Military Base Energy Conservation: Best Practices That Can Save Municipalities Money

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Introduction

As energy demand continues to rise to new levels, energy conservation has taken a prominent position at the federal level. "Between 2000 and 2020, U.S. natural gas demand is projected by the Energy Information Administration to increase by more than 50 percent, from 22.8 to 34.7 trillion cubic feet. […] The projected rise in domestic natural gas production—from 19.3 trillion cubic feet in 2000 to 29.0 trillion cubic feet in 2020—may not be high enough to meet projected demand" (National Energy Policy 1-8). This concern, among others, facilitated the development of the Energy Policy Act of 2005, which assigns conservation responsibility to federal agencies and state governments.

With respect to individual state's responsibility, the Energy Policy Act of 2005 declares that each state must have an energy conservation goal "[…] consisting of an improvement of 25 percent or more in the efficiency of use of energy [be achieved by 2012]" (Section 123). To manage this goal, state governments must rely heavily on the ability of their local government to conserve energy.

This practice guide is intended to assist municipalities in making the transition to energy conservation by providing examples from military base sustainable best practices. It will also list the mechanisms used by military bases to fund energy conservation technology. Additionally, this guide will discuss the social and environmental benefits of energy conservation.

Why Military Base Best Practices?

Military bases are similar to municipalities in that they are spatially bound with populations to uphold, and are constrained by fiscal budgets. Regardless of these limitations, military bases have made great strides in decreasing the nation's energy consumption.

Regional integrated planning encourages military bases to embrace sustainable development because of their proximity to the civilian population and because of their responsibility to preserve the environment. Consequences of this proximity are negative environmental externalities that are not paid for by the producer of the externality, but rather by the public (the externalities of importance to this guide are those pertaining to pollution resulting from extraneous energy consumption). If a military base pollutes, a nearby city is affected and must therefore cover the costs of abatement. The same relationship holds if the city pollutes and affects a military base. Therefore, it is in the best interest of the military base and the city to work together in planning for energy conservation, so that the population of both the city and base can enjoy a healthier lifestyle.

As previously mentioned, the federal government has begun to hold military bases and other federal agencies accountable for their energy consumption by mandating a reduction in their overall energy consumption. This reduction is not funded through the federal government but instead through alternative financing mechanisms, which will be explored later in this practice guide, that require no initial costs. Using these creative financing mechanisms to fund the transition to energy conservation has allowed military bases to realize huge reductions in both energy consumption and energy costs.

Rising Energy Prices

Executive Order 13123—*Greening the Government through Efficient Energy Management* of 1999, declared that by 2005 all federal agencies must decrease their energy consumption by 30 percent. The report also stipulated that a further reduction of 35 percent (relative to the 1985 baseline) by 2010 (Section 202). The Energy Policy Act of 2005 updated Executive Order 13123 by stating that all federal buildings and laboratories must reduce their energy usage by another 20 percent per gross square foot by 2015 relative to energy consumption per square foot in 2003 (Section 102a).

This move towards energy consumption reduction is compelled by increasing energy costs and by negative externalities to the environment (pollution). In 2006, the Energy Information Administration projected that energy prices will continue to climb well through 2007. Over the past five years, the price of electricity has increased by 9.2 percent, natural gas by 34.3 percent, and heating oil by 25.3 percent. For more information on energy prices, see Table 1: Energy Information Administration/Short-Term Energy Outlook 2006 in the Appendix.

Responsibility to the Environment

According to Kevin Palmer of Science Application International Corporation (SAIC) at Fort Bragg[1], the environment is as important as the monetary economics involved in the decision making regarding energy conservation. When a federal agency makes the transition to conserve energy, incentives are not only found in the amount of monetary savings that conservation will incur, but also in the decrease of negative environmental externalities. He states that a level of responsibility is assumed by our inhabiting the planet—especially if our long term goal is to maintain our quality of life. If we chose to ignore potential environmental perils in our economic decisions, we will only invite extreme remediation costs in the future. Mr. Palmer is of the opinion that military bases have long wanted to become sustainable in regards to their energy consumption; the Executive Order 13123 has given them the final push necessary to put their plans into action (personal communication, January 18th 2006).

