

# Linking Building Energy Efficiency and Nationally Determined Contributions

—Transcript of a webinar offered by the Clean Energy Solutions Center on 11 January 2017—  
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## Webinar Panelists

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<b>Meredydd Evans</b>	Pacific Northwest National Laboratory (PNNL)
<b>Jennifer Layke</b>	World Resources Institute (WRI)
<b>Marie-Christine Roger</b>	French Ministry of Energy, Ecology and Sea

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## Eric Lockhart

Hello, everyone. I'm Eric Lockhart, with the National Renewable Energy Laboratory. And welcome to today's webinar, which is hosted by the Clean Energy Solutions Center, in partnership with the Pacific Northwest National Laboratory. Today's webinar is focused on the role of building energy efficiency and successful NDC implementation. 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 your telephone. If you choose to listen through your computer, please select the mike 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.

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Finally, one important note to mention before we begin our presentations 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 many best practices resources reviewed and selected by technical experts. Today's webinar agenda is centered around the presentations from our guest panelists—Sarah Stinson, Meredydd Evans, Jennifer Layke, and Marie-Christine Roger—who have joined us to discuss linking building energy efficiency and nationally determined contributions, or NDCs.

Before we jump into the presentations, I'll provide a quick overview of the Clean Energy Solutions Center. Then following the 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'll be automatically prompted to fill out a brief survey as well. So thank you in advance for taking a moment to fill that out. So 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. 24 countries and the European Commission are members, covering 90 percent of clean energy investment, and 75 percent of global greenhouse gas emissions.

The Solutions Center is one of the nine initiatives of the Clean Energy Ministerial. Other CEM initiatives include ISGAN, 21CPP, and Global LEAP. All of the initiatives work towards the three overarching goals—to improve energy efficiency worldwide, enhance clean energy supply, and expand clean energy access. This webinar is provided by the Clean Energy Solutions Center, which focuses on helping government policymakers design and adopt policies and programs that support the deployment of clean energy technologies. This is accomplished through support and crafting and implementing policies relating to energy access, no cost expert policy assistance and peer to peer learning and training tools such as this webinar. 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 Mexico.

The Solutions Center has five primary goals. It serves as a clearing house of clean energy policy resources. It also serves to share policy best practices, data and analysis tools specific to policies and programs. The Solutions Center delivers dynamic services that enable expert assistance, learning, and peer to peer sharing of experiences. The Solutions Center also fosters dialogue on emerging policy issues and innovation around the globe. And, lastly, the Solutions Center serves as a primary resource for project financing options and information to expand markets for clean energy. This finance technical assistance service of the Solutions Center was announced last year at COP21. Our primary audience is made up of energy policymakers and analysts from governments and technical organizations in all countries. But we also strive to engage with the private sector, NGOs, and civil society.

The Solutions Center is an international initiative that works with more than 35 international partners across a suite of different programs. Several of the partners are listed above, and include research organizations like IRENA and the IEA. Programs like SE4ALL. And regionally focused entities, such as the Eco-Watch Center for Renewable Energy and Energy Efficiency. A marquee feature that the Solutions Center provides is the no cost expert policy assistance, known as Ask an Expert. The Ask an Expert service matches policymakers with one of more than 50 global experts selected as authoritative leaders on specific clean energy finance and policy topics. For example, in the area of demand and policy evaluation, we are very pleased to have Bruno Lapillonne, from Enerdata, serving as one of our experts. If you have a need for policy assistance in energy efficiency, or any other clean energy sector, we encourage you to use this valuable service. Again, the assistance is provided free of charge.

If you have a question for our experts, please submit it through our simple online form at [cleanenergysolutions.org/expert](http://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 brief introductions for today's panelists. First up today is Sarah Stinson, who has been the director of the Buildings and Industry Division in the Office of Energy Efficiency at Natural Resources Canada since April 2014. Following Sarah, we will here from Meredydd Evans, who is a senior scientist with the Pacific Northwest National Laboratory in the US, where she is an energy policy and finance expert with experience working on energy efficiency and clean energy policies and projects in numerous countries.

Following Meredydd, we will hear from Jennifer Layke, who is the global director of WRI's energy program, where she oversees initiatives and projects that aim to expand access to clean an affordable energy that will reduce climate risk and strengthen communities worldwide. And our final panelist is Marie-Christine Roger, who has been with the Ministry of Energy, Ecology, and Sea as head of the Building Regulations Department since 2013, and has extensive experience in buildings and building codes, both in France and within the European Commission more broadly. With those brief introductions, I'll turn it over to Sarah.

## Sarah

Wonderful, thank you. So I think this morning my presentation is going to focus on how energy efficiency in the built environment will help Canada achieve its NDC, and how horizontal that is across \_\_\_\_\_, and vertical, that is with subnational governments in Canada, how collaboration can translate these targets into practical policies and programs. The government of Canada is committed to taking action to address climate change by setting pathways for our country to reduce its domestic GHG emissions and transition to a resilient, low carbon economy. Canada's target is 30 percent reduction in GHG emissions below 2005 levels by 2030. As a vast northern country, Canada faces unique challenges to address climate change. This includes extreme temperatures, large land mass, and diversified growing economy, with significant natural resources. And these circumstances influence our greenhouse gas emission.

However, despite these challenges, Canada has one of the cleanest electrical systems among G7 and G20 nations. Since 2011, Canada's per capita GHG emissions have been at their lowest level since tracking began in 1990. While our economy has continued to grow. As noted in Canada's NDC, the government of Canada has taken previous action to reduce GHG emissions. And these include, for example, establishing stringent regulatory standards to reduce emissions in the industrial, transportation, and electrical sectors, as well as overseeing the operation of science and technology programs aimed at advancing clean technology.

