

## **Tapping the U.S. First Fuel – Policy Initiatives to Improve Residential Energy Efficiency**

October 16, 2008

### Introduction

Currently America is facing a critical challenge to its energy and environmental future. The nation is facing all of the following daunting challenges:

- Peaking oil production and growing dependence on imported oil
- Global climate change
- Inadequate electrical capacity

Energy efficiency is seen by many energy policy experts as the “first fuel” needed to meet these challenges. The reasons that this particular term has been coined include:

- Energy efficiency is the least cost carbon mitigation option.
- It represents the only immediate near-term resource option.
- It is a resource that is available everywhere in large amounts (We have only scratched the surface of achieving its cost effective potential.).
- It represents the least cost option for the American economy in that it creates large numbers of jobs that can not be outsourced and significantly reduces energy payments to foreign countries.

If energy efficiency represents our “first fuel”, how will we take advantage of this opportunity?

The American Council for an Energy Efficient Economy advocates and RESNET supports the following steps:

- Adopt policies that overcome market barriers that prevent maximizing the full economic potential of energy efficiency.
- Adopt climate policies that exploit energy efficiency.
- Provide affordable and accessible financing.

In order to address the energy and environmental challenges the United States faces, energy consumption in buildings must be addressed. The U.S. Department of Energy’s Energy Information Administration reports that building energy use represents 70% of U.S. electricity consumption and is the nation’s largest source of carbon emissions (39%).

Estimates are that the U.S. could cost-effectively save about 30% of U.S. building energy use today through improved efficiency. It is probably reasonable to expect that new building energy use could be reduced by at least 60% by 2030 and that existing building energy use could be reduced by at least 40% by that time. That would free up about 21% (0.85 trillion kWh/y) of 2006 electric energy use by 2020 and 35% (1.4 trillion kWh/y) by 2030.

One of the key challenges for the new presidential administration and Congress will be crafting policies to address the nation's energy and climate change challenges. To assist in the process, the Residential Energy Services Network (RESNET) worked with a wide array of energy efficiency advocacy and environmental organizations in developing a set of initiatives to tap the potential that residential energy efficiency represents. RESNET used the set of principles adopted by the G8 climate initiative as the starting point for its recommendations.

Clearly, priority must be placed on existing housing stock. There are more than 107 million existing residential units in the U.S. The Brookings Institute has estimated that 75% of all buildings that will be in use in 2050 are already built. It is simply not tenable to purport that we can make significant progress in achieving all cost-effective building energy efficiency solely through better energy codes for new buildings.

### Proposed Residential Energy Efficiency Initiatives

#### **Time of Sale Energy Assessments**

A large barrier to the ability of consumers to place a premium on energy efficient homes is the lack of information on the prospective home's energy performance. Fannie Mae has reported that energy represents the highest cost of housing outside of the mortgage loan. With a readily understandable, uniform label of a home's energy performance, a consumer can make an informed decision on the home being considered for purchase. The European Union recognizes the importance of providing this information to consumers. As a cornerstone of its climate change initiative, the European Commission has adopted the Energy Performance in Buildings Directive (EPBD), which requires that a building's energy performance be rated at the time of sale or change of occupancy.

This effort has moved to the U.S. shores. Already the State of Nevada has enacted legislation that requires an energy assessment of a home at the time of sale. There are four other states considering such legislation. However, unless these efforts result in a uniform method of determining the home's energy performance, consumers and the marketplace are likely to remain confused and a large part of the advantages of labeling will be lost.

The federal government is urged to encourage and assist states in adopting and implementing legislation and regulations to require the uniform labeling of a home's energy performance at the time of sale.

### **Financing of Energy Improvements of Existing Homes**

Another key barrier to improving the energy performance of buildings is the "first cost basis" where the up front costs of investing in energy upgrades are not made despite their economic attractiveness. In order to capture the economic potential of improving building energy performance, innovative financing needs to be encouraged. The federal government must take an active role in working with financial organizations, states and utilities in developing effective financing tools. Following are a number of innovative options:

- Loan Guarantees – As it does with student loans, the federal government can reduce risk to lenders and this will result in lower interest rates. In the 2005 Energy Policy Act Congress authorized a loan guarantee program and capitalized the program with \$30.5 billion. The U.S. Department of Energy should be mandated to include a portion of this fund to guarantee loans for the upgrade of building energy performance.
- On-Bill Financing – A major barrier to improving the energy performance of existing homes is the lack of affordable financing. This problem is even greater with the loss of home equity and tightening of credit as a result of the current lending crisis. Recognizing this, an innovative way to finance energy efficiency upgrades would be to have the loan go to the utility meter. A small surcharge would be added to the monthly utility bill to finance the improvements. Since the loan is with the home and not the occupant then the financing would be more affordable since there is not the danger of loan foreclosure with an individual.
- Energy Efficiency and Environmental Offset Trading – There is an emerging market opportunity on the monetizing of the energy and emissions savings that result from the improvement of the energy performance of buildings. A utility or investor could capture the ownership of the energy and environmental savings in return for financing the upgrades of the building. The utility could then take the credit for the savings as part of its portfolio requirements. A financier could sell the energy saving certificates on the carbon or white tag markets. In order for this market to develop, the federal government must ensure that building energy efficiency is recognized in a national carbon cap and trade system and in utility portfolio standards.