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Social and Monetary Benefits of Energy Efficiency

While the cost of energy is high, it is still not high enough to cover the damage it causes to society—both the environment and human health. Consider the following:

[1] SAIC is a company that provides information systems and technology solutions for international organizations.

In Kentucky, if you spend $100.00 per month on electricity in a commercial building, your estimated annual electricity usage (kWh) is: 22,642[2]. Per year, you will emit the following pollutants into the atmosphere:

Carbon dioxide (CO_2)	50,468 lbs
Volatile organic compounds (VOCs)	1 lbs
Nitrogen oxides (NO_X)	120 lbs
Carbon monoxide (CO)	6 lbs
Sulfur dioxide (SO_2)	285 lbs
Particulates (PM 10)	5 lbs

The following is a list of some of the health and environmental hazards for the aforementioned pollutants (these pollutants are not exclusive of electricity; they are emitted from natural gas as well) (Kahn 1998).

Carbon dioxide (CO_2):
- Increases the temperature of the atmosphere.
- Increases the acidity of the oceans.
- Creates respiratory problems and offsets the pH balance of blood, which can lead to kidney problems.

Volatile organic compounds (VOCs):
- Adds to the accumulation of ozone in the troposphere (which is about seven miles from the earth's surface) because of the reaction between nitrogen oxides and sulfur dioxides. This leads to eye irritation and respiratory problems.

Nitrogen oxides (NO_X):
- Contributor to acid rain (which damages buildings and other materials) and smog.
- Creates eye irritation and respiratory problems.

Carbon monoxide (CO):
- Interferes with the body's ability to circulate oxygen through the blood by way of ozone accumulation in the troposphere.

Sulfur dioxide (SO_2):
- Contributor to acid rain.
- Creates respiratory problems.

Particulates (PM 10):
- Some particulates are carcinogens which lead to cancer.
- Creates respiratory problems.

The cost of remediation (the cost of the negative externality), to the environment and to human health is the social cost of electricity. With energy conservation, individuals and businesses can reduce their own costs and help decrease the societal costs that would have to be accounted for at some time in the future, if not through taxes but through increases in private health care costs.

[2] To calculate your estimated annual electricity usage, visit: http://www.cleanerandgreener.org/resources/pollutioncalculator.htm

The Costs of Illness, a handbook by the U.S. Environmental Protection Agency lists illnesses associated with environmental pollution and their total annual costs per patient. Consider the following costs per illness[3]:

Asthma	$742.84
Dry eyes	$118.23
Headaches	$148.27
Fatigue	$172.49
Congestion	$166.79
Dry skin	$104.74
Allergy services	$168.87

Illnesses related to pollution are negative externalities of energy production and consumption. Basic economic theory of externalities states that they are paid for by either the producer of the externality or by society. Where there is a gap between the actual costs of a good and the total cost of the impact the good has on society, there is an externality. The cost of the impact should be accounted for by the producer of the good, but this is not always the case, such as in energy. The cost of energy does not include the cost of the impact that energy has on the environment and human health. That cost is paid for by society.

Community Participation

Military bases are occasionally confronted with the issue of encroachment in respect to their energy consumption and pollution. Encroachment encompasses the limitations placed on military bases by local area governments that avert military operations (ICMA). To eliminate encroachment, many military bases have begun to collaborate with their neighboring local governments. These relationship building tactics can lead to a successful collaboration between local government and the military bases to achieve their energy conservation goals (see examples of *Camp Pendleton, Air Station Yuma, and Camp Lejeune*).

