



Driving Transformation to Energy Efficient Buildings: Policies and Actions, 2nd Edition

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Jennifer Layke Executive Director, Institute for Building Efficiency

Katrina Managan Program Manager, Institute for Building Efficiency

Heather Stafford: Good morning and welcome to the Clean Energy Solutions Center, and you are attending the Driving Transformation to Energy Efficient Buildings: Policies and Actions, 2nd Edition webinar. This will be moderated by Vickie Healey from the National Renewable Energy Laboratory and Heather Stafford with Confluence Communications. Thank you for joining us.

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Our agenda this morning, we will first have introduction and welcoming remarks, there will be an overview of the Clean Energy Solutions Center. Next, we will have Jennifer Layke, Director, Institute for Building Efficiency and Katrina Managan Program Manager, Institute for Building Efficiency.

We should note that Clay Nesler will unfortunately not be joining us today but his work will be presented by Jennifer and Katrina.

We are going to hold right there for one moment, be right back.

Thank you for your patience, we are back. I would like to introduce the Clean Energy Ministerial & UN Partnership Supporting the Solutions Center. Clean Energy Ministerial (CEM) launched the Clean Energy Solutions Center in April, 2011 for major economy countries. It is one of eleven CEM Initiatives and is led by Australia and U.S. with other CEM partners.

The Partnership with UN-Energy is extending scope to support all developing countries. This will enhance resources on policies relating to energy access, small to medium enterprises (SMEs), and financing programs. It will offer expert policy assistance to all countries and expand peer-to-peer learning and training.

The Clean Energy Solutions Center (<http://www.CleanEnergySolutions.org>) has goals, first to serve as a first-stop clearinghouse of clean energy policy resources. To Share policy best practices, data, and analysis tools across countries. To deliver dynamic services that will enable expert assistance, learning, and peer to peer sharing of experiences and to Foster dialogue on emerging policy issues and innovation across the globe.

The target audiences primarily are Energy policy makers and advisors and analysts. And, secondarily private sector companies, energy entrepreneurs and investors, non-governmental organizations, civil society, others engaged in clean energy.

We have an Ask Our Expert Program. We will connect you to a global network of energy experts for personalized attention and quick response technical assistance on strategies, regulations, standards, financial incentives, and deployment programs for a broad range of clean energy sectors and technologies including Energy Access, Energy Efficiency, Renewable Energy, Smart Grid, Transportation, and Utilities.

If you would like to request assistance from this wonderful program, please register online at the link <http://cleanenergysolutions.org>.

How can you get involved? You can request expert assistance or tailored technical resources for your country; you can participate in webinars such as the one you are attending now; you can offer advice and suggest resources to share, you can sign up for the newsletter, and join conversations on the Policy Forum.

I would first like to introduce Jennifer Layke, Director of the Institute for Building Efficiency. Jennifer is the Director of Johnson Control's Institute for Building Efficiency.

Welcome, Jennifer. Are you there?

Jennifer Layke: Hi good morning everyone.

Heather Staford: Thanks for your patience this morning. We had some technical difficulties. We are back online and we can hear you. Welcome!

Jennifer Layke: Thank you very much and thank you to NREL and to the partners of the Clean Energy Solutions Center for the opportunity to present our work on the driving transformation project. We appreciate the opportunity and look forward to your feedback and questions as we move through the PowerPoint presentation. I know there is functionality for asking questions but we also would make ourselves available for follow up if there are questions that you have elected to take offline.

Well I'm going to start by giving you a very brief introduction and overview to the Institute for Building Efficiency and Johnson Controls and then we will move into the meat of the presentation today.

The Institute for Building Efficiency is an initiative of Johnson Controls that is about 2 ½ years old and we are a group that is designed to provide analysis and insight on the technology policies and practices for efficient high performance buildings and smart energy systems around the world. We function globally as does Johnson Controls building efficiency business but the institute is an engagement platform and an opportunity to understand from a private sector perspective some of the drivers and opportunities associated with energy efficiency.

The report we are going to share with you today is the culmination of a 13-month project that we undertook with a number of partners in order to help support policy makers who are looking for opportunities to scale up energy efficiency policy around the world. So, I'd like to thank our partners The Business Council for Sustainable Energy, The Center for Clean Air Policy, the World Green Building Council, and the US Green Building Council.

And we had significant contributions from advisors and reviewers as we prepared this material. So if you could go to the next slide please.

The Institute for Building Efficiency works in a number of different issue areas. On the second slide in our PowerPoint, you see that we focus on existing building retrofits, green building technologies and approaches, smart grids and smart buildings, renewable and distributed energy technologies and clean energy finance as well as energy and climate policy opportunities and actions. Again, it's a global initiative and we focus on a number of global issues. What you see today is not specific to any one country's initiatives in the policy domain but aggregates a number of different examples of policy leadership from around the world.

I'd like to move beyond our project partners on the driving transformation slide over to the slide that focuses on the business case essentially for energy efficiency as a policy that's critical at this juncture for countries around the world. In 2008 3.3 billion people, more than half the world population lived in urban areas. That number is expected to increase to 5 billion people by 2030. Urbanization is driving construction and the energy consumption of buildings with that urban build-out is expected to grow, as all of you are aware.

