State Energy Advisory Board
Meeting Minutes: February 22 – 24, 2011
Berkeley, CA

MEETING ATTENDEES

Designated Federal Officer (DFO):

- Gary Burch, STEAB DFO, Senior Management Technical Advisor, Intergovernmental Projects, Golden Field Office, Denver, Colorado

STEAB ATTENDANCE		
BOARD MEMBERS	Present	Absent
Susan S. Brown, Deputy Administrator, Wisconsin Division of Energy	✓	
Dan Carol, Strategic Advisor/Organizational Consultant	✓	
William Vaughn Clark, Director, Office of Community Development, Oklahoma Department of Commerce	✓	
John H. Davies, Director, Division of Renewable Energy and Energy Efficiency, Kentucky Office of Energy Policy	✓	
Cris Eugster, Executive Vice President and Chief Sustainability Officer, CPS Energy		✓
David Gipson, Director, Energy Services Division, Georgia Environmental Facilities Authority	✓	
Philip Giudice, Commissioner, Massachusetts Department of Energy Resources	✓	
Ryan Gooch, Energy Policy Director, Tennessee Economic and Community Development		✓
Paul Gutierrez, Vice Provost for Outreach Services, Associate Dean and Director, Cooperative Extension Service, College of Agriculture and Home Economics, New Mexico State University	✓	
Duane Hauck, Director, Extension Services, North Dakota State University	✓	
Elliott Jacobson, Vice President for Energy Services, Action Energy	✓	
Peter Johnston, Project Manager, Clean Energy Technologies, Burns & McDonnell	✓	
Maurice Kaya, Hawaii Renewable Energy Development Venture	✓	
Steve Payne, Managing Director, Housing Improvements & Preservation, Department of Commerce, Washington State	✓	
Larry Shirley, State Energy Office Director, North Carolina Department of Administration	✓	
Roya Stanley, Deputy Director, Iowa Office of Energy Independence	✓	
Janet Streff, Manager, State Energy Office, Minnesota Department of Commerce	✓	
David Terry, Executive Director, ASERTTI		✓
Steve Vincent, Regional Business Manager, Avista Utilities	✓	
Daniel Zaweski, Assistant Vice President - Energy Efficiency and Distributed Generation Program, Long Island Power Authority	✓	

Contractor Support:

- Emily Lindenberg, SENTECH, Inc.

DOE Staff

- Gil Sperling, Senior Advisor, Office of the Assistant Secretary, EERE, DOE.

Public:

- No public representatives participated in this meeting.

WELCOME & INTRODUCTION

The February 2011 STEAB meeting commenced at 8:30 am PST on Tuesday, February 22, 2011.
Paul Gutierrez (PG) Board Vice Chair, welcomed members to the meeting and thanked them for traveling to Berkeley, CA. PG asked the group to then please Board the bus to Lawrence Berkeley National Lab (LBNL) where the group would spend the day touring the lab and listening to presentations from lab staff.

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SPEAKERS

Speakers from the LBNL, the Earth Advantage Institute and the Department of Energy (DOE) participated in the February STEAB meeting and provided updates and insight with regard to specific areas of interest to the Board.

- **"LBNL and EET Division Overview"**
  Robert Kostecki, EET Deputy Division Director, LBNL.
- **"Nine Challenges of Alternative Energy"**
  David Fridley, Staff Scientist, LBNL.
- **"DOE's Commercial Buildings Partnership Program and Buildings Control Lighting System"**
  Cindy Regnier, Buildings Program Manager, LBNL.
  Francis Rubinstein, Lighting Group Leader, LBNL.
- **"Driving Demand for Home Energy Improvements"**
  Merrian Fuller, Electricity Markets and Policy Group, LBNL.
- **"Technical Assistance to State and Local Governments – Benchmarking Performance"**
  Chuck Goldman, Electricity Markets & Policy Group Leader, and Deputy Head Energy Analysis Dept., LBNL
- **"Recent High Tech Industry Research and Demonstration Projects, Encompassing Data Centers, Laboratories and Cleanrooms "**
  Bill Tschudi, Senior Program Manager, Applications Team, LBNL.
- **"Demand Response Research and Implementation – Programs and Technologies, Including Open Automated Demand Response"**
  Mary Ann Piette, Research Director, Demand Response Research Center, LBNL.
- **"Residential Retrofits"**
  Iain Walker, Buildings Scientist, LBNL.
- **"Research and Demonstration Partnership Initiatives with Industry and Communities"**
  Doug Davenport, Strategic Initiatives Program Manager, LBNL.
- **"Overview of the Energy Performance Score"**
  Sean Penrith, Earth Advantage Institute.
- **"Presentation on Hawaii Progress on Integrated Deployment"**
  Steve Lindenberg, Senior Advisor, EERE, DOE
- **"Update on Hawaii Deployment"**
  Maurice Kaya, PICTR, and STEAB member.

Copies of all of the presentations can be found online at www.STEAB.org, under the "Meetings" tab. All presentations can be viewed or downloaded directly from the website.

LBNL and EET Division Overview

- Robert Kostecki welcomed the Board to LBNL and thanked them for coming to hear about the new programs and projects happening at the lab, and looked forward to receiving feedback from the Board at the conclusion of the tours and presentations. Mr. Kostecki elaborated on the vision of the Lab which is to be a global innovation hub for science/technology in order to address the world's critical energy challenges. The mission of the lab is analysis, research and development in order to create and lead better energy technologies in an effort to lessen the environmental impact of energy use in daily life. The Environmental Energy Technologies (EET) division is the most applied of all groups within the lab and received $28 million in funding under the American Recovery and Reinvestment Act (ARRA). In this division is managed the largest buildings sector, outside of EERE. Additionally, LBNL is undertaking the Carbon Cycle 2.0 Initiative. This is an initiative to provide "the science needed to restore this balance by integrating the Lab's diverse research activities and delivering creative solutions toward a carbon-neutral energy future."
- Mr. Kostecki also gave a brief overview of the research projects going on within his division. Those include Energy Efficiency (EE) Building Systems, the Electric Energy Storage and Conversion Systems, Energy Markets, Policy and Analysis, International/Developing Counties, Combustion and Atmospheric Science, and Advanced Energy Technologies. Maurice Kaya (MK) asked about the labs investment in research regarding energy storage and the response was that there were some seed projects using ARPA-E funding, but that grid management and integration were the key issues LBNL was focusing on. Dan Carol (DC) asked about the

deployment programs occurring at LBNL, and Mr. Kostecki noted there are collaboration efforts with private entities in an attempt to better understand how industry develops and markets their technologies, and the lab then uses those demonstration models to successfully replicate an internal deployment process. Gary Burch (GB) continued by asking to share with the Board the ways the STEAB can assist with getting technologies out of the lab and into the marketplace, and Mr. Kostecki noted much of this would be covered on the tours. Peter Johnston (PJ) offered the STEAB as a way to liaise with the local community as well as the state as in his experience, the outreach by labs is very localized and communication tends to flow into the lab instead of out. John Davies (JD) agreed with this comment and Mr. Kostecki replied that indeed the lab was trying to be more open and transparent and also attempting to synchronize their activities to those of other labs to utilize the available resources and outreach opportunities.

- PG thanked Mr. Kostecki for his overview and enlightened the group of LBNL staff about what the STEAB was looking to accomplish while on-site at the Lab. This included understanding and learning about the types of technologies that are ready for market deployment, and would like more information on the labs commercialization and deployment activities. The Board is specifically looking for ways to get the individual states involved in assisting with the "applied" aspects of LBNL.

Nine Challenges of Alternative Energy

- Dr. David Fridley next spoke to the Board about a paper he wrote as a fellow for the Post-Carbon Institute about the challenges of alternative energy. The discussed nine challenges were as follows:
  1) *How do you make energy return on investment*? - a very important concept is an Energy Return on Investment. The lower the Energy ROI, the more energy a society must devote to producing energy and the less energy there is left for society itself.
  2) *Scalability and timing* - current depletion rate is key. For alternative energy to be achieved it has to be supplied in the time frame and at the volume needed.
  3) *Substitutability* – very few technologies available now are "drop in" technologies as there are infrastructure changes needed to make energy substitutable.
  4) *Commercialization* - it takes 15 to 25 years from the invention of a new alternative energy technology to full market-ready roll-out.
  5) *Input Requirements* – inputs to alternative energy development are material resources and not money. *Intermittency* – our energy system operates 24/7 and the system has been built on this expectation. Large scale deployment of renewable energy requires storage solutions, and energy storage is a very big issues in terms of energy density.
  6) *Land and water* – the denser an energy form is, the less land is needed for its deployment. Large scale deployment of alternatives will incur considerable costs.
  7) *Stock vs. flow* – fossil fuel is based on the consumption of a stock already available. Society can exploit that at the rate we demand. When moving towards EE and RE, there is more of a flux/flow of energy instead of a stock from which to draw.
  8) *The Law of Receding Horizons* – breakeven costs of energy-input-intensive-alternative energies will dynamically rise with the overall cost of energy.
- Dr. Fridley concluded his presentation noting that currently alternative energy relies heavily on fossil fuel and until we can eradicate that, these technologies need to be thought of as "assisting" technologies and not as "replacing" technologies.

DOE's Commercial Buildings Partnership Program and Buildings Control Lighting System

- Francis Rubenstein spoke to the STEAB about the Buildings Control Lighting System noting the buildings sector is the largest user of energy for lighting, and consume 40% of total energy production. This program handles the research, development, demonstration and deployment of buildings lighting systems. They have a three-fold approach; 1) design, delivery and operations, 2) deployment and market engagement, and 3) buildings systems. Using a systems approach, the program integrates optimizing energy with also capturing social equity and maintaining health and other concerns. The "Great Challenge" of this program is a focus on the life-cycle of the building, the integrated smart building system, the intersection of technology and policy as well as being about to measure and document energy usage. A success this control lighting system has is with the New York Times building where LBNL helped integrate intelligent lighting and shade control to drive down the cost of energy and address the issues of wasted lighting.