Meeting Canada's commitments under the Paris Agreement requires an intensification and acceleration of domestic actions on climate change already underway. Mobilizing the efforts of all levels of government in Canada, as well as engaging indigenous people, civil society, business, and individual Canadians, is a key factor in achieving progress towards both our short term and long term outcomes. The focal point of federal, provincial, and territorial efforts in Canada over the last year has been on developing the Pan-Canadian Framework on Clean Growth and Climate Change, or, as we call it Canada here, the PCF, which was formally adopted in early December by the Canadian Prime Minister Trudeau, and provincial and territorial leaders.

The Pan-Canadian Framework is Canada's plan to both address climate change and grow our economy. It represents an important step in putting in place the necessary actions to help Canada meet or exceed its 2030 targets. The framework will build upon existing federal provincial territorial climate change actions and build a competitive and resilient low carbon economy. The Pan-Canadian Framework is publically available on the government of Canada's website. In transitioning to a low carbon economy, Canadians will use energy more efficiently. And an increasing portion of the energy used in homes, businesses, and vehicles will come from clean or renewable sources. The Pan-Canadian Framework also calls for modernizing the electrical system to expand energy storage, updating infrastructure, and deploying smart grid technologies to accelerate the phase out of coal fire \_\_\_\_\_ sources that will contribute to the de-carbonization of the economy. Complimentary actions in other sectors include the built environment, industry, forestry, agriculture, and waste.

Existing measures will deliver 89 megatons of GHG reduction. The Pan-Canadian Framework, as a vision, aims to reduce 86 megatons, and other related measures, such as green infrastructure and technology innovation will deliver the remaining 44 megatons required to achieve our objective. These reductions would be in the year 2030, from a level of 742 megatons down to the targeted 523 megatons in 2030. 742 megatons is the forecasted business as usual level of emissions in 2030, published in December 2016. Horizontal coordination among federal departments, as well as vertical coordination between levels of government, in Canada, allows the federal government to forecast the collective GHG impacts across all measures, to eliminate the possibility of double counting.

So turning to the more specifics around the built environment, to give you a snapshot of what that looks like in Canada, currently 17 percent of Canada's total GHG emissions come from homes and buildings. The Canadian residential market is made up of about 14 million homes. And Canadians spend a little over \$28 billion on home energy use in 2013 alone. And spending for buildings was a little over \$20 billion. 600,000 commercial and institutional buildings are comprise the workplace, and are occupied by 743 million square meters in 2013. About 75 percent of the forecasted building stock in 2030 already exists, while the remaining 25 percent will be built in the coming years.

As previously mentioned, Canada is a relatively cold country. As a result of that, space and water heating account for over 80 percent of the energy requirements in the built environment. More than 80 percent of this load is met by GHG emitting sources, such as natural gas, heating oil, and fossil fuel powered electricity. Appliances and lighting almost exclusively use electricity. As also previously mentioned, Canada is fortunate to have one of the cleanest electrical systems among G20 nations, with almost 80 percent of our electricity supply already emitting no greenhouse gasses. We are improving our GHG performance. Through measures such as more efficient building envelopes and heating equipment, total built environment GHG emissions have fallen over 12 percent between 2005 and 2013. Despite an almost 17 percent increase in total floor space in Canada. But more remains to be done.

Federal, provincial, territorial collaboration on energy efficiency is paramount for success. Energy Efficiency is an area of shared jurisdiction in Canada between the national and subnational levels of government. And in choosing an ambitious target for the built environment in the Pan-Canadian framework will require significant collaborations across all orders of government. While the federal government in Canada regulates energy efficiency standards for equipment and appliances, our provinces and territories regulate energy use in buildings through codes, as well as some product standards. Municipalities also play a key role in implementing and enforcing building codes, and delivering building retrofit programs. All jurisdictions must work together to achieve reductions in this sector.

So turning back now to the specific measures that are reflected for the built environment in the Pan-Canadian Framework, I will briefly touch on the five key initiatives that are outlined in there. The first is net zero energy ready codes, which will ensure that new buildings in Canada are constructed to the most energy efficient level possible. Energy codes for existing buildings raise the prominence of energy savings considerations during major renovations. Labeling and disclosure measures make more visible the information consumers and businesses need to make informed decisions about energy consumption of buildings. Helping to pull the market towards greater levels of efficiency. Equipment and appliance initiatives can provide leadership on the minimum energy performance of key technologies. And of course collaborative RD&D efforts will accelerate innovation in the built

environment and bring new high performing and lower cost technologies to market sooner.

Throughout the development of the Pan-Canadian Framework, Canada was guided by international best practices via our bilateral relationships and our involvement with organizations such as the IEA and IPEEC as well various clean energy ministerial initiatives. I'd be very interested during the discussion portion of this webinar to hear about some of the experiences of others in implementing energy efficiency measures in the built environment, particularly in the context of a federated governance structure. So to drill down a little bit on those key areas that Canada has developed a vision for in the built environment, codes for new buildings fall within provincial and territorial jurisdiction in Canada, as they have to take into account regional and regulatory differences. Model codes for subnational adoption are developed at the federal level with significant input from subnational governments, industry, and other stakeholders.

The Pan-Canadian Framework includes a vision for reaching net zero energy ready model building code by 2030 which will require a roadmap consisting of increasingly stringent tiers for adoption. A net zero home costs more in the beginning but pays off over time with operating costs that are 30 to 55 percent lower. Research and development will help reduce construction costs, and Canada's data has indicated these costs have already dropped by 40 percent in the last decade. In Canada, we are looking to the rest of the world for best practices and new technologies to address some of the challenges associated with reducing the incremental cost of building to net zero energy ready. Again, I'm very interested in hearing about some of the international experiences with developing net zero energy ready building codes.

With respect to energy codes for existing buildings, in Canada, 75 percent of buildings already standing will be still be in existence in 2030. And so maximizing their efficiency is paramount. We will be working with provinces and territories and other stakeholders to develop a model retrofit code by 2022, which for subsequent adoption by provinces and territories, after that, and as appropriate. Options such as connecting the code to building permits for renovations and scaling requirements to the depth of retrofit activity are being considered. This could include for example recommissioning requirements to improve performance by optimizing building systems. The federal role in this particular case would include potentially developing tools, best practices, or providing funding to support subnational incentive programs. And during our research, we noted that there's been a lack of—a relative lack of international experience with respect to energy codes for existing buildings. Again, we're interested in learning from others, and so where those experiences have been undertaken, we would welcome the opportunity to engage on that with you.

