RENEWABLE CITIES

FINAL REPORT

GLOBAL LEARNING FORUM
MAY 13-15
VANCOUVER, BC

FORUM.RENEWABLECITIES.CA

#RECITIES

SFU | CENTRE FOR DIALOGUE
SIMON FRASER UNIVERSITY

FUNDERS AND PARTNERS

Funders

NORTH GROWTH FOUNDATION

sitka foundation

Alterra POWER CORP

CITY OF VANCOUVER

Pacific Institute for Climate Solutions
Knowledge. Insight. Action.

Vancity
Make Good Money™

CONSULATE GENERAL OF THE UNITED STATES OF AMERICA
Vancouver, BC

RBC

Partners

Pacific Institute for Climate Solutions
Knowledge. Insight. Action.

CLEAN ENERGY CANADA

CITY OF VANCOUVER

FCM FEDERATION OF CANADIAN MUNICIPALITIES / FÉDÉRATION CANADIENNE DES MUNICIPALITÉS

World Future Council

ICLEI Local Governments for Sustainability

100% RENEWABLES
www.go100re.net

THESOLUTIONSPROJECT

Umwelt Bundesamt

Media Partners

Clean Technica

ClimateAccess

Bloomberg BNA

bullfrogpower

This event was powered by 100% renewable energy

TABLE OF CONTENTS

FOREWORD

When we concluded our first Global Learning Forum on Friday, May 15, I made a commitment that we would document as fully as possible the wealth of ideas raised about how cities can undertake an ambitious transition to using renewable energy. The Forum itself offered an almost infinite combination of possible pathways for participants. No two people were exposed to exactly the same ideas over the three days. So, this Final Report represents our best attempt to capture the richness of the ideas shared in the thirty-two separate dialogues and six plenary sessions held during the Global Learning Forum.

This Final Report of the Forum is complemented by a number of other multimedia pieces: First and foremost is the short, powerful Overview Video, which conveys in 1:45 minutes the spirit and sense of momentum shared by all of us who were at this event. I would also commend the videos of the PechaKucha presentations, which were delivered by twelve of our session leaders at the opening night event. In addition, we organized seven Dialogue Videos between different pairs of our session leaders, covering a wide range of subjects.

With an eye on the Global Learning Forum, but looking to the future, we drafted our own Synthesis Report, which contains the main ideas from the Forum that we believe should inform cities and citizens that aim to transition their cities to 100% renewable energy. Renewable Cities will be using the findings of this report as the basis for organizing future international dialogues to carry forward our. Finally, for completeness sake, we have posted every Speaker Presentation and Audio Recordings of every panel at forum.renewablecities.ca

As a program of the SFU Centre for Dialogue, Renewable Cities believes deeply in the power of face-to-face dialogue to advance collective understanding of solutions for difficult problems. We were fortunate to have been able to bring together such a talented and diverse group of expert participants in Vancouver this past May. We look forward to convening again in Vancouver and elsewhere around the world this emerging community of people committed to building renewable cities.

Michael Small,

Executive Director, Renewable Cities
SFU Centre for Dialogue, Simon Fraser University

INTRODUCTION

May 13-15, 2015 a diverse group of over 300 international experts in urban sustainability and renewable energy gathered in Vancouver, Canada for one shared purpose: to support cities in adopting ambitious renewable energy goals. The Forum drew participants from 17 countries on six continents who work in a myriad of sectors. Elected officials engaged with city staff, members of civil society engaged with CEOs, grassroots organizers engaged with researchers, engineers engaged with financial experts, First Nations community members engaged with foreign dignitaries; all were working through the same challenges and opportunities in transitioning cities to 100% renewable energy and energy efficiency. The Global Learning Forum broke down the usual silos that isolate communities of practice and enabled conversations that normally would not take place, but are needed to highlight transferable lessons and accelerate solutions.

