air Station.

Annie Haskins, Outreach Program Manager for FEMP, provided guidance and assistance. FEMP's Tatiana Muessel provided early guidance and direction.

In conducting the campaign at Fort Lewis, we are indebted to contributions from Fort Lewis's Department of Public Works, especially Resource Efficiency Manager Charles Howell, personnel from the Base's Housing and Training departments, mayors, and of course the residents themselves. At the Yuma Air Station, we thank Housing Manager Mark Smith, Assistant Housing Manager Pat Queen, and Energy Manager Ron Durfey and his Energy Monitors Gunnery Sergeants Dale Billingsley and Daniel Drier. We also thank Anne N'Ait Ali and her Family Childcare Providers Network for their insightful comments and assistance.

We thank energy science professionals at Pacific Northwest National Laboratory for technical assistance, guidance, and review. We thank Merrilee Harrigan, the Alliance to Save Energy, for review and suggestions. We thank Judi Heerwagen, former Laboratory staff member, for early direction. We also appreciate Washington State University Cooperative Extension Program's Energy Ideas Clearinghouse for making additional resources available to us.

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Pacific Northwest National Laboratory
March 2000

1.0 Introduction

This revised handbook was prepared as part of a government energy-efficiency program with emphasis on military housing, as described below.

1.1 Background

The U.S. Department of Energy's Federal Energy Management Program (FEMP) helps agencies reduce the cost of doing business through energy efficiency, water conservation, and the use of solar and other renewable energy. As a large energy user, the U.S. Department of Defense (DoD) has been one of the government sectors of focus.

Several military installations have shown substantial energy savings since 1985. Most of these efficiency projects, however, have focused primarily on physical upgrades, technologies, and purchasing habits. Further, most projects have focused on administrative and operational areas of energy use.

The energy-related behaviors of residents in military housing, in particular, have received little formal attention. Behavior-based change is a challenging, but potentially fruitful area for energy conservation programs. Efforts to change behaviors involve links with values, social networks and organizations, and new ways of thinking about living patterns. This handbook attempts to fill a gap by offering guidance for promoting such efforts.

This revision of the handbook reflects insights from the final energy data and resident survey results from two campaigns.

1.2 Purpose and Audience

This brief handbook is intended to be used by energy managers, housing officials, and others who want to improve energy efficiency in on-base residential housing by emphasizing behavioral changes.

Specifically, the handbook was written with two primary groups of people in mind: 1) military personnel and contractors, and 2) nonmilitary organizations and groups, including Department of Energy employees, utilities, contractors, energy coalitions, and universities.

1.3 Scope and Use

The guidelines here are based on low-cost or no-cost behaviors that residents can carry out themselves, as opposed to physical facility upgrades or technology. The guidelines are particularly applicable to situations where residents do not pay their own utility bills and thus are not motivated to conserve energy by reducing personal expenditures.

The guidelines have been applied in field studies conducted at the Fort Lewis Army Installation in Washington State and the Marine Corps Air Station in Yuma, Arizona. However, the guidelines are intended to be

broad enough to apply in other situations. Individual bases should choose and adapt their own activities to fit their unique situations.

For quick reference and ease of use, each section ends with a short list of highlights, called "In Summary." These highlights represent the essential kernels of information necessary for planning, designing, implementing, and evaluating a campaign.

1.4 What the Handbook Contains

The handbook describes some factors driving energy efficiency in military housing and characteristics of military bases that affect residential energy use (2.0). Following sections describe steps in planning (3.0), conducting (4.0), and evaluating (5.0) a campaign and sustaining the effort (6.0).

The appendixes provide sample information materials, surveys, and other resources.

2.0 Energy Efficiency in On-Base Military Housing

With literally thousands of facilities nationwide consuming significant amounts of energy daily, why is military housing a particular area of focus? And how might military housing residents be motivated to use energy efficiently? The drivers and the unique characteristics of military populations need to be understood in order to design an effective energy-efficiency campaign.

2.1 Drivers

Several factors make military housing a prime target for energy conservation:

Regulatory, policy, and institutional factors are driving the effort to reduce energy use in military housing.

- **Regulations and federal targets for energy conservation are set in federal facilities.** The federal government has set goals of a 30% reduction in energy consumption from 1985 levels by fiscal year 2005. In June 1999, a Presidential Executive Order extended this goal to a 35% reduction in federal facilities by 2010 from 1985 levels.
- **Congressional and public scrutiny has increased taxpayer-funded military programs.** Over the past several decades, the DoD has been held to increased standards of accountability, both by its funding source (Congress) and by citizens who pay for it and whose loved ones serve in it. The June 1999 Executive Order 13123 for energy efficiency, for example, included more stringent standards of accountability by federal agencies to reach energy goals. The Executive

Order requires each federal agency to submit an annual report to the President describing its progress in meeting energy reduction goals, and the Office of Management and Budget will evaluate each agency's performance using "score cards" that are submitted to the President. The President's Management Council will monitor agencies' progress on energy management and identify ways to accelerate improvements. The military, being one of the largest energy users among federal agencies, is a particularly high-visibility target.

- **Energy use in residential housing is a substantial portion of total base energy costs, representing an often-untapped source with large potential savings.** The DoD is the largest energy user of all federal facilities, according to the DoD's Annual Report to the President and Congress for 1999. And, at military bases, residential housing often represents a substantial portion of the utility budget. At the Fort Lewis Army Installation, for example, residential energy use accounts for 25% of the base's total energy use and 40% of base energy costs. Most energy-efficiency projects on military bases have focused on reducing usage in administrative and troop barracks areas rather than family housing units. It makes sense, therefore, to include military residential housing as a particular area of focus to meet federal energy-efficiency goals.

At some bases, residential housing accounts for 40% of total base energy costs. This represents an opportunity for substantial energy savings.

2.2 Characteristics of Military Bases and Populations

An effective energy-efficiency campaign is designed around the unique characteristics of military bases that affect residential energy use and conservation programs:

- **No direct utility bills to residents.** Many military housing areas are still master-metered, where all or large portions of residential housing areas are billed together. In these cases, residents do not pay their individual energy bills based on individual usage. Instead, a set amount of their housing allowance is dedicated to energy use, regardless of how much is actually spent. This situation means that residents have less incentive to conserve energy because they can neither save money by reducing their own use nor are they "penalized" by being charged more if they use more. This master-metering also makes it more difficult to promote conservation, even if a savings for an entire master-metered section is displayed, because it is impossible for people to know how much their own family contributed (or did not contribute) to the savings.

  The military and Congress have been moving toward privatization of military housing and utilities on the assumption that private-sector management will increase efficiencies and reduce costs. Privatization, however, may not address energy billing to individual homes.

- **Transient nature of personnel.** According to the DoD's DefenseLINK web site (www.defenselink.mil), military families move every three years on average. Frequent relocation presents a challenge for behavior-based

energy efficiency. If organizers are relying on people to be aware of the need to conserve energy and get into the habit of doing so, these behaviors must be reemphasized and relearned every so often with each new wave of residents, or the behaviors will not continue. This means a sustained effort—really what is needed is institutional change—that is ingrained into behavior regardless of where families move.

- **Varying housing quality that affects energy loss.** Housing units on many military bases were constructed decades ago, some dating back to World War II. According to the DoD's Annual Report to the President and Congress for 1999, two-thirds of the agency's 297,000 existing housing units are in need of extensive repair. Houses may be undergoing continual upgrades, and newer homes have more energy-efficient features. However, at any one time, families may be living in houses with inefficient energy features such as single-paned windows, inadequate insulation, nonprogrammable thermostats, or inadequately sealed doors and windows. In these homes, energy efficiency will be limited by structural deficiencies, and resident behavior can accomplish only so much.

- **Limitations on upgrades.** The military must carefully budget for and schedule housing upgrades while maintaining a consistency in housing conditions for its constantly changing residents. These restrictions can affect energy efficiency. For example, like civilian renters, many military families are restricted in upgrades they themselves can make to improve energy efficiency. For example, a base may not allow residents to install plastic sheeting on windows to improve insulation.

  In addition, a base's housing budget at any one time may pay for some things to do be done, but not others. For example, a base may pay for defective caulking around windows to be replaced, but not for caulking to be installed where none existed before. A base may pay to have a broken thermostat repaired but not replaced with a programmable one.

- **Chain of command and accountability.** Instituting a campaign on a military base is somewhat like mounting a campaign inside a large corporation that has many layers of approval and external oversight. The entire campaign usually requires the endorsement and involvement of one or more organizations, such as Housing, Public Works, and Energy Management. The approach, activities, and information materials must all be carefully reviewed and approved through the proper channels. Any financial incentives, of course, must be approved at appropriately high levels.

  Costs and/or time provided by the base for activities or materials are carefully scrutinized to ensure that they fit within the base's mission and can be justified as a worthy use of taxpayer dollars. Base officials are increasingly being held accountable for meeting energy-efficiency goals, and it is important that the base's investment in a campaign pays off in significantly decreased energy use.

People are more likely to take action when they hear that their neighbors and friends are doing the same things. Existing military social structures, such as recreational and educational groups, can serve as excellent tools.

- **Institutionalized family and social support structures.** In the interest of supporting the well-being of troops and their families, most bases have extensive family and social support structures. These include programs for educational, social, spiritual, and recreational well-being. Many of the same programs enjoyed by civilians, such as Scouts, clubs, and recreational groups, are supported on military bases.

  Studies have shown that people are more likely to engage in long-term behavioral change when their neighbors and friends also engage in the behavior. These social structures can serve as excellent tools for designing and carrying out a campaign that is institutionalized across the base.

- **Competition.** Studies have shown that competition among similar groups improved workplace performance. The culture of competition that is ingrained into the military can be tapped into for a campaign.

  However, the frequent turnover in military housing may mean that competition in that setting may not be as effective as competition in professional military activities. It may be that competition between branches of the armed services would be a better source of motivation than competition among neighbors or neighborhoods.

- **Patriotism.** Patriotism, endemic in the military, can be an underlying message in a campaign, in terms of national goals and conserving our nation's environmental resources. In fact, it has been argued that practicing energy conservation in the United States makes us less vulnerable to worldwide oil crises that might prompt military intervention.

- **Desire to do the right thing**. Researchers mention this explicitly as a characteristic of military communities. Housing residents at Fort Lewis and MCAS Yuma described themselves as motivated by their desire to do the right thing and to set an example for their children.

The patriotism of military personnel can be a source of appeal. Conserving our nation's environmental resources makes us less vulnerable to worldwide oil crises.

2.3 In Summary: Energy Efficiency in On-Base Military Housing

Consider the following factors to help put energy efficiency in context in a military housing setting:

- **Regulatory, policy, and institutional factors** are driving energy-efficiency efforts in military housing.

- Congressional legislation and Presidential Executive Orders mandate specific **energy reduction goals in federal facilities**, with greater accountability for meeting efficiency goals.

- **Military housing** represents a significant portion of military energy use and thus potentially significant savings through conservation.

- The military embodies certain **cultural and institutional factors** that must be considered in any energy conservation campaign.

- **Factors that make energy conservation more challenging** are (1) residents not being billed for their own energy use, (2) transient nature of personnel, (3) varying housing designs and limitations on improvements, and (4) chain of command requiring approval of various campaign aspects.
- **Factors that can work in favor of energy-efficiency campaigns** include (1) institutionalized family and support structures, (2) a culture of competition, (3) patriotism, and (4) the desire to "do the right thing" and set a good example for children in the home.

3.0 Planning the Effort

In deciding whether to launch an effort at a certain base, consider whether the necessary resources are available there. If the appropriate resources can be marshaled, decide how you will approach the effort.

For simplicity, this handbook uses the term "campaign" to represent all energy-efficiency efforts of limited duration.

To offset the lack of individual billing for utilities, one incentive is to return to residents a portion of money from energy saved.

3.1 Resources Required

The following elements should be in place for an effective campaign. Of the listed items, the most important is enthusiasm of a person or people who can pull together resources and get things done at the site.

- **Approvals and champions.** Base officials from the affected divisions must give permission for the effort. These would include, as a minimum, the site commander, the energy manager, the housing office, and the office that deals with military personnel and family life. It is important that these officials understand which resources they are committing, especially those involving funds, personnel, and other resources from their divisions.

  The appropriate people in the chains of command must be on board and be willing to pass information through their commands as appropriate.

  Beyond merely approving the effort, a high-level, well-respected base official should personally "champion" it. This means he or she endorses it, perhaps even serving as a spokesperson. The involvement of this high-ranking official demonstrates the importance of the effort to residents, as well as a top-down commitment to energy efficiency.

  A logical candidate to champion energy efficiency is the base's Energy Manager. At Yuma MCAS, the Energy Manager was well liked and respected—and had won awards for energy efficiency. In addition, a base Energy Monitor toured the base (on a bicycle) to visually check energy-use practices.

- **Funding.** If not funded by an outside grant or project, or not part of existing on-base jobs, the base must

be willing to fund certain activities associated with a campaign. Buy-in

from the base in the form of in-kind support demonstrates a commitment to the campaign. In-kind support may include producing and distributing information, conducting surveys, and collecting and analyzing energy-use data. A budget describing each expense and its purpose should be approved by all funding sources in advance. Appendix A gives examples of typical budget items.

- **Incentives.** Most behavior-based campaigns will not be effective without incentives and perhaps disincentives. For example, the base may decide to give a portion of money saved back to residents, or some other incentive award. Residents who "overuse" an energy allotment could be required to pay for the extra usage, or not receive some sort of "perk" that other users get. Obviously, base officials must designate and approve these incentives and disincentives, especially when money is involved. If a portion of money from energy saved is being given back to residents in some way, the base must also ensure that the funds can be transferred from the utility account to an account that benefits residents directly.

- **A team with specialized skills.** A team of people must have adequate time and resources available to design and execute the campaign. Team members should have strong communication skills and the ability to work well with people, including high-ranking officials. Members should also be experienced in field research, conducting focus groups and interviews, developing activities, producing targeted information materials, and evaluating results. One or more team members should be experienced in graphic design.

  If this experience is not available on base, a consultant could help train and guide an on-base team. However, a core group of on-base team members is essential to any site-specific campaign.

- **Access to communication channels and production capabilities.** Communicating during a campaign requires access to channels of communication and production resources. Someone on the team needs access to media (newspapers, newsletters, radio, closed-circuit TV, electronic billboards), as well as any specialized methods for communicating with residents, such as community meetings.

  Depending on the campaign's specific activities, facilities and capabilities must be available for producing printed materials, displays, and videotapes. Special activities could include printing of T-shirts, Scout badges, banners and flags, educational materials for schools, and so forth. Access to a high-quality computer system and software will enable printed materials, including graphics, to be easily produced, updated, and digitally translated so that the same art can be used for a variety of materials.

  Many bases already have these resources in their Public Affairs and Training Divisions; however, the proper facilities and approvals for producing campaign-specific information must be in place.

- **Residential leaders who are willing to volunteer time.** The more involved residents are in the campaign's design and implementation, the

greater potential for success. A core group of interested and willing residential leaders should be identified at the outset. Mayors or others in positions of authority—including leaders of educational organizations, clubs, and day care providers—can be excellent resources. They can help design the campaign, help convene focus groups and host interviews of residents, communicate with other residents about the campaign as it continues, hand out materials, serve as points of contact for the campaign, and serve as behavioral role models for other residents. They can also alert campaign organizers of any difficulties and problems with the campaign as it progresses, so that corrective action can be taken.

- **Links with institutional groups.** Studies have shown that social groups can be influential in encouraging behavioral change. The importance of enlisting community leaders has already been mentioned. If the campaign involves organizations such as schools, community groups, or Scouts, points of contact and approvals must be in place. These groups may require additional resources such as educational materials tailored to their groups. The team must be willing to sustain a high-quality outreach with these groups, meet their needs, and have regular contact with them to ensure that campaign goals are being met.

- **Evaluation mechanism.** Someone on the team must have access to, and the ability to understand, energy-use data over the campaign time period, including previous energy-use data if comparisons are being made. The data must be available, or calculable, at the level and in the form that are useful for analysis. Useful data include savings in energy units—such as therms or MBtus—as well as cost savings to the base. Other variables to watch include energy use by geographic area on the base (such as neighborhoods), demographics of residents (such as officer versus enlisted housing), house type, and energy type (gas, electricity).

  When making comparisons over time, someone must be able to calculate how weather temperatures affect energy use. In other words, a base can not take credit for a drop in energy use if it can be attributed to warmer or cooler temperatures and thus lower energy demand.

Resources for evaluating the campaign via resident input should also be available. For example, if a survey of residents will be conducted, someone must have access to mailing lists and approval to use them. In addition, resources and approvals must be in place to send and receive mass mailings as well as enter and analyze survey data. If a mass survey will be conducted, it is helpful to have data-analysis software designed for that purpose.

3.2 Options for Approaches

There are three options for an energy-efficiency effort: (1) a short-term campaign, (2) a kickoff campaign coupled with a longer-term emphasis, or (3) an ongoing endeavor. This section gives guidelines for each approach.

