Strategy 1:

Improve the Energy Efficiency of Kentucky's Homes, Buildings, Industries and Transportation Fleet

GOAL **Energy efficiency will offset at least 18 percent of Kentucky's projected 2025 energy demand.**

Strategy 1 encompasses elements of Kentucky's proposed Renewable and Efficiency Portfolio Standard (REPS) and the Alternative Transportation Fuels Standard (ATFS).

The REPS states that "by 2025, Kentucky will derive at least 25 percent of its projected energy demand from energy efficiency, renewable energy and biofuels while continuing to produce safe, affordable and abundant food, feed and fiber."

The ATFS states that "by 2025, Kentucky can displace 60 percent of its reliance on foreign petroleum by utilizing fuels such as those derived from biomass and coal, plug-in hybrid vehicles, and compressed natural gas."

INTRODUCTION

Both nationally and worldwide, we are experiencing dramatic increases in costs for our traditional sources of energy – coal, natural gas and petroleum. Supply and demand are seeking new balance points at much higher price levels with devastating impacts in many regions of the world. In the United States, including Kentucky, the rates charged by electric utilities are increasing as a result of rising prices for coal and natural gas used to generate power.

Prices for coal, natural gas, and petroleum likely will continue to increase, and therefore consumers' energy bills will continue to rise. Most would agree that the era of cheap energy is over. The choice we face is to take no action and see large price increases, or to take prudent actions now and see smaller price increases. In the near term, energy efficiency and conservation represent the fastest, cleanest, most cost-effective, and most secure methods we have to reduce our growing demand for energy and to help us address issues surrounding global climate change.

Nationally, approximately 25 percent of total electricity usage can be saved cost-effectively, at an average cost of three cents or less per saved kilowatt-hour. New generation sources cost five cents or more per kilowatt-hour, making efficiency the lowest cost electricity resource (Laitner, 2007). A recent analysis conducted by La Capra Associates shows that Kentucky's marginal cost of electricity could increase by 15 to 65 percent with the implementation of federal climate change and greenhouse gas policies. Such increases further underscore the value of energy efficiency (Smith, 2007).

Although the terms energy efficiency and energy conservation are often used interchangeably, the two can have different meanings. Energy conservation typically refers to reducing the services energy provides from the levels that would normally be used. For instance, if you raise your

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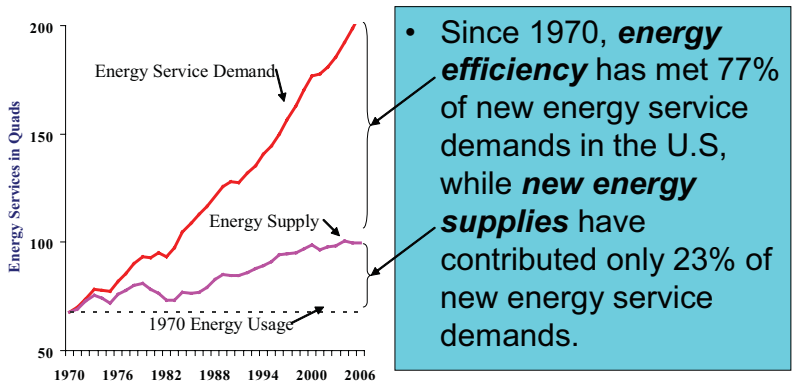


(Ehrhardt-Martinez, 2008)

Figure 5: Contributions from Energy Efficiency Outstrip Contributions from New Supplies: 1970-2006

home's thermostat from 70 degrees to 74 degrees during the summer cooling season, then you are practicing energy conservation. On the other hand, if you replace an incandescent light bulb with a compact fluorescent bulb, you are increasing your energy efficiency.

Both energy conservation and energy efficiency concepts may also be placed into the broader context of "energy demand management." In a utility regulatory context, an example of a demand management program that is neither conservation nor energy efficiency would be a load shifting program. From the utility's point of view, having people change their consumption from peak times of day to off-peak times may allow the utility to avoid turning on a natural gas-fired generating peaking unit, which costs more to operate than a typical base load coal-fired generating unit. Such actions will save money since the higher cost unit is not being used.

Again using energy efficiency as an expression for all types of energy demand management programs, many studies have concluded that it has a key role in meeting our future energy demand. Stated conversely, energy efficiency can be thought of as an important source of incremental energy supply to help meet future energy needs.

According to the American Council for an Energy Efficient Economy (ACEEE), since 1970 energy efficiency has contributed more than three times as much energy to the U.S. economy as new supplies have contributed. In other

ENERGY STAR Schools in Kentucky

Kentucky is proving that energy-efficient schools make a difference by building schools that qualify for the ENERGY STAR label. Schools that earn the ENERGY STAR label use less energy, cost less to operate, lighten the load on the environment and improve the comfort and indoor air quality for building occupants. Kentucky has 34 buildings that have received the ENERGY STAR label, with 15 of those being public K-12 schools. These schools are some of the most energy-efficient facilities in the commonwealth. On average, these schools use as much as 33 percent less energy than a traditionally built school, and can save $45,000 to $50,000 in annual energy costs. ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy that helps save money and protect the environment through superior energy efficiency.

words, since 1970, based on projections of historical energy consumption increases, we would have had to build/discover and bring to market four times as much "new supply" of energy as we actually delivered to the market (Ehrhardt-Martinez, 2008).

Not only does energy efficiency result in savings today, the savings are compounded over time as energy prices continue to rise. Dollar for dollar, energy efficiency is one of the best energy investments Kentucky can make.

