

Promoting Energy Efficiency Finance: Examples of Tools and Best Practices

—Transcript of a webinar offered by the Clean Energy Solutions Center on 30 November 2017—
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Webinar Panelists

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Katie

Today's webinar is focused on Promoting Energy Efficiency Finance: Examples of Tools and Best Practices. Before we begin I'll quickly go over some of the webinar features. For audio you have two options: you may either listen through your computer or over the telephone. If you choose to listen through your computer, please select the mic and speakers option in the audio pane. Doing so will eliminate the possibility of feedback and echo. If you choose to dial in by phone, please select the telephone option and a box on the right side will display the telephone number and audio PIN you should use to dial in. If anyone is having any technical difficulties with the webinar you may contact the GoToWebinar's helpdesk at (888)259-3826 for assistance.

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Finally, one important note of 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 Resource Library as one of many best practices resources reviewed and selected by technical experts.

Today's webinar agenda is centered around the presentations of our guest panelists, Peter Sweatman and Carolina Herrera, who have joined us to discuss Energy Efficiency Finance Tools and Best Practices. Before we jump into the presentations I will provide a quick overview of the Clean Energy Solutions Center. Then following the panelist's presentations we'll have a question and answer session where the panelists will address questions submitted by the audience. At the end of the webinar you will automatically be prompted to fill out a brief survey as well, so thank you in advance for taking a moment to respond.

The Solutions Center was launched in 2011 under the Clean Energy Ministerial. The Clean Energy Ministerial is a high-level global forum to promote policies and programs that advance clean energy technology, to share lessons learned and best practices and to encourage the transition to a global clean energy economy. Twenty-four countries and the European Commission are members, covering 90 per cent of the clean energy investment and 75 per cent of the global greenhouse gas emissions.

This webinar is provided by the Clean Energy Solutions Center, which is focusing on helping government policymakers design and adopt policies and programs that support the deployment of clean energy technologies. This is accomplished through the support of in crafting and implementing policies related to energy access, no-cost expert policy assistance, and peer-to-peer learning and training tools, such as this webinar. The Clean Energy Solutions Center is co-sponsored by the governments of Australia, Sweden, and the United States, with in-kind support from the government of Chile.

The Solutions Center provides several clean energy policy programs and services, including a team of over 60 global experts that can provide remote and in-person technical assistance to governments and government-supported institutions, no-cost virtual webinar trainings on a variety of clean energy topics, partnership-building with development agencies and regional and global organizations to deliver support, and an online library containing over 5,500 Clean Energy Policy-related publications, tools, videos, and other resources. Our primary audience is made up of energy policymakers and analysts from government and technical organizations in all countries, but we also strive to engage with private sectors, NGOs, and civil society.

The Solutions Center is an international initiative that works with more than 35 international partners across its suite of different programs. Several of the partners are listed above and include research organizations like IRENA and the IEA and programs like the SEforALL and regionally focused entities such as ECOWAS, Center for Renewable Energy and Energy Efficiency.

A marquee feature of the of Solutions Center provides the no-cost expert policy assistance known as Ask an Expert. The Ask an Expert service matches policymakers with more than 60 global experts selected as authoritative leaders on specific clean energy finance and policy topics. For example, in the area of energy efficiency financing, we are very pleased to have Dave Carey, principal at Harcourt, Brown, & Carey serving as one of our experts. If you need for policy assistance in energy efficiency financing or

any other clean energy sector we encourage you to use this valuable service. Again, this assistance is provided free of charge. If you have a question for our experts, please submit it through our simple online format cleanenergysolutions.org/expert. We also invite you to spread the word about this service to those in your networks and organizations.

Now I'd like to provide a brief introduction for today's panelists. First up is Peter Sweatman, who is the Chief Executive of Climate Strategy & Partners, a strategic consulting group in clean energy, clean technology, energy efficiency, and climate change strategies. And our final speaker today is Carolina Herrera, who is a Latin American Advocate for the International Program within the NRDC. She works on clean energy, climate change, and sustainable development issues in Latin America, and particularly in Mexico and Chile.

And with those brief introductions I'd like to welcome Peter to the webinar. Peter.

Peter

Yes. Hi. Thank you, Katie. Thank you for that very kind introduction. Let me just share my screen and make sure that you can see the presentation.

Katie

It looks great. Thank you so much.

Peter

Great. So, yes, let me just add my thanks to Katie, Stephanie, Lindsey, and your teams, both at the Clean Energy Solutions Center, SAM, and the DOE, for giving me this great opportunity to share the work of the G20's Energy Efficiency Task Group with you and to answer your questions on matters relating to energy efficiency finance.

I've, just as a quick additional series of sort of remarks to help position the audience in terms of sort of who I am and what my role is here, the Energy Efficiency Finance Task Group of the G20 is a specific—and I'm just going to quickly show you the next slide, which gives some highlights of our work. But it is a formal task group that was initiated three years ago in the Australian presidency of the G20. It is affiliated to the IPEEC, which is the International Partnership on Energy Efficiency Collaboration, as a secretariat and coordination body. We have collaborated extensively with other NGOs, most notably the IEA, on matters pertaining to policy work and technical information and inputs. The United Nations Environment Program's finance initiative, notably for the engagement that we have undertaken with private sector financial institutions, banks, institutional investors, and insurance companies. And we regularly send teams to join the debate in the G20's Energy and Sustainability Working Groups, which over the last three years have provided the base for us to engage with countries to develop our G20 products.

I, myself, am the rapporteur and technical lead for this group, and it gives me great pleasure to introduce our work. As, again, just some data points to orient the listeners, we have 15 of the G20 countries as members of our group, whose flags are illustrated on the left-hand side of this slide. And the two co-chairs responsible for shaping our work are France and Mexico.

In 2016 we engaged with just around 1,200 expert individuals through a program of 18 workshops and contributions to the then-Chinese G20 presidency. We held physical activities in four continents and we continue to build an active database of participants and experts for whom we rely to ensure that our work is on point. Particularly during 2016, as a for-instance, we had a good survey which enabled us to generate 140 specific new ideas and instruments and approaches, which we were able to refine into a 2016 report. We constantly provide our information through reports and interventions into the energy—the G20 Energy and Sustainability Working Group track, which culminated in 2016 at an energy ministerial communiqué, where the matters pertaining to the upscaling needs of those countries for energy efficiency investments was highlighted. And during 2016 we also launched a successful campaign with 122 global banks and \$4 trillion worth of global asset managers that were supportive of the incorporation of energy efficiency in more detail into the business models.