- Cindy Regnier continued this discussion by speaking specifically about the Commercial Buildings Partnership Program. This is a DOE flagship program to develop a set of EE and market-ready building solutions that can be widely deployed throughout commercial buildings in the country. It is a multi-lab consortium launched in 2008, with additional funding received from ARRA in 2010. There are currently 54 projects underway to lead by example and showcase high energy savings with these buildings in hopes to encourage others to adopt these types of technologies and strategies. LBNL is providing technical assistance as well as measuring data and documenting what is collected in order to ultimately leverage this information so it can be replicated throughout the building industry. The biggest challenge facing this program, however, is how to engage better with utilities and other organizations to get the word out about the successes these buildings are having. Larry Shirley (LS) asked if this project got states involved at any level, and Ms. Regnier replied in the negative, but would be happy to work with states if there was a department or contact which would be best to reach out to. Currently the only involvement with states is via the Energy Alliance, and the engagement remains tertiary. Vaughn Clark (VC) asked about the methodology behind building tenant engagement and the attempts to change tenant behavior. The response from Ms. Regnier is that the program works with tenants prior to their move to a new building. The program tries to institutionalize occupant behavior changes while the tenant is still in the current space in an effort to make the transition to the new space easier and less disruptive to the daily activities of the tenants. She noted culture change is key to the success of this program and that has to start immediately

Driving Demand for Home Energy Improvements

- Merrian Fuller provided the next presentation about how LBNL is providing technical assistance with regard to EE financing, driving demand for building EE upgrades, and assisting with post-ARRA sustainability for current EE programs. The lab recognizes that many local governments had little to no EE experience and with ARRA grants there was an immediate need for support. Currently, the majority of support is done with Better Buildings grantees. The type of support provided includes hands-on support, webinars, peer-to-peer exchange facilitation, the creation of tools and resources to highlight innovation, and an analysis of best-practices and lessons-learned. The 'Driving Demand for Home Energy Improvement" was a report put out by LBNL recently and spoke about the limited success to-date of motivating large numbers of Americans to invents in comprehensive home energy improvements, especially in cases where they are being asked to pay for major improvement costs. This report looks at things from a marketing and motivational aspect and includes case studies for documentation.
- The major themes of the report are as follows:
  1) Engage Trusted Messengers - start with local opinion leaders, model success, encourage personal contact with peers, and get buy-in from local organizations. Make sure the first people have a great experience and therefore encourage the follow-on.
  2) Partnering With Contractors - design a program that contractors want to sell, and consider sales training/marketing incentives for contractors. Understanding that not all contractors have same business model is vital.
  3) Identify a Target Audience – don't try to reach everyone in the initial launch. Focus on early adopters and use focus groups to help build and change strategies by targeting hot issues.
  4) Sell Something People Want – people want comfort, a practical investment, self-reliance, health, a sense of community. Contracts and projects sell a *solution* to a "problem".
  5) Language Matters - words have power. The key is to figure out what words/terms are not effective (i.e. audit). Understand that communication styles matter and precipitating a language change matters to long-term success.
  6) Pilot Experiment, And Measure - know the success and failure of a project by measuring and experiment to figure if it work in the most effective way possible. To be successful long-term we need to make sure we know what is working and what is not.
- DC thanked Ms. Fuller and commented on the necessity of using intermediaries, like state officials, in projects like this. He has observed that a plethora of websites and materials are available to consumers, but DOE, he feels, has been slow to understand the importance of using these avenues and resources available from the states to engage consumers.

Technical Assistance to State and Local Governments – Benchmarking Performance

- Three key points were discussed during Chuck Goldman's presentation. Those included the US Energy Services Company (ESCO) Industry and Market Trends, ESCO Project Performance and the results from the LBNL and the National Association of Energy Services Company (NAESCO) Database, and benchmarking tools and information to assist state governments. An ESCO, or Energy Service Company, is a business that develops, installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities over a period of time. They act as project developers for a wide range of tasks and assume both the technical and performance risk associated with the undertaking. ESCO's focus on performance-based contracting. When LBNL and NASECO teamed up to measure success, the partnership relied on voluntary participation from industry, government agencies and ESCO provided data which was verified through a peer review process. The outcome of the report showed LBNL and NAESCO that consumer are spending more money on investing in better EE and RE projects. The average savings when invested in ESCO projects is about 25%, but up around 30% to 40% for lighting and retrofit projects. From this report both groups realized that they had enough data to set benchmarking tools for all ESCO projects and they are currently working on creating fact sheets to help grantees asses potential performance of proposed projects. Within the next few months, these actual benchmarks will be rolled-out and that information will be forthcoming from the Office of Weatherization and Intergovernmental Programs (OWIP). These benchmarks will help establish base-line metrics and measure which apply to all projects.

Recent High Tech Industry Research and Demonstration Projects, Encompassing Data Centers, Laboratories and Cleanrooms

- Prior to departing for the LBNL tours, Bill Tschudi spoke to the STEAB about how his group works to bridge the gap between research and application as it related to high-tech buildings and data centers. The reason for the focus on high-tech buildings like cleanrooms, data centers, hospitals, etc. is because they have a large energy footprint, continuous operation, and high-energy intensity without a focus on EE or trying to understand common infrastructure opportunities to reduce energy use. There are similarities between all of these building types with regards to barriers to efficiency; redundancy options, sizing issues, and many are exempt from building codes due to their facility use. Mr. Tschudi's group reviewed the types of activities occurring in these buildings and from that review created benchmarking, roadmaps, and assistance for federal data centers and provided demonstrations of emerging technologies which could be of use in the building. Some of the different demonstrations LBNL has been involved with include DC Power for data centers at UC San Diego, the Novel Control Strategies, and Novel Cooling Systems. Concluding this presentation, Mr. Tschudi summarized that more outreach and training for the industry is needed in order to keep pace with the growing high-tech industry. The only way to help change industry behavior is to break-down old paradigms and continue collaborations with the lab and industry.
- Following this presentation, the STEAB toured the LBNL Data Center to hear more about the types of activities on-going at the lab as well as to see a demonstration of the types of activates being used in the industry to bring EE to high-tech buildings, labs and data centers. Following that tour, the STEAB visited LBNL's windows Test Facility and met with Eleanor Lee who demonstrated several types of emerging technologies and day-lighting strategies either in use or being tested for eventual roll-out.

Demand Response Research and Implementation – Programs and Technologies, Including Open Automated Demand Response

- Mary Ann Piette was the first speaker after the conclusion of the lab tour. She focused on Demand Response Research noting the scope of Demand Response Research is focused on three areas; energy systems integration, buildings, and industry. Demand response allows retail customers to participate in electricity markets by giving them the ability to respond to prices as they change over time. Ms. Piette focused her presentation on California's Open Automated Demand Response (OpenADR) which is a communications technology which uses an internet based continuous 2-way signaling system begun in 2002. The internet signal interacts with buildings that are pre-programed to change the electricity load at certain intervals in an effort to reduce the number of black-outs and brown-outs affecting the state during peak load times. Though this system is successful, LBNL is currently looking to develop a new mode and model; one which provides more feedback, assesses how quickly loads can change, and focusing on what types of energy can be dispatched quickly at peak load intervals.

- On the residential side, smart meters are the visual element for consumers to better understand Demand Response as well as begin to understand the importance and value of the SmartGrid system. Though the actual link/communication between the smart meter and the utility company is proprietary, LBNL is working to develop an internet based system which could get the information off of the smart meter and into the home on a display of some sort in order to engage and inform the consumer about their home energy use.

Residential Retrofits

- Iain Walker spoke to the group about the work LBNL is doing with residential retrofits. The big question is what can the lab and industry do to energize the country to want to retrofit their homes? The lab isn't trying to invent something that is a one-size fits all because they recognize each home and resident is different and has varying needs. Current projects are focusing more on monitoring and looking at the individual end recipients of retrofits. The lab is pulling together information for contractors to help them understand best-practices to help them do their job better and build consumer interest and confidence. 2020 is a target date where all new residential construction has to have net-zero energy usage. Mr. Walker reminded the STEAB that the technology to do this exists, its changing contractor and consumer behavior that will make this a reality.
- Changing behavior and understanding has begun with DOE labeling on homes and buildings. Labels would give good or poor energy ratings to the home and occupants. The lab has a tool called the Home Energy Saver (homeenergysaver.lbnl.gov) where consumers may enter information about their home and location and receive a score/rating of the efficiency of the home. He emphasized that in order to do residential retrofits well, DOE, the lab, contractors and industry have to know what consumer are doing at home already and what they use in the home before the real savings with retrofits can be measured. There needs to be better information and stronger guidance given to contractors, city and state governments in order for those entities to then deliver that information, as a trusted peer, to the consumer. Changing mass-consciousness is key, and the way to do that is to get trusted messengers to deliver correct information in a timely and effective fashion to consumers.

Research and Demonstration Partnership Initiatives with Industry and Communities

- The final lab presentation of the day came from Doug Davenport who spoke to the STEAB about current partnership initiatives with industry and local communities. Mr. Davenport's group works to find the right ways to leverage expertise in order to address energy challenges in conjunction with industry, government, and utilities. Being able to find appropriate and challenging scale test beds or demonstration facilities is vital to this as well. Along with finding the appropriate testing location, the lab has to leverage resources and expertise in order to address barriers to technologies and establish systems to expedite the inclusion of the technologies into the marketplace.
- An emerging project at LBNL is the Silicon Valley Network. It represents 38 cities and counties and the role of the network is to create partnerships between the private sector and city government in an effort to solve key issues, one of which is the large-scale roll-out of the SmartGrid. Currently the network is doing community grid forming to test grid management issues. The benefit of this type of system enables integration of on-site power generation, creates a lower net carbon footprint, and improves power quality for those connected to the grid. This type of small-scale tests helps foster innovation within a real-world grid context and addresses the issue of high-density renewables within a defined area.
- Another project focuses on urban infrastructure in an effort to reduce energy use and pollution. LBNL wants to look at the effects of different types of cooling materials to address the "heat-island" effect. The effort will address both the cost of improving building energy performance, as well as assessing the efficacy of smart grid integration and the return on investment for "smart buildings." The San Jose Cool Cities Pilot is a project which will do exactly that. The city wants to delineate a 2 – 4 Km square sector of the city as a "Cool Zone." The benefit to the community is an infrastructure to look at advanced materials testing and creates an opportunity to design a repeatable program for accelerating cool roofs in other cities across the United States.VC and DC commented that there are many technologies and pathways, aside from these partnerships, which already exist, but they feel the labs and DOE do not take advantage of these different opportunities. By using existing infrastructure, associations, partnerships, etc., the lab would have more success than just beginning a new initiative. The key is to get information, technology, innovation, understanding and assistance out to consumers so the end-user can begin to make changes in energy use and ultimately facilitate a wide-spread consumer behavior change.