Energy efficiency can also provide significant benefits to the state and national economy. Energy efficiency improves business competitiveness, household savings and the environment. Green jobs, sometimes called green collar jobs, that result from investments in energy efficiency and renewable energy, can create opportunities for the economy as well. While additional Kentucky-specific research is necessary to estimate the job impact attributable to increased levels of energy efficiency or use of renewable energy sources, there are numerous studies that provide information on a national scale.

For example, a November 2007 study by the American Solar Energy Society showed that renewable energy and energy efficiency industries today generate nearly $1 trillion in revenue in the United States and contribute more than $150 billion in tax revenue at the federal, state and local levels (Bezdek, 2007).

The National Action Plan for Energy Efficiency (NAPEE), a national commitment to energy efficiency by more than 50 leading U.S. gas and electric utilities, utility regulators, and partner organizations, estimates that if utilities were to invest roughly $7 billion a year in energy efficiency, this would leverage another $20 to $30 million in non-utility investment, yielding annual savings to consumers of some $22 billion by 2017. These investment levels could result in the creation of nearly 300,000 jobs annually (Song, 2007).

Kentucky's investment in energy efficiency will not only reduce our emissions of greenhouse gases and dependency on oil from foreign sources but will serve to stimulate economic growth and new job creation. Thoughtful policies that encourage Kentuckians to consider and implement cost-effective energy efficiency measures will help Kentucky's economic outlook.

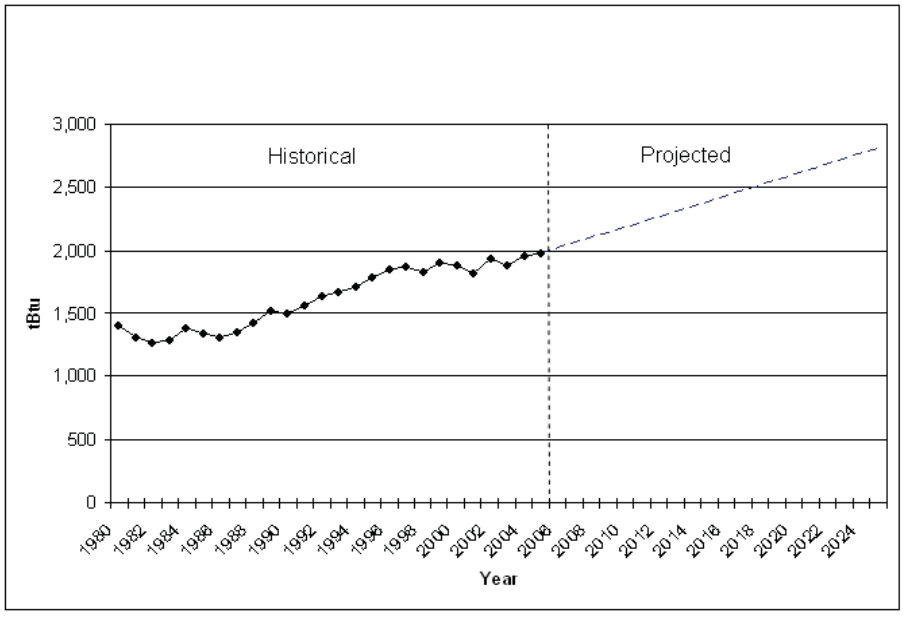


Figure 6: Total Energy Consumption 1980-2005, Projected to 2025 (EIA, 2005b)

Kentucky's Current and Projected Energy Use Patterns

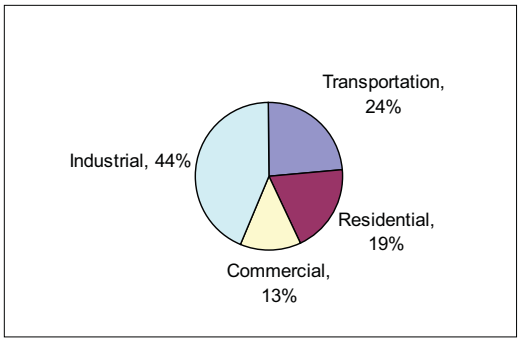
With our electricity rates among the lowest in the United States, it is not surprising that Kentucky's per

capita consumption of residential electricity is among the highest in the country. Our low rates have tended to be a barrier to the adoption of effective energy efficiency practices in the state.

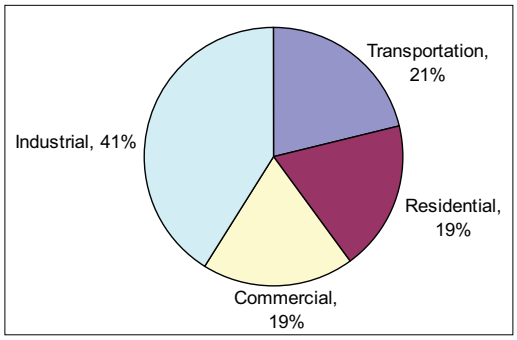
In 2005, total energy usage in Kentucky was the sixth highest per capita in the United States (EIA, 2005a). In the same year, the average expenditure per Kentuckian on energy was $4,084, ranking the state ninth nationwide even though we ranked 45th nationwide in energy prices (dollars per million Btu). This discrepancy underscores the fact that Kentucky is an energy-intensive state on a per capita basis. In 2006, Kentucky's electrical use per industrial customer was 427 percent above the national average (ranking third highest); residential use per customer was 24 percent above the national average (sixth highest). These averages indicate that there is opportunity for energy efficiency in Kentucky.

Energy consumption in Kentucky has increased dramatically since 1980, and the trend toward increased consumption is expected to continue.

2005 Source Energy Usage in KY
(Total = 1970 tBtu/yr)



2025 Projected Source Energy Usage in KY*
(Total = 2815 tBtu/yr)



* Business As Usual – BAU projections assume energy efficiency and energy conservation continue at current levels but no new efficiencies or conservation initiatives are introduced.