So part of the mandate for energy efficiency in the next slide is really around slowing the energy demand growth. The energy efficiency agenda creates significant co-benefits in terms of climate change, economic opportunity and opportunities for smarter growth providing services, valuable electricity and comfort to the world population even as we understand that the need for those services continues to expand and increase. This slide is one of ours that we used from McKenzie Global Institute focusing on the opportunity to help curb demand through significant enhanced productivity in buildings.

If you look at the next slide, slide 6, we focus here on the climate action opportunity. When you view the opportunity for buildings recognizing that buildings are a significant portion of the electricity consumption in the global scenarios the ITCC put out you see the difference between the emissions you see in 2010 from buildings and the emissions anticipated as a result of energy demand for buildings in 2030. The significant increase for demand in Asia, in Latin America, and Africa and the Middle East will fuel the growth for emissions from buildings in those growth in those areas of the world. There is an opportunity to focus again on climate at preparation, adaptation, and mitigation over the course of the policies that could be in place between now and 2030.

When you look at the scale of that opportunity on slide 7 that you can see that energy efficiency is the largest abatement potential between now and 2030. When we look at efficiency and end use efficiency, which is the blue column or row on your chart there is the focus of percentage of share over 50% of the opportunity in 2030 comes from end use energy efficiency in buildings and infrastructure segment.

But we recognize that in fact the opportunity is not exclusive to the mitigation opportunity if you look at the next slide you can also understand and those of us on the East Coast of the United States are focusing on this right now that resilience to climate impact is also a critical functionality that better design and more energy efficient buildings can deliver recognizing that buildings that are well designed an efficient are easier to cool on hot days, the exteriors can reduce the heat gain the summer and are better adept at handling variable temperatures and that insulation allows poor households to stay warm during extremely cold

winters in addition to helping maintain comfortable temperatures in summer heat.

We recognize that the opportunity for resilience is also interlinked with the opportunity for better water usage efficiency as water based energy consumption is also critical whether it's heating water, transporting water or treating water that there are multiple resilience and adaptation impact opportunities associated with the connection between water and energy.

I'm now going to turn over to Katrina Managan, who is going to walk us through some of the content in the report itself on the policies that can help capture the mitigation and the resilience opportunities associated with building energy efficiency and then we will turn to a recent tool that we have been working on that builds off of many years of the interaction with building efficiency clients in the business and offers an opportunity to begin to assess priorities for policy makers looking to understand and get started with a suite of energy efficiency policies in their own counties or cities.

So Katrina, I will turn it to you.

Katrina Managan:

Great and we will move it to the next slide. So in the report that we are presenting here today Driving Transformation to Energy Efficiency Buildings we reviewed the number of policy options that can help overcome some of the barriers to energy efficient buildings and this slide our picture really gives that overview picture of what the report is trying to accomplish. We are trying to move from the way sort of the way buildings are done today, to the current stakeholders and to a green energy efficient building future and policies can really help bridge this gap and help overcome some of the barriers we see in the market today to energy efficient buildings. Those barriers we will get into a little bit more in detail on the next slide.

So first, I want to talk a little bit about the life cycle of a building. Because we are talking about transforming the building environment this is about completing one project or changing one decision in the life of a building buildings are around for a long time from design and construction to tenant moving in and out and a building is old, it's operated, maintained and leased over its life and at every one of these decision points there is the opportunity to improve the energy efficiency and make good decisions about how the building is being managed. So policies need to really think about and be designed to target each of these steps in the buildings life.

And change the way decisions are made. So for the next slide, I will talk about a few of the barriers to energy efficiency today. And one of the biggest barriers in the market barriers category is split assessments, in most of the world the building owner is not the one who pays the energy

bills, usually it is the tenants who pay the energy bills in buildings and the owner is the one who invests in capital improvements to improve the energy efficiency of the buildings. So the person making the investment, the owner is not the one that would be saving on the energy bill.

There are also financial barriers. There's an upfront cost to investing in energy efficiency, the perception that there's an investment risk that financial institutions have for making these investments if someone wants to take out a loan to improve the energy efficiency of their building often that investment is not well understood by the financial institutions, there's not a lot of awareness of those types of investments and what the risk level is.

There are also technical barriers: so there may be the lack of technical capacity of the market. In some locations, there may not be good access to affordable technology so a lot of the energy efficiency policy as you are all probably aware is quite affordable. It can be a significant barrier in the lack of awareness about the building efficiency opportunity for example if each of you think back on a time that you rented a home or apartment or you bought a home or apartment, you probably weren't given any information about the energy cost of operating that building and that's pretty much true in most building markets in the world there's not a lot of transparency about the energy cost and there's not a lot of awareness about those costs and they are not factored into the decision making process.

These policies can help overcome all of these different barriers.

Next slide.

I'd like to talk a little bit about the types of policies that can enable transformation and I'll get into each of these policies in greater depth so I won't spend long on this slide. But one of the reasons we sort of have this six policy categories all placing into the center of building efficiency is because it takes an integrated policy approach to transform the build environment, no one of these policies by itself is probably going to be sufficient to make all of the buildings in a market more efficient but taken together we think that we are starting to see the right. There is an interesting example of combinations of integrated policies that can really transform the building environment.

So going onto the next slide, let's start with the first policy category. Codes and standards, and in new buildings codes are really one of the key go-to policies in particular building codes and appliance standards and the requirements for building design and construction. Building codes can also be written for existing buildings to undergo a major retrofit there are examples of code that require a major retrofit be a certain efficiency standard.