This Forum demonstrated the power of convening experts through dialogue processes that unearth insights and ideas which often remain buried below jargon, politics, and bureaucracy. The value of committing time and resources to this major international event is evident in the extremely positive feedback we received during and after the event. Leading up to the Forum, numerous international partners and urban sustainability networks convened pre-meetings with their members,

including the USDN Carbon Neutral Cities Alliance, and C40's district energy working group.

On opening night, we convened "Renewable Cities Powered by PechaKucha" in which twelve of our invited session leaders energized participants with their personal stories and their visions for a world powered by renewable energy. Videos of their presentations, each told in only 20 slides in 20 seconds, are available on our YouTube channel.

Over the next two days, participants met as a whole in six plenaries and in four rounds of eight parallel small group dialogues, for a total of 38 different sessions. We also brought together seven pairs of participants for separate conversations now recorded on our YouTube channel. This report captures the ideas we heard across all of these discussions. We hope it will inspire further exchanges among participants. It was also written to be accessible to people who were not able to attend. We encourage you to share this report widely, to pull ideas from it and most importantly, to continue the dialogue about the prospects for building renewable cities.

WHAT IS DIALOGUE?

Processes for the dialogue sessions at the Global Learning Forum were designed by the Renewable Cities team in collaboration with session leaders and facilitated by staff from the SFU Centre for Dialogue and partner organizations as well as skilled volunteers (see Appendix 4 for the full list of facilitators and volunteers).

In the interest of having an open and candid discussion, the small group dialogue sessions were governed by Chatham House Rule.[1] Agendas were designed to enable maximum participant engagement.

Capacity building represented the core activity of the Global Learning Forum and included three types of sessions:

Knowledge Mobilization (1-hour): Session leaders presented an case study and hosted a discussion around the challenges and learnings.

Peer to Peer (1.5-hours): The session leader facilitated a dialogue with participants about a particular issue, project, or concept based on a set of guiding questions. Participants contributed their expertise and considered the subject in their own contexts.

Intent to Action (2.5 hours): These highly interactive workshops were built around a scenario, process, or planning tool. Participants worked through barriers and opportunities to uncover potential ways to move cities forward in implementing renewable energy.

SFU | CENTRE FOR DIALOGUE
SIMON FRASER UNIVERSITY

[1] Participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.

WHO CAME?

Sectoral breakdown of participants

Category	Individuals
Municipal or regional governments - staff	67
Private sector companies	54
NGO/Non-profit networks	54
Universities	28
Municipal or regional governments - elected officials	24
National governments	13
Associations	9
Foundations	8
Media	7
Utilities	6
Sub-national governments	5
Individuals	2
Total	277[2]

Regional breakdown of participants

Countries
Australia
Brazil
Canada
Denmark
France
Germany
Hong Kong
Japan
Netherlands
New Zealand
Norway
South Africa
Spain
Sweden
United Kingdom
United States
Zimbabwe

Canadian Provinces
Alberta
British Columbia
New Brunswick
Northwest Territories
Ontario

US States
California
Colorado
District of Columbia
Florida
Kansas
Massachusetts
New York
Oregon
Pennsylvania
Texas
Vermont
Virginia
Washington

[2] The sectoral breakdown and total number does not include SFU Centre for Dialogue staff or volunteers.

MULTIMEDIA AND OTHER RESOURCES

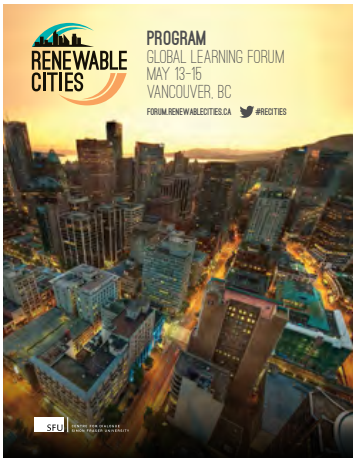
Our goal is to publish online as many resources from the Global Learning Forum as possible. See the event's webpage at forum.renewablecities.ca for a master list of speakers and sessions as well as speaker presentations. The page also contains the Global Learning Forum Program Schedule and Synthesis Report, our media report, and multimedia from the Forum. These materials are accessible by clicking the links below.