Moving on to the third key element for the built environment in the Pan-Canadian Framework is labeling and disclosure of energy use in buildings, which encourages retrofit by providing transparent information regarding energy performance. This allows owners and building managers to

benchmark energy use and estimate energy costs. In the context of the Pan-Canadian Framework, federal, provincial, and territorial governments will strive to require labeling of building energy use by as early as 2019. A nationally harmonized approach in Canada would facilitate implementation and lower development costs.

We will need to coordinate the development of a standard for energy disclosure based on existing labeling and expansion of benchmarking tools that Natural Resources Canada currently provides and supports. These include, for example, our EnerGuide label, and the Energy Star Portfolio Manager. Support. We will also need to support a national labeling benchmarking system that can underpin provincial and territorial regulation.

Finally, the Pan-Canadian Framework includes a commitment for the federal government to set new standards for heating equipment and other key technologies to the highest level of efficiency that is economically and technically achievable. Energy efficiency standards for equipment and appliances save consumers and businesses money on their energy bills. An early market signal by the government, in the form of an intention to introduce standards by a specific year, can motivate the market to accelerate the uptake of targeted technologies. Regulations can be supported by actions to educate consumers, demonstrate benefits, and overcome market barriers. For example, Canada's EnerGuide label tells consumers how much energy is required to run their equipment and appliances. The Energy Star brand is highly recognized by consumers, and identifies the highest efficiency products.

In the context of the NDC, this will be particularly relevant for reducing GHG emissions from the very large space and water heating load. Most of which is derived from natural gas combustion. Subnational governments in Canada can help pave the way to regulations by first providing incentives through their utilities to early adopters who purchase high efficiency furnaces and water heaters in advance of regulations coming into place. Beyond heating equipment, energy efficiency standards on other products also deliver GHG reduction. By 2020, Canada will have about 60 new updated standards in place.

To conclude, I would like to draw—make a few recommendations based on Canada's experience of linking programs and policies to the NDC. In Canada, the federal government will continue to work with subnational governments and industry to support the built environment measures, such as codes, labels, and equipment standards. From our experience, best practices to align built environment policies and programs with NDCs include national collaboration among different levels of government, which is key to aligning policies with implementation. We must collaborate horizontally at the federal level with our counterparts to ensure that GHG reduction estimates are aligned, consistently estimated, and only counted once. Engagement is also important, as consumers, businesses, and other stakeholder support is required to realize our GHG reduction. Indigenous communities are particularly important, as

some are most impacted with climate change, while having the least capacity to reduce emissions and adapt to a changing environment.

The Northern Canadian Arctic has seen more dramatic changes than anywhere else, and these communities are highly dependent on GHG intensive diesel fuel. We must also report on results for continuous improvement, adjust actions when results are not being achieved is also key. Critical is having good data. We need to know how energy is being used to determine where the greatest GHG reductions can be found. Canada has a robust system for the built environment, and all energy and use sectors. The Pan-Canadian Framework includes actions to improve coordinated measurement and recording of GHG outcomes. For particularly large countries like Canada, with diverse climate zones, local decision making for the built environment is helpful for maximizing our reductions, as specific climate and other circumstances can be factored into these decisions.

While there's much work to be done on the Pan-Canadian Framework, there is interest and commitment from all parties in identifying ways to improve Canada's built environment. I look forward to hearing from you about the experiences of others during the discussion portion of this webinar. Thank you very much.

**Eric Lockhart**

Great, thank you, Sarah. With that, we'll turn it over to Meredydd.

**Meredydd**

Great, thank you. Let me just get this up. So I wanted to share a few insights regarding—

**Eric Lockhart**

Meredydd, sorry to interrupt. If you could just go full screen.

**Meredydd**

Sure. So thank you again everyone for participating. Wanted to share a little bit of—is this okay now? Anyhow, I'll keep moving. Some information on the links between NDCs and building energy efficiency. We reviewed the NDCs that countries have submitted in particular regarding what they share on buildings. So as many of you know, 190 parties accounting for some 97 percent of global emissions have submitted INDCs. Buildings account for about a third of global final energy use, and global emissions. And while that sounds great at first glance, because it's such a large share of total emissions, it's still clear that many opportunities to save energy in buildings can be hard to tap. For example, the IEA estimates that only 20 percent of the potential energy efficiency savings in buildings are captured today.

Furthermore, translating NDCs into policies and programs can be challenging for other reasons, such as translating commitments on a national level, to actions at a more local scale. Okay. The encouraging action in this sector can be difficult also from an international platform, like the UNFCCC, to buildings, which are typically governed locally. So how to best build those links and how to ensure that we're getting the most energy savings and the most emissions reductions we can out of the building sector. That was really the idea behind this webinar. And then in addition there's the idea that the building sector is really complex. Jennifer Layke will also speak to this. There are many different partners who have to work together on creating



buildings. So between the homeowners, builders, developers, investors, as well as government officials.

So in the study, we basically looked at the NDCs and tallied up the number of countries that mentioned buildings or construction or housing, and energy efficiency, in their NDCs. We also to the extent that it's possible we looked at countries that have published NDC implementation plans, and examined how they're addressing buildings there. Because sometimes the NDCs themselves are rather general. And the implementation plans may provide more detail on what a country is actually planning to do in the building sector. So, of the countries that submitted NDCs, 53 mentioned building efficiency. And that of course excludes the EU, because the EU had a combined NDC that was—did not go into sectoral details. 38 of the countries mentioned building energy codes or regulations. And 11 of those mentioned existing building policies and measures. So that speaks a little bit to the challenge that countries are going to have going forward in clarifying exactly how they're going to achieve their NDC goals, and in particular in the building sector.