Planning to Conserve Energy

Military bases have a high success rate for their energy conservation plans because of their knowledge of where to conserve energy and how to accomplish their conservation goals. Like military bases, municipalities must know where their highest energy costs are located. A thorough analysis of current energy consumption must be done to determine where to begin conservation efforts. Once this is done, a plan of action must be drawn up with measurable goals. Throughout the life of the plan, it is useful to measure progress continuously so that inefficient projects can be replaced by more efficient ones. Also, through continual monitoring of the plan, the completion of successful projects can be recognized and the savings realized.

[3] All dollar values are adjusted for 2006.

ENERGY STAR®

ENERGY STAR® is a government sponsored program that assists federal agencies in planning for their transition to energy efficiency. It has been particularly beneficial for military bases, as several have used it as a manual for implementing energy conservation technology. For a list of military bases that have partnered with ENERGY STAR® to improve their energy efficiency, see Table 2: Business Improvement Partner List in the appendix. ENERGY STAR® composed *Guidelines for Energy Management* in which they list a step-by-step procedure for becoming energy efficient. The complete *Guidelines* can be found at the ENERGY STAR® website[4], but a portion is summarized here.

In launching the transition to energy conservation, the first task is to appoint an energy policy director and team; the energy team need not be large. The size is relative to the size of the local government and its goals. For example, in 2004, George Lopez of Andrews Air Force Base in Maryland initiated an energy conservation program that reduced energy usage by 36 percent[5]. His accomplishment is particularly impressive because it was executed by a one-man team—himself—without any funding. The savings were found in implementing small projects and good management on Mr. Lopez's account. For instance, he changed the approach of the base in areas such as maintenance, new construction and through something as simple as switching to energy efficient lighting (FEMP 2003).

The second step is to determine where to begin conserving energy. On military bases, this task is usually contracted out to an energy technology specialist such as a utility provider. Contracting portions of the plan is economically advantageous for the military base. If the military base holds a public auction for the contract to assess their energy consumption, energy technology firms will compete for the contract, thereby giving the base the lowest price for the contract. If a local government contracts out the energy consumption assessment portion of the plan (or any other portion of the plan), it is fundamentally strengthening its local economy by creating jobs in the public sector and by funneling public money (tax dollars) into the hands of its local businesses. Ultimately, it is the responsibility of the local government to explore the variety of options available for assessing its energy consumption.

Subsequent to the assessment of current energy consumption, the energy policy director and team should develop their statement of objectives. This third step of developing the objectives should make clear what the conservation goals are and which steps are necessary to accomplish them. A clear set of realistic objectives is important because the actual energy policy will be developed from them. For instance, the methodology of Fort Knox's previous energy policy always included altering human behavior—changing the waste habits of base's residents. To a certain extent, while human behavior can be changed—especially in an agency such as a military base it was not sufficient to mandate that the base's residents adopt an energy conservation consciousness. Officials at Fort

[4] www.energystar.gov

[5] Based on Andrew's Air Force Base 1985 energy consumption.

Knox realized that if the policy was to make a large enough difference in conserving energy, enforcing behavioral change among the base's residents was not enough to accomplish conservation goals. The base would need to replace their old energy technology with more efficient equipment, such as new insulation and new heating and cooling systems. Fort Knox made energy conserving technology the standard, where as before it was an option.

Once the energy policy has been enacted, the policy must be constantly reviewed, especially in the early stages. This fourth step serves two purposes. First, the local government must understand its consumption patterns in order to evaluate where energy cuts have been made so far and where opportunities still exist to conserve. Reviewing the policy requires tracking data, which will show where the monetary savings are found. Whether a local government is insulating its buildings or installing new heating and cooling technology, it must know the source of the savings. If one technology is more efficient than another, then that may be the one to advertise to its citizens to implement. If the energy policy is saving millions of dollars every year, the data sets would be of concern to both higher governments and stakeholders of the community interested in the city's budget and affairs. The municipality can and will begin to receive recognition for its energy conservation and monetary savings. The second reason to review the policy is to appraise the performance of the staff so that they and the other parties involved in the success of the transition to energy conservation can be properly rewarded. Recognition is an effective way to inspire individuals to alter their behavior. It is also an incentive to maintain the energy policy.