Global program:

www.renewablecities.ca

Global Learning Forum website:

forum.renewablecities.ca



RENEWABLE CITIES POWERED BY PECHAKUCHA

The Global Learning Forum opened with an inspirational opening night event, Renewable Cities Powered by PechaKucha at the Djavad Mowafaghian Cinema, SFU Woodward's. It featured a series of rapid-fire presentions by a dozen thought leaders in PechaKucha format (20 images, 20 slides).

SPEAKERS (Left to right)

POWERED BY PechaKucha 20×20 IMAGES SECONDS
PechaKucha.org
DEVISED & SHARED BY KLEIN DYTHAM ARCHITECTURE

- Shauna Sylvester, Director, SFU Centre for Dialogue
- Mark Jacobson, Director, Atmosphere and Energy Program, Stanford University
- Sadhu Johnston, Deputy City Manager, City of Vancouver
- Bárbara Rubim, Campaigner, Climate and Energy, Greenpeace Brazil
- Harry Lehmann, Head of Division, Environmental Planning and Sustainability Strategies, German Federal Environment Agency
- Merran Smith, Executive Director, Clean Energy Canada
- Ross Beaty, Executive Chairman, Alterra Power
- Esperanza Garcia, Founder and CEO, Cleantech Impact
- Chris Henderson, President, Lumos Energy & Board Chair, Globe Conference and Exposition
- Elizabeth Monoian & Robert Ferry, Founders, Land Art Generator Initiative
- Zachary Shahan, Director, CleanTechnica
- Michael Small, Executive Director, Renewable Cities

Available on:

YouTube


Imagine 100 %

PLENARY SESSION – RENEWABLE ENERGY GLOBAL STATUS UPDATE AND TRENDS

This plenary session set the stage for the Global Learning Forum by providing a "big picture" update on global and local renewable energy (RE) adoption. **Merran Smith, Executive Director of Clean Energy Canada**, introduced the panel and highlighted the major global renewable energy trends. According to the IEA, energy sector carbon emissions recently plateaued due to the implementation of renewables and energy efficiency measures. Over $310 billion was invested in renewable energy in 2013—more than all fossil fuel investment combined. Smith went on to describe the pace of adoption in the solar industry, as well as innovation in energy storage. The superpowers of China and the US are also taking action on climate and energy policy. "Policy leadership leads to investment, which creates price drops in technology, which leads back to more policy leadership," Smith explained, "This is spreading. 100% RE isn't just an environmental strategy, it's an economic one."

Next, **Harry Lehmann, Head of Environmental Planning and Sustainability Strategies, German Federal Environment Agency**, brought lessons from the German energy transition, or Energiewende, to the Forum. "We started the Energiewende 35 years ago and spent the 1980s improving renewables and getting out of coal. In the 1990s we decided to move away from nuclear." There are three components to Germany's energy transition: 1) increasing renewable energy sources; 2) investing in future smart grids that fit volatile, but predictable, RE sources; and 3) increasing energy efficiency. "We're doing it to protect the climate, create jobs, and add value to our export-based economy." He elaborated, "A lot of people think Energiewende is a burden. It's not. The wholesale price of electricity has fallen and it supports local industry."

David Renné, President of the International Solar Energy Society explained the rise of the world solar energy industry. "Under a business as usual scenario, we could see a 4-6°C increase in global warming." By the end of 2013 the world had over 139 gigawatts of installed solar capacity, with the sector growing at 40 gigawatts per year. However, as of 2015, solar PV still represents only 1% of the world's total energy capacity. "There are three components required for solar growth: technology improvements, policy-making, and finance... The next one could be community

acceptance—which this conference is all about—even utilities are starting to accept the rapid penetration of solar."