The majority of countries do not yet have NDC implementation strategies. So that also represents an opportunity for countries to begin to flesh out these plans. Of the total NDCs that mentioned building efficiency, 63 percent—I'm sorry, of the countries that mentioned building efficiency, they cover 63 percent of global energy use in buildings. So it's a substantial share. And that percent is likely to rise further as countries that have more general NDCs begin to mention details in their NDC implementation plans. So for example six additional countries in addition to those 53, six additional countries, many EU countries, mentioned building efficiency in their climate strategies. Looking at the top building energy consumers globally, you can see that the majority do in fact reference building energy efficiency in their NDCs. However, several don't have NDC implementation strategies. And importantly, several large building energy consumers, such as Russia, Nigeria, and Indonesia, in particular, don't yet have details of any sort on buildings related to their NDCs.

So, looking at the strategies that the NDCs mention, it's a range of different strategies. Not unlike what we just heard from Sarah regarding Canada. They—where there's detail, it can include things like building energy codes for either new or in some cases existing building stock. Energy efficiency resource standards. Rating systems. Renovation targets. And in some cases energy consumption goals. Looking forward, a couple of things that seem important to think about include how best to link the national and subnational. It can be overwhelming for local governments to try to learn from international best practice, but at the same time, if we are going to achieve the maximum energy savings possible, we need to find better and faster ways to support local governments, as they work on building energy efficiency. Also, the link in many cases, at the national level, between environment officials and officials that work on construction. They may not always be in the same industry. They may not have strong working relationships today. So and that can be a barrier to energy savings and links with the NDC. So that in some countries can be an important area to consider.

Public private partnerships also can help in facilitating work in this area. And many companies, industrial organizations and professional organizations have also taken a leading role in trying to promote energy efficiency in buildings. So with that, I'd like to close, and hand the baton over to Jennifer.

**Eric Lockhart**

Thank you very much, Meredydd.

**Jennifer**

Good morning, all, and thank you to the organizers for including me in the webinar today. I'm delighted to get a chance to share with you some of our thinking on NDC implementation and the role of public private collaboration.

**Eric Lockhart**

If you wouldn't mind just full screening it.

**Jennifer**

There we go. So for those not familiar with World Resources Institute, let me just say we're a global development and environmental organization focused on bringing ideas into action to help solve the most challenging development issues and environmental challenges we face. Clearly climate change is one of the critical areas we work on. I lead the energy program in that capacity work with our cities team to focus on how to build a robust strategy around building efficiencies at the national as well as subnational level. And I'll talk a little about that opportunity today. So just moving quickly through to talk about our topic, which is around energy efficiency in the building sector, and unfortunately my slides are not forwarding. So here we go.

We recognize the urgency in the debate and \_\_\_\_\_ opportunities we have for efficiency to contribute. We are at this point focused on four particular areas of work—sustainable development goals, energy is one of the sustainable development goals. The opportunity to transform our economy to deliver sustainable development and climate targets. We do a lot of work through the Sustainable Energy for All, which allows us to focus very exclusively in on the opportunities to double the amount of renewables in the global energy mix, and to double the rate of improvement in energy efficiency worldwide, as well as the implementation of the Paris Agreement. We have about a decade to create the scale of change that we know the science dictates we need to do to stay below two degrees and hopefully put us on a 1.5 degree trajectory.

Unfortunately, the new climate economy's work has indicated that we are accelerating our decoupling of energy and emissions, but we're not getting there fast enough. We will need to significantly increase the rate and scale of investment in a new set of solutions, and bring to market these solutions within a very accelerated time horizon. In doing that, we recognize that the private sector will need to be a critical investor, and the private sector is going to be helping to deliver what the new climate economy estimates to be the needed \$90 trillion in infrastructure investment. That's an increase in 37 percent towards energy efficiency, an increase of 31 percent in low carbon infrastructure solutions, and the recognition that much of that investment needs to move into the emerging markets and the developing world. That level of funding is unprecedented, and certainly is not going to be exclusively the domain of aid institutions.

But we also know we have the opportunity to focus now on specific areas of rapid growth for those investments. If we can help build a market around buildings, we see the floor area expectations continue to expand dramatically. That's in due part due to the rapid urbanization occurring about they estimate between 50 and 70 percent of the buildings in much of the emerging cities are yet to be built. So we're looking at major growth expansion and opportunity. So the question is are NDCs, and is our engagement with the private sector, going to help transform a business as usual construction and development agenda, which has traditionally focused on supply side low carbon energy, and focus instead on delivering the comfort, the safety, and the low carbon structures that will enable our communities to deliver against our development goals at the same time they're delivering on our climate ambition.

When we look at this, we see that the problem with buildings is paramount. This is a chart we put together looking at the durable lifespan of many of the types of investments that an individual or a corporation may make in the energy efficiency space. And if we don't focus on the built environment and buildings as structures, we very quickly see a problem in the stranded assets and in the lock-in effect associated with the built environment. So again, accelerating that investment rapidly is essential. And, as we know, the private sector is responsible for financing building, owning, and operating most building stock. Which leads us to a very important set of questions around how we're changing BAU, and how we're getting the market to function to demand a better performance in the built environment, and especially how we do that as we're thinking about the very real financial constraints that an average consumer or a small business may face in some of the emerging economies and developing countries.

The IFC has estimated and published a report recently looking at the investment potential again trying to get investors interested in this sector. Buildings are listed as one of the highest opportunities \$900 billion of investment potential in the Latin America and Caribbean alone. That's a significant opportunity, and yet we know that the market is not yet functioning to deliver this. So where are the challenges in the market? For a private sector engagement on this challenge, well, it's around the ability of the consumer and the supplier of efficiency services to connect how to access and tap into an understanding that there is an opportunity here, that it can be beneficial to the consumer, that can lower their monthly operating costs or make their building more comfortable and safe. That there's an opportunity to think about technologies, but how those technologies are available to a building owner. Are they understandable? And are they \_\_\_\_\_? So, is this a technology that is in the market today?