We go onto the next slide, we see that the target is the next big category of building efficiency policies that we looked at. And target is the idea that a broad goal is that for what percent savings or percent improvement a given location country or a state or a city would like to achieve in the energy efficiency of their buildings. Would they like to see the buildings become 10% more efficient or 20% more efficient? And who is going to be held responsible for that, in some jurisdictions the utility can be put in charge of meeting the energy efficiency target. Targets really help focus the market around a goal and can often sort of be a first step that can then facilitate some of the other policies following on that.

Another case of targets that can be set is just for the government can lead by taking on a target for improving efficiency of their own government office spaces that they own and occupy. So going on to the next slides, I will talk about information and market transparency policies that can help build greater awareness.

The first is just having good data about buildings. Collecting data and having baselines can help with implementing something like a building target, it can help owners and managers make better energy management decisions because if a building owner doesn't have good information about the energy spend of their building and how that compares to other buildings in the market they may not know they are underperforming.

Another way a type of policy that can build awareness are competitions and awards program. Those are simple to implement and can just give awards to good efficient buildings and can call attention to those market leaders and another type of policy is the audit.

The requiring or offering of audits to builder owners is a start to see that in understand what the potential is for improving the energy efficiency of their buildings.

Go on to the next slide, a few more of the awareness building policies that provide more information to the market. Some of them best grading and certification program like the energy star programs in the US where buildings are benchmarked against their peers and the privately handle the US green building council has the LEED program.

And taking that one step further in some jurisdictions including the UK and a few of the US cities, they are starting to require the disclosure on energy performance in buildings and that's sort of staking those rating and certifications and requiring that it be disclosure about all building, those are for when someone is renting or building a home or building office space.

Know what that energy cost is going to be, they know what kind of investment has been made in energy efficiency and it can be factored into the decision making process.

So going onto the next slide there's also a whole number of policies that are being tried around the world to create incentives for greater energy efficiency that's rebates and grant spending that provides sort of direct financial incentives to building owners to make these investments.

There are risk mitigation guarantees for revolving loan funds that work with financial institutions to help them have sort of the incentive to get involved in this new market.

There are, going on to the next slide, there's a number of tips of legislation that can help enable energy performance contracting, which is the kind of work that Johnson Controls does when we go in and retrofit a building and make significant energy efficiency improvements. Having standard contracts really helps enable that business model to work, having sort of pre-approved list of providers can really help that process work better so that so enabling legislation can enable the project to move more easily in the market. Then tax incentives also, that can be given directly to the building owners or tenants for making the investments.

And there's some interesting policies and I will get a little bit more into this in one of the key studies where the financing is provided or repaid through the tax lien on a building has helped overcome in particular that incentive policy because taxes in at least the US and in many other Australia also other jurisdictions we are seeing taxes passed along to the tenant quite easily. So the investment in energy efficiency can be repaid on the property taxes then the owner doesn't have to repay the investment, the tenant repays it, while the tenant is also the beneficiary.

So that's a line of the interest - the financial interest and the investment and the savings are being held by the same entity.

So moving to the next slide, the final set of policies are actions the second to last really, the actions the utility can take. The utilities have been sort of often tasked with the role of improving the energy efficiency of their customers. They can see that broadly across all of their customers through benefit building charges, then they run programs to on-bill financing where they finance individual projects on the utility bill. Again, this helps to overcome that split incentive barrier.

If we go on to the next slide, I will highlight a few of the smart grid policies that the utilities that would be involved with for example advanced metering infrastructure, deployment and timed rate pricing so that encourages conservation at peak times.

And demand response policies that enable the consumers' devices in their homes and offices to interact with the grid. A lot of these advance metering and timed based pricing policies help reduce peak demand for electricity but of course, that also reduces the overall electric capacity that is needed and improves efficiency of the whole system.

Moving on to the final policy category – is capacity building policy. And this can be everything from direct technical assistance to help governments to local municipalities to inform legislation to work training programs to increase the skills of job seekers in the energy efficiency market.

So that's our overview of the types of policies that we found around the world we really reviewed policies that we saw being tried all over the world. To see what the sort of long list of options are available to governments to improve the energy efficiency of their buildings.

The next question that we really wanted to dive into was so which of these policies is really going to be the most effective at driving investment and we don't have firm conclusions from that but we started to have some interesting discussions.

So if we go on to the next slide, we did roundtable discussions among large multinational corporations who are investing in emerging economies in developing countries in the building efficiency sector and asked which factors influence your investment in emerging economies and some of these answers wouldn't be a surprise I think to anyone – the size of the market or course determines a companies' interests to investing in emerging economies, having a market that enabling regulatory regime, a stable investment network, integrity of the business community, small and mid-size companies that are available and willing to enter into partnerships came out as quite important. Public funding and incentives, a skilled workforce, government willingness for public private partnerships and adequate intellectual property protection and enforcement policies came out as broadly as what corporations are looking for when they are investing in an emerging economies.

We had a good discussion with the companies if you go to the next slide about what the role is of the private sector in setting policy priorities.

So you can see here we have four columns, the first is the private sector has a role in forming the policy design and the real conclusion of that roundtable discussion was that the private sector could probably have a role in forming policy design across all of these different policy categories but the policy implementation that the private sector would particularly potentially help with building rating systems for government leadership programs where it's private contractors who might go in and prove the

efficiency of government owned buildings. Energy departments contracting enabling tech policies and part of the private sector would be involved with litigation policies because those are the target in most of the finance sector, involved in implementing those policies As well as technical capacity.

