

Webinar Panelists

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Sean Esterly Hello everyone! I'm Sean Esterly with the National Renewable Energy Laboratory, and welcome to today's webinar hosted by the Clean Energy Solutions Center and the UN Foundation's global partnership for energy efficient buildings. Today we are very fortunate to have Mark Hopkins, Marcene Broadwater and Prashant Kapoor joining us. This outstanding group of panelist will be inspecting developing the IFC's EDGE Green Buildings Market Transformation Program.

And one important note I'd mention before we begin our presentation is that the Clean Energy Solutions Center does not endorse or recommend specific products or services. Information provided in this webinar is featured in the Solutions Center's resource library as one of the many best practices resources reviewed and selected by technical experts.

Now, before we begin I just want to go over some of the webinar features. You have two options for audio today. You can listen through your computer and if you choose to do that please select the "mic and speakers" option in the audio pane, as that will eliminate any feedback. If you choose the calling over your telephone, a box on the right side will display the telephone number and audio pane that you should use to dial in. Panelists, we just ask that you please mute your audio device while you are not presenting. And if anyone has any technical difficulties with the webinar platform today, you can call that help number at the bottom of the slide and that number is 888-259-3826, and they can help you there.

I'll encourage the audience to ask questions at any point throughout the webinar. If you have a question that you'd like to ask to the panelist, simply submit it to the question pane which can be found in the Go To Webinar panel. And we'll present those questions to the panelist during the question and answer session. If anyone is having difficulties viewing the materials through the webinar portal, you can find PDF copies of the

presentation at cleanenergysolutions.org/training and follow along as the speakers present today. Also in the next day or two we'll be posting an audio recording of the presentations to that site. I will send out a link to that site as well.

So, we have a great agenda prepared for you today. That focuses on discussing the International Finance Corporation or IFC EDGE Green Buildings Market Transformation Program which is the low-cost main building design and certification tool. Now, before our speakers begin their presentations, I'll provide a short informative overview of the Clean Energy Solution Center, some introductions for the panelist and then we'll have a question and answer session, closing remarks and a brief survey at the end.

I'll provide a bit of background how the Solution Center came to be. The Solution Center is the initiative of the Clean Energy Ministerial and is supported through a partnership with UN-Energy. It was launched in April 2011 and was primarily led by Australia, the United States and other CEM partners. It has now come with the seeming partnership which includes the board of developing countries through the enhancement of resources on policies relating to energy access, no-cost expert policy assistance and peer to peer training tools such as this webinar.

The Solution Center has four primary goals. First goal is to serve as the clearinghouse of Clean Energy Policy resource. Second goal is to share policy practices, data and analysis tools specific to Clean Energy policies and programs, and the third goal is to deliver dynamic services that enable expert assistance, learning and peer to peer sharing of experiences. And then lastly the center fosters dialogue on emerging policy issues and innovation around the globe.

Now, our primary audience is energy policy makers and analysts from government and sector innovation in all countries. But then we also try to engage with the private sector, NGOs and civil society.

The next slide gives a short overview of the Ask an Expert feature which is offered to the Solution Center. So, Ask an Expert is a great service offered at zero charge. So we have established a broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis to all countries. So, for example in the area of energy efficiency and buildings, we are very pleased to have [inaudible] [00:04:22], leader of the Mexico Green Building Council, serving as their expert. So if you have a need for policy assistance on energy efficiency in building or any other clean energy sector, we encourage you to use this service. Again this provider is free of charge.

So, to request assistance, you'd simply go to the Ask an Expert page which is at cleanenergysolutions.org/expert and submit your request there. We also invite you to spread the word about the service to those in your networks and organizations who might find it useful.

So, in summary we encourage you to explore and take advantage of the Solution Center resources and services included in the expert policy assistance. Subscribe to our newsletter and participate in webinars like this.

And now I'd like to provide some brief introductions for our distinguished panelists today. First off, we'll be hearing from Mark Hopkins of the United Nations Foundation. Mark directs the UN Foundation efforts to incorporate strong energy efficiency commitments in to international agreements and helps countries deploy energy efficiency through the UN Sustainable Energy for all emissions.

As following Mark, we will hear from Marcene Broadwater. Ms. Broadwater is the Global Head of Climate Strategy and Business Development with the IFC Climate Business Department. Ms. Broadwater is responsible for growing IFC investments in sustainable business with an emphasis on renewable power, industrial energy efficiency, green buildings, urban infrastructure climate-smart agriculture and bio-energy.

And then our third and final panelist today is Prashant Kapoor, the Principal Industry Specialist with the IFC Climate Business Department. Prashant is the creator of EDGE, which stands for Excellence in Design for Greater Efficiency, an application that reveals solutions at the early building design stage to reduce energy, water and material consumption.

So, with those introductions please join me in welcoming Mark Hopkins to today's webinar.

Mark Hopkins

Well, thank you. We are extremely interested in this webinar, that the IFC is doing for us, because I think it's exactly the kind of initiative that the world bank and its member institutions need to be doing to realize the objective—one of the objectives that the UN Secretary General has suggested to member countries as part of the sustainable energy for all initiative. And that is to double the annual rate of energy efficiency improvement globally by 2030. The UN Foundation has been working for the past couple of years to help the Secretary General implement this effort. I would say one of the key ways in which work is being done on this is to involve international institutions to really ramp up their engagement on the energy efficiency objective.

What we have been doing here at the UN Foundation is—put on the next slide please—is putting together a global partnership on energy efficient buildings. In an effort to bring together the private sectors especially those companies that market energy efficient products or services, those that

have an interest in seeing that market grow, along with organizations primarily NGOs and other institutions that have expertise in various aspects in environment and energy efficiency.

And then, the financial community whether it would be private institutions or public financing institutions into a collaborative that can work to help countries reform with the kind of policies, programs, regulatory change and initiatives that really result in greater investment in energy efficient buildings. This group, this partnership works also on the whole issue of the global governance on energy efficiency and trying to improve the capacity and we try to highlight the kind of proven policies and especially the business models that are stimulated by those policies—creating jobs and doing businesses and other new innovations.

Overall we tried to showcase what our partners are doing in this area. This is a growing interest and I'm one of the members of this effort. It has been an international finance corporation. In meetings with them, we learned about this Energy EDGE Green Buildings tool which we thought would be a very useful tool and exactly the kind of approach that we felt—that was the kind of thing World Bank group should be doing in terms of rating tools that result in scaling up and creating a greater market for energy efficiency.