Figure 7: 2005 Source Energy Usage in Kentucky and Projected to 2025

Table 1: Percent Increase from 2005 to 2025 of Source Energy Used

Source Energy Used in 2005 And Projected Use in 2025 (tBtu)			Percent Increase
Year	**2005**	**2025**	
Residential	370	536	45
Commercial	260	527	103
Industrial	863	1147	33
Transportation	477	605	27
TOTAL	1970	2815	43

(Colliver et al., 2008)

The EIA Annual Energy Outlook (AEO) gives projections for annual energy consumption through 2030 for the East South Central region of the United States. In order to use the AEO as the basis for the state's projected usage, Kentucky's fraction of the existing East South Central region usage was assumed to continue into the future (Colliver et al., 2008). The EIA updates its energy forecast on an annual basis; rather than continuously track the most recent forecast the AEO 2006 was used as the reference case.

"Source energy" is the energy content of the primary fuel and is a measure of energy before electric transmission and generation losses. Between 2005 and 2025 Kentucky's total source energy usage is projected to grow from 1,970 trillion Btu per year to 2,815 trillion Btu per year, an increase of over 43 percent, approximately 1.8 percent each year for the 20-year period in a business-as-usual scenario (see Figure 7). The commercial and residential sectors are predicted to experience the largest percentage growth in energy usage (Table 1) (Colliver et al., 2008).

Toyota is committed to the continuous improvement of energy performance by having systems in place to identify opportunities for energy savings. The company accomplishes this through their successful plant-wide energy assessments to find energy reduction opportunities. These assessments have allowed Toyota to continually improve their energy performance. Within the span of one year alone, 2005, Toyota decreased energy intensity eight percent while increasing production four percent (EPA, 2008a).

Conservation and Energy Efficiency in Context

With cost-effective programs in place, conservation and energy efficiency are projected to be the largest contributors to meeting our growing energy demand in 2025. Figure 8 shows that energy efficiency could offset up to 18 percent of our total energy, or 511 trillion Btu, in 2025. Stated another way, about 60 percent of our new energy requirements could be satisfied with energy efficiency, not new production. This is not unrealistic as the United States has met 77 percent of its new energy demands with energy efficiency since 1970 (Laitner, 2007).

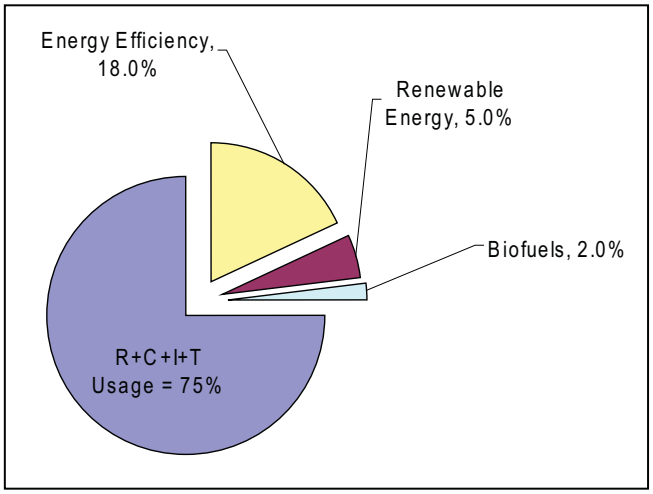


Figure 8: Projected Contribution of Energy Efficiency, Renewable Energy and Biofuels to meet Kentucky's Total 2025 Energy Demand (Total Demand=2815 tBtu)

Using an analysis by the University of Kentucky as a basis, energy efficiency in the residential, commercial and transportation sectors could offset about 10 percent of our projected 2025 energy demand; renewables five percent (*Strategy 2*); and biofuels another two percent (*Strategy 3*) (Colliver et al., 2008). The remaining eight percent in *Strategy 1* includes industrial, transportation and energy efficiency technologies not addressed in the University of Kentucky analysis. Additional analysis is needed to determine the total energy efficiency potential for the industrial sector in Kentucky.

The identification and implementation of energy efficiency programs is a dynamic process. Rising energy prices and technological advances significantly affect the cost-effectiveness of energy-efficiency programs. Industry and business must continuously reassess these variables along with business trends to find optimum energy efficiency solutions that help reduce operating costs.

Opportunities to Reduce Energy Consumption

Energy Efficiency Resource Standards

A growing number of states are adopting energy efficiency resource standards (EERS) or energy efficiency portfolio standards (EEPS), to help ensure that cost-effective energy efficiency measures for electricity and natural gas are being implemented.

Currently, 17 states have goals using EERS that quantify how much energy savings will be generated from energy efficiency measures. EERS consist of electric or natural gas energy-savings targets for utilities, often with flexibility to achieve the target through a market-based trading system. EERS encompass end-user energy-saving improvements that can include distribution system efficiency improvements, combined heat and power (CHP) systems, and other high-efficiency distributed generation systems (Nadel, 2006). In Kentucky, the Tennessee Valley Authority (TVA) established a voluntary energy efficiency target to reduce future systemwide demand by 1,200 megawatts by 2013 (EPA, 2008b) (Figure 9).

Notes: New Jersey and Michigan have pending EERS requirements.

(ACEEE, 2008)

Figure 9: State Energy Efficiency Resource Standard (EERS) Activity, May 2008

EERS require that energy providers meet a specific portion of their electricity and natural gas demand through energy efficiency. EERS are intended to help overcome the various barriers that keep utilities and other players from investing in cost-effective energy efficiency that several studies predict could meet up to 20 percent of the nation's energy demand, or about half of the expected demand growth (Nadel, 2004). However, in many states, market barriers, regulatory disincentives, or insufficient information about the benefits of energy efficiency keep utilities and other customers from investing in cost-effective energy efficiency to its full potential.