- PG thanked all of the presenters for their time and thanked LBNL for its hospitality to the STEAB during the day of talks and tours. He noted the overarching themes of the day were a need for outreach and training, the importance of consumer and industry buy-in with regards to new EE and RE technologies, the vital need for collaboration with industry and local governments in order to facilitate a change to consumer behavior, as well as the need for better communication both into and out of the National Labs.

Overview of Home Energy Performance Score

- Wednesday morning, February 23, 2011, opened with a presentation by Sean Penrith from the Earth Advantage Institute. He spoke of projects in Oregon and Washington which spurred retrofit action by starting with a small program and rolling it out to a larger-scale project focused on education for those who were certifying homes with the Energy Performance Score (EPS), and building consumer trust by showing the back-end measurements of savings to the home-owner. He spoke about how five tools are being used to determine a home's performance and those tests were what has been dubbed EPS. He did acknowledge the variety and prevalence of other home performance labels, and reviewed the pro's and con's of each. Speaking about how to motivate consumers and incentivize them to change behavior is a key part of getting the labeling correct.
- A brief overview of how the EPS for a home is determined as well as the implementation of the program was highlighted during the presentation. He elaborated for the STEAB how after the first year EPS rolled-out, the average home showed an energy savings 15% higher than the EnergyStar average savings. New home builders are buying into EPS and the program is taking off in Seattle and parts of Portland. He noted the average conversion rate from audit and score to actual retrofit nationwide is only about .05%, but with EPS in Washington and Oregon, the adoption rate is between 50% and 70%.
- The Earth Advantage Institute is working with DOE on an online client based database which uses 28 data points to provide a home energy score in less than 60 minutes. This system is fast and easy for consumers to use and allows the consumer to participate and interface with the actual home audit. Mr. Penrith did note that currently there are multiple home energy score labels available, but not all are comparable at this point. He feels a national label is the answer to this, but for now, the solution is to create a place, DOE or otherwise, where the consumer can go to get information and assistance on the different types of labeling available and the types of retrofits and the actual costs of the retrofits should the consumer choose to proceed. Coupled with that, if multiple labels continue to exist, there needs to be a set of standards put in place to insure each label is standardized to the same range of metrics so the comparison between houses can truly be apples-to-apples. Roya Stanley (RS) asked Mr. Penrith about what is going on specifically within Oregon and Washington that is assisting with the high adoption rate of retrofits after the EPS was received? Are there programs or ad campaigns which are assisting with the adoption rate? The response was that the EPS was using testimonials from consumers and contractors and coupling those with the estimates for the retrofits to show other consumers how their peers feel about the process. It has created almost an Angie's List type of review and vetting process which means something to the consumer and increases their likelihood of buy-in.
- A general Board discussion ensued after the conclusion of Mr. Penrith's presentation. The Board discussed changes in staffing at DOE within the EERE Front Office, the impact of the Efficiency and Renewables Advisory Committee (ERAC) on the efficacy of the STEAB, as well as reviewed the previous day's presentations and tours. The Board discussed at length the lab tour and the overall themes they heard at the lab while visiting. During the discussion the Board identified several general areas where they felt the National Lab structure needed improvement and/or assistance. Those areas were as follows:
  1) *Communication* – there are communication problems at the labs, both internally and externally. The labs are not communicating effectively with one another, nor are there any promising outreach programs occurring that connect the labs with their communities, aside from the limited R&D aspects and industry partnerships.
  2) *Coordination with other National Labs* – a communication issue as well as a collaboration issue. How do the labs know they are not replicating research or other efforts that have already been tried by other National Labs? Could Dr. Karina Edmonds help facilitate better collaboration and coordination between the labs?
  3) *Feedback* – its clear to the STEAB that the labs do not know what the states want or need. The labs need to work with their local and state government to determine what the immediate needs of the community is so research, development and demonstration can be tailored in a meaningful way.

4) *Better public access to the labs* – investors, industry, private consumers need access to the labs information and assistance. Perhaps the National Labs can create an economic development plan to assist these potential stakeholders.
5) *Lack of new technologies presented by the lab* – the technology demonstrated to the STEAB were things the Board was already aware of or had already seen. They felt the focus was more on policy development than ground-breaking research.
6) *Structure around the projects* – too many players at each lab and they are not well connected to common defined goal. The focus on project connection is missing, as is their connection to the private sector.
7) *Deployment* – any deployment or commercialization efforts need to be done in a top down approach with concrete goals and appropriate project funding levels.
8) *Lab Research* – research should be tied more closely to commercialization and marketability. Also coordination must occur within the lab as well as with the private sector.
9) *Dialogue* – there is a distinct lack of continuing dialogue between labs, with the labs and DOE and the lbas and groups like STEAB, ERAC, other organizations, etc.
10) *Collaboration* – the lab can only go so far with R&D and deployment. A need for private sector involvement or the creation of tax incentives to help overcome the Commercialization Valley of Death.
11) *Science vs. deployment* – do the scientists and researchers know how to commercialize, deploy, and push technologies in the market? If not, what can STEAB or DOE do to help teach and train labs and scientists about the vital need for the commercialization of the technologies being developed within the National Lab structure?

- After identifying these areas, the Board determined there was a need for either a Resolution or some sort of white paper which the STEAB could write and then deliver to the labs about their observations, concerns and questions. This document should be made applicable to all labs, not just LBNL or the other labs visited by STEAB because the above issues pervade the entire lab structure. This paper would focus on the need for outreach, communication, collaboration, deployment and commercialization, as well as address the successes many labs have already had, and the ways in which an existing infrastructure can be used to increase the effectiveness of research and development while leveraging the tax dollars already invested.

Hawaii's Progress on Integrated Deployment

- The next presentation was by Steve Lindenberg of DOE's Hawaii Clean Energy Initiative (HCEI). The purpose of HCEI is to transform 95% petroleum dependent energy structure into one that by 2030 is 70% run on renewables and other clean energy technologies. The purpose is to increase Hawaii's energy security, economic security, as well as provide job growth to the islands. Hawaii received many private company investments in clean energy, up to $1.2 billion annually, because Hawaii is a good place to invest because of the predictability of price and the investment by state government. HCEI is working with organization to get local buy-in to the program and increase community and stake-holder involvement.
- There have been major strides with RE initiatives, such as the building of a new 30 MW wind farm, integrating RE technologies into the grid, and also utilizing Hawaii's PV infrastructure which is three time higher per capita than anywhere else in the US. On the EE side there have also been real strides made. The establishment of a Public Benefits Fund and a" lead by example" program as well as new building codes and the weatherization of a large number of homes across the state. Hawaii has designed and developed strong building codes and that have been successfully adopted by county boards.
- Mr. Lindenberg spoke of the need to get stake-holders involved early. Utilities, oil companies, county and state government were brought to the table in the beginning of the process and there are also currently five non-profits involved as well. The group holds sector meetings three times a year, and there is a steering committee established to make sure that the working groups are going in the right direction and no one group is bearing the brunt of the work and planning. He reiterated the importance of having stake-holder involvement noting that currently there are efforts with national labs to help Hawaii conduct analysis of the progress, as well as help HCEI build models and methodology which can track progress and success. With regards to cost, its has been about $4 to $7 million a year for three years, and that funding comes from stake-holders, DOE, the state and other areas.
- Elliott Jacobson (EJ) asked if there was a report which could be delivered to the STEAB about this process. He noted interest in also learning more about how an initiative of this kind could be adapted to cold weather climates. Mr. Lindenberg responded by noting the successes in Greensburg, KS after the city was destroyed by

a tornado. DOE worked closely with the city from the beginning, understanding what the energy needs were, what the available infrastructure was, and how to make this type of system work effectively in that type of community with its weather and climate needs. This strategy has also been adapted in places like the Virgin Islands which has its own unique climate needs.

- Concluding the presentation, Mr. Lindenberg reviewed the lessons-learned during this program and noted this type of large-scale integrated deployment has been most successful in markets where utility costs are very high. Ensuring access to resources for analysis of the program are key because metrics can be established and properly monitored. Buy-in is key and being able to motivate people to think about energy and encourage them to go as big as they can with their resources. Having a Governor or other leader as a part of the process is key because that individual already has won over the public trust. The goal now is learning how to manage the transition from petroleum based energy system to one of EE and RE integrated technologies and resources. Making sure to share the credit where it is due, with all of the stake-holders, is part of the reason this program has been successful and continues to draw interest from government and industry.

Update on Hawaii Deployment

- MK gave the next presentation and provided another update on Hawaii deployment activities. Reiterating the purpose is to help Hawaii grow into a greener economy, reduce emissions and grow jobs, he noted the challenges of wind intermittence, and full-scale integration are still occurring. Some of the other challenges is that the state needs 2 GW of energy to fully power the state, and none of the island grids are currently connected. Recognizing these challenges, there is a program which matches the needs of the state to market transformation efforts. This program is called Hawaii Renewable Energy Development Venture (HREDV) and is an earmark program set-up in 2008 to solve some of these challenges and be a catalyst for local clean energy industry and initiatives. The program is a technology motivator assisting RE technologies over the commercialization "Valley of Death" and addressing other issues arising out of HCEI. The need of the community drives how the investment program is set up.
- MK noted the venture reviewed all of the private companies who were interested in investing in Hawaii and in this initiative. Innovation is a critical part of the future of HCEI and HREDV. MK noted that unless this initiative supports these innovators Hawaii will lose more and more ground and the incumbent electricity providers have to be open to accepting innovation in a tight market. State policy can only do so much, so HREDV really needs hands on folks taking this and putting it into practice in the different communities. Today, there is a vertically integrated tightly market controlled system but in the future Hawaii will move more and more to a system which is more horizontally integrated.
- MK wrapped-up his presentation by reiterating what Mr. Lindenberg said about needing a person who can help others connect the dots and bring a common vision to everyone. Coupled with that approach, stake-holder and local buy-in is key to help change the minds of utility companies and consumers, as well.