So, we got a hold of the Clean Energy Solutions Center and suggested this webinar and I'm glad to see we have most 80 people here on the line to learn about this. So, without speaking further let me ask Marcene Broadwater who is a senior person at the bank at IFC and is in fact focuses on the climate agenda and the business development potential in dealing with climate to give kind of overview of IFC and this new tool before we hear more detail about the tool. So, Marcene, would you like to take over at this point?

Marcene Broadwater Hi. I'm the Head of IFC's Climate Strategy and Business Development Team and I'm here today with my colleague Prashant Kapoor to talk about IFC's new Green Buildings program called EDGE. In this session, we'll begin by giving some context as to why IFC has developed a new buildings program and what is the approach of IFC and the World Bank in general to developing cities and their buildings.

I'll give some examples about work and then Prashant will give you a demonstration of the EDGE design tool which is at the heart of the program. Before jumping into the agenda, I'd just like to quickly review who IFC is and how it fits into the World Bank group.

The mission of the World Bank Group is to reduce poverty and to boost shared prosperity in developing countries. To implement this mission, the World Bank group works through five institutions. Two of those institutions, IBRD and IDA are called the World Bank and they lend money and provided by the governments in middle-income and low-

income countries. IFC which is where Prashant and I are based provides financing in advice to the private sector.

MIGA which provides political insurance to private investors, and ICSID which arbitrates investment disputes. So, IFC is the largest development bank in the world that focuses solely on the private sector. We have about 3800 staff and are located in 95 developing countries plus our head quarters in Washington DC. We provide three main services are Investment Services which provide market-based funding—we're not concessional, we provide market-based funding to private companies doing business in emerging markets.

We have Advisory Services which aim to help overcome barriers for private sector growth and improve the investment's climate. And finally our Asset Management Company, it manages third party capitals such as Southern Wealth funds et cetera to invest side by side with IFC. We also invest in a variety of industries including infrastructure, natural resources, financial intermediaries, manufacturing, agro-business and service industries such as health, education, retail and tourism. So, that's a little bit about IFC and the World Bank Group.

At the World Bank Group we recognized that climate change threatens the World Bank years of development advances if we don't address it aggressively. So, this is why we feel the climate change is a priority for our mission to reduce poverty and boost the prosperity both IFC and the World Bank. In the next few decades, its rapid organization will change the economies and lifestyles of people living in developing countries. As you know world population will reach nine billion people by 2050 which is 34 percent higher than today. Growth will be the fastest in the poor countries where populations expect to actually double.

Today, 50 percent of the world lives in cities, and 70 percent will live in urban areas by 2050. Again the biggest change will come from developing countries. So, population growth combined with the movement to the cities and rising incomes place cities at the heart of economic development, energy consumption and GHG Admissions. Cities consumed 66 percent of the world's energy today and they account for 70 percent of current GHG Admissions.

So we feel that the right urban policies can have huge economic and social impact as well as direct the trajectory for reducing GHG Admissions in developing countries. Because of this, sustainable urbanization has become one of the World Bank Groups' five climate change priorities.

So our solutions—our climate-smart solutions for cities include interventions both on the public and the private side. IFC helps the public sector by directly lending cities and municipalities and structuring public and private partnerships. We also invest with the private sector to deliver private sector goods such as waste management, district heating, transport,

et cetera. And we engage with cities in the area where private sector has a large foot print and namely that's in the building sector and construction.

So, why do we find that buildings are so important? Well, buildings account for 15 percent of emissions today and these emissions are doubled by 2030 under a high gross scenario. And that growth will come most entirely from the developing world. There is this organization trend that I've mentioned creates a huge demand for new buildings and in particular housing. In fact, according to the Pike Research Navigant housing represents three quarters of all new buildings between now and 2020. At the same time with rising ill prices, it makes economic sense to design these new buildings to save energy.

For example, for those living in low-income housing in the developing world, they could also pay up to 20 percent of their disposable income on utility bills. So this really hits people's pocket books. It makes a difference. What this graph shows though, that despite those overwhelming reasons for energy efficiency and with the current economic returns from improving efficiency in buildings, 80 percent of the economically viable energy savings in buildings is left untouched. And that's more than an industry, transport or power generation.

So if the right investment choice is not met today, we'll be locking in high carbon urban infrastructure for the next 40 to 70 years. Reducing urban GHG emissions are going to meet innovation in urban planning, investment, services and regulations. The public sector will need to take a leading role but the private sector solutions will also need to step up to the play.

So, we thought why does so much of this economic value being left on the table? And we recognized that really it's not a problem with technology, the know-how's available, there's been great advances and prices have been falling in terms of technology, and economic benefits are well documented. But obviously barriers remain. The building sector is complex; there are many players in seeing this chart. We've got home owners and builders and developers and investors and commercial side. So there are a lot of players and these players have a divergence of interest and there's the symmetry of information and value creation between builders and buyers.

Some of the main challenges that we see to moving to a low carbon path include a perception about the costs. Builders and developers and owners seem to feel that Green Buildings are very expensive, up to 80 percent higher than a non-green building. [Inaudible] [00:20:29] Green Building Council did a study that shows actually these cost premiums are the range of negative point five percent to the very high end of 12 percent. So there's none in alignment of reality and perception.

Now, there are additional costs and another of the challenge is who pays for those additional costs? Developers are concerned about absorbing the cost for being able to pass that cost on to owners, particularly because the savings on utilities don't go to them but they go to the owners. The owners are also concerned about the immediate affordability and that often outweighs uncertain energy, water savings and long term appreciation.

And then on the financing side, the bankers also are concerned about financing costs because they're afraid that it will increase payment risk. And we hear time and time again from our clients in the banking industry that they're concerned about establishing systems to validate savings, to do this financing if there's not a sufficient amount of pipeline on Green Buildings coming online for them to finance.

So, underlying all of these is this concern about cost and this misperception about cost, and there's a lack of data about the benefits actually of Green Buildings—both on the financial and the environmental side. So, there are studies that show in the developed world, that the U.S. and Europe, that builders can command a higher sales price for Green Homes ranging from four to nine percent. Green Homes with green home selling is much as four times faster and buyers can save 15 to 20 percent of utility bills and the resale value can be four to 10 percent higher.

And banks actually—despite their concerns, enjoy a lower default rate from buyers of Green Homes up to 33 percent lower. So, IFC decided to address these concerns by creating a holistic program addressing each of the buyers, each of the stake holders in the construction ecosystem. Only by addressing the concerns of each of these areas simultaneously and reaching out to them through a multi-grown program to rethink that we could create actual transformation in the building sector.

