September 30, 2010

Mr Lee A. Solomon, Esq.
President
NJ Board of Public Utilities
44 South Clinto Ave, 7th Flr
Trenton, NJ 08625
Sent via email

Re: Energy Master Plan

Subject: Green Building Opportunities

Dear Mr. Solomon,

The New Jersey Chapter of the US Green Building Council (USGBC-NJ) wishes to commend Governor Christie and the Board of Public Utilities for conducting a review of the N.J. Energy Master Plan (EMP). We applaud the open process put forth to gather input from all sectors, and the collaboration with other State Departments to develop a comprehensive and integrated approach. The recognition of the Triple Bottom Line as the basis for policy decisions has long been held by the US Green Building Council, and we wish to offer our support to the great State of New Jersey in these efforts.

We recognize that many things have changed since 2008, so this review and course correction is entirely prudent. The economic models obviously need to be adjusted for the recession, and the impact on growth of the economy and associated jobs and tax revenues. The oil spill in the gulf, mining accidents and continued environmental consequences from burning coal, as well as economic competition from China in renewable energy manufacturing are all factors that should be driving us to act decisively and urgently. We need to enact policies that are economically, environmentally and socially sustainable for the State of New Jersey, especially in view of the limited progress made toward National energy reform.

To assist in this undertaking, we respectfully submit the attached position paper, which attempts to outline a number of recommendations which we believe can help make New Jersey cleaner, greener, and economically sustainable. These recommendations touch upon policies and functions within the Board of Public Utilities, as well as associated departments, including but not limited to the Department of Environmental Protection, Economic Development Authority, Department of Community Affairs, Department of Labor.

In addition to our position paper, we wish to express our support for the Corporate Real Estate (CRE) Solution, and urge the State to recognize the importance of this situation. The CRE Solution was developed by Architecture 2030 with the assistance of William Lashbrook, who serves as Vice Chair of USGBC-NJ. Between now and 2014, $1.3 trillion in commercial real estate loans will come due nationally, and one half of these will be underwater. The CRE Solution proposes to promote energy efficiency in a manner that will create 1.3 Million jobs, and generate billions of dollars in tax revenues. Copies of the proposal and a summary document are attached for your consideration. We would urge the State to promote this initiative at the National level via our Congressional

Delegates, and to consider implementing any of the features as they might apply at the State level.

We thank you for your consideration, and look forward to working with Governor Christie, the BPU and all of the other State agencies departments and industry stakeholders in making New Jersey the most economically, environmentally and socially sustainable State in the Nation.

Very Truly,

William Amann, P.E., LEED AP
Chairman
US Green Building Council-NJ Chapter

Cc: USGBC-NJ Board of Directors
Florence Block, Executive Director

WA/ml

US Green Building Council
New Jersey Chapter

PROPOSAL AND RECOMMENDATIONS

To the

STATE OF NEW JERSEY

Regarding the

ENERGY MASTER PLAN

September 30, 2010

US Green Building Council
New Jersey Chapter
14 Maple Ave, Suite 201
Morristown, NJ 07960

Foreword

The New Jersey Chapter of the US Green Building Council (USGBC-NJ) is a not for profit 501(c)3 organization, representing architects, engineers, manufacturers, educators, contractors, building owners and other industry sectors, that are committed to making our buildings healthier, more productive, and more efficient. Our mission is to promote, advocate, and provide education for the planning, design, construction, operation and maintenance of high performance buildings and communities that are environmentally responsible, cost effective, productive, and healthy places to live, learn and work.

The New Jersey Chapter of the US Green Building Council (USGBC-NJ) wishes to commend Governor Christie and the Board of Public Utilities for conducting a review of the N.J. Energy Master Plan (EMP). We applaud the open process put forth to gather input from all sectors, and the collaboration with other State Departments to develop a comprehensive and integrated approach. The recognition of the Triple Bottom Line as the basis for policy decisions has long been held by the US Green Building Council, and we wish to offer our support to the great State of New Jersey in these efforts.

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Green buildings provide economic, environmental and health benefits. The transformation from conventional buildings to green buildings will not succeed through punitive legislation or the creation of unrealistic goals. The transformation will only succeed when all interested parties understand the benefits of building green and make a responsible business decision to proceed along that path. USGBC-NJ is prepared to enthusiastically support the education effort through our training program, speaker's bureau, and advocacy initiatives. We look forward to partnering with the State of New Jersey to bring about positive change and deliver a plan that will provide for a healthy and prosperous future for all of NJ's citizens.

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GREEN BUILDINGS

"Green" has become a popular but widely abused term. As it becomes more fashionable, we see more and more "greenwashing", which includes false and misleading claims about environmentally friendly products and services. There is a tremendous amount of misinformation, and a general lack of understanding of what green buildings are really about. The USGBC-NJ represents the most diverse cross-section of professionals in the green building and construction industries, and we are continuing to provide education and promote awareness throughout the State.

In 2007 the New Jersey Legislature directed the Commissioner of the Department of Community Affairs to publish a "New Jersey Green Building Manual", which is being developed by the Rutgers Center for Green Building (RCGB) at the Bloustein School of Planning and Public Policy, but has not yet been published. Meanwhile, various State Agencies requested interim guidance on green buildings guidance in order to move forward with plans to achieve the objectives of the New Jersey Energy Master Plan and the Global Warming Response Act, as well as for the EDA Economic Redevelopment and Growth Grant program. In 2009, an interim green building guidance task force was formed, and developed by consensus a set of definitions of what "green" is for new commercial, existing commercial, new residential and existing residential buildings. The definitions reference the LEED (Leadership in Energy & Environmental Design) rating system for commercial buildings; the ICC-700-2008 National Green Building Standard, which was developed by the National Association of Home Builders for residential buildings, in tandem with the Energy Star Homes program. A copy of the Interim Definitions is attached for reference.

We would urge the State to formally adopt these interim definitions until the International Green Building Code is adopted in final form, which is schedule to occur in 2012. The following excerpts from the interim definitions are given here:

LEED *is an internationally recognized green building certification system developed by the U.S. Green Building Council (USGBC) providing 3rd-party verification that a building or community was designed and built using strategies aimed at improving performance across a variety of metrics: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. On April 27, 2009, USGBC launched LEED v3.LEED Rating Systems – which streamlined LEED rating systems into 3 overarching categories: Green Building Design & Construction, Green Interior Design & Construction and Green Building Operations & Maintenance. Underlying these categories are more specific rating systems (e.g., New Construction, Core & Shell, Schools, etc) which may be drawn upon depending on the project scope. In addition, there are LEED rating systems for residential construction (LEED for Homes) and neighborhood development (LEED ND), which are referenced in this document. Certification levels include: certified, silver, gold and platinum (See www.usgbc.org).*

The ***ICC-700-2008 National Green Building Standard,*** *approved by the American National Standards Institute (ANSI) on January 29, 2009, establishes practices for the design and construction of green residential buildings, building sites, subdivisions and renovations thereof. It provides criteria for rating the environmental impact of design and construction practices to achieve conformance with specified performance levels of*

green residential buildings. The National Green Building Standard also provides in-depth guidance for green remodeling and a basis for scoring green remodeling projects. There are bronze, silver, gold and emerald performance levels that can be attained within this program. Submissions are 3rd party certified by verifiers who are accredited by NAHB research center (see: www.nahbgreen.org).

*The **New Jersey ENERGY STAR Homes program** is part of the larger EPA ENERGY STAR program developed to promote energy efficient construction. It is a 3rd-party verified program that utilizes the Home Energy Rating System (HERS) Index to score energy performance. The New Jersey Home Performance with Energy Star program is similar, but for existing homes. Multiple achievement levels are possible and incentivized through the Office of Clean Energy, BPU (see: www.njcleanenergy.com).*

By adopting these nationally and internationally recognized programs, we do not need to re-invent the wheel. Indeed LEED and NGBS themselves simply collect and integrate "Best Practices" of the trades.

ENERGY EFFICIENCY VIA GREEN BUILDINGS

Green buildings are a significant part of the solution to energy dependence and climate change. Commercial and institutional buildings built according to LEED are designed to use an average of 32 percent less electricity, 26 percent less natural gas and 36 percent less total energy than conventional buildings.

This is significant, considering the EMP places energy efficiency as the highest priority. This is consistent with the LEED Rating system, which offers far more "Points" for energy optimization than for all other sustainability credits. The KWH which we never consume is the most cost effective unit of energy. We therefore applaud GOAL 1: Maximize the State's energy conservation and energy efficiency to achieve reductions in energy consumption of ***at least*** 20% by 2020.

The Energy Code sets a minimum baseline requirement for energy efficiency, whereas the LEED NC (New Construction) Rating System requires energy performance of at least 10% above the baseline, and encourages, based upon the point scoring system, efficiency improvements of up to 48% above baseline. So while performance above code requirements is a new concept for most industry professionals, we have been actively designing our buildings in this manner for years.

The EMP emphasizes that the programs must utilize a "Whole Building Approach". This could be interpreted as meaning inclusion of multiple conservation measures, i.e., insulation factors, lighting, and HVAC systems.

One recent study, by the New Buildings Institute, indicates that new buildings certified under the US Green Building Council's LEED rating system are performing 25 to 30 percent better than non-LEED certified buildings in terms of energy use. The study also documents a correlation between increasing levels of LEED certification and increased energy savings. Gold and Platinum LEED certified buildings have average energy savings approaching 50 percent.

The Energy Master Plan as written in 2008 recognizes the primary importance and inherent value of energy conservation. We note that some of the programs initiated to promote energy efficiency have had some success. But we believe we need to achieve a far greater impact, and can do so at lower cost.

We applaud the recent Code Adoptions made on September 7, 2010. For commercial and industrial (C&I) buildings, the NJ Energy Code will now be ASHRAE 90.1-2007, as published by The American Society of Heating, Refrigerating and Air Conditioning Engineers. According to the DCA website, compliance can be demonstrated by either hand calculations, or the Federal Department of Energy (DOE) software call COMCheck. The code has requirements for the architectural components (wall & roof insulation, window efficiency, etc.), as well as mechanical systems (Boilers, air conditioners, water heaters, etc.) and electrical systems (lighting power levels, voltage drop, etc.) Seemingly because it transcends these three areas, and the absence of mechanical permits for anything beyond plumbing, there is very rarely any reviews for compliance.

In order to meet our energy objectives, we need to enforce the energy code, and encourage owners, builders, and lessees to go above and beyond the minimums. We

therefore suggest that the DCA issue a directive that no permits be issued without proof of compliance with the Energy Subcode.

Requiring the submission of energy calculations is quite easy. Hiring and training enough people to understand and review them is another matter. This will take some time, and represents an opportunity to create Green Collar Jobs, which is another aspect of the EMP. Indeed, the International Code Council (ICC) has announced that they will establish an examination process to accredit Green Building Code Officials. In the meantime, the USGBC already has a process and professionals in place to perform reviews of energy calculations that EXCEED the code requirements. This cannot be accomplished by COMCheck, and would require a new process be established. But by using the LEED Rating System, third party review is already in place, working, and is a minimal cost.

As noted previously, two methods currently exist. We propose that buildings that are LEED Registered, and have been approved by the USGBC for their design submissions be exempt from Energy Subcode review. Furthermore, we would suggest that some incentives, such as expedited review, and/or permit fee rebates, be offered for these high-performance buildings. Such incentives are currently offered by the NJ Meadowlands Commission, the City of Chicago, and other entities.

In regard to State Owned and Leased Buildings, there is already an Executive Order that requires they be built to LEED Standards. We recommend this be updated to meet the Interim Green Building definitions. We would welcome the opportunity to provide LEED training to the staff at DPMC and the NJ Building Authority to help them assimilate the concepts, methodologies and process.

OTHER ENERGY RECOMMENDATIONS

Since USGBC-NJ members include some of the leading design professionals, building owners, builders and other energy-related companies, we wish to use this opportunity to provide input toward the EMP above and beyond issues directly related to green buildings. These suggestions and comments are in no particular order, but are offered as perspectives and concerns from the professionals that are out there working on these issues every day.

1. New Jersey should develop a strategic plan for implementing a truly interactive Smart Grid. The increased adoption of demand response, together with further deployment of distributed generation, including solar, wind, and CHP, will require a grid that is able to compensate for these dynamic changes in sources and loads.
2. New Jersey should require our utilities and PJM to protect the grid from threats which could potentially have devastating effects on our economy. Adoption of best practices for grid security should remain a priority.
3. The Demand Response Program should be automated by PJM, and promoted on its own merits to limit our additional capacity requirements.
4. Combined Heat & Power is recognized as an extremely efficient means of generating power while providing heating, cooling or process loads. However, CHP systems can only be successful where electricity loads are co-located with appropriate thermal loads. WE suggest that every major development or re-development project that is afforded financial incentives from the State be required to analyze the potential for CHP as part of the initial planning. The typical development process carves up the project into multiple pieces, which precludes the application of CHP. If for instance a hotel is collocated with an office building, the waste heat from the office building computers might pre-heat the domestic hot water for the hotel. Matching the expected load profiles of various building types can open up these opportunities, but only if we plan intelligently.
5. Fuel Cells offer one of the cleanest and most efficient types of CHP. Unfortunately in New Jersey, the quality of natural gas supply is so poor that the gas must be scrubbed, and those costs make the systems financially infeasible. It would seem prudent to require the gas produced by our oil refineries be cleaned up at the source so the customers could utilize this technology.
6. Recognizing that energy efficiency projects require special expertise as well as financing, the resurgence of Energy Service Companies (ESCO's) in New Jersey is vitally important. Recent legislation to allow them to enter long tern contracts with public entities is a positive direction. It seems however that much of the architectural, engineering and construction management services are being performed out of State, and therefore not delivering the economic benefit nor jobs creation that could be achieved. With the architectural profession and construction trades suffering extremely high unemployment numbers, incentives to source these services locally should be considered.
7. Shifting responsibility for managing energy efficiency programs back to the utility companies would seem to have some merits. However, they are in the business of selling more power, not less, so they are somewhat conflicted in this role. Furthermore, they disbanded whatever demand-side expertise they once had years ago, and do not seem equipped to pursue efficiency measures effectively.