So why do we focus and how do we focus on energy efficiency at G20? So, first of all, G20 countries represent 84 per cent of global energy use. So, if you're going to save energy that is a pretty good place to start. And the other thing which G20 countries notably state is that in the area of energy efficiency finance, because the finance and investment markets tend to be global, the G20 forum was built on a financial footing, having been launched directly following the financial crisis, therefore the mixing of energy use, financing, and delivery of energy savings is a very fertile area for countries to collaborate, because it is essentially non-competitive in the quick copying of good, solid energy efficiency and energy savings-delivering policies and the encouragement of global financial institutions to replicate models from one country to another country that work, makes inordinate sense. And I think this is why the work of this task group has been highlighted in all of the ministerial-level communiqués since the task group was launched three years ago.

This slide shows a key product which was launched under the German G20 presidency this May in Hamburg, and it is referred to in the G20's Hamburg Climate and Energy Action Plan, which was agreed by leaders later this year, in July. This is a G20 toolkit, which is designed to scale up energy efficiency investments in G20 countries. The framework of the toolkit as shown by this slide is divided into three sections. There is a policy section, which is specifically based around this task group's energy efficiency investment principles for G20 participating countries, that was highlighted and included as an attachment to the G20 leader's communiqué from Antalya in Turkey in 2015 and to the work that we did together with the Chinese presidency, which is captured under the G20's energy efficiency leading program that was launched by the G20 leaders in China last year. The policy details are captured in the following slides and there's plenty of references, which anyone listening can go to on the IPEEC website, which is IPEEC.org.

In the center you will see the segments of the private finance sectorial work, which are task group has been engaging in, particularly this year. We divide that so all of these three strands are supported by the United Nations

Environment Programs Finance Initiative Networks, and we were very pleased to be able to add additional bank names throughout 2016 in China, notably some of the largest banks in the world, and through 2017 in Germany and now increasingly with a focus on Latin America as the Germans hand over to the Argentine G20 presidency for 2018.

The three areas of work have tended to focus on allowing financial institutions to make voluntary commitments in the form of statements. So, there is a Bank Energy Efficiency Finance statement, which is available in our reports. There is an Institutional Invested G20 Energy Efficiency Statement, and we have been collaborating with the principles for sustainable insurance to find a way to encourage those insurance companies who are participating in those principals for sustainable insurance to look at energy efficiency and help us understand and develop insurance products that can promote greater uptake of energy efficiency measures.

On the right-hand side there is the Public Finance Statement shown. We repeated our successes in the private financial sector with a working group that was launched in 2016 in the sidelines of the World Bank's annual general meeting, in which many of the leading public sector financial institutions, including the World Bank Group, the EBRD, the EIB from Europe, and KfW, and others whose logos you can see on the side of this statement, came together to discuss and to identify seven key areas which public sector financial institutions could see as necessary to improve the uptake of energy efficiency investments from their perspective. And we note that whilst there is a decent overlap between how the public sector financial institutions see the barriers and opportunities in energy efficiency, they are highly complementary with the way that the private sector financial institutions are often partners of the public sector also see them.

So, the toolkit itself does a deep dive into these areas and shows a snapshot as described by this slide, of the level of investments that are going into energy efficiency. So, you'll notice on this slide it shows the level of global energy investments of 2015, which is on the right-hand side, a colorful chart which shows the relative amounts being invested in the global energy sector between coal, oil, and gas, both upstream and downstream, electricity networks, energy efficiency, which is the 12 per cent sort of brown-colored box, power generation, and renewables. The energy efficiency segment is sub-divided again into buildings, industry, and transport, which is the smaller circle to the left-hand side. I think that when we produced this we launched this report together with the EIA in May of this year, and then subsequently the EIA have been able to update these figures for 2016. The interesting thing about the 2016 energy efficiency investment number is for the first time it has come up to around \$320 billion globally, which is roughly equivalent to what is being invested globally into renewable energy. And I think that's quite an important milestone for those of you focused on energy efficiency investing, because clearly this segment is very significant and has been growing in the recent past very quickly.

So, recognizing that at one level there are these very big numbers of integrated—what we refer to as integrated energy efficiency investments, there is a definitional question around energy efficiency investment that we have begun to look at and that we think is important. Because the energy efficiency market is sometimes blended into other markets. So, there are what we've defined in our reporter's call, energy efficiency investments, those are energy efficiency investments which are self-financed by the energy savings. In other words, there is a class of investments, notably from the energy service companies, ESCOs, which are third-party investors that undertake technical upgrades to buildings, infrastructure, transport systems, and the like, and industries, where the energy savings under an energy performance contract will directly pay for the upfront capital invested by that third party.

That we see as being a subset of the type of energy efficiency investments which are being done only and purely based on the present value of the energy savings. That is definitely a small component of the bigger integrated energy efficiency investment market. The integrated market would be, for example, the choice of technologies of a construction firm building a building and making energy efficiency choices within the construction of a building. So, the building's total construction budget may be quite significant; within that there are certain choices that need to be made around insulation, windows, and equipment choices. Now if those choices are made using the most highly energy efficient technologies then the component of that investment that relates to energy will be an integrated energy efficiency investment in that building. So, a green building will have integrated in it some energy efficiency investments by definition, but an energy efficiency boiler change within a building—within an existing building will be a core energy efficiency investment as defined by this chart.

If you look on the left-hand side, we wanted to make sure that people had relative orders of magnitude in their heads when they thought about the private finance sector versus the public finance sector. It's quite interesting to note that the top 1,000 banks in the world have a total aggregate balance sheet size of \$110 trillion, and the top public financial institutions have the aggregate size of around \$176 billion. So, there is 1,000 order of magnitude difference between what is able to be invested in aggregate from the private space—the top 1,000 private banks, versus the top public financial institutions. The reason we show this is because this task group's work has been very focused on how public financial institutions can come up with risk-sharing instruments which allow and create this space for the large amounts of capital that are available from the private sector. And if I was to focus—if I was to say that there was one conclusion, that would be the area for key growth, which I think that all G20 countries working together with us are keen to exploit.