Representing the geothermal industry through the **International Geothermal Association and the International Renewable Energy Alliance (REN Alliance), Marietta Sander** highlighted the countries leading in geothermal energy: the US, Indonesia, New Zealand, the Philippines, and Mexico. Geothermal can be an important component of urban heating and cooling. Speaking on behalf of the REN Alliance, Sander concluded, "A symphony of renewables is needed to change urban design and municipal heating and power generation. Our aim is to bridge policy and practice."

Rob Thornton, President and CEO of the International District Energy Association, began his presentation with an image of a typical US power plant. "We need renewal in our energy system; 36% of the energy consumed in the US is wasted in the form of heat." Thornton explained that the power plant across the street from where he grew up in Massachusetts loses up to $400 million per year in waste heat. "This is inefficiency in action, but there's another way. You take the heat, put it in a pipe, and use it to heat cities," he said. Thornton then outlined how Copenhagen's commitment to district energy in the 1980s is now paying dividends and that local district energy networks are the backbone of Denmark's energy efficiency achievements. "Mayors want an integrated thermal and electric grid," and in light of extreme weather, Thornton argued, "They want resiliency and the reliability of district energy."

To conclude the panel, **Mark Jacobson, Director of the Atmosphere and Energy Program, Stanford University, and Co-founder of The Solutions Project**, talked about his research that shows how the US could move to 100% renewable energy by 2050. Illustrating the progress that could be made within the transportation sector, "an electric vehicle (EV) is up to 86% efficient, 'plug to wheel,' while an internal combustion engine is only 17-20% efficient from 'tank to wheel.' Over the course of 15 years, consumers can save $15,000 in total, by moving to an EV." His plan to move the US to 100% RE calls for 19% offshore wind, 31% onshore wind, 35% solar, 1.2% geothermal, and 2.8% hydro power for all energy purposes. "We can keep the grid reliable, eliminate 63,000 premature air pollution deaths per year, create millions of jobs, and reduce emissions." He has produced similar plans for every American state and within a few months will be releasing 100% renewable energy plans for 139 countries from around the world.

PLENARY SESSION – VANCOUVER'S STORY: ENERGY AND THE GREENEST CITY ACTION PLAN

On March 25, 2015, Vancouver's City Council made history by becoming the first Canadian city to set a 100% renewable energy target. The motion was passed unanimously and began the process for city staff to develop a plan and timeline to shift the city's electricity, heating and cooling, and transportation sectors to renewables. **Vancouver Mayor Gregor Robertson** and **Deputy City Manager Sadhu Johnston** gathered all participants and solicited their best advice for Vancouver's transition to 100% renewable energy.

Mayor Robertson remarked that an "incredible braintrust on greening cities" was present and that he was excited to hear from all of the experts in the room. "We have a big goal to become the greenest city in the world by 2020." The Mayor went on to say that other cities also want this crown and he was happy to see this competitive approach to green city building. The 100% renewable energy goal is a major part of becoming a more sustainable city. "It's not only a necessity, but an economic opportunity." Robertson reiterated that he wanted to build on past successes, such as the transportation modal shift that is underway, but that he had questions about transportation fuels, district energy, solar and wind energy, and mobilizing citizens for green initiatives.

On implementing ambitious renewable energy and energy efficiency targets, Johnston described technology as "not the limiting factor anymore. It's procedure and regulations—a challenge that cities are rising to the world over." His questions for Forum participants were based on regulatory structures, the city's role in providing electricity, how to foster private sector investment, and how to manage public perceptions about energy rates.

Robertson and Johnston acknowledged the level of expertise in the room and thanked all participants for contributing to the dialogue. Johnston said Vancouver plans to report back to council in the fall of 2015.

PARTICIPANTS' ADVICE

The following includes a sampling of advice. Comments were also given on paper and on Twitter at #Van100RE.