At the heart of the program is EDGE—the design tool—and it is stated earlier it stands for Excellence in Design for Greater Efficiency. Prashant will tell you more about the EDGE tool and will give you a demonstration. But the world of the tool in this program is to provide an easy to understand standard of Green Buildings that focuses on cost savings and GHG reductions through less use of energy in the building and its materials. The EDGE standard is to reduce energy by 20 percent, water use by 20 percent and reduction and energy embedded in building materials by 20 percent. And the tool helps developers choose the lowest cost options with their projects to achieve these standards.

People have asked us why the standard for EDGE is only focused on the three areas. Basically, our concern in developing countries, we're seeing very low penetration rates for Green Buildings. For example in India, only approximately three percent of new construction is registered for Green Certification. Meanwhile India is expected to double its residential stock by 2030, while China alone is building the equivalent of square footage in Latin America in the next 10 years. So we have perfectly focused in a

simple, low-cost achievable goal in order to get developing countries to take that first step on to the Green path—size and scale matters.

Transitioning a sizeable trunk of the upcoming building stock to be more energy efficiency is needed if we're going to really reduce GHG emissions in the next 10 years. So the objective of this program is to achieve a penetration rate of 20 percent in our target market and sectors within seven years of launching the EDGE program. So, time, scale, size is important in getting focused on that road on to the Green path is key.

With the clear definition of the Green Building and the savings it generates, the program addresses each of the major players in the system. So, if you're looking at what we call our flower at the top petal is government. And the idea with engaging governments is to—our aim is to raise the bar and to get incentives right. So governments can do a lot in terms of incentivizing the system and indicating to the system that it is important to move on to this Green path.

We also want to reduce disincentives. For example when we were working in Egypt, which is a very dry climate. Some of the best things one could do is to double shade level glaze the windows. And we found that there was a tax—a luxury tax on double glaze, double pane glass because it was thought about as an extraordinary luxury type of item. Well, of course because of that no one put double pane glass into their buildings. So, this is a type of disincentive to building Green and working on those is just as important as working on incentives such as non-financial incentives such as extreme line permeating or zoning.

Working with governments is an important of moving the infrastructure but it also often takes a long time and there are often capacity issues particularly in the developing world in terms of implementation. So, at the same time while we're moving forward with governments to raise the bar, raise the minimum, we're also launching a voluntary Green Building Certification program based on the EDGE standard. This program grew out by our clients who wanted to design Green Building but they needed a way to communicate and verify the benefits of their efficiency to their investors and users. They love the tool but again they said, "Well how can we show others what we're accomplishing here?"

So, the emphasis of the program is on the mass market and Prashant will talk a little bit about other Green Certification programs like Lead and Briam and how it would fit in to that. But in general our focus is really on mass market with low-cost, easy tool that can reveal these efficiencies at an early designing stage and helps the builders make choices to minimize their payback periods for building Green.

We've been using the EDGE with our clients, which is why they've encouraged us to allow and do this broadly and certify projects in Mexico and in Costa Rica. And finally financing is key. So, IFC has relationship

with almost a thousand banks worldwide and getting banks to understand the value that the savings from Green Buildings is key to supporting this transition to a Green path. Exciting thing about Green Buildings is that the investment and financing for the construction industry already exists.

The challenge is to incorporate the upfront cause for resource efficiency into the financing which is paid for out of increase savings, better credit rating and higher resale values of the Green Buildings. So IFC is working with financial institutions to support new products such as Green mortgages and Green construction finance. Banks are also worried about putting in the resources to development products trained staff and convince their management to take risks if there is no reliable flow in building stock. So, we have to work on both sides. Building the stock of business through the certification process which arrives at Green Building stock and getting its developers a credit for building green, as well as financing Green Buildings.

So, IFC is using our own balance sheet to find developers for demonstration projects. And today we invested over five million worldwide in building that stock of investable Green Buildings. Okay, I'm gonna wrap up and turn this over to Prashant. I just want to give a few quick examples where we're working. One is in Latin America, we have a very strong Green Building presence. Our first private projects were on this region, we've done about a 172 million investments particularly in Mexico, including home developers, hospitals, property funds and ESCOM. Our advisory work is on Green Building code is almost completed in Columbia and underway in Peru and Panama. And we're getting banks involved to provide financing to Green Developments and develop a Green mortgage program.

In Asia, this is where we're focusing here, it's one of the fastest growing regions where GHG savings potential is tremendous. We've done a lot on the building code side with governments and in fact we helped pass a code in Jakarta which is put in effect in January of 2013. We also have engagements in the Philippines, Vietnam and a memorandum of understanding in China. And in South Asia, this is a very good example of us working on both sides of the aisle with the financial institutions and with the developers. We've made a loan to housing finance company, Dewan Housing, where we have put in our own money and brought in some Canada money from Canada to incentivize Dewan to develop a Green mortgage program and to lend into buildings of Green Homes. And on the other side we have invested our own balance sheet with a developer called Value Budget Homes to build that stock of Green Homes that can be certified and then financed as Green.

So, again that's how we're trying to bring the two sides together, the financing side and building the stock while working on codes and using that voluntary system that EDGE tool standard to pull it all together. And

finally, in Africa we started in South Africa where we're making great progress. South Africa actually has low-electricity cost but they have supply problems with the growing population and their real gap and affordable housing for those who are looking to move up in the world. So, we have MOU working with South Africa Green Building Council and have developed relationships with ESCOM which is the utility and have a lot of interest from local banks, again putting together a program of certification, financing and building stock.

So, those are quick examples, we hope to reach as I said 20 percent of new construction certified as Green and these target markets we're working in, and we believe that will result in five million units with lower utility bills for homeowners, power savings of 5,000 giga-watt hours of electricity and 115 million metrics of water and GHG reductions that are prevalent to taking one million cars off the road. And finally and equally as important we hope to capitalize up to 300 billion dollars of private sector investment in Green Buildings over that period.

With that, I'd like to stop and turn this over to Prashant who will tell you a little bit about the tool and will give you a demonstration. Thank you very much.

Prashant Kapoor

Hi, there I'm really excited to be here to demo the tool live. So, I'm going to start with explaining what the EDGE product is. The EDGE product is a basic design tool, it's also a certification system and it's a global pre-building standard for nearly a hundred emerging economies. The idea is to create a platform that anyone can use—anyone who's interested in designing Green Buildings whether it's occupants, engineers, developers or building owners. The first complement is the EDGE tool itself which is a tool of empowers of early stage and technical solutions that happen by providing operation caused information as well as environmental impact information. Based on the sort of user information that one puts in, it can select Green measures and the EDGE tool will reveal how much operation savings one would have and how much problem emissions reduction one would have too.

