RESNET
Residential Energy Services Network
Setting the STANDARD for QUALITY

RESNET Work Plan on Environmental, Capacity Value and Energy Efficiency Certificate Trading

With the softening of the new housing market there is a clear need to expand the range of business opportunities for the building performance rating industry. In these changing times the industry can not afford to be totally dependent on the ENERGY STAR Homes Program. A dynamic opportunity to diversify the industry is the monetizing of building energy savings through environmental and energy efficiency trading. This opportunity presents:

- The ability of certified raters to expand the value proposition of their services to include the calculation and verification of the environmental savings from improving a building's energy performance and trading that value in the emissions markets (NOx; Carbon, Mercury etc)
- The ability of certified raters to use the emerging capacity markets that will pay for reductions in peak electricity use
- The potential for energy efficiency to create certificates that can be included in Renewable Portfolio Standards (compliance markets) or voluntary clean power markets
- Creation of a new revenue source for building owners to finance the energy performance of their homes and offices, and for raters to aggregate and sell the value of savings they have quantified.

The Strategic Planning Framework adopted by the RESNET Board of Directors in 2006, identified "Residential Pollution Reduction Verification Protocol" as a strategic opportunity for the organization. Because of the importance of this opportunity the RESNET Board of Directors tasked the RESNET Executive Committee to develop a plan of action for this initiative. The following is the proposed plan of action recommended by the Executive Committee.

Introduction

There are two parallel market developments that can combine to expand the value proposition for enhanced energy efficiency in buildings. First is the environmental emissions markets that include required purchases of renewable energy that can include efficiency as a category as well as the 'cap and trade' markets that will emerge in the fight against Carbon pollution, and that exist in NOx markets today.

The second is the participation of energy efficiency in the capacity and reliability markets that exist in each region of the country. New England is the first to adopt efficiency in its capacity market beginning on Dec 1, 2006, and other regions are already looking to include 'behind the meter' resources in their markets.

Together these developments incorporate the same concept of 'monetizing the improved performance of buildings' and selling that improved performance to achieve the objectives of energy and environmental markets. This will combine with the inherent value of reducing energy consumption for the owner/occupant with the external value to society of that reduced consumption.

Monetizing building energy savings offers a new and unique opportunity to enhance the long term financing for building energy performance that currently rests on capturing reduced energy costs for the consumer over time.

This opportunity was described in a paper co-authored by RESNET, the International Energy Agency and the Florida Solar Energy Center and presented to the 2006 American Council for an Energy Efficient Economy Summer Study on Energy Efficiency Buildings. This prospect becomes more realistic as public concern over global climate change and policy makers' interest in energy efficiency's role in utility capacity grows.

Clearly, building energy efficiency can play a critical role in reducing climate changing greenhouse gases. Approximately 40% of the carbon dioxide produced in the U.S. comes from the energy consumption in buildings.

An increasingly popular strategy for addressing climate change is "cap and trade" regimes. The concept works as follows – the government establishes maximum emission levels and issues tradable allowances to meet the cap. To achieve "carbon neutrality," a company producing excessive emissions of CO_2 can offset their "cap" by purchasing emission savings from another company (An example of this is the 2007 RESNET Building Performance Conference. The CO_2 produced by the conference facility and participant's travel will be offset by RESNET purchasing clean renewable energy credits, "Green Tags".)

This process, established in the U. S. Clean Air Act, creates a market with built-in incentives to find the most cost-effective methods of reducing emissions. The cap and trade mechanism was incorporated in the Kyoto Climate Change Accord. The Accord empowers the United Nations to develop the international protocol for the cap and trade of carbon emissions. As a result of the Accord, the volume of carbon trading in the European Union exceeded $4 billion in 2005. In the US, many states have cap and trade programs to reduce NOx emissions (to lower Smog) and states have the ability to 'set aside' a portion of those capped

allowances for efficiency. Massachusetts has such a policy that has brought approximately 2 million dollars in added revenues to efficiency services. Conservation Services Group (CSG) has aggregated NOx allowances for Energy Star Homes and Home Performance with Energy Star measures and secured almost $100,000 in new funding for these efforts.