Moreover, tracking data allows the municipality to determine a new budget based on energy consumption. The disparity between the new and the old budget will vary from the success level of one policy to the next; however, it is expected that the new policy will be considerably lower. In addition, the data will tell where the municipality stands in becoming eligible for the ENERGY STAR® label. The ENERGY STAR® label has a prestigious status in the energy conservation spectrum. The Energy Policy Act of 2005 compels all federal agencies to be in accordance with the ENERGY STAR® label requirements and to procure ENERGY STAR® appliances. ENERGY STAR® compliance requires that buildings be evaluated on a scale of 1-100 on their "physical attributes, operating characteristics and monthly energy consumption" (EPA 2002)[6]. Those that score above 75 will be given the ENERGY STAR® label. Being in compliance with ENERGY STAR® label standards can assist a municipality in establishing itself as a benchmark for energy conservation, all the while saving money year after year.

Financing the Energy Conservation Transition

Alternative financing mechanisms are creative ways of funding an energy policy while expanding nearby economies by redirecting funds in the annual budget to local businesses. According to the military, alternative financing mechanisms have been the foundation for the success of their energy policies.

[6] For more on the ENERGY STAR ® label, visit: www.energystar.gov

By using alternative financing mechanisms, military bases are able to implement energy conservation technology without initial out-of-pocket costs and without additional funding from the federal government. The Executive Order 13123 that mandates the reduction in energy consumption does not allocate funding to them; instead, it suggests alternative financing mechanisms such as performance contracts and tax-exempt lease purchase agreements.

Performance Contracts

The Executive Order 13123 encourages alternative financing mechanisms such as energy saving performance contracts. Energy performance contracting is a negotiation between an agency and an energy services provider (ESCO) under which the ESCO engineers design facility improvements with no initial costs to the agency. It is understood between both parties that the ESCO engineers will achieve energy savings for the agency and that the billing period savings will cover the initial operational costs, capital costs and associated financing fees. Also, the contract is good for the life of the project as long as appropriate operations and maintenance procedures are checked continually. After the costs and fees are satisfied, the savings belong to the agency (FEMP 2004).

Tax-Exempt Lease Purchase Agreements

Like performance contracts, tax-exempt lease purchase agreements afford an agency the opportunity to fund energy conservation systems with the savings accrued through implementation. The primary difference between tax-exempt purchase agreements and performance contracts are that under the former, should the agency become unable to pay back the lease, the equipment installed at the owners facility will be returned to the lender (ENERGY STAR ®, 2002).

Utility Energy Service Contract

Utility energy service contracts (UESCs) are partnerships between an agency and an ESCO which may or may not include coverage for energy conservation projects. If the contract does not stipulate coverage for energy conservation, a new contract can be drawn up to encompass the project. The project is financed and carried out by the ESCO, and like performance contracts, they are paid back with the savings generated by the conservation project (FEMP 2004).

Fort Knox, Kentucky

Motivated by the Energy Policy Act, Fort Knox prepared an ambitious plan to reduce its energy consumption by 35 percent. Since the Act of 1992 did not provide funds to implement the changes, Fort Knox chose to utilize alternative financing mechanisms, such as the performance contract. Fort Knox entered into the contract with Nolin Rural Electric Cooperative Corporation (Nolin RECC). The contract, referred to as a Utility Energy Services Contract (UESC), was drawn on the condition that the $27 million project would be financed by Nolin RECC. The loan was to be repaid in 10 years and would be a part of the base's electric bill and would be covered by the energy savings due to its conservation (Trane ® 2003).