So, this on the policy side, so moving from how we measure and how we define energy efficiency investments to our first sector activity in the policy case study, I thought it was useful for people to have a sense of how this definitional part can allow us to create policy recommendations. One of the areas which we believe the G20 policymakers can make a big difference on

through their policy activity going forward is to better understand the way that we define energy efficiency premium. So as an initial approach that has worked for the past, there is a mechanism that says the cost of a good or the cost of a building according to a baseline of standards is cost one. And then if we make this building a very energy efficient building or a green building we're going to have to add an additional amount of investment, because the assumption is that saving energy costs money, and therefore thicker glass on the windows is going to cost more, and so that element of the building will be more costly, and therefore the whole building will cost more. But the benefit will be found in green premium, i.e. will be able to sell the building for more, or the fact that the cost of ownership or the people living in that building or working in that building subsequently or the tenants will have lower energy bills to pay.

This has been the standard assumption and is the standard assumption that's worked into the International Energy Agency's assumptions, which I've shown you. It is a question, though, as to whether or not this is the way that we should see this market evolving going forward. Our argument as a task group is that if policymakers raise standards and adopt specific approaches to the different sectors it may well be that as a result of obsolete products or wasteful or inefficient energy devices being phased out or not interesting to, for example, new builders and retrofit builders, the cost of those—the market opportunity for those, and therefore their cost will go down—sorry, will go up, and the energy efficiency premium that we've been observing over time will come down and down and down until there comes a time in the future where taking an energy efficient choice is at no premium or is the market obvious choice. So, there are many ways to achieve that policy as one, and another way to achieve that would be a procurement mechanism which considers not just the upfront capital required to construct infrastructure or buildings, but the total cost of operation of those buildings for the period of their natural life.

So, in terms of policy tools, one of the things the toolkit clearly does is offer readers access to tools. So, the first set of tools that we offer access to are the policy databases, which track energy efficiency policies in different ways. We reviewed eight of them, and the leading one was the IEA's PAMS database. So, what we did there as an exercise was take all of the 2,000 policies in the IEA's policy database that tracks the G20 and other countries' energy efficient relevant policies, and we spread them out across the principles within the voluntary energy efficiency investment principles framework, which our G20 task group created in 2015. What that enabled us to do, looking at the top graph here on the right-hand side, is stack in bars the number of G20 countries that had active policies which were working on the different segments of the voluntary energy efficiency investment principles. What that means is green tool _____, such as the one under Principle 3A is where a large proportion of the countries have active policies in that area, however, the short red bars, such as Principle 2 or sub-Principles 3D, 3F, 4A, and 5 are examples where there are policy gaps.

So essentially what we did here is we identified where G20 countries should focus going forward in their policy development to provide the kind of investment frameworks that are necessary to stimulate additional investments. Because you don't probably have the list of principles in front of you, a specific example is Principle 2 of our framework says that in energy system planning supply side policies should be balanced with demand-side policies. In other words, what that means is that countries, when planning their energy systems should not only consider how much additional supply, renewable energy, and additional new sources need to provide, but the possibilities that customers in the future will not be demanding as much energy as they had been due to the energy efficiency measures that have been successively implement. This would give rise to a different demand curve and would give rise to a different necessity for supply. There are only two or three countries that were noted through our study that were doing this, and one example of that would be the European Energy Efficiency First policy, which is giving rise to a European approach that tries to rebalance the thinking around energy supply and energy demand. So, these findings and others relative to this appear in the first chapter of our toolkit.

The second chapter deals with the private sector tools, which I've already mentioned partially in the form of collaborative and collective statements. But things which I haven't mentioned were the survey that we did with our banks. I mentioned that there were 122 banks that had signed our bank statement, and a good subset of those provided us information through a survey which concluded that energy efficiency for them was indeed a well-recognized opportunity, however, it did require additional awareness-raising and supportive policies internally for those banks and it required greater tracking of energy efficiency finance through banks' balance sheets and activities.

The chart to the right-hand side is an example of where that additional tracking is required. So, 58 per cent of our respondents say they do not track the energy performance of the assets on their balance sheet; 29 per cent do track energy performance of real estate; 21 per cent tracks the energy performance of the energy sector investments, 18 per cent in industry, and only 16- percent in transport. To us this suggests there exists a very strong opportunity to attach the environmental or green attributes of individual bank investments to those assets in their balance sheet to provide additional visibility and tracking to those financial institutions to encourage them to, for example, be able to say whether a green building is a better or worse credit risk than a brown building. We at the task group have read studies that suggest it is, but the more tagging and visibility that is available to banks the more they will be able to corroborate those findings for themselves.

Finally, having not spent much time talking about investors, we, in our toolkit, analyzed what investors are doing about energy efficiency and how that appears within their current investment strategies. We also talked a great deal to how insurance companies, aside from being investors—so insurance companies have two ways of acting in our framework. The first is they are significant long-term investors themselves and therefore need to consider how to adapt their strategies to include more energy efficiency investments. But

perhaps more notably, they can provide insurance products to de-risk the energy efficiency investments for others.

This means two things: the first thing it means is taking away technical risks. So sometimes banks and long-term investors are concerned that particular technologies involved in energy efficiency projects won't deliver the energy savings that they promise. There are now insurance products, particularly the energy savings insurance product which is being managed in Latin America, mainly by the Inter-American Development Bank, and there are others available in Europe and North America, which for a premium will ensure that the technical outcomes of a particular project are met. And of course, when you enter an energy performance contract with a third party they have a credit risk and it's possible that the factory or the host of that particular project may go bankrupt during the life of the contract, and so therefore there is a credit risk and other financial performance risks, which these insurers are very used to working with. And so, these are two areas we've been developing with insurers.

And then finally, and this is the third section, the third pillar of our work, and this just gives you some insights into how that work has been evolving. We did launch a joint G20 energy efficiency statement that was the result of our working group. Our working group contained more public financial institutions than are listed here, but those that are listed here were signatories of that statement. And the three key areas, the public financial institutions were particularly interested in order to upscale energy efficiency investments were the showcasing replication of their energy efficiency investment models, the identification and implementation of financial instruments that facilitate this replication and scale up those energy efficiency investments, and the identification of internal policies such as the World Bank's safeguarding mechanism as one example, which mainstream energy efficiency investment activities across the whole organization.