8. The impact of electric vehicles on our grid, on power production, and potential use for storage are all very new issues and difficult to predict. As the most dense State in the Nation, we potentially have the greatest to gain from these new technologies, and also the greatest risk of negative impact. We urge the State to collaborate with the Department of Energy to develop a strategic plan for accommodating electric vehicles.
9. There is a great amount of misinformation and confusion about geothermal energy. If there is high pressure steam available deep below New Jersey, that would be good to know, but we are not aware of any studies that have investigated this. In regard to earth-coupled heating and cooling systems, we note that there is considerable confusion about the application of open loop and standing column systems. Clear information regarding drilling rules and an information database on aquifers from the DEP would help bridge the gap between the well-drilling industry and the HVAC industry.
10. The energy" rebate" programs have been successful in driving a great deal of energy efficiency and renewable energy projects. The programs however remain difficult to navigate for the average person or organization. This in not necessarily the fault of the program, but is inherent in dealing with contractors, and the need to protect the finds from fraud. There are no easy solutions to these problems, but we suggest that financing programs for efficiency measure as well as renewable energy might be easier to administer, and could be made permanent and financially sustainable.
11. The data shows that commercial/industrial buildings offer the greatest potential for energy reductions. However, a great percentage of these buildings are occupied by tenants, who ultimately pay for the building energy indirectly through the provisions of the triple-net-lease. These tenants cannot access the energy efficiency programs offered by the Office of Clean Energy, and the landlords have no motivation to be efficient, because they would not receive the financial benefit. We need to bridge this gap between those paying for the energy and those whose names appear on the meter accounts. This can be accomplished in one or more ways.

- Require all buildings above a certain size to have a Level 2 Energy Audit performed. The building Owner would be required to implement all energy conservation measures that meet an established economic criteria within X years. This is similar to legislation passed in New York City.
- Require all commercial buildings above a certain size to have their energy use benchmarked and published. Much like the window sticker on a car, tenants would have the information on how efficient each building is, and market forces would then incentivize owners to offer more efficient properties.
- Similar measures might be warranted for multi-family residential properties.

RENEWABLE ENERGY

While energy efficiency is our most important goal, we will always require a significant amount of energy to run our buildings. So for the energy use that we cannot eliminate, the most sustainable source is renewable energy, in its various forms. New Jersey should be rightly proud of our position as the second largest State in terms of solar energy production.

We strongly encourage the State to continue use of the Edison Innovation Fund - Clean Energy Technology Commercialization & Clean Energy Manufacturing program to foster development of renewable energy technologies here in New Jersey. This is where the light bulb and the transistor were invented. New Jersey should rightly be in the forefront of renewable energy research and manufacturing.

SUSTAINABLE SITES & NEIGHBORHOOD DEVELOPMENT

Sustainable Sites and Neighborhood Development – New Jersey can be proud of the Smart Growth provisions of the State Plan. Planning future development in areas with or near existing infrastructure will create opportunities for Combined Heat & Power systems, and minimize transmission losses of power. Smart Growth policies should be reinforced as appropriate in the EMP.

The energy master plan should include goals about providing viable options within overall land use planning for people to affordably live within proximity to employment opportunities…

Energy conservation must be incorporated into land use planning. To that end, the municipal land use law should be modified to require a sustainability plan be developed by each township as part of municipal master plan re-evaluations, rather than its current status, which simply allows a sustainability plan element.

The master plan should consider additional tax incentives for businesses locating within proximity to mass transportation opportunities.

The energy master plan should include working with mass transportation management organizations (NJ Transit, etc.) to connect mass transportation lines to needed local networks to reduce energy demands associated with decentralized transportation.

The latest LEED Rating system is LEED for Neighborhood Development. In addition to the fostering the whole building approach to sustainability, the LEED ND platform addresses energy used by transportation, where energy savings is created by reducing vehicular travel In the Sustainable Sites category, credits are given for projects that encourage transportations with bicycles and locate themselves in more urban pedestrian friendly locations. In the Neighborhood Pattern & Design category, there are mandatory prerequisites and credits for projects with walkable streets and compact, pedestrian friendly development. In addition, there are credits for projects with neighborhood centers, mixed income diversity, reduced parking and walkable access to transit, all of with contribute to reduced vehicle miles traveled and energy savings. So this represents a new tool that can be used by planners and policy makers to help implement the principles already established by NJ futures, ULI, CNU, RPA and other organizations, to support building towns instead of suburbs, protecting valuable land, and socially/environmentally responsible planning. What LEED ND brings to the table is some exact modeling to affect those results.

WATER EFFICIENCY

Recent droughts and engineering studies indicate that New Jersey will be facing water shortages in the near future. Water and waste water consume significant pumping energy, and hot water for domestic and industrial use is a major percentage of overall energy use. So it just makes good sense to include water conservation and efficiency as part of any audit and/or efficiency initiative.

When energy audits are performed via BPU sponsored programs, they should include water conservation measures. This is already done at the National level in the Energy Star programs.

Nature and man can cooperate to rebuild healthy communities and restore natural ecologies through incorporation over time of sustainable infrastructure designs and principles, with water at the center of these designs. Emerging examples of these concepts include:

- Treatment technologies that mimic natural membranes and filters and that use smart localized controls that adjust to changing water use at homes
- Closed-loop water systems in residential and commercial buildings, where stormwater and wastewater are treated and reused for landscape irrigation, toilet flushing and cooling, and minimal waste leaves the site
- Recovery of methane gas and fertilizer from wastewater resources
- Rain gardens that trap stormwater and sustain trees and plants on roofs. These plants restore beauty and improve air quality in cities, moderate energy flows, and provide potential food sources
- Patterns of neighborhood development that interconnect nature and the built environmental, preserve open space and respect natural drainage flows.
- Restoration of natural cycles of water infiltration and evaporation in cities and towns, through localized treatment and groundwater recharge, trees, parks and roof gardens, and stream daylighting and restoration
- Restoration of natural watershed flows and functions, through localized water use and recycling into natural wetlands, groundwater, and air.

These systems will restore and preserve vegetation and wildlife, and minimize climate changes and warming.

- Integration of infrastructure planning and management at all scales, including the site, the neighborhood, the municipality, and the watershed.
- Co-evolution of technologies with the institutions and governance to implement them and the cultural changes to support them. Many of these involve greater involvement and responsibilities in the private and nonprofit sector and in the behavior of individuals.

The Baltimore Charter for Sustainable Water Systems is attached for reference and additional information and specifics.

MATERIALS AND RESOURCES

From the flotsam that washes up on the Jersey Shore, to the transportation costs to truck our waste out of state, there is no shortage of arguments in support of better use of resources. Again, New Jersey is a leader in recycling, and efforts to increase compliance and percentages are on-going. But to achieve biomass energy recovery, we will need a more comprehensive set of goals and processes to achieve these goals economically. This represents an area where becoming more efficient can represent cost savings to our taxpayers.

INDOOR ENVIRONMENTAL QUALITY

As a reaction to the oil shortages in the late 1970's, energy conservation was introduced by means of the energy codes. As a result, we created "Sick Building Syndrome", and we continue to see escalating rates of asthma and allergies in our children and adults. On average we spend 90% of our time indoors. Eliminating VOC's, formaldehyde and other chemicals from our indoor environments makes sense, and offers the opportunity to reduce health care costs, which is one of the greatest burdens upon our State finances and those of our citizens. The current code for ventilation (ASHRAE 62-2004) sets minimum requirements to prevent most people just from getting sick. In offices, schools and hospitals that employ enhanced ventilation, we see lower absenteeism, higher test scores, and earlier discharges from hospitals. The cost implications of these factors outweigh the energy costs by orders of magnitude.

The issue is really quite simple. If you are given the choice of using a product in your house, or in the school where your children spend their day, would you like the product with the known carcinogen, or without? We suggest that we adopt the "best practice" of using products that meet the Green Seal Standard and/or the South Coast Air Quality Management Rule # 1168. We recommend that we introduce this market transformation by requiring their use in all NJ School construction, and DPMC, BCA projects, and all projects and work funded by the EDA and Office of Clean Energy

TRANSPORTATION OPPORTUNITIES

State departments of transportation and other transportation agencies are struggling with how to integrate sustainability into their investment and operating decisions. In part, this is because there are multiple definitions of sustainability, and they are variously applied at different scales and at different points in system planning and programming; project development, design, construction, and maintenance; and operations. Transportation agencies are incorporating the principles of Context Sensitive Solutions and environmental stewardship into their decision-making, and sustainability potentially presents at least a variation and at most an entirely new way of evaluating agency performance. Agencies need assistance in developing sustainability goals and objectives and related performance measures.

Transportation provides movement of people and goods and it critical in the New Jersey market between our multiple airports, major port facilities, and connecting roadways. As transportation will continue to grow a State Energy Plan should have objectives for allowing transportation related industries to become energy independent.

Transportation has many facets that can change energy consumption, most directly with all owned and managed facilities. Building and operating according to LEED and Energy Star standards is a given. Additionally the BPU can support the transformation of the transportation infrastructure with partnered renewable energy projects that support the infrastructure for upgrades, maintenance, and mass transit projects. Renewable energy projects can be deployed along major state highways and integrated into the rest stations along the length of highway. This initiative can create renewable power, manage surges (battery storage for EV), and collect a % of revenue that will support transportation system expansions. Lithium-ion batteries have high abuse tolerance, low heat evolution, and more than 95% of battery materials can be recovered and reused. When a battery is running low, a car only need only pull into a battery switch station, where their power source is replaced with a fully charged battery in a few minutes.

This program should encourage the Clean Cities concept, park-and-ride, idle reduction tactics, and other required transportation-related activities under the SEP guidelines.
Popular definitions of sustainability consider the environmental, economic, and social implications of a decision and the rate of natural resource consumption relative to resource availability and the needs of future generations. For sustainability to be successfully incorporated into transportation decision making, it is essential that these concepts are adequately understood, quantified and applied.

Transportation agencies have strategic goals that cover a broad range of topics, many of which may be consolidated into categories that specifically address the dimensions of sustainability—economic health, social equity, and environmental stewardship.

Examples include improved safety, reduced congestion, wetland conservation, enhanced economic opportunity, improved air quality, reliable mobility, system preservation, accelerated project delivery, economic vitality, ecosystem services, neighborhood preservation, and increased value of transportation assets. Climate change constitutes an emergent and critical area where agencies need immediate assistance.

To achieve the goals of sustainable transportation, agencies require practical and easy-to-use tools or methods to continuously integrate sustainability into current agency performance measurement programs. Working with performance measures, however, can be a daunting task due to the large number of possible measures, extensive data that might be required, and computational complexity—hence the need for identifying useful and easy-to-use performance measures.

We would propose to develop a guide for the State Departments of Transportation (DOT), New Jersey Transit, and other transportation agencies to use to measure the sustainability of their networks, systems, facilities, projects, and activities, at the appropriate scales, stages (long-range planning, programming, project development, design, construction, maintenance, operations), and time frames. This project should clearly describe the underlying principles of sustainability as they apply to transportation agencies. The guide will (1) support agency decision-making processes at various management levels; (2) enable agencies to develop appropriate sustainability goals, objectives and associated performance measures, and methods for conducting performance measurement and monitoring; and (3) describe computation methods for these measures and possible data sources. We would be happy to meet with the BPU and/or DOT to further discuss this effort.

EDUCATION AND TRAINING

One of the most critical elements that will impact the success in implementing the NJ Energy Master Plan is education of all the stakeholders. This population includes:

- All staff within the DEP, BPU and DCA – customized to address their respective areas of responsibility.
- energy auditors
- weatherization personnel
- building inspectors
- design and construction consultants
- trades
- businesses interested in applying for incentives under the EMP

The LEED Green Associate Accreditation is recognized globally as demonstration that the candidate has a full and comprehensive knowledge in the field of green building and sustainability and would demonstrate that the key staff is qualified to meet the progressive goals of the EMP. USGBC NJ proposes to provide the training that would prepare these stakeholders for the LEED GA Exam. This prepares the Staff to communicate on a balanced level with the private sector entities necessary to execute the work prescribed under the EMP.

USGBC NJ faculty is highly qualified and accredited professionals that possess comprehensive background that includes key roles on multiple Green/LEED projects throughout the state and tri state area. USGBC NJ has 8 years experience in customizing coursework to ensure the relevance of the curricula to the attendees' work function in the context of "bigger picture" which includes energy efficiency, renewable energy and best practices in green building. USGBC NJ is in the process of implementing a major grant by the NJ DOL to train incumbent NJ Businesses and their employees in the field of Sustainability with highly acclaimed reviews of success within this workforce population. Expanded knowledge and education provided by this program is designed to also spur the employability of our workforce and competitive edge of our State's businesses.

Information on the training classes we already offer through the NJ Department of Labor is attached. We can also customize classes for the various NJ Agencies and Departments to provide them with more detailed tools and knowledge about the best practices that affect their respective missions.

NEW JERSEY

COURSE DESCRIPTIONS FOR USGBC NJ DELIVERY OF TRAINING FOR GRADUATES OF THE NEW JERSEY DEPARTMENT OF LABOR GREEN JOB TRAINING PARTNERSHIP PROGRAM

Part I: Fundamentals of Sustainability – LEED for Design & Construction -8 hours

This workshop is intended for those who are transitionin into the sustainability realm beginning with an introduction to the effects our built world has on our environment; what green building technologies can achieve; the basics of sustainability for our future; climate change and building impacts; motivators for green building; and conventional versus integrative approaches - and the associated benefits - to building design, construction and operations.

The concept of integrated design brings together a design team very early in the process, taking into account all of the individual needs of a project. Conventional building design usually involves a series of hand-offs from owner to architect to builder to occupant. When involved with a green project issues are discovered early in the process and are changed easily, saving the project time and money. In addition to extensive collaboration, integrated design involves a "whole building design" approach. A building is viewed as an interdependent system, as opposed to an accumulation of its separate components (site, structure, systems and use). The goal of looking at all the systems together to is make sure they work in harmony rather than against each other.