Cap and trade mechanisms are being incorporated in state and regional climate action plans in the United States as well. This year the State of California adopted carbon cap and trade legislation that requires a 25% reduction in emissions over the next two decades. In the Northeast, the states of Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York and Vermont have joined the Regional Greenhouse Gas Initiative (RGGI) cap and trading program. In Oregon, the Climate Trust secures new carbon emission reductions (mandated by legislation requiring these offsets for new power plants) through a proposal process that funds efficiency projects. These efforts are taking place at the state and regional level because of inaction on the federal level (the Bush-Cheney Administration opposes a national cap and trade policy).

Recognition that building energy efficiency can play a role in pollution mitigation was recognized by the U.S. Environmental Protection Agency in 2001 when the agency approved incorporating energy efficiency through adoption and enforcement of a residential energy code as part of Texas' SIP plan. This action gave a dramatic boost to ENERGY STAR and home energy ratings in the state.

Green Tags is another growing market. Public utility commissions in twenty states and the District of Columbia have adopted Renewable Portfolio Standards (RPS). RPS's are electricity generation requirements, imposed on electric utilities by a state, requiring either a specific amount of electric capacity or a percentage of total capacity be generated from renewable resources such as wind, solar, biomass and geothermal energy. These state laws have created a marketplace for Tradable Renewable Energy Credits (Green Tags) by allowing electric utilities to purchase their state mandated requirements. In 2005 over $700 million in Green Tags were traded in the U.S. The 2007 RESNET Building Performance Conference's carbon emissions are being offset through RESNET's purchase of Green Tags created by wind generation in the Upper Midwest.

Spurred by this success, state regulatory commissions are now adopting energy efficiency portfolio standards that will lead to White Tag trading. The states of Connecticut, Nevada and Pennsylvania have already adopted White Tag requirements. The State of Nevada requires that 25% of the energy efficiency spurred by the state's utilities must come from the residential sector.

Another opportunity lies in utility capacity trading. Led by the State of Massachusetts state utility regulatory commissions are beginning to require regulated utilities to meet a portion of their capacity requirements through energy efficiency. Like Green and White Tags utilities are allowed to purchase the energy efficiency through third parties. CSG is actively involved in this opportunity and is aggregating new energy efficiency resources to participate in this market. The current potential value projected for a kw of reduced peak use is $700. If a new energy efficient home reduces its peak use by 2kw this could mean $1,400 in capacity value to the region.

This promises to be a legitimate revenue source for raters/providers who aggregate the emissions credit; the immediate objective is to establish the protocol. One presenter at the recent EEBA conference had traded a years worth of credits using the organization Carbonfund.org and was able to present the homeowner with a $25 dollar check for a years worth of emissions credits. What is surprising about this is most of them time you trade 10 years at a time. $25.00 is not worth the hassle but $250.00/house would be for those large providers doing thousands of houses per year.

Emerging Market

The potential market for environmental and energy efficiency trading in the U.S. is substantial. In February, 2006, the *Los Angeles Times* projected that trading in carbon emission credits could become a $40 billion market in the U.S. by the end of the decade.

Challenges to Emerging Market

The potential for growth in the environmental and energy efficiency trading market is being impeded by the lack of federal leadership on this issue. The result of this lack of leadership means initiatives are only being implemented and standards established on a state-by-state or region by region basis. By each state/region developing its own standards there is a danger of diffusion. Advocates working across the country can share developing new standards and implementation strategies to push for common or at least compatible standards and mechanisms.

Because there is no national standard or mandate as there is in Europe, the market for carbon trading is not meeting its potential. It is illustrative to compare the carbon trading market between the European Union whose members have mandatory cap and trade requirement and the U.S. which is following a voluntary approach In July, 2006, carbon was trading at $14 dollars a short ton in the European Union while in the U.S. the voluntary market for carbon emission

savings is less than $5 a short ton. In 2005 the carbon market in the European Union was greater than $4 billion while at the same time the market in the U.S. was less than $5 million.

Challenge to Recognize and Capitalize Building Performance Savings

Another challenge is to convince regulators of the potential that building energy efficiency can present. Most emission caps focus on “smoke stacks and tail pipes” where regulations can easily identify large emission producers such as utilities, industries and vehicles. However, buildings are the largest single source of carbon emissions.