The total cost of the program is intimidating; however, the program was projected to incur annual savings of $3.5 million. It would take the base 7.7 years to payoff the loan with just its conservation savings. Nolin RECC sub-contracted with Trane®, a manufacturer of energy efficient technology to determine exactly what needed to be done at Fort Knox to make the base run in a more energy efficient manner. Trane® developed an energy conservation system tailored to meet the base's specific needs to maximize efficiency.

Performance contracts are beneficial to each party involved: the military base acquires the funds needed to pay for the money saving energy conservation transition through conserving energy; the investor receives a percentage of the loan; and the sub-contractors receive long-term contractual work. Municipalities can easily use similar types of contracting to assist in energy conservation transitions of their own.

Camp Pendleton, California

Marine Corps Base Camp Pendleton has used $36 million in 27 UESCs from their local utility provider, San Diego Gas and Electric, to implement their energy conservation systems. In 2004, two of the contracts saved the base a total of $3 million. The projects implemented included modernizing their direct digital controls (the microprocessor technology that maximizes energy efficiency in heating and cooling functions by taking into account various factors that affect temperature) and installing efficient heating, ventilation and air cooling (HVAC) units where necessary. The base has also taken steps to install natural day lighting (FEMP 2003).

Air Station Yuma, Arizona

Marine Corps Air Station Yuma has negotiated a $1.5 million UESC with their local utility provider, Arizona Public Service, to implement several energy conservation systems. Annual savings from the projects are estimated to be $186,000. These systems include such technology as using direct digital controlling and replacing old incandescent fire alarm transmission box lighting with light emitting diode technology (FEMP 2003).

Marine Corps Camp Lejeune, North Carolina

In deciding to conserve energy, Marine Corps Camp Lejeune decided that it would upgrade its family housing. The base negotiated a $16 million UESC to replace 2,093 air-to-air heat pumps and heating and cooling units with geothermal heat pumps. Annual savings are projected to be at $1.5 million (FEMP 2003).

With these and other alternative financing mechanisms, a municipality can implement energy conservation technology without upfront costs. A loan acquired through one of these alternative financing mechanisms is paid for through the savings in the energy bill.

However, if a municipality is considering using one of these financing mechanisms, it should first consult with its state statutes for regulations to ensure that there are no there available options.

Best Practices for Energy Conservation

There are a variety of ways in which a municipality can conserve energy. The following examples of where and how to conserve energy are from Joseph A. Mulloney Jr.'s *Energy Conservation: The Next Pollution Prevention Frontier*. Examples range from simple alterations in consumption habits to installing energy saving technology, but all are practical and reasonable approaches to energy efficiency[7].

Heating, Cooling, and Insulation Projects

A large amount of energy is wasted in improper installation, operation and maintenance of heating and cooling systems. New technology in this area allows the user to manage and measure energy consumption to meet efficiency goals. It is assumed that of all Btus[8] expended in this area, a reduction of at least five percent is expected.

New technologies in air conditioning use approximately 28 percent less energy than outdated ones and new technologies in heating use save over 90 percent[9]. For instance, the 42nd Civil Engineering Squadron of Maxwell Air Force Base and Gunter Annex saved $1.4 million a year by computerizing their central heating plant and central chiller plant and by replacing components of their energy management control systems. It also installed lighting controls with efficient bulbs.

Proper insulation of a building can result in a 15 percent reduction in energy consumption. Some issues to address are interior and exterior ventilation and air-infiltration. Strategies for efficient insulation include the use of:

- Water barriers for walls and ceilings.
- Storm and multiple glazed windows.
- Exterior and interior shading.
- Tinted and reflective glazing.