- **Short-term campaign.** A limited-term campaign of less than one year is

useful when testing approaches and activities specific to a particular base. For example, a base may mount a three-month campaign emphasizing certain energy conservation activities tailored to that base, certain information and social channels, and certain incentives for residents to encourage energy efficiency. At the end of the campaign, the managers compare energy use and get feedback from residents to determine which activities and approaches were useful and why or why not. The results can be used to design a longer-term campaign tailored to that base.

Short campaigns may also be useful for educational efforts. For example, say a base has just upgraded all its residential heating to use programmable thermostats that require proper programming and use by residents. A short-term campaign may be useful to emphasize the benefits and steps of proper thermostat use.

Short-term campaigns may also be useful periodically as personnel change. For example, if the population of residents has significantly changed over two years, a short campaign could be run every two years to reemphasize and motivate energy efficiency.

A festival or other celebratory event is a good way to kick off a campaign.

- **Kickoff campaign.** A campaign can also be used to "jump start" a longer-term emphasis. Used in this way, the campaign raises awareness and attention to start a more sustained effort.

  A kickoff campaign attempts to attract widespread attention. If resources are available, a festival or other celebratory event could be held, prizes could be given out, a competition could be announced, a high-profile speaker could be brought in, and local media could be invited to cover it. The sustained effort, lower key, would continue with continued reporting of results and reminders.

  A potential drawback of this approach is the possibility of high interest and action at the beginning that tapers off. Organizers should aim to create sufficient motivation to continue the energy-efficient behaviors after the initial kickoff.

  Another factor to consider with this approach is personnel turnover. With residents coming and going, it is important to make sure that the longer-term emphasis continues to reach newcomer families.

- **Ongoing effort.** Persuading people to change their habits, especially when people feel that they are being asked to give up something, is quite difficult—as designers of anti-smoking and seatbelt-wearing campaigns can attest. Nevertheless, the ultimate goal of any energy-efficiency effort is to sustain long-term change.

  A long-term effort focused on permanent behavior change is most effective when base officials are personally committed to and accountable for energy savings, when methods exist to measure energy use for each residence, when financial incentives and disincentives are directly tied to individual energy use, and when a longer-term effort is preceded by a test campaign (as described above).

Section 6.0 recommends ways to aim for a sustained effort.

3.3 In Summary: Planning the Effort

Consider the following factors in the planning phase:

- With the proper base approvals in place, the most important resource is the presence of an **on-base champion**(s) who has the willingness, time, and authority to pull together resources and get things done.
- **Other important factors** are funding, incentives, a team with specialized skills, access to communication channels and production capabilities, residential leaders who are willing to volunteer time, links to institutional groups, and an evaluation mechanism.
- An energy-efficiency effort can take one of three **approaches**: (1) a short-term campaign, (2) a kickoff campaign as part of a longer effort, and (3) an ongoing endeavor.

4.0 Designing and Executing a Campaign

After a team is convened and resources are secured, the campaign can be designed and carried out. The guidelines in this section should be adapted as necessary to fit particular sites and situations.

4.1 Establish Goals

Goals are the ultimate desired outcomes. In a behavior-based campaign, a typical goal is to get residents to modify their habits so that energy use is reduced by a certain amount over a specified time period. The target amount of reduction can be based on a variety of factors, including federal energy goals, base energy goals, or behavior-based energy reductions achieved in other areas of the base.

Set goals that identify the desired outcomes. Set measurable objectives that help achieve the goals.

Another goal may be to reduce energy costs over a certain time period. Be aware, however, that reduced costs, though desirable, may not necessarily mean reduced energy use. Reduced costs could reflect reduced gas or electricity rates even when the same, or more, energy is expended. Thus, one of the campaign's goals must be actual reductions in energy use, not simply lower expenses to the base.

Set campaign goals while keeping in mind available resources and time to carry out the campaign. Getting people to change their behaviros is challenging and usually requires time to make the behavior a habit. It would be unrealistic, for example, to expect residents to use 20% less energy over a three-month time period based solely on personal behavior change.

When setting the goals, keep in mind how they will be measured. Factors that may affect energy use, including weather, housing upgrades, occupancy, and turnover, will need to be accounted for when determining whether the target goals were achieved. Section 5.0 discusses evaluation in more detail.

4.2 Establish Objectives

Develop objectives that help achieve the campaign goals. In a behavior-based campaign, objectives could include increasing the percent of people who engaged in certain behaviors, such as the following:

- kept their thermostats at a certain level when the house was occupied and at night
- requested energy audits or other in-home visits
- signed a commitment form promising to do certain things
- eeplaced incandescent lights with compact fluorescents
- turned off their outside lights during the daytime
- replaced their furnace filters monthly
- filled out home energy checklists with their children.

Make sure you have a way to measure these behavior changes before you set them as objectives. Some changes, such as outside porch lights being turned off, can be directly observed by people whose job it is to monitor energy use. The number of audits requested by residents can be tracked. Items purchased at base commissaries and PXs can be tracked, such as compact fluorescent bulbs and furnace filters.

For many behaviors, however, residents must be asked directly what they are doing differently as compared with the baseline period before the campaign started. Getting feedback that represents a good cross section of residents usually requires a survey, as described in Section 5.2.

4.3 Set a Budget

In the planning stages, a preliminary budget may be all you need. Then, after campaign activities are better defined, you may need to develop a detailed budget to be approved by base officials. You should establish the budgets and obtain approvals early in the process.

The budget must cover all labor, materials, production, distribution, activities, and monetary incentives, if any. Appendix A shows typical budget items.

A budget may be predetermined by the base's resources, or it may be somewhat negotiable. Some services and materials may be donated by the base, local utilities, government organizations, and even local universities as student projects. In addition, certain services, such as creating training videos, may be part of the base's existing mission and thus covered under other budgets.

Base officials may ask you to document the return on investment—the cost of the campaign versus the amount of reduced energy costs you hope to achieve. If the costs of carrying out a campaign significantly exceed the expected energy cost savings, you may have a tough time defending your plan.

The budget for an energy conservation effort must cover all labor, materials, production, distribution, activities, and monetary incentives, if any.

4.4 Set a Schedule

A campaign schedule is necessary to keep the work on track. It also keeps the team from missing certain time-dependent events such as school schedules, Energy Awareness Month (October), or base community fairs. It also takes advantage of times when base populations are more likely to be performing certain behaviors that the campaign is targeting for change (for example, starting just before the heating or cooling season).

Depending on how energy usage statistics are tallied at a given base, there may be a delay before statistics such as monthly meter readings and billings are available. If so, factor this into the schedule. For example, if final campaign results have been promised in December, but energy statistics are available 30 days after the previous month, you will need to end the data collection with November's results, or even October's, so you have time to tally the results and conduct a survey, if necessary.

Some aspects of a campaign schedule may be somewhat inflexible. The endpoint may be set by the budget running out at the end of a fiscal year. The endpoint may be set by the base's previous energy goals or driven by federal goals. If you have flexibility in setting the endpoint, keep in mind that a campaign targeting several behaviors for large base populations can take a minimum of six months to get visible results, with a year being a more reasonable time frame.

You may wish to set the schedule by starting with the endpoint and working backward. With this approach, determine how much time it will take to complete each step before the endpoint. This sequence will determine when the campaign needs to begin. This exercise will reveal any schedule problems, where planned activities must be deleted or modified to fit into a timeline.

4.5 Understand Your Base Setting by Talking with Residents and Officials

Use the input and ideas of residents to design the campaign for a particular base.

The most successful campaigns are tailored to the specific military base, using input and ideas from residents themselves and emphasizing the things residents are allowed to do themselves and those for which the base will pay. Thus, organizers should fully understand the base's policies and practices before starting a campaign, to become aware of what can and can't be done by residents.

Using input from residents to design the campaign is important for three reasons. First, it ensures that the campaign's content, themes, activities, and communication channels are valid for that population. It does no good to emphasize proper use of air conditioners, for example, if a base is located in a temperate climate that rarely requires air conditioning. If residents resent energy auditors coming to their homes without being requested, don't make this a campaign activity. If the residents seem particularly receptive to education activities that involve children, this could become an emphasis. And if residents tell you they get most of their

information through newsletters and newspapers, radio can probably be eliminated as a communication channel.

The second reason to involve residents is that more involvement up front encourages more buy-in and participation as the campaign gets under way. If residents have been involved in designing the campaign, they are more likely to feel a part of it and want it to succeed. Another way to view this is to consider the opposite effect. Without their input, residents may well perceive a campaign as another imposition by the military bureaucracy ("They're telling us what to do again"), designed to deprive residents of personal comfort or convenience. Residents with this attitude are more likely to resent the campaign, ignore it, or even sabotage it.

The third reason for involving residents up front is to gain individual contacts that can be drawn upon as resources for the remainder of the campaign. Because these people have already expressed enough interest to contribute ideas for the formative phase of the campaign, they may be willing to continue to contribute in other ways later. For example, you may call on them later to help distribute information, participate in events, contribute energy-saving tips for publication, help develop educational programs, poll their neighbors, and other such activities.

To gather background information from residents, small discussion groups (focus groups) are helpful. It often works well to include the focus group discussion as an additional agenda item for an existing community meeting or other such event. That way, you don't have to seek focus group members, schedule a meeting time and location, or advertise the meeting; someone else has already done that for you.

Focus groups and informal interviews are good ways to gather background information, test slogans and logos, and identify feasible behaviors to target for the campaign.

The following general questions for focus groups can be adapted for particular sites:

- What's the best way to get people interested and involved in saving energy?
- What are the best ways to communicate project results?
- How should energy conservation progress and results be depicted?
- Here are some things we're asking people to do to use energy wisely. Are any of these unreasonable or not doable? If so, why?
- Would you be interested in being in a training video/participating in other events/etc.?
- Do you have any other suggestions for us as we plan this campaign?

You can also use the focus groups to brainstorm and select campaign themes, slogans, and art. Appendix B, for example, shows a logo (light bulb containing a dollar sign) and a slogan ("Smart Energy Use") selected by Fort Lewis residents for an energy-efficiency campaign.

In addition to talking with residents, it is important to get input from base officials who are responsible for housing and utilities, including housing maintenance. You will not want to tell residents to adjust their own water

heater temperatures, for example, if housing authorities have determined that the switches are close to high-voltage wires and thus present a safety hazard. Base officials can also clarify what residents are responsible for purchasing and what the base provides, such as weatherization materials, solar-screening films for windows, furnace filters, and compact fluorescent lights.

Personal interviews are the best format for getting input from base officials. You can ask them the same questions as the residents. An additional question for officials is, "Are there any constraints or additional necessary approvals we should be aware of in carrying out this campaign?" And, as mentioned, verify the details of any financial incentive or other awards provided by base officials. It is important to understand the exact nature of the incentive so that it can be communicated in a way that properly represents the intention of officials giving it.

Public Affairs or other base personnel who are responsible for base communications should also be interviewed. These could be newspaper or newsletter publishers, on-base TV and radio studios, people who manage reader boards, and so on. You'll want to understand their requirements, deadlines, and approval processes.

4.6 Consider a Pre-Survey

A pre-survey of residents establishes a baseline of actions that people are already taking. It also gets people thinking about the behaviors you are targeting to change.

A pre-survey of residents is not essential, but if you have the resources to carry it out, it can be very useful.

A pre-survey of residents can be used in four ways. First, you can use it to design the campaign. With this approach, residents are asked about their current housing situations (appliances, thermostats, air conditioners, etc.) and which actions they are already taking. This information can be used to help identify behaviors and actions to emphasize for the campaign.

You can also use a pre-survey to gather some of the same information described previously with the focus groups. For this purpose, you would ask residents about communication channels, logos and slogans, and potential incentives.

The third use for a pre-survey is as a "pretest"—a baseline for later comparison and evaluation with a post-survey. With this approach, you compare responses about energy-use behaviors before and after the campaign to help evaluate how effective the campaign was in changing peoples' habits.

A fourth use of a pre-survey is to initiate or introduce the behaviors you are targeting for change. By asking people whether they are already doing energy-efficient things, you educate them on what those activities are and imply that such activities are somehow better or more important than others are. In this way, you actually start your campaign with the pre-survey.

If considering a pretest-type survey, remember that it is less effective if the resident turnover rate is significant or occupancy is likely to vary considerably. In these situations, many people who initially filled out the survey will not be the same population surveyed at the end, thus invalidating the comparison.

These four uses can be combined into one survey, though it may be unwieldy. The more purposes you combine into one survey, the more risk that it will be unwieldy and more complicated to analyze. Appendix C contains an example of a pre-survey for Marine Corps Air Station Yuma.

A survey expert can be valuable in helping design or advise on a survey and its implementation. Here are some general guidelines:

- Ask only questions that give you answers you need for the campaign. Don't waste survey questions on things that are nice to know, but not critical.
- If you want to group the responses by certain categories, make sure you ask the appropriate questions that will allow you to make comparisons. For example, you may want to compare responses from one-couple families with families having children, compare communities with each other, compare officer housing with enlisted housing, or compare houses with different floor plans.
- Be cautious in asking about attitudes or intentions in energy use. Studies have shown that attitudes ("How important is it for you to conserve energy in your home?") and intentions ("Do you plan to replace your furnace filter in the next two months?") are notoriously inaccurate indicators of actual behavior where energy use is concerned. Thus, even if you measured increased positive attitudes or intentions as a result of the campaign, the real mark of success is changed behaviors that led to reduced energy use.
- A printed survey or phone survey should tell residents who is conducting the survey and how their information will be used. Assure anonymity. In a printed survey, give a deadline for responding. Use incentives ("The first 100 people to respond will receive a small prize"), follow-up postcards, and other reminders to increase the total response rate.
- When developing survey questions, some general rules apply. A telephone survey should not last more than 15 minutes. Limit a printed survey to two pages at the most; one page is even better. Use simple language. Try to word questions as close-ended "check the box" alternatives, rather than asking for narrative responses. Put the most important questions up front; some people will tire out or drop out before the end. However, put demographic questions, which some people feel are sensitive, at the end. Don't ask "double-barreled" questions: "Do you use the energy-saving settings on your washer and dryer?" Don't ask questions that make people appear stupid or bad: "Do you know … ?" or "Do you leave your sprinklers on all day long?"
- Pretest your survey questionnaire with a few residents and officials before using it. Ask them to read the questionnaire and tell you what they think of it. This will help you identify any questions that are confusing, worded incorrectly, or not applicable to residents.
- Aim for a response rate of 40% for results that will be used to draw general conclusions about the base population. Feedback from a response rate of lower than 40% still is valuable for helping design and

evaluate a campaign. Nevertheless, the lower the response rate, the less representative the data and conclusions.

4.7 Identify Desired Behaviors

Each base should identify its own set of target behaviors for energy efficiency, based on house designs, climate, and other factors.

Using the results of focus groups and interviews described above, identify the actions you will be asking residents to take in the campaign. Here is a partial list of actions that may be appropriate for military housing:

- When heating a house, set back or program the thermostat 5 to 10 degrees lower at night or when leaving the house for more than four hours.
- Use air conditioners only when the in-home temperature is more than 78 degrees.
- Clean the air conditioning filter monthly.
- Use open windows as much as possible, rather than air conditioners.
- If air conditioners must be used, augment with fans rather than decreasing the thermostat temperature.
- Caulk doors and windows and install weatherstripping around doors, or request this service from the base maintenance organization.
- Wrap the water heater with insulation material.
- Adjust the water heater temperature to 120 degrees.
- Close doors and windows when heat or cooling are on.
- Keep blinds or curtains drawn in the hot part of the day.
- Make sure floor vents are not blocked by furniture or draperies.
- Use the energy-saving features on dishwashers, clotheswashers, and dryers, including “air dry” settings.
- Use cool water for washing clothes.
- Clean the dryer lint filter regularly.
- Set the refrigerator temperature to 38 degrees and the freezer temperature to 0-5 degrees.
- Close the refrigerator and freezer quickly after selecting your food item.
- Keep the coils on the refrigerator clean.
- Clean or change furnace filters monthly.
- For incandescent lights, use 60 watts or less.
- Replace incandescent light bulbs with compact fluorescent lights.
- Avoid using space heaters.
- Turn off unused lights, including outside porch or path lights, during the day.

- Install a timer on the porch light that automatically turns it off when daylight comes.
- Turn off unused appliances.
- Install solar-reflecting films or other heat-blocking materials on windows.
- Install water-restriction flow valves in showerheads and faucets.
- Close vents in unused or little-used rooms, such as laundry rooms.

Guidelines for choosing and listing actions follow.

- Make sure the actions chosen are allowable, feasible, and reasonable for your base and its house floor plans. For example, military residents are not expected to purchase their own wall insulation or double-paned windows, so those would not appear on the list. Some base housing may not have programmable thermostats; others may not have air conditioners; some fixtures may not take compact fluorescent lights.
- Choose five to ten actions. Asking people to do too many things confuses them and may appear too daunting.
- Group the actions by topic; for example, temperature, washing and drying, and lighting. Actions can also be grouped by area of the house; for example, kitchen, bathroom, laundry room, and living areas.
- In communicating the actions, list those with the greatest potential for savings first. In most cases, this will be actions related to heating and cooling, including preventing loss of heated and cooled air to the outside. Studies have shown that people typically underestimate the energy-saving potential of certain actions (insulation, for example) and overestimate the savings of others (such as turning off lights). For example, a refrigerator uses almost five times the electricity the average television uses. Thus it is important to emphasize the higher-value actions to educate people.