Board Discussion

- PGD and DC began the Board discussion with a review of the white paper written by the Deployment Task Force. The goal of the Task Force is to disseminate the paper to interested parties including trade associations, community organizations and the White House, and once interest is drummed up, the paper will be presented to the EERE front office for consideration. Gil Sperling (GS) volunteered to set up the EERE front office briefing and DH suggested the June STEAB meeting in Washington, DC focus on deployment and this implementation of the recommendations set out in this paper. Though PGD did not want to impose a timeline on DOE to act on these recommendations, John Davies (JD) asked if this paper should be edited to include a Road Map and everyone agreed that would be a good idea. David Gipson (DG) suggested adding a section to this paper about metrics or bench-marks, and PGD also suggested making this paper align more closely with the draft DOE Strategic Plan which the Board commented on a few weeks ago. The STEAB agreed the Deployment Task Force would slightly edit this document to make the suggested changes and the group would them come together and vote on the paper at a later time during the meeting.
- JS asked the Board to please review the Task Force breakout and membership, and asked new STEAB members to volunteer to join Task Forces. Steve Payne (SP) asked to join the HUD/DOE Task Force. Larry Shirley (LS) asked about combining the current SEP and ARRA Task Forces, but GS commented that Weatherization and SEP have to have conversations starting immediately because the levels of funding will be changing and these programs cannot be sustained should funding be cut significantly. Steve Vincent (SV) commented that

the HUD/DOE Task Force was set up at a time when the make-up of the STEAB was different and the WAP and SEP programs were not at risk of losing all of the funding. He suggested a change to the name of the Task Force as did JS who suggested the members of the HUD/DOE Task Force re-align the goals to meet the current issues facing the program. JS also asked that the ARRA and SEP Task Forces Merge to become one and the short-term goal of the new SEP Task Force would be to look at the SEP Evaluation as well as the funding questions. All members of the Board agreed and the Task Forces then took a short time to meet with one another in break-out sessions.

- Following the Task Force break-out sessions, the Task Forces provided a brief update to the STEAB as to the new goals and objectives moving forward. The Deployment Task Force provided a new draft of the white paper which incorporated the suggestions form the previous discussion. JS asked if there was a motion to adopt the white paper and Paul Gutierrez (PG) motioned, and Daniel Zaweski (DZ) seconded. The white paper by the Deployment Task Force was unanimously adopted on February 23, 2011[1].
- The SEP Task Force provided the next update and Roya Stanley (RS) asked GS to please help arrange a webinar with DOE to provide the Task Force with an update on what is currently underway with regards to the SEP evaluation. JS added that the Task Force would review the evaluation process and work to showcase the benefits and progress of SEP and RS reiterated the importance of articulating the vital role states play in accomplishing the President's objectives. DG completed the update by noting energy assurance needs to be a priority of the Task Force and since SEP funding was ramped up with ARRA, the group needs to insure that energy security is maintained even if energy assurance ends up being eliminated. RS suggested DG become the chair of the Task Force and DG accepted the appointment.
- EJ provided the update for the HUD/DOE Task Force. EJ and SP outlined the two new goals of the Task Force which are developing a long-term strategy for the viability and sustainability of the Weatherization program, and working with HUD and other agencies to develop models to which WAP can be applied to low and moderate income occupied multi-family buildings. GS asked the Task Force to begin a dialogue with DOE on this immediately and suggested contacting Robert Adams about this issue. He noted there would be a big WAP and SEP Stakeholder meeting in Washington, DC in May and perhaps members of the Task Force could attend this meeting and gain insight into the future of both programs. Susan Brown (SB) and EJ asked about how to get included in those types of activities and GS promised to put them in touch with the right people at DOE.
- Duane Hauck (DH) presented the USDA/DOE Task Force update and shared copies of the Task Force Concept Paper and the metrics document with the Board[2]. The metrics document outlines measures and bench-marks which could be applied to a potential partnership in order to measure success. The next steps for the Task Force are to work with DOE and USDA to identify individuals from each agency to participate on a joint committee in order to outline parameters around this partnership and work together to "sell" this idea to the Secretaries of each agency. Another goal is to have PG meet with Senator Bingaman and Senator Conrad to explore the idea of having both Senator's support a legacy resolution which speaks to this Concept Paper. The Task Force also plans to try and meet with Dr. Kathleen Hogan at DOE again and work to engage her in this process as well.
- JD asked about what the group decided to do with feedback after the visit to the lab. RS noted the issues are things that are universal to all labs, not just LBNL. DC agreed, and Peter Johnston asked if it was possible for the STEAB to get a report from NREL about how well that lab is doing with deployment efforts? Does a report like this exist so at least the Board would know what has been done and what is being done? The STEAB needs to focus on deployment next time we go to a lab, instead of just hearing presentations.
- GB said the STEAB can reach out to the labs the Board works with and ask for reports like this. The STEAB can continue to visit labs and make recommendations to the directors and deployment folk by emphasizing the reason for the visit is because STEAB is deployment focused. RS noted when asking for this report, the request needs to go to the top and ask for specific things. Like with NREL, they have CRADA's and CREED and the Board wants to make sure they are asking for the right thing and not just "anything" related to deployment. That way, there can be a better understanding of the results of these initiatives and really understand their impact. GB observed the labs current utilize four criteria to measure success and all the criteria focus on technical papers published, number of CRADA's, etc. None of those metrics for a labs success focus on deployment.

[1] A copy of the adopted White Paper can be found directly following the minutes as Appendix A.
[2] A copy of the USDA/DOE Concept Paper can be found following the minutes as Appendix B.

- GS suggested setting up a Lab Task Force to work with labs to make sure EERE funding is working well and going to the right programs. MK understood there was an effort in DOE to get all the labs together periodically in order to increase *efficiency* of the labs. Is there still an effort of this sort? Usually we had a lab or lab representative in our live meetings, but could there be a benefit of having Lab representatives and DOE representatives at all STEAB meetings? GS noted there are meetings between Lab directors in order to increase efficiency and eliminate redundancy. Lab directors meet with the Secretary routinely. GB suggested STEAB have a presence at the meetings where lab directors are when they meet with the Secretary.
- DH reminded the STEAB that the focus of labs used to be on relevant deployment and there was a division in DOE to deal with deployment initiatives. Does this group still exist? Did that process work? The STEAB really need to do something, because current efforts are not working. Last time in Berkeley, the STEAB created a webinars which was really successful and highlighted a "deployment ready" technology. RS suggested whatever group is established needs to be insular from politics. STEAB has to have more time than just the 4 years during an administration and we really need to do something separate from politics in order to get that done. Coupled with that, the Board really needs resources in order to make this work.
- DC noted that expecting DOE to change is simply too optimistic and not realistic. The Board needs to identify what to do about the lab structure and then identify ways to get DOE to buy into it. So often it is all about the money and if there are better ways to spend the money on deployment, there is a need to look at that. Vaughn Clark (VC) believed the issues with labs currently all focuses on the communications and pipeline issues. Labs would be impressed how many people want to get in touch with them, as we saw from our networking event. GS asked the group if it makes sense to have a meeting with Casey Porto from NREL and other lab directors sit at our meeting in June. JS agreed, as did EJ who suggested a lab visit for the November 2011 meeting. RS reiterated the need for a task force to talk about all of this and look at lessons-learned and best-practices. There are a set of things we have learned from these meetings and we need to make sure we take a fresh approach to this problem with the labs. MK agreed saying the Board needs to not just work with the labs to be effective. Deployment within EERE is scattered and dysfunctional. The Secretary is about to move Karina Edmonds out of the Office of Science and into the office of the Secretary. Only 1% of budget will be set up for a deployment fund. If STEAB were to force these questions we have already identified at a timely opportunity, we can help indirectly steer programs for deployment in the right direction.
- PJ offered to be on a new Lab Task Force, as did MK and VC suggested getting a volunteer from the Labs to join the Task Force. SP also asked to be on the Task Force and JS confirmed that there was clearly a need to officially establish a Lab Task Force and PJ asked again that the first order of business be getting a report from the labs indicating what they have done. Lab representation at meetings is also key and the Task Force could work up a 1 to 2 page paper for submission back to LBNL about the Board's experience and thoughts on how LBNL can be more effective.
- DC suggested with all of these changes and updates and the work of the Task Forces, perhaps the STEAB can work on trying to create a blog of some kind. DC offered to help set up a blog link on the STEAB website and JS, and EJ agreed this would be a good idea and would help DC create a blog or at least postings about STEAB initiatives and success stories.
- The meeting then turned to the portion of the agenda where the meeting opened up to public comment. Neither GB, GS nor the contractor support had received written statements or verbal statements from members of the public to be presented at the meeting. Seeing as there were no members of the public present at the Board meeting, the public comment portion of the meeting was closed by JS.
- JS then moved on to the STEAB logistics portion of the meeting. The group decided to keep the teleconference calls on the third Thursday of each month at 3:30 PM Eastern Time. The next live Board meeting is scheduled for June 7 – 9, 2011 in Washington, DC at the Capital Hilton. Members discussed possible presentation topics and the overall consensus was for the meeting to focus on deployment initiatives, and try to bring Lab representation to the meeting. EJ wanted a focus of the June Board meeting to also be on Weatherization and the future of the program and PG would like there to be an opportunity for the Task Forces to meet as small groups and bring in representatives from DOE and other agencies to meet with each Task Force. JD suggested inviting the Assistant Secretary for EERE and SP questioned as to whether or not to continue the discussion of the Home Energy Performance Score.
- DC asked about the fall 2011 meeting of the STEAB and what dates to choose as well as what location. The dates were chosen as November 8 – 10, 2011 and the location was unanimously proposed as Hawaii in order to continue the Integrated Deployment discussions, visit sites where deployment was successful, meet with

stakeholders and state partners to better understand the vital role bottom-up buy-in plays with the successful implementation of programs of this type. RS, VC, DC, LS and JS suggested Oak Ridge Lab as a second choice if Hawaii was not possible. GS promised to work with EERE upon his return to Washington, DC to begin getting the proper approvals for a Hawaii meeting, and MK agreed to work with the SEO in Hawaii to draft a letter of invitation to the STEAB.

- JS asked if there were other comments or any additional new business to be discussed. Seeing as there was none, JS asked if there was a motion to adjourn the meeting. PG motioned, LS seconded and the Board unanimously voted to close the meeting. JS adjourned the STEAB February meeting at 11:17 am on February 24, 2011.

APPENDIX A

From Deployment Chasms to Energy Solutions

DOE's Role in Accelerating Job Creation and Clean Energy Deployment

US State Energy Advisory Board (www.steab.org)
Market Transformation and Deployment Task Force Report
Approved Final Report: 2/23/11

The U.S. State Energy Advisory Board (STEAB) has taken on as a top priority to identify any and all ways for the US DOE to accelerate clean energy deployment and job creation in America. To carry out this priority, the STEAB created the Market Transformation and Deployment Task Force to develop recommendations for adoption by the STEAB and for inclusion of these recommendations in its annual report to the Secretary of Energy and to the US Congress, in accordance with section 365 of the Energy Policy and Conservation Act (42 U.S.C. 6325).