"Inspiration requires knowledge mobilization and knowledge mobilization requires seeing what other leaders are doing. Work out a staff hosting program to share knowledge with Central and South American cities, for example."

"The Pacific Institute for Climate Solutions just launched a new report on social mobilization for climate solutions and you should take a look."

"Financial incentives are the fastest way to shift behaviour. If you could work with the province for differential property tax rates you could give a break to buildings with good energy performance."

"If you want more rooftop solar you need to create the financial institutions to make installation painless: finance 100% of the installation cost and have the loan paid back from the energy savings."

"Have you looked into regional carbon taxes as well as investing carbon offsets locally?"

"Palo Alto used to take nine months to issue solar panel permits. Now it's over the counter."

"On EVs, get around regulations prohibiting the re-selling of electricity by charging a flat fee. Push electricity regulators to clarify their positions on electricity markets."

"Place the strongest emphasis on conservation: it starts by cutting energy use by 50%. Use the strength of natural systems, tree canopies for example, to reach your goals. Limit the use of glass in new building and keep promoting a modal shift and emphasize the multiple benefits."

"Partner with the school board to engage youth, create demonstration projects, provide an anchor load for district energy systems, and promote density around schoolyard green spaces."

"The new fourth generation of district energy systems are being piloted: they aren't doing 90°C heating, they're providing 55°C in heat, which has less waste and is more efficient."

KNOWLEDGE MOBILIZATION SESSIONS

1. WALK THE TALK: THE CITY OF COPENHAGEN AS A LEADER IN THE GREEN TRANSITION

Brian Hansen, Head of Citywide Strategies, City of Copenhagen

PRESENTATION

Brian Hansen opened the session by stating Copenhagen's target: to be carbon neutral by 2025. As of 2015, Copenhagen has reduced its CO2 emissions by 31% of 2005 levels while the city population has grown by 15%. Hansen detailed the specific initiatives the City has undertaken to achieve its success, as well as its plans to reach the 2025 goal.

PLENARY DISCUSSION

Participants were eager to understand the funding models for Copenhagen's decarbonization initiatives, and whether the funds were sourced from private investment or tax revenue. Hansen said it was a mix of both; significant investment had come from the private sector but Copenhagen also assesses a municipal income tax, specifically for use within the city itself. Hansen indicated he would find it difficult to imagine a model succeeding without a strong tax base from which to operate. He also pointed to federal policies that regulate the private sector as a key to the City's success. Denmark provides incentives that encourage long-term private sector planning over short-term profits—an essential element of meeting city targets is to ensure large-scale investment in infrastructure.

Participants wondered if there was something specific in the Danish psyche that promoted environmental awareness, or whether the City's success is a result of long-term engagement and education campaigns that could potentially be replicated elsewhere. Hansen acknowledged that some aspects, like Danish enthusiasm for cycling, predate

targets for decarbonization, and are likely a result of historical factors. Support for taxes that are designed to discourage behaviours that conflict with public interest may also be specific to political ideologies of the European context.

Finally, Hansen described the culture of innovation in Copenhagen, mentioning the Copenhagen Solution Lab as well as a partially federally funded energy lab, both of which serve as incubators and innovation hubs to help develop the solutions needed to keep Copenhagen moving towards its goals.

PARTICIPANT TAKEAWAYS

Participant feedback from the session indicates that many were inspired by the Copenhagen example, especially that a “green city” must necessarily be a livable city, meaning that there is more to this idea than just sound environmental policy.

2. LIFE IS AN ELECTRIC HIGHWAY: A REVIEW OF SUCCESSFUL EV UPTAKE POLICIES GLOBALLY

- **Jonn Axsen, Assistant Professor, Simon Fraser University**
- **Gil Friend, Chief Sustainability Officer, City of Palo Alto**

PRESENTATION

For this session, Jonn Axsen summarized his research on electric vehicle (EV) uptake around the world, including technical research on understanding different types of plug-in electric vehicles (PEVs); the constraints on different technologies; and the policies that can enable or hinder uptake of EVs—from a demand-side and a supply-side because, according to Axsen, both are necessary to transition to PEVs.