  Another reason to emphasize the higher-value actions is that people will be more likely to focus on them if they choose only one or two actions to carry out. At Fort Lewis, for example, the list of energy-efficiency tips was prefaced with the statement, "If you can only do one thing, it should be turning down your thermostat at night."

Emphasize the actions that contribute the most toward energy conservation, such as heating and cooling.

4.8 Select Themes, Messages, and Visuals

Based on the focus groups and interviews described above, choose themes and messages that provide a focal point on which to "hang" the campaign. Themes are the guiding communication frameworks. Examples of themes are "Comfort for military families" and "Sustaining America's natural resources."

Messages are statements that support the themes. Messages form the basis for action. Residents should relate to, believe, and be motivated by the messages. Here are some examples of messages:

- The base is being held accountable for reducing energy use.
- Every person's actions count. It takes everyone's efforts to accomplish the goal.
- Make your home more comfortable.
- Make your home a healthier environment.
- It's easy to do these things. People here will help you.
- Teach your kids good habits that will last a lifetime.
- Make a commitment to do three new things this year.
- Your neighbors, friends, and relatives are all doing this.
- Get an incentive award for smart energy use.
- Make your community the leader.
- Let's do even better than last year.

At Yuma Air Station, targeted behaviors were the focal points for weeklong messages. The first week's cartoon, electronic billboard messages and the Energy Monitor's activities related to water conservation, the next week's messages to air conditioning use, and so on.

Messages do not have to be stated explicitly in the campaign, but they underlie information materials, visuals, and activities of the campaign. Let's say, for example, that one of your messages was about how easy it is to do certain things and that others are there to help you. This message could be reaffirmed by showing children in a video doing energy-efficient actions in their homes, offering home energy visits, listing the phone numbers of energy managers who can answer questions, describing the things the family housing maintenance organization can do to make homes more energy efficient, and by holding workshops and open houses to demonstrate certain actions.

Themes and messages also form the basis for slogans. A slogan is a short, catchy phrase that is repeated throughout the campaign and usually appears with the logo or other identifying visual. Examples of slogans are "Smart Energy Use," "Save Army Energy," "Healthy Homes," and "Energy Winners."

To raise awareness and visibility, call the campaign something with a military tone, such as Operation Energy. Groups of kids or energy auditors can be called "The E-Team" or other upbeat names.

The Energy Bandit, a sneaky bad guy, was created for a base residential energy campaign. A videotape showed residents doing things to save energy in their homes, thus outsmarting the bandit.

In your communications, look for ways to adapt popular movie or book titles; TV, movie, or cartoon characters; historical and military figures; or even famous sayings. Heroes and villains are especially effective for a military setting—as long as residents are not made the bad guys! The Fort Lewis and Yuma Air Station campaign videos, for example, used a character called the Energy Bandit, a sneaky bad guy who stole energy but was ultimately conquered by energy-saving things residents did (one of the scripts

is in Appendix D). In choosing these characters and sayings, make sure the intended audience relates to them, and don't use anything that is trademarked.

Based on the theme, choose an identifying visual or logo for the campaign, and place it on all campaign materials. The logo should be simple, self-explanatory, distinguishable in black and white (as well as color), and visible when reduced to a small size. It may use a familiar landmark from the base. Be careful, however, not to infringe on logos copyrighted by other organizations or to mimic the logo of a particular command or division of the military.

DOE's Federal Energy Management Program logo for its "You Have the Power" campaigns

You can raise awareness and interest in the campaign by hosting a logo and slogan contest for residents. Or, post sample logos and slogans and have residents vote on them.

If your campaign falls under the U.S. Department of Energy's Federal Energy Management Program (FEMP), you must use their logo and slogan (a hand holding a globe, "You Have the Power") in your materials. You also need to credit the Department of Energy as a sponsor or partner. At Fort Lewis, the FEMP logo was used as a secondary visual, but the primary logo and slogan were chosen by the residents: a lightbulb with a glowing dollar sign inside it and "Smart Energy Use" (Appendix B). At MCAS Yuma, the FEMP logo and slogan were the primary visual and slogan. If you are interested in linking with FEMP, visit http://www.eren.doe.gov/femp or call (800) DOE-EREN.

Other visuals can include kids' art made into posters, cartoon strips created by residents, banners, displays, skits, videos, or anything else that is feasible and tailored to the base.

An important aspect of developing visuals is deciding how energy use and savings will be communicated to residents periodically. Regular feedback in an easy-to-understand format is critical for motivating residents and keeping them on track. Bar charts, pie charts, and other visual formats are better than numbers only. Show trends and comparisons, not just a new number each time. If you are aiming for a specific goal, consider showing progress toward the goal.

Residents usually can relate better to dollars than to energy units such as Btus or therms. If you do use energy units, put them in context. For example, it may help to say that the base has saved enough energy to "light up the Astrodome for a week" or other memorable analogy.

4.9 Choose Communication Channels

Identify the communication channels you will use in the campaign, and when and how you will use them. Choose communication channels based on what residents said in previous discussions and interviews. The channels will vary for each base. Examples of typical communication channels include

- Base newspapers
- Base newsletters

Using a wide variety of communication channels, and repeating information, increases the likelihood that residents will become aware of the campaign.

- Closed-circuit TV on base
- Training video
- Reader boards
- Posters and notices at places such as community centers, Commissary, and PX
- Banners
- Displays and exhibits for special events such as educational or patriotic fairs
- Fliers and brochures
- Information packets that newcomers receive
- Community and mayors' meetings
- Area coordinators
- Chains of command
- Social or educational groups such as Scouts, clubs, schools
- Door-to-door visits.

Using a wide variety of communication channels, and repeating the same information, increases the likelihood that residents will become aware of the campaign. In advertising, it has been calculated that people must see an ad seven to ten times before they remember it! Keep this in mind as you decide when and how to communicate.

4.10 Identify Motivators and Incentives

People value thermal comfort and resent deprivation. Emphasize how various actions improve well-being, health, and convenience for residents.

A common mistake is to assume that if people understand the need to conserve energy, believe energy conservation is important, and know what to do, they will adopt energy-efficient practices. As numerous energy-conservation studies since the 1970s have shown, these factors are not enough to change behavior. If your campaign is based solely on giving information to residents, it will almost certainly fail!

Changing peoples' energy use behaviors must go beyond one-way education to action. The campaign must address barriers to change as well as making the behaviors easy, convenient, relevant, and socially acceptable. Research and case studies reveal some factors that have proven effective in other situations. You may wish to adapt these for your campaign.

- **A positive gain, not deprivation.** People resent hardship, especially in the military where many already feel that they are making sacrifices in their living arrangements. Don't imply they must give up more to save energy. Instead, emphasize what residents GAIN from adopting certain behaviors. For example, the number-one factor in energy-related activities is thermal comfort. People resist doing things that make them feel uncomfortably cold or hot, even if they save energy by doing so. They are much more receptive to things that will improve their comfort and health, and which give them a sense of control over their environments.

Therefore, focus on activities that improve the well-being and convenience of residents. Weatherstripping and caulking, for example, reduce drafts and condensation, improving personal comfort. Clean furnace filters improve air quality and even decrease allergies by reducing airborne dirt particles. Closing curtains and blinds in the summer keeps the house cooler and keeps furniture fabric from fading. Clothes dry more quickly when lint traps are kept clean. Water heaters that are set at the proper temperature reduce the possibility of accidental scalding, especially with children in the home. Using lower-voltage lights, keeping draperies away from vents, and avoiding space heaters help prevent fires. Air-drying lightweight clothes helps prevent shrinkage and makes fabrics last longer. Compact fluorescent bulbs last for months or years before they need to be replaced.

Throughout the campaign, consider using the terms "energy efficiency" and "energy awareness" rather than conservation, which can imply imposed deprivation.

Home visits, if viewed as helpful rather than punitive, are effective for giving specific suggestions and offering assistance. Follow-up visits can be used to assess progress, solve problems, and encourage continuing change.

- **Personal, interactive contact.** Face-to-face, back-and-forth communication is one of the most effective motivators in energy education efforts. When people are personally confronted with an opportunity to adopt more energy-efficient behavior, as opposed to having the opportunity presented through information materials or the media, their participation rises dramatically.

  If your base has the resources, home visits are extremely effective when conducted in a positive, not punitive, way. An energy educator can go through a checklist with residents and even tour their homes, giving specific suggestions and offering help as appropriate. Follow-up visits are extremely effective in assessing progress, problem-solving, and encouraging continuing change.

  If you use this approach, make sure residents don't view it as intrusive and "big-brotherish." One way to lessen potential resentment is to have trusted leaders in the community conduct the visits. In fact, it has been shown that a personal relationship with the educator is a primary benefit. Kids can also go through checklists with their parents as part of an educational project.

- **Active involvement and commitment.** When residents decide which actions to take after talking with someone about a variety of energy choices, they are more likely to carry out those actions. It also helps when residents sign an action plan as a sign of commitment. A public commitment, such as publishing the names of residents who have pledged to undertake various actions, is more effective than a verbal commitment. Another way of public commitment is to publish ongoing energy tips from residents, using their names.

  As mentioned previously, involvement can also take the form of residents contributing ideas or actively helping design, implement, and evaluate the campaign. Commitment is increased by the "foot-in-the-door" method: If residents agree to make one small commitment at the beginning, they are more likely to make a larger commitment later.

- **Demonstrated commitment by the military leadership to the comfort and health of residents**. At both Fort Lewis and MCAS YUMA, residents overwhelmingly cited energy-efficient homes as the number-one factor that makes energy conservation difficult. Many residents complained in detail about poorly weatherized windows and doors, thermostats that didn't work, and repairs that had been requested but not made. One resident said "When the Army fixes our houses, then we will care [enough to do energy-efficient things]." Responses such as these indicate that residents are less inclined to take personal action when they perceive that the military is not doing all it can to provide a reasonably comfortable home environment.

Ask residents to choose certain energy-efficiency actions and sign a commitment to carry them out.

- **Feedback.** Feedback is information residents receive about actions they have already taken. In an energy campaign, feedback shows residents how much energy they have saved over certain periods of time. Feedback helps people visualize the results of their actions, which is important because these results are often invisible or difficult for residents to evaluate. Feedback is most effective when used in conjunction with a commitment to take action. For specific suggestions about how to display progress visually, see Section 4.8.

- **Incentives.** An incentive can take the form of a monetary reward or other desired outcome such as a new playground on the base. The incentive could be a portion of energy costs saved over a period of time. Use of incentives has been mixed, with most effectiveness for short-term change rather than sustained habits.

  Group incentives appear effective under certain conditions. The money should be provided to the entire group or every member of the group, not individuals who receive it in a raffle. If the group receives the money in a lump sum, all members should have the opportunity to say how the money should be allocated. The amount received must be enough to elicit behavior change. Payment should be received periodically rather than delayed for long periods of time.

  Make sure monetary incentives for energy savings are feasible. At the Fort Lewis and MCAS Yuma bases it was impossible to transfer money from the utility account to the account that directly benefits family housing residents. This situation may become more flexible as military housing becomes privatized.

- **Social interaction.** People are more likely to adopt an innovation or behavior change if they have heard about it or seen it adopted by a friend or respected member of the community. Community meetings and other events can be used to conduct focus groups that design and evaluate campaigns, and help foster exchanges of information. Community leaders can make energy efficiency a high-status activity. Service clubs can promote energy efficiency through their existing missions. Schools, Scouts, and other youth programs and events can promote educational activities that involve kids. Kids, in turn, help influence and remind their parents to use energy wisely.

- **Competition.** Competition among similar groups has been shown to motivate behavior changes. This is especially true in the military culture, which is based on competition and winning. For example, energy use of various housing areas can be compared with each other. If housing areas are architecturally and/or demographically different, energy use of various housing areas can be compared with their own use from a previous time period, or energy use-data can be normalized according to the number of people participating. Incentives can be offered to "winners" or to all those who achieve a certain goal.

  For competition to work, people must perceive that the comparison is fair; in other words, that groups being compared are equivalent in factors that affect energy use. In addition, as many group members as possible must be aware of where they stand in comparison with others. Individuals must feel that their actions make a difference in the entire group's outcome.

Competition—prized in the military culture—sometimes can be used to motivate behavior changes among residents.

  The groups being compared must have enough pride in their group identities to motivate competition. At Fort Lewis, for example, the relatively high personnel turnover rate may have kept housing residents from establishing neighborhood bonds and thus lowered the motivation to compete against other neighborhoods, on base. At MCAS Yuma, however, many residents said they were motivated by the desire to make their entire post the most energy-efficient in the Marines. In this case, residents (with lower turnover and a smaller housing community) apparently identified strongly enough with their post to want to elevate it above other installations in their branch of the service.

- **Vivid, relevant, personalized information.** Information that is presented in a vivid form, such as a personal story involving danger or victory, is more likely to prompt action than something like a standard list of tips or numbers. If the desired behaviors are modeled, people are more likely to visualize themselves doing them. Videotapes of people doing energy-efficient things in their homes have prompted similar actions by viewers, even after one viewing.

4.11 Get the Word Out

In accordance with your schedule, produce and distribute information and use the channels of communication you've identified. Information materials may fit into several categories:

- **Campaign description.** These materials are intended to raise awareness among residents about the campaign, its incentives, their role, and the time frame. Names and phone numbers of campaign managers and resource people should be listed. Appendix B contains some examples of materials introducing the campaign.

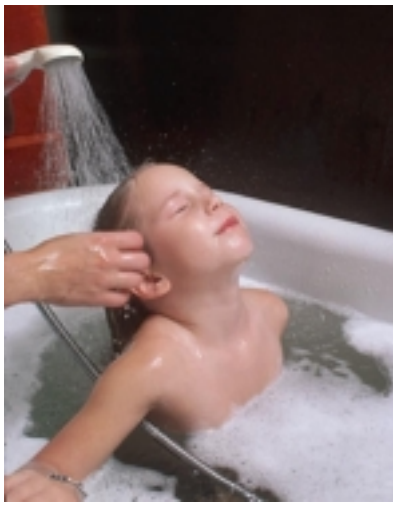
Fliers, brochures, posters, news articles, and community meetings can be used to convey this information. It is important to get the word out to as many people as possible, as early as possible, about the campaign to motivate behavior change.

To maintain awareness despite personnel turnover, information about the campaign must be conveyed on a regular basis. For example, materials could be placed in newcomers' packets, letters could be sent to homes when families move in, or newcomers could be required to view a short video as part of their base orientation.

◆ **Information channels for targeted behaviors.** The desired energy-saving actions (see Section 4.7) should be conveyed in many different ways, to reinforce them and to ensure that as many people as possible become aware of them. Here are some examples of ways behaviors can be described:

- Posters (see example in Appendix B)
- Brochures and fliers (see Appendix B)
- Children's art work
- Videos where residents demonstrate the actions (see Appendix D)
- Reader boards highlighting one action each time
- Cartoon strips (see examples in Appendix B)
- Refrigerator magnets, T-shirts, door hangers
- Workshops
- As part of displays and fairs
- On a "commitment sheet" where residents check off the actions they plan to take
- On educational worksheets where children and parents are guided through their own homes by answering questions about energy use in each room
- Mock "tests" ("Guess which one of these appliances is the biggest energy hog?").

Studies have shown that a particularly effective "grabber" is to convey one or more behaviors in a personal story form. The more vivid and dramatic, the better. These stories could emphasize the impacts of taking certain actions. For example, a pediatrician may be willing to speak about how she treated a child for hot water burns, which could have been prevented if the water heater was set at the proper temperature. A dad could describe how his children suffered fewer allergy symptoms after he began cleaning the furnace filter monthly. A base firefighter could describe a home fire that was caused by improper use of a space heater or high-wattage light bulbs. A teenager could brag that her job of replacing burnt-out light bulbs has all but disappeared after she talked her family into replacing the incandescent bulbs with compact fluorescent ones.



Use stories from residents to emphasize the target behaviors. Water heaters set at the proper temperature, for example, reduce the possibility of accidental scalding.

Another way to get these stories is to have residents contribute their own energy-conservation tips—and publish them with the names of the contributors. This approach highlights residents as role models while conveying the feeling that neighbors and friends are indeed making changes.

- **Progress by residents.** It is critical to give regular feedback about how well residents are doing, in comparison with a goal, if appropriate. Residents need to visualize a tangible result of their efforts to be motivated, especially in the absence of personal utility bills that typically provide this feedback to homeowners.

  This feedback can be shown in bar charts, pie charts, and other visual formats. As mentioned previously, put results in a format familiar to residents, such as dollars saved versus Btus. Appendix B shows a format that could be adapted to show progress in energy savings among various communities or neighborhoods on a base.