And then we looked at in our discussion among the private sector do these policies have a really direct impact on growth in building efficiency industry or is it indirect?

And you can see here that some of these policies have that really direct effect like codes are going to direct affect the building efficiency industry where as targets might have more of an indirect affect yet they still drive quite important because they provide that focus and vision to the market.

If we go on to the next slide, this diagram shows sort of reflects that discussion that we had with the private sector about how these policies start to come together.

You make the combination so that's the very tip of the diagram. Let's start at the top and work my way down. You see on the left which of the policies really affect the new buildings and on the right the policies that affect the existing buildings that are most effective for existing. You can see targets came out at the top of our discussion as one of the key building efficiency policies the private sector was looking for as an indication that the market was a good place to invest in building efficiency in new buildings and existing buildings.

Having that broad vision and goal in place shows that there's political motivation to probably do some of these other things anyway. The other policy that came out really high in priority was the energy performance disclosures, having that transparency around what is the building's efficiency, what is the energy spend in the building so that the rental rates can reflect the efficiency of a building, the retail value of a building can reflect a building that has efficiency investment have been made came out really high as a priority.

And then in new buildings, building codes were really first a sort of common sense building codes came out strongest as our most important indicative policy as seeing a good market to invest. Sort of codes that help meet the target, the existing buildings enabling energy performance contracting, enabling the finance mechanisms to work, and having good risk mitigation policies in place are what really start to enable meeting those targets. And having certification policies sort of supports that.

The energy performance contracting and energy performance disclosure those top middle sections of the diagram are some of the policies that rose

as being really key to fixing the building efficiency market. The low that you can see the four categories of policies that came out as supportive of all of those others and tax incentives and grants always come out as being important.

We were talking to the private sector buyers of building efficiency and we also do a survey of building owners 4000 facility managers, building owners who are making decisions on the demand side on managing their building and wanted to find out tax incentives grants and rebates always come out as top policy priorities for driving investments for building efficiency among owners and facility managers who are making the decisions on a day to day basis, interestingly there's a difference when you look at the companies that are supplying building efficiency and the building owners and decision makers in the buildings themselves and all in both cases that policy is rising as one of the top priorities. If government leadership is another one that is a high priority for the private sector having government buildings being made that are going to be made more energy efficient. Starting point in the market the data collection and technical capacity also came building also came out as some of the highest priority policies.

So, if we go onto the next slide, I'm going to go through a couple of case studies and there's a lot more case studies in the report. We will make sure and add the link to the full report on the website through to you on the webinar so that you can download it along with all of the resources and tools there at the end of the call but just to highlight a couple of the case studies.

First, in Thailand there's an interesting combination of finance policies or incentive policies they have set up the end com end, which they financed through a levy on petroleum products and through that they supported a number of energy efficiency and renewable energy activities including research and development, an awareness campaign, a capacity building. One of the key things they financed was the energy efficiency revolving fund that provided capital at no cost to Thai banks that then provided low interest loans to energy efficiency projects and the idea there was to really get banks involved in this market because there is a cost to develop new financial instruments so by providing no cost capital to Thai banks they helped those banks learn how to finance energy efficiency projects.

Then they also provide tax incentives, which of course we learned in our research that the building owners and facility managers really like. In terms of helping them make good investments.

Going on to the next slide, we looked at what's happening in Eastern Europe in work by the European bank on new construction and development. They provided technical assistance and regulatory

preparation and financing for energy performance contracts and in Romania in particular they gave a loan to help catalyze a 10 million Euro loan, which catalyzed 45 million on projects that will be implemented over the next 10 years.

In the Ukraine they've identified and facilitated a whole number of regulatory reforms that are really enabling the uptick of energy performance contracting.

Going onto one more case study here, and there are many more in the report itself, it's looking at India. Next slide for that one.

In India we, here I just want to highlight how one energy performance contract worked, there's a project the Inorbit mall which is the largest mall in Mumbai and it was the first energy performance contract we did in Asia as part of the Clinton Climate Initiative Energy Efficiency Building Retrofit program. This was a huge retrofit project, chilled water and convertor pumps, and variable air handlers, LED lighting in the car park, sub metering each of the different tenant spaces, solar power installed and the whole project and it had a 2.8-year simple payback on the investment. That makes a lot of sense financially. Also and it was a good case to sort of start getting the big retrofit of an existing buildings type of project off the ground in India and Asia.

Going on to one more slide and then I'm going to turn this back over to Jennifer to talk about our building efficiency policy assessment tool.

I wanted to talk about how two of the pillars for getting started with a pathway for building efficiency policy.

Really, first, the country has to really think about sort of prioritizing since the policy objectives and instruments, what is it they really want to do. The next step is to think about how to go ahead and sequence policy implementation and how to achieve policy implementation.

And the final step is who and find a framework for effectively delivering a policy that you want to implement.

So I'm going to pass it back over to Jennifer now.

Jennifer Layke:

Terrific, thanks Katrina and when we went through and worked on this project with our partners we were very clear that we were taking on a series of distinct questions, as Katrina described. The first of these was how do we classify or categorize them, what do we think are effective ways of engaging the private sector recognizing that in order to improve the energy efficiency of buildings the private sector needs to be a participant in helping to realize those social goals. And then the third activity that we took on was really about how do we get started.