This old picture of the [inaudible] [00:34:43] head of a compelling business case for building design we believe. The key features of the tool and what's behind it is that there is a whole bunch of contextual data on things like utility cost, climatic information for different cities and the whole tool is based on the building physics calculation model which probably helps design buildings in a quick way rather than the promise relation soft way. And, the calculation method is a monthly quasi heavy state model which is based probably on the CN of the ISO 13970 standard. So, it's kind of in line with what energy star or the EPC standard in Europe is really looking at.

The idea is to provide investment planning tool for building owners and developers essentially. The tool as you will see I'll be showing you is for

the homes but we are also sort of developing one for hospitals, offices, hotels, retail and just basically support different user types and the idea behind creating used specific tools is that we can really cut down the market information which is generic and be very specific about what is needed by building to understand it better.

Then we have the standard which is a basically a global Green Building standard which sets a minimum criteria for what a Green Building means. It's focused on resource efficiency. So, in order to comply, building must demonstrate a 20 percent reduction in operation managing consumption, water use as well as embodied energy of building materials as compared to save the local practice in that country. The EDGE defines agreeable standard while contextualizing the base case to the occupants and their location. So, that's the idea behind the standard.

The certification program or the EDGE certificate, approaching that beats the end standard will receive a certificate informing that the projects are predicted performance; it's a massive breaking tool—predicted performance of “meets the criteria.” The idea is that this could then be traded in order to apply for better financing or for corporate lending or for marketing. The certification itself—been working on this, will be delivered through our certification partners and IFC is currently engaging with various partners in at least 10 to 11 countries to develop a local infrastructure to certification.

Just to step back a little bit to explain where we are and why we are doing this. As you know in developed countries, we've already seen large scale adoption and Marcene mentioned this lots skill adoption of the Green Building certification whether it's Briam in the UK or Lead in the U.S. And probably things like the performance certificates in Europe or energy star as well as a strong building regulations and policies have also pushed the building industry in developed countries towards higher energy performance and efficiency in general.

However, in emerging economies the Green Building certification systems have mainly been focusing on the top tier, you know clients essentially. And this makes it a little more complex because whilst they're focused their governments they have very limited capacity to implement mandatory needs and codes on Green Buildings on energy efficiency. And given the fast pace of building sector group in these countries, there's a danger that will lock energy efficiencies if large scale energy efficiency standards are not implemented.

So, the decent line, you know we sort of created the EDGE tool, but thinking behind the EDGE tool was that you know how would it solve the problem where others may not have. The thinking was that we needed three specific innovations to make this happen. Firstly, a simplification of the assessment criteria to reduce dime and cost to meet the standard, a sharper focus on resource efficiency such as energy consumption, water

consumption and finally the provision of the EDGE tool which offers cost effective solutions to make it easier for people to comply with the EDGE standard.

With this background, with this in mind we have created the EDGE tool and the idea is that we'll support what is already happening in developing countries where they have their own programs and energies similar to get this across. So, before I'll go to the tool itself, I'm very excited to demonstrate the tool to you however I must let you know that we are at the beta stage and as soon as we have publicly, sort of ready, we will let all the people who had registered for the conference to have access to that so they can give us feedback, we will also have access to use it.

So, now I'm gonna switch to the tool itself which is found here, it's a web-based tool. So, I hope you can all see the tool itself. So, it basically has one page where you enter data with its project details and things like that and you'll be able to see that information. And then you would have the location and specific data. You could choose any of those hundred developed countries that we have on the list and just for the demo, I'll choose Mexico. It provides you with the list of cities that we have data for in Mexico. The idea is that when you choose say, Mexico City it has information on the monthly, average temperatures, it will have information on wind velocity, humidity, solar radiation, rain fall, but also the sort of emissions of fuel, average cost of electricity, all of that information would come in.

Then you fill information on the building that you're actually testing using the tool. And here you can choose an apartment or a house, you can enter the average size. For example if I choose 55 square meters, it automatically predicts the area details that that particular design may have. And the idea is that when you are in the detail design stage, you can customize this information as you go along. And here you can choose for example number of bedrooms to be two; you can choose number of floors to be five and essentially it then sort of starts to get a sense of what the building looks like as a base case. That's really all you need in the initial stages to kind of start looking at all sorts of measures work. The idea is to keep it that simple.

But at the same time we got a whole list of assumptions that one can update, depending in fine tune as you go along, say the cost of electricity is changed, one can change that or if there's a certain micro-plan variation and you're in a different sort of part of the city you can actually also change the temperature, we have values—all these future values here.

So, I will now go to the Green measures part, which basically has the energy measures, the water measures and the material measures. So, first thing you'll notice is that it provides you with the base case. And the idea is that you can quickly look at what the benchmark energy consumption would be in terms of square meters and it goes to tell you where the junk

could go, the energy could go whether it's in cooling or for heating water, for lighting. This by itself is quite useful I think for developing countries it has lowered times they don't have base case data to compare against. And the idea is that this is a dynamic base case so if I choose for example, I go back to the design page and choose a different city and you'll see that this benchmark would be different for this city. You can see the cooling has gone up and sort of the solar hot water because the water temperature there is a bit warmer and is automatically calculated based on the climatic conditions of that city.

So, that's the base case and then you have the improved case right now it's the same as the base case, the idea is to make this go down. Right at the top—the top part of it has the results. It has the predicted energy consumption, the predicted water consumption; it has the basic energy bills that the typical home would have a month. And finally, you've got the energy savings this year; it's showing currently zero percent. The idea is that you would choose measures on the list here and this is the home tool, it's fairly sort of simpler, sort of second measures and for other tools that you get a lot are more complex if you like as you look through this.

The idea is that you can then choose say, if I have reflective paint on the roof that reradiates heat and reduces the heat thing, up-waters the cost reduction energy reduction for this. So, you can see by adding the reflective paint it has point five percent reduction whereas if I use reflective paints on the externables. It has two percent reduction in that sort of thing. You can also use this to compare something like roof paints with external shading which has a huge impact in a warm and humid climate like Mexico for example.

So, you can ask again starting to get a sense of which measures make the most sense in that specific climate. This is very important because different cities, different climatic zones have better sort of situations where insulations might make more sense in some places, sometimes it's the radiation that's the problem; sometimes it's the humidity that's the problem. And this helps you kind of where and what measures would make sense.