Sustainability has transformed the way in which construction is approached in only the last ten+ years. This has helped to raise the awareness of not only the professionals at the design side, but the users, constructors, carpenters, maintenance staff etc.

We will offer an introduction to green building principles and the fundamentals of the LEED Rating Systems. This course will offer you a beginning understanding how sustainability has changed the linear system and you will gain essential knowledge of the core concepts of sustainability and applications in different practice areas. .

1. **Overview of Green Buildings** – the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and deconstruction..
2. **Depletion of Resources**, our current natural resources are being depleted at a rate greater than they can be replenished. Additionally there are finite limits to some of the naturally occurring resources we use. It will be discussed the elements of what these resources are and how green construction techniques address management of them.
3. **Water Control & Consumption** – water can be seen as a blessing or a curse depending on the region that you are in. Too much water either being used or lack of causes flooding, infrastructure problems and valuable resource mismanagement. Buildings can use water efficiently, take advantage of not using drinkable water for toilet flushing and provide xeriscape landscape plantings.
4. **Viable Eco Systems** – protecting the current eco systems will ensure that the future of our world as we know it will continue on for the foreseeable future.
5. **Indoor Air Quality/Occupancy Comfort/Well Being** – Our comfort and wellbeing has a large impact on how we perform our jobs inside of buildings. We explore the elements of a building that contribute to that occupancy comfort.

6. **Climate Change –** The actions of our building techniques have a negative effect on climate change. We will discuss these actions and how green building design can reverse our GHG emissions and their negative effects.
7. **Economic Incentives of Green Buildings** – The federal government has seen the positive elements of green building and has instilled their own green metrics, and requires LEED silver on all buildings. Economic incentives exist on the local, state and federal level. These funds are what is helping to drive green building and we will explore a few of the programs and give resources of these funding programs.

Part II: LEED-GA Green Associate Prep Course - 8 hours

This course will prepare you for the LEED Green Associate Exam and focus on the process to become accredited. You will learn about LEED in greater detail, including specific strategies, metrics and standards; each credit impacts to the project and associated synergies that can exist in projects. The workshop begins with an overview GBCI (Green Building Certification Institute); steps necessary to take the exam; and a detailed study plan with additional materials you will need to read/study.

All topics are geared toward understanding the elements of the LEED rating systems with the core of the workshop discussing LEED intents and concepts at the credit category level - across building types and rating systems - touching on strategies, synergies, and specific examples that are reinforced by real project cases. Key LEED metrics and LEED referenced standards are addressed throughout the workshop.

- Identify the key components of the LEED Rating Systems
- Discuss the LEED Certification process
- Describe the intents and associated concepts of each LEED credit category
- Describe successful LEED strategies
- Introduction to Green Building Fundamental and Integrated Design Principles
- Review of all LEED Rating System Categories
- LEED Green Associate Exam Tips

Green jobs can reduce the environmental impacts of industrial enterprises and help lessen the burden of progress. The concept of green jobs that we elevate the current working force and bring them new techniques and talents to support their current position, and position for a better job with green focus. This course will provide the students a complete review of the five core elements of sustainability that are part of the LEED rating system and prepare them for the examination with what to study, how to gain more information on green construction techniques and discuss opportunities in the green market.

New careers are being born from the techniques and knowledge base of green building. During our session we will explore each of these elements in detail and discuss the array of related job opportunities that are available. Some examples are: Construction: carpentry, electrical work, plumbing installations, HVAC installation and repair. Additional secondary related industries are in resource management, recycled content, sales, construction waste management, and indoor air climate testing & controls ventilation.

The Imminent Commercial Real Estate Crisis and The CRE Solution

Architecture 2030

May 28, 2010

Update

July 15, 2010

After careful research and consultation with Building Sector leaders, Architecture 2030 is recommending that the 3-year tax deduction proposed in the CRE Solution, be tradeable and fully transferable (saleable) to a new owner for the life of the deduction. This would bring Energy Service Companies (ESCO's) and Architecture/Engineering/Construction (A/E/C) firms into the CRE efficiency renovation market, and allow Real Estate Investment Trusts (REIT's), pension funds, and properties with complex ownerships to participate more easily.

It should be noted, that for each $1 sf/yr (per square foot, per year) of energy saved, a commercial building will increase in value about $11.75 per square foot at a capitalization rate of 8.5%. For example, if a building owner of a 10,000 square foot building saved $10,000 on annual energy expenses, the building would increase in value $117,500.

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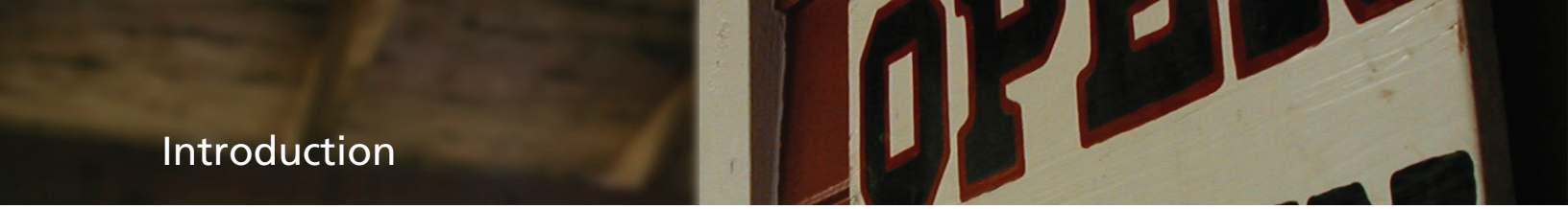

Introduction

Without swift intervention, the commercial real estate (CRE) crisis will cripple the economic recovery, raise unemployment, and lead to scores of small business and community bank failures. To avert this crisis, Architecture 2030 recommends that Congress implement the 'CRE Solution', providing a tax deduction tied to specific energy reduction targets that will create 1.3 million jobs while restoring credit capacity and liquidity in the CRE market.

Problem Summary

CRE transactions have dropped a staggering 90% since 2007. Between now and 2014, $1.4 trillion in CRE loans will be coming due; half of these currently are underwater. Commercial property values have plummeted by more than 40%, and commercial vacancies continue to increase. In addition, the construction industry has lost over two million jobs. Construction unemployment now stands at 21.8%. Finally, current CRE government intervention programs simply will not avert the CRE crisis because they do not target the largest sector of the CRE market – small and medium-sized CRE properties and businesses.

The CRE Solution

To restore credit capacity and liquidity in the CRE market while decreasing building operating costs and creating 1.3 million construction-related jobs, Architecture 2030 recommends implementing the CRE Solution. The CRE Solution would amend the Energy Efficient Commercial Building Tax Deduction (26 U.S.C. 179(d)) from $1.80 per sq.ft. to a range of $3.00 to $9.00 per sq.ft. for meeting the energy reduction targets of the 2030 Challenge[1], as follows:

Existing Building Renovations

3-Year	Minimum Energy Reduction Target
Maximum annual tax deduction per square foot of floor area	Percentage better than ASHRAE 90.1-2004
$4.50	30%
$6.00	50%
$7.50	75%
$9.00	Zero-Net-Energy

New Building Construction

3-Year	Minimum Energy Reduction Target
Maximum annual tax deduction per square foot of floor area	Percentage better than ASHRAE 90.1-2004
$3.00	30%
$4.50	50%
$6.00	75%
$7.50	Zero-Net-Energy

For each $6 billion of deferred CRE tax revenue, the CRE Solution would generate $73.4 billion in new private spending, and $15.9 billion in new federal tax revenue, more than paying for itself.

The CRE Solution Impact

- Creates 1.3 million jobs, quickly, and cost-effectively,
- Increases after-tax cash flow and property values, and reduces loan defaults,
- Increases CRE desirability and investment value,
- Increases new CRE sales (narrows the gap between the bid and ask price of CRE property),
- Decreases building energy consumption, greenhouse gas emissions, and operating costs, and
- Generates billions of dollars in federal, state, and local tax revenue.

[1] The 2030 Challenge®, issued by Architecture 2030, calls for incremental building energy reductions of 50% below the regional average for each building type (30% below ASHRAE 90.1-2004) to carbon neutral or zero-net-energy by the year 2030.

Understanding the Crisis

According to a recent report by the Congressional Oversight Panel[2], "Between 2010 and 2014, about $1.4 trillion in commercial real estate loans will reach the end of their terms. Nearly half are at present "underwater" – that is, the borrower owes more than the underlying property is currently worth."

The Commercial Real Estate Market

The recession, with its prolonged high rates of unemployment, has led to increasing commercial vacancy rates and reduced cash flows, depressing property values. Specifically, the high rates of unemployment have led to a decrease in demand for office, retail, manufacturing, warehouse, and hotel space, as people shop less, take fewer vacations, rent less space, and save more. The National Association of Realtors[3] projects further increases in U.S. office vacancy rates from 16.3% in the fourth quarter 2009 to 17.6% in the fourth quarter 2010, as well as an increase in industrial vacancy rates from 13.9% to 14.9%, and retail vacancy rates from 12.4% to 12.7%, over that same period. With high commercial vacancy rates, rents are going down, making it more difficult for borrowers to make their loan payments. During 2010, rents are expected to decline 7.2% for office space, 9.6% for industrial space, and 2.4% for retail space. While vacancy rates for multi-family housing are expected to remain stable for 2010, rents are expected to decline 3.4%.

Because commercial real estate (CRE) loans typically have three- to ten-year terms, there is approximately $1.4 trillion in real estate property loans that will come due over the next five years and require new financing. Many of these loans were originated in the commercial boom years of 2005-2007 when property values were exceptionally high. However, since 2007, commercial property values have fallen more than 40%, resulting in higher loan-to-value (LTV) ratios[4]. As a result, building owners will have difficulty refinancing, even if their property is performing well.

The largest CRE loan losses are projected to begin in 2011 with banks facing as much as $200-$300 billion in losses. These losses will fall disproportionately on smaller regional and community banks, many of which are FDIC insured and have high concentrations of CRE loans. Because these banks play a critical role in providing capital to small businesses and new business start-ups, their failure could undermine the economic recovery, leading to further unemployment and greater economic instability[5]. Also, many banks are now reluctant to trade CRE loans and incur losses or to foreclose, choosing instead to extend loan maturities[6]. This in turn limits their ability to make new business loans, slowing the nascent economic recovery. Financial institutions are literally stuck holding illiquid assets, the value of which cannot be easily determined because relatively few CRE transactions are taking place. According to Ernst & Young, only $54.5 billion in CRE transactions were posted in 2009, compared with $557.8 billion in 2007, a drop of over 90%[7].

Another critical factor that must be considered when analyzing the CRE market is its relationship to the commercial building and construction industry. Because of their interdependency, negative circumstances in either can quickly translate to the other, creating a negative feedback loop that drags both down at an accelerated rate.

The Construction Industry

The construction industry is key to the economic health of America. Virtually every U.S. industry – from steel, concrete, insulation, caulking, mechanical and electrical equipment, solar systems, glass, wood, metals, tile, fabrics, and paint to architecture, planning, design, engineering, banking, development, real estate, manufacturing, construction, wholesale, retail, and

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[2] Congressional Oversight Panel. *February Oversight Report: Commercial Real Estate Losses and the Risk to Financial Stability*. Washington: Government Printing Office, February 2010. http://cop.senate.gov/reports/library/report-021110-cop.cfm.

[3] The National Association of Realtors. (2010, February 23). *No Meaningful Recovery in Commercial Real Estate Before 2011*. http://www.realtor.org/press_room/news_releases/2010/02/commercial_recovery.

[4] Congressional Oversight Panel. *February Oversight Report: Commercial Real Estate Losses and the Risk to Financial Stability*. Washington: Government Printing Office, February 2010. http://cop.senate.gov/reports/library/report-021110-cop.cfm.

[5] Ibid.

[6] Ernst & Young LLP, *More Pain, Some Gain for Real Estate Private Equity Sector in 2010*. Business Wire, http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news_view&newsId=20100406007069&newsLang=en.

[7] Grinis and Seyfarth, Ernst & Young LLP, *Is History Repeating Itself?, U.S. distressed real estate loans investor survey*, 2010. http://www.ey.com/Publication/vwLUAssets/Is-history-repeating-itself/$FILE/Is_history_repeating_itself.pdf.

distribution – depends on the demand for products and services generated by the construction industry. Yet, this industry is mired in the worst downward economic spiral since the Great Depression[8].