As Katrina outline in the last slide we really focused in at the beginning with how do policy makers view the development of their actions and opportunities for the engaging of the private sector and other stakeholders and we leveraged a tool that we had been using inside Johnson Controls for many years, it's called the Sustainability Navigator in the Johnson Controls world. But we decided it would be helpful because what this tool allows us to do in the context of working with an individual client that has many different stakeholders inside their corporation that they are trying to engage in the fact of a prioritizing a set of activities around sustainability that this tool could be leveraged for individuals who are in the decision making capacity looking to establish and build a plan for the engagement of stakeholders on the journey toward a more energy efficient built environment.

So, what we did was create a model workshop, a tool that could be used in a workshop that policy makers could convene in a multi-sector, multi-stakeholder environment to gather input into the priorities that would allow them to succeed in engagement towards their goals. Adaption on climate mitigation and on building out a high performing built environment in their city.

So, we really view this as an opportunity to take on five different aspects of the agenda. First, creating a workshop that allows individuals to present their vision, to share and engage in envisioning the exercise to identify where their head is and where they'd like to go.

The second step in that process is to understand and establish a common understanding of the current policies that are in place within that location. Again recognizing that different stakeholders may have different understanding about what the current status is in terms of the policies that impact or are in place in the build environment in the context of the city of country.

The third aspect of the workshop is to allow individual participants to provide their input in to the relative importance of diff policy choices and the difficulties that they see in terms of the implementation of those policy choices, Out of this exercise of assessing the important and gathering input in the context of the workshop you then have the ability to look at those short and long term priorities based on the input of the stakeholders that are part of that workshop.

And then finally taking the material and the information that comes out of the multi-stakeholder workshop in the assessment tool to create an action plan and move forward to identify and create processes to implement the next steps in that plan.

So I'm going to walk you through a little bit what we see as the approach that the workshop takes in providing the background about those workshops so that those of you who are in positions where you may be either supporting policy makers or you may be policy makers looking for an understanding of the tools that may help you catalyze and bring together different stakeholders in a kind of a visioning and action planning approach, it gives you a relative understanding of the priorities to those different constituents.

And we are going to talk a little bit about how you plan for a workshop like this, a multi-stakeholder workshop that allows you to gather that kind of input. First of all I would highlight that we have found that the most effective workshops that we have done with our clients over this past decade whether we have been using this kind of a tool have really focused on creating an opportunity for individuals to provide input and create a consensus based collaboration. And that is an important part of this so the workshop has visual tools, you'll see that one of the things we recommend that we created worksheets and we do little exercise with different color post it dots to allow a visual depiction of the priorities in the room.

The policy workshop is designed to be a half day format but we recognize that there's an opportunity to do a pre-workshop education which could be helpful in a 2 part, 1 day framework.

The workshops themselves really are a critical moment to identify key stakeholders that either have been involved or could be more involved in the support of a robust policy engagement.

Public sector, private sector and civil society and nonprofit can all provide different and unique contributions to a visioning and consensus building process. We recommend that the size of the workshops be somewhat limited, that we think about these workshops as a sort of 30 person activity, if you get over 30 people it's hard to have individual feel that their voice is being heard and captured.

But clearly there is the opportunity to run multiple workshops if you were exploring this in the context where you have more than 30 participants you could certainly take and conduct the workshops in multiple stages or with multiple audiences.

So finally in the report that you make you sure to have the link to and the driving transformation and on the website you can download the tools they are all free and publicly available. The materials that we are going to share with you, the worksheet, the Excel based tool and the charting of the results are all publicly available on our website and can be downloaded.

So the first part of the exercise in the workshop is the visioning step and I'm going to describe on the next slide for you a little bit how this works. Our goal here is to get the participants involved thinking positively about how to engage the environment and we always start by asking if we transported ourselves 10 years in the future and we were interviewed by a reporter what would we say about we'd accomplished because of the building policies that resulted from this workshop. It's always a nice way to think about what's the vision of the future and how to get to that vision. Every participant will write down a couple of accomplishments on a post it note and the facilitator asks volunteers to share the ideas with that group and moving that content to a flip chart.

And after all of the ideas are shared then the material is shared on a page so that you can go back and refer to it as you are looking at the next steps you can always refer back to your vision of the future 10 years out.

So the second part of the workshop is really the examining the current policy status. When you look at this sheet in it's hard to read I apologize on the energy codes on the right hand side this is simply the way that we organize and orchestrate those worksheets and activities. Essentially what we are seeking for input on in the course of the workshop here is the opportunity for participants to assess whether there is and I'm going to read the columns across because you can't see them very easily on their screen, whether there's no policy or planning in place for that specific policy or that there is a plan or pilot already in place, whether there's piloting of that policy on a limited basis, or there's subnational or limited implementation of that policy or comprehensive policy implementation occurring. So participants in the first step are going to write down on the court case built the energy codes what they believe that current status is. The first step is evaluate the current status and then to begin to think though what are the desired states and whether that's a difficult policy to implement.

So we will go on to those next ones. You'll see on the right hand side there is a key that we have with different color dots by sector in terms of which whether you are a participant that represents a private sector entity, a public sector entity, or a non-governmental organization.