You will see that there's a scan of house rules that will give you a little bit more description and the whole tool itself will be supported by user guide, which one can use to kind of understand what's behind this, how you comply with these measures and such. So, if I choose the external walls and if I choose better glazing, you can see you're getting pretty high levels of reduction. But you can also start to say, okay I didn't want to have few values of point four five, I'm happy with point six. A few values it will automatically calculate what the reduction would be for that. Sorry I choose the wrong one. If I choose point six, if I bring it down to one you'll see that this automatically calculates the new value—the properties of that particularly roof surface what it does to the end result and such.

Then if I scroll down and I say the low energy lighting, it attacks the red [inaudible] [00:46:52] which is the lighting or if I choose for a hot water, you can see really it tucks in to the energy savings, at the energy consumption. What's interesting is that it tells you how much cost savings one would have. So, in this prediction it's suggesting that this homeowner would have about \$30 savings a month which is quite important for the banks and such right? Because then they can say okay, you have an annual mortgage of \$200 and out of its \$30 is saved and therefore they may be more eligible for some benefits in terms of higher equity that the bank can provide, or it could be in terms of a low interest rate because the risk is reduced. That's the kind of connection between these.

You can also see that whilst you're selecting these things it's also telling you what the settings may be and the energy impact of adding more insulation for example has gone up so you're able to balance those up. One final thing I want to mention on the Energy Measures page, which is what is the virtual energy for comfort?

Now, comfort has traditionally measured in terms of the kind of temperature inside the building but here what we're trying to do is if the building is more air conditioned, for example, I go back to the design page, and choose air condition no. What it does is it moves the cooling competent or the predicted energy that may be used in the building for cooling on to a virtual energy for comfort that essentially works as a proxy for how much energy one may be using or should someone actually retrofit an air conditioning system. But it also gives you a sense of how the building is performing in terms of comfort. That's how we kind of bridge the two together.

So, I'll quickly go on to the water page, so that's the energy page—the water side of things. Similar to the energy part, again it has the basic water consumption. It tells you where most of the water will go whether it's in the showers or in flushing the toilets. Again the improved case is the same as the base case, and here you can choose measures like dual flush, DWCs or low flow showers and again you can choose what sort of floorings you have and changing eight to six and see the impact of that directly.

The water measures also linked the energy measures. So when you choose low-flow showers it will automatically calculates the impact of energy. So, earlier it was 34 percent, now it's going up to 36 percent because the energy consumption for water is also dropped. So, that's basically, it has rainfall data so if you click Rainwater Harvesting for example, it predicts how much roof area you have and how much you can essentially be able to recycle, in order to say recycle the rainwater for flushing toilets or for irrigation.

So, that's the water system. Again it's supported by some measures and again it will have a user guide that will explain how some of these things could work. And finally the materials, part of it you can see it shows

minus one because you actually increased the embodied energy because it's been part of the base case, you've added insulation and essentially what you can do is choose from these options. It also tells you where the big compliment of embodied energy is. So, in this particular case, the internal walls have the highest amount of embodied energies, you can tap that first or you might have a certain building method that you use.

So for example if you're using Precast joists and beams, then you can actually choose that and you can get a sense of how much embodied energy savings you may have from that system. I'll do the same for example here, and you can see about eight percent savings from just the slabs and then if you'll look at the internal walls right now the base is set for brick construction and if I choose say, hollow concrete blocks, even solid bins concrete blocks. You can see significant savings. Now, you can imagine that most people don't realize that a lot of energy is embodied in the bricks, and therefore just choosing sensible alternatives to that and informing people as to what would be the sensible option is where we are hoping this tool will help.

So, I'd stop with that, you can see that with a few clicks you can actually get the energy savings to happen and water savings to happen as well as the materials. And essentially when you're finish with this, you can click download results and essentially it gives you a print out of all your data entry and it give you what your final results were. The idea is that you can use this to go to the department to get yourselves certified using all of these or you can use it as a proof to go to the banks to get a lower or favorable loan. So that's basically the tool. I'd be more than happy to answer questions that you may have.

I just want to go back and share one slide that—to explain what else is coming. So, what you've just seen is the tool, with developing user guides for all the various tools we have. We've been supporting this for a Methodology Manual that will explain the calculation that is going behind it and the thinking behind it. The idea is that the tool would be completely, freely relevant to anybody whether you get yourself certified or not. I would imagine, universities can use this to teach and anybody else who just wants to check the benefit of one decision versus another, they can use this. And finally the idea is that once this thing is in place then we would also provide training—webinars or local training assistance so that people can know how to use the tool in a more correct way. But the idea is that it is intuitive enough that doesn't need a lot of guidance and such.

So, I'll stop with that and I'll pass it back on to the UN Foundation.

Sean Esterly

All right, thank you Mark, Marcene and Prashant. At this point we'll move on to questions from the audience. Would you have questions that came in? So, the way that we'll do this is I'll just ask the question and whoever wants to answer it make sure you have a microphone, unmute it and jump right in. The first question that I have received today is kind of a two part

question. Do energy EDGE buildings have higher upfront cost? And if so, how did developers react because the higher quality aspect of Energy EDGE building provide enough value to developers to cause them to build more efficient buildings?

Mark Hopkins So, should I tackle that first or shall I wait for the other questions? What is the best approach here?

Sean Esterly Go ahead, one question at a time.

Mark Hopkins Okay, great. The reason of front cost if you had insulation or what the market is normally doing or if you're doing sort of the hot water. The idea is to kind of help developers choose the best solutions that work for them in terms of meeting the standard. Our tools that we have for hotels and offices and normal residential buildings where the developers not involved will also provide a cost benefit sort of calculator that helps understand what the payback is. But as you can imagine for a home developer, there isn't really a payback as such so there isn't upfront cost. Our thinking was that if you depend a lot in terms of the volume of construction that they're choosing to do, and we reckon that it'll be about two to three percent.

So, if there is an increase in cost, the idea is that the upfront cost can be articulated that provide the developer therefore once there is a value creation in the market, the home buyer is able to be charged a small premium for this. But also from the banking side, the Green mortgages that would be in the market should be able to cover some of the cost both in the user end—home buyer end and also from the developer or financing end. So, that's what we are thinking.

Marcene Broadwater Can I add one thing that we found that we tried to communicate to developers is the data suggest that if you do build Green, that your time in terms of being able to sell the home market, sell those products is much faster. So some of the additional cost is also balanced off with a decon with your holding cost which is very, very expensive. So, this is another piece of the information and the data that we're trying to put together in the developing world—which exists in the developed world to show these tradeoffs and get the information to all the different parties.

Sean Esterly Great, thank you. And Marcene, that actually I think lead then to the next question a little bit and that question is, what is IFC's approach to reaching the large and formal building sector in developing countries?