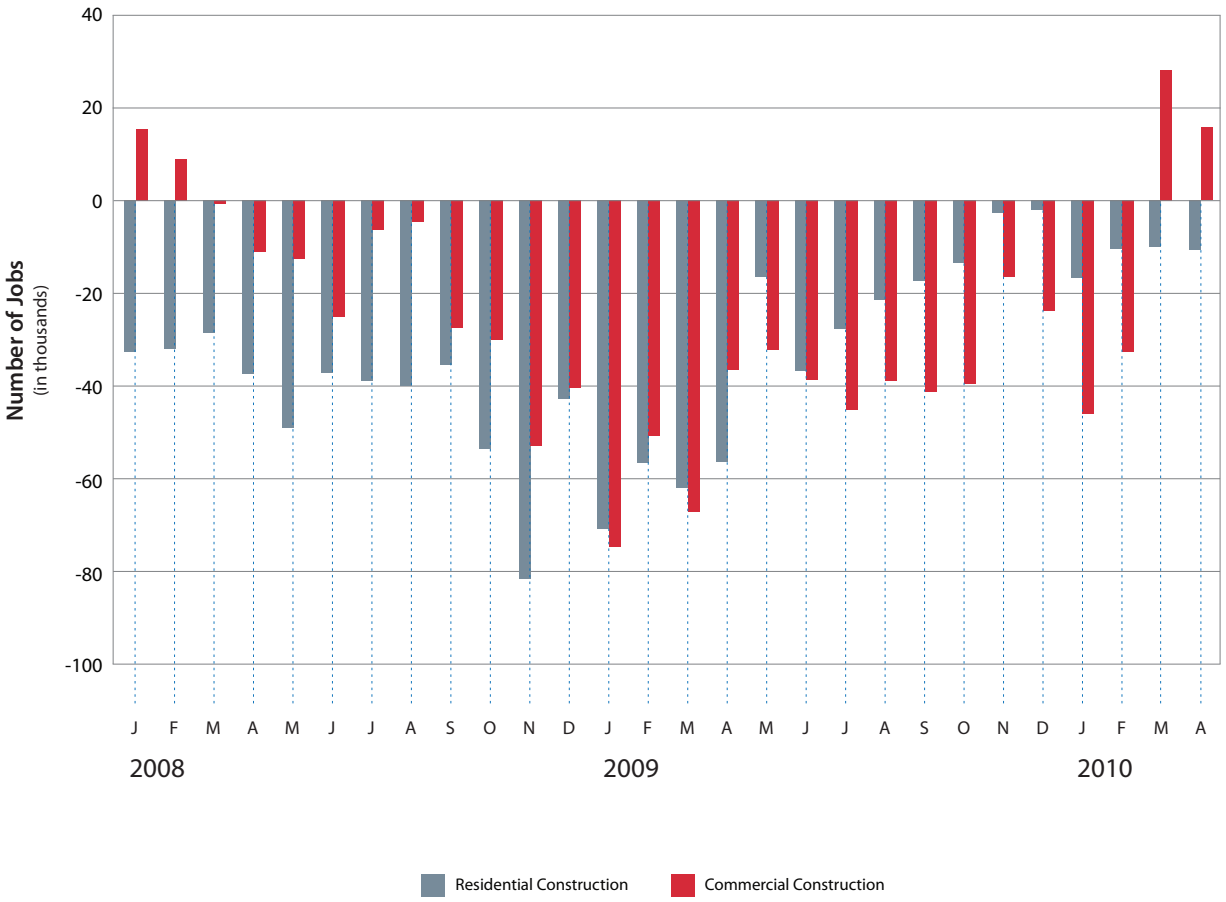
The depth of the construction industry crisis is sobering. The industry has lost over two million jobs since August 2007. Construction unemployment hovers at 21.8% with more than one in five construction workers out of work. In 2008, most construction job losses were concentrated in the residential building sector. By early 2009, commercial (non-residential) and heavy construction job losses began to surpass residential job losses, and since May 2009, most construction job losses have occurred in the commercial building sector (Figure 1)[9].

Over the past 12 months, the construction industry has lost an average of 46,000 jobs per month (Figure 2). In an attempt to keep their businesses open, many contractors are taking a loss on projects; thousands of others are going bankrupt or shutting down.

An important and perhaps overlooked result of these dire conditions is that the industry is experiencing a consequential loss of skilled labor. Many of our nation's most highly skilled designers and construction workers are leaving the building industry to move into new careers, and may never return. The extraordinary structures designed and built by U.S. professionals and labor and found throughout our nation stand as a testament to the significance of losing such highly trained and skilled workforce. If the downward spiral of

Figure 1: Monthly Job Losses or Gains in Construction

Source: U.S. Department of Labor



[8] Davidson, P. (2010, February 25). Construction unemployment still on the rise. *USA Today*. http://www.usatoday.com/printedition/money/20100225/construction25_st.art.htm.

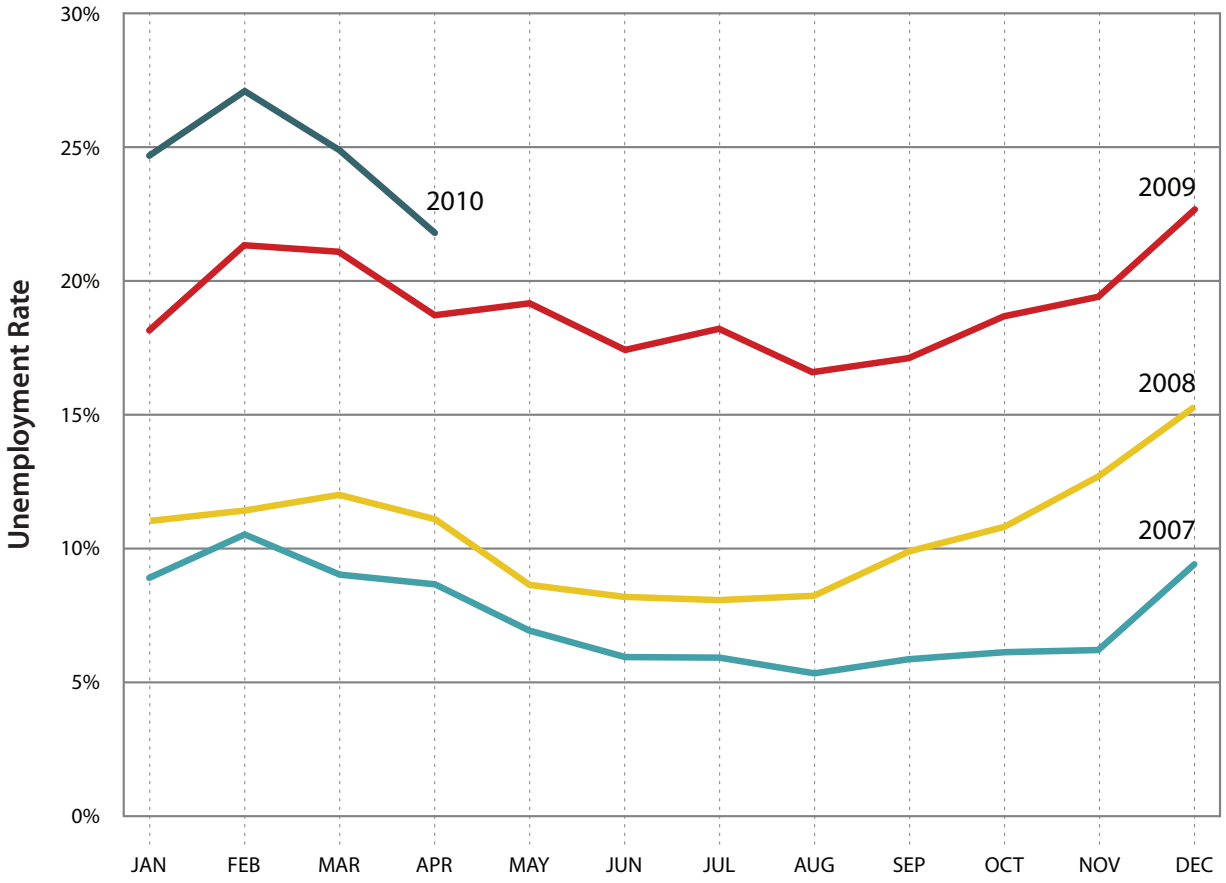
[9] Department of Labor. Bureau of Labor Statistics. Employment Situation Summary. ONLINE. 5 March 2010. Bureau of Labor Statistics. Available: http://www.bls.gov news.release/empsit.nr0.htm.

this industry is not reversed soon, it will take years for the industry to recover from such a loss.

The building industry, already under siege, is now faced with a potential meltdown in the commercial real estate market. With commercial property depressed, vacancy rates increasing, and commercial building financing frozen, the current trend of construction job losses is expected to continue and further exacerbate the CRE crisis[10]. If this meltdown is not averted, the negative feedback loop that has already begun will continue to accelerate, affecting not only the stability of the economic recovery, but, according to the report issued by the Congressional Oversight Panel on February 10, 2010, the nation's financial system, as well[11].

Figure 2: Construction Unemployment Rate (2007-2010)

Source: U.S. Department of Labor



[10] Ratiu, G. (2010, February). National Association of Realtors. *Commercial Real Estate Outlook: Commercial Real Estate Faces Another Difficult Year.*

[11] Congressional Oversight Panel. *February Oversight Report: Commercial Real Estate Losses and the Risk to Financial Stability.* Washington: Government Printing Office, February 2010. http://cop.senate.gov/reports/library/report-021110-cop.cfm.

The Current Response

The Financial Regulators and Administration have begun to address pending CRE loan losses. On October 30, 2009, regulators issued a "Policy Statement on Prudent Commercial Real Estate Loan Workouts". This policy adjustment eases existing bank regulations by allowing banks to pursue 'prudent' loan workouts, such as loan renewals or extensions to creditworthy customers, extension of additional credit, or a loan restructuring with or without concessions [12].

Also, on February 5, 2010, the President outlined a plan [13] to expand the Small Business Administration's (SBA) 504 program to temporarily allow for the refinancing of owner-occupied commercial real estate loans that are not underwater. Businesses would be eligible to refinance up to 90% of a property's current value up to a maximum of $5 million. However, the President's proposal would only help refinance a maximum of $18.7 billion each year in commercial real estate that might otherwise be foreclosed and liquidated, a very small fraction of potential distressed properties.

Legislation that is less ambitious than the President's proposal has been introduced in the House (H.R. 4302) and Senate (S. 2869). This legislation would allow businesses to finance, through the SBA, only a maximum of 80% of a property's current value.

Developing an Effective Response

Today, the most effective means for thawing and stabilizing the CRE market is to provide incentives to increase building owner cash flow and property values and the financial attractiveness of commercial property, encouraging transactions and narrowing the large spread between the current bid and ask price for commercial property. Due to our continuing high unemployment rate, any federal incentives should also be used as an opportunity to create jobs. Simply put, without more jobs, the markets cannot recover and the risk of additional defaults created by maturing commercial real estate loans will only worsen.

The most effective job creation mechanism in the CRE market is widespread demand for building construction services, i.e. building construction and renovation. However, due to increasing vacancy rates, job creation should primarily focus on generating a greater demand for construction renovation and additions. By focusing on energy efficiency renovations and additions, other critical changes needed in the CRE market can also be realized, including lower operating costs and increased property values.

Renovation: A More Stable Market

In addition to spurring job creation, focusing on expanding the commercial renovation market is advantageous for another reason. This market tends to be less responsive to economic changes than the new building construction market, which is more volatile, responding to the ups and downs of the economy (Figure 3). In contrast to new buildings, the value of commercial renovation has remained fairly constant throughout the recession [14]. Over the past five years, from 2005 through 2009, commercial building renovations and additions have averaged $73.4 billion, totaling $69.1 billion in 2009. This provides a substantial existing and stable market for incentives, since it is much easier to conduct additional renovation work and add new space when construction is underway than it is to initiate new construction work.

Energy Efficiency Renovation and Federal Policy

In addition to lowering building operating costs and increasing owner income and property values, focusing on energy reductions aligns with current federal energy and climate policy as established by Congress in the Energy Independence and Security Act of 2007, the American Clean Energy and Security Act (H.R. 2454) passed by the House, and the American Clean Energy Leadership Act (S. 1462) passed out of committee in the Senate in 2009. *By using the energy reduction targets for commercial buildings established in these bills, federal policy can be reinforced and the markets incentivized to meet the reduction targets while the financial benefits of energy efficiency are utilized to stabilize the CRE market.*

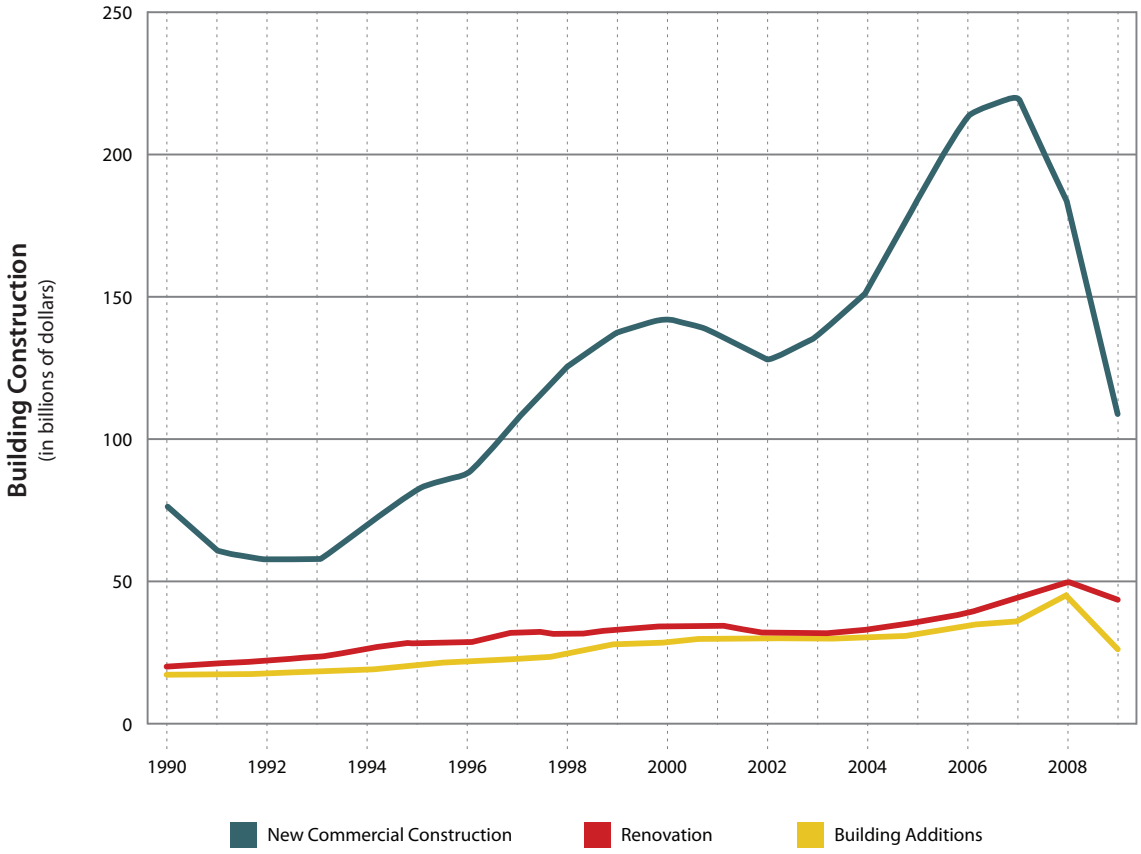
[12] Financial Regulators. (2009, October 30). *Policy Statement on Prudent Commercial Real Estate Loan Workouts*. www.federalreserve.gov/boarddocs/srletters/2009/sr0907a1.pdf.