States have found that establishing explicit targets, based on sound analysis of technical and economic potential, can help reduce energy demand, cut emissions, help address concerns with system reliability and provide other energy-related benefits (EPA, 2006).

In some cases, states have combined EERS with additional policy measures such as demand-side management (DSM) programs, public benefit funds and different pricing structures that allow incentives for utilities to earn revenue in ways that are not entirely linked to additional sales. Aggressive EERS targets will require that all economic sectors be considered and addressed.

Under EERS, a state utility commission specifies numerical energy savings targets that natural gas and/or electricity service providers must meet, on an annual and sometimes cumulative basis. EERS can be set as a percentage of load growth or base year sales, or as a fixed number of units of energy savings (e.g., kilowatt-hour or Btu). Targets can also cover peak electricity demand (e.g., megawatts capacity). The appropriate EERS target depends upon a number of factors including the economically achievable energy efficiency potential, funding availability, emission reduction goals, and other issues including how to treat any existing energy efficiency requirements (EPA, 2006).

The implementation of an EERS occurs primarily through designated utilities. However, continued state involvement is important to oversee the development of implementation rules. In particular the state's role in evaluating measurement and verification (M&V) is critical to maintaining credibility for the market and commodity.

PUBLIC BENEFIT FUNDS

Establishing regulatory mechanisms and funding sources for utility programs to help achieve the efficiency resource goals is another key issue states have encountered. Different approaches have included one or more of the following: utilizing resources under a public benefit fund (PBF), allowing for cost recovery as part of utility rates, providing direct funding, and establishing regulatory provisions that allow new rate designs (EPA, 2006).

PBFs, also known as system benefits charges (SBCs), are typically created by levying a small charge on every customer's electricity and/or natural gas bill. These funds provide an annual revenue stream to fund energy efficiency programs. Currently, 30 states and Washington, D.C., provide nearly $3 billion annually for energy efficiency and related programs via this mechanism. States with restructured as well as traditional electricity markets are using PBFs as a component of their energy efficiency, renewable energy and low-income portfolios. In Kentucky a PBF of 1mil per kilowatt-hour would generate approximately $67 million annually, based on 2006 retail sales of 66,886 thousand megawatt-hours by Kentucky's regulated investor-owned and cooperative utilities.

The development of both utility-sponsored and non-utility-sponsored programs should be considered when designing a plan to achieve the EERS. Utility-sponsored programs are traditional demand-side management programs using cost recovery while non-utility-sponsored programs are those funded through other mechanisms (e.g., PBF).

A challenge for Kentucky to implement an EERS will be to ensure that it is applied equitably across the commonwealth and that both jurisdictional and non-jurisdictional energy service providers and their customers are considered. How best to approach this challenge will require further analysis and discussion between stakeholders, legislators, regulators and executive agencies.

As energy efficiency programs designed to achieve the EERS increase in sophistication and complexity there will be a demand for improved energy management protocols and control systems. These new protocols and systems will come as improvements and upgrades are made in the energy transmission infrastructure. Several states are already upgrading their energy transmission infrastructures through the implementation of "smart grid" technologies. These are technologies that enable consumers to choose what type of energy they receive, as well as having the ability to manage their own consumption habits through in-home automation. Consumers better understand how energy is used within their home or business, how much usage costs them, and the impact that energy usage has on the environment (Xcel Energy, 2008).

A "smart grid" is essentially an electric system that integrates the infrastructure, processes, devices, information and market structure so that energy can be generated, distributed, and consumed more efficiently and cost effectively; thereby achieving a more resilient, secure, reliable and environmentally benign energy system. "Smart grid" builds on many of the technologies already used by electric utilities but adds communication and control capabilities that will optimize the operation of the entire electrical grid. It is also positioned to take advantage of new technologies, such as plug-in hybrid electric vehicles, various forms of distributed generation, solar energy, smart metering, lighting management systems and distribution automation (NEMA, 2008).

The development of a new technologically advanced electric network will require additional resources and funding that must be evaluated and balanced against enhanced capabilities, reliability and overall benefit to the utility and their customers.

Beyond the benefits tied to reduced energy use, states have found EERS have a number of particular advantages as a policy approach (EPA, 2006). The advantages include:

- Simplicity - EERS create a straightforward resource acquisition target for energy providers.
- Cost-Effectiveness - Setting an energy efficiency requirement without explicitly setting aside a pool of funds challenges electricity and natural gas providers to meet the goal in the most cost-efficient manner.
- Specificity - By articulating a specific numeric target, EERS can be effective in illuminating how much energy efficiency will contribute to reaching goals of energy demand reduction as well as emission reductions and other public policy goals.
- Economies of Scale - The macro-level targets inherent in EERS allow energy providers to aggregate savings across enough end-uses and sectors to meet the overall savings goals cost-effectively. This helps address a fundamental barrier to energy efficiency resource development: the distributed nature of energy efficiency resources. Securing substantial energy-efficiency gains in every end-use and use sector involves millions of homes, offices, factories, and other facilities and thus can be difficult when approached at a micro-level.
- Accountability - Because utilities will have an measurement and verification protocol to follow, reliable estimates of actual savings can be developed. This feedback can lead to ongoing modifications to energy efficiency programs to make them more effective.

There is little doubt that energy prices will continue to climb. Higher energy prices will certainly be followed by significantly higher energy bills, unless policies are put in place to reduce energy demand and usage. There will be a cost associated with implementation of an EERS program. However, there will also be a payback.

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Energy Efficiency Education, Outreach and Marketing

Energy efficiency outreach and education are critical to help consumers learn about the benefits of energy efficiency and to provide information on the array of products and services available to them to help reduce energy consumption.