Within the framework of action for public financial institutions and country partners, to achieve this scale-up there are four key points which come out of that work which are worth considering. The first point is for those public financial institutions involved in policy-based lending there are policy frameworks that require and promote energy efficiency in the context of what we call Life-cycle Cost Optimal Procurement. That's a bit of a mouthful, but it refers to how governments buy new public infrastructure and buildings. If in the contracting phase, in the procuring phase of that new infrastructure and buildings, energy efficiency over the life cycle of the asset were considered, then those assets would have a tendency to deliver greater energy efficiency throughout their lives.

Number two, there is a clear identified need to increase the amount, availability, simplicity, and connectedness of technical assistance and project development assistance facilities. This is the critical capital which enables an ecosystem of project developers to survive in a given geography or region to develop the pipeline of investible energy efficiency projects that are necessary.

And thirdly, to look for multiple retail distribution mechanisms. Again, public financial institutions typically working with private sector banks because private sector banks have customer relationships with the owners of homes, the owners of office buildings, and are very needed in order to be the on-lending partners for wholesale financial institutions that may not have the level of retail penetration that their partners have. I must note it's not just retail banks who are partners to those institutions, but also utilities and other customer-holding private businesses.

And finally, it's critical to public financial institutions to consider how energy efficiency can deliver future mobility of smart grids and intelligent infrastructure, which is clearly an important area for development at the G20 level.

So as I close this presentation the key opportunities which have been highlighted this year in the development and the launch of this toolkit and that can be hopefully brought through and continued through this task group and contributors working 2018 is to recognize that this toolkit provides a frame, a frame in which countries and financial institutions and stakeholders within energy efficiency markets can co-create the environment that's necessary and to rapidly replicate those good practices. The appendices to our toolkit has 32 multi-country best practices within it and we're always looking for new good practices to be able to highlight in subsequent years.

The design and implementation of enabling policy framework remains very front of mind and there is, again, as I mentioned at the beginning of this conversation, many opportunities to copy working policies from one country to another. There are many specialized products and services for energy efficiency that cannot only improve the visibility of energy efficiency in general, but also enable the tracking of the asset energy performance such as green tagging, which I mentioned. These insights and good practices will continue to be provided by future iterations of this toolkit. And we continue to want to see public financial institutions de-risking and dedicated concessional financing instruments for energy efficiency and that they can also take a leading role in developing the awareness and capacity among their partner banks and bank management teams and staff to help develop future specialized products and services for this space.

So, going forward and in summary, the energy efficiency—the G20's energy efficiency investment toolkit is really a collaborative architecture. There's over 1,000 experts that are contributing to it on an annual basis. We see very much our relationships with the kinds of network like the Clean Energy Ministerial Solutions Center and others as bringing the network value that allows it to collaborate with you and continue to develop our thinking in order to scale up energy efficiency investments. As I mentioned, the toolkit itself is really three-in-one. There's a ten-page tear-off at the front for policymakers that provides our recommendations directly to the policymaking members of the Energy and Sustainability Working Group of the G20. There is the comprehensive toolkit which gives and provides the detail of some of the things which I have referenced in this talk. And there are the 30 case studies

in the back which I've referenced also, which you can find at this link here on this final slide, which is for further information on the IPEEC website.

So, with that I appreciate your listening. Thank you for the time and the opportunity to explain this, and I welcome your questions.

Katie Wonderful. Thank you so much, Peter, for that presentation. I'd like to remind the audience that they can submit questions at any time during the question pane. And now we'd like to welcome Carolina Herrera to the webinar. Carolina.

Wonderful. We can see your presentation, Carolina. Are you able to unmute your phone? We don't have any connection yet.

Carolina Sorry about that. Okay, let me just see. Can you see the screen?

Katie We can see it. You'll need to put it in the presentation mode.

Carolina Okay. There you go.

Katie Wonderful. Perfect. Welcome to the webinar.

Carolina Great. Thank you, Katie. And thank you for that presentation, Peter, about the toolkit.

I wanted to just—if you can just give me a second. As you know, I've been having computer issues and it seems like my connection might be about to fail again. Let me just double-check on something.

Okay. Sorry about that. The IT person had to come in and fix something. Sorry about that.

Katie No worries.

Carolina Well, again, thank you, Katie, for having me on the webinar today, and also thank you to the rest of the SAM and the DOE team. I know that this webinar has been some time in planning and I'm glad that it has finally been able to come together.

And I wanted to first start just by giving some brief background on the Natural Resources Defense Council, my organization. NRDC is an international non-profit group. We have over 2.4 million members and activists. Our work covers a very broad range of different environmental, energy, and public health issues. We work in the United States. I'm based in Washington, DC, but also in China, India, Latin America and in diverse global _____. In Latin America we've, as you noted earlier in the introduction, we've worked particularly in Chile and Mexico in recent years. I'm part of NRDC's Latin America Project and the work of our team is focused on identifying and promoting policies and solutions, including innovative financial solutions that can help countries in the region grow

towards low carbon climate resilient futures as well as still protecting their natural resources and communities.

And my team in the Latin America Project has been working with our colleagues in NRDC's Center for Market Innovation, who work closely with entities known as green banks, which I'll talk about later, and have helped form the Green Bank Network of a number of existing green banks, and we've been working with them to sort of together identify how the green bank approach or model could be a reference for the Latin America region, how it could be adapted to the context of countries that might be interested in developing their own green banks or similar institutions. Let me just see if this is—okay.

So today I'll be discussing the green bank approach and some case studies of how some existing green banks have been tackling financing of energy efficiency, particularly in the residential sector. And also briefly touch on some of the potential ways that we see this approach or this green bank model could potentially be adapted to Latin America. Let's see.

But first I just wanted to briefly touch on the opportunity for efficiency in the region. The IEA has estimated that energy efficiency investment worldwide reached \$231 billion in 2016. A lot of this or most of this went into the building sector. And looking at Latin America and the Caribbean, a conservative estimate by the IFC found that by 2030 there was an investment opportunity of over \$43 billion in efficiency and industry transport and buildings, and this is just looking at Peru, Mexico, Colombia, Chile, and Brazil. So certainly there is potential already and it's going to be growing.