Capitalizing building energy consumption is challenging because of its diversity. In order to make a trading scheme work aggregators are needed who would purchase individual building emission savings then bundle and broker them in the commodities market.

Another barrier is that most regulatory bodies are not aware of the availability of national standards and procedures for analyzing a building’s energy performance and calculating the energy and emission savings resulting from improving that energy performance.

This presents RESNET with both a challenge and an opportunity. With the lack of a national program for carbon emissions capping and trading the development in the U.S. is only taking place on the state level. On one hand, this makes it difficult for large private investment firms to invest in a carbon or utility portfolio trading system. On the other hand, the standard that RESNET has adopted for verifying a home’s energy performance provides a solid foundation for regulators to bench mark building performance.

RESNET’s Opportunity

RESNET is the logical candidate for verification of environmental and energy efficiency savings in a trading market. RESNET’s residential standard is already recognized by the Environmental Protection Agency for labeling of ENERGY STAR Homes, the U.S. Department of Treasury for the verification for the tax credits for energy efficient homes, the mortgage industry for capitalizing energy savings in the mortgage loan, and 19 states for verification of their residential energy codes.

The RESNET standards already address:

- The calculation of the energy performance of homes

- A suite of tests to verify the accuracy of software calculation and modeling tools
- The establishment of a reference home by which to measure other homes' energy performance
- A national uniform metric for measuring a home's energy performance
- The procedures for inspecting and performance testing homes
- The requirements for training and certifying raters

In addition, several of RESNET's accredited software tools already calculate the emissions savings from upgrading the home's energy performance. Currently these calculations are based upon a national average. To move forward, these calculations will need to be adjusted based on local or regional numbers that may be agreed to by the regulating authority.

The above provides a solid foundation to establishing the metrics for calculating a building's energy performance and emissions savings as the basis for emissions and capacity trading.

RESNET also has an opportunity in the commercial and high rise apartment buildings sector. In Steve Baden's discussions with Sterling Planet, the nation's largest retail brokers of Green and White Tags, he found the lack of standards for measuring energy savings in new commercial buildings to be a large barrier in including these buildings in White Tag trading. The RESNET Strategic Planning Framework has identified expanding the RESNET standards to commercial and multifamily buildings as a strategic opportunity. RESNET has begun discussions with the task force that is overseeing a pilot ENERGY STAR high-rise multifamily program.

RESNET Plan of Action

The RESNET Board of Directors has adopted the following plan of action:

The first priority is to convince state regulatory bodies to recognize building energy efficiency as a tradable commodity for meeting emissions/energy efficiency/capacity trading. Currently the focus of regulators is on limiting emissions at the smoke stack and tail pipe. Because there is only activity at the state level, RESNET's network must be trained and motivated to make the case for buildings, to introduce RESNET's standards of quality and the availability of the infrastructure of trained and certified raters at state regulatory hearings.

The second priority is the need for accredited rating software tools to calculate the emissions savings specific to state and regional areas adopting cap and trading programs in addition to the current national average.

The third priority is to incorporate capacity savings into software to provide peak reduction values for buildings. These need to be consistent with the various state and regional demand profiles.

The foundation of the proposed plan of action involves two efforts both internal and external to RESNET:

- Advocacy and Education
- Infrastructure Development

The following are the recommended strategic objectives that RESNET should adopt for this initiative.

Internal Infrastructure Development Strategic Objectives

I. Ability of Rating Software to Calculate Emission and Energy Capacity Savings at the State Level

A necessity for energy raters to become involved in the verification of environmental emission savings is the need for the rating software tools to be able to model and calculate the emission savings and capacity reductions from a building.

2006 Roundtable of rating software developers to discuss protocols that will be required to calculate emission and capacity savings for state regulatory requirements

2007 Develop suite of verification tests for calculating emission savings

II. Commercial/Multi-Family Building Standard Development

To become economically attractive to regulators and investors the market for building energy and environmental savings can not be limited to the residential sector. To capture the opportunity RESNET's standards need to be expanded to include high-rise multifamily and commercial buildings. There are currently no other organization that has developed standards for modeling and calculating the energy performance of commercial buildings. The RESNET Strategic Planning Process has set the expansion of the RESNET standards to include high-rise multifamily and commercial buildings as a near-term strategic opportunity for the organization.