And this allows you to understand that different stakeholders may have different opinions about where the implementation of building energy codes reside. So some may believe that there are very limited policies, some of them may believe there are significant policies in place but there's a market failure if you have your private sector participants who believe there's limited building codes in place and public sector participants believe there's codes in place and widespread. There's an opportunity to begin to think about a common view in that action planning process.

So the second step when you look at the next slide is around the importance and the difficulty in implementation of that policy so again in our example here we've got building energy codes and we ask the person in the second step to assess whether this is important and how difficult it would be to implement it. So policies with a large concentration of dots as you see on the bottom right hand corner are those who are high in importance and relatively low in difficulty – those are good opportunity for near term impact or opportunity. When we asked them to generate their assessments here they have to think about two things, the importance around where it achieves their broader goals and their challenges they would face in doing so. So the policies with a large concentration of dots in the upper right hand corner would be those that have a high level of importance and are relatively difficulty. They may be candidates as a longer term priority.

Finally we want to make sure that those barriers are captured so you'd have a flip chart page which would be et to the assessment sheet and as you are discussing where the placement of those dots is and ask for input about why people selected that specific are you can then make sure you are capturing the difficulties on that flip chart so that you can go back and review what the best practices have been or where you see opportunities to address those barriers as you move through the rest of the workshop.

The third step if you move to the next slide is really understanding and expanding on the sort and the long term priorities. Again looking at our example here when we are reviewing building energy code we have walk these people through where they think they are currently in the current status, we've asked them to comment on the difficulty and the relative importance in that grid at the bottom portion of the sheet and then we ask about the desired state. So up until now we have been asking them for input but we also need to then ask about whether or not what the desired state in terms of their understanding that policy and the applicability and approach in that specific context.

So in doing so we are asking about whether these are going to be short term or long term priorities recognizing that people may also view that they have a different time frame for implementation specific types of policy action. And the goal here is to be able to optimize the opportunity and improve the chance for success by agreeing on those policies that are going to be better in the short versus the long term agenda.

The next step in the policy assessment workshop is to begin the action planning process.

So each one of these policies you would take through just as we did with the building energy codes and explore with the participants the current status, the importance and difficulty of the policy, the desired state and

you would end up with these kinds of sheets that would then be available to refer to in reviewing where those opportunities lead you. And the facilitator could then talk about it appears the short term and the long term here's where we are and here's what we've agreed on and how we would begin to proceed in something that then the facility and the host could take away and report back on.

But critical in maintaining momentum out of these workshops is to create a time for the group to review the results as a whole. So you'll have anecdotal results at the end of the workshop, you'll be able to discuss the follow up and the next steps but then you want to schedule a time for the group to review the results more formally and to review either a draft of or to convene together to draft an action plan. This is actually critical next step, you don't want your participants to have provided you with all of this input and not be part of the follow up process that reviews the take-aways and action plans that are generated as a result.

These spreadsheets that we have just walked you through are available and we have got the website in English and Spanish below.

But I want to show you before we move off of this section just quickly what the results that can get generated once the material has been generated from the tool sheet the specific policy sheet into the Excel sheet that are on the report generator itself. So if you move to the next slide you can see where the policy map ends up and you may need to click two times through on this to look at the next two slides, which circle the short term priorities and the long term priorities.

The tool generates the difficulty and importance and places the specific policies that you've reviewed on each worksheet into a report that shows you the important and the difficulty of those specific policies as identified by the participants.

So and you'll recall each of the worksheets only look uniquely at each policy, this results sheet gives you those relative importance and difficulty of each policy on one visible reporting tool.

So that each of your policies could be viewed compared to the other policy, which is not the exercise that the first part of the workshop provides.

If you move to the next slide the other report that we find that is very valuable for most of the participants in these workshops that we do with our corporate clients and with our government and institutional clients and our Navigators is really around the understanding of the option and the long versus short term visibility in terms of participants views to whether this is something that should be implemented in the short and long term.

Again the reporting tool that we've generated in Excel charts this for you, where and how your participants see the relative short vs. long term status and desirability of a specific policy compare to the other policies. So in this context you can see that the green chart, the desired long term is the where you would be going in terms of the importance, you have the short term importance in the red and you have the current status as perceived by the participants in that dark blue in the middle, so you can view in that chart a zero would be no policy in place.

Policy pilot in place would be a number 2, policy in limited basis would be number 3, number 4 is subnational and 5 is comprehensive national implementation. And you can see where your participants view the need for comprehensive national implementation as opposed to what they view as the starting point for their current status. And that steps in between.

So with that I have given you an overview of a tool that we've built to try to increase stakeholder participation in the policy making process recognizing that there are two important ways the policies are being made – 1 is the top down perspective what the key priorities are in a national level and the other is the bottom up perspective recognizing that the markets and the adoption of policies also often requires market implementation approach and in doing this kind of an approach articulate the vision and priorities of different stakeholders you can build that and match that top down vision with a bottom up approach that align the interest of the stakeholders and create better outcomes in the build environment for the country and for the city in which the policy review is occurring.

On the final slide here I just want to make sure that we leave you with the Institute for Building Efficiency website in case you are interested in reading the report and the materials and the specific report link so that you have that to access at a later date. We would be happy to make sure that we provide you with any questions as you are reviewing the tool it's often hopeful to have someone to talk to you so we recognize that this is just an overview and we would be happy to take question now or to follow up when you've had a chance to review the material in further details

Katrina Managan: I would also point out Vickie sent this link in the clickable form, it's not clickable on the PowerPoint. If you just got to the chat area you can get a clickable version of this link you can get directly to the link and the workshop. Over on the side.