  Another way to show progress is to tie it to a goal that the base is working toward. For example, if residents are working toward a goal of upgrading playground equipment, you could show a picture of the equipment gradually being "filled in," representing the portion of the goal achieved so far. List the targeted behaviors at the same time progress is being shown, to reinforce the idea that these behaviors are resulting in this amount of savings.

  Again, information on progress should be shown in several different forums to help ensure visibility among as many residents as possible. These could include posters, fliers, news articles, direct mail, and door-to-door fliers handed out by energy monitors or community leaders.

- **Final results and rewards.** At the end of the campaign, or whenever awards or other incentives are given out, residents must be made aware of them. If incentives are given out periodically, conveying this to residents will help motivate continued behavior change.

  Results and rewards should be announced with some degree of fanfare and celebration. If awards are given to certain housing areas or parts of the base, it may be appropriate to have a high-level base official hand out the award at a ceremony where those residents are invited. If the base achieved a tangible award such as a playground upgrade, a plaque could be permanently placed there, engraved with words such as "New playground equipment made possible by energy savings in XYZ Base family housing, 2000." Individual, low-cost awards, such as certificates, can be given out to individuals or groups who carried out special activities to make the campaign a success, such as energy monitors, community leaders, schools, Scouts, and clubs.

  Posters, news articles, and other materials can help convey the results across the base.

4.12 Conduct Activities and Involve Residents

Visible, interactive activities such as exhibits are great for getting the word out and showing progress in base energy savings.

Visible, interactive activities help get the word out, invite participation in fun ways, and reach specific groups. Activities can claim huge amounts of time and resources, so make sure you have sufficient amounts of both before beginning. Examples of activities include the following:

- **Hosting displays or exhibits at fairs and other community events.** At Fort Lewis's Kids Fest, for example, the energy resource manager staffed an energy-education booth and handed out hundreds of "give-away" materials donated by local utilities. MCAS Yuma has made an Energy Fair a yearly event, with local utilities and the University of Arizona providing exhibits and prizes for drawings.

- **Working with education-oriented groups to target children.** Family housing residents are very attuned to the well-being of their children, and this can be capitalized on for campaigns. Sometimes the same residents who are reluctant to have energy monitors come to their houses may welcome visits from students as part of an educational project. In addition, an excited and involved child can motivate and serve as a role model for other family members, including parents. Results of the final survey at MCAS Yuma indicated a large number of housing residents surveyed (42%) chose energy-efficient behaviors because they wanted to set a good example for their children.

  Work with existing education-oriented groups whose missions involve children. Scouting groups, for example, may wish to include family energy efficiency as part of the requirements to earn certain badges. Scout leaders may also be willing to set up required community service projects that contribute to the campaign. Schools where the base's children attend may also be willing to include an energy-efficiency unit in their curricula. Day care centers for school-age children may welcome age-appropriate energy-related activities, such as art work by children that is converted into posters and used in the campaign or games featuring energy-efficient behaviors.

  Resources for working with kids on energy issues are also available from the Alliance to Save Energy. The Alliance's Green Schools project offers free lesson plans on the Internet for elementary and middle-school ages (www.ase.org/educators). The Green Schools Project is designed to reduce facility energy costs while educating students. Lesson plans include activities, games, and home energy audits that kids can do themselves.

In working with education-oriented groups, keep the following guidelines in mind:

- Have a single point of contact representing each group. This person must be willing to expend personal effort and lead others to make sure the energy-related educational projects are carried out effectively. Make sure that person is willing to get the proper approvals for any energy-related projects (school district officials, etc.).

- Be prepared to work closely with group members to prepare materials and activities. Most educational groups are extremely busy and will look to you for ideas and help. Some teachers and other leaders may not feel competent teaching about energy use and may want a prepackaged curriculum that fits with their teaching goals. Resources such as the free lesson plans from the Green Schools Project, mentioned earlier, can be very effective. Appendix E lists other resources. Most materials will need to be tailored to your particular base and situation.
- Understand the group's mission and how you fit into it. Most schools, for example, will require that children learn something from a particular activity. Thus, school officials may frown on children simply carrying fliers home, but they may be very interested in an educational unit that teaches children how to calculate "before and after" energy use in their homes.
- Make sure everyone involved understands each other's roles. For example, who will provide the educational materials? In what form? Who will tailor them to meet the group's needs? Who pays for what? Who will host activities for children? Who will provide prizes and other awards for children, if required?
- Make sure all activities are age-appropriate. Older children, for example, may enjoy participating in neighborhood energy audits with adult energy monitors, whereas younger children may prefer going through a simple checklist with their parents. The leaders of each group can advise you on what is age-appropriate for their group of children.

Work with existing education-oriented groups to involve children. Children can motivate and serve as role models for other family members.

◆ **Using October, Energy Awareness Month, to highlight the campaign**. Examples of activities that fit well with this theme include the following:

- Contests and giveaways
- Fairs
- Awards for progress to date
- Open houses in various neighborhoods where energy-efficient elements are highlighted (and snacks are given out!)
- Community workshops demonstrating certain activities, such as how to program a thermostat and when to use the various styles of compact fluorescent lights, with lights given out as door prizes
- Special activities for kids.

4.13 In Summary: Designing and Executing a Campaign

In designing and executing a campaign, consider the following steps:

◆ Establish **goals**, or the desired outcomes. A typical goal is to get residents to modify their habits to reduce energy use by a certain amount over a certain time period.

- Establish **objectives** to achieve goals. Typical objectives are to increase the percent of people who engage in certain measurable behaviors.
- Set a **budget** that covers all labor, materials, production, distribution, activities, and monetary incentives, if any. Get the budget approved early.
- Set a **schedule** to keep the work on track and to include time-specific events. The schedule may be influenced by the availability of energy-use data and the time required for behavior change.
- Understand your base setting by **talking with residents and officials**. Use input from them to design a campaign that is tailored to the site. Use focus groups and interviews to learn what residents are interested in and willing to do, allowed to do, want to participate in, and how they want information communicated. Talk with base communication personnel to learn about their requirements, deadlines, and approval processes.
- Consider a **pre-survey**. A pre-survey of residents can be used to design the campaign; select logos, slogans, and incentives; form a baseline for later comparison and evaluation; and begin introducing the target actions. Design surveys using accepted practices for data gathering and wording. Pretest the survey with residents before administering it.
- Identify **desired behaviors**. Choose actions that are allowable, feasible, and reasonable for the base and the houses' floor plans. Emphasize the actions with the greatest potential for savings.
- Select **themes, messages, and visuals**. Themes are the guiding communication frameworks. Messages are statements that support the themes and provide the basis for action. A slogan is a short, catchy phrase that often appears with an identifying visual or logo. All visuals should be in familiar, easy-to-understand formats.
- Choose **communication channels** that residents have said they pay attention to. Use a variety of channels and repeat information for best coverage.
- Identify **motivators and incentives** to prompt behavior change. Giving out information is not enough. Emphasize gain rather than deprivation—health, well-being, and convenience. Use personal, interactive contact such as home visits. Encourage written commitment by residents. Use feedback to show residents how much energy they have saved over time. Consider monetary or other tangible rewards. Work through existing social groups. Foster competition. Make information vivid, relevant, and personalized.
- Get the word out**.** Produce and distribute **information** about the campaign itself, the targeted behaviors, progress, and final results and rewards.
- Conduct **activities** and **involve residents**. Use interactive activities to share information, invite participation, and reach specific groups.

When working with educational groups, understand their mission, clarify each others' roles, and be prepared to provide tailored information materials.

5.0 Evaluating and Reporting on the Campaign

Evaluating the effectiveness of a campaign involves measuring the results against the goals. Evaluation enables you to understand the extent to which the expected results were achieved. Perhaps more importantly, evaluation should also reveal what elements of the campaign were effective and which were not—in other words, what worked, what didn't, and why? The findings can be used for mid-course correction or to design future efforts.

5.1 Mid-Course Evaluation

Persuading people to change their habits is challenging, because so many things influence peoples' behaviors. Thus, even if you've done your homework to tailor a campaign to your base, some surprises are bound to arise along the way. That's where a mid-course evaluation becomes valuable.

If you wait until the campaign ends before evaluating it, you may discover that certain aspects of your approach were not effective. By that time, however, you've lost the opportunity to make changes or corrections. A mid-course evaluation allows you to fine-tune the campaign in progress to better achieve the desired outcomes. In addition, you can shift resources to areas that are working well, while eliminating or cutting back on activities that are less effective.

A few telephone calls to responsive residents can be used to evaluate a campaign that is under way. Use feedback to make mid-course corrections.

A mid-course evaluation need not be expensive or time-consuming. Several strategic phone calls, personal interviews, or a couple of informal discussions with a group of community members can reveal much about what's working, what's not, and what needs to be done differently.

If you are using phone or face-to-face interviews, start with your established contacts—the people who provided input to design the campaign or leaders who are contributing to its implementation. Ask each person if there are others to whom they can refer you who would be willing to answer a few questions. If possible, try to get a diverse group of respondents—men, women, and children from different kinds of houses or different locations on the base. Assure them that their responses will help improve the campaign and that no names will be used.

A mid-course correction should provide answers to the following questions:

- Are residents aware of the key elements of the campaign, including incentives, if any?
- Where are they getting their information about the campaign?
- Do they know what they're being asked to do to use energy efficiently?

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A mid-course correction should provide answers to the following questions:

- Are residents aware of the key elements of the campaign, including incentives, if any?
- Where are they getting their information about the campaign?
- Do they know what they're being asked to do to use energy efficiently?

- Are they doing anything differently now in their homes as a result of the campaign, and if so, what?
- Is there anything keeping them from doing these things? If so, what?

In phone interviews or group discussions, listen carefully to what residents volunteer when they answer questions. Their comments may indicate misunderstandings that need to be corrected as well as the need for greater emphasis in some areas.

At Fort Lewis, for example, many residents said they didn't need compact fluorescent lights, thinking that they were only for the fluorescent-type tube fixtures. Though the campaign had encouraged the use of compact fluorescents, people didn't understand what they were or that they were available at the base PX. From this finding, future campaign communications placed more emphasis on showing compact fluorescent lights, demonstrating how they fit into various existing fixtures, and reminding people to purchase them on base.

5.2 Final Evaluation

Evaluate two factors as a minimum: (1) the amount of energy saved and (2) the influence of residents' actions on the savings.

As a minimum, the final evaluation should investigate two factors: (1) the amount of energy saved, and (2) the extent of peoples' behavior change that contributed to the savings. Together, these two factors indicate the effectiveness of the campaign. The first factor is relatively straightforward to measure by examining before-and-after energy-use data. The second factor is more interpretative, but just as important.

- **Energy saved.** Energy-use data should be available from Housing, another base organization responsible for base energy, or the provider utility. Depending on how data are gathered, you can calculate and present energy use and savings in various ways that make sense for your campaign. For example, energy savings can be calculated by season, by neighborhoods or parts of the base, by different house designs, by gas versus electricity, and so on.

  Section 5.3 describes factors that should be considered when calculating energy savings.

- **Behavior change.** To understand peoples' behavior change and to what extent the campaign contributed to it, you need direct feedback from residents. The best ways to do this are to conduct small discussion groups and/or survey all residents who were targeted in the campaign.

  The discussion groups and survey process can be similar to those described in Section 4.5 for designing the campaign. When conducting focus groups for this final evaluation, try to convene groups that represent a diversity of people and housing situations. Conduct focus groups until you begin to hear people from different groups repeating the same things, with no significantly different information arising. According to noted focus group expert and Portland State University professor David L. Morgan, a typical number of groups is three to five with six to ten participants, for topics and participants with moderate diversity. When you begin hearing the same information coming up in

various focus groups, you will have confidence that what you are hearing is somewhat representative of the larger population.

At the end of the campaign, you want to understand two fundamental things:

- to what extent people took actions that reduced energy use (including actions taken)
- the effectiveness of various campaign activities and communications in prompting those changes.

You may also wish to gauge residents' willingness to continue their energy-efficient lifestyles.

To learn about these things, ask questions similar to those described in the mid-course evaluation (Section 5.1), tailoring them for the end of the campaign. The goal of the evaluation is to understand the effectiveness of the campaign well enough to be able to use or adapt its activities for longer-term efforts, eliminating or replacing activities that were ineffective.

When asking about the target behaviors, ask which things residents were already doing before the campaign began and which ones they began doing after the campaign started (see the MCAS Yuma survey in Appendix C). Asking the question this way has three benefits: (1) people like to "get credit" for the positive things they're already doing, (2) it more clearly shows which activities were caused by the campaign, and (3) it shows which activities may need more or less emphasis in ongoing efforts.

A mail survey can ask similar questions and give you more confidence of having representative results, though you won't get the insights or depth of responses as in oral discussions. With an adequate response rate, a mail survey adds somewhat more rigor to an evaluation because it goes to the entire target population and shows the percent of respondents who said certain things. Appendix C shows examples of mail surveys sent to all residents for final evaluation of a campaign.

A telephone survey can also be conducted, though it can be very time-consuming if you are trying to hear from a large population of residents. In addition, people who are "cold-called" (as from a telephone list of all residents) may resent the intrusion.

The information received from residents, combined with other information you may have access to, helps you put the energy-use data in perspective. You may discover, for example, that one area of residential housing saved considerably more than others, but not know why until you hear from its residents. You may learn from them that their members were the only ones who received a certain newsletter or had educational projects involving children. You may also discover that they had the highest percent of home visits or signed the most commitment forms promising to take certain energy-saving actions in their homes.

On the other hand, you may discover that residents who moved to the base after a certain date were unaware of the campaign and consequently did nothing to change. Or perhaps people were enthused at the beginning of the

campaign, but as time went on, enthusiasm waned and behaviors reverted. Or perhaps certain behaviors, such as turning down a thermostat, proved uncomfortable or inconvenient over time.

These kinds of findings, both positive and negative, help shed light on the effectiveness and timing of certain campaign activities in contributing to the overall result.

With adequate resources and time, the best evaluation uses several methods, quantitative (involving numbers such as energy amounts saved, how many people said what, or number of energy home visits requested) and qualitative (interpreting the meaning in what people have said or done). Once the combined data are analyzed and compared, the key findings about the effectiveness of the campaign will rise to the top. It helps to have various team members conduct this evaluation together and discuss the combined findings, to reach a consensus of perspectives.

5.3 Factors that Affect Energy Use Results

Several factors can make energy-use results appear artificially high or low. You need to acknowledge and account for the factors that apply to your campaign.

Account for temperature-related weather conditions when comparing energy use from different time periods.

- **Account for temperature-related weather conditions.** Let's say, for example, that you launched a campaign for summer and winter 2000, and you are comparing it with summer and winter energy use from 1999 to calculate savings from one year to the next. If the year 2000 happened to have an unusually cool summer or warm winter, people would likely not use their cooling or heating systems as much, thus saving energy. However, this reduced use alone would not be a result of informed behavior change, but of weather conditions. The resulting energy saved could appear very positive, but artificially so. By the same token, if the year 2000 happened to be an unusually hot summer and cold winter, the energy results could look particularly bleak because people would have used their cooling and heating more than usual. In fact, even if residents did take actions to save more energy, the results could be masked by weather-related increases in heating and cooling.

  What you really want to measure is, did residents save even more energy beyond that associated with weather-related heating and cooling? For the answer, correct energy data for weather effects by using a mathematical calculation. Appendix F describes the process.

- **Account for physical upgrades in housing**. If the base is upgrading certain physical features of base housing during the time of your campaign, it may affect campaign results. Upgrades such as installing double-pane windows, insulation, programmable thermostats, and sealing door and window frames should improve energy efficiency and reduce energy use. Yet most of these upgrades do not require behavior change by residents. (An exception is the programmable thermostat, which residents must program and not manually override.) To account

for the effect of upgrades on energy savings, subtract the expected upgrade-related savings from the energy-use data. Estimates of savings from upgrades are available from analysis that the military or its contractors must conduct to justify housing modifications.

- **Account for occupancy.** Occupancy that is significantly lower than usual during the time of the campaign or during the comparison period may affect energy results. In such cases, it could appear that residents saved more or less than they did when the energy use actually reflects fewer occupants in the homes.

  Which occupancy situations probably are not cause for concern? Most bases have slightly fluctuating occupancies as people move in and out and routine maintenance is performed. These constant, slight fluctuations won't affect energy results because they are the same in both time periods of comparison.

  Another cause of occupancy is deployment. Deployments usually don't affect energy use significantly, however. Though one parent may be deployed away from the home, most energy use continues at the same rate, especially heating and cooling. What about when both parents are deployed at the same time? According to the DoD's DefenseLINK web site, only about 6% of service members are married to other service members. Though some bases may have higher rates of married service members, the military makes an effort not to deploy both parents at the same time to prevent children from temporarily moving elsewhere, meaning few homes are completely unoccupied during deployments.