Marcene Broadwater Well, this tool in the certification is mostly focused on the formal sector, because one, it's where—again our overall objective is reduction of GHGs and building practices and it's where the mass building is being done where most of the GHGs is being created and we would like to reduce it. So, this has an opportunity I think by putting out into the free of charge into the market so that NGOs, universities and other groups can have access to it. I think that helps reach out into the formal sector. But the

certification program itself, the banking program which talks about the instruction finance and mortgages, those in general are focused on the formal sections.

Although the idea to bring this financing into two areas, one the microfinance lending which is just beginning to move in to micro-mortgages, you'll see an evolution in microfinance institutions in that way. And also we've been approached by often governments who are doing well-income housing that has a government component to it, finance to it. They're very interested in that. Prashant might be able to talk about that, it's a very good example of how government has really looked at low-income housing and used it to really try to drive financing of that, to drive a Green agenda.

Sean Esterly Great, thank you Marcene. And the next question Prashant touched on it a little bit I think when he was showing the tool, but the question is maybe on it, within the EDGE format, are there any rewards for application of passive energy systems through design and building materials?

Prashant Kapoor Yes, I believe the question is how do we incorporate passive design features, correct?

Sean Esterly Yes, specifically through design and building materials.

Prashant Kapoor Right. So, EDGE does currently take into account a lot of the passive design features. I mean for example, having reflective roofs or installation or even for that matter, choosing a certain material, it automatically knows the properties of the material and therefore, you know, includes energy savings from that. So, it's not really made just act assistance if you like and the idea of creating that virtual energy for comfort was to capture things that would mean, you know, virtual energy saving which is basically a passive saving if you know what I mean. What we've had to do is to take into account as many things in the passive front. In fact, the top, you know, 6, 7 things are all passive related things, was that certain things we thought that we would be quite— to do in large volume housing for example, like orientation. So, what EDGE does is it takes – it averages the orientation effect by taking eight orientations into account and then takes the average value. So, you've had to account the orientation a little bit especially given that we want to make it easier and quicker to do this but some of the other tools like for hospitals or offices have a lot more of that orientation related things about it. Yeah, but the broad answer is it does take passive features into account here.

Sean Esterly Thank you, Prashant. And the next question that I received is how broadly is the EDGE certification being used in the world market and are there specific countries that had adopted EDGE and the green standard?

Prashant Kapoor Sure. So, you're working, you know, the EDGE 2 is also to – all the developing countries really which we have on the list. It's about hundred

countries that we have data for and about 250 cities within those countries and we can expand that as we go along but what we're trying to do is, you know, what Marcene explained, the programmatic approach. We're trying to start off with the larger markets, the 10 we have currently identified which are Vietnam, China, Philippines, Indonesia and India in Asia and then in Latin America, we've got Brazil, Peru, Colombia and some of the Central American Countries. So, that's where we are really engaged and we have South Africa too, sorry, and we've got partners that we're talking to. Some of them – and sort of more developed state and we're about to sort of sign, you know, operation agreement for them to be the local certifying voice. So, things are evolving fast. Pilots—also testing and piloting the EDGE certification and the tool or some of our own clients. They've got a fair amount of, you know,—lines who are in this and this and that's happening – that's currently offered directly from IFC, the disc for outlines but the – this is kind of work in progress and we expect that by the end of the year, we would have at least 2 or 3 certification programs in some of these countries licking off, you know, where they would be able to offer certifications in these countries, South Africa and, you know, some of the countries in Asia like Indonesia and Colombia, fairly advanced. So, it's almost there in terms of getting this launched in these tested markets.

Marcene Broadwater Yeah, I mean, one thing just to add that's special about EDGE is that, you know, the tool can be calibrated and it's calibrated for each of the specific countries. So, part of the work that we're doing, you should see we're still—version with the tool, is each country we are calibrating the data so that really is very accurate in testing that since we show the predictive capability of EDGE is very aligned with the actual energy and water savings in areas. So, that takes time and once we have gotten that, it's part of the whole process of going—and working with our different parties.

Sean Esterly Great, and the next also is similar to the countries you're just talking about what – this attendee wonders when they will be able to get a certification Green Buildings in Russia and then also, who are your local partners that deliver the certification and what are the cost associated with the certification?

Prashant Kapoor Okay. So, there are three things there, right. So, one is Russia –

Marcene Broadwater Who are the local partners? Well, in terms of the Russia question, you know, in Eastern Europe in particular, there's a great focus on retrofits and so the work that IFC is doing in most of – mostly in Eastern Europe and in Russia particularly with a fairly long standing program on energy retrofits because there's not a huge amount of new building going on. The real challenge in those areas are retrofits and while we are thinking as a second stage of making EDGE available and develop four retrofits, right now, we feel like the low hanging fruit is in these markets that are fast growing and really building a great deal of new – on housing. I spoke a little bit about the trends and population growth and urbanization and we feel like that's

the real, you know, issue that we need to attack in order to change the trajectory of GHG admissions in the building structure. So, EDGE is really focused on new build and that's why we've chosen some of these high growing areas in Asia and in Latin America and in Africa. So, eventually we'll get to Russia in terms of new builds or right now, what I see is doing in Russia is Retrofits outside of – using the EDGE tool.

Prashant Kapoor Just to cover the second thought which is who, we have a memorandum of understanding between us and the World Green Building Council to kind of offer this platform with the local Green Building Councils in different countries. So, we're working with some of them and they, in the local Green Building Council, is the right partner. We're looking to find other partnerships to make it happen but the idea is to find a suitable partner who could build this out. So, for example like Marcene mentioned in South Africa, we've already signed an MOU. We are about to do similar things with Indonesia and Vietnam, you know, so that's kind of the way we're looking to do this, that we are open to do other ways to make it work, should that not be the moment for that country. And regarding cost, the idea as I mentioned was to really bring down the cost of certification, right. So, and by a factor of 10 but ultimately, the amount that our local partner will charge would be really up to them in terms of how they want to price this but we see this as, you know, some – in sort of \$2,000.00 worth of certification, in that sort of range rather than twenty thousand or \$200,000.00. That's doubly what we think this has been and our pilots also suggest that that's the sort of range that – this will make it cost efficient to do.

Marcene Broadwater And also I guess, just adding to that, again, our business model is that we're trying to have high penetration of a market. So, it's a national market we're looking at. In some of the countries we're working in, they may have lead or Pram, etcetera available in the market but they're touching 60 or 100 homes or buildings, etcetera and we're talking in the thousands and the tens of thousands and the hundreds of thousands. So, the model is, again, scale impact, low cost, simple.