[13] The White House. Office of the Press Secretary. *President Obama Outlines Latest in a Series of New Small Business Proposals*. ONLINE. 5 February 2010. Office of the Press Secretary. Available: http://www.whitehouse.gov/the-press-office/president-obama-outlines-latest-a-series-new-small-business-proposals.

[14] McGraw-Hill Construction. *U.S. Construction Starts in Millions of Dollars*. Bedford, Massachusetts.

Figure 3: Annual Value of Commercial Building Construction

Source: Adapted from McGraw-Hill Construction Statistics



The Size and Makeup of the Current Commercial Real Estate Market

How best to create demand for energy efficiency construction services within the CRE market depends greatly on the size and makeup of this market. There are over 4.7 million commercial buildings containing 78 billion square feet of space in the U.S. today[15]. Commercial buildings are often thought of as big box stores or high-rise buildings in city centers; however, most commercial buildings in the United States (90%) are less than 25,000 square feet, just twice the size of a residential lot, and 90% are one and two stories in height (Figures 4 and 5)[16]. Of total commercial building square footage, 65% is less than 100,000 square feet and 37% is less than 25,000 square feet[17].

Also, the majority of commercial buildings in the United States are privately owned (86%), 46% of those are owner occupied, and 81% are single establishments (Figure 6)[18]. Of the owner-occupied buildings, 91% are small commercial buildings under 25,000 square feet. In addition, 87% of all owner-occupied commercial buildings are one- and two-story buildings[19].

Of particular importance, the majority of the CRE market consists of smaller one- and two-story buildings, many of which are either owner-occupied or single-tenant occupied. This is significant because this category of buildings is easier, less expensive, and faster to renovate than other categories, such as large multi-story, multi-tenant-occupied buildings.

[15] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. *The 2009 Buildings Energy Data Book Table 3.2.1*. ONLINE. October 2009. Office of the Press Secretary. Available: http://buildingsdatabook.eren.doe.gov/.

[16] U.S. Department of Energy. U.S. Energy Information Administration. *2003 CBECS Detailed Tables; Table B17 Occupancy of Nongovernment-Owned and Government-Owned Buildings, Number of Buildings*. ONLINE. September 2008. U.S. Energy Information Administration. Available: http://www.eia.doe.gov/emeu/cbecs cbecs2003/detailed_tables_2003/detailed_tables_2003.html.

[17] U.S. Department of Energy. U.S. Energy Information Administration. *2003 CBECS Detailed Tables; Table A1 Summary Table for All Buildings (Including Malls)*. ONLINE. September 2008. U.S. Energy Information Administration. Available: http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html.

[18] U.S. Department of Energy. U.S. Energy Information Administration. *2003 CBECS Detailed Tables; Table B17 Occupancy of Nongovernment-Owned and Government-Owned Buildings, Number of Buildings*. ONLINE. September 2008. U.S. Energy Information Administration. Available: http://www.eia.doe.gov/emeu/cbecs cbecs2003/detailed_tables_2003/detailed_tables_2003.html.

[19] Ibid.

Figure 4: Commercial Buildings – Percentage by Size

Source: U.S. Energy Information Administration

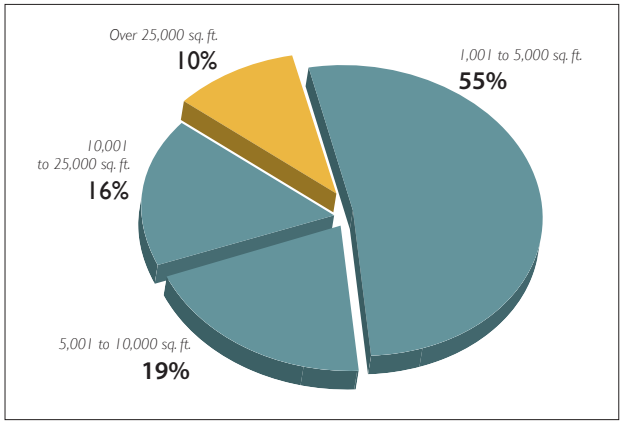


Figure 5: Commercial Buildings – Percentage by Number of Stories

Source: U.S. Energy Information Administration

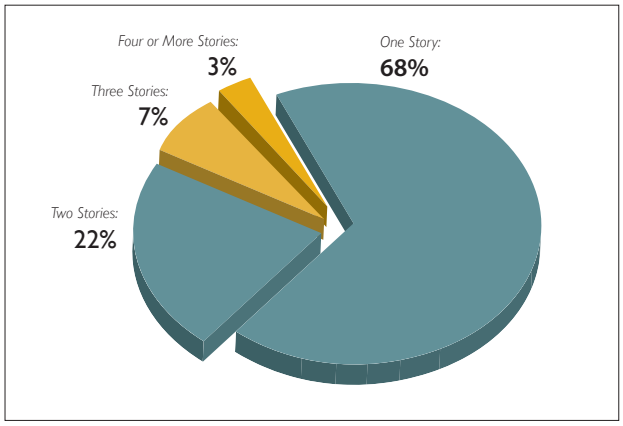
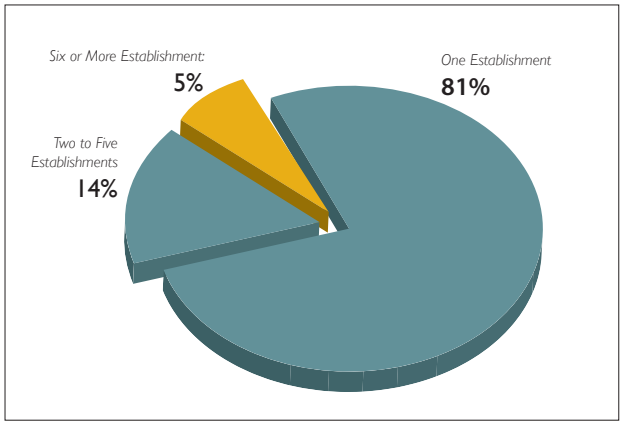


Figure 6: Commercial Buildings – Percentage by Number of Establishments

Source: U.S. Energy Information Administration



Commercial Building Energy Efficiency Renovation for Small Commercial Buildings

Smaller commercial buildings typically use less complex technologies and simpler equipment in greater quantities (more equipment per square foot) than larger buildings. Smaller buildings can also be more easily added to and renovated with products, systems, and architectural features designed to reduce energy consumption. They have a large roof area (per square foot of floor area), which can accommodate solar hot water heating systems, photovoltaic panels for electricity generation, and skylights, sun-lighting fixtures, and clerestories for distributed daylighting and passive heating of interior space. Large roof areas provide leasing options and additional income for building owners for solar electric generation and lease-purchase opportunities, with little up-front investment, for photovoltaic systems. Building owners can also take advantage of low interest Property Assessed Clean Energy (PACE) utility and revolving loan funds being established all over the country. These loans are used to finance energy efficiency retrofits and renewable energy systems. They require little or no equity and are paid back from a portion of the monthly energy savings.

That smaller one- and two-story commercial buildings are easier, less expensive, and faster to renovate and add onto is highly beneficial in many ways. It allows a solution to be developed that can be implemented quickly with the benefits, including job creation and increased income and property values, being achieved in a manner that is more timely and cost effective than other options. Additionally, this solution would directly help vulnerable small businesses and CRE borrowers, as well as the regional and community banks that hold a majority of smaller commercial building loans.

A Directed Solution Designed to Maximize Reach, Impact, and Benefits

By building a response to the CRE crisis, the solution developed can be structured so as to maximize the reach, impact, and benefits of the effort utilized. Incentives are an effective method for creating demand for services and products[20]. Employed strategically, the effectiveness of a particular incentive can be multiplied significantly. Specifically, by focusing a tax deduction for the energy efficiency renovation of commercial buildings and additions, this approach can be broadened to not only include stimulating CRE transactions, commercial building construction, increasing commercial building property values, and reducing the number of CRE defaults, but also reemploying this sector's highly skilled workforce and lowering building energy consumption, operating costs, and greenhouse gas emissions.

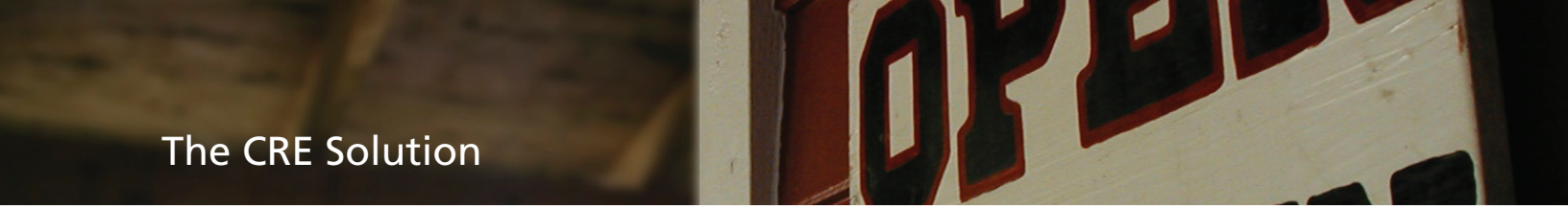
Providing incentives to encourage energy reductions in commercial buildings is already established in legislation. The Energy Policy Act of 2005 (EPAct 2005)[21], which passed with strong bipartisan support, provides a well-established mechanism for immediately and effectively implementing expanded incentives and energy reduction targets in the CRE market.

Currently, the Act provides up to $1.80 per sq.ft. for specific energy reduction targets in new and renovated commercial buildings. However, the Act can be amended to better align with the 2030 Challenge and current federal policy, as established in the American Clean Energy and Security Act (H.R. 2454) passed by the House and the American Clean Energy Leadership Act (S. 1462) passed out of the Energy and Natural Resources Committee in 2009, by expanding and increasing the existing energy-efficient commercial building tax deduction provision of EPAct 2005 from $1.80 per sq.ft. to a range of $4.50 to $9.00 per sq.ft. for renovations and $3.00 to $7.50 per sq.ft. for new buildings (for three years) when meeting the energy reduction targets of H.R. 2454 and S. 1462. This would provide an effective tax benefit for building purchases, renovations, and high-performance new buildings and additions, as well as significant energy savings for businesses and commercial property owners.

The specifics on how the amended Act would work, as well as its benefits, are provided in the CRE Solution detailed below.

[20] American Wind Energy Association and the Solar Energy Research and Education Foundation. (2008, February 13). *Economic Impacts of the Tax Credit Expiration*; http://www.awea.org/newsroom/releases/Delay_in_Extending_Renewable_Energy_Incentives_Risks_American_Jobs_020408.html.

[21] *Energy Policy Act of 2005*; HR 61, SEC. 1331. ENERGY EFFICIENT COMMERCIAL BUILDINGS DEDUCTION, Public Law 109-58, 109th Congress, August 8, 2005: http://www.govtrack.us/congress/bill.xpd?bill=h109-6.



The CRE Solution

In order to qualify for the limited, three-year tax deduction provided for under the CRE Solution, a building owner must renovate, add or build new to meet the energy reduction targets of the 2030 Challenge. It is this tax deduction for renovation that will make CRE property more attractive to buyers and create the needed demand that will close the gap between current bid and ask pricing, generating new CRE sales and $73.4 billion in private construction investment and spending; and, it is this investment and spending that will make over one million new jobs possible[22]. The Plan also creates a robust market for the effective distribution of capital accumulating in utility, PACE, and low-interest revolving loan fund programs.

The Plan leverages the benefits of increased tax deductions and energy reductions by offering, for both existing and new commercial properties, a limited, tiered, three-year tax deduction program tied to specific building energy reduction targets. The available tax deduction depends on the energy reduction target achieved; the more efficient the renovated or new building, the greater the tax deduction available. Because the CRE market is depressed with high vacancy rates, the tax deductions provided are greater for existing building renovation than new building construction.

Under the Plan, those owning or purchasing an existing property or constructing a new building could choose to receive a tax deduction for three years in return for investments in specific commercial building energy reduction targets. The annual deduction for renovations and new additions or buildings is equal to the total amount (100%) of the energy-efficient commercial property expenditures, subject to a maximum, as provided in the following tables:

Existing Building Renovations

3-Year	Minimum Energy Reduction Target
Maximum annual tax deduction per square foot of floor area	Percentage better than ASHRAE 90.1-2004
$4.50	30%
$6.00	50%
$7.50	75%
$9.00	Zero-Net-Energy

Renovation Example: For meeting a 50% energy reduction target, a building owner, purchaser, or investor of an existing 28,000 square foot commercial building would receive a tax deduction equal to the cost of building efficiency upgrades and/or renewable energy systems, up to $168,000 per year ($6.00 per sq.ft.) for three years. The owner would also save $1.47 per square foot each year on energy costs (total of $41,040 per year). In addition, the $1.47 per sq.ft. per year energy savings would increase the building's value by $16.29 per sq.ft.[23] For this example then, the investor would receive a total of approximately $250,128 in energy savings and tax deductions over the three years.

[22] See Appendix. Job estimates are based on a $6 billion Plan allocation of $4.8 billion for renovation and $1.2 billion for new construction. Job figures are derived from the Political Economy Research Institute's estimates as follows: 596,363 direct jobs, 356,653 indirect jobs and 383,763 induced jobs.

[23] U.S. Environmental Protection Agency. Energy Star. *Summary of the Financial Benefits of ENERGY STAR® Labeled Office Buildings.* Washington: February 2006. (Pg. 7). The capitalization rate was increased by 0.5% for each incremental reduction beyond 30% to be conservative.