This development needs to be as soon as possible, for the following reasons:

- Savings that could occur from this market segment can be significant
- This market segment can more clearly define who has the ownership rights to the green house gas savings

2007 Incorporate high-rise apartment ENERGY STAR pilot project into as a RESNET standard

2008 Develop commercial building standard

III. Existing Homes

Existing homes presents the greatest cot-effective economic opportunity to improve the energy performance and reduce environmental emissions. In addition there are a much greater number of existing homes than there are new homes. The monetizing of the energy savings through creating a market for the trading of the energy/environmental savings from the upgrade of a home' s energy efficiency provides an exciting source of financing for homeowners to be able to afford to make the improvements. RESNET is taking the first important step by developing a national standard for the energy audits of existing homes.

2007 Adopt national standard for home energy audits for existing homes and tools for calculating energy, emissions and capacity savings from improvements made as a result

2008 Develop direct financing package for upgrades of existing homes

External Infrastructure Development Strategic Objectives

I. High Rise Apartment ENERGY STAR Pilot Working Group

RESNET is currently in discussions with the High Rise Apartment ENERGY STAR Pilot Working Group and the Environmental Protection Agency about merging high-rise apartment buildings into the RESNET standard. This effort will serve as an introduction of expanding RESNET's standards into commercial buildings.

2006 Negotiate agreement to merge High Rise Apartment ENERGY STAR Pilot with RESNET

II. ASHRAE

The new ASHRAEA president has made it a priority of the organization to lead commercial building to be 30% more efficient over the current ASHRAE standard. This effort will create a technical platform by which RESNET can base a commercial building rating standard upon.

2007 Develop reference building and technical metrics for measuring a building's performance above code

III. American National Standard Institute (ANSI)

In order to gain the credibility with the investment community and the regulatory bodies RESNET's standards will need to become compliant with national standard setting protocols. The national body in the U.S. that certifies standards is ANSI.

2008 Certify RESNET Standards to meet ANSI Standards.

Compliance Issues: Measurement and Verification Protocols and Ownership

I. Software to calculate potential energy, capacity and environmental benefits needs to be coupled with Verfification protocols that meet the standards of the regional ISO's as well as the protocols developed by administrators of emissions trading systems. These M and V protocols need to be designed to not only calculate the potential savings but also to verify their delivery. Some of these components are already in the RESNET process but will need to be reviewed and upgraded to insure compliance with the range of M and V requirements. These may need to insure addressing issues of 'additionality'.

II. Markets will need to be assured that the owner of the certificates or capacity savings has clear title. There will need to be standard procedures to insure that the legal ownership issues are resolved as a standard course of business. This is complicated by potential conflicted title claims between public incentive programs, owners or ESCO's/contractors/raters.

2007 Develop a Working paper on these issues and identify new actions needed by RESNET to incorporate these issues into RESNET standards and technical support documents for the rating community.

Internal Advocacy/Education

I Education

It is critical that RESNET educate raters, trainers, and software tool developers on the opportunities and business development benefits of verification and trading

2006 Special edition of RESNET Notes

2007 Series of audio rater roundtables and sessions at the 2007 RESNET Building Performance Conference

2008 Launch special RESNET web page

II. Advocacy

Because the decisions on the protocols are being made on a state-by-state basis, regulatory bodies need to be educated on the role of building energy and emissions savings in meeting the caps on emissions and the existence of the RESNET standards and infrastructure.

2007 Develop briefing materials, talking points, and PowerPoint presentations for RESNET network to advocate at state regulatory hearings and coordinate and organize activities

External Advocacy/Education

The effort required to achieve the potential requires resources greater than RESNET can realistically expect to deploy. For this reason RESNET needs to develop strategic partnerships with the following organizations:

I. RESNET member organizations and allies

Several RESNET members are active in promoting these strategies and are in the forfront of these efforts. RESNET can advance this agenda by organizing and calling on these members to actively support RESNET and other members in understanding and supporting these issues.