Heather Stafford: Thank you so much Katrina and Jennifer, this is Heather Stafford from Confluence Communications. We actually gathered some great questions while you were presenting that I would be happy to hand over to both of you and you guys can decide who wants to take it.

Our first one came from and please forgive me if I'm it incorrectly, Jen Derstine. Does anyone collect information on building efficiency use by type of building commercial, industrial or even more specific hospital, office, data center at the state or local level?

Jennifer Layke: Well there certainly are a number of different ways of getting at that data and information in the US context you can do this to some extent with the tools available on EnergyStar. We know that there are opportunities in terms of what the US Green Building Council is collecting in those LEED certified buildings and those specific LEED categories there are some benchmarks against. At the state and local level I'm not as familiar with the tolls and resources but I certainly know that a number of states including CA have been building extensive database and many university resources are available if there are certain states that are of interested in the US context we could help you identify some resources that may be applicable.

Internationally it is more challenging to gather that kind of information. There are websites like buildingrating.org, there are others that can provide you with some of the information and material in the Europe context there are energy performance certificates and the sort ability functionality varies and the classification of building types also varies but there are a number of different public reporting requirements in the Europe context that can give you some visibility into certain types of buildings including things like the UK's carbon reduction commitment approach.

Heather Stafford: Super. And actually also from Jen Derstine, there hasn't been much talk of combined heat and power as an energy efficiency solution for building retrofits. Does this study include CHP as an energy efficiency option?

Jennifer Layke: That's a great question. You'll notice that throughout the report and the tool here we have been technology agnostic so in viewing the opportunities with buildings we recognize that the minute we put out there specifics around the appropriate types of different technologies in the context of a policy discussion that could be quickly outdated or it could be viewed as supporting specific technologies over others. Combined heat and power presented a wonderful opportunity to increase the efficiency at a facility level, although we are not specific to the policies that are appropriate for combined heat and power in this tool and in the report it clearly is one of the opportunities to improved onsite efficiency.

The second thing I'll say is we have in the study that Katrina referenced the energy efficiency indicator survey that we do every year, is a global survey of the executives who are making decision around energy efficiency investments, we do gather data on specific technologies that are being purposed and all of that data and information is available to the

public so we can certainly look at a specific set of technologies as applicable to participants interest but what we don't do is match in that study the policy context in terms of the technologies that are being deployed as a result of policy decisions. So we are simply asking those executives about the approaches and techs that they have taken in the past year, their plans for the future and what influences their decision making. So we may have the technology view and we may have the policy view but they are not connected in terms of the policy that influenced the technology in each of those locations. We can talk more offline but the reality is that there are terrific resources out there that begin to get at some of the market data and some of the specific information around what can change behavior CHP could be included in those policies as an appropriate technology.

Sorry for the long winded answer

Heather Stafford: Thank you so much. And from Terry Walters, you discuss a range of policies but the details are critical does the Institute have model language for energy efficiency policies or legislation?

Jennifer Layke: We do not, the Institute for Building Efficiency, is a thought leadership platform, we are not part of the advocacy groups that may be participating in the development of model legislation or language. But there are terrific resources out there. I know that there are groups around the world that focus in specifically on the appropriate policy language or legislative language in the context of a specific national policy agenda. We are offering insights at an aggregated level.

Heather Stafford: Ok. Thank you and then also another question from Terry Walters. How should developing countries coordinate policies for building related energy efficiency and renewable energy?

Jennifer: That's an excellent question. The need for a distributed onsite renewable option does intersect with the need for highly efficient operations at the building level or at a community level. One example of this is the net zero building or near zero building space and I'll actually let Katrina talk a little about some of the research and work that we've been doing at the Institute in the last year to try and explore opportunities for the successful implementation and deployment of near or net zero energy building in the context of early lessons out of the US and Europe. Katrina, did you want to talk a little bit about that work and how we see the issues coming together in that space?

Katrina: Yeah, so the net zero energy buildings the one of the key things that we've been finding is that the standard across how net zero is achieved to maximize the energy efficiency opportunity first, because often energy efficiency is the most cost effective way to make a building to net zero and

then to meet the remaining energy demand that is left with renewable energy onsite or sometimes we've looked at community level net zero projects where perhaps the renewables are being done at a community scale in a city or a neighborhood or a college campus. So I think that the energy efficiency and renewable energy in that context are often talk about in sort of a load in order where the energy efficiency is easily done first at some point when the details of a project are worked out in a net zero home the cost of diff measure will be compared and renewable option is cheaper and lower cost than some for the energy efficiency measure at that point you would go ahead and do the renewables, there's a cost trade off.

At a policy level how that translates, it sort would depend on the priorities of the given jurisdiction, you know the building efficiency opportunity is often some of the lowest cost but it can be more challenging to capture given the need to have a whole integrated policy solution like the one we are talking about sometimes the renewable policy can look a little bit simpler to implement and we've seen some more uptick in renewable policies around the world. So, it can be up to a given jurisdiction to figure out how to put the two together. I think some of the good writings we've had a lack of building efficiency policy or a lower level of implementation in building efficiency policy than renewable policies even though they are some of the cost effective solutions to having clean energy future.