Gil Friend, Chief Sustainability Officer, City of Palo Alto, provided commentary on the policies that are needed for California to reach its goal of 80% GHG emissions reductions by 2050; he noted that to reach this goal, the transportation system must be transformed. There are a lot of challenges that still must be overcome to electrify transportation; as PEV demand grows, there will be fundamental grid-supply and stability issues that need to be addressed, said Friend.

PLENARY DISCUSSION

Participants discussed some of the innovative policies that can be used to incentivize PEV ownership. They discussed examples such as Norway's policy to not charge PEV drivers on toll roads and the City of Edmonton's policy to create free parking spaces for PEVs. Participants also discussed the infrastructure elements that cities can build to make PEV ownership easier, such as widely distributed charging stations powered by renewable energy located in areas where people live, work, and play. The opportunities for PEVs in carsharing programs, in commercial fleets, and for public transit were also discussed, as well as some of the challenges or barriers to PEV uptake.

One challenge mentioned was the proprietary nature of PEV technologies, such that batteries cannot be easily swapped between models. Some municipalities may also be waiting for a clear market signal of a 'winner' in PEV technology before investing in complementary infrastructure. Participants discussed the psychological aspects of car ownership—freedom to drive long distances, freedom to carry big loads—that play into consumers' decision-making processes, and the fact that the transition to PEVs must entail some planning for a social-emotional and psychological transition, not merely a technical one. Finally, participants noted that

increasing PEV usage should not come at the price of decreasing spending on infrastructure for active transportation, and that a wide range of policies and practices would probably be necessary to truly transform urban transportation.

PARTICIPANT TAKEAWAYS AND UNANSWERED QUESTIONS

Participant feedback indicated they gained a better understanding of the kinds of policies being used to increase PEV uptake and how some jurisdictions are choosing to address some of the barriers to PEV adoption.

Participants left with questions about how to best address “range anxiety” (concern that EVs cannot travel as far as combustion engines) and the emotional components of car ownership in a policy context. For example, consumers buy cars that can do ‘everything’ rather than just for the things they do most often.

3. AESTHETICS, INTEGRATION, AND BUILDING PUBLIC SUPPORT FOR URBAN RENEWABLES

Elizabeth Monoian and Robert Ferry, Founders, Land Art Generator Initiative

PRESENTATION

Elizabeth Monoian and Robert Ferry drove all the way from Pittsburgh, Pennsylvania to share the visionary ideas of the Land Art Generator Initiative (LAGI). LAGI works to increase public support for clean energy by integrating art and interdisciplinary creative processes into site-specific public art installationss. Monoian and Ferry discussed the opportunities for public art to play a role in sustainable city planning and public engagement. They shared innovations in renewable energy technology that offer flexibility and creatively integrate into public spaces. They observed that distributed energy will have a real impact on the built environment of cities, which will necessitate novel infrastructure and situational interventions. Finally, they proposed ideas for energy generation that can help with placemaking in the city; for necessary infrastructure that can be built as beautiful, useful, playful spaces.

PLENARY DISCUSSION

The group considered public art as a public engagement strategy:

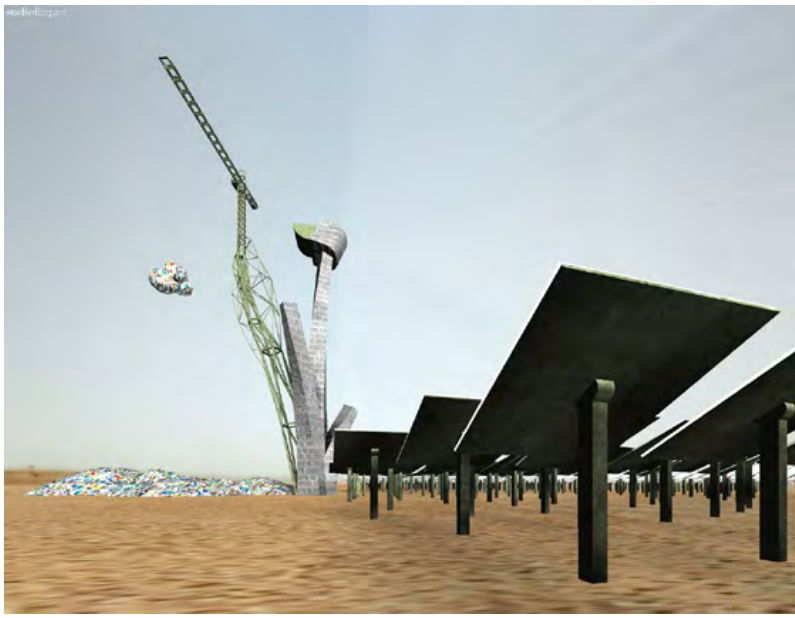
- *As a medium to engage those not engaged in other municipal processes:* Public space processes can engage voices of the marginalized, for example, in dialogue about energy futures in an equitable, sustainable way.
- *As a way of bringing a new vision of energy to the public:* We know how energy systems must change from a technical standpoint, but how does that change how people experience cities or energy in cities? Playful, egalitarian energy visions might reduce discomfort around technology.
- *As a way to overcome barriers to talking about climate change:* Art and playfulness can help break down entrenched political barriers.
- *As a way forward in neighbourhood*

integration and specificity issues: Projects need to be contextualized by, and focused on, local energy issues for residents; they must not become tourist-centered, as happened in San Francisco's Market Steet re-visioning project.

Participants also raised the issue of coordinating across municipal departments: planners in municipalities, especially energy planners, work in silos; engineers do not often work with planners; and neither group has many opportunities to work with sustainability departments, or scientists or artists. They also proposed that creative solutions to shape a city's energy supply may also transform a city's narrative.

FURTHER QUESTIONS

- *"Neighbourhood contexts are critical, but if projects are necessarily localized and integrated to their contexts, how do we scale up? Can we scale up?"*
- *"How can we connect engineers and technologists with everyday people that they are designing for? "*
- *"What are the technical barriers to success?"*
- *"Is embedding technological risk in public art problematic?"*
- *"Scalability is a big issue here; can we get beyond the idea of community-based interventions needing to be scalable?"*
- *"What regulations apply to these kinds of projects? Building codes? Energy utility policies?"*
- *"Are there ways to mandate the inclusion of aesthetics into renewable energy project design? Is there a way to add aesthetics to municipal planning guidelines?"*



4. BUILDING CITIZEN AND POLITICAL WILL FOR 100% RENEWABLE ENERGY: GLOBAL LEARNINGS FROM GERMANY'S ENERGY TRANSITION

- **Anna Leidreiter, Senior Program Manager, Climate and Energy, World Future Council**
- **Bertram Fleck, Chief Administrative Officer, Rhein-Hunsrueck County, Germany**
- **Pia Buschmann, Project Manager, deENet**

PRESENTATION

Anna Leidreiter, Pia Buschmann, and Bertram Fleck collaborated on this session about Germany's Energiewende (energy transition). In lieu of traditional presentations, Leidreiter and Buschmann hosted a wide-ranging interactive conversation about how national policies have empowered community and citizens to transition to 100% renewable energy. Fleck spoke about the success of the transition to 100% renewable energy in the district that he represented as administrator, Rhein-Hunsrueck.

The key lessons learned through Germany's energy transition include:

- Citizen engagement is critical. Energiewende succeeded because of citizen ownership, such as cooperatives.
- National policy allows for local government and community solutions.
- The National Climate Initiative (a German federal policy) was an important policy instrument that created a fund for low-carbon investment, including renewable energy projects.