Success at addressing this deployment challenge could mean millions of more Americans employed in high-wage jobs in clean energy technology infrastructure in all areas of the country. Effective deployment will also help achieve the President's goals on jobs and competitiveness, and do more for less with scarce Federal resources.

We observe that we have extensive and cost-effective clean energy technology that we have not deployed at scale because we have not sufficiently aligned all of the necessary public policy and private sector levers. DOE has the distinguished opportunity to relieve these bottlenecks and align public and private forces to solve this competitive challenge.

DOE's Role in Deployment and Market Creation

While within the Department of Energy there are some divergent views as to whether the agency is responsible for *job creation* or *technology development*, outside of the agency it is clear that the DOE is accountable for *clean energy deployment* and a central actor in a national drive towards economic competitiveness.

In parallel, a number of concerns and recommendations have been offered in the last several years to enhance the Federal government's and the DOE's effort in strategic deployment, innovation and collaboration. In 2005 and 2010, for example, the National Academies (Science, Engineering, and Institute of Medicine) were tasked by the Congress to offer insights on the increasing concern over America's competitive posture. The Academies issued two reports, "Rising Above the Gathering Storm" (RAGS, 2005) and RAGS Revisited (2010). These reports address the national need to create an innovation ecosystem that adequately addresses basic

research, and foster an environment that facilitates the transition of that research into markets, calling for deliberate speed.

A number of other studies and reports have made even more pointed recommendations regarding how the DOE could organize itself more effectively around deployment. For example, the Association of State Energy Research and Technology Transfer Institutions (ASERTTI) recommended in November 2008 that the DOE create a new high-level position at DOE on State and Local Innovation and Collaboration. ASERTTI's reasoning was that such a position "would help strategically focus and align human and financial state, local and federal resources to accelerate the adoption, commercialization and implementation of clean energy and energy efficiency technologies."[3]

More recently, the President's Council of Advisors on Science and Technology (PCAST), in its report, *Accelerating the Pace of Change in Energy Technologies Through an Integrated Federal Energy Policy*, called for significant changes in the way the Federal government coordinates the complex job of fulfilling the Nation's energy needs across individual agencies and programs.[4]

A wave of additional studies and task forces have also recommended changes in Federal energy deployment and economic development.[5]

More recently, the President in his January 25, 2011, State of the Union, and Secretary Chu, in recent speeches, have declared that the competitive challenges this nation faces, especially with regards to clean energy, to be this generation's "Sputnik moment". In addition, DOE's new Federal advisory committee has called for transformative goals, such as a $1/watt Sunshot solar initiative, to drive deeper deployment and wholesale market penetration by 2016.[6]

In addition, a significant set of changes potentially affecting Federal energy deployment are expected to occur as a result of the January 21, 2011, executive order creating a new White House Council for Jobs and Competitiveness, to be chaired by GE's Jeffrey Immelt. The President's new budget proposals also call for the creation of innovative mechanisms to do more with less, and emphasize the role of public-private partnerships and place-based

[3] ASSERTI letter to President-Elect Obama, November 16, 2008, http://www.asertti.org/about/index.html.

[4] http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-energy-tech-report.pdf

[5] See, for example, The Kaufmann Foundation (2010) (http://www.kauffman.org/newsroom/acceleration-of-u-s-energy-sector-requires-reform-at-every-stage-of-the-innovation-pipeline.aspx.aspx), the Clean Economy Network Roadmap, 2011 (expected) and various recommendations emerging from the Federal inter-agency workgroup, the Task Force on Regional Innovation Clusters, 2010-2011. http://www.eda.gov/AboutEDA/RIC/

[6] See http://www.eere.energy.gov/sunshot/

innovation as critical catalysts in US job creation and competitiveness.[7]

In short, the wake-up call on deployment has been sounded both for the DOE, and by the DOE's Secretary Chu. The question is what exactly to do next.

Fundamentally, DOE will need to think through every aspect of its role in terms of how the entire ecosystem of Federal, state, local and private sector participants will work together to get the desired results. This is clearly not just about better technology solutions or Federal funding, but it is about thinking through for each solution how best to work together to get results. Many detailed questions will need to be addressed as DOE wisely considers revising its role in deployment, including:

1. Should DOE re-engage a regional structure to enable communities from locations beyond the Federal labs?

2. Should its role be limited to largely technical review and assistance on behalf of other agencies whose job it is to engage and build public-private-community partnerships?

3. Should the DOE engage deeply in creating collaborative public/private-partnerships among businesses, communities and government agencies across the US?

4. Should DOE limit its role to lab- and hub-focused research and re-program economic development funding for clean energy deployment and market transformation to other actors?

The Deployment Gap: Defining The Problems We Need To Solve

STEAB believes that the clean energy job creation and deployment gap results from a combination of the wrong policies with a lack of the right *implementation mechanisms* on-scene to engage state, city, business and community leaders in problem-solving beyond the Beltway. Understanding this context and what's missing is critical to defining the appropriate role of the DOE in deployment.

Many, many important economic challenges lie ahead for the US economy and for the DOE; suffice it to say here that there are four *systemic and persistent challenges* that demand urgent attention and new mechanisms if we are to effectively accelerate deployment and the transition to a stronger, 21st century foundation. We need to:

[7] See, for example, the President's closing remarks at the Winning The Future forum held February 22, 2011 in Cleveland, Ohio. (http://www.whitehouse.gov/the-press-office/2011/02/22/remarks-president-closing-session-winning-future-forum-small-business-cl)

- Lift up young, job-creating companies, seed entrepreneurship, grow worker skills and dynamically re-think the Federal economic development pipeline to meet the challenges of the 21st century – to create not just small businesses but *new* businesses and *new* industries.

- Understand that start-ups alone won't define success; we must also build what Intel's Andy Grove calls job-centric, effective business eco-systems to drive the scaling of new businesses, new industries and US manufacturing opportunities that make economic sense.[8]

- Deeply engage the private sector as a critical solutions partner in addressing these systemic changes, or risk a continuing and negative narrative that these efforts are simply wasteful public sector programs -- rather than the next catalytic success in a long line stretching from the Erie Canal to the Internet.

- Recognize that public funds are limited and must be committed in ways that leverage private capital.

These challenges exist not only for the deployment of existing proven technologies that have not scaled, but also to the path from idea inception to new product development. I n fact, we believe there are an important set of issues and implementation tensions that need to be resolved at DOE around how best to accelerate *innovation*, a key priority of Secretary Chu[9]. A competitive economy depends on infusion and embedding of technology, and successful technology implementation to *achieve* innovation means that not only must you invent in the laboratory, you must deploy that technology to gain benefits in economic productivity and thus, compete effectively.

Resolving this tension with clarity is an important challenge for the DOE, and for its Federal and non-Federal partners in achieving the President's goals on jobs and competitiveness.

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[8] Grove further notes: "Without scaling, we don't just lose jobs—we lose our hold on new technologies. Losing the ability to scale will ultimately damage our capacity to innovate." See Grove piece here: http://www.bloomberg.com/news/2010-07-01/how-to-make-an-american-job-before-it-s-too-late-andy-grove.html and discussion of regional economic ecosystems here: http://www.eda.gov/NewsEvents/Speeches/NADOSpeech.xml

[9] Secretary Chu has spoken more to the innovation rather than the deployment issue recently here: http://www.energy.gov/news/documents/Chu_NationalPressClub112910.pdf

The Need for Bottom-Up Acceleration Mechanisms

Creating and scaling transformational clean energy jobs, industries and success stories is hard to do – it's even harder using stove-piped Federal and state programs and institutions. Too often individual entities – both public sector (eg, Federal, state and local governments) and private sector (non-profits, startups and established businesses) are acting alone or with only ad hoc coordination. Acting alone, they are unable to remove hurdles necessary for success. The deployment challenge is therefore much more than just creating better technology solutions, which has been a central focus of US DOE's efforts; it is taking responsibility for the end goal – deployed clean energy solutions at massive scale and the jobs necessary to create the solutions.

That's why it is critical that the DOE adopt a transformative goal of understanding and changing the entire deployment value chain to enable massive scale deployment of clean energy solutions. This work will require intentionally mapping out with all stakeholders -- state and local governments, business leaders, community leaders, community foundations and national foundations to clearly define value added roles and responsibilities, performance metrics and measureable expected outcomes around clean energy deployment and regional market transformation.

(1) <u>The Narrative We Need</u>

This work begins we believe with building a common lexicon. Right now, inside government and outside, all strategic partners are essentially operating as less than the sum of our parts. Large and separate economic policy silos – eg, "small business finance", "clean energy", "infrastructure and economic development", "energy hubs and regional consortia" and "university R&D and commercialization" need to be better linked together into one integrated *jobs & innovation* effort for championing 21st century American competitiveness, with one narrative and <u>shared lexicon.</u>

Within DOE, an opportunity to do this exists within the new leadership in the "technology transfer" program and technical assistance programs now being ramped up, as well as through ARPA-E. These programs could move swiftly to develop clearer lexicon and cross-agency cohesion to enhance service and clarity from the perspective of the DOE's many "customers" – which include states, cities, counties, private grantees and universities, to name a few.

(2) Critical Policy, Implementation and Finance Gaps Also Need To Be Addressed

Just as a new, integrative narrative is needed to define collaborative efforts around clean energy deployment, we also need flexibility and new implementation and finance mechanisms to drive our economic transition.

The DOE may fail to meet its Sputnik moment on deployment if it doesn't actively engage with other Federal, state and private sector partners around efforts to fix a broken Federal economic development pipeline that directs billions in formula funding to well-intentioned programs that are often 40 years old -- and miss the target by failing to reach key companies ripe for job creation and commercialization.[10]

Can DOE achieve its goals simply using its labs and Washington DC headquarters as the sole deployment network? There are other assets. The government supports a long catalogue of efforts by the SBA, EDA, HUD, and other Federal agencies to promote community and clean economy planning, development and deployment. In time, many of these efforts must be pooled through new community centers for jobs and innovation, chartered to promote innovative, public-private job creation clusters and economic development.

These "acceleration networks" would connect entrepreneurs with those who have the resources to create companies, and connect these startups to the opportunities presented by other administration initiatives, such as the newly-announced Jobs and Competiveness Council chaired by Jeffrey Immelt, the National Export Initiative, Startup America, EDA's Jobs and Innovation Partnership, The President's proposal to create 20 Growth Zones[11], and the Skills for America's Future announced in 2010 for community colleges. These centers also would connect job seekers with employment opportunities and training, and offer information and new incentives for companies to locally in-source the key components of their supply chains and workforce development. Restrictions under law that limit this approach need to be remedied. Policy must be aligned with the integrative strategies necessary to success.