Another sort of driver of energy efficiency or the need for a greater energy efficiency investment is certainly going to be that efficiency is an important part of several of the climate commitments or nationally determined contributions that countries have made in the region under the Paris Agreement. Yet while efficiency and other clean energy investments and other low carbon and climate resilient infrastructure investments are a critical part of actually implementing the NDC commitments, the IFCs found that only \$32 billion is currently being invested in the region in LCR infrastructure—in low carbon and climate-resilient infrastructure, where the need to achieve the NDC targets is bordering \$176 billion per year by 2030. And this is just in energy urban infrastructure and industrial efficiency sectors.

So essentially there are significant investment opportunities already and the urgency of meeting climate commitments just means that this opportunity and need is going to grow. But clearly there is a gap in the financing that is available for not just energy efficiency, but other clean energy solutions as well. And so it's going to be increasingly critical to bring in additional private capital and quickly.

But of course there are a number of barriers to energy efficiency investments, and I probably don't need to go into detail in these with this audience, but there are various—they can be complex, there can be various different

barriers within individual sectors and also different barriers across different stakeholders in the marketplace. The initial upfront cost of efficiency investments is an important barrier oftentimes, and it's certainly common, but it's not necessarily or always the most significant barriers; there's also high level of transaction costs for both consumers, who might not know how to—you know, who to hire to do an audit for improvements, what solutions make the most sense for them. Once they figure out how to access financing, the terms of the financing might not be appropriate. And for financial institutions there's also high transaction costs because of the small size of, you know, a lot of the projects and the due diligence that is necessary, but obviously there is also still incipient knowledge sometimes of the different efficiency technologies, how to actually structure financial products to be able to finance them.

And then there's also capacity constraints, some of which I think Peter was mentioning earlier. There's capacity constraints in terms of knowledge and experience with the sector within banks, but even within service providers, sometimes some countries don't have well developed ESCO specters, but there can also be, you know, contractors, but they're more specialized in certain types of efficiency technologies, like heating and ventilation and air conditioning, but not necessarily building envelope, and so they're not necessarily targeting those sectors.

And service providers may also have limited capacity in terms of how to market the energy efficiency services that they can provide and how to acquire new customers and how to sort of reach different customer types. And then obviously there's competing priorities. A lot of times the first time that consumer is going to be confronted with a need to potentially purchase an efficient piece of equipment is when the existing equipment has failed, and that's not necessarily the time when they're going to be investing in research and trying to figure out what the best options are. And certainly financing institutions also have various competing priorities.

So essentially in response to this combination of barriers, to increase investment in efficiency is going to require a more programmatic approach. It's going to be necessary to both de-risk efficiency investments—let me just go to the next slide. It's going to be necessary to both de-risk efficiency investments and to develop greater demand for the solutions. And this is where we see that the green bank approach or model can come in.

So just to be clear, when I'm referring to a green bank or a green investment bank I'm not actually talking about a bank. The green banks that exist currently are not banks in the conventional sense; they don't take deposits, they don't offer checking or savings accounts. It's not a bank that has a sustainability or a green policy internally or that is developing one in terms of, you know, developing environmental and social safeguards and things like that. And it's not a financial institution that on occasion invests in green projects because it makes sense. What a green bank is in the way that I'm referring to it is essentially an entity that is, you know, a specialized financing vehicle that's designed specifically to attract or crowd in private capital

towards various low carbon and climate-resilient sectors, including energy efficiency. So in short it's really fundamentally a policy tool, a way that governments can tap into private capital markets and direct these capital flows towards the sectors that need this investment to come in.

So essentially the green bank model or function will use limited public funds to work with private capital providers to leverage that capital and direct it into centers, for example, like efficiency, and they'll use a suite of different financing tools; they can use debt or equity or various types of credit enhancements, like low-loss reserves. Some of them will aggregate smaller projects so they can secure _____ and eventually issue green bonds. And then on the other side of the market they'll also work to increase demand for cleaner solutions. And this can be simply by providing different levels of technical assistance to different stakeholders in the market, helping to bring together the various stakeholders that have to come together in order for a deal to happen. And sort of a fundamental role that the green banks are taking on is really sharing the knowledge that they acquire about what works in terms of financing some of these technologies that there's less experience in dealing with.

And then finally another sort of defining feature of this model is that the focus is not on using the limited public funds for subsidies, but rather in finding ways that these funds can be recycled. So, you know, when a loan is repaid back the green bank can then use those funds to focus on other sectors, other projects where they issue a green bond, they can use that fund to recapitalize themselves.

And I think another point to kind of highlight here is that their design, their approach is meant to be flexible and nimble. So the focus on sectors that just need targeted interventions to really take off, and once there's a few demonstration projects that show how this approach for the technology, you know, in question works, they can then move on to another sector. So once they've shown that, yes, it does make sense to finance energy efficiency and affordable housing, they can move on to, you know, whatever the need is identified in the market, whether it's, you know, storage or EVs.

Essentially the green banks that exist now have been designed with a fairly— with a locally specific organizational structure, depending on what the local context is, and also with local missions, to essentially achieve the public policy goals of the jurisdiction in question, whether it's a country or a state level, and now we're seeing some at the municipal and even city level. And so they'll have very specific missions and very specific market strategies, but they do tend to share certain characteristics, and one of the most important ones I think is that they have a narrow mandate that's focused on low carbon technologies or solutions, you know, clean energy in practice. A lot of the ones that we're seeing right now are focused on clean energy specifically. And they also have a very local market focus. And this is sort of what distinguishes them from other financing institutions that we see also participating in the financing of energy efficiency and other clean energy

technologies. They are very focused on their own markets and they are definitely very focused on clean energy.

And this is just sort of an overview of some of the different technologies that green banks have been working with. And this is drawn from—so NRDC's climate—sorry, CMI, the Center for Market Innovation, has been working to create what's called the Green Bank Network, it's essentially a virtual platform where existing green banks can exchange knowledge and sort of best practices and where jurisdictions that are interested in learning from the experiences of these institutions can also go to learn more about this approach. And so, this slide here draws from the members, existing members of that network, and we can see that 19 per cent of their investments have been targeted towards energy efficiency.