  A situation that could affect energy rates, however, would be if the base were performing major upgrades on a significant percentage of homes, leaving them empty for a time. To determine how much this situation would affect energy results, you would need to "normalize" the data on a per-house or per-square-foot basis. This involves dividing total energy consumption by the number of homes to get the consumption per residence. Then, a ratio using the percent of unoccupied homes could be compared with the same ratio from the time period when homes were occupied, to determine the difference in energy use. A more general way to do this would be to estimate the energy use from the unoccupied homes and subtract that from the energy used when the homes were occupied. This would become your new energy baseline.

- **Account for changes in energy rates.** One of your campaign goals may be to reduce the base's energy bill for family housing. Be aware, however, that changes in costs of gas, oil, and electricity rates will also affect costs. In other words, if electricity rates dropped significantly during the year of the campaign, the base could show energy cost savings from the previous year even if the same, or even more, energy was used by residents. The reduced costs would be the result of reduced energy rates, not necessarily behavior changes by residents. By the same token, if rates increased substantially, energy savings could look artificially negative even if residents had saved more energy from the previous year.

This situation is not a problem if your cost savings are based on energy units used (such as therms) that you multiply by a constant dollar amount. If you're using the energy bills the base received from the utility, however, you should also examine actual energy use and not just what the base was charged.

5.4 Reporting on and Publicizing Results

In reporting on a campaign, be prepared to discuss findings, recommendatins, future plans, and how the campaign contributed toward federal energy goals.

Residents, base officials, and sponsors have the right to know the results of the campaign in some form. Base community leaders who participated in the campaign may appreciate a separate briefing. Higher-level military officials, U.S. Department of Energy organizations, local utilities, professional scientific societies, schools, and energy coalitions may also be interested in the results. All of these people will also want to know about any follow-up or ongoing efforts.

Reporting can take many different forms, but should be tailored to the audience for which it is intended. For example, communications with residents may emphasize incentives won, pride, and celebration, as well as the need for ongoing action. Base officials may be interested in how to extend or improve on the results to meet future energy conservation goals. The base's public affairs office may wish to send press releases to local news media, emphasizing local angles such as school or utility involvement. Scientific societies and coalitions may be interested in new or corroborative findings and implications for future studies.

In reporting on campaign results, be prepared to provide or discuss the following:

- Data, visuals, other information, and quotes in various formats and for various audiences
- Why the campaign was or was not successful, and, more importantly, what will be done in the future as a result
- How the campaign fits into a broader context, such as meeting federal and military energy goals
- Implications of upcoming changes that could affect future energy use. Examples are privatization of military housing and increased use of Energy Saving Performance Contracts, where contractors upgrade facilities to make them more energy efficient and are paid from the resulting energy cost reductions.

5.5 In Summary: Evaluating and Reporting on the Campaign

Keep these guidelines in mind when evaluating and reporting on the final results of the campaign:

- Evaluating the effectiveness of a campaign involves **measuring the results against the goals.** Evaluation should also reveal what elements of the campaign were effective and which were not—in other words, what worked, what didn't, and why.

- A **mid-course evaluation** allows you to change or correct your approach and activities to help achieve the final goals more effectively.
- A **final evaluation** should be more extensive and representative. A combination of methods is helpful. As a minimum, the final evaluation should investigate two factors: (1) the amount of energy saved, and (2) the extent of peoples' behavior changes that contributed to the savings.
- In calculating the amount of energy used and saved, account for factors such as **weather conditions, physical upgrades in houses, occupancy, and changes in energy rates.**
- **Report the campaign results** to residents, base officials, and sponsors, at a minimum. Convey information about the effectiveness of the campaign and any follow-on efforts in forms tailored to the intended audiences.

6.0 Sustaining the Effort

Studies have shown that the most challenging aspect of energy-efficiency programs aimed at changing behavior is sustaining new behaviors over time. For a variety of reasons, it is very difficult to change ingrained habits and underlying attitudes. (As evidence, recall how many years it took to get people to recycle, wear seatbelts, and exercise regularly—and many people still don't do these things, despite the obvious benefits!)

Added to this challenge is residential turnover on military bases, which makes it difficult to sustain messages and interest. (On the other hand, people who take changed attitudes and behaviors with them can spark changes on other bases.) The most significant challenge, of course, is the need to maintain motivation in the absence of individual utility bills.

Despite these barriers, federal mandates for energy reductions in federal facilities are becoming more stringent. Every tool must be used to meet energy conservation goals and drive costs down. That is why technology and upgrades proven effective in achieving long-term savings must be augmented with enduring efficiency actions by people if continuing energy goals are to be met.

One campaign, regardless of how effective, is not much help if people revert to their former behaviors when the campaign ends. The following sections give some guidelines for sustained behavior change, based on research findings and programs found to be effective.

6.1 Reaching Newcomers

Newcomers to base housing, including children, should be targeted to keep resident awareness high as personnel move in and out. Newcomers typically receive a package of many different kinds of information materials, but many don't take the time to read all of them. Thus, don't rely on printed materials in the orientation package to carry the message about the base's energy programs.

More effective would be a requirement, as part of housing orientation, to view an energy-efficiency video that models the desired behaviors. Newcomers could receive a personal visit or phone call from an energy manager describing the base's energy-efficiency program and offering assistance. Energy managers could work with schools where the base's children attend to offer repeatable educational materials and curricula; each year could focus on a new action or theme.

6.2 Self-Motivation

A long-term effort should remind residents of the self-satisfaction associated with using energy wisely.

Financial incentives have been shown to have some effect on short-term behavior, but are less effective in maintaining that behavior when the incentive ends. In addition, studies have shown that weak or small incentives, including those not involving money, seem to be as effective, or sometimes even more effective, than large incentives. This is apparently because people who receive smaller "prompts" are more likely to feel that they are acting out of their own desires rather than simply doing what someone else told them to do.

The underlying principle is that motivation from within (self-directed, or intrinsic) has been shown more effective in changing energy-use habits than from an outside source (external), including money. Studies have shown that people obtain a great deal of satisfaction from being frugal, participating in a worthwhile endeavor, and behaving in an ecologically responsible fashion. In addition, environmental programs have found that parents often are motivated to take actions that will make a better world for their children.

These are exactly the attitudes that a long-term effort must capitalize on to succeed. A long-term efficiency effort, therefore, could include reminding residents of the self-satisfaction associated with using energy wisely. The importance of passing along energy-efficiency values to children should also be emphasized.

Non-financial, ongoing incentives might include such things as certificates of achievement, public recognition such as having names of energy savers listed in the base newspaper, recognition of military personnel by chains of command, the opportunity to be held up as an energy leader or mentor on base, and school award programs. To identify effective non-financial incentives, get feedback from residents. Test the effect of the incentives by evaluating savings and behavior change after incentives are made available.

6.3 Commitment

Personal commitment to take certain energy-efficiency actions seems to be one of the best techniques for lasting behavior change. In one study, for example, participants who agreed to have their names published as part of the conservation study used 15% less natural gas and 20% less electricity than the control group. The most encouraging finding is that the differences were still significant 12 months later.

Again, considering that military families move an average of every three years, commitment should be requested periodically. Residents should be provided with feedback (energy or dollars saved) that shows the effect of their actions.

6.4 Feedback through Mock Billing

It has been argued that the most effective long-term motivator may be to charge individual residents directly for their utilities, perhaps through a housing allowance that includes a "cap" for energy use. Residents would pay out of their own pockets for any energy over the cap. However, individual services, in particular the Army, have been extremely reluctant to adopt such an approach for base housing, despite DoD encouragement to do so. Understandably, this reluctance stems from an unwillingness to penalize the families of military personnel and risk reducing morale and retention.

For military installations where residents do not pay their own bills but where homes are metered individually, a mock billing process could help promote behavior change. A simulated "bill" would show each family its energy use and cost to the base in a clear, understandable way.

Nevertheless, there may be a way to capitalize on the benefits of individual feedback that billing provides, without actually charging residents. One approach is a mock billing process.

If the base has the ability to meter individual houses for energy use, a mock "energy bill" could be sent to each resident monthly or quarterly. The "bill" would show the family's energy use and cost to the base in a clear, understandable, meaningful way. Studies have shown that descriptive energy bills work because they make obvious what is usually invisible and vague to most people.

For best success, feedback through "billing" should be coupled with a commitment to a challenging conservation goal or other strong reason to try to conserve. That way, residents can see the effects of their actions, thus powerfully reinforcing behavior change.

A mock billing approach should be accompanied by an educational effort that assures people that they are not actually being billed for energy use, but that the "bills" are being provided for their information only, and teaches people what to look for on their "bills" and how to read them.

Studies have shown that the most effective energy bills contain the following information:

- costs that reflect weather-corrected energy use, so that savings are not masked by temperature-related effects
- a cost comparison to the same month or quarter, in the previous year, preferably in a graphic form such as a bar graph
- a summary of annual energy costs from residential housing, describing savings opportunities
- an occasional breakout of estimated use by source (to counteract peoples' tendency to estimate appliance energy use incorrectly, such as overestimating the contribution of lighting and underestimating water heating)

- plain language that helps residents understand how to interpret their bills, what to look for on them, and how their energy-use habits (and perhaps the base's housing upgrades) influence costs
- tips on how to lower costs.

6.5 Institutionalization

Several government initiatives are paving the way for institutionalized energy efficiency in military housing.

The foundation for fostering enduring energy-efficient behavior must be built on institutionalization throughout all DoD bases. This means that regulations, policy, decisions, and behaviors incorporate energy efficiency as a fundamental value, rather than being imposed or added on. The ultimate outcome is that residents incorporate energy efficiency into their daily lives by habit and because it's important to them—like keeping their lawns mowed and their children immunized.

The government already has several initiatives in place that are helping institutionalize energy efficiency in military family housing. A 1999 Presidential Executive Order reaffirmed and extended previous energy reduction goals for federal facilities. The DoD's Military Housing Privatization Initiative, signed into law in 1996, is paving the way to increased private funding of construction, operations, maintenance, and management of military housing units. Existing, inadequate family housing is expected to be eliminated by 2010.

Department of Defense Reform Initiative Directive #49, issued December 1998, directs military departments to award privatization contracts, if cost-effective, for all utility systems by September 30, 2003. Solicitations are to be released in 2001.

The DoD has its own Federal Energy Management Program and Energy Conservation Investment Program to implement energy conservation measures. Energy Savings Performance Contracting also is being used to cut energy costs. These contractors can make energy-efficiency investments in housing and obtain a portion of the energy savings in return.

The DoD's working group on sustainable design, under the White House Climate Change Task Force, is integrating energy-efficiency and environmental sustainability principles into facility design, construction, and management. The DoD is implementing sustainable design in all new buildings and facilities planned for construction after FY 2000, for a planned 30 to 50% increase in energy efficiency.

Most of these efforts are focused on better facility design, upgrades, new technology, and improved management of housing and utilities. Once institutionalized, these kinds of changes produce tremendous gains in energy efficiency. In partnership with these efforts, however, we must continue to harness the power of peoples' values—values that translate into ongoing actions by residents in their homes. These combined efforts, supported and institutionalized by military bases and their partners, ultimately will result in long-lasting efficiencies.

6.6 In Summary: Sustaining the Effort

To sustain long-term energy-efficiency behaviors, consider the following guidelines and principles:

- Target base **newcomers** to keep awareness and interest high.
- Tap into **self-directed motivation**, rather than financial incentives or external awards.
- Ask residents to **commit** to specific actions, preferably in writing.
- Consider a **mock billing process**, combined with a commitment to achieve certain energy goals, that shows residents the results of their actions. Teach them how to understand and interpret these informative "bills."
- Use the power of **institutionalization** to foster enduring behavior change.

7.0 Reference Materials and Resources

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Appendix A

Typical Budget Items for a Campaign

Here are some typical items to consider when developing a campaign budget. Costs should be estimated for each item that applies. Some labor and materials may be donated by base organizations, utilities, energy coalitions, and schools, thus reducing costs.

Labor

- Obtaining base approvals, identifying necessary resources, and designing the campaign
- Conducting focus groups
- Conducting surveys
- Researching, writing, designing, and printing information materials
- Creating art, including a logo, cartoons, etc.
- Shooting, narrating, and editing a video
- Working with media representatives to encourage coverage
- Working with residents and base leaders to develop, carry out, and evaluate the campaign
- Preparing educational materials for kids
- Gathering and analyzing energy-use data
- Preparing and conducting events such as energy fairs
- Distributing materials around base
- Answering resident questions
- Preparing a summary report for base officials/sponsors

Materials

- Postage for mailing surveys and/or information materials to residents
- Postage for mailing draft materials back and forth to team members, if not all reside on base
- Paper for printed materials, including poster paper
- Computer programs, disks, and color printers
- Videotape cartridges
- Display materials for special events
- "Giveaways" or prizes such as refrigerator magnets, T-shirts, coffee mugs, coloring books

Direct Costs

- Incentives for residents
- Travel costs, if some team members do not reside on base
- Food, beverages for focus groups and meetings.

Appendix B

Examples of Printed Information Materials

(press release introducing campaign)

FOR IMMEDIATE RELEASE

Today we kick off the MCAS Yuma "You Have the Power" campaign to use energy and water efficiently in base housing. You will be asked to complete a survey about how you use energy and water. You will see information and reminders on the electronic bulletin boards, in the "Cactus Comment" and the newsletter. Your children may be involved in energy-saving projects.

We hope to decrease energy use – focusing on our electricity-guzzling air conditioners – and water use. Together, we can improve the environment, cut our energy and water bills, and become recognized as a Marine Corps leader in the efficient use of energy and water.

Smart Energy Choices

Operation Energy

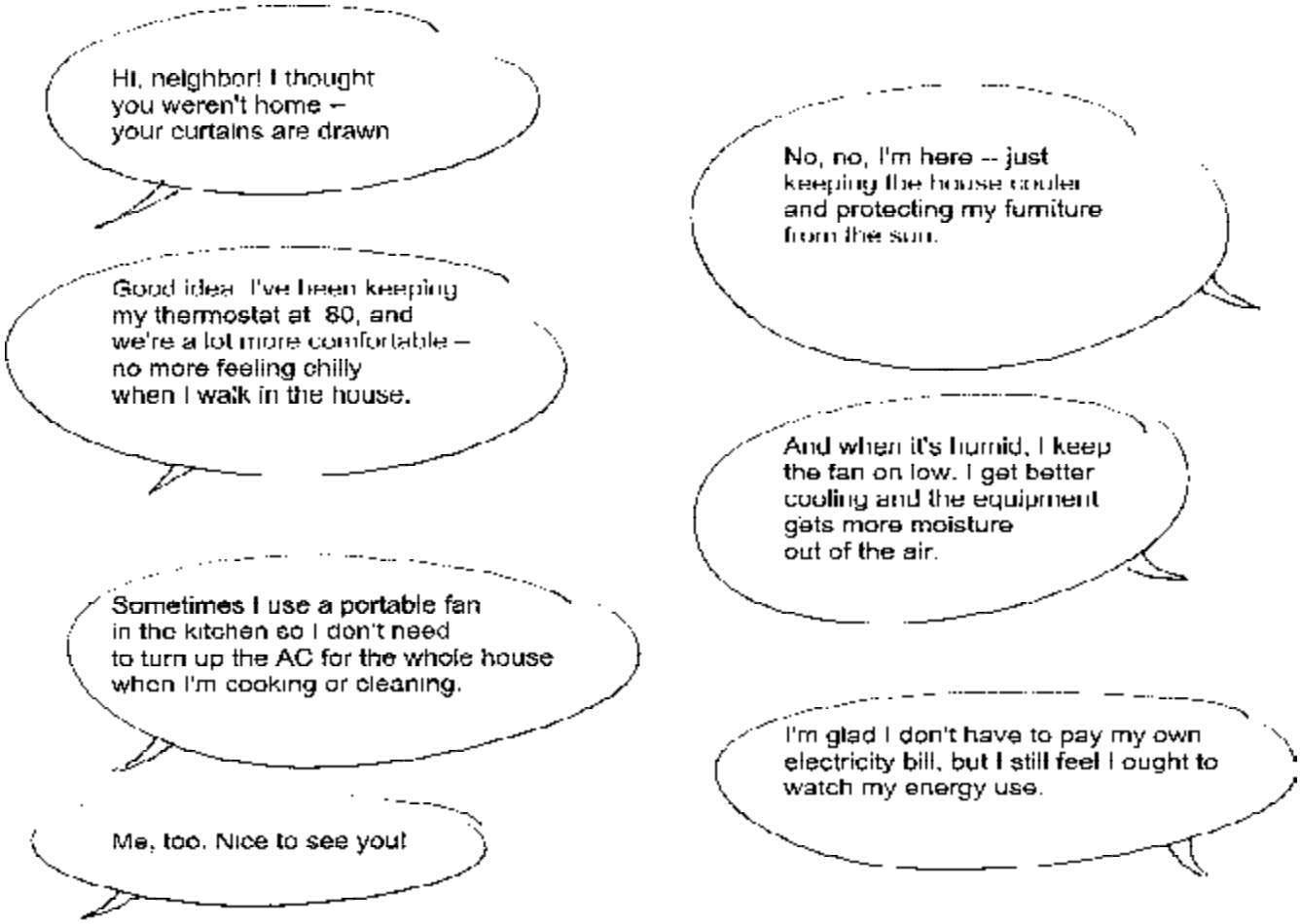
Tips for Families Living on Post at Fort Lewis

Use heat wisely. Managing your thermostat is the most important thing you can do to use energy wisely! Keep the thermostat at 70 degrees or lower. Turn down the thermostat at night to 65 degrees or lower when you go to bed or leave your house for more than four hours. Keep doors and windows closed when the heat is on. Close drapes and blinds in the evening and at night. Minimize the use of portable heaters. Keep air outlets and radiators clean. **Don't "draft" your family.** You will feel more comfortable if you keep drafty air from seeping into your home. Check for air leakage around doors and windows. If cold air is seeping in, contact your Family Housing Work Order Desk. **Get a bright idea.** Use lights only when you need them. Turn lights off in unoccupied areas, including porch lights when you go to bed. Buy light bulbs that are 60 watts or less. Even better, get energy-saving compact fluorescent lights – they last much longer and you won't have to change them as often! **Wash wisely.** Heating water takes a lot of energy. Make sure the dishwasher and clotheswasher have full loads before running them. Use the "air dry" setting on the dishwasher. Wash clothes in cold water when possible, and rinse them in cold water **Keep your cool.** Hot air can be hard on clothing. Use the air dry setting on the dryer when possible. This will help reduce shrinkage and make clothes last longer. To keep your dryer from working too hard and overheating, clean the lint filter after every load. And keep the outside exhaust vent clean. **Take charge of your fridge.** Set your refrigerator temperature at 37 to 40 degrees and your freezer at 0 to 5 degrees. Close the door quickly after you select an item.