How do people make decisions around the impact or performance of that technology? And where and how do they find the funding in order to create that investment? So we have a disconnect, and we need a set of investments that right now are not structured to be able to create the scale. So WRI, along with many partners, wrote a revision of a book that Johnson Controls had published early on focusing on the opportunities and eight actions that urban

leaders could take to build environmental building efficiency standards, and to focus on the city level implementation, which I'm going to talk a little bit about. And this harkens up back to Sarah's comments, specifically around the link between subnational and national. So when we look at the policy agenda, there are at least four areas where there are very strong opportunities for NDCs. And when we looked at the NDCs, as they were published, 36 did mention codes and standards. 15 specifically mentioned technology or appliance standards. 12 had mentioned audits or performance information and certification. And only seven focused on including incentives or finance mechanisms to improve the marketplace for energy efficiency.

Again, if we're trying to think about a combined public-private collaboration around NDC implementation going forward, codes and standards are a top down policy measure. Incentives in finance can help deliver the outcomes. And yet we know that as of now, that private sector engagement portion, when you just look at the numbers in the NDC, has not yet been thought through, and could use additional approaches in order to make those happen. And the codes and standards, although it's top down, requires implementation strategies that link a national aspiration, established through an NDC, with a local strategy for implementation, for adoption or adaption, adaptation, of a national code, to a local circumstance, and then the ability for the private sector to perform against those requirements. And that requires things like the verification and enforcement capacity to act. So we're thinking about these policies, priorities, and engagement strategies to build the market and overcome the challenges we face.

So we think that one of the mechanisms we're using today within WRI, under the United Nations Sustainable Energy for All, offers a model, a model for building out this kind of implementation strategy that NDCs will require. We're focused on working with some of the aspirational and inspirational cities around the world that are seeking to link building efficiency to their cities development activities. Often, as in the case of Mexico City, there are aspirational goals around emission reductions for climate change agenda. But there are also very important local sustainable development benefits that are sought, such as congestion or pollution reduction, in the context of Mexico City's emission reductions targets. In thinking about these cities, there are the opportunities to build a collaborative engagement, which is what our Building Efficiency Accelerator has done, with over 35 organizations and businesses, we're focused on a collaborative process in cities that bring technical expertise and experience in building markets to the city administrations who often may have a permitting department, they have a budget or a treasury, a finance department, and an environment department, that have not got the technical expertise to ask the question how do we deliver better buildings to our city?

Even if they recognize that the opportunity for an improved infrastructure is one of their goals, to what extent have they been able to find the mechanism to access international, technology, expertise, and finance, to be able to deliver against those cities targets that require you have a marketplace that's functional, an investment community that's knowledgeable, and a link to your

public goals at the national level. This is infrastructure and an ecosystem that has yet to be built in many places. We hope the Building Efficiency Accelerator work can demonstrate the pathway forward.

We're one of six different accelerators under Sustainable Energy for All. All working on varying aspects of this transformation, whether it's through standards and equipment appliance harmonization standards around the world, or thinking about the energy supply and the district energy solutions that could be available, both of which link to buildings—the appliances, lighting, and district energy solutions are all part of the ecosystem in which buildings are consumers of energy. So what does it take to make that alignment happen, to help move us to implementation? I'd offer a few closing thoughts. First, we really will need to very carefully map the national to local jurisdictional authority, look at governance issues around this, and help bridge the policy community. And I was pleased to see, and I think in both Meredydd and Sarah's presentations, again this reference to where are we heading in terms of standards, and the need for standards to continue to evolve, and to be implemented locally, with an aspiration to being passive or net zero at the building or community scale within the next two decades.

Clearly we need to have an awareness and capacity for technical advice and support for these markets to function. There needs to be trust in the solutions. And there needs to be local capacity around how to deploy them and how to manage the technologies. The third area I'd offer is around implementation risk. This data collection, the ability to do verification and enforcement, to build the capacity, to work with the policymakers and the private sector around the performance of within the sector. This is critical. And the private sector has a lot to offer in that regard as well. We'll need to increase the incentives for a changed construction, and energy efficient finance package. We'll need to build local capacity among financial institutions and create dedicated funds to allow for those—for solutions to come to market.

And finally, in working with cities, it's very clear that the financial constraints in the public sector will need to be overcome through new funding mechanisms and approaches. We've seen emerging ESCO industry worldwide. We've certainly see that play out in a scale through the EESL program for street lighting in India. And we have in the United States, Canada—we have an ESCO model that works in both a public private partnership, a three P arrangement, to build new infrastructure and buildings, as well as in the opportunities to provide new types of revolving loan funds, and other resources that have been tested in other markets as well. But clearly the ability to capitalize on the long term cost and the long term affordability of energy efficient technologies needs to change the way we do our budgeting and cities and national governments are going to need to work collectively to help overcome the budgetary constraints that we face in trying to move the investment into this sector.

So, thank you very much for the opportunity to join you, and I look forward to our discussion.

**Eric Lockhart** Great. Thank you very much, Jennifer. Before we turn to Marie-Christine, I just wanted to remind all the attendees to put questions into the questions pane, if you have them, along the way, and we'll get to them after Marie-Christine's presentation.

**Marie-Christine** Hello?

**Eric Lockhart** Yes, we can hear you.

**Marie-Christine** Hello from Paris. I'm very happy and good afternoon everybody, because it's the afternoon here in Paris. I am very happy to give an overview of the way France is acting now to tackle building energy efficiency issues. It is very important—sorry. It's not the right slide, sorry. I have to go back to the first one. Sorry. Okay. So first, it is important to keep in mind that for all the European countries, NDCs are actually a common agreement \_\_\_\_\_ for all the member states, among which France \_\_\_\_\_. So EU and its member states are committed to combined targets of at least 40 percent—sorry? Can you hear me?