Lighting Systems

Reductions of 40 percent are expected in energy consumption when lighting is made efficient. Several efficient light bulbs include compact florescent lighting and T-8 bulbs. Substantial reductions in energy consumption can be achieved through simply paying attention to electricity usage patterns. Sensors that turn lights on and off with activity or daylight can do this. For instance, switching to efficient lighting in a typical commercial parking lot will save an average of ten percent per year in Btu consumption. An added

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[7] The percent improvements listed above are in Btus per square foot per year. The actual monetary savings would depend on the cost of a given amount of energy in a given municipality.
[8] A Btu is a British thermal unit that measures one unit of energy consumed.
[9] These saving depend on the age and/or condition of your current cooling or heating system.

bonus to reducing energy use in regard to lighting is that air conditioning will decrease as well since energy used for lighting is transformed into heat.

Consider the 7th Civil Engineer Squadron Operations Flight that utilized a $5.4 million energy savings performance contract to implement an energy efficiency project. This strategy incurred savings of more than 46 billion Btus and savings in excess of $682,000 per year by replacing outdated lights bulbs with new T-8 bulbs. As a result, lighting was drastically improved, increasing employee comfort and productivity.

Other Military Case Studies

Several other military bases have been highly recognized for their energy conservation and more notably for their energy consumption cost reduction. Listed below are a few examples of successful case studies:

Veterans Affairs Salt Lake City Health Care System, Utah

The Veterans Affairs Salt Lake City Health Care System implemented several technologies to conserve energy. These included installing efficient lighting and controls, a new cooling system, solar hot water system, and a rotoclave medical waste sterilizer. The upgrades to the facility have afforded the staff the opportunity to manage energy usage and consumption in new ways. Then the facility took energy efficiency one step further. The entire staff was required to attend training seminars to ensure proper operation and management of the new technology. This way, the staff knows exactly how to monitor, measure, and maintain the facility's energy efficiency. The result is a staggering reduction of energy consumption in the amount of 50.7 billion Btus (a 24 percent reduction) and annual savings of $493,000 (FEMP 2003).

Fort Carson, Colorado

By installing ENERGY STAR® windows, furnaces, and lighting units, Fort Carson was able to conserve 42 billion Btus per year. Furthermore, the base installed energy-efficient lighting, made necessary roof alterations, and used photovoltaics to power water pumping systems. Total annual savings are $1.4 million (FEMP 2003).

Conclusion

Military base best practices were used to exhibit the individual successes in making the transition to energy conservation. They show how to begin the transition and how much money conservatory measures can save no matter how small the project is.

Energy conservation is an economically viable choice. Although it is often associated with high initial costs, it can however, be financed with alternative mechanisms that make it affordable and even profitable in the long-run.

Conserving energy saves money and reduces pollution, thereby making the workplace conducive to higher productivity and efficiency. On a larger scale, energy conservation contributes to the betterment of society in the form of abated pollution and the health benefits thereof.