Breathe easier. Filters that are clean help keep dust out of the air. Change or clean filters monthly. Get new filters from the Self-Help Store.

YOU HAVE the POWER

For more information about wise energy use, contact Public Works at 967-2837.



These tips on being comfortable and energy efficient are brought to you by your Housing Office and by your Energy Manager.

Oh, no! He left his sprinkler on all day again?

Yes, he did. This part of the street got flooded again, and I got my feet wet getting into my car.

The sad thing is, it doesn't even help his lawn.

You're so right. In the morning and/or the evening, 30 minutes max. That's the best.

Short watering times let the grass absorb water in the root zone better. Those puddles just mean evaporation and runoff.

I got one of those timers to put on my sprinkler. I just turn on the water, set the timer, and walk away.

And I keep my grass longer in hot weather – about 4 inches – so the grass itself shades the roots and soil.

I wonder how we could get the message across to him. Maybe an article in the *Cactus Comment*?

These tips on efficient watering are brought to you by your Housing Office and by your Energy Manager.

Operation Energy

The push is on to curb energy use in post housing

BY JEFF CLAYTON

Fort Lewis and all military installations must reduce energy consumption by 30 percent, based on 1985 levels, by the year 2005. Energy use on post costs about $12 million a year according to Charles Howell from Public Works. "We have been doing different kinds of energy programs and have increased our target to a 35 percent savings," Howell says. "We've been concentrating on the troop side, getting soldiers to monitor energy use in the barracks, and now we want to focus on housing."

In one year, energy conservation programs in the barracks and administrative buildings have saved Fort Lewis $200,000, says Andrea McMakin of PNW National Lab, a contractor working with Fort Lewis and the Department of Energy.

Similar savings in housing may be a much larger challenge. Housing accounts for around 25 percent of all energy consumption on post, or around $2 million in a year. On the job, a commander can mandate turning off the lights when you leave ... not so at home. "When you're not paying the bill, you don't see the bill. But Fort Lewis pays for it," McMakin says. "Relying on residents to make behavioral changes is a particular challenge, because family housing residents don't currently pay their own utility bills and thus lack the incentive of lower utility bills."

To meet this challenge, Fort Lewis is conducting a new campaign called Operation Energy. The objective is to increase energy efficiency in on-post family housing through activities family members can do themselves. McMakin says this is the only campaign they have found nationwide that focuses on energy efficiency in Army family housing, using no cost or low cost activities family members can do themselves (as opposed to upgrades and technology).

Operation Energy, which begins in September and is expected to run through December, focuses on simple activities such as turning down the thermostat at night, turning porch lights off during the day, and keeping filters clean.

The campaign is gently supported by the U.S. Department of Energy's Federal Energy Management Program. DOE is interested in the results and wants to make this campaign a model for other military bases. Results from the campaign, along with support materials including a locally produced video, are expected to be used by DOE nationwide.

To help meet this challenge, Fort Lewis has taken the unusual and innovative approach of offering incentives to families who conserve energy based on the amount of money saved each month. Howell promises there will be things like block parties and picnics for communities that reduce energy use.

McMakin says other groups want to get involved. "Scouting leaders," she says, "have expressed a high degree of interest in folding energy efficiency activities into their programs. We've talked about having them create art that would be used in the campaign. They also may go door-to-door handing out fliers or other information, and may be asking people what they do to conserve energy." She also expressed the hope that community mayors would get into the act.

Operation Energy has created a video called "In Search of the Energy Bandit" which will be aired in October, National Energy Awareness Month. The video features a cartoon character, the energy bandit. "He's a sneaky bad guy who runs around sucking up energy, creating drafts and creating havoc in people's homes. We tell people how to outsmart him by doing things around the house to use energy efficiently," McMakin says. ■

Energy saving tips

■ **Use heat wisely:** Keep the thermostat at 70 or lower; turn it down to 55 or lower when you go to bed or leave the house for more than four hours. Keep doors and windows closed when the heat is on. Close drapes or blinds in the evening. Do not use electric heaters; they are a fire hazard. Arrange furniture and draperies away from registers so air can circulate. Keep outlets and radiators clean.

■ **Breathe easier:** Change or clean filters monthly. Get new filters from the Self-Help Store.

■ **Don't "draft" your family:** Check for air leaks around doors and windows. If cold air is seeping in, contact your Family Housing Work Order Desk.

■ **Get a bright idea:** Use lights only when you need them. Turn out porch lights when you go to bed. Use 60-watt or less bulbs or long lasting, energy-saving compact fluorescent lights.

■ **Wash wisely:** Make sure the dishwasher and clothes washer have full loads before running them. Use the "air dry" setting on the dishwasher. Wash clothes in warm or cold water when possible and rinse in cool water.

■ **Keep your cool:** Use the air dry setting on your dryer when possible to help reduce shrinkage and make clothes last longer. Clean the filter after every load and keep the outside exhaust clean.

■ **Take charge of your "fridge:** Set the temperature at 35 to 40 degrees and the freezer at 0 to 5 degrees. Close the refrigerator door as quickly as you can. ■

strokes & plugs

One gun, two gun

FORT LEWIS – The 1st Personnel Group will host a training session on conducting Personnel Asset Inventories from 9 a.m. to noon Sept. 2 in Room 101 in the Stone Education Center. For more details, call 967-6391.

One dollar, two dollar

FORT LEWIS – A Persons Financial Readiness Counselor Training Course for active duty personnel interested in serving as financial counselors will be available from 9 a.m. to 5 p.m. daily from Sept. 21-25 at Army Community Services inside Weller Hall. For more information, call Dr. Gloria Winrick at 967-6925.

Custer's new stand

FORT LEWIS – Lt. Col. John M. Custer III will grab the helm of the 201st Military Intelligence Brigade from Co. John W. Hall during a change of command ceremony at 10 a.m. Sept. 1 at Watkins Field, in Fitness, head for Jensen Gym. A reception will follow at the Fort Lewis Officers Club.

Evacuation evacuates

FORT LEWIS – The 85th Medical Evacuation Battalion, XVIII 86th Med Evac Bn and 73rd Med Det (VET) will deactivate at 10 a.m. Sept. 8 at Watkins Field. Lt. Col. Betty J. Wiley joins 62nd Med Group Commander Col. Armstrong in casing the battalion colors.

50th reunion

McCHORD AFB – The 25th Air Division 50th Anniversary Reunion is scheduled October 23-26 at McChord. Call 984-4715 for more information.

USO volunteers needed

SEATAC – Volunteers are needed at the USO centers at SeaTac and McChord Air Force Base. Be a part of a team of citizens expressing the appreciation of a grateful nation to its sons and daughters who face harm daily so we may all live in peace. Training and parking are provided. Call 246-1908 (SeaTac) or 589-8772 (McChord). ■

MONEY PROBLEMS?
WE CAN HELP IMMEDIATELY
- Consolidate Bills
- No Phone Calls from Creditors
- No Credit Checks
- Immediate Relief On All Unsecured Debt and High Interest Credit Cards

FOR INTERVIEW/APPOINTMENT
BBB
CALL : 581-0135
NON-PROFIT/NON-LENDING ORGANIZATION

WASHINGTON USED TIRE & WHEEL
BUY–SELL–TRADE
WHEN YOU "RETIRE" SEE US!!
OPEN SUNDAYS at Canyon Rd. E.
GOOD USED TIRES AND WHEELS
CREDIT CARDS ACCEPTED
6831 So. Tacoma Way 471-0275
11325 Canyon Rd. E. 536-1196

CASH 'TIL PAYDAY LOANS
UP TO $500
Basic Qualifications Include
Personal Checking Account

The Operation Energy Campaign

Family housing at Ft. Lewis accounts for about 25% of all the energy used on Post. In 1998, Operation Energy was launched at Fort Lewis to help family housing communities use electricity and gas energy more efficiently.

Federal Legislation requires the federal government–including military bases–to reduce energy consumption by 30% from 1985 levels. FORSCOM has increased that reduction goal to 35% for all Forces Command installations.

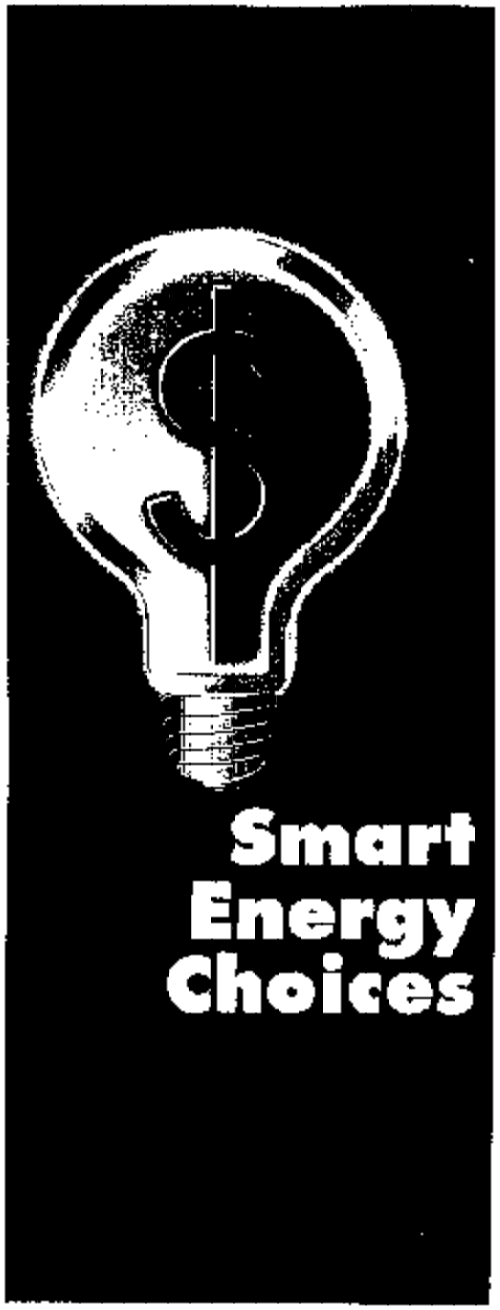
Fort Lewis saved $200,000 in energy costs in one year in barracks and work areas. Now, the focus has expanded to residential communities.

Public Works is tracking energy use by housing community. Each community will receive an incentive based on how much energy it has saved from the previous year's use.

Operation Energy is supported in part by Fort Lewis and by the U.S. Department of Energy's Federal Energy Management Program.

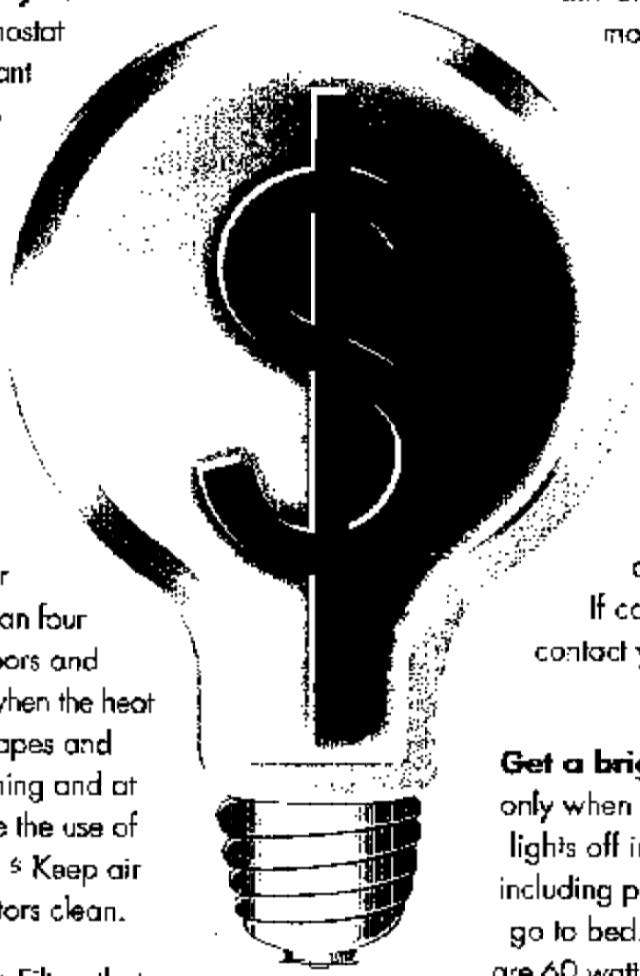
YOU HAVE the POWER

For more information about wise energy use, contact Public Works at 967-2837.



Operation Energy
Tips for Families Living on Post at Fort Lewis

Use heat wisely. Managing your thermostat is the most important thing you can do to use energy wisely! Keep the thermostat at 70 degrees or lower. Turn down the thermostat at night to 65 degrees or lower when you go to bed or leave your house for more than four hours. ✎ Keep doors and windows closed when the heat is on. ✎ Close drapes and blinds in the evening and at night. ✎ Minimize the use of portable heaters. ✎ Keep air outlets and radiators clean.



Breathe easier. Filters that are clean help keep dust out of the air. Change or clean filters monthly. Get new filters from the Self-Help Store.

Don't "draft" your family. You will feel more comfortable if you keep drafty air from seeping into your home. Check for air leakage around doors and windows. If cold air is seeping in, contact your Family Housing Work Order Desk.

Get a bright idea. Use lights only when you need them. Turn lights off in unoccupied areas, including porch lights when you go to bed. Buy light bulbs that are 60 watts or less. Even better, get energy-saving compact fluorescent lights – they last much longer and you won't have to change them as often!

Wash wisely. Heating water takes a lot of energy. Make sure the dish-washer and clotheswasher have full loads before running them. Use the "air dry" setting on the dishwasher. Wash clothes in cold water when possible, and rinse them in cold water.

Keep your cool. Hot air can be hard on clothing. Use the "air dry" setting on the dryer when possible. This will help reduce shrinkage and make clothes last longer. To keep your dryer from working too hard and overheating, clean the lint filter after every load. And keep the outside exhaust vent clean.

Take charge of your fridge. Set your refrigerator temperature at 37 to 40 degrees and your freezer at 0 to 5 degrees. Close the door quickly after you select an item.

UNDER OUR ROOF HOUSING DIVISION FORT LEWIS, WASHINGTON

Volume 4 Issue 5 SEP/OCT 98

OPERATION ENERGY

by Andrea McMakin

As part of a new "Operation Energy" campaign, Family Housing members can look forward to receiving an incentive for using energy wisely. The campaign, which begins this month, highlights simple ways family members can use energy efficiently in on-post housing.

Operation Energy builds on our success with barracks and troop administrative areas, where we saved about $200,000 in energy costs in fiscal year 1997. For Family Housing, each neighborhood will receive an incentive equivalent to how much energy the community saved each month, compared with last year's energy consumption.

Housing residents in several communities were consulted for ideas to develop the campaign. Residents chose the campaign logo (light bulb containing a dollar sign) and slogan "(Smart Energy Use"). Residents also provided a valuable "reality check" on an initial set of energy-saving actions and contributed ideas for involving people and communicating results. Scout leaders are planning ways to involve scouts in Operation Energy as a way to earn merit badges and meet community service requirements. This month, the video "In Search of the Energy Bandit" will begin running on Channel 2. Residents from five neighborhoods – Beachwood, Broadmoor, Davis Hill, Evergreen, and Greenwood - are featured in the video. Beginning in October, Public Works will report how much money each community has saved in energy use. Residents are also invited to give energy tip , which will be published each month.