**Eric Lockhart** Yes, we can.

**Marie-Christine** Okay. So, sorry. So, EU and its member states are committed to combined targets of at least 40 percent reduction in GHG emissions by 2030, compared to 1990 emissions, the previous commitment that has to be achieved is the 20 percent emissions reduction by 2020, compared to 1990. As you probably know, French policies are rooted in the European Union's framework. So how does it work? The indices are the bedrock of the policies, as they set the target for 2030 in the European Union. Then, three fundamental directives shape the framework of the national regulations. The EED—Energy Efficiency Directive. The EPBD—Energy Performance of Buildings Directive. And last but not least the (0:51:35) \_\_\_\_\_ Directive. All these directives are being in revision by the European Commission at the moment.

In France, we do have important policy tools. The energy transition law and the housing energy renovation plan. Both tools are—I'm going to present both tools in my presentation on the following slides. Moving on to the energy consumption and GHG emissions in France. The building sector accounts for 43 percent of the whole total energy consumptions. And the figures for GHG emissions are similar to what I have heard from Canada. The buildings account for—the building emissions count for 21 percent of the total GHG emissions.

I would like to draw your attention to the French Administrative Organization, as it was renewed in 2007 in a way that is quite important to the implementation of the relevant policies. So in 2007, the President of France at the time decided to gather in this same ministry the policies relevant to environment energy housing policies and climate negotiations issues. And he created the Ministry of Ecology, Energy, Sustainable Development, and Climate Negotiations. Moreover, this new configuration made easier the launching of the Grenelle de L'Environnement Roundtable, which was quite an important conference, bringing together the government, the local authorities,

the trade unions, business and market people, and the voluntary sectors. And this gave the opportunity to draw up an action plan to tackle all the environmental issues. And we can say now that both Grenelle de L'Environnement and this re-dimensioned ministry were a turning point in environmental policies, and in energy efficiency policy in France.

Unlike Canada, France is a unitary state, not a federated one. So laws and decrees are “edicted” by the government at the national level. We have building codes in which are defined the regulations targeting efficiency of buildings, all which means that all over the country, developers have complied with this unique regulation. Of course, this regulation in the field of \_\_\_\_\_ regulation depends on local climates. It's true that this organization tends to facilitate and \_\_\_\_\_ implementation, but it couldn't succeed without the involvement of local authorities. Because regulation isn't the only leverage to foster energy efficiency. So I move to the—I move now to an important policy tool.

The Act Relating to Energy Transition for Green Growth. We had of course, as you can imagine, this law was prepared in a supportive environment of COP21. And the Minister of Ecology of France, Ségolène Royal, was and still is deeply committed to launching a significant energy transition process. The act is consistent with the process that has been implemented since the Grenelle, with regard to improving both new and existing building stock. That's an important point to raise. So the act sets out medium and long term goals. And as well as operational measures. And all this framework consolidated a fundamental (0:57:52) \_\_\_\_\_ for energy efficiency in France. The 2014 French strategy. And it is so called the Housing Energy Renovation Plan.

I would like to highlight some key points of the French renovation strategy. The building sector accounts for 35 million dwellings in France. And the energy transition law aims to renovate a rate of 500,000 dwellings renovated per year by 2017. Included 120,000 in the social housing stock, and 380,000 dwellings in the private housing stock. So this strategy is based on three pillars. The first pillar is the development of a specific support to households, especially households suffering from energy poverty. And this support tends to provide appropriate advice. And it is based on the involvement of local authorities. I come back to this point very soon. The improvement of financing scheme was spotted as a crucial point in the discussions of the law. Especially towards disadvantaged households, again. And last but not least point, the necessity to involve all the stakeholders was an important issue. \_\_\_\_\_ building companies are now involved in the development of a better \_\_\_\_\_ and quality of works scheme.

So a few words about the way of the supports of households is organized. A network of regional energy renovation platforms all over the country was implemented. And this platform provides information to visitors, to households. And in these platforms, people and families can find councilors that are in charge of helping them in their renovation project. So far, much information was provided in these renovation platforms. The financing of

energy renovation works had to be improved and made more simple than it was. An important program, so-called Habiter Mieux, living better, was implemented by the national agency of housing to combat fuel poverty. A rate of 70,000 renovations of dwellings was attained last year, in 2016. And we expect at one time to be able to found 100,000 renovations in 2007. The relevant renovations account for an aggregate energy savings of 40 percent. So it is very important in the strategy to support and to continue at this program. For public social housing, a specific loan scheme was implemented to foster energy renovations. And the tax credits scheme was made more simple than it was, and the tax credits are now available to households willing to renovate their own property. The only requirement is to have the renovation works achieved by a certified craftsman or company.

Now let me show you just a snapshot of what is going on, in energy efficiency, in the field of new buildings. We have current regulations targeting new buildings to—developers have to achieve near zero energy buildings in accordance to the energy performance of buildings directive. So we are now working to prepare the following \_\_\_\_\_. And to include more renewables, and in the new buildings, and we are also working on a low carbon building regulation, using and intending to use the life cycle analysis approach. An experiment was launched to encourage frontrunners to build further and to build such (1:05:26) \_\_\_\_\_ buildings.

I would like to move to my last slide. And to come back to renovation strategies. And to show how European directive can be a very useful framework to help member states to implement their national policies. Actually, the article (1:06:03) \_\_\_\_\_ sets aside main eight of the renovation strategies. It has to encompass an overview of the national buildings stock, as well as cost effective approaches relevant to the building. It has to encompass as well measures to stimulate effective deep renovation, perspective to guide investment decisions, and evidence based estimate expected energy savings. And you can see that 34 percent of the strategy is addressed in the main elements. And ten countries fully comply with the ED. I confess that France fully complies with the article four of ED. So I think it's very interesting to have a good view of what happens at the regional level, at the national level, and at the EU level. Maybe it's a key to success. So, thank you, and thank you for your attention.