## **Utility Energy Efficiency Portfolio Standards with a Building Energy Efficiency “Carve Out”**

Utility renewable portfolio standards have proven effective in the incorporation of renewable energy into the utility grid. Currently over 29 states and the District of Columbia have adopted renewable portfolio standards. Following this trend a number of states are now adopting energy efficiency portfolio standards. These standards require that regulated utilities must meet a percentage of their demand through improved energy efficiency performance.

In the past two sessions of Congress there was a vigorous debate over having a national renewable portfolio standard. This debate will carry over to the new president and Congress. When considering a national portfolio standard Congress and the new administration must also include a national energy efficiency standard. Since buildings are responsible for 70% of the electrical consumption in the U.S. the utility energy efficiency portfolio must contain a “carve out” for building energy efficiency that sets a goal that a certain percentage of the savings must come from the building sector.

### **Performance-Based Federal Tax Incentives**

In the Energy Policy Act of 2005, Congress established federal tax incentives for improving the energy performance of buildings. For new energy efficient homes that were at least 50% more efficient than code, a builder would receive a credit of \$2,000. A homeowner was eligible for a cost-based credit of up to \$500 covering 10% of the cost of the upgrades. There was also a tax deduction for commercial buildings. The existing homes credit expired on December 31, 2007 and the energy efficient new homes and commercial building incentives will expire on December 31, 2008.

The new homes credit was effective in getting builders to improve the energy efficiency of homes they built. In 2007, 23,702 homes were certified as complying with federal tax credit (50% more efficient than code) (2.3% of new homes).

The existing homes credit was not so successful because of the low amount of the incentive and the fact that it was cost based and did not create an incentive for the homeowner to maximize increasing the performance of the home.

The commercial building was also not as effective due to the amount of the incentive being offered and the lack of clarity in the legislation and rules.

Congress should immediately extend the new energy efficient homes credit that is working at moving builders to higher performing homes. The existing homes and the commercial building incentives should be modified and extended. A

useful tool in modifying the incentives was embodied in the Snowe-Feinstein Bill that was introduced in this Congress.

## **Energy Retrofit Emergency Fund**

Congress should act immediately to implement a performance-based, whole house retrofit program that will save Americans money and stimulate the economy. The energy we could find by drilling for efficiency in our own homes is cheaper and available in a matter of weeks, not decades. Americans dealing with high gasoline prices cannot afford inaction from their leaders while heating oil prices this winter may approach \$5 per gallon.

### **The Program**

The whole house rebate program would allow residents all over the country to begin to save at least 20 percent on their energy bills in a matter of weeks. The \$500 million program would rebate 40 to 60% of the costs for efficiency retrofits based on the energy savings achieved with a minimum of 20%. The rebate would be available to homeowners and any party receiving owner's consent, and the amount would be performance based, determined by the percentage of energy saved compared with the building in its original state. The program would be administered by the same lending institution with which the project is financed. The lending institution determines the specific structure of the financing as approved by Department of Energy (DOE).

### **The Benefits**

A homeowner who elects to pursue only the quickest and most cost-effective efficiency improvements would receive a 25% energy use reduction and a \$3,000 rebate to cover half of the total \$6,000 project cost. This resident would save \$500 a year on energy bills at national average prices. If this homeowner used oil-fired heating equipment, as is common in the Northeast, then the savings would balloon to more than \$1,100 per year, with \$850 of those savings occurring this winter. Another option for the homeowner is to invest in a retrofit that pursues efficiency through high-efficiency heating and cooling equipment in addition to the improvements described above. This resident would save about 55% on their energy bills and receive a rebate of \$6,600. This represents 41% of the project cost and would provide the customer with \$1,100 savings on energy bills per year. Again, if heating oil is the fuel source, the savings explode to more than \$2,500 per year and \$1,850 during this heating season. The payback periods for retrofits with the rebate program are three to five years around the country and less than one year in the Northeast.

The net benefits to the country produced by the rebate program are enormous. If the program reaches the 100,000 homes that are budgeted in the first year.,, the total electricity savings would be 375 gigawatt-hours and the natural gas savings would total 2.4 billion cubic feet, enough to power and heat 35,000 average

homes for a year. But the benefits do not end after one year; they continue to accrue. Congress can provide for exponential growth in energy savings and economic benefits by re-authorizing the program for multiple years so that more homes are retrofitted. The possible energy savings are immense. Should the program last for 10 years and retrofit 100,000 more homes per year, enough energy would be saved to power and heat all the homes in Massachusetts for a year. Efficiency is an untapped resource in American homes. Homeowners simply cannot afford to continue to let up to half of their fuel oil leak out of their homes without providing any service, or be forced to decide between heating their home for a week or buying groceries. Congress must act now prevent the worst effects of the winter heating crisis.