The campaign is supported in part by the US Department of Energy's Federal Energy Management Program and may become a model for other military installations. For more information about Operation Energy or to contribute an energy tip, contact Charles Howell at Public Works at 967-2837. (8743)

Energy Tips for Families Living on Post at Fort Lewis:

☆ *Turn your thermostat down to 65 degrees when you go to bed or leave your house for more than four hours.*

☆ *Keep doors and windows closed when the heat is on.*

☆ *Change or clean furnace filters monthly. Get new filters at the Self Help Store.*

☆ *If cool air is seeping in through old weather stripping or caulking around doors and windows, contact the Work Order Desk at 964-8844.*

☆ *When you need a new light bulb, check the Commissary and PX for compact fluorescent lights, which last ten times longer than regular light bulbs.*

☆ *Turn off all outside lights during daylight hours.*

☆ *Run full loads in your dishwasher and clothes washer.*

☆ *Use the "air dry" and "energy saver" features on the dishwasher.*

☆ *Use cold water for rinsing clothes, and use the "air dry" setting on the dryer.*

☆ *Clean the lint trap on the dryer before every load.*

☆ *Set your refrigerator temperature at 37 to 40 degrees and your freezer at 0 to 5 degrees. Close the door quickly after you have selected you food item.*

TOWING ABANDONED AND DISABLED VEHICLES

by MSG John Jackson

The Housing Area Managers have been given the authorization to have abandoned and disabled vehicles towed. The abandoned or disabled vehicle will be marked first. The registered owner will then have nine days to either register the vehicle if it lacks a registration, or remove it from the housing area if it is disabled. If action is not taken within the nine-day period, the vehicle will be towed at the registered owner's expense.

UNDER OUR ROOF HOUSING DIVISION FORT LEWIS, WASHINGTON

Volume 5 Issue 3 MAY/JUN 99

FAMILY HOUSING TO GET $$$ BACK FOR SMART ENERGY USE

by Launa Morasch and Charles Howell

Since September, four family housing areas have saved big bucks by making smart energy choices. In the five months since September 1998, here is what residents have saved, as compared with last year's use: Beachwood ($14,895), Davis Hill ($18,728), Greenwood ($433), and Madigan ($1,512).

Some of these savings are very impressive! And even better, each community will get part of its energy savings back in a block party or other community event when the Operation Energy campaign ends this fall. The more energy dollars each housing area saves, the more its residents get back.

If your housing area shows no savings yet, there is still time to earn money back for your community. Savings can change dramatically from month to month by hundreds and even thousands of dollars. The Public Works Energy Management Office is monitoring energy use monthly. The best way to save consistently is for family members to make smart energy choices every day (see tips below).

Learn more about Operation Energy on Channel 2, where you will see your friends and neighbors in action against the dreadful Energy Bandit! Residents also learned about the campaign at the Kids Fest in April, on reader boards, at community forums, monthly mayor's meetings, and in fliers and posters around the installation. For more information, contact your mayor or the Public Works Energy Management Office at 967-2837.

How to Save Energy Dollars in Family Housing

How many of these things do YOU do?

Indoor Temperature and Comfort. Turn thermostat down to 65 degrees when going to bed or leaving the house for more than four hours. Keep doors and windows closed when heat is on. Change or clean furnace filters monthly (get new filters at the Self-Help Store). Call the Work Order Desk at 964-8844 to repair weather stripping, caulking, or broken thermostats.

Lights. Buy compact fluorescent lights at the Commissary and PX. They use one quarter the energy of regular bulbs and last ten times longer. Turn off inside lights when not in use. Turn off all outside lights during daylight hours.

Kitchen. Wait until you have a full load to run your dishwasher. Use "air dry" and "energy saver" settings on the dishwasher. Set your refrigerator's temperature at 37 to 40 degrees and your freezer at 0 to 5 degrees. Close the door quickly, and make sure the door is closed tightly.

Washer and Dryer. Run full loads. Use cold water for rinsing clothes. Use the "air dry" setting on the dryer. Clean the lint trap before loading the dryer.

NEWS FROM YOUR VET

Do you have pets ***going to Hawaii***? Owners are advised to contact the Veterinary Services at 967-3988 at least seven months prior to departure for new State of Hawaii importation regulations for pets. Pet vaccinations and health certificates are required for interstate and international travel. A copy of orders is required for health certificates.

Stray pets found on Fort Lewis and McChord AFB are held for three working days at the Stray Animal Holding Facility located at the Veterinary Treatment Facility (Building 9988 at Old Madigan). If not claimed, pets are put up for adoption or euthanized.

How are you saving energy today?

Oh, no! He left his sprinkler on all day again?

Yes, he did. This part of the street got flooded again, and I got my feet wet getting into my car.

The sad thing is, it doesn't even help his lawn.

You're so right. In the morning and/or evening, 30 minutes max. That's the best.

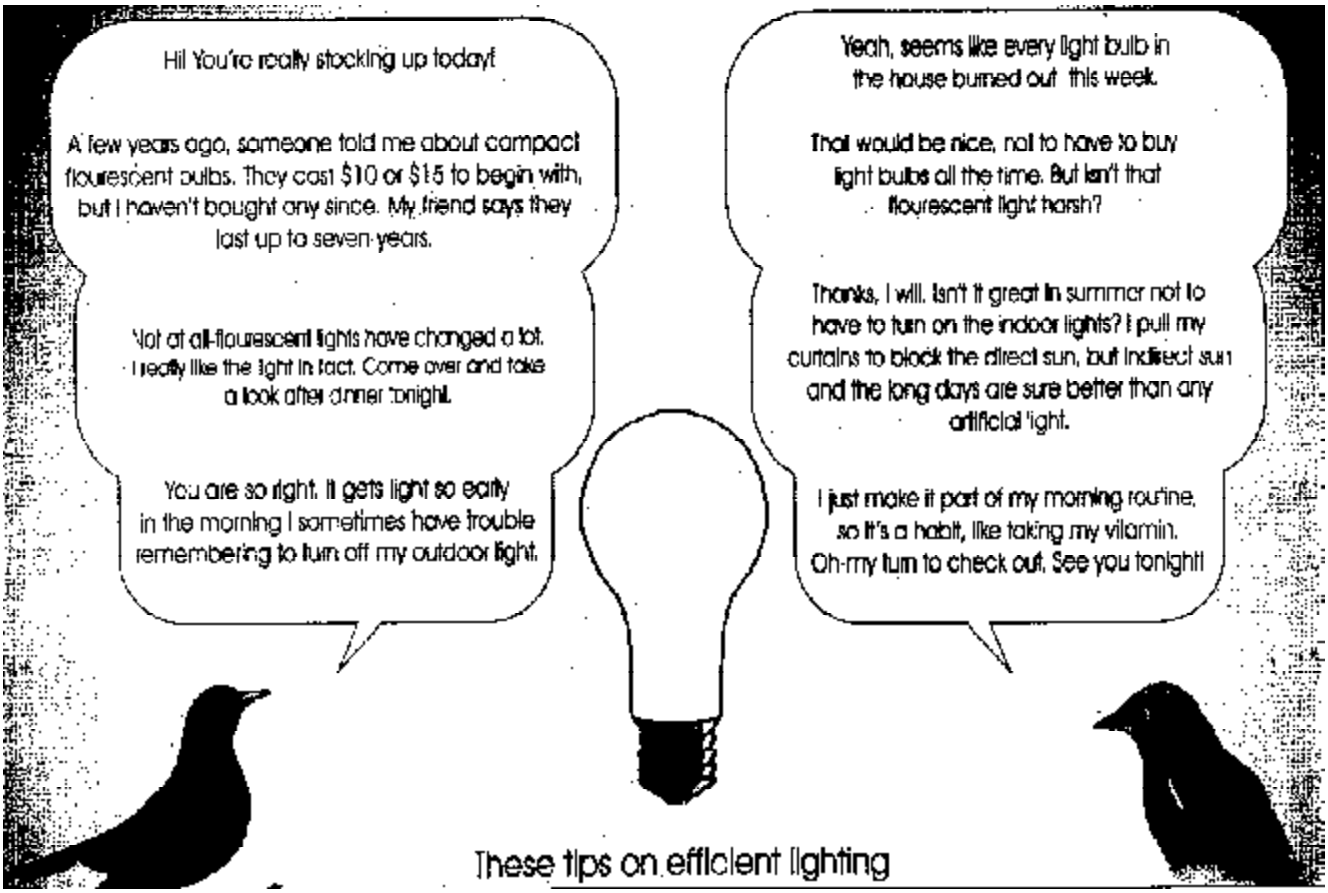
Short watering times let the grass absorb water in the root zone better. Those puddles just mean evaporation and runoff.

I got one of those timers to put on my sprinkler. I just turn on the water, set the timer, and walk away.

And I keep my grass longer in hot weather-about 2 to 3 inches-so the grass itself shades the roots and soil.

I wonder how we could get the message across to him. Maybe an article in the Cactus Comet?

These tips on efficient watering are brought to you by your Housing Office and by your Energy Manager.


Hi! You're really stocking up today!
A few years ago, someone told me about compact flourescent bulbs. They cost $10 or $15 to begin with, but I haven't bought any since. My friend says they last up to seven years.
Not at all-flourescent lights have changed a lot. I really like the light in fact. Come over and take a look after dinner tonight.
You are so right. It gets light so early in the morning I sometimes have trouble remembering to turn off my outdoor light.
Yeah, seems like every light bulb in the house burned out this week.
That would be nice, not to have to buy light bulbs all the time. But isn't that flourescent light harsh?
Thanks, I will. Isn't it great in summer not to have to turn on the indoor lights? I pull my curtains to block the direct sun, but indirect sun and the long days are sure better than any artificial light.
I just make it part of my morning routine, so it's a habit, like taking my vitamin. Oh-my turn to check out. See you tonight!
These tips on efficient lighting

"WANTED"
"ENERGY BANDIT"
A sneaky little fellow who steals your dollars and your comfort.
Be a good energy user.
Station Energy Monitor 341-5255
Station Housing Office 341-2825
Military Chain of Command
Copyright (c) 1996 Maxisoft Inc.

We know you have a lot to say.
So say it.

If you live in Family Housing at Fort Lewis,
you may have heard about OPERATION ENERGY.
Since last fall, we've been telling residents how they can
use energy wisely in their homes …
while staying comfortable …
and getting an incentive award for their communities.

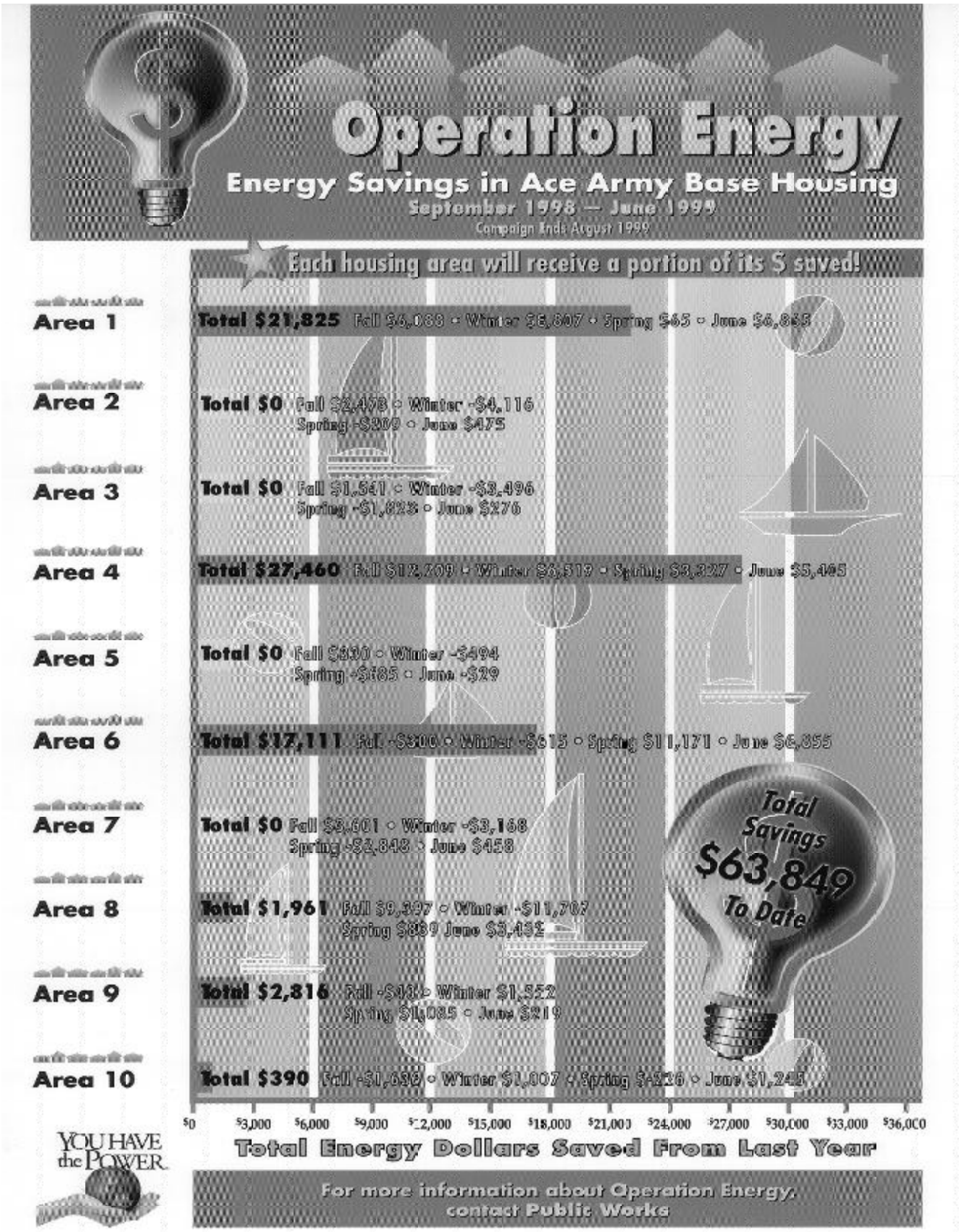
Now, we want to hear from you.

Did it work?
Are people doing anything differently?
What really motivates people to use energy wisely?
What should we do next?

You talk. We listen. Free refreshments.

Not a bad way to spend an hour.

Family Housing Residents Invited
Friday, August 13, 1999
7:00 - 8:00 p.m.
Family Resource Center


Operation Energy
Energy Savings in Ace Army Base Housing
September 1998 — June 1999
Campaign Ends August 1999
Each housing area will receive a portion of its $ saved!
Area 1
Total $21,825 Fall $6,068 • Winter $8,807 • Spring $65 • June $6,865
Area 2
Total $0 Fall $2,478 • Winter -$4,116
Spring -$209 • June $475
Area 3
Total $0 Fall $1,541 • Winter -$3,496
Spring -$1,823 • June $276
Area 4
Total $27,460 Fall $12,209 • Winter $6,519 • Spring $3,327 • June $5,405
Area 5
Total $0 Fall $330 • Winter -$494
Spring -$185 • June -$29
Area 6
Total $17,111 Fall -$300 • Winter -$615 • Spring $11,171 • June $6,855
Area 7
Total $0 Fall $3,601 • Winter -$3,168
Spring -$2,848 • June $458
Area 8
Total $1,961 Fall $9,397 • Winter -$11,707
Spring $889 June $3,432
Area 9
Total $2,816 Fall -$48 • Winter $1,552
Spring $1,085 • June $219
Area 10
Total $390 Fall -$1,638 • Winter $1,007 • Spring $226 • June $1,245
Total Savings $63,849 To Date
$0 $3,000 $6,000 $9,000 $12,000 $15,000 $18,000 $21,000 $24,000 $27,000 $30,000 $33,000 $36,000
Total Energy Dollars Saved From Last Year
YOU HAVE the POWER
For more information about Operation Energy, contact Public Works

Appendix C

Survey Examples

(baseline survey)

MCAS Yuma Home Energy Survey

Sponsored by the Federal Energy Management Program

This survey is one of the first activities in the 1999 campaign to improve energy efficiency in family housing at MCAS Yuma. YOU, the energy user, are the most important element in this campaign. This survey will provide baseline data by which we can identify where information or other assistance is needed.

Do you use any of the following appliances in your residence?

	No	*Yes*
Space heater	•	• .....If yes, how many? _____
Electric fans	•	• .....If yes, how many? _____
Air conditioners	•	•
Dishwasher	•	•
Computer	•	•
Clothes washer and dryer	•	•

HOME ENERGY IMPROVEMENTS: Have you done any of the following energy improvements in your house?

	Yes	No	Don't know
Installed energy-efficient light bulbs (such as compact fluorescent tubes)	•	•	•
Set hot water at 110°F or less	•	•	•
Installed flow restrictors on shower heads	•	•	•
Installed flow restrictors on faucets	•	•	•

AIR CONDITIONING:

Do you regularly practice any of the following?