The need for this initiative is imminent. In the near term, private sector and community foundations should be recruited to create "Go-Fast Centers" on their own in partnership with

[10] One recent study calling for re-tooling the clean energy and economic development pipeline found that stimulus funds were not effectively reaching young companies, which multiple studies show create the most net new jobs. See The New Policy Institute, 2010 (The Acceleration Agenda, http://www.newpolicyinstitute.org/wp-content/uploads/2010/09/AccelerationAgenda.pdf)

[11] The President's new budget proposal, released February 14, 2011, called for a new Growth Zones initiative to invest $40 million to lever private/public partnerships that drive high-growth industries and markets. Building on its innovative 2010 call for creative jobs and innovation partnerships, EDA will lead a collaborative initiative with HUD, USDA and Treasury to accelerate 20 pilot sites split between urban and rural America. The Growth Zones will include $2 million per site, plus targeted tax incentives replacing the old enterprise zone program.

Federal, state and local government sectors. A current working example is the Innovation Lab created by McKinstry in Seattle.[12]

Critical in any role will be the development of new performance metrics for DOE/EERE (see Task Force Table 2)

An immediate step for DOE to take would be to re-engage with the Federal Agency Task Force on Regional Innovation Clusters.[13]

The President's new Growth Zone initiative (see footnote 9) also offers DOE another opportunity to accelerate job creation and eliminate deployment and bureaucratic barriers in 20 pilot locations.

Another specific first step that the DOE can take now is to connect more closely with USDA's Agricultural Extension Service, as recommended by STEAB Resolution 10-01.

For more:
See STEAB's USDA-DOE Task Force Report (2010).

[12] http://www.xconomy.com/seattle/2010/08/11/mckinstry-innovation-center-cozies-into-position-as-cleantech-%E2%80%98accelerator%E2%80%99-director-elsa-croonquist-on-what%E2%80%99s-next/

[13] http://www.whitehouse.gov/blog/2010/08/20/urban-update-regional-innovation-clusters

(3) Recommendations of Additional Steps DOE Could Take to Strengthen Deployment

At our most recent STEAB meeting, a number of specific ideas were raised to accelerate deployment effectiveness. These include:

- In light of the President's call for 80% clean energy by 2030 and laudable, new efforts by DOE to develop a strategic plan to achieve this goal, ensure that stakeholder involvement in implementing the plan is continuous over time. Experience to date with integrated deployment systems suggests that multiple models will be needed to drive scale and market transformation.

- Create a centralized DOE Deployment Services Hub integrated with program offices and infrastructure at the state and local level. This could ideally include ASSERTI's idea of a new DAS for market transformation and deployment or re-visiting new regional office structure or deeper deployment partnerships with other Federal agencies who already have such on-the-ground reach.

- Develop more "market centric" performance measures within the DOE, e.g., number of companies created, jobs created, sales, market capitalization, investment leverage. The need for clear and specific performance metrics is especially acute for DOE's labs in clarifying their mission in the 21st century to achieve desired outcomes from Federal lab investments.

- Work with DOE's expanding Technology Transfer Office and ARPA-E to more closely connect technical assistance and technology transfer to the needs of state and local partners and to the work of the inter-agency Task Force on Regional Innovation Clusters.

- Encourage DOE to create a technology commercialization acceleration cookbook to help clean energy entrepreneurs and state/local officials accelerate their efforts and share their most successful recipes. Align DOE technical assistance and lab capabilities to support these efforts.

- USDOE should create a "SEE-like" action network for Renewable Energy to get more local /state/business input.

- Consider and implement STEAB resolutions adopted 6/20/07 and 9-01 and 10-01 and 10-02 with a renewed focus to include deployment.

- Identify and actively engage regional, state and local partner organizations.

Additional recommendations focused on longer-term agency improvements included:

- Make it easier to engage with the DOE and its programs. Remove unnecessary bureaucratic layers as much as possible. Get front-line feedback on what works and what doesn't, i.e., improve the interface where the market engages.

- Conduct working sessions with state and local leaders and the private sector on ideas around the DOE's role in market creation and expansion.

- Engage leading edge projects at the state and local level to conduct joint research and development around important issues, e.g., circuit-level reliability for large solar farm, better forecasting for renewables.

- Host state/local conferences or seminars to engage the community on DOE capabilities, technologies, and engagement rules.

- Prioritize technology within DOE that has the greatest potential for market creation and expansion for additional funding.

- Develop a client-focused service culture focused on intake and the needs of "clients" – eg, clean energy startups, Governors, utilities, cities, counties, etc

- Review/address deployment issues caused by separation of EERE v Office of Electricity.

- Identify the challenges and opportunities around regulatory innovation and alignment, a critical deployment issue that depends on aligning complex Federal-state regulations involving FERC, state PUCs and many other actors.

- In addition to creating research hubs and engaging with the President's place-based Growth Zone initiative, consider the creation of special **"**Acceleration Zones" based on quantifiable performance standards[14] and key factors such as:

    - Completion of EDA regional job creation/cluster blueprints
    - Presence of public-private partnerships and Innovative Finance Mechanisms
    - Use of 21st century technology to document job creation and other metrics[15]

[14] Various performance standards are currently used in Head Start, substance abuse and mental health services administration and other programs (Examples at: NGA Center for Best Practices, The Government Performance of Results Act of 1993, and GAO Reports B-284548, 2/4/2000 and B-277438, June/1998, HUD CPD-03-09, 9/3/2003).

[15] See http://www.whitehouse.gov/open/documents/open-government-directive for emerging national efforts and FreshwaterTrust.org and www.willamettepartnership.org for innovative new ecosystem credit accounting and streambank restoration tools.

Task Force Table 1
DOE and Deployment Partners: A Look at Roles

Entity	Activity/Role	DOE's Primary Engagement
DOE	Deployment Partner	
State Energy Offices	Market transformation, coalition building	Implementation
Local Government Organizations (Applied Solutions, ICLEI, etc)	Market transformation, coalition building, location based investment	Implementation
Governors	Executive leadership, alignment of state and local support organizations	Development of regional deployment roadmap
Mayors and County officials	Facilitate partnership building within communities	Development of regional deployment roadmap
Regulators	Market rules and transformation	Regulatory Innovation
Universities	R and D alignment with deployment strategy	Tech transfer
ASERTTI and consortia	R and D alignment with deployment strategy	Tech transfer
EDA, SBA	Seed funding, development of regional clusters, training	Technical review
Private sector, utilities and energy efficiency officials	Project development and finance	Development of regional deployment roadmap and financing
Etc.		

Task Force Table 2
Possible Metrics for EERE-Focused Energy Deployment

Activity	**Current Metrics (R & D focus)**	**Supplemental Metrics (Deployment focus)**
Tech development	$/watt	Incr. in % tech jobs created Percentage of program budget devoted to deployment
Tech development	Conversion efficiency	BTU/$ output GDP improvement
Program delivery	% $ contracted	# of satisfied state and local entities
Program delivery	Treat states as grantees	Treat states as co-equal partners
Economic Performance	# lab technologies commercialized	# clean tech companies created
Economic Performance	# of contracts issued	# of public-private partnerships created
Innovation	# of patents issued	# commercial products in market
Transparency	# web sites created and info posted	New culture of openness created
Market transformation	# TAP assistance grants provided	# of clean energy businesses delivering new products and services
Collaboration	Meetings and conferences, R and D awards	# of strategic partnerships created

This Task Force Report was approved and adopted by the US State Energy Advisory Board Meeting on February 23, 2011.

Members of **STEAB's Market Transformation and Deployment Task Force**:

Phil Giudice, Commissioner, State of Massachusetts, Chair
Dan Carol, NDN/New Policy Institute
Cris Eugster, CPS Energy
Maurice Kaya, Hawaii Renewable Energy Development Venture
Steve Vincent, Avista Utilities
Dan Zaweski, Long Island Power Authority

What is STEAB?

The State Energy Advisory Board was established by Public Law 101-440 (The State Energy Efficiency Programs Improvement Act of 1990) to advise the Department of Energy on operations of its Federal grant programs. The Board's statutory charge is to develop recommendations regarding initiation, design, evaluation, and implementation of energy efficiency and renewable energy programs, policies, and technologies. The Board is legislatively mandated to advise and make recommendations to the Assistant Secretary for Energy Efficiency and Renewable Energy (EERE) on efforts relating to EERE programs, with a specific focus on technology transfer and State issues.

The Board is comprised of State energy directors, Weatherization directors, other State officials, representatives of State and local interests, and recognized experts in energy-related disciplines. In its capacity as an advisory board, STEAB serves as a liaison between individual States and the Department of Energy with regard to energy efficiency and renewable energy programs. STEAB is in an advantageous position due to the fact that, unlike other EERE FACA committees, it is not program specific. They offer a forum for the exchange of ideas and information through which Federal, State, and local voices can be heard at the Department of Energy.

In compliance with STEAB's enabling Statute, the Board submits an annual report to the Secretary, the U.S. Congress, and the General Services Administration (GSA) on the activities carried out within the previous fiscal year. This report contains not only a summary of the Board's activities, but also a copy of all of the Board's Resolutions to the Assistant Secretary during that fiscal year.

APPENDIX B

USDOE/USDA
State Energy Extension Partnership (SEEP) Concept Paper
October 1, 2010

Background – The State Energy Advisory Board (STEAB) adopted Resolution 10-01, which encourages the USDOE and USDA to initiate an active dialogue which will result in the establishment of a formal partnership between State Energy Offices (SEOs) and State Extension Services (SES) for the purposes of enhancing the education of Americans regarding energy efficiency and renewable energy. Based on the above, this "white paper" is known as the State Energy Extension Partnership (SEEP). SEEP will enhance the education of American citizens regarding energy efficiency and renewable energy through the collaborative efforts between SEOs and SES. Resolution 10-01 outlined several recommendations regarding the establishment of a formal agreement between the two agencies, and charged a Task Force to initiate a dialogue with USDOE and USDA in order to pursue the recommendations.

The STEAB Task Force held meetings and conference calls with USDA and USDOE officials in September to gauge interest in the Resolution. Leadership from both groups expressed positive interest in the concept and agreed to participate in a joint meeting to further explore the recommendations. The STEAB Task Force hopes to schedule their next meeting in early November 2010.