**Eric Lockhart**

Great. Thank you very much. Thank you to all of our panelists for those fantastic presentations. As we shift to the Q&A, I'd just like to remind everyone again to enter your questions into the questions pane as they come up along the way. We'll also keep up several links on the screen throughout for quick reference that point to where to find more information about upcoming and previously held webinars. Okay. So the first question is directed to Sarah, but I think others might like to speak to it as well. And the participant asks, what is one lesson Canada can share with other economies on preparing subnational governments for implementation of national building efficiency policies?



**Sarah**

So certainly we have there's a number of in Canada sort of structured forums and less formal forums for engaging with provinces and territories. In particular with respect to the buildings component of our Pan-Canadian Framework, we work through the federal, provincial, territorial body called the Energy and Mines Ministers' Conference, which is an annual gathering of federal, provincial, and territorial ministers responsible for energy. There are similar ministerial level forums for environment ministers, for example, as well. And so those are some of the formal mechanisms that you know. And then at the official level, there are various different working groups established to support the ministers in those established formalized forums. But of course as well we also rely heavily on solid working level relationships with provinces and territories. We work bilaterally with many of them. And engage with them regularly in an effort to both seek their views, understand what their programs and policies are—so as to harmonize national initiatives. And I think sort of those two approaches, the formal and the informal, hopefully create an environment where there's information sharing, dialogue, and in many respects trying to leverage programs that might exist at the subnational level with ones that we might be looking at, at the federal level, and vice versa.

**Eric Lockhart**

Thank you very much. Would any others like to comment on the subnational and national intersection? All right. We'll turn to the next question. So we've talked a lot about the NDCs as a driver of growing building energy efficiency work. But one question is about the intersection of NDCs with other pre-existing national development plans, and existing building code initiatives. So, in other words, NDCs are driving a priority focus on it now, but how you weave together building energy efficiency with other national development priorities outside of NDCs to drive their implementation.

**Jennifer**

This is Jennifer. I'm happy to chime in a little on this question. I think there are a couple critical things. And this is true for the national to subnational dialogue as well. The reality of working across ministries, or in sort of horizontal or vertical policy alignment, and I think Sarah used those terms as well in her comments, the key is to create sort of shared outcomes that are going to be implemented through a combined set of activities. So if you're looking at again thinking about a public works department or a permitting office and an environment office, and in the case of a place like Mexico City, for example, where we're working to help support the localization and implementation of a building energy code that Mexico as a country has had for several years already on the books. But the linkage is critical, across these departments. And the goal to success or the key to success is creating these shared goals. And what we have not seen yet is in many of the plans that are coming forward the outreach and engagement around sectoral lines. WRI is honored to be helping support a group of countries that are building what's called the NDC partnership initiative.

And in that effort they're looking at what are going to be the critical needs in doing this type of sectoral work, building on the sectoral strategies, focusing on national goals, and then setting up these implementation approaches that can bridge across the industries, and the ministries, or departments that are in

charge. But it will require a deliberate structure. I was really impressed by Marie-Christine's comments, as well as others, around how you begin that process. But as you saw in my remarks, the engagement and the ability to build trust across sectors, across departments, or across ministries, is an area around sort of our human capacity for risk, our ability to co-create, and the need for shared accountability for shared implementation authority, and to build budgetary approaches, as I highlighted, that are going to overcome some of these very real first-cost challenges. If you're working in energy efficiency, often the operational savings are seen by a different department than the department that has to make that investment in the capital stock or first cost. So we really have to be deliberate about those strategies in order to create the linkages for a successful implementation in the building space.

**Eric Lockhart**

Great. Thank you very much. Let's pause for a second in case any others would like to jump in on that question. Great. Our next question is about public funding for energy efficiency. Two attendees have asked about this. I'll put both questions together. One is curious about level of public funding. Understanding this varies across countries greatly. But the level of public funding available to support policy development, data collection, training, building code design, etcetera, as differentiated from technology and energy efficiency, energy efficiency technology investment? So what level of public funding there is, and sort of how to grow that pie and where it should focus is one question. The other is what role federal government in your various experiences should have or has had in funding local governments for implementation of energy efficiency? Sorry, that was a lot. But the first question is about public funding for energy efficiency policy development and data collection and training. And the second one is about the intersection between federal funding and local funding and funding flows there.

**Meredydd**

This is Meredydd. I think it is a challenge to find adequate funding. It's a really important question to consider. One model that I might mention that has tried to augment the funding available at the local level is, in the US, under many state utility programs, the states can take credit, or the utilities can take credit for investments related to example the building energy code or other policies if they carefully document it. So utilities—and that's against their requirements to produce energy efficiency under state portfolio requirements. So you can see in many states the utilities investing either in efforts to improve implementation of the building energy code, or in some cases in the infrastructure that may also support that. And it's also linked up with a system to document—to assess what the compliance rate is. So that makes it easier for utilities to be able to get that credit.

**Jennifer Layke**

This is Jennifer. I think we need to be, as you saw in the numbers I presented, we need to be really careful. The public investment in energy efficiency is unlikely to deliver the level of change we need. This is going to have to come down to a private investment and public investment as a catalyst. When I look at the mechanisms that have been some of the most successful mechanisms, we are seeing as Meredydd said, clearly the role of the utility in offering incentives and rebates, the ability for state energy offices in the United States to create grant programs that can overcome some of the—pay for some of the

incremental costs of energy efficiency and renewable energy. And then there's the ESCO market in the United States. In the US, estimates are that the utility programs are about \$6 billion a year, and the ESCO markets are about \$6 billion a year in funding. Those are catalyzed through public policy goals, and through policy action.

But it's private investment that is often ultimately being leveraged into those programs in the ESCO side of things. I know in delivering some of the most innovative building efficiency and renewable energy projects, the three P model has worked well, where the private sector is on the hook for performance levels and makes the investment in a public infrastructure. Now there are pluses and minuses to that system, but I believe in Canada schools and hospitals in many instances are using that. In the United States many state government like Hawaii are turning to that approach, ESCO approaches and three P models, because public funds simply can't raise a \$40 million investment, and that's what Hawaii is putting into efficiency and renewables now, to be able to be much more energy independent through the matching of those two resources, and I think that's the type of investment that we're going to need to be looking at, and the approaches we're going to need to be looking at worldwide.