I'll just add really quickly that the initiation of a net or near zero energy policy is part of a long term planning process perhaps and Katrina referred to the life cycle of the building and the need to think about the investments you that make along the life cycle and at what point in the life cycle you are making different investments and it's very easy to imagine that both the long term aspiration to have it either energy positive or near net zero energy integrates in thinking about renewables along that life cycle as Katrina explained. So there are emerging policies in that are in that near net zero energy that change the way you view the life cycle of the building and the technology deployment for that building type or that community. And that's where I think you get a really positive engagement between small scale renewables and energy efficiency onsite and I think that the large scale, utility scale renewables is often compared to the utility scale alternative as opposed to the building efficiency alternative. And that's the dialogue that Katrina spoke to that we are trying to change. So that there is an opportunity to view the building as part of that large scale plan that can be discussed in the same context as you would discuss utility scale energy supply investments. Can you imagine as we talked about the business case, that buildings could supply a level of energy sufficiency that would reduce the need for supply side investment for the first time? That's what we believe could be the value proposition that has not yet been captured and implemented at scale.

Katrina Managan: Yeah, and sort of highlighting what an interesting statistic for the Sustainable Energy For All organization, they point out that one dollar invested in energy efficiency will usually save the same amount of energy that 2 dollars invested in energy supply could generate. And so, it's capturing that value that we would really like to help capture. You give it the support and all up work with workshops.

Heather Stafford: Ok. Thank you. There is one more from Terry Walters. Can you discuss the best practices for determining actual energy saved in energy efficiency policies for instance when determining tax credits or meeting energy efficiency standards?

Jennifer Layke: That is the 60 million dollar question, as you would phrase it in the US cultural context. There are methodologies out there for assessing the cost effectiveness and the implementation effectiveness of policy actions. I would site that the American Council for Energy Efficient economy has a featured has a summer study in the European equivalent to that also has a summer study every year there are many papers that are produced that specifically focus on the impact of the policies in terms of the cost effectiveness and the program implementation evaluation criteria and how the policies measure against those kinds of program review criteria. We have not categorized or catalogued the specific methodologies for the evaluation of the policy effectiveness this has been our effort to come at the front end of this to provide policy assessment prioritization at the outset. Recognizing that there have been many utility programs, studies and written about through the kinds of state and national initiatives already in place. But if you are interested in more information on the program evaluation side we'd be happy to put you in touch with some of the experts in resources that we think have been at the leading edge of looking at that evaluation conversation.

Heather Stafford: I think we have time for one more question, unfortunately we don't know who submitted this or I don't have it, the name, we apologize for that. When would you suggest your policy workshops would work best in the policy planning process?

Jennifer Layke: Good question. You know, recognizing that most governments are not at a blank slate point in time, almost everyone has some type of activity of policy environment in which they are operating I actually think that it's important to do this at a point where there needs to be a more comprehensive review of the approaches. So you know that you're not starting with a blank slate but that you ought to be gathering input and engagement. One specific example that is easy to cite is one that helps spur this project as a whole, based on our work in Johnson Controls we were interested in understanding how many of the policy discussions that were occurring in the context of the UN framework conventions for climate change, the UNFCCC, how many NAMA policies nationally

mitigation action policies in the emerging economies were being submitted by countries with building efficiency as part of the policy area that they were submitted. So were they submitting the national policy action into the UN context saying that building efficiency was a policy they were going to take on at a mitigation opportunity and what we found was that there were fewer than 10 countries that had significant energy efficiency in their policy conversation. That would have been a perfect opportunity we were beginning to think about what we are going to do to address those growth of emissions and within your own policy and action context your exploring where is your mean to change the emissions projection trajectory of your country. In that context we would expect that the workshop would be very useful.

Similarly, if you are a Sustainable Energy For All country and you are looking at ways to double the rate of energy efficiency within the context or your pledge or your commitment to sustain energy for all initiate then having that conversation like this or a workshop like this would enable you to gather input as you were putting together your approach to achieving that goal. The goal may be around local economic growth and you are viewing it in that context, or the goal may be around reducing emissions or the goal may be integrated resources planning, thinking about what kind of utility scale investments and what do you need to now in terms of the kinds of policies that could impact the supply side. All of those questions are good organizationally for offering this kind of input and feedback into the policy making process

Katrina, anything to add?

Katrina Managan: No I don't think anything specific to that. One thing that I might add before we wrap up regarding the building efficiency policy assessment tool and the workshops is that we are going out and piloting these workshops today and we are interested in talking with you if you are on the line and thinking that this sort of policy planning workshop would be useful for you at this point in your policy planning process. We are interested in sort of doing some pilots as I had mentioned and are available for those pilots and staff time to potentially help facilitate workshop and help take you through that process. So let us know if that sort of be of interest and useful.

Heather Stafford: Thank you so much, Jennifer and Katrina. We really appreciate it. On behalf of the Clean Energy Solutions Center, I'd like to thank you all for participating in today's webinar. We've had a great audience and we very much appreciate your time. I invite our audience to check the Solutions Center web site in the next few weeks if you would like to view the slides and listen to a recording of today's presentations as well as other previously held webinars. Additionally, you will find information on upcoming webinars and other training events. We also ask you to inform

those in your networks about the Solutions Center resources and services, including the no-cost policy support. And with that, we bring this webinar to a close. Have a great rest of your day and we hope to see you again at future Clean Energy Solutions Center events.