Appendix

Table 1. Selected U.S. Average Consumer Prices* and Expenditures for Heating Fuels During the Winter									
Fuel / Region				Winter of				Forecast	
	99-00	00-01	01-02	02-03	03-04	Avg. 99-04	04-05	05-06	% Change
Natural Gas									
Northeast									
Consumption (mcf**)	81.7	87.3	67.7	87.4	79.9	80.8	79.8	77.5	-2.9
Price ($/mcf)	8.39	10.01	9.41	9.74	11.47	9.81	12.91	16.48	27.7
Expenditures ($)	685	874	637	851	917	793	1,029	1,276	24.0
Midwest									
Consumption (mcf)	88.0	98.3	77.4	92.0	85.3	88.2	85.0	85.9	1.1
Price ($/mcf)	5.74	8.77	6.26	7.61	8.76	7.48	10.01	13.97	39.5
Expenditures ($)	505	862	485	701	748	660	851	1,200	41.0
South									
Consumption (mcf)	55.9	67.0	52.5	60.3	55.6	58.3	54.1	56.2	3.9
Price ($/mcf)	7.65	10.22	8.18	9.02	10.67	9.20	12.31	16.09	30.7
Expenditures ($)	428	684	429	544	594	536	666	904	35.8
West									
Consumption (mcf)	49.3	54.4	48.5	47.2	47.6	49.4	48.4	47.5	-1.7
Price ($/mcf)	6.39	9.76	7.08	7.55	8.86	7.96	10.21	14.10	38.2
Expenditures ($)	315	530	343	356	422	393	493	670	35.9
U.S. Average									
Consumption (mcf)	69.2	77.8	62.5	71.7	67.2	69.7	66.7	66.9	0.3
Price ($/mcf)	6.80	9.52	7.45	8.37	9.76	8.41	11.13	14.94	34.3
Expenditures ($)	471	740	465	600	655	586	743	1,000	34.7
Households (thousands)	56,846	58,180	59,367	59,602	60,388	58,877	61,227	62,086	1.4
Heating Oil									
Northeast									
Consumption (gallons)	681.6	713.5	544.8	693.7	641.8	655.1	641.8	622.1	-3.1
Price ($/gallon)	1.26	1.44	1.18	1.43	1.46	1.36	1.93	2.42	25.7
Expenditures ($)	857	1,030	641	992	935	891	1,237	1,508	21.8
Midwest									
Consumption (gallons)	555.5	618.1	449.4	533.8	492.9	529.9	486.8	496.4	2.0
Price ($/gallon)	1.12	1.35	1.03	1.35	1.34	1.24	1.84	2.34	27.1
Expenditures ($)	620	832	463	720	661	659	895	1,160	29.6
South									
Consumption (gallons)	421.8	479.6	342.9	423.0	398.4	413.1	382.7	396.8	3.7
Price ($/gallon)	1.25	1.45	1.13	1.41	1.45	1.35	1.95	2.37	22.0
Expenditures ($)	525	697	387	596	578	557	745	942	26.5
West									
Consumption (gallons)	504.9	484.3	338.8	304.1	317.8	390.0	327.2	313.5	-4.2
Price ($/gallon)	1.19	1.49	1.09	1.39	1.46	1.32	1.98	2.43	22.6
Expenditures ($)	600	723	369	422	463	515	648	761	17.4

U.S. Average									
Consumption (gallons)	665.4	708.8	542.7	670.5	625.1	642.5	622.9	611.2	-1.9
Price ($/gallon)	1.24	1.44	1.16	1.42	1.44	1.35	1.92	2.41	25.3
Expenditures ($)	827	1,020	627	951	903	865	1,199	1,474	23.0
Households (thousands)	8,828	8,466	8,119	8,000	8,018	8,286	8,052	8,089	0.5
Propane									
Northeast									
Consumption (gallons)	769.1	875.6	741.2	940.4	870.1	839.3	869.2	844.7	-2.8
Price ($/gallon)	1.36	1.65	1.40	1.55	1.65	1.53	1.87	2.12	13.0
Expenditures ($)	1,045	1,442	1,040	1,461	1,436	1,285	1,629	1,789	9.8
Midwest									
Consumption (gallons)	768.4	899.7	725.7	856.1	795.7	809.1	787.0	798.3	1.4
Price ($/gallon)	0.88	1.27	1.00	1.07	1.20	1.09	1.42	1.66	17.6
Expenditures ($)	678	1,140	727	917	951	882	1,114	1,329	19.3
South									
Consumption (gallons)	486.4	598.1	493.2	573.4	535.0	537.2	515.6	541.5	5.0
Price ($/gallon)	1.22	1.63	1.24	1.45	1.57	1.43	1.79	2.03	13.8
Expenditures ($)	593	975	611	833	842	771	921	1,101	19.5
West									
Consumption (gallons)	581.4	672.0	624.3	600.2	602.1	616.0	609.5	599.5	-1.6
Price ($/gallon)	1.12	1.56	1.25	1.38	1.54	1.38	1.78	2.01	12.9
Expenditures ($)	652	1,050	783	830	925	848	1,087	1,207	11.1
U.S. Average									
Consumption (gallons)	637.2	756.5	634.4	720.9	679.4	685.7	670.0	681.0	1.6
Price ($/gallon)	1.08	1.46	1.16	1.29	1.42	1.29	1.64	1.89	14.8
Expenditures ($)	689	1,108	736	928	962	885	1,102	1,286	16.7
Households (thousands)	4,837	4,917	4,982	4,939	4,972	4,929	5,007	5,055	1.0
Electricity									
Northeast									
Consumption (kwh***)	8,876.2	9,980.6	8,955.3	10,825.0	10,125.7	9,752.6	10,105.6	9,894.1	-2.1
Price ($/kwh)	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	5.1
Expenditures ($)	965	1,102	1,000	1,182	1,147	1,079	1,185	1,220	2.9
Midwest									
Consumption (kwh)	9,873.3	11,266.9	10,118.6	11,366.3	10,799.3	10,684.9	10,742.3	10,819.0	0.7
Price ($/kwh)	0.08	0.07	0.08	0.07	0.08	0.08	0.08	0.09	14.2
Expenditures ($)	750	837	774	850	824	807	830	955	15.1
South									
Consumption (kwh)	8,395.1	9,199.5	8,146.7	8,815.4	8,484.4	8,608.2	8,338.7	8,515.0	2.1
Price ($/kwh)	0.07	0.07	0.08	0.07	0.08	0.07	0.08	0.09	11.5
Expenditures ($)	598	678	615	656	666	643	682	776	13.8
West									
Consumption (kwh)	7,444.6	7,945.4	7,375.7	7,237.7	7,295.4	7,459.8	7,368.4	7,259.4	-1.5
Price ($/kwh)	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.10	6.2
Expenditures ($)	599	667	675	645	661	649	665	696	4.6