Program Objectives and Outcomes – The STEAB Task Force recommends the following ***objectives*** for this joint national effort:

- Educate and provide technical assistance to multiple publics (youth and adults) in energy efficiency and renewable energy for individuals, homes, communities, and businesses;
- Educate individuals about incentives for purchase and use of renewable energy and energy efficient appliances, transportation, and home remodeling expenses;
- Support community (especially smaller units of government, including counties, cities, schools, etc.) learning and actions to effectively leverage State and Federal energy programs (e.g., ENERGY STAR) that support appropriate demonstration projects at the community level;
- Design and carry out energy efficiency and renewable energy program impact evaluations; and
- Facilitate community-based exploration and decision-making processes.

The following ***outcomes*** could be derived from these activities:

- Reduce the use of energy in homes and businesses;
- Increase the number of participants in energy efficiency incentives programs;
- Increase understanding by community leaders about how to participate in energy efficiency programs;
- Increase the number of homes and businesses that utilize renewable energy technologies;
- Increase consumer awareness of energy issues when making large and small purchases;
- Increase the number of ENERGY STAR®-labeled buildings and homes; and

- Increase sales of ENERGY STAR® appliances.

  Program Design – The STEAB Task Force recommends that USDOE and USDA establish a joint working group of National Program Leaders to design and manage this effort. Federal resources in the range of $20 - $25M per year would need to be identified, shared in some fashion between the two agencies. Funding would be allocated through the State Energy Offices, and the program would need to be conducted for a minimum of three years in order to be effective.

  A "soft" grant approach would be used requiring SEOs and SES to collaborate on a single State proposal that would be submitted to the USDOE / USDA joint working group for evaluation and selection. States not submitting a joint proposal would be ineligible for the grant. It is recommended that USDOE / USDA establish minimum threshold criteria for grant awards, and a formal evaluation would be required. In response, program objectives, activities, and outcomes would need to be clearly identified in each State's proposal.

  The funding would be awarded to individual States through their State Energy Office for program implementation. Formal program evaluations would be conducted by the SEO / State Extension Service partnership, and State impacts would be reported back to the USDOE / USDA joint working group.

  Initiation – STEAB recommends this joint effort between USDOE and USDA be started as early in Fiscal Year 2011 as is feasible, in order to fully support the current Administration's commitment to help move the Nation to more practical uses of its energy resources.

  Further, STEAB is committed to supporting this effort; and they plan to continue their discussions with all parties in order to help move the project forward.

  Attachments:

  Appendix A – State Energy Advisory Board
  Appendix B – State Energy Programs
  Appendix C – Cooperative Extension System

APPENDIX A: STATE ENERGY ADVISORY BOARD

The State Energy Advisory Board was established by Public Law 101-440 (The State Energy Efficiency Programs Improvement Act of 1990) to advise the Department of Energy on operations of its Federal grant programs. The Board's statutory charge is to develop recommendations regarding initiation, design, evaluation, and implementation of energy efficiency and renewable energy programs, policies, and technologies. The Board is legislatively mandated to advise and make recommendations to the Assistant Secretary for Energy Efficiency and Renewable Energy (EERE) on efforts relating to EERE programs, with a specific focus on technology transfer and State issues.

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APPENDEX B: STATE ENERGY PROGRAMS

The State Energy Program (SEP) is the only Federally-funded, State-based program administered by the U.S. Department of Energy (USDOE) that provides resources directly to the States for allocation by them for energy efficiency and renewable energy uses. The SEP provides financial and technical assistance to States through both *formula* and *competitive* grants. States use their *formula* grants to develop State strategies and goals to address their individual energy priorities. *Competitive* grant solicitations for the adoption of energy efficiency / renewable energy products and technologies are issued annually, based on available funding. States provide a 20% match under SEP annual *formula* allocations. SEP emphasizes the State's role as the decision maker and administrator for the program activities within the State. The Energy Offices in each State and Territory are a vital resource for delivering energy benefits, addressing national energy goals, and coordinating energy-related emergency preparedness across the Nation.

With SEP funds and the resources leveraged by them, the State and Territory Energy Offices develop and manage a variety of programs geared to increase energy efficiency, reduce energy use and costs, develop alternative energy and renewable energy sources, promote environmentally conscious economic development, and reduce reliance on oil produced outside the U.S., all in the interest of helping to assure energy reliability and strengthening America's competitive position and national energy security.

Additionally, State Energy Offices are involved in administering public benefit funds and emergency preparedness. In this regard, States manage and invest more than $3 billion of their own funds derived from appropriations and system benefit charges each year.

Congress created the State Energy Program in 1996 by consolidating the State Energy Conservation Program (SECP) and the Institutional Conservation Program (ICP). Both programs went into effect in 1975. SECP provided States with funding for energy efficiency and renewable energy projects. ICP provided hospitals and schools with a technical analysis of their buildings, and identified the potential savings from proposed energy conservation measures.

Under the American Recovery and Reinvestment Act of 2009 (Recovery Act), the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE) received $3.1 billion to be distributed through the SEP to stimulate the economy by creating and preserving jobs while increasing energy efficiency and the use of renewable energy. Under the authorizing legislation for the SEP, the 50 States, 5 Territories, and the District of Columbia (States) had a degree of flexibility to design and implement programs that met their specific energy needs and goals. In response to a DOE, the States prepared plans summarizing energy-related programs and projects planned for the SEP Recovery Act funds. After reviewing those plans, EERE awarded Recovery Act funding to the States for approved projects consistent with the goals of the program. The $3.1 billion awarded through the Recovery Act was a dramatic increase over the $25 million appropriated for SEP *formula* grants in Fiscal Year 2009.

APPENDEX C: COOPERATIVE EXTENSION SYSTEM

All universities engage in research and teaching, but the Nation's more than 100 land-grant colleges and universities have a third critical mission – extension. "Extension" means "reaching out," and – along with teaching and research – land-grant institutions "extend" their resources, solving public needs with college or university resources through non-formal, non-credit programs.

These programs are largely administered through thousands of county and regional extension offices, which bring land-grant expertise to the most local of levels. And both the universities and their local offices are supported by the National Institute of Food and Agriculture (NIFA), the Federal partner in the Cooperative Extension System (CES). NIFA plays a key role in the land-grant extension mission by distributing annual Congressionally-appropriated formula grants to supplement State and county funds. NIFA affects how these formula grants are used through national program leadership to help identify timely national priorities and ways to address them.

NIFA administers funding for Smith-Lever Act services in cooperation with State and county governments and land-grant universities. The Smith–Lever Act of 1914 is a United States Federal law that established a system of cooperative extension services, connected to the land-grant universities, in order to inform people about current developments in agriculture, home economics, and related subjects. In brief, the appropriation for cooperative extension is shared between the States based on a specific formula.

Congress created the extension system nearly a century ago to address exclusively rural, agricultural issues. At that time, more than 50 percent of the U.S. population lived in rural areas, and 30 percent of the workforce was engaged in farming. Fewer than 2 percent of Americans farm for a living today, and only 17 percent of Americans now live in rural areas. Yet, the extension service still plays an important role in American life – rural, urban, and suburban. With its unprecedented reach – with an office in or near most of the Nation's approximately 3,000 counties – extension agents help farmers grow crops, homeowners plan and maintain their homes, and children learn skills to become tomorrow's leaders.

Despite the decline in the population and economic importance of rural America, the national Cooperative Extension System remains an important player in American life. It increasingly addresses urban, suburban, and rural issues; and it has responded to information technology changes in America by developing a national Web presence.

Over the last century, extension has adapted to changing times and landscapes, and it continues to address a wide range of human, plant, and animal needs in both urban and rural areas. Today, extension works in six major areas:

•4-H Youth
•Agriculture
•Leadership
•Natural Resources
•Family and Consumer Sciences

•Community and Economic Development

Regardless of the program, extension expertise meets public needs at the local level. Although the number of local extension offices has declined over the years, and some county offices have consolidated into regional extension centers, there remain approximately 2,900 extension offices nationwide. Increasingly, extension serves a growing, increasingly diverse constituency with fewer and fewer resources.

The extension system also supports the eXtension Web site. One of the goals of eXtension is to develop a coordinated, Internet-based information system where customers will have round-the-clock access to trustworthy, balanced views of specialized information and education on a wide range of topics. For customers, the value will be personalized, validated information addressing their specific questions, issues, and life events in an aggregated, non-duplicative approach.

Information on the eXtension Web site is organized into Resource Areas. Each Resource Area includes articles, news, events, and frequently asked questions (FAQs). The information comes from land-grant university system faculty and staff experts. It is based on unbiased research and undergoes peer review prior to publication. Current Resource Areas are organized around many topics, including – but not limited to – energy, community, family, farm, youth, and more. The Energy Resource Area includes communities that address home energy, farm energy, and wood energy.

The eXtension Web site also includes a collection of news stories from partner institutions, a Frequently Asked Questions section, a calendar of extension events, online-learning

DOE/USDA Partnership

Draft 1, 12/27/2010

The following is a listing of potential metrics identified by the STEAB DOE/USDA Task Force that could possibly be pursued through this partnership.

- Reduced use of energy in homes, farms and businesses—kWh and BTUs saved. From this data we could calculate expected dollar savings and carbon reduction.
- Increased number of trained renewable energy workers, businesses and jobs created in each state, including average wages paid and tax revenues generated.
- Increased number of participants in energy efficiency incentives programs; growth and maturation of programs over time.
- Increase understanding by community leaders about how to participate in energy efficiency programs, contributing to leaders who use energy as platforms for public office.
- Increased number of homes, farms and businesses that utilize renewable energy technology
- Number of dollars saved or earned through adoption of energy efficiency measures—note: an economic development indicator
- Increased consumer awareness of energy issues when making large and small purchases
- Number of hits to websites; also track "friends" on Facebook and followers on Twitter
- Measure the impact of energy efficiency and renewable energy on approved mortgages and the financial industry
- Number of renewable energy industry products in each home offered by the builder
- Number of publications developed
- Number of Webcasts produced
- Number of Extension agents trained
- Number of ENERGY STAR certified buildings (statewide)
- Number of farms producing biofuels or renewable energy, and kWh

The following are examples of existing partnerships between the State Energy Office and the State Extension Service in several states.

North Carolina

The NC Solar Center receives a state appropriation managed by NC Energy Office. We do not think this is based on a MOU. The funding is funneled through the Dept. of Commerce and then to the NC Solar Center. The desire of the NC State Energy Office is to assure that the funding is in congruence with State Energy Office priorities, so the staff of the NC Solar Center write Plans of Work related to State Energy Office initiatives and report to those plans. With this kind of appropriation the funding permits more flexible use based on actual and priority needs. The plan is more global with basic tasks outlined, such as "Help the building industry build more green homes." It does not dictate how this has to be done. NCSU collects metrics, but these metrics are not top down. The New Homes grant has dictated metrics on the number of homes that must complete annually (150).