Prashant Kapoor Yeah, and my cost sort of suggestion, that was really for the project, the whole project rather than individual units, you know, so when it comes to individual units, you know, that would be close to say 25 or hundred dollars or something close to that rather than, you know, thousands for example. That's broadly what it's made for, yeah.

Sean Esterly Alright. Thank you. And the next question that we have is asked as the, EDGE knowhow can be transferred for a local certification entity so that they can apply certification locally?

Prashant Kapoor Right. That's an interesting sort of question actually. VR, you know, and this one I would expand it to say the regulations too and some countries, you know, they got interest from local regulators to kind of see if they can use the same platform to kind of also specify what the government wants

to see as the minimum standards along with the voluntary EDGE standard. So, in both cases, you know, the tool is, as I mentioned earlier, is really available. The idea is that, you know, we would kind of keep the tool up to date and make sure that the data and the feedback in terms of, you know, how it's being used as managed but in terms of, you know, who used it and for what purpose, I think we're open to it, you know, to kind of allowing others to leverage this and that's broadly the idea too. So, if the local regulator of Green Building Certification System wants to use the energy part of it, you know, they can direct people to this side and actually use the calculator if you like for that but when it comes to the certification – we are still not, you know, totally certain as to whether that could be of use certification or not but it constable with, you know, helping making it easier for others to do this. So, if somebody wishes to use RS2 to get a different certification, we're open to that or using our S tool to get the government compliance, I'd be open to that too.

Sean Esterly Thank you, Prashant. And the next question – just to ask, the online tool that you showed for home, does that also apply or is there a tool that applies for developers of residential, commercial and industrial space?

Prashant Kapoor Yes. So, as I mentioned earlier, we've got tools for homes, offices, commercial buildings broadly, of hotels, you know, we do a lot of hotels. So, we have a strong tool there and then one for retail that covers supermarkets all the way to shopping malls and hospitals but we don't currently sort of have any plans for industrial buildings but not because— that's the bulk of our building sector market and that's why we focus on those. So, yes, I think those are – all the prototypes had been developed and are being tested right now and – in a couple of months, we should have them online too. All of these are the tools.

Marcene Broadwater Yes, and I—industrial work and industrial energy efficiency. It's one of our, you know, major areas that work on but we do it in a different way. It's much more, you know, it's not a mass market approach. It's – yeah, it's very, you know, specific to the industries that we work with but we're doing some very interesting things and everything from, you know, use of LED lightings, water resource saving, smart systems, energy efficiency or refrigeration and cooling, I mean, many, many things that we're working on the space of industrial energy efficiency and just not through this EDGE program.

Sean Esterly Is the tool for a new construction only or existing as well?

Prashant Kapoor It is —

Sean Esterly Are you still there? Hello, Prashant. I believe we are having a technical difficulty with your audio. You seem to be – Alright. Prashant and Marcene, can you hear me?

Marcene Broadwater Yes, we can.

Sean Esterly Okay. I think we lost audio from you for a second but I just heard you there. So, let's see if we can go ahead now.

Prashant Kapoor Okay.

Sean Esterly We can't hear you. She's speaking. Sorry.

Prashant Kapoor Okay. Sorry. So, the last question I had was if they can be applied to – or if the tools apply to only new construction.

Marcene Broadwater Did you hear his answer to that?

Sean Esterly I did not.

Prashant Kapoor Okay. So, the short answer is yes. It is really for new construction. As Marcene mentioned, it was created really to tackle the fast growing economies and make sure that we didn't lack in efficiencies in new construction although we are developing one for—2 in places like Russia and other places but – that's the short answer but it can potentially be used for a building that exist on order to judge its assets performance. It's got to be in performance, you know, rather in this operational to check if you know what I mean. As an asset, you could use that to kind of check if the specification is good. Yeah. Did I answer your question so far?

Sean Esterly Thank you. And so the next question we have is in the context of developing countries, speaking economic instability, is the acceptance of Green Building Reform, can that be corruptible in that context?

Marcene Broadwater Now, we think that moving on to a green path is a profitable proposition for, you know, we see there's a win, win, win, you know, it certainly be profitable for all parts of the construction ecosystem for developers. We talked about greater housing values on the housing market. We talked about banker, whether they are able to get better credits and we've talked about owners being able to get better savings on their utility bills which can actually make a big difference and obviously from the environmental and climate side, incredibly important things, you know, in terms of that.

Prashant Kapoor Yeah, just one more thing to add actually. I mean – research suggest that, you know, in an average household, in say in Asia or Latin America, they could land up spending about 10 to 20% of their annual salary or household income on utility bills and they could really make sense, you know, if home buyers can identify projects that are efficient as such and therefore reduce their ongoing cost, you know, and then there are countries where there are sort of power cuts in India, there are specific issues that we could tackle as we go along but broadly, it does make economic sense both to the government and the – and that side of things but also as Marcene explained, from the financial risk side, the banks would appreciate it and as long as the developer is able to transfer the value, it's communicating the value and sees the value of making the

projects clean and the home buyers recognizes the brand and sees the value of actually saving the money, I think that would be a good ecosystem that can take off soon and it does makes sense.

Marcene Broadwater I think you also have to realize that, you know, as I mentioned earlier on buildings account for a huge proportion of the energy, the end use of energy, right, and we got this fast growing population, this fast growing due and so energy savings really translates for the country as a whole of having to make less investments in power generation. So, if you can save that energy, you don't actually need to produce that energy. You don't need to put that investment into power plants and other infrastructure surrounding a power and transmission when you know there's a lot of – they're quite a bit of losses. So, what you saw in Mark's original slide. So, it really impacts the entire ecosystem and is the low hanging fruit. It is the most cost effective way and the easiest way for us to get a hand on, you know, managing, being able to have energy for all, access energy for all which is very important part of development but at the same time, you know, really being on a low carbon path in terms of its impact on environment and, you know, overall lifestyles.

Prashant Kapoor And that's specifically why we chose—sufficiency as the main focus of this Green Buildings Certification System, because we felt that, you know, I mean, for developed countries, it's big to kind of look at the broader picture but for really articulating—good value for proposing in a developing country, it really had to make sense in terms of, you know, cost saving and it had to make sense to the government in terms of the infrastructure needs and given that, you know, 50% of all constructions happening in China and, you know, 70% of it is yet to be built. It's a great opportunity for us to get this right, through a voluntary systems as such.

Sean Esterly Alright. And I'm going to try to group the next two questions together a little bit. It has to do with the different uses of EDGE and the first part is does it make sense to use EDGE with final users as an awareness tool and also, can EDGE be used by financial institutions?