- Cooperation between national and local/regional level governments is very important—in Germany there appears to be much more conversation between these different levels of government than in Canada, for example.
- Start from a cost-reduction basis (i.e. energy efficiency), rather than loftier climate or energy goals. If you can demonstrate reduced costs, it is easier to gain the support of both citizens and elected officials.
- Knowledge sharing and dialogue between local governments facing similar challenges is very important, but does not happen often enough.
- Communicating renewable energy is different than communicating about other forms of energy, and it requires new approaches; storytelling cannot be about costs alone, but also about the kinds of investment needed (i.e. up-front capital costs) versus ongoing fuel costs.
- The role of strong policy cannot be overstated. Creating the right economic and market signals are crucial to success.

PARTICIPANT FEEDBACK AND UNANSWERED QUESTIONS

The session leaders demonstrated that Germany has strong federal policy enabling its energy goals, and participants wondered how cities in countries with weaker, or non-existent, federal energy policies might learn from the German example. Several participants indicated they had questions about the nature of the subsidies put forward in Germany's plan for the transition, and how jurisdictions with different subsidies might learn from the German example.

5. REALITIES OF RENEWABLE ENERGY IMPLEMENTATION IN CITIES: A FINANCING AND POLICY PERSPECTIVE

- **Jane McRae, Executive Director, Sustainable Cities International**
- **Leshan Moodliar, Chief Electrical Engineer, eThekwini Municipality, City of Durban**
- **Norm Connolly, Community Energy Manager, City of New Westminster**
- **Bertine Stelzer, Program Manager, Sustainable Cities International**

PRESENTATION

Facilitated by Sustainable Cities International (SCI), this session explored peer-to-peer learning between Durban, South Africa and New Westminster, BC, Canada, through SCI's Energy Lab collaboration model.

Leshan Moodliar introduced Durban's centralized electricity supply system, which is primarily coal, and the trend towards individual homeowners to install solar PV, which deprives the utility of grid connection funding. New Westminter's municipal utility, also faces a problem with revenue generation that impacts the adoption of renewable energy and energy efficiency.

PLENARY DISCUSSION

Participants recognized similarities with their own contexts. For example, in Australia solar PV is suddenly booming, but utilities there are regarding the grid as a service and looking at ways to expand "beyond poles and wires." Examples of diversified services utilities could provide that are being considered by New Westminster are:

- Net-metering
- A leasing model for distributed energy

According to participants, utilities need to better understand the policies for tying into the grid. However, one participant pointed out the difference in decision-making autonomy

when the municipality owns its utility.

An example of a municipality's sphere of influence arose out of a discussion on the sensitivity of district energy systems to a sudden decline in natural gas prices. One participant explained that a municipality must ensure electrical and heating costs stay below natural gas prices and one way to do so is by setting different tariffs for different users. A participant also highlighted that large energy purchasers, like hospitals and commercial developments, make DE feasible.

In addition to costing decisions, participants discussed the decision framework around how municipalities can drive value out of carbon reduction strategies. For example, Surrey, BC, earns low carbon fuel credits for fueling waste collection trucks with biofuel from curbside organics. While municipalities can claim the savings achieved by the private/residential sectors they cannot yet apply for the carbon credits.

Despite the effects of different geographic and historical contexts, one participant pointed out there is a "universal thirst for solar." Utilities could risk becoming fractured or obsolete as homeowners disconnect from the grid for reasons such as to avoid fixed charges. How do utilities keep people connected to the system? Some jurisdictions mandate homeowners remain connected to the grid; for example, it can cost $0.03/kWh to leave the grid in Texas.

In a country that produces coal, such as South Africa, renewable energy is still too expensive for utilities. To increase renewable energy production, South Africa introduced an independent power producer program in 2008, which has attracted international investors. The government set the rates to share the costs across the grid; this is making small-scale renewables very profitable but it has raised electricity prices for customers.

NEW AND UNANSWERED QUESTIONS