There are many readily available, easy to implement, cost-effective methods and products that Kentucky residents and businesses can use to save energy and lower expenses. Unfortunately, many people are unaware of these products and services, or they do not fully understand the benefits to be gained from them.

For example, for some measures that are not currently cost-effective or that are more expensive to purchase up-front, the federal government may offer incentives to help bring down the initial cost. Unfortunately, many consumers might not know these incentives exist. In some cases, certain energy efficiency measures are required by law, as in the case of the Kentucky Building Code (KBC) and the Kentucky Residential Code (KRC), which requires certain standards be incorporated into building practices. Still, many of these methods and products have not been widely adopted in Kentucky. Increasing public awareness of the need to strengthen energy provisions in the KBC and KRC, along with enhanced code enforcement, will improve the energy efficiency of Kentucky's buildings.

A multi-faceted and wide-ranging public information campaign would increase the knowledge of energy consumers and help them make better educated decisions about energy consumption and equipment purchases.

Energy Efficiency Leadership by State Government

State government can improve its building and vehicle energy efficiency and, at the same time, substantially cuts its costs. Activities already being initiated by the

Kentucky Energy Efficiency Program for Schools (KEEPS)

In partnership with the University of Louisville, the Energy and Environment Cabinet (EEC) supports the Kentucky Energy Efficiency Program for Schools (KEEPS), which helps participating schools and universities improve energy efficiency by offering tools, training and expertise. KEEPS allows participants to analyze and understand their energy consumption, which includes everything from lighting usage, heating and cooling issues to natural gas consumption. The 2008 Regular Session of the General Assembly passed HB 2, which requires that all 174 Kentucky public school districts enroll in the KEEPS program by January, 2010. Within the past two years, more than $160,000 in grant funding has gone to support KEEPS. An example of the program's effectiveness is Bullitt County school district, which joined KEEPS in 2006 as a pilot program. During the 2007-2008 school year, district electricity consumption was reduced by 11 percent (a savings of approximately $180,000) and natural gas usage was reduced by seven percent. The district's total avoided costs including account credits equaled nearly $246,000 for the 2007-2008 school year.

Finance and Administration Cabinet through the "Green Team" program must become more robust and must be adopted as the normal course of doing business. Additionally, as a large energy buyer, the state can boost the markets for advanced technologies and clean energy sources. The state should adopt and implement energy management practices and utilize renewable fuels and resources where doing so has a life-cycle cost benefit or can assist in transforming the market for these practices and technologies. See Near-Term Action 1 for details on state government actions.

Transportation Energy Efficiency

Transportation is closely tied to Kentucky's economy, security and health. High prices for fuel divert household dollars from other uses, traffic congestion erodes worker productivity, and prices climb for a broad range of consumer goods, including food. In the summer of 2008, crude oil prices set record highs.

One approach to reduce the cost, health and environmental impact of the transportation sector is to adopt technologies that make the vehicle-based transportation system more fuel efficient. Hybrid gasoline-electric vehicle (HEV) and plug-in hybrid electric (PHEV) technologies use less fuel per passenger-mile or ton-mile (freight), and alternative power sources at rest stops reduce the need for truck drivers to use fuel to idle their engines during overnight stays. Other transportation technologies help traffic flow more smoothly, enabling vehicles to use fuel only when necessary. All of these measures are in use and available in Kentucky, and they offer ways to reduce fuel costs and consumption. Technological advances in other transportation modes (e.g., rail and air) will also contribute to reduced fuel consumption.

"Smart" traffic control makes the flow of traffic more efficient through real-time monitoring, synchronized traffic devices and other technologies that reduce stopping and idling. These technologies include traffic cameras, sensors and controls that respond to traffic activity, and synchronized traffic signals or roadway configurations (roundabouts) that reduce idling (Georgia, 2006).

Efficient transportation technologies, such as fuel efficient vehicles, also significantly reduce the cost, health and environmental impact of the current transportation system. Transportation demand management (TDM) addresses the increasing demand for mobility by promoting alternatives to vehicle use, particularly single-occupancy vehicle use. Carpooling, vanpooling, telecommuting, public transit, walking and bicycling are TDM measures that promote conservation of transportation energy resources (Georgia, 2006).

In addition to these measures, the 2007 Energy Independence and Security Act will help Kentucky improve its overall vehicle fuel efficiency. The act requires the U.S. Department of Transportation to set tougher fuel economy standards, starting with model year 2011, until the standards achieve a combined average fuel economy for model year 2020 of at least 35 miles per gallon (MPG) (DOE, 2008).

ACHIEVING THE GOAL

Energy efficiency will offset at least 18 percent of Kentucky's projected 2025 energy demand.

Four action items have been identified to achieve this goal.

- An energy efficiency program for state government that has aggressive internal energy savings targets will be implemented. This program is important as it establishes a leadership role for state government.
- As part of an overall REPS, an Energy Efficiency Resource Standard (EERS) for electric and natural gas utilities will be set with a goal of reducing energy consumption by at least 16 percent below currently projected 2025 energy consumption. To achieve the EERS a combination of both utility-sponsored and non-utility-sponsored energy efficiency programs will be developed and implemented.
- Kentucky will have a strong education, outreach and marketing component that will support all of its other energy efficiency activities. Specific savings are not being attributed to this activity since it will support all of the efficiency and conservation efforts.
- Transportation energy efficiency programs and vehicle fuel economy initiatives will contribute at least another two percent representing a savings of approximately 500 million gallons of motor fuel annually. This percentage may be significantly large with efficiency improvements in air and rail transportation, and with greater adoption of plug-in hybrid vehicles and fuel-efficient diesel engine vehicles.