New Building Construction

3-Year	Minimum Energy Reduction Target
Maximum annual tax deduction per square foot of floor area	Percentage better than ASHRAE 90.1-2004
$3.00	30%
$4.50	50%
$6.00	75%
$7.50	Zero-Net-Energy

New Building Example: For meeting a 50% energy reduction target, the owner of a newly constructed 28,000 square foot building would receive a tax deduction of $126,000 per year ($4.50 per sq.ft.) for three years. The owner would also save $1.00 per square foot each year on energy costs (total of $28,000 per year). In addition, the $1.00 per sq.ft. per year energy savings would increase the building's value by $11.11 per sq.ft.[24]

By tying financial incentives to meeting specific energy reduction targets, the CRE Solution effectively eases the stress on the CRE market, helping owners, developers, purchasers, and sellers by:

- decreasing building energy consumption and operating costs,
- increasing cash flow and property values, reducing the risk of default,
- narrowing the gap between current bid and ask price for commercial property,
- generating new CRE sales,
- increasing CRE desirability,
- providing an incentive to renovate and reposition re-sold properties, and
- creating new jobs.

Jobs, Tax Revenue, and Cost to the Federal Government

Based on $6 billion in deferred federal taxes, $73.4 billion in new private spending would be generated, resulting in the creation of 1.3 million jobs[25].

The Plan will also generate significant tax revenue, making it revenue positive both in the short term and long term. The tax base created by the new jobs and private capital invested will generate $15.9 billion in federal tax revenue, which is $9.9 billion more than the $6 billion in deferred taxes. The Plan would also generate $5.25 billion in much needed state and local government revenue for education, community services, and infrastructure projects.

In addition, as stated in the provisions of the existing legislation, the basis of the property is reduced by the deduction amount and the remaining asset value is depreciated over its tax life for the class of property. Once the property is sold, the federal government receives the deduction amount back in the form of taxes. The Plan's ability to pay for itself and generate additional revenue provides the opportunity to continue the Plan as needed.

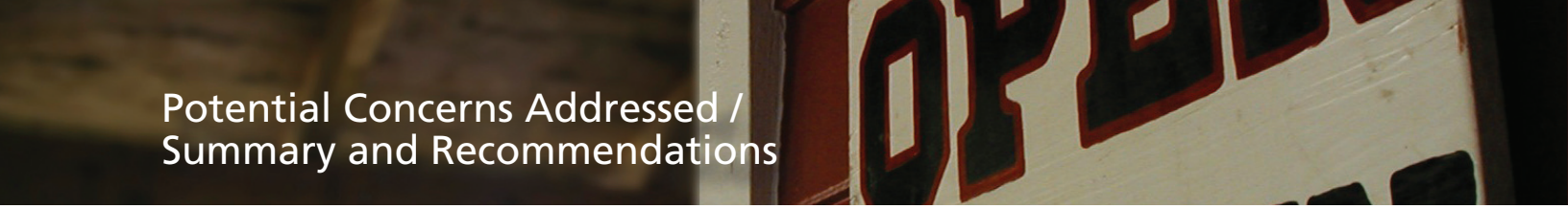
Major benefits of the CRE Solution include:

- generating $73.4 billion in new private spending,
- generating enough tax revenue to pay for itself,
- creating over one million new jobs[26], and
- reducing commercial building energy consumption by 95.4 Trillion Btu's annually and greenhouse gas emissions by 7.85 MMT CO_2e.

[24] U.S. Environmental Protection Agency. Energy Star. *Summary of the Financial Benefits of ENERGY STAR® Labeled Office Buildings*. Washington: February 2006. (Pg. 7). The capitalization rate was increased by 0.5% for each incremental reduction beyond 30% to be conservative.

[25] 596,363 direct, 356,653 indirect, and 383,763 induced jobs.

[26] The cost to the federal government per direct job is $10,061. This does not include the tax revenue the federal would receive from the direct, indirect and induced jobs created.



Potential Concerns Addressed / Summary and Recommendations

Potential Concerns Addressed

Timelines of implementation, certification of compliance, and cost to the federal government are legitimate concerns for any plan proposed to address the CRE crisis in today's economic environment, so these concerns are specifically addressed here:

How long will it take to implement the CRE Solution?

It will take at most 90 days to implement the Plan since legislation, specifically EPAct 2005, Section 179D, Energy Efficient Commercial Buildings Deduction, has been in effect since 2005 and is not set to expire until December 31, 2013[27].

How will the work be certified?

The work will be certified using the procedures currently required in EPAct 2005. Subsection (d)(6) of Section 179D outlines the certification process for inspection and testing that ensures compliance.

How much will the Plan cost the federal government?

It will cost $6 billion in deferred revenue to implement the CRE Solution; however, during the three-year period the Plan is in effect, the federal government will collect $15.9 billion in tax revenue from the $73.4 billion in new private spending generated by the Plan. Additionally, since the basis of the property is reduced by the amount of the tax deduction, the federal government will also receive the deferred tax deduction amount when the commercial property is sold.

Why not use accelerated depreciation instead?

Because accelerated depreciation for CRE property that is not coupled with efficiency renovation work will not guarantee new jobs, lower building operating costs, and result in new federal tax revenue that will more than cover the cost of the Plan.

Summary and Recommendations

Over the next few years, $1.4 trillion in commercial real estate loans generated during the boom years of 2005-2007 will come due and need refinancing; nearly half are underwater and many are near underwater. Due to a weak economy, high unemployment, and increasing vacancy rates, commercial property values have fallen more than 40% since the beginning of 2007. With a severely weakened commercial market, an additional and substantial wave of commercial loan losses could undermine an economic recovery and lead to further job losses, small business failures, and greater economic instability.

EPAct 2005 provides a ready instrument for implementing the changes needed to stabilize the CRE market while providing substantial benefits to commercial property owners, purchasers, small local and regional banks, businesses, and federal, state and local governments. Based on the ease of implementation afforded by EPAct 2005, the substantial benefits that would be realized by both the CRE market and the U.S. economy, and the reductions in energy consumption and greenhouse gas emissions, we recommend aligning Section 1331 of EPAct 2005 with the specific energy reduction targets of 30% below code up to zero-net-energy for new and renovated commercial buildings established by the 2030 Challenge and current federal policy.

Specifically, we recommend expanding and increasing the existing energy-efficient commercial building tax deduction provision of Section 1331 from $1.80 per sq.ft. to a range of $3.00 to $9.00 per sq.ft. for three consecutive years for meeting the congressional energy reduction targets of H.R. 2454 and S. 1462, as demonstrated in the CRE Solution.

Due to the scale and potential fallout of the looming CRE crisis, we recommend that the CRE Solution be adopted and implemented before the first wave of commercial loans become due.

[27] *Emergency Economic Stabilization Act of 2008*; HR 1424, SEC. 303. ENERGY EFFICIENT COMMERCIAL BUILDINGS DEDUCTION, Public Law 110-343, 110th Congress, August 8, 2005: http://www.govtrack.us/congress/billtext.xpd?bill=h110-1424.

Acknowledgements / Contacts

Acknowledgements

We are grateful to the following people who reviewed this whitepaper and provided constructive comments, insight and useful information (as individuals and not as representatives of their organizations):

Kermit Baker
Senior Research Fellow, Joint Center for Housing Studies, Harvard University, Cambridge, MA; Chief Economist for the American Institute of Architects, Washington, DC.

William G. Lashbrook III
Senior Vice President, PNC Real Estate, East Brunswick, NJ.

Roger Platt
Senior Vice President, Global Policy and Law, U.S. Green Building Council, Washington, DC.

Heidi Garrett-Peltier
Research Fellow at the Political Economy Research Institute, University of Massachusetts, Amherst.

Fabrizio Lillo
Professor, Santa Fe Institute, Santa Fe, NM.

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The concepts and views expressed in this paper are solely those of Architecture 2030.

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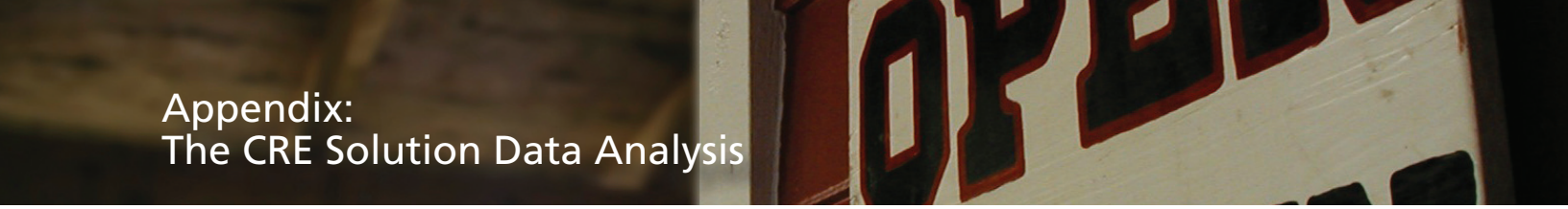


Appendix: The CRE Solution Data Analysis

Renovations of Existing Buildings

Percentage Better Than ASHRAE 90.1-2004	Private Investment ($/Sq. Ft.)[1]	Max. Annual Tax Deduction ($/Sq. Ft.)	Annual Energy Savings ($/Sq. Ft.)[2,3]	Annual Energy Savings (kBtu/Sq. Ft.)[3,4]	Asset Valuation Increase ($/Sq. Ft.)[5]
30%	$4.50	$4.50	$1.14	54.85	$13.41
50%	$6.00	$6.00	$1.47	70.52	$16.29
75%	$7.50	$7.50	$1.87	90.11	$19.71
100% (Zero-Net Energy)	$9.00	$9.00	$2.28	109.70	$22.80

New Construction

Percentage Better Than ASHRAE 90.1-2004	Private Investment ($/Sq. Ft.)[6,7,8]	Max. Annual Tax Deduction ($/Sq. Ft.)	Annual Energy Savings ($/Sq. Ft.)[9]	Annual Energy Savings (kBtu/Sq. Ft.)[4]	Asset Valuation Increase ($/Sq. Ft.)[5]
30% or ASHRAE 189	$148.61	$3.00	$0.60	32.91	$7.06
50%	$151.61	$4.50	$1.00	54.85	$11.11
75%	$154.61	$6.00	$1.50	82.28	$15.79
100% (Zero-Net Energy)	$157.61	$7.50	$2.00	109.70	$20.00

	Federal Tax Deferred	Allocated Percentage of Total Federal Tax Deferred	Square Footage Participating[10]	New Private Spending	Direct Jobs[11]	Indirect Jobs[11]	Induced Jobs[11]	Total Jobs[11]
Renovations of Existing Buildings	$4,800,000,000	80%	1,297,354,497	$6,349,206,349	59,683	27,937	34,921	122,540
New Construction	$1,200,000,000	20%	448,148,148	$67,085,010,582	536,680	328,717	348,842	1,214,239
Total	$6,000,000,000	100%	1,745,502,646	$73,434,216,931	596,363	356,653	383,763	1,336,778

	Total Annual Deferred Savings[12]	Total Annual Energy Savings	Total Annual Savings	Total Annual Energy Savings (TBtu)	Total Annual CO_2 Savings (MMT)[13,14]	Federal Revenue from New Private Spending[15]	Local State Revenue From New Private Spending[15]	Deferred Federal Revenue From Tax Deduction Over the Life of the Program (3 years)	Net Federal Revenue Over the Life of the Program (3 years)
Renovations of Existing Buildings	$1,600,000,000	$1,598,240,019	$3,198,240,019	76.90	6.33	$1,379,047,619	$453,968,254	$4,800,000,000	-$3,420,952,381
New Construction	$400,000,000	$336,772,487	$736,772,487	18.47	1.52	$14,570,864,298	$4,796,578,257	$1,200,000,000	$13,370,864,298
Total	$2,000,000,000	$1,935,012,506	$3,935,012,506	95.37	7.85	$15,949,911,917	$5,250,546,511	$6,000,000,000	$9,949,911,917

Appendix Endnotes

[1] The annual tax deduction granted is equal to the private investment for energy reduction measures, each year for three years.

[2] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. *2008 Building Energy Databook: Table 3.3.8 Average Annual Energy Expenditures per Square Foot of Commercial Floorspace, by Year*. Washington: March 2009. Using 2010 data.

[3] 2030 adjusted for renovation using relationship between percentage below code and percentage below existing energy use, based on: 2030, Inc. / Architecture 2030. (2008). *Meeting the 2030 Challenge Through Building Codes*. Released June 20, 2008, www.architecture2030.org/news/multimedia.html.

[4] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. *2008 Building Energy Databook: Table 3.1.3 Commercial Delivered and Primary Energy Consumption Intensities, by Year*. Washington: March 2009. Using 2010 data.

[5] U.S. Environmental Protection Agency. *Summary of the Financial Benefits of ENERGY STAR® Labeled Office Buildings*. Washington: February 2006. (Pg. 7). 2030 increased the capitalization rate by 0.5% for each incremental reduction beyond 30% to be conservative.

[6] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. *2008 Building Energy Databook: Table 3.5.1 Value of New Commercial Building Construction, by Year*. Washington: March 2009. Using 2006 data.

[7] U.S. Energy Information Administration. *Annual Energy Outlook 2009 Reference Case Reflecting Provisions of the American Recovery and Reinvestment Act and Recent Changes in the Economic Outlook: Table 5. Commercial Sector Key Indicators and Consumption*. ONLINE. 2009. Energy Information Administration. Available: http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html [April 2009]. Using 2006 data.

[8] Kats, G., *Greening Our Built World*, Island Press, 2010. 2030 assumed no additional cost for a 30% reduction from ASHRAE 90.1-2004 and added $3/sq. ft. for each incremental reduction based on the average cost premium of new green construction..

[9] The Average Annual Energy Expenditures per Sq. Ft. for New Commercial is assumed to be $2.00 per sq. ft.

[10] Of the total renovated existing buildings participating 75% reach the first tier, 15% reach the second tier, 7% reach the third tier and 3% reach the final tier of net-zero energy. Of the total new construction participating 60% reach the first tier, 30% reach the second tier, 7% reach the third tier and 3% reach the final tier of net-zero-energy.

[11] Political Economy Research Institute (PERI).