Prashant Kapoor Yeah. So, okay, the first part – actually if you want to see this being used as advantage to – I mean, we see the tools being used independent of the certification or the standard to some extent because we feel that the tool itself provides some value in terms of, you know, being able to communicate, you know, between—right, between [advantage] raising between a person who's learning architecture and is in a college for him to understand how to design their projects and understand what works in their city but also between the home buyer and the developer and developing the energy, articulate why is my house green because a lot of times you get, you know, projects that are certified green but there isn't a clear kind of a story as to why, am I green, you know, and that would be a value for the banks to actually understand why is this project better, you know, and understand the cost saving dimension and as I mentioned, the other tools also have a cost—cost investments connect to them and all of

that I think would help them—raising. We do very much want to see this being used much widely, you know, much more widely than just the certification system.

Marcene Broadwater Again, I guess from the American context, we kind of think of it as, you know, the certification you get on your washing machine or something or your refrigerator, it actually shows the consumer okay, this refrigerator is designed to save you this amount, you know, versus a standard one. And so for the consumer at the very end when they have a green building or they have a green home, it means something to them. It means like, oh, well, this means that I can save this much in water and my water cost will be less. So, this just means I can save this much energy in my energy cost of this and even with the building material, I mean, it tells you that you that you're helping reduce, you know, GHG's or pollutions into the environment because your home was built with materials that are less polluting than your neighbors. So, it gives you the information that, from the pocketbook information to the field information to the end users and getting to the end user is very important.

Prashant Kapoor Right, and this one final thing to add there actually, you know, in terms of the tool part of it, you know, for use – being used for—raising, you know, so far we've seen two types of systems being used, right. One is the sort of, you know, books that give you an approximate idea of what a green, you know, putting a green roof or putting installation. It doesn't have conflict of information so a lot of times, designers are going by their judgment of what is right. On the other hand, you got—and simulation models that take a long time to build. It needs a fairly—design to work with and are fairly expensive, you know, something like \$25,000.00 to build a—model and make some sense of it. So, this is kind of trying to be these tool that sits somewhere in the middle of, you know, that people can use at the design—you know, to almost ride the brief for designers, can use all those features too. So, yeah, just to connect with the—part of it.

Sean Esterly Great. We're trying to get to a couple more questions but we are starting to run a little low on time. Could you elaborate on how EDGE works with programs like Lead and Green?

Prashant Kapoor Me, speaking to the U.S. Green Building Council in terms of, you know, in terms of how this could relate to Lead. It's very early days. So, we don't have key answers to how it could really related but potentially, you know, it could be like I mentioned earlier, it could have a deem to comply kind of feature where certain credits might be used for Lead. I mean, this is all at the early stages. It's not really worked up what the leakages are. We see this as a platform that people can use. So, you'd imagine as—20% of the market absorbing this and articulating this. So, in a sense to just close, to say energy stop. All the energy performance certificate where a lot of people use it and if you look at the relationship between Energy—Lead which is that Energy Star would be, you know, could give you certain credits or help you define what the energy contents, performance of that

building would be. That's the sort of relationship we wished to build in the markets.

Marcene Broadwater Exactly, because I think that, you know, we're acknowledging on this, is we're really trying to get developing countries on this path to a low carbon development on this path to green buildings and so, it is very focused. It is simple. We're only focusing on three areas while Lead and [Priam] and Green Star are much more comprehensive, right? They incorporate a lot more elements to it and which we think is great. So, the idea is that, you know, let's us on the path. Let's do this as a mass market and ask people get on that path. They'll be looking for ways to do more and to do different things and I think Elite or [Priam], etcetera will give them, you know, those opportunities to do those, you know, broader, conceptual type of programs.

Sean Esterly Great. And I think we have time for one more question and any questions that we don't get to, I will e-mail to the panelist and give them the opportunity to respond directly to the attendee. So, if we don't have time to get your question, I apologize in advance. The last question I have for today is, is there any validation data from real projects showing that the model predictions are actually achieved in the real product?

Prashant Kapoor Yes. So, there are two things here. One is that, you know, what you just saw there was the Global EDGE platform, right? So, what we're doing is in every country, we are a market study to understand how we should find in the base cases over there to bring more grand—in terms of—sending the building that are built in that particular context but also collects imperative data on actual building performance. So, the EDGE2 in that specific country, in those 10 countries I mentioned earlier is going to be calibrated to give similar answers to the imperative data that we have collected. So, it's supposed to be set up to give, you know, that sort of number and finally, the – we've done some checks in Mexico as well as in Philippines currently and they're beginning to do that everywhere else. We see that there is a variation between EDGE results and the market empirical data ranging from 5 to 8%, you know, the base case variation which we think that as long as it's below 10%, that's reasonable sort of number. That's how it should. So, that's – and so – in a sense we're almost calibrating it to give similar answers to the real data. So, although this is an asset rating, we're trying quite hard to match the operation performance of the buildings, yeah, and that's one of the thinking – that was one of the reasons why we included things like cooking or appliances which EDGE doesn't necessarily tackle but wants to include in order to kind of give a holistic picture of where the energy is going.

Marcene Broadwater Right. And I think that, you know, part of the program is we've very focused on data capture. So, we really are going to look to validate data as we go forward and then, you know, use that to – back and to continue to improve the – and calibrate the tool because again, you know, the idea of this is that this will represent money that goes into people's pockets, that it

is a value that can be actually validated by banks, etcetera. So, data collection will be a very important part of the ongoing program.

Sean Esterly

Great. Thank you again to Marcene and Prashant for the – answering all those questions. We do have quite a few there. We're don't have time to get you today but as I said, I will e-mail them along and they can respond when they have the chance to those questions. And at this point, I just like to ask the audience to please participate in the quick survey we have. We just have three questions that we'd like ask, that help us evaluate our webinars and make improvements that's necessary and—can display that first question.

Now, did the webinar content provided me with useful information and insight? And the next question please. The webinar's presenters were effective? And the final questions is overall, the webinar met my expectations. Great.

Thank you very much for participating in our survey and on behalf of the Clean Energy Solution Center, I just like to again thank the expert panelists today and also our candidates for participating in today's webinar. We appreciate the questions and your time very much and I do invite you to check the solution center website over the next day or two if you'd like to listen to an audio recording of today's webinar. The slides are already posted to the website so you can view those right now. —you can find any information on other upcoming webinars and training events and I invite you to inform your colleagues and those in your network about the solution center resources and services including the—Expert Quality Support. I hope everyone have a great rest of your day and we hope to see you again at Clean Energy Solution Center events and this concludes our webinar.