### **Building Codes to be Based on Total Cost over 30 Year Period**

Energy efficiency measures not installed in a home when being built represents a "lost opportunity" because once built, it is more difficult and costly to fix. Fannie Mae reports that the cost of energy is the highest cost of housing outside of the mortgage loan. The federal tax credit for new energy efficient homes has demonstrated that it is cost effective to reduce a home's energy consumption by 50% over standard construction. The leaders of the leading industrial nations in the world (G8) have found improving building energy performance as a key component for combating climate change. The G8 leaders have endorsed the International Energy Agency recommendation that the member nations adopt an economic calculation in determining the stringency of building energy codes that would optimize total energy costs over a thirty year lifetime. The U.S. Department of Energy should ensure that building energy codes be strengthened to maximize energy efficiency and minimize energy costs over the useful life of a building such that the total costs of buildings are minimized over at least a 30-year lifetime.

### **Adopt Policy that Sets the Goal of Having Net Zero Energy Homes as the Standard of Construction by 2030**

A net zero energy home produces as much energy through renewable energy sources as it consumes. The U.S. Department of Energy through its Building America Program believes that it is possible to build net zero energy homes today. It should be the goal of the federal government to continue the research and development to ensure that net zero energy homes are cost-effective. The government should set the goal that by 2030 net zero energy homes become the standard of construction of homes in the U.S. States such as California have already adopted such a policy goal and the federal government should too.

## **Foster Development of Residential Energy Service Companies (ESCOs)**

The residential retrofit market is hamstrung by two major market barriers:

1. A lack of expertise on the part of homeowners with respect to their energy efficiency options and with respect to effective contracting for home energy improvements; and
2. Difficulty in obtaining financing specifically designed for home energy efficiency improvements.

Private market Energy Service Companies (ESCOs) are specifically designed to overcome both of these problems in large commercial buildings where owners have neither the expertise nor the available capital to effect energy improvements in buildings. Generally an ESCo will accomplish building energy improvements through “shared savings” programs, whereby they will determine the most cost effective options, secure the capital financing, contract for the improvements and share the energy cost savings with their client for some period of time following the completion of the project, collecting sufficient revenues to repay the capital cost and make a healthy profit. ESCos normally conduct these activities in fairly large buildings and building complexes, where the transaction costs (cost of securing the job, obtaining capital, negotiating contracts, conducting initial assessment, collecting cost savings, etc.) are reasonably small compared with total project capital cost.

In the residential retrofit marketplace, where total project costs are likely to be relatively small (in the 10’s of thousand dollars rather than the multiple 100’s of thousand dollars), transaction cost can be a significant burden with respect to making a shared savings program profitable.

However, with the correct government incentives and controls, residential ESCos (or something of close kinship) might work well in the residential marketplace.

The following considerations are important:

- There must be widely accepted practitioner certification and quality assurance in place to engender consumer confidence and keep con artists out of the market place, effectively warranting that savings, as advertised, will be achieved.
- There must be incentives for homeowner participation that overcomes the following barriers:
  - The hassle of finding and contracting with qualified energy efficiency expertise
  - The hassle of obtaining capital financing for the retrofit
  - The hassle of temporary construction mess and displacements
  - The hassle of writing another check each month to pay for the retrofit.
- There must be some mechanism in place that effectively reduces transaction costs to the ESCo so that the majority of the cost effective savings can be obtained through shared savings.

RESNET should enter into discussions with governmental units, financial institutions, the construction industry, congress and others to see if effective programs could be designed to overcome the barriers and encourage private companies and capital markets to develop and implement business plans aimed at creating a marketplace for residential ESCos.

### **Revise Mortgage Financing Underwriting Guidelines to Factor the Energy Performance of a Home into the Mortgage Loan**

Fannie Mae has found that the cost of energy is the highest cost of housing outside of the mortgage loan. With the current housing crisis and spiking of energy costs, this has become an even more important factor. Despite this important element in the cost of housing, the mortgage industry generally does not consider energy costs when calculating the qualification for a mortgage loan. Congress saw this issue. In the recently passed home foreclosure legislation, Congress included a requirement that the federally sponsored second mortgage market identify the barriers to considering a home's energy performance in the mortgage loan and make recommendations to Congress on how to alleviate the obstacles found. The next presidential administration should require the government sponsored mortgage markets to revise their underwriting guidelines to factor a home's energy efficiency into the loan. This can be through one of two methods: taking the monthly energy savings documented through a home energy rating to reduce the calculation of housing costs or revising the formula of principal, interest, taxes and insurance by adding the subtraction of the monthly energy savings.