Near-Term Actions (1-3 years)

1. Kentucky will improve the energy efficiency of state-supported facilities and the fleet fuel efficiency of state-owned vehicles. State government will aggressively pursue achieving the requirements outlined in Sections 4-8, House Bill 2 and seek other opportunities that will reduce the energy consumed by all state-financed or state-owned buildings and vehicles.

   To measure progress toward improving energy efficiency in state government, the following targets are recommended:

   - By 2015, state-supported facilities will reduce energy consumption by 15 percent measured in energy per square foot per year using 2009 consumption as the baseline year. By 2025, state-supported facilities will reduce energy consumption by 25 percent as compared to the 2009 baseline year.
   - By 2015, the state vehicle fleet fuel economy measured in miles-per-gallon will improve by 30 percent, or by approximately five miles-per-gallon as compared to a 2007 baseline. By 2025, the state vehicle fleet fuel economy will improve by 50 percent as compared to the 2007 baseline.

   The Energy and Environment Cabinet (EEC) will have overall program responsibility to ensure that these goals are achieved and coordinated with state agencies, post-secondary schools and K-12 schools.

   The Finance and Administration Cabinet (FAC) will have a critical role in measuring and tracking progress, building and operating high performance facilities compliant with House Bill 2 standards, and procuring highly fuel-efficient vehicles for the state fleet. The High Performance Building Advisory Committee created in House Bill 2 will set aggressive building performance standards. The Kentucky Council on Post-Secondary Education, the Kentucky Department of Education and the Education Cabinet will also serve in support capacity to reduce energy usage in their respective school facilities.

The Judicial Branch will also implement actions that support the state energy goals for the facilities that they build, maintain or for which they pay energy costs.

The EEC in collaboration with state agencies, post-secondary schools and K-12 schools will develop a comprehensive energy management plan to achieve the state goals. The energy management plan will establish and support the following initiatives.

Buildings

- Establish an interagency energy management council consisting of representatives from all cabinet-level state agencies, the Kentucky Council on Post-Secondary Education and the Kentucky Department of Education to coordinate implementation of the plan. The EEC Secretary will chair the council.
- Leverage federal and state funding resources to support procurement of a computer-based energy management system that will allow FAC to track and measure energy consumption, develop benchmarks and evaluate progress in state-owned facilities.
- Require that all new state-funded buildings be commissioned, a quality assurance process that verifies and documents that a facility and all of its subsystems are operating as intended by the building owner and as designed by the building architects and engineers.
- Strictly ensure that new building construction complies with whole building life-cycle cost analysis as prescribed by KRS 56.778.
- Aggressively pursue the use of energy savings performance contracts (ESPC) as a financing mechanism for energy efficiency renovation projects. By January 2010, all state-owned buildings of 20,000 square feet or larger will be evaluated by the FAC to determine if they are viable candidates for ESPC. All viable candidates will be included in an ESPC by January 2012.
- Identify fiscal strategies that will allow capital construction budgets to be augmented by long-term energy efficiency savings from operational budgets.
- Establish a grants program for public K-12 school districts that will help offset the cost differential, if any, associated with designing and constructing a new or renovated school to ENERGY STAR or Leadership in Energy and Environmental Design (LEED) standards.

Procurement

- Establish minimum energy performance criteria for appliance and equipment purchases. ENERGY STAR appliances, lighting products and other products will be purchased when available.
- Develop purchasing criteria for the commonwealth to increase the overall fuel efficiency of the vehicles in its state fleet.

Vehicle Fleet

- Reduce the state fleet inventory to the minimum level feasible while still meeting agency travel needs.
- Downsize fleet vehicles to the smallest class possible while still meeting agency mission requirements. Purchase the most fuel-efficient vehicle having the best value within the class.

- Integrate cost-effective advanced technologies (e.g., Geographic Information System) into the management of Kentucky's vehicle fleet to reduce fuel consumption and improve overall asset control. The FAC should continue and expand current efforts to reduce fuel consumption of the state vehicle fleet.

2. Establish an Energy Efficiency Resource Standard (EERS) with the goal of reducing energy consumption by at least 16 percent below projected 2025 energy consumption.

   As components of the EERS:

   - Kentucky will implement recommendations from the House Bill 1, Section 50 report to authorize the Kentucky Public Service Commission (PSC) to develop model demand-side management programs and review, evaluate and approve DSM programs for regulated utilities. Developing and approving aggressive DSM programs will be the first step toward achieving the EERS goal. These recommendations include: amending the existing DSM statute (KRS 278.285) to broaden the PSC's authority to require utilities to implement specific DSM programs; clarify and standardize rules governing industrial customer exclusion from utility DSM programs; establishing standards for the evaluation of both proposed and ongoing DSM programs; and provide for additional PSC staffing and relevant training necessary to support increased activities associated with Integrated Resource Planning, DSM, Certificate of Public Convenience and Necessity, and other issues.

   - The EEC and PSC will conduct a study analyzing the energy efficiency potential of Kentucky's residential, commercial, industrial and transportation sectors.

   - The PSC and EEC will determine the impact, surcharge amount and cost of establishing a public benefit fund to support non-utility sponsored energy efficiency programs; education, outreach and marketing programs; and the renewable energy programs outlined in *Strategy 2*.

   - The EEC and PSC will conduct a study that analyzes how a PBF or EERS could be applied to both jurisdictional and non-jurisdictional energy service providers and their customers.

   - The PSC will conduct a proceeding to evaluate the impact and ramifications of setting an EERS goal of reducing energy consumption by at least 16 percent below projected 2025 energy consumption levels. The proceeding will address the following issues:

     – Identify the mix of programs that should be implemented to cost-effectively achieve the EERS by 2025.
     – Define a framework and specific tests for determining which efficiency programs and policies are cost-effective.
     – Develop and implement a plan for the recommended programs.
     – Estimate the cost to attain the energy consumption reduction goal.