And sort of—oops, sorry—I'm working on another computer. As I mentioned, I've been having computer problems, so I'm working on someone else's computer and it's a little bit sensitive.

So I'm going to be drawing three case studies from this group, from the Green Bank Network: the Australia Clean Energy Finance Corporation, the Connecticut Green Bank, and the New York Green Bank. And the first case study that we have is the Clean Energy Finance Corporation. Essentially this agency was created by an act, by a government act, and among their goals or their objectives was to reduce energy costs for low to moderate income residents with efficient and affordable housing. In Australia there's a pretty significant shortage of affordable housing for low to moderate-income residents, and so one of the objectives at the CEFC was to address this need. And the barriers that they were finding were, you know, barriers that were pretty familiar in various markets and countries, essentially the providers of this housing—community housing providers we tried the organizations tasked with developing and offering subsidized rental housing don't have sufficient revenue of their own to pay for new construction or retrofits outright and they have difficulty sourcing private financing at appropriate terms.

And on the flip side, commercial banks aren't familiar with the technology or really how to assess these investments and how to structure financial products. So the solution that came from the Clean Energy Finance Corporation was through its Community Housing Program, which essentially provides long-term debts to community housing providers and other organizations that are looking to develop energy efficient community housing in Australia. And so one transaction that we've seen is with the Saint George Community Housing entity; it's one of Australia's largest not-for-profit community housing providers. And CEFC partnered with Saint George. Saint George received a loan for about \$130 million or the equivalent in US dollars of the Australian equivalent in debt for retrofit of existing properties and construction of 500 new community housing—homes in Sydney, Australia. And so essentially with this loan this enabled Saint George to provide energy efficient housing for low-income families. And as most other community housing providers, Saint George gets its revenues from rental income, from management fees, and other services that they offer in the community

housing sector. And so with those revenues they've been paying back the loan to CEFC.

The important thing here is that CEFC was willing to provide this loan, whereas other financiers wouldn't have been willing to do so. And another key thing here is that Saint George understands the market, this particular market very well; they have the connections, they understand the needs of the end users, they have the relationships with the final residents. So this is why this partnership essentially is enabling the construction of these properties to move forward.

The second case study that we have is in Connecticut. Connecticut Green Bank is actually the first I guess institution that started calling itself a green bank. And they also have an explicit mission as part of their overall mission to serve low income and multi-family building sector. And again, the barriers that they saw in Connecticut are similar to the ones that they saw in—or that Australia has seen and that property owners have difficulty paying up from costs or are unfamiliar with how to actually implement improvements. They have difficulty accessing financing at reasonable terms and private sector capital providers are hesitant because there really isn't too much internal knowledge in the financial institutions and they perceive these projects as more risky without an existing track record.

So the solutions that Connecticut Green Bank offers essentially entail, you know, a suite of both technical assistance, financing, and project financing solutions. So on the technical assistance side they'll offer loans for pre-development work, for project definition, working with strategic partners, which I'll talk a little bit more about later. They'll offer a network of service providers that have been pre-vetted, so that cuts down on, you know, the burden that an end-user would have in terms of identifying who to go to for an audit or for an installation, et cetera.

And on the project finance side they have a couple of different loan products. One is the commercial property assessed clean energy loans or CPACE. And this is essentially a fund that will cover the entire cost of an improvement, and then it's repaid over time by an assessment that's placed on the property's tax bill. And even if the property is sold it will stay with the building. So it's something that gives certainty to investors because eventually property taxes will be paid.

Another product that they offer is the Low Income Multifamily Energy loan, the LIME loan, which I'll talk about a little bit more, and this is targeted at serving low to moderate-income residents and there are certain requirements for the types of projects that are eligible. And if there should be an end-user that isn't eligible for either of these two loan products the Connecticut Green Bank also has a credit enhancement fund that is used to work with an end user to secure financing from other lenders. So to reduce the lender risk and figure out a solution that will work for the end user.

And so how this LIME loan has worked is that essentially Connecticut Green Bank has partnered with Capital for Change, which is Connecticut's largest

community development finance institution, and the Green Bank provided \$3.5 million to capitalize an initial \$5 million fund from which the LIME loans are drawn. And then the rest of the \$5 million came from other partners and investors. And so the LIME loans are actually offered by Capital for Change and they are used to implement energy efficiency improvements. The loans can go from \$300,000.00 to \$1 million. And Capital for Change, which again, knows the market very well and has a network of service providers, works with customers to understand the improvement process and sort of how the contract works, et cetera.

Once the energy efficiency improvement is in place, again, as I mentioned, the costs are recovered over time and this is what enables Capital for Change to eventually pay back the Green Bank. But because lending money to low or moderate-income can have a certain level of risk, the Connecticut Green Bank has also created a loan loss reserve, and this will enable to cover any sort of losses that are incurred due to failure to pay the loans.

And then the third project or case study is in New York. Again, very similar goal, trying to get energy efficiency homes in the state of New York—this is a state-level goal, and the New York Green Bank is tasked with helping to implement the state-level energy strategy. And again, same, similar household barriers in terms of from costs being high and similar barriers for private investors. The solution the New York Green Bank has offered is that they are capitalizing special purpose vehicle entities to essentially be intermediaries that can finance energy efficiency upgrades and be the ones that manage individual loans.

So one specific transaction that we've seen is that the New York Green Bank signed a contract with a company or an ESCO called SEALED. And this contract essentially grants SEALED with a revolving credit of \$5 million to complete energy efficiency retrofits in 400 homes. And this is directly homes, not the buildings. And SEALED has a loan called Home Advance that offers single-family homes customized alternatives for paying their energy efficiency improvements. So SEALED will pay for the energy efficiency upgrade and then figure out a payment plan based on the monthly energy savings. And it's the New York Green Bank's involvement in this business model that has essentially helped SEALED implemented and start scaling the business model up.

Peter was mentioning insurance for energy efficiency investments, and in this case SEALED also does have an insurance that they have hired and contracted that will cover any losses and essentially enable them to pay the New York Green Bank back.