Other departments at NCSU have grants through the NC Energy Office, and there are no MOUs. They are very metrics driven.

How long in place? In the 1970s when there was an oil embargo and gas prices were very high, there was a lawsuit about overcharging for oil prices from oil companies to give money back to consumers. This funding was sent to states. NC spent this at a slow pace to keep initiatives funded. It lasted 15 years. The NC Solar Center at NCSU began funding from 1988-2004, then in 2004-05 the overcharge money ran out. The NC State Energy Office had to get state funding. Three universities worked together to get funding for energy centers. This is when the state appropriation model emerged.

North Carolina Cooperative Extension has a long-standing relationship with the State Energy Office, both through non-formal efforts and formal agreements. Most funding has emerged through contractual agreements, although there has been an extended collaborative partnership in place. Currently, NC Cooperative Extension has a contract with the State Energy Office to provide residential energy education for NC citizens across the state. The program developed from this funding is known as the E-Conservation Residential Energy Education program and it addresses energy related techniques, technologies and behaviors that improve efficiency and conserve energy in the home. This on-going effort began in 2004 and makes use of NC Cooperative Extension professionals based at NCSU as well as its extensive network of county-based Field Faculty. The project gathers information from program participants related to energy use and savings, energy efficient improvements, and energy efficient purchases. Other collaborative projects preceded this current effort, and while a contract may not always be in place, the on-going relationship has continued as Cooperative Extension and the State Energy Office share mutual goals related to improving the energy efficiency of structures across the state.

Minnesota

The Clean Energy Resource Teams, or CERTs, is a collaborative effort of the Minnesota Office of Energy Security's State Energy Office, the University of Minnesota's Regional Sustainable Development Partnerships, two local non-profits—the Green Institute and The Minnesota Project—and the Southwest Regional Development Commission. The CERTs' mission is to connect individuals and communities to the resources they need to identify and implement clean energy projects. We see CERTs as a non-partisan, non-advocacy program that works with citizens across the state to strengthen their communities by supporting money-saving conservation and energy efficiency projects and building entrepreneurship around growing renewable energy industries.

CERTs was officially launched in 2003, building on a foundation of collaboration and community-based energy work amongst its founding partners. Key milestones over the past seven years have included:

2005: Regional Strategic Energy Plans published in each of six rural CERT regions. The plans assessed current energy use and opportunities for greater energy efficiency, and clean energy projects. The process of developing plans brought stakeholders within each region together to learn, share perspectives, build trust and identify common ground.

2006: Seed grant funding initiated to spur local clean energy project development.
2007: CERTs written into State Statute [216C.385].
Metro CERT launched; new program partner added.
2009: Minnesota Schools Cutting Carbon launched. MnSCC is a collaboration among CERTs, Minnesota Pollution Control Agency, and Office of Energy Security targeting carbon footprint reductions at 100 public high schools and universities.
2010: CERTified campaigns launched. These campaigns utilized a behavioral science approach to spur increased adoption of energy efficiency actions.
GreenStep cities rolled out. GreenStep is a best practice sustainability program geared toward cities that CERT helped develop in conjunction with a variety of other partners including state agencies, non-profits and the League of Minnesota Cities.

A recap of other milestones is compiled on the CERT website:
http://www.cleanenergyresourceteams.org/files/CERTs_Milestones_2010.pdf
While CERTs is not governed by an official memorandum of understanding, it does have several structures in place that support ongoing evolution.
CERTs brings together team members from diverse backgrounds, including farmers, utility representatives, state and federal government staff, educators and academics, small business owners, members of non-profit and environmental groups, as well as individuals interested in energy issues. Together they work within and across the seven CERT regions to identify and implement community-scale energy efficiency and renewable energy projects across the state.

CERTs' approaches, carried out by our staff and Regional Coordinators, are organized along three primary themes:

- **LEARN**: CERTs share clean energy resources and information through our website, social media tools, monthly updates, e-mail lists and traditional media outreach.
- **CONNECT**: CERTs convenes regional workshops, events and tours that bring people together to learn about clean energy projects and technologies, and share their own expertise and perspective.
- **ACT**: CERTs provides seed grant funding to catalyze local projects that provide on-the-ground examples of scalable projects and project models, and offers CERTified Campaigns that provide clear and actionable ways to implement energy efficiency and renewable energy projects.

Of our approaches, the CERTified Campaigns are the newest, and if properly resourced, could prove to have a dramatic impact on Minnesota and the Midwest's energy future. Over the past two years we've also coupled with on-the-ground regional coordinators in each of our seven regions across the state to offer a unique way to mobilize community members, connect them to additional technical assistance, garner earned media attention, allow participants to take immediate action, and track implementation and energy savings.

As referenced above CERTs was written into state statute in 2007. This statute specifically defines CERTs as a partnership among the state, university and non-profits.
Dollars for CERTs are directed to the State Energy Office by the Minnesota State Legislature. Over the past four years this funding has come from Xcel Energy's Renewable Development Fund. The State Energy Office then contracts with the University of Minnesota (which contracts

with the Southwest Regional Dev. Commission), the Green Institute and the Minnesota Project to carry out CERTs work. Each of these contracts is governed by a two-year work plan. CERTs also work with foundations for additional funds because the state funding is never a certainty. Executive Directors of the CERT Partner organizations meet every six to eight weeks to discuss strategic opportunities and address any inter-organizational challenges.
Staff members from all of the partner organizations who work on CERTs for all or a share of their time all meet on a monthly basis to share highlights and case studies from the regions, provide small group updates regarding emerging programming ideas, and discuss and plan for key action items and priorities for the upcoming month. Regional coordinators from all seven regions also have a monthly conference call to share key successes and challenges.

Kentucky

Since 2003 the Kentucky energy office, through the federally-funded State Energy Program (SEP), and the University of Kentucky Cooperative Extension Service (CES) have enjoyed a solid partnership that is helping educate Kentuckians about energy efficiency and renewable energy. Working together these agencies have developed numerous programs, studies and outreach materials designed to improve the energy efficiency of Kentucky homes, communities, schools and businesses. Together they have initiated energy programs and demonstration projects to highlight the environmental and economical benefits of Kentucky's renewable energy resources. SEP and CES are helping shape Kentucky's energy future.

Program Initiatives

- Established an ENERGY STAR circuit rider who travels across the state promoting ENERGY STAR at public events including home and garden shows and electric cooperative annual meetings, as well as a large exhibit at the Kentucky State Fair. The circuit rider connects with over 750,000 Kentuckians annually to promote energy efficiency and renewable energy.
- Helped to establish the Kentucky Rural Energy Consortium (KREC) designed to promote renewable energy and energy efficiency. KREC seeks to advance research, development and deployment related to biomass, renewable energy and energy efficiency of Kentucky agriculture, rural communities and industries. KREC was established in 2005 and awarded seven competitive research grants totaling $1.5M in 2006 with funding from US DOE.
- Developed a renewable and energy efficiency road map for Kentucky designed to secure an economically and environmentally sustainable energy future. The roadmap concluded that by the year 2025, Kentucky could use renewable energy and energy efficiency as a means to offset at least 25 percent of its total energy demand.
- Developed a guide and a 40-hour training course for building energy-efficient homes in Kentucky. These materials are helping to support Kentucky's community colleges and technical service schools to train builders, remodelers and contractors.
- Developed "virtual" tours for both ethanol and biodiesel production facilities that were used to educate state officials and citizens across the Commonwealth about the

production and utilization of clean/ alternative fuels. The “virtual” tours, titled The Kentucky Biodiesel Journey and the Kentucky Ethanol Journey, are both CD-based, movie-like journeys.

- Provided expert witness testimony at residential and commercial building code adoption proceedings, updates and revisions for statewide implementation.
- Supported the University of Kentucky’s 2009 Solar Decathlon house by engaging Kentuckians to learn about solar living opportunities through an integrated home design approach.
- Assisted in establishing the Kentucky Home Performance program. The program provides training, tools, marketing, incentives and quality assurance to transform the Kentucky housing market. The objective is to produce a sustainable model that stimulates the residential home improvement market to deliver whole-house energy efficiency improvement services.

North Dakota

The North Dakota State Energy Office and the NDSU Extension Service has an on-going working arrangement that dates back to the early 1980s. No formal MOU is used. Below are examples of programs conducted by the NDSU Extension Service with support from the North Dakota State Energy Office:

Home Energy Audits—In response to the lack of trained energy professionals, the NDSU Extension Service worked in conjunction with the N.D. State Energy Office to offer a home energy auditor/rater training. Arrangements were made to bring the Kansas Building Science Institute into North Dakota to conduct quality residential energy audit training. As a result of the course, there are now trained residential energy auditors throughout the state.

Go Green Lesson Plan—The NDSU Extension Service developed a Go Green packaged program that included a presentation with slide descriptions and associated activity, and provided it to all Extension agents in the state. The agents delivered the program to various groups in their individual counties to provide a basic understanding of residential energy use and ways to reduce consumption.

Home Energy Education—The NDSU Extension Service, in collaboration with the N.D. State Energy Office, began a program to educate homeowners concerning recommended insulation levels and areas where heat may be leaking from their homes. The program included writing news releases, educational publications, presentations, home energy exhibits and training county agents to provide information to homeowners.

4-H National Youth Science Day—To combat the shortage of young people pursuing science in college and as careers, 4-H created the National Youth Science Day to spark an interest in science and science education in youth. In 2009 a national experiment, called “Biofuel Blast” was conducted to teach youth how cellulose and sugars in plants, such as corn, can be converted into fuel, and how alternative energies can be used in their own communities. Over

2,500 North Dakota youth participated in this experiment and received great news coverage across the state.

Energy Education Spurs Interest in Science—The NDSU Extension Service Center for 4-H Youth Development has created several energy trunks for staff to use in schools, after-school programs and 4-H club activities. Topics include Energy in Motion, Heat and Heating, Light and Lighting, and Chemical Energy. Trunks include demonstration guides, student instruction and equipment to conduct hands-on experiments.

Top Ten Home Energy Checklist—A publication was developed to provide individuals with information on where to look for energy waste in a home. The publication prompted WDAY television to work with NDSU Extension to develop a series of news stories on ways to reduce energy consumption in a home. The news spots ran Monday nights for six weeks during fall 2009. Copies were also provided to Extension agents to use with local media.