   - The EEC will identify and recommend new tax incentives that will further enhance energy efficiency in the commonwealth.

3. The EEC, in conjunction with other state agencies and energy service providers, will conduct a vigorous and ongoing public energy efficiency awareness and education program.

   - The public awareness program will target both the general public and specific consuming sectors (agricultural, transportation, commercial, schools, etc.). The program will utilize partnerships, for instance with the state's universities and technical colleges and organizations such as, but not limited to, the Kentucky Cooperative Extension Service, the National Energy Education Development Project, Kentucky League of Cities, and the Kentucky Pollution Prevention Center, to increase outreach capabilities. It will aggressively market and promote the efficiency tax incentives in House Bill 2.

   - The EEC's development of a Kentucky public energy efficiency awareness and education program will include the following:

     – Form focus groups to assist in the development of survey design.
     – Determine baseline attitudes, practices and awareness of energy efficiency, conservation, use of renewable energy and biofuels through surveys.
     – Specify objectives and outcomes.
     – Develop the message, training outcomes and select media.
     – Implement the education, outreach and marketing program.
     – Assess results and make corrections to increase effectiveness.

   - The EEC will determine the benefits of establishing energy efficiency Centers of Excellence to deploy energy efficiency technology into all sectors of Kentucky's economy.

4. Kentucky will reduce continued reliance on imported oil by creating incentives that develop a robust plug-in hybrid electric vehicle and highly fuel-efficient vehicle market in Kentucky.

   - Support transportation demand management efforts that significantly reduce vehicle miles traveled (VMT) and utilize telecommunication technologies to reduce travel.

   - The EEC will identify and recommend incentives for plug-in hybrid electric vehicles and highly fuel-efficient vehicles in Kentucky to increase market share.

   - Implement "smart" traffic control and transportation demand management strategies through actions by the Kentucky Transportation Cabinet.

   - Develop and grow partnerships with utilities, universities and manufacturers that support an emerging highly-efficient vehicle industry in Kentucky.

   - The EEC will examine the impact of a vehicle carbon emissions standard and assessment for automobiles, SUV's and pick ups.

Mid-Term Actions (4-7 years)

1. A policy for "smart grid" development will be established for Kentucky. Electric utilities must work in concert with the PSC to develop "smart grid" networks and technologies that will facilitate the next generation of DSM programs.

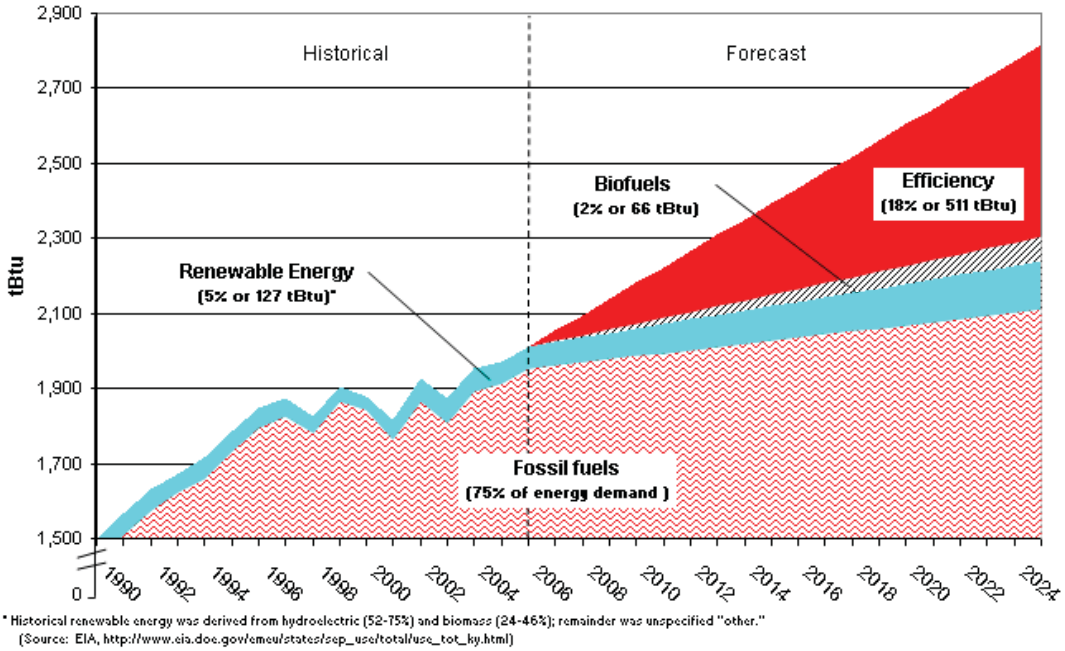
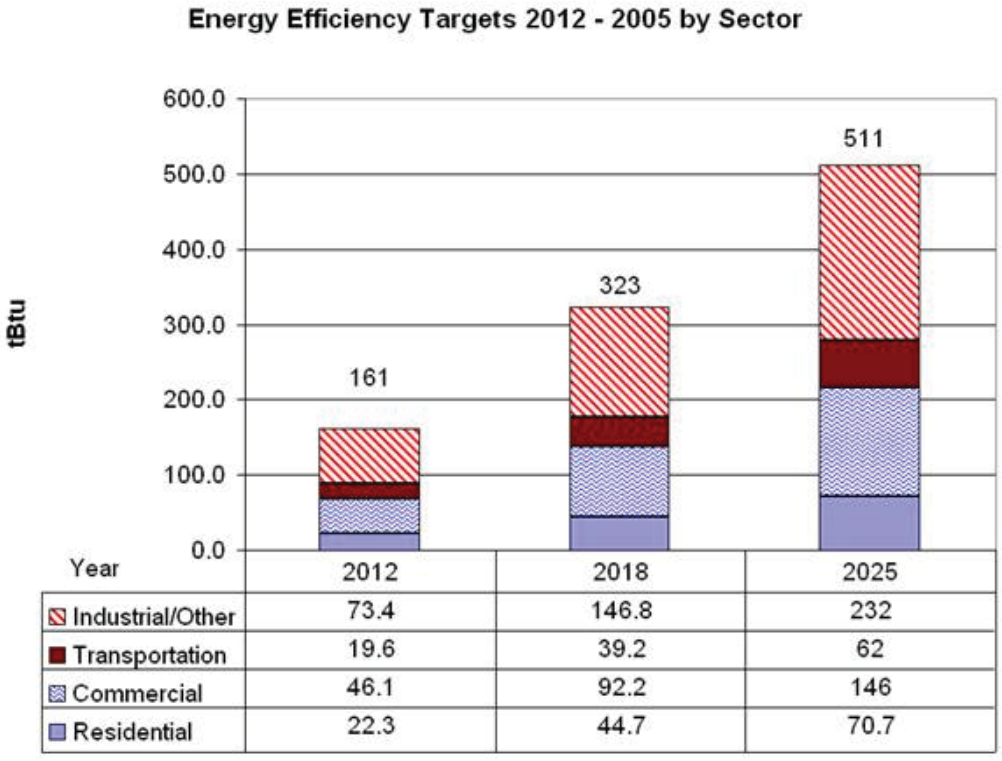