**Sarah**

It's Sarah here, just to jump in and sort of reinforce that point. I mean I think certainly from our perspective we're very conscious of the need for private sector investment in this space. And very cognizant of ensuring that federal funding, whatever that might be, doesn't crowd out that private sector investment and funding. And I think, too, given our structure, having to—working with the provinces and the territories, we also need to be very cognizant of ensuring that federal funding does not cannibalize or sort of replace existing funding and programs that are working well at the provincial or territorial level, and ensuring that there's sufficient flexibility so that subnational governments can in fact tailor their programs to their regional circumstances. Canada being such a diverse, large country, that local decision making and regional circumstance are very paramount to ensuring success in program delivery.

**Eric Lockhart**

Great, thank you both. That's a good segue into a related question that's come up about the existing built environment. So the participant asks if we could talk more about engaging the private sector and working on existing built environments. Jennifer mentioned lock in; Sarah mentioned 75 percent of buildings in 2030 are already existing. So the other question is about what to do to engage the private sector specifically on existing building stock.

**Jennifer**

This is Jennifer. I want to say one of the things I've been most heartened by in the last two decades has been the beginning of what I'd consider to be differentiation within the real estate community that is not exclusively based on location or facades. And that is around green attributes. I mean we look at the scale up of the aspirations towards green buildings. In many markets around the world this has truly been the transformative conversation around green buildings. Now, the question is—is there an approach that allows to recognize the ability for us to differentiate on climate performance in these

buildings, clearly in existing building stock. We need those kinds of mechanisms, and we need to be thinking carefully about the private sector, which ultimately has the role to play, whether it's in technology sales locally, or in the ability to think about just getting different equipment into those buildings. One of the most interesting conversations I had recently was with a country that said we have a tremendous problem with our existing building stock. But we also have a problem because we're technology takers.

We don't have a strong manufacturing base locally; we don't have a strong local employment approach for the energy efficiency. And so they were looking at this as what are we going to do in terms of transforming our economy, making this a local opportunity? And renovating buildings that are existing is very much a local job creator. So I think part of the linkage to what we'd consider the sustainable development agenda is to focus on existing buildings, not just on the new buildings, but focusing on those existing buildings, and then finding ways like we've done with the green building movement to create an amount of clout around that, around the renovation process, in the existing building space.

**Eric Lockhart**

Great. Thank you very much. So we're running out of time. So I wanted to thank the panelists again for that informative question and answer session. For questions we didn't have a chance to get to, we'll connect with those attendees offline, and also be posting the slides from this webinar on the website as well. The link is on the screen there. Before we close, I'd like to just offer each of the panelists an opportunity to make any closing remarks you'd like to make. Perhaps we'll go in the order you all presented, starting with Sarah?

**Sarah**

Sure. Well, in closing, we look forward to continuing this kind of engagement with our international partners. It's through these kind of forums that we can glean best practices. And put forward proposals for policies and programs that will help us achieve our targets in 2030. And I'd like to thank the organizers for thinking of us, and inviting us to participate in this. It's been really valuable. Thank you.

**Meredydd**

Thank you. And I'd also like to thank the Clean Energy Solutions Center for hosting us. It's really encouraging to hear about the great work that's going on in Canada and France and so many other countries. And to see countries start to grapple with these issues, which are not necessarily new, but there's been a new impetus, I think, following the COP in Paris, to come together and try to solve these issues. And recognizing that it is not simply going to be an added cost to us, but it's going to be transformative, as Jennifer mentioned. So thank you again, and looking forward to continuing this conversation.

**Jennifer**

I just want to I guess reiterate the five things I think need to happen and that we'll be looking for as we move into an implementation phase with NDCs. And that's really around policy alignment across departments, and vertical policy as well as horizontal policy alignments. Revised budgeting procurement strategies that will allow energy efficiency investments to be attractive to the market. The focus on the third one is the focus on passive or net zero energy, and the need to really again build the private market towards

those goals. And then fourth to then developing stronger funding mechanisms that incent the total lowest cost of ownership options. Then, finally, this idea that we can create some milestones and guideposts along the way, and how we do that with our industry colleagues and create that linked set of metrics and goals. And I think that's something the building efficiency world has yet to develop. And I hope the Global Alliance for Buildings and Construction, which France stood up in time for the COP21, and their presidency can continue to help align and build this work together.

**Marie-Christine**

This is Marie-Christine. Thank you for inviting me. And I was very happy to hear of what happens in other countries out of Europe. And as you said, you all said, it's for me it's very interesting to see that all the countries are committed to going forward. And so it's not such an issue of money. Of course, funding is important. But what is important is this new impetus, and that everyone—thanks to COP21, I think—is now involved in the process. And this is a key issue, because the citizens are now carrying out renovation works. Of course, they are happy to be fostered, to receive funds. But the awareness is here. That's my point, and that's why it's so interesting to have this kind of webinar. I thank you again.

**Eric Lockhart**

Great, thank you all again, very much, for joining us. On behalf of the Clean Energy Solutions Center, I'd like to also thank our attendees for participating in today's webinar. We appreciate your time and hope in return that there were some valuable insights you can take back to your ministries, departments, or organizations. We also invite you to inform your colleagues and those in your networks about Solutions Center resources and services, including the no-cost policy support through our Ask an Expert service that I mentioned earlier. 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 presentations, as well as previously held webinars. You'll also find information there about upcoming webinars and other training events. And we are now posting webinar recordings to the [Clean Energy Solutions Center YouTube channel](#). Please allow about a week for those audio recordings to be posted. Finally, I'd like to kindly ask you to take a moment to complete this short survey that will appear when we conclude the webinar. Please enjoy the rest of your day. We hope to see you again at future Clean Energy Solutions Center events. This concludes our webinar.