So a few lessons that we've sort of seen from these case studies and a few others that we've looked at. And the first two are really about the overall context. While green banks can do very important things and are doing significant things, all of this happening within sort of a context that there was a policy mandate or some sort of directive directing them towards these sectors. And this is particularly two sectors that are particularly challenging, such as the low-income sectors and multi-family housing. Australia, for

example, was directed by its investment mandate; Connecticut, again, like I said, has an explicit mandate to serve these low-income sectors.

Another sort of context that is important to note is that energy efficiency standards are key to help ensure performance and results. So the program offered in Australia has energy efficiency standard requirements in place. The new community housing that is constructed needs to meet a certain rating on the Nationwide House Energy Rating scheme. So it's not something that is happening in a vacuum.

But certainly there's practices within these institutions that are relevant and potentially things that could be replicated elsewhere. One of them is that it's important that these are—that the solutions that are offered by these institutions complement and align efforts that other government initiatives and utility programs are offering. So the goal should be to maximize the impact of efficiency programs across the markets, working together rather than in competition, and trying to avoid replicating efforts. If there's another government initiative that is already doing something then the green bank doesn't have to go into that particular area.

Another lesson is that active stakeholder engagement and flexibility to adapt based on that engagement is important. Successful programs that we've seen in these institutions have often been the result of an iterative process with stakeholders saying, "This is what we would need to improve. This is how we would be able to work with you," et cetera. Technical support is also key. Both, as I mentioned, Connecticut and Australia provide different types of technical support. Connecticut does a lot on the back-end, so they have the network—the contractor network through their strategic partner. They'll deal with existing rebate programs that the state offers. They'll provide, you know, opportunities for marketing and network. And so an important role of these institutions is to sort of bring all these different pieces together.

And then tracking data, documenting, and sharing progress and learning is also an important lesson from these institutions. One of the challenges for efficiency financing is in part the lack of data. So, for example, the Australia program is starting to document energy efficiency and green procurement opportunities to sort of learn from that and help them improve the management of their portfolio.

And then just very briefly in terms of what we see the green bank model meaning for Latin America. We recognize that the region, Latin America and the Caribbean, has a rich ecosystem of financial institutions that, you know, the national development banks, for example, that are already involved in clean energy sector and financing these sectors that are a bit more challenging or where there's unfamiliarity with the technology. But what we have seen is that there was a recent survey from the IDB that essentially identified that to varying degrees the NDBs that they've surveyed face different types of financial and technical capacity or governance or policy constraint issues. And here's where we see that there could be learning possibility from green banks in other jurisdictions or potentially adapting the model to the region, to the local context.

We've done a number of different—and I know you've seen a number of different documents about what green banks have been doing internationally, what are some of the tools that they offer us—sort of the pathways for thinking about how to potentially develop a green bank in different local contexts, and then one document specifically about sort of that relationship between national development banks and this green investment bank concept essentially.

And here's just sort of the barriers that were identified by the IDB survey. But essentially we see that given the context of national development banks in the region that are already working with energy efficiency and other clean energy technologies, there's still a few options that jurisdictions that are interested could consider. One option could obviously be a brand new institution, which is what had happened in other countries. But another option sort of on the other end could be simply creating a green investment bank function or division within an existing institution that can leverage sort of the existing network, the existing connections, the existing knowledge of the market, but ideally have a ring fence capital that can be directed towards low carbon and climate resilience and infrastructure, including energy efficiency.

There's a couple of other options too that we've started to explore, one being that National Development Bank has a sort of quasi-independence affiliate special purpose vehicle that is managed by Development Bank personnel. Another sort of take on that is that sort of green affiliate is also sort of quasi-independent, but it's co-managed both by the National Development Bank and by potentially a private fund manager. So there's certainly various structures that could potentially be considered if this approach is something that is of interest to countries.

Again, I'm happy to take questions and look forward to the discussion.

Katie Wonderful. Thank you so much, Carolina. And thank you to Peter also for the wonderful presentation. We're going to jump right into questions.

Our first question is for Carolina. In South Asian countries like India, Pakistan, Bangladesh, it's difficult to make business case for financing in energy efficiency when concrete data is missing and financial institutions are unwilling to relent. How would you recommend managing these issues?

Carolina That's a great question and I think that's exactly where the role of a green investment bank, of a green bank or whatever similar type of entity that might exist in a country comes in. Because they are normally dealing with public funds that are more patient and more willing to take risk they can invest these projects and play a fundamental role in tracking this data, tracking this information and making it public so that the rest of the marketplace can start getting a greater comfort level with this type of investment and start seeing that the data does indeed exist.

Katie Wonderful. Thank you. Peter, would you like to add anything to that?

Peter

Yeah. I particularly like this question because one of the members of our task group is the country of India, and there is a great model which I enjoy talking about, because the government of India together with the Indian utilities launched a joint venture, which actually turns out to be now I think the largest ESCO in the world, which is called Energy Efficiency Services Limited, EESL. Now the reason why that's relevant is because EESL takes a technology-specific view of the world, trying to identify which specific technologies independent of whether you can measure the specific savings are so attractive. When provided to customers the customers can see immediate savings on their bills. So LED technologies fit this category very well.

The EESL program, since launched just a mere four years ago, has distributed 265 million LEDs to some of the very poorest and rural regions within India because the adaptation of the LED allows the customer to immediately accept that technology, install it, and see savings immediately on their bill, being charged a small increment for the cost of the LEDs. So in affect what that mechanism allows is in countries where there's very low savings rate and very energy-poor communities, energy efficient technologies can leapfrog and take over the implementation in those solutions. And I do think that's a model which while you don't measure with perfect exactitude, exactly the savings, the success in India is really talks for itself.

Katie

Wonderful. Thank you so much, Peter. Our next question is how do you avoid double-counting investments in the public and private sectors, specifically with grants or solicitations where funding can go between entities?

Peter

I can take that. Basically a lot of the databases that we tend to work with to measure energy efficiency investments come from two sources. They either come from global estimates, which essentially look at different sectors and they work out baselines and they determine what levels of standards are relevant, for example, in transport and so on and so forth. And so they're really built up from the asset level. So in other words if we know the price of a standard sort of car and we know the price of Prius say, and, you know, we know how many cars are sold and how many of those are Prius, then the issue of double-counting doesn't really exist because we're not building it up from an observation of financial institutions, we're building it up from an observation of individual assets. So that's I guess point one, and that talks a little bit about how the IEA works.