[12] United States Government Accountability Office. Report to the Committee on Finance, U.S. Senate. *U.S. MULTINATIONAL CORPORATIONS: Effective Tax Rates Are Correlated with Where Income Is Reported*. (August 2008).

[13] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. 2008 Building Energy Databook: Table 1 and 6 of Summary Sheet. Washington: September 2007.

[14] U.S. Department of Energy. U.S. Energy Information Administration. *Emissions of Greenhouse Gases in the United States 2007*. Pg. 17. Washington: December 2008.

[15] Assumes commercial construction produces the same percentage of tax revenue per dollar spent as residential construction. National Association of Home Builders. Fiscal Impacts of Building an Average Housing Unit on the U.S. Economy in 2005. Based primarily on data from the U.S. Bureau of Economic Analysis. Released August 5, 2005, http://www.nahb.org/generic.aspx?genericContentID=44096.

The Imminent Commercial Real Estate Crisis and The CRE Solution

Problem Summary

Commercial real estate (CRE) transactions have dropped a staggering 90 percent since 2007. Between now and 2014, $1.4 trillion in CRE loans will be coming due; half of these currently are underwater. Commercial property values have plummeted by more than 40 percent, and commercial vacancies continue to increase. In addition, the construction industry has lost over two million jobs leading to job losses in related sectors and further shrinking revenue to state and local governments. Construction unemployment now hovers at about 20 percent. The largest CRE loan losses are projected to begin in 2011 falling disproportionately on small businesses and smaller regional and community banks, many of which are FDIC insured and have high concentrations of CRE loans. Because these banks play a critical role in providing capital to small businesses and new business start-ups, their failure could undermine the economic recovery, leading to further unemployment and greater economic instability.

The CRE Solution

The 'CRE Solution' is a 3-year, tax deduction program that encourages commercial property owners to complete substantive efficiency renovation projects. The deduction would be granted on the full value of qualifying efficiency improvements up to a maximum amount. It would be tradeable and fully transferable to a new owner for the life of the deduction. The CRE Solution would amend the Energy Efficient Commercial Building Tax Deduction (26 U.S.C. 179(d)) from $1.80 per sq.ft. to a range of $3.00 to $9.00 per sq.ft. for meeting energy reduction targets as follows:

Existing Building Renovations

3-Year	Minimum Energy Reduction Target
Maximum annual tax deduction per square foot of floor area	Percentage better than ASHRAE 90.1-2004
$4.50	30%
$6.00	50%
$7.50	75%
$9.00	Zero-Net-Energy

New Building Construction

3-Year	Minimum Energy Reduction Target
Maximum annual tax deduction per square foot of floor area	Percentage better than ASHRAE 90.1-2004
$3.00	30%
$4.50	50%
$6.00	75%
$7.50	Zero-Net-Energy

For each $6 billion of deferred CRE tax revenue, the CRE Solution would generate $70.8 billion in new private spending, and $15.4 billion in new federal tax revenue, more than paying for itself.

The CRE Solution Impact

- Creates 1.3 million jobs, quickly and cost-effectively,
- Increases after-tax cash flow and property values, and reduces loan defaults,
- Increases CRE desirability and investment value,
- Increases new CRE sales (narrows the gap between the bid and ask price of CRE property),
- Brings ESCo's and A/E/C firms into the CRE efficiency renovation market,
- Decreases building energy consumption, greenhouse gas emissions, and operating costs, and
- Generates billions of dollars in federal, state, and local tax revenue.

The CRE Solution and Jobs

The 'CRE Solution' commercial building tax deduction is designed to leverage deferred federal tax dollars to stimulate private spending for efficiency renovation and high-performance new construction. For each federal tax dollar deferred, building owners will spend, on average, $11.80 on commercial building renovation and new construction. It is this $70.8 billion in new private spending that creates 1.3 million jobs[1] for each $6 billion in deferred taxes. Additionally, the CRE Solution will generate $5 billion in state and local government revenue and $15.4 billion in new federal tax revenue, more than paying for itself. And, as CRE property is sold, the government receives the deferred taxes. Since the CRE market is now frozen with few transactions and little construction taking place, a tax deduction tied to efficiency construction will increase government revenue as CRE property is sold and renovated, and new buildings built.

Both the amount of tax deduction and deferred allocation is weighted toward building efficiency renovation rather than new construction. The maximum tax deduction for renovation ranges from $4.50 to $9.00 per sq.ft. for renovation and $3.00 to $7.50 per sq.ft. for new construction. For each $6 billion in deferred taxes, $4.8 billion is allocated for renovation and $1.2 billion for new building construction.

[1] 588,621 direct, 339,020 indirect, and 372,937 induced jobs.

September 30, 2010

Mr Lee A. Solomon, Esq.
President
NJ Board of Public Utilities
44 South Clinto Ave, 7th Flr
Trenton, NJ 08625
Sent via email

Re: Energy Master Plan

Subject: Green Building Opportunities

Dear Mr. Solomon,

The New Jersey Chapter of the US Green Building Council (USGBC-NJ) wishes to commend Governor Christie and the Board of Public Utilities for conducting a review of the N.J. Energy Master Plan (EMP). We applaud the open process put forth to gather input from all sectors, and the collaboration with other State Departments to develop a comprehensive and integrated approach. The recognition of the Triple Bottom Line as the basis for policy decisions has long been held by the US Green Building Council, and we wish to offer our support to the great State of New Jersey in these efforts.

We recognize that many things have changed since 2008, so this review and course correction is entirely prudent. The economic models obviously need to be adjusted for the recession, and the impact on growth of the economy and associated jobs and tax revenues. The oil spill in the gulf, mining accidents and continued environmental consequences from burning coal, as well as economic competition from China in renewable energy manufacturing are all factors that should be driving us to act decisively and urgently. We need to enact policies that are economically, environmentally and socially sustainable for the State of New Jersey, especially in view of the limited progress made toward National energy reform.

To assist in this undertaking, we respectfully submit the attached position paper, which attempts to outline a number of recommendations which we believe can help make New Jersey cleaner, greener, and economically sustainable. These recommendations touch upon policies and functions within the Board of Public Utilities, as well as associated departments, including but not limited to the Department of Environmental Protection, Economic Development Authority, Department of Community Affairs, Department of Labor.

In addition to our position paper, we wish to express our support for the Corporate Real Estate (CRE) Solution, and urge the State to recognize the importance of this situation. The CRE Solution was developed by Architecture 2030 with the assistance of William Lashbrook, who serves as Vice Chair of USGBC-NJ. Between now and 2014, $1.3 trillion in commercial real estate loans will come due nationally, and one half of these will be underwater. The CRE Solution proposes to promote energy efficiency in a manner that will create 1.3 Million jobs, and generate billions of dollars in tax revenues. Copies of the proposal and a summary document are attached for your consideration. We would urge the State to promote this initiative at the National level via our Congressional

Delegates, and to consider implementing any of the features as they might apply at the State level.

We thank you for your consideration, and look forward to working with Governor Christie, the BPU and all of the other State agencies departments and industry stakeholders in making New Jersey the most economically, environmentally and socially sustainable State in the Nation.

Very Truly,

William Amann, P.E., LEED AP
Chairman
US Green Building Council-NJ Chapter

Cc: USGBC-NJ Board of Directors
Florence Block, Executive Director

WA/ml

OPOWER thanks the New Jersey Board of Public Utilities ("BPU") for the opportunity to comment on its conversations around updating the Clean Energy Master Plan. In updating the Clean Energy Master Plan, the BPU is looking at how to achieve large-scale energy reductions in the state despite a significant reduction in funding for energy efficiency. These reductions present an opportunity for the BPU to make energy efficiency in New Jersey more cost-effective, and customer-friendly.

OPOWER, an energy efficiency software company using behavioral science and data analytics to drive measurable reductions in residential energy consumption, writes to discuss the importance of including proven, cost-effective programs in the Clean Energy Master Plan update. Currently, 39 utilities in 18 states, including Pennsylvania and Maryland, are working with OPOWER to provide behavior-based efficiency to their customers. These deployments have demonstrated that behavior-based efficiency is both measurable and cost-effective.

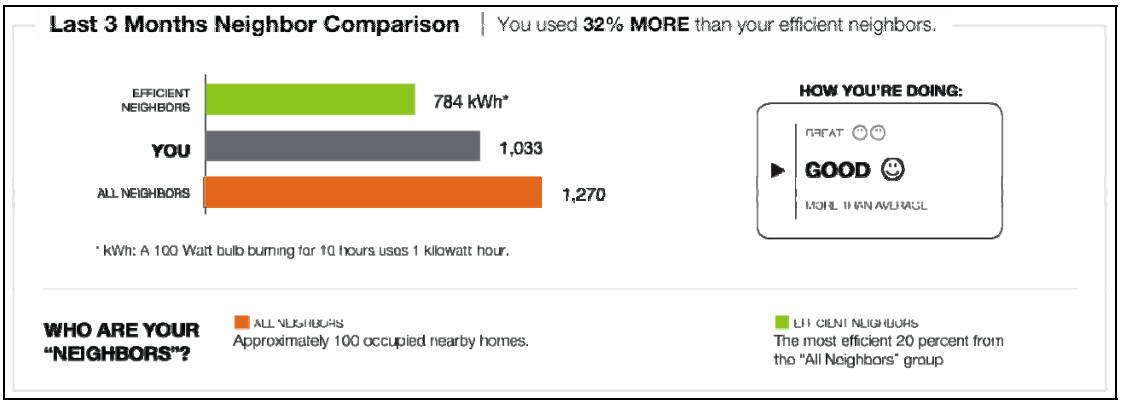
I. Behavior-based messaging creates measureable energy savings.

Behavior is the single largest untapped efficiency resource. The reason is straightforward – behavior impacts almost every facet of energy use in the home or business.[1] For example, the value of an energy star washing machine is reduced if the consumer views the "Energy Star" label as a license to use the hot cycle. Furthermore, adjusting behavior is often the only way for renters to realize meaningful energy savings, for example by remembering to turn off the television when they leave a room or lowering the thermostat when they leave for work. By providing tailored information to each individual household, behavior-based programs, like OPOWER's, motivate large numbers of customers across all demographics to take actions that result in measurable, large-scale energy savings.

OPOWER's approach to energy efficiency is organized around two concepts – motivating behavior change, and providing relevant, targeted information to the motivated consumer. Relying on utility supplied data, OPOWER's program translates individual usage patterns into meaningful insights coupled with targeted action steps.

OPOWER's Home Energy Reports provide recipients with a context for understanding their energy use. OPOWER does this by dynamically creating a 100-home comparison group for each house that only compares homes of similar square footage. Home comparison groups are further defined by a number of customizable variables, including proximity (e.g., within 0.25 miles) and census and climate data. Years of behavioral science research have demonstrated that peer based comparisons is a highly motivating way to present information. A sample neighbor comparison module is shown below.

[1] McKinsey and Company. *Unlocking Energy Efficiency in the US Economy*. Page 22



Second, customers receive individually targeted savings tips based on their energy usage patterns, housing characteristics, and demographics. Instead of presenting customers with a thick booklet of ideas on how to save energy, OPOWER presents customers with only several of the most relevant and immediately actionable suggestions on how to save. For example, OPOWER would not suggest that a renter insulate his apartment, but might recommend smart thermostats to owner-occupied homes with high heating bills.

Critical to OPOWER's strategy is an "opt out" program design with an emphasis on mailed reporting. Mailed reports enable utilities to engage the majority of targeted customers and enable the delivery of large-scale energy savings. By using mail, behavior-based messaging reaches all demographic groups, including low income and elderly populations. This means that participating utilities can engage 85% of recipients—far more than other efficiency measures. [2]

This high participation rate means that a relatively small savings on a per household basis adds up to significant savings in aggregate. Moreover, behavior-based messaging increases participation in other utility programs. By motivating customers to act and enabling them with information, OPOWER has demonstrated a 15% impact on utility-sponsored efficiency programs.

Most importantly, these efficiency changes are generated cost effectively – on average, OPOWER's program costs $.03/kWh saved. This means that by including Home Energy Reporting in its portfolio, New Jersey utilities can generate significant, large-scale energy savings at very low cost.

II. Behavior-based programs are proven to generate measureable and verifiable results.

OPOWER's Home Energy Reporting program has been consistently effective in each deployment to date. Every utility with at least six months of results has achieved energy savings between 1.5% and 3.5%. These results have been consistent across electric and gas utilities, as well as in winter-peaking, summer-peaking, and mild climates.