2007 create a standing committee of RESNET members who are participating in these markets to provide support and guidance to the organization.

II. Environmental Organizations

Environmental organizations are a natural ally in this effort. In many cases it is the environmental community that is taking the lead in advocacy for state regulatory bodies to adopt cap and trade regulations.

2007 Education on the contributions that building energy performance can make

2007 Education on the existence of RESNET Standards

III. Financiers

Increasingly Wall Street is seeing trading of environmental and energy savings a potential economic opportunity. Private investment companies are need to be made aware of the contributions that building energy performance can make and the existence of RESNET's standards and infrastructure of trained and certified building performance professionals.

2007 Develop plan of action to educate the investment community

2008 Begin the implementation of the plan of action

IV. Regulated Industries

As described earlier emissions caps have focused on the large concentrated emissions such as the energy, industrial and transportation sectors. This is understandable because it would be difficult to set emission requirements for such as a diverse sector as buildings. This, however, should not preclude the ability of large emission producers to invest in and receive credit from emission savings from improved building performance. The argument can be made that it would be far more economical for an industry to invest in building energy efficiency than to change their production process.

2007 Develop plan of action

2008 Begin implementation of the plan of action

V. State Energy Offices

State energy offices are another natural ally in this effort. The mission of the nation's state energy offices includes improving the efficiency of the building stock. It is a natural partnership since RESNET's and the home energy rating industry's foundation was sponsored and assisted by state

energy offices. After being educated on the contributions that building performance can make in meeting the goals of a state cap and trade initiative and the availability of the RESNET standards and rating infrastructure the energy offices can be a strategic partner in educating their sister state agencies setting the regulatory requirements for the cap and trade system in their state.

2007 Develop plan of action

2008 Begin implementation of plan of action

VI. State Regulatory Agencies

With the absence of federal leadership on this issue it is the state regulatory bodies that are setting the standards and protocols for cap and trade initiatives. These bodies must be educated on the contribution that building energy performance can play in meeting their goals and the metrics of measurement and verification provided by the RESNET standards and the home energy rating industry.

2007 Develop plan of action

2008 Begin implementation of the plan of action

VII. European Union

In reality environmental emissions and energy saving trading is a commodities market. The key to a commodities market is volume. In order to actualize the economic potential of environmental trading a global market must be established. An important step was taken with the Kyoto Accord. The Accord itself creates an international carbon cap and trade mechanism. In addition in order to meet their member nations' emission reduction obligations the European Union adopted the Energy Building Performance Directive. The Directive requires that member nations' require the energy rating of all buildings at the time of sale of change of occupancy. The European Union is in the process of developing standards for the calculation and inspection of buildings energy performance. To be part of the global market it is critical that the RESNET standards complement the European standards. An important step was taken in 2005 when Steve Baden and Philip Fairey meet with our counterparts in the European Union and the International Energy Agency. Another important step being taken is that the chair of committee that is drafting the European standards will be the key note speaker at the 2007

RESNET Building Performance Conference. Together RESNET, the European Union and the International Energy Agency need to advocate to the United Nations to include building energy performance as a tradable commodity in the international carbon cap and trade protocol.

2007 Continue dialogue with the European Union and the International Energy Agency

2008 Develop joint plan of action to advocate to the United Nations to include building energy performance as a tradable community as part of the international carbon cap and trade protocol.

VIII. United Nations

The Kyoto Accord empowers the United Nations to developing the international protocol for carbon cap and trading. It will be the United Nations who will decide whether to include building performance as part of the trading protocol.

2008 Begin in partnership with the European Union and the International Energy Agency the advocacy to the United Nations on including building performance as part of the international carbon trading protocol.

Conclusion

The RESNET Board of Directors sees a great opportunity in establishing the RESNET standards for the verification of building performance for environmental and energy efficiency trading. RESNET will provide a leadership role in this effort as it has with federal tax credits and energy efficient mortgages.

This issue will be more difficult than the other initiatives since it is being developed on a state-by-state basis. This will require a different approach. The RESNET network will be need to be educate and provided the tools to advocate at the state level and RESNET will need to reach out to forge alliances with new partners such as environmental groups and state energy offices.

The challenge is great but so is the opportunity.