When we talk about the balance sheets of public and private sector institutions it certainly is true to say that a de-risking facility which provides a first loss, for example, or an insurance contract or the initial capital of one of the green financing facilities Carolina mentioned is one element of the capital structure. And then underneath that public element can come various multiples from the private sector. The way we would account for that, at least within the activities of our G20 task group, is we would look at—we wouldn't double-count. So if it's a guarantee and the guarantee is covering 100 of private capital, that private capital would just be counted once from the

private capital provider and not twice through the guaranteed provider and the private capital underlying provider.

Katie Wonderful. Thank you very much. Our next question is can you give an example of how you track green building credit risks? The asker is trying to get support from credit committees in the Caribbean. Peter, what are your thoughts on that?

Peter Okay, that's a great question. I think the way I will answer it is so there is no—to my knowledge, at least, there's no one global study that you can point to that says green buildings are better credit risks than non-green buildings. There are about 20—the last time I saw a slide on this, I saw a slide that identified 26 academic studies dotted around the world. I do not recall one in the Caribbean, sadly for the questioner, but there are 26 recognized peer-reviewed global studies that talk to the relative sizes of green premiums in general across the world.

I would note that coincident with the One Planet Climate Summit taking place on the 12th of December in Paris next month, I and co-author Nick Robins will be launching with ten European banks a study on green tagging. The reason that's relevant is whilst the study is European, it is focused on the latest results emerging from the banks who have rigorously been analyzing their own portfolios to see which of their assets are green and which of their assets are not green. From that study, which is not yet published, but when it is I'm happy to share it with the Clean Energy Ministerial's Solutions Center and other collaborators, you will certainly see the results of that work within European banks, and hopefully that will provide you a basis to make your case.

Katie Wonderful. Thank you, Peter. Carolina, would you like to add anything to that?

Carolina No, I think that pretty much covers it. I think I agree with everything Peter said.

Katie Okay, great. Thank you. Peter, on slide 8, relating to the green tagging to track energy performance, can you detail techniques for tracking that could be implemented by banks that did not track?

Peter So that's an interesting question. That's a question which sounds—it feels like it's eating its tail kind of towards the end of it. So if I understand it correctly—I'm just going to repeat it back. So, slide 8 of my presentation refers to a survey that we did where we asked banks, "Which of these asset classes are you tagging at the moment?" and as I pointed out during the presentation, most of the banks, 58 per cent of those that we talked to do not tag their assets.

Now green tagging isn't something you have to do at loan origination. This is I think probably the questioner's point. A number of our European banks are going back through their existing balance sheet where there is no information on the green attributes of the underlying, in this particular case properties, and

they are identifying national energy performance certificate databases. So take one example, in the UK, the UK has a national database that provides the energy performance certificates of 11 million registered properties. So a UK bank can go to that publicly-available database and can take their own private loan portfolio, comparing address lines with postal codes in the UK and produce a map of the energy performance of their underlying asset portfolio. I do recognize that that's not possible in countries or regions where that publicly-available data is not easily at hand. However, it is one of the recommendations that my European task group is making at the European Union level and something I hope the G20 will take forward, which is to provide asset-level green data on a more publicly and transparent basis so that financial institutions can start to make these assessments without having to attach green characteristics at loan origination.

Katie

Great. Thank you very much. And thank you again to the panelists for that informative Q&A session. Now I'd like to provide the panelists with an opportunity to provide any additional or closing remarks you'd like to make before we close the webinar. Peter, would you like to begin?

Peter

Yes, thank you, Katie. Well, look, I appreciate you that we've tried to cover quite a lot of ground in a relatively short space of time. I apologize to listeners if we skipped across a number of topics and not done as much detail as you would like for your regions.

The one thing that I would underline is that the G20's Energy Efficiency Investment Toolkit is designed as a framework which is applicable to G20 countries and that can work in non-G20 countries as well. I'm very keen to see that my team was last week in Buenos Aires, working with the future G20 presidency in Argentina. I'm quite hopeful that following public comments by their minister that we will be able to see a good, strong regional development of the Energy Efficiency Investment Toolkit in the Latin American region and the Caribbean. So I very much look forward to being able to assist and support any listeners from that region engaging with the toolkit and my task group in those countries.

So again, my offer previously, if there are people who wish to get more tightly engaged to our work, then the e-mail address provided in my presentation is where I want you to submit requests. But thank you again for your time and for this opportunity to make the presentation.

Katie

And, thank you so much, Peter. Carolina, would you have any closing remarks for us today?

Carolina

Yes, sure. Well, first of all thank you again, Katie, for organizing the webinar. I wanted to mention something that I forgot to mention I think earlier. As I said, my colleagues in the Center for Market Innovation have been working with another group to develop the Green Bank Network. It's essentially a network of six existing green banks and they have a website that is www.GreenBankNetwork.com. I don't know if you can maybe send it around afterwards if people are interested. But that has sort of a repository of information about what different green banks are doing, how they're

addressing challenges in different types of sectors, and I think it's a wealth of information for people that are working on these issues.

Even if, you know, green bank is not the approach taken in a country, there are certainly lessons that can be learned from what some of these institutions are doing, and my contact information I think is at the end of the slide. If people are interested in learning more I'm happy to discuss afterwards as well.

Katie

Great. Thank you again. On behalf of the Clean Energy Solutions Center I'd like to extend a thank you to all of our expert panelists and to our attendees for participating in today's webinar. We very much appreciate your time and hope in return that there were some valuable insights that you can take back to your ministries, departments, or organizations. We also invite you to inform your colleagues and those in your networks about the Solutions Center resources and services, including no-cost policy support through our Ask an Expert service. I invite you to check the Solutions Center website if you'd like to view the slides and listen to the recording of today's presentation, as well as previously held webinars. Additionally, you'll find information on upcoming webinars and other training events.

We are also now posting the webinar recordings to the [Clean Energy Solutions Center YouTube channel](#). Please allow about a week for the audio recording to be posted. Finally, I'd like to invite you to take a moment to complete the short survey that will appear when we conclude the webinar. Please enjoy the rest of your day and we hope to see you again at future Clean Energy Solutions Center events. And this concludes our webinar.