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[2] Summit Blue. *Impact Evaluation of OPOWER SMUD Study*. September 2009. <http://www.opower.com/LinkClick.aspx?fileticket=naU7NN5-430%3d&tabid=72>

Figure 1 shows the consistency of savings that utilities have achieved through OPOWER's program:

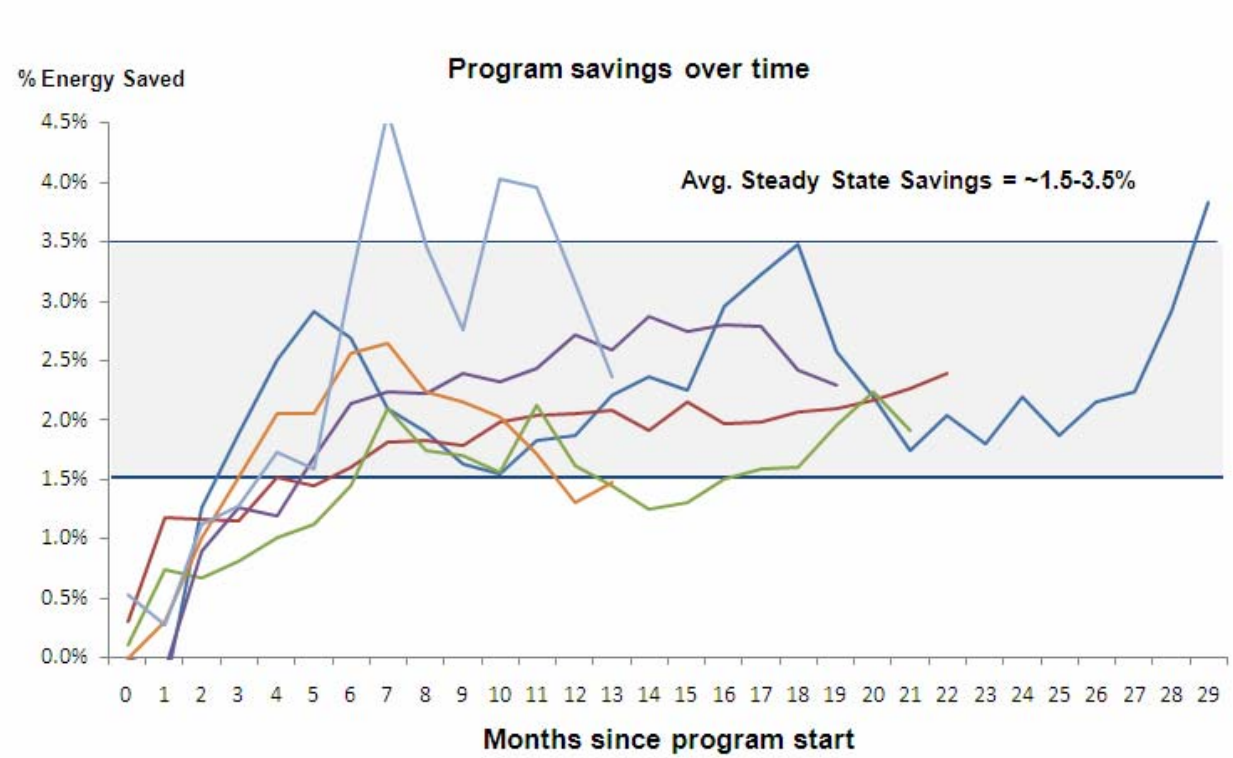

Figure 1: Results from OPOWER's Home Energy Reporting Program

These results have been verified by several leading authorities in the field. Summit Blue, an industry leading evaluation firm, has verified OPOWER's impact in Sacramento, California.[3] Professor Ian Ayers, of Yale University, has verified OPOWER's impact with in Washington State.[4] Professor Hunt Allcott, of the Massachusetts Institute of Technology, has verified OPOWER's savings with Connexus Energy in Minnesota.[5] Moreover, Professor Allcott and Professor Sendhil Mullainathan, of Harvard University, published a discussion of OPOWER's approach in *Science*.[6] In each case, the studies have not only verified the results of OPOWER's program, but have concluded that behavior-based programs are a simple and cost-effective source of energy savings.

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[3] Summit Blue. *Impact Evaluation of OPOWER SMUD Study*. September 2009. <http://www.opower.com/LinkClick.aspx?fileticket=naU7NN5-430%3d&tabid=72>

[4] Ayres, Ian. *Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage.* July 2009. Available online at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1434950>

[5] Alcott, Hunt. *Social Norms and Energy Conservation.* February 2010. Availabe online at: <http://web.mit.edu/allcott/www/Allcott%202010%2020Social%20Norms%20and%20Energy%20Conservation.pdf>

[6] Alcott, Hunt and and Sendhil Mullainathan. *Behavior and Energy Policy*. Science. March 2010. Available online at: <http://web.mit.edu/allcott/www/Allcott%20and%20Mullainathan%202010%20-%20Behavioral%20Science%20and%20Energy%20Policy.pdf>

III. The results of OPOWER's program can be accurately measured through experimental design

The results of OPOWER's Home Energy Reporting are measured using a simple test and control methodology. By using test and control groups, OPOWER is able to isolate and cleanly evaluate the impact of its program.

For example, consider SMUD's behavior-based program. Together with OPOWER, SMUD launched its behavior-based program to 35,000 homes, while maintaining a 50,000 home control group. The two groups were randomly selected and had no statistically significant difference in their energy consumption prior to deployment. Since deployment, the impact has been clear – over twenty months, behavior-based messaging has decreased consumption by 2.5% in the test group. Because the groups are, in the aggregate, identical—except that one group receives OPOWER's reports while the other does not—the difference in energy savings may safely be attributed to OPOWER's Home Energy Reporting.

This test and control methodology is explicitly endorsed in the California Evaluators Protocols and the guidelines for the National Action Plan for Energy Efficiency, which was jointly produced by the US Department of Energy and the Environmental Protection Agency.

IV. Leading states are including behavior-based programs in their efficiency portfolios.

The strong, verified results behavior-based programs have been central to the support of regulatory authorities in several states for utility filings that include large behavior-based savings. Although behavior-based programs have become a critical efficiency resource in many states, decision makers in Massachusetts, Minnesota, and California have been particularly strong in their support for utilities including behavior-based programs in their efficiency portfolios.

- Massachusetts – The Massachusetts Department of Energy Resources ("DOER") is allowing IOUs in Massachusetts to count savings generated by OPOWER's program towards their state-mandated energy savings targets. In a filing approving these goals, the DOER noted that, "one successful organization upon whose work the Program Administrators [utilities] would like to build is Positive Energy [now OPOWER], a corporation that is committed to persuading consumers to save energy through a combination of technology, analytic direct marketing, and behavioral science."[7] In total, OPOWER's programs will account for 24% of the residential efficiency portfolio for electric consumption and 20% for gas.

[7] Massachusetts Joint Statewide Three-Year Electric Efficiency Plan: 2010-2012. Page 238

Savings claimed for OPOWER's program by National Grid (MA)

	Total kWh saved	Number of Households	Total Annual kWh saved per HH
2010	26,000,000	100,000	260 kWh
2011	52,000,000	200,000	260 kWh
2012	74,520,000	300,000	248 kWh

Due to the initial success of the program, in September 2010 National Grid expanded its portfolio with OPOWER to include 425,000 homes total. With this expansion, OPOWER will be serving nearly half of National Grid's Massachusetts service territory.

- Minnesota – Minnesota's OES has approved two of the state's largest utilities, Centerpoint Energy and Minnesota Energy Resources Corporation (MERC) to count savings generated by OPOWER's programs to their state-mandated energy efficiency targets.

Savings claimed for OPOWER's program by Centerpoint Energy (MN)

	Total Mcf Saved	Number of Households	Total Annual Mcf saved per Household
2010	85,250	50,000	1.71 Mcf
2011	127,875	75,000	1.71 Mcf
2012	139,035	100,000	1.71 Mcf

After reviewing filings including OPOWER's program, OES was effusive in its praise of behavior-based programming:

> *OES Staff are pleased to see that CPE [Centerpoint Energy] will be starting the Residential Home Energy Reports project in 2010. Recent evaluations of programs across the country and in Minnesota suggest that home energy reports are a cost-effective way to educate customers and encourage energy saving behavior. CPE plans to include 225,000 residential customers, approximately 30 percent of the Company's residential customers, in this program by the third year of its triennial plan. This project is also expected to be one of the largest drivers of new energy savings in the Company's Residential Segment. CPE's program provider, Positive Energy [now OPOWER], reports that customers receiving a home energy report typically reduce their energy use by 1.5 to 3 percent. Based on this information, the Company estimates that households receiving home energy reports will reduce their energy use by 1.55 percent or 1.71 MCF annually. OES Staff believe that this is a reasonable assumption at this time. In future filings, the energy savings claimed by the Company should reflect the*

actual energy savings associated with the project based on measurement and verification by Positive Energy [now OPOWER].[8]

- California – In a landmark decision in April 2010, the California Public Utilities Commission concluded that behavior-based efficiency should be an efficiency resource for the state's investor-owned utilities. In reaching its conclusion, California examined four independent evaluations of OPOWER deployments, addressed head-on common concerns about double-counting, and solicited input from stakeholders of all kinds. In approving behavior-based savings, the Commission commented, "It is essential that we create a regulatory environment in which potential game-changing efforts such as these innovative behavioral-based strategies can flourish."[9]

V. Behavior-based programs have significant energy-saving potential in New Jersey

The New Jersey Clean Energy Master Plan contains an ambitious plan to deliver significant energy savings in New Jersey. The portfolio of programs includes a complete set of rebates and incentives designed to help New Jersey citizens save money by helping them purchase energy efficiency appliances, as well as finance solar and wind renewable projects.

While the Master Plan contains a rich portfolio of programs, OPOWER believes that there is a significant gap – the lack of behavior-based programming. Since it is much less capital intensive than other initiatives, behavior-based programming would cost-effectively generate *significant, immediate, and cost-effective* results across the state, help ratepayers save money, and maximize the value of other efficiency investments in the OCE portfolio.

Behavior-based programs have tremendous potential for energy savings in New Jersey and have less than a one-year payback. A 2.0% impact on electric consumption for every home in New Jersey would save households $24.60[10] a year. This means that behavior-based programs put money back into the economy in a matter of months, instead of requiring the type of multi-year payback period necessary for other more capital-intensive programs.

Moreover, behavior-based programs can maximize the value of other investments in New Jersey's portfolio. Increasingly, it appears that when consumers install energy efficient hardware such as a furnace or light bulbs, they operate this equipment more intensively. In other words, behavior disrupts efforts to save energy because consumers using their appliances more heavily. This phenomenon, commonly known as the "rebound" effect or the "take-back" effect, has been well documented. A recent study by McKinsey and Company showed that consumers receiving insulation upgrades on average increased their indoor temperatures one to three degrees Fahrenheit higher than before. Together, this added up to a 15%-30% decrease in energy savings.[11] USA Today also reported on the same phenomenon — a study done by the American

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[8] Minnesota Office of Energy Security. *Proposed Decision.* October 2009. Page 23. Behavior-based programming was approved in the Final Decision dated November 23, 2009.

[9] California Public Utilities Commission. CPUC Adopts Protocol To Count Savings from Behavior-Based Energy Efficiency Programs. April 8, 2010. <http://docs.cpuc.ca.gov/PUBLISHED/NEWS_RELEASE/116078.htm>

[10] This projection is conservative because the estimated saving level, 2%, is significantly lower than the impact that behavior-based programs have had to date.

[11] McKinsey and Company. *Unlocking Energy Efficiency in the US Economy*. July 2009. Page 33

Council for an Energy Efficient Economy (ACEEE) showed that people who install efficient lights lose 5%-12% of the expected energy savings by leaving them on longer.[12]

This risk can be minimized by including behavior-based programs in the Clean Energy Master Plan. Behavior-based programs minimize the risk of the "rebound" effect by maintaining efficient behavior. When customers are engaged about their energy usage, they are more likely to ensure that their habits do not change. In this way, behavior-based programs can help realize and enhance the value of other investments outlined in the Clean Energy Master Plan.

VI. Conclusion

Behavior-based efficiency is a proven, measurable, and cost-effective source of efficiency that has the potential to deliver immediate savings in New Jersey while augmenting programs already underway. OPOWER encourages the Commission to incorporate behavior-based programming in the Clean Energy Master Plan.

[12] USA Today. *Consumers Can Sabotage Energy Savings Efforts.* March 2009. <http://www.usatoday.com/money/industries/energy/2009-03-22-energysavings_N.htm>

NJAA
New Jersey Apartment Association
Home to New Jersey

September 24, 2010

New Jersey Board of Public Utilities
Two Gateway Center
Newark, New Jersey 07102

RE: Energy Master Plan Stakeholder Meetings – 2010

On behalf of the New Jersey Apartment Association (NJAA), I am writing to applaud President Solomon and the Board's decision to take a fresh look at the 2008 Energy Master Plan (EMP) and actively engaging stakeholders in this important policy process.

One-third of New Jersey's working families, young couples and seniors call apartment living "home." Of the over 1 million rental units in the Garden State, approximately 500,000 of those are located in larger, professionally managed properties of 5 units or more. The NJAA is the largest advocacy organization for professional multi-family rental housing providers in the state, and we represent owners and managers of over 165,000 apartment units.

As we have learned through the prior Energy Master Plan (EMP) process, **multi-family rental housing in New Jersey does not fit neatly into the Board's current rate structure, and is often overlooked when the Board crafts new incentive programs for energy efficiency upgrades, improvements, and installations**. Multi-family is neither purely "residential" nor purely "commercial," but is actually a hybrid class of its own.

Achieving greater energy efficiency in all residential buildings in New Jersey, including multi-family rental housing, is an important goal of the EMP.

As a result of our geography and the location, many of the multi-family housing buildings in New Jersey are older than those in neighboring states. This makes addressing **energy efficiency issues in older buildings more complicated and nuanced than in new construction**. With new construction projects that are designed, approved and executed from "the ground up," the overall project can be tailored to accommodate new equipment designs, tolerances, and code-based requirements.

However, for multi-family renovation, rehabilitation or retro-fit projects, the planning dynamics and engineering are quite different, and housing providers are forced to work with a building that is of older architecture with significant limitations on space for new equipment installation. This requires that property owners, property managers, and regulators follow a **customized, building-by-building approach** as the only option when looking to make short and long-term investments in energy efficiency improvements in existing buildings.

No two multi-family buildings in New Jersey are designed, engineered, built and managed exactly alike, whether located in Newark, Trenton or Cherry Hill. Whether the policy discussion is on the expansion of utility sub-metering technology to promote greater consumer education and conservation, or efficiency upgrades such as new boilers and furnaces, any decisions made must reflect the realities of New Jersey's housing stock.

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Policy makers must recognize this important fact and should remember to allow property owners, managers, builders and developers the situational flexibility to most effectively address their individual projects or buildings, while still achieving the energy efficiency and increased conservation we all seek.

The NJAA is pleased to offer our continued support, expertise, and resources to the President Solomon, all Board members, Board professional staff, and the Governor's Office in collaborative efforts to advance energy efficiency and conservation.

We look forward to the next steps in this process.

Sincerely,

Conor G. Fennessy
Vice President – Government Affairs

The NJAA represents over 600 multi-family rental housing providers and affiliated businesses. We are a statewide organization dedicated to maintaining, improving and building new and affordable rental housing that serves hundreds of thousands of New Jersey's working families, young couples and seniors.