Figure 10: Kentucky Total Energy Consumption and Savings Potential (2025 Goal)



Year	2012	2018	2025
Industrial/Other	73.4	146.8	232
Transportation	19.6	39.2	62
Commercial	46.1	92.2	146
Residential	22.3	44.7	70.7

Figure 11: Energy Efficiency Targets 2012-2025 by Sector

2. The PSC and EEC will evaluate rate design and ratemaking alternatives to enhance the impact of cost-effective energy efficiencies.

Long-Term Actions (>7 years)

1. Kentucky will continue to enhance its electric power system, from power generation to customer appliances, by integrating advanced "smart grid" technologies and communication systems to help Kentuckians better manage and control their energy demand and costs.
2. Kentucky will reevaluate the Energy Efficiency Resource Standard (EERS) goal of reducing source energy consumption by at least 16 percent below projected 2025 energy consumption to determine if additional reductions are achievable.

IMPLEMENTATION SCHEDULE

It is estimated that the energy efficiency measures outlined above can reduce Kentucky's projected "Business-As-Usual" (BAU) total source energy consumption in 2025 by at least 18 percent. Figures 10 and 11 identify *Strategy 1* targets for 2012 and 2018 as well. With energy efficiency targets, it is frequently difficult to determine the impact certain actions will have on the state's energy mix. The rate of adoption of energy efficient practices in the private sector will be greatly influenced by market prices. If energy prices continue to escalate at recent rates, adoption of energy efficient techniques and technologies will be greatly accelerated. If, on the other hand, energy prices were to decline sharply we would probably return to making decisions about energy based solely on energy price, and not on the true cost of energy, a cost that takes into account the very real impacts our energy consumption has long term on our environment, our economy and our national security.

Implementing energy efficiency is a dynamic and on-going process that changes with advances in technology and new economic markets.

In the near term, ensuring the PSC has adequate authority to spur expansion of DSM programs and providing authority for implementation of an EERS, along with implementation of effective public education and outreach initiatives, will help to accelerate early adoption of energy efficiency practices.

With those actions related to state government buildings and fleet vehicles, the state has direct control. Therefore, the targets established for state government will be more readily measurable. The High Performance Building Advisory Committee will recommend standards and regulations for high performance buildings pursuant to KRS 56.777. The FAC will promulgate regulations so that beginning July 1, 2009, all construction or renovation of public buildings for which 50 percent or more of the total capital cost is paid by the commonwealth will be designed and constructed, or renovated, to meet the high-performance building standards. Actions by the FAC and EEC to increase the fuel efficiency of the state's vehicle fleet will be put into action by October 2009.

By October 2009 the EEC will complete a plan designed to increase the market share of highly fuel-efficient vehicles in Kentucky using state incentives. This plan will be presented to the 2010 legislative session for consideration. Included in the plan will be recommended incentives designed to increase the market share of plug-in hybrid electric vehicles and highly fuel efficient vehicles in Kentucky.

The EEC will seek funding to conduct a study on the impact of establishing a vehicle carbon emissions standard and assessment for automobiles, SUV's and pick up trucks.

ENVIRONMENTAL BENEFITS & LIMITATIONS

The estimated 511 trillion Btu reduction in projected 2025 source energy consumption attributed to energy efficiency alone will result in a reduction of 39 million metric tons of carbon dioxide from the Business-As-Usual forecast, assuming there is no change in our energy portfolio mix from the present. This calculation is based on Kentucky's energy consumption profile as of 2005.

The environmental benefits of aggressively implementing cost-effective energy demand management programs are significant, though difficult to quantify. Cost-effective energy conservation programs have an immediate monetary effect by reducing energy related expenditures today. Taken together, energy efficiency programs will perpetuate the savings over time as long as people continue to conserve. While most cost-effective energy efficiency programs may require a greater up-front expenditure than conservation programs, they will result in ongoing savings with no further action required by the consumer.

To the extent that Kentucky's energy demand management programs are successful, the incremental insult we do to the environment is minimized. Also, when federal greenhouse gas mitigation legislation occurs, energy efficiency will benefit Kentuckians by helping to reduce the production of these gases.

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