	Yes	No
Keep indoor temperature at 80°F or higher when at home	•	•
Close windows and doors when air conditioner is on	•	•
Use fans to supplement air conditioning	•	•
Clean air conditioner filters at least once a month during the air conditioning season	•	•

Do you:

	Yes	No
Use the air conditioning primarily during the day hours	•	•
Use the air conditioning primarily at night for sleeping	•	•
Use the air conditioning all day during hot weather	•	•

LIGHTING: Do you regularly practice any of the following?

	Yes	No
Turn off outdoor lights during the day	•	•
Turn off lights in unoccupied rooms	•	•
Rely on daylight hours instead of turning on lights	•	•

WATER USE: Do you regularly practice any of the following?

	Yes	No
Wash most or all of the laundry in cold water	•	•
Run only full loads in the clothes washer	•	•
Run only full loads in the dishwasher	•	•
Water the garden/yard in the evening or early morning rather than during mid day	•	•

REFRIGERATOR/FREEZER: Do you regularly do the following?

	Yes	No
Set refrigeration temperature at 40°F or higher	•	•
Defrost the refrigerator at least twice a year	•	•
Use a personal refrigerator in addition to the one furnished by the government	•	•

RECYCLING: Do you recycle any of the following items?

	Yes	No
Newspaper	•	•
Cardboard and wood	•	•
All other paper	•	•
Glass	•	•
Aluminum cans	•	•
Plastic	•	•
Yard/garden waste	•	•
Other: _____	•	•

TRANSPORTATION: Do you

	Yes	No
Bicycle or walk to work?	•	•

BACKGROUND INFORMATION

	Yes	No
Number of adults in your household: _____		
Number of children in the household: _____		
Is anyone regularly home during the day?	•	•

Thank you for your participation!

Please feel free to call me if you have any questions or concerns.

Pat Queen
Assistant Housing Manager
MCAS Yuma

Please return this survey to the Housing Office between 0700 and 1600 Monday through Friday or tape it to your front door on 19 July and it will be collected during the day. Thanks!

(final evaluation)

Energy Efficiency in Fort Lewis Family Housing

1. Have you heard about the Operation Energy campaign to use energy more efficiently in post family housing?

___ Yes ___ No (If no, go to Question #7) ___ Not sure

2. How did you become aware of the Operation Energy campaign? Check all that apply.

___ My mayor or other mayors

___ Video on Channel 2, "In Search of the Energy Bandit"

___ Flier or brochure

___ Guardian newspaper

___ Newsletter article from "Under Our Roof" (published by Housing)

___ Other

___ Family members, including children

___ Friends or neighbors

___ Poster

___ Display at Kids' Fair or Armed Services day

___ Reader board

___ Not sure

___ My community's newsletter

3. Have you heard that each housing community that saves energy will receive an incentive award?

___ Yes ___ No

4. Which community is saving the most energy so far? (Choose one)

___ Beachwood/Lakewood ___ Broadmoor ___ Clarkdale

___ Davis Hill ___ Eagle View ___ Evergreen

___ Greenwood ___ Old/New Hillside ___ Madigan

___ Parkway ___ Don't know

5. Here are some things we asked residents to do in Operation Energy. Please check the things that you started doing AFTER Operation Energy began in September 1998.

___ No change

Heating and Cooling

___ Began turning the thermostat down at night before going to bed (or turned it down lower than before)

___ Began turning the thermostat down when leaving the house for 4 hours or more (or turned it down lower than before)

___ Asked All Star to repair broken thermostat

___ Asked All Star to repair caulking or other weatherization materials

___ Began closing windows and doors when heat was on (or closed them more often than before)

___ Cleaned or changed furnace filter for the first time (or more often than before)

___ Reduced or eliminated use of a space heater

Lighting

___ Began purchasing new light bulbs at 60 watts or less

___ Replaced a standard (incandescent) light bulb with a compact fluorescent light bulb

___ Started turning off outside lights in the daytime (or turned them off more often than before)

Washing and Drying

___ Began using cold water for washing clothes (or used it more often)

___ Began using the low or cool setting on dryer when possible (or used it more often)

___ Began running full loads of clothes in washer and dryer

___ Began cleaning the lint trap in the dryer (or cleaned it more often)

___ Began running full loads in the dishwasher (or ran them more often)

___ Began using the air dry setting on the dishwasher (or used it more often)

Refrigerator and Freezer

___ Adjusted the refrigerator temperatures to be 37-40 degrees or the freezer temperature to be 0-5 degrees

6. What caused you to start doing those things? Check any that apply.

___ I wanted my housing community to get money back

___ All the housing communities on post were being compared, and I wanted my community to excel

___ I wanted more comfortable temperature conditions in my home

___ I was reminded whenever I saw or heard something about Operation Energy

___ My family, friends, or neighbors were talking about it

___ The video (TV) demonstrated how to do things

___ It's the right thing to do

___ I want to set a good example for my kids

___ Other: _____

7. Is there anything that made it impractical or difficult for you to save energy? Check any that apply.

___ My house wastes energy because of the way it is constructed, or because of its age

___ I have asked to have things repaired that could save energy, but it hasn't happened

___ The Army does not allow us to do some things that will make the house more energy-efficient

___ We don't have a cool or air dry setting on our washer/dishwasher/dryer

___ The kids leave the doors and windows open

___ I'm too busy to think about it; other things are more important

___ As long as I'm not paying for it, it's not a priority for me

___ I won't be stationed here long enough to make a difference

___ Other: _____

8. Which housing community do you belong to? (Choose one)

___ Beachwood/Lakewood ___ Broadmoor ___ Clarkdale

___ Davis Hill ___ Eagle View ___ Evergreen

___ Greenwood ___ Old/New Hillside ___ Madigan

___ Parkway

9. How long have you lived there?

___ 3 months or less ___ 4-6 months ___ 7 months to 1 year ___ More than a year

10. In your opinion, what will it take to motivate residents to keep using energy wisely?

_____

_____

THANK YOU!

Please return this survey in the enclosed, postage-paid envelope by _____.

Appendix D

Example Video Script

"In Search of the Energy Bandit"

Training Videotape Used with the Operation Energy Campaign
for Fort Lewis Family Housing
1998

Video	Audio/Graphic Effects	Narration
Camera searching along window frames, seen through circle like telescope	Character music	
Title: "In Search of the Energy Bandit"	Character music fades out	
Mom and son walking up sidewalk to house, reaching front door, and if time, opening it (show flag on house).	Happy, relaxed music	At Fort Lewis, our homes are safe and comfortable ...
Family doing puzzle on table	Happy music continues	… A place to relax and have fun with our families. Our homes are so important to us that we guard against anyone breaking in to steal our possessions.
Energy bandit creeping	"Sneaky" character music	But there is one unsavory character lurking around inside our homes, most of the time .. . the ENERGY BANDIT.
Energy bandit "vacuuming" energy	Character music continues, then fades.	The Energy Bandit runs around stealing energy, creating drafts, and generally wreaking havoc, when it comes to energy efficiency. But you can outsmart the energy bandit – home by home.
Playground with house in background. Housing names superimposed on scene: Broadmoor Beachwood Eagle View Greenwood Parkway Davis Hill New Hillside Old Hillside Clarkdale Evergreen Madigan	Background (energetic) music	Family housing at Fort Lewis costs about $3 million dollars annually for electricity and gas energy. So, by using energy wisely, you and your family can make a BIG difference.
Mom turning down knob in freezer (show hand on knob close-up only)		YOU are the best weapon against the Energy Bandit. It's easy … and you won't have to sacrifice comfort.

Video	Audio/Graphic Effects	Narration
Dad and mom changing lightbulb [very quick clip, maybe taking the old bulb out]		By making smart energy choices around the house, you can reduce the amount of energy that the Bandit is getting away with.
Energy Bandit moving across screen, holding sign saying "Temperature"	New music	
Setting back the thermostat	Energetic music.	One of the most important things you can do is to control the temperature in your home. If you do only one thing to save energy, this should be the one. Keep the thermostat at 70 degrees or lower to heat your home during the day. Turn it down to 65 degrees at night, or if you'll be gone for more than four hours.
Words: 5 degrees less at night = $500 - $3,000 saved per month, for a typical housing community		Turning your thermostat down 5 degrees at night saves a substantial amount of energy and money. If everyone in a typical housing area did this, they could save five hundred to three thousand dollars each month in energy costs, for that neighborhood alone!
Mom guiding son inside from patio on Big Wheel, closing sliding glass door.		Your furnace has to work harder if doors are left open. Make sure doors are firmly closed when someone enters or leaves.
Mom shutting heating vent in ceiling.		Close the heating vents in rooms that don't get much use.
Mom, carrying baby, putting heater-in closet.		Minimize the use of portable heaters. They use a lot of energy and can be a fire hazard.
Dad taking out filter and looking at it. Vacuuming it, then hosing it off.		It's important to clean or replace your furnace filter monthly. Not only does this help your furnace run more efficiently, it reduces the amount of dust in the air. Less dust means a healthier home with fewer allergies, and hey, maybe even a little less housework. When your furnace filter wears out, get a new one at the Self-Help Store.

Video	Audio/Graphic Effects	Narration
Words on screen: Family Housing Work Order Desk 964-8844		Report any problems with thermostats or furnaces to the Family Housing Work Order Desk.
Energy Bandit pulling sign that says "Drafts"	New music--Energetic or sneaky	
Mom cranking window shut.		Open windows can cause uncomfortable drafts when it's cool outside. Make sure your windows are closed.
Full shot of camera moving around inside window frame (one without shades).		If you can still feel air leaking in through closed windows and doors, your sealant materials may be worn out.
All Star technician ripping off old weather-stripping, screwing new weather-strip into door frame and squeezing out new caulking in window.		Old weather-stripping can be replaced, and caulking can be reapplied, as the maintenance technician is doing here. This will make your home much more warm and cozy, eliminating those drafty spots. Contact the Family Housing Work Order Desk for this service.
Energy Bandit pulling screen that says "Lighting."	New music	
Mom and son entering house and turning on light in living room. [Try to cut before Mom walks out of scene. We want to imply that she is staying in the room with the light on.]		Using light wisely helps beat the Energy Bandit. Turn lights on only in rooms where you need them.
Dad leaving house to go to work, seeing porch light, turning it off, then coming down front steps.		Of course outdoor lighting is necessary for safety and security, but don't forget to turn off your porch light when you go to bed … or at least when you get up in the morning.
Mom and Dad changing light bulb and turning on light		You might want to check all the light fixtures in the house – after turning off the lights, of course—to see if the right wattage bulbs are installed. It is unsafe to have a 100-watt bulb in a fixture that is marked for 60 watts.

Video	Audio/Graphic Effects	Narration
Dad, holding son, at Commissary checkout counter buying CFL.		Check the Commissary and PX for energy-efficient compact fluorescent lights. These lights last ten times longer than regular bulbs, so you won't have to change them as often.
Energy Bandit pulling screen that says "Laundry."	New music	
Mom putting clothes in washer, turning knob to cool.		The laundry is a great place to put a lid on the Energy Bandit. Do full loads of laundry. Use cold water for washing whenever possible, and always use cold water in the rinse cycle.
Mom shaking out mesh shirt, putting it in dryer, turning to "air fluff," turning on.		To dry lighter-weight items, use the air-dry setting. If you need to use heat, dry several loads of laundry one after another. It takes a lot of energy to heat up a cold dryer.
Mom pulling out lint screen and cleaning it off.		Clean the lint screen in the dryer between each load. This way, your dryer will not have to work as hard to produce heat.
Mom cleaning exhaust vent.		And keep the outside exhaust vent clean.
Energy Bandit pulling screen that says "Kitchen"	New music	
Mom opening fridge door, turning down temp controls, closing door.		The energy bandit loves to lurk around your kitchen. Check your refrigerator and freezer. They may be too cold. Set your refrigerator at a level that reaches about 37 to 40 degrees. And push the "energy saver" button if you have one.
Mom turning down freezer temperature, closing door.		Set your freezer temperature at mid-level, reaching about zero to five degrees.
Girl opening refrigerator door, taking milk carton out, closing door, pouring milk [and taking a drink, if time]		And we don't want all that cold air leaking out. Select your items quickly, and then shut the door.
Dad putting last glass and plate in dishwasher, pushing air dry, and water saver buttons.		Always run the dishwasher with a full load, and use the air dry setting. Use the "water saver" feature if your dishwasher has one.

Video	Audio/Graphic Effects	Narration
Family playing on floor, cat walks in.	New music, maybe the relaxed happy music from the beginning?	Making smart energy choices helps you and your family. Your home can be more comfortable because of fewer drafts …
Mom pushing "cool" button on washer.		… more hot water for other things when you use cold water for clothes washing …
Dad vacuuming filter.		… and less dust particles when furnace filters are cleaned or replaced regularly.
Col. Bryant clip. Superimposed on beginning of clip: "Colonel George Bryant, Director of Public Works."		
Energy bandit with a "no" symbol superimposed (circle with line through it).	Character music	So remember the battle plan to eliminate the energy bandit.
Mom turning down thermostat		turn down the thermostat at night ...
Dad pulling out furnace filter and looking at it.		... clean or replace furnace filters monthly ...
Dad turning off porch light		... reduce unnecessary lighting ...
Mom shutting sliding glass door after son comes in.		... and keep doors and windows shut in cool weather.
"You Have the Power" icon (hand holding globe)		You have the power to make a difference!
Icon of light bulb with words superimposed: For more information, contact: Your Community Mayor Or Public Works Department, 967-2837.		For more information about making your home energy efficient and comfortable, contact your community mayor or the Public Works Department.
Credits Etc. Operation Energy Campaign, 1998		

Appendix E

Additional Resources

U.S. Department of Energy
Federal Energy Management Program (FEMP)
FEMP Help Desk: 1-800-363-3732 (DOE-EREC)
FEMP Office: 202-586-5772
FEMP Fax: 202-586-3000
http://www.eren.doe.gov/femp/femp.html
Internet site includes an electronic order form for FEMP publications, including software, CDs, case studies, annual reports, posters, newsletter, and other materials

DOE's Energy Efficiency and Renewable Energy Clearinghouse
P.O. Box 3048
Merrifield, VA 22116
Phone: 1-800-363-3732
Fax: 703-893-0400
E-mail: doe.erec@nciinc.com
http://www.eren.doe.gov

U.S. Department of Defense
Information and publications on the U.S. military, including family housing and energy efficiency initiatives
Internet site: DefenseLINK
http://www.defenselink.mil/index.html

The Alliance to Save Energy
A nonprofit coalition that promotes the efficient and clean use of energy worldwide. Offers free, energy-related lesson plans for educators and a "green schools" program. Offers an on-line, interactive, personalized "home energy checkup." Sponsors and conducts research.
1200 18th Street, NW
Suite 900
Washington, DC 20036
Phone: 202/857-0666
Fax: 202/331-9588
E-mail: info@ase.org
http://www.ase.org/

Home Energy Saver
Internet tool that lets users enter their zip codes and, based on geographic area, suggests ways to improve energy efficiency in homes
Sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Energy
http://HomeEnergySaver.lbl.gov/

Washington State University
Energy Ideas Clearinghouse
Will search for existing published energy-related materials by topic
1-800-872-3568

Executive Order 13123
Greening the Government through Efficient Energy Management
June 3, 1999
http://www.eren.doe.gov/femp/aboutfemp/exec13123.html

Appendix F

Process for Accounting for Weather Effects in Energy-Use Data

A billing analysis comparison approach is the standard method for estimating energy savings from energy conservation programs. The utility billing approach estimates energy savings by establishing an energy consumption baseline or baseline model using 12 or more months of energy consumption (the energy source used for heating and cooling) for the housing area of interest. That baseline consumption is compared with actual consumption after implementation of the conservation project.

One limitation of a simple comparison of the monthly consumption, however, is that it does not account for other factors that can affect energy consumption and vary over time, such as weather. For example, we know that the amount of natural gas or electricity consumed for heating depends on the outside air temperature – the colder it is, the more heating required to maintain the same comfort level in the residence. So, if the outdoor temperatures in the winter months used to establish the energy use baseline were significantly colder than the months used to determine the actual energy use, the predicted energy use based on the baseline model would be significantly greater than actual energy use, artificially inflating the "real" energy savings derived from the project.

A multivariate regression analysis is one technique to account for the differences in weather conditions between the pre- and the post-project periods. The basic data requirements for this approach are housing community-level monthly natural gas consumption, the dates of the meter reading, and daily average outdoor air temperature representative of the site.

The baseline statistical model is constructed by regressing the daily energy consumption against the daily average temperature (or heating degree day) for the billing period to determine the baseline energy performance model. Once the appropriate baseline model has been determined for the housing project, the post-installation energy use is estimated by running the baseline model using post-project daily temperature and operating conditions as model input. The energy savings are calculated by comparing the differences between the actual energy use and the energy use predicted by the model for the same time period.

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Other Sections

The *Revised Handbook for Promoting Behavior-Based Energy Efficiency in Military Housing* is published in three parts:

Revised Handbook for Promoting Behavior-Based Energy Efficiency in Military Housing, Sections 1-4.

Revised Handbook for Promoting Behavior-Based Energy Efficiency in Military Housing, Sections 5-7.

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