U.S. Average									
Consumption (kwh)	8,098.5	8,896.4	7,980.9	8,547.5	8,260.4	8,356.7	8,191.6	8,252.0	0.7
Price ($/kwh)	0.08	0.08	0.08	0.08	0.09	0.08	0.09	0.10	9.2
Expenditures ($)	643	718	666	699	702	686	715	787	10.0
Households (thousands)	30,535	30,760	30,961	31,226	31,655	31,027	32,122	32,580	1.4
All households (thousands)	101,046	102,323	103,429	103,766	105,033	103,120	106,408	107,810	1.3
Average Expenditures ($)	564	774	551	672	703	688	786	985	25.3
* Prices include taxes									
** thousand cubic feet									
*** kilo watt hour									
Energy Information Administration/Short-Term Energy Outlook 2006									

Table 2. ENERGY STAR ® Business Improvement Partner List		
Name	**Sector**	**Location**
Fort Collins Post Office	Federal Government	Colorado
Goodfellow AFB	Federal Government	Texas
Inland Empire Job Corps Center	Federal Government	California
Lake Allatoona Preservation Authority	Federal Government	Georgia
Mount Rainier National Park	Federal Government	Washington
Naval Air Station, Brunswick	Federal Government	Maine
Naval Submarine Base, Bangor	Federal Government	Washington
Tennessee Valley Authority (TVA)	Federal Government	Tennessee
The National Security Agency	Federal Government	Maryland
U.S. Air Force / Dyess Air Force Base	Federal Government	Texas
U.S. General Services Administration (GSA)	Federal Government	Maryland
US Army Fort Myer Military Community	Federal Government	Virginia
US Army Garrison Fort Belvoir	Federal Government	Virginia
US Coast Guard Washington DC	Federal Government	District of Columbia
US District Court of the Northern District of Alabama	Federal Government	Alabama
US Hill Air Force Base	Federal Government	Utah
US Postal Service Baltimore - Associated Offices	Federal Government	Maryland
US Postal Service Baltimore - Distribution	Federal Government	Maryland
US Postal Service, District of Maine	Federal Government	Maine
US Postal Service, South Florida District	Federal Government	Florida

ENERGY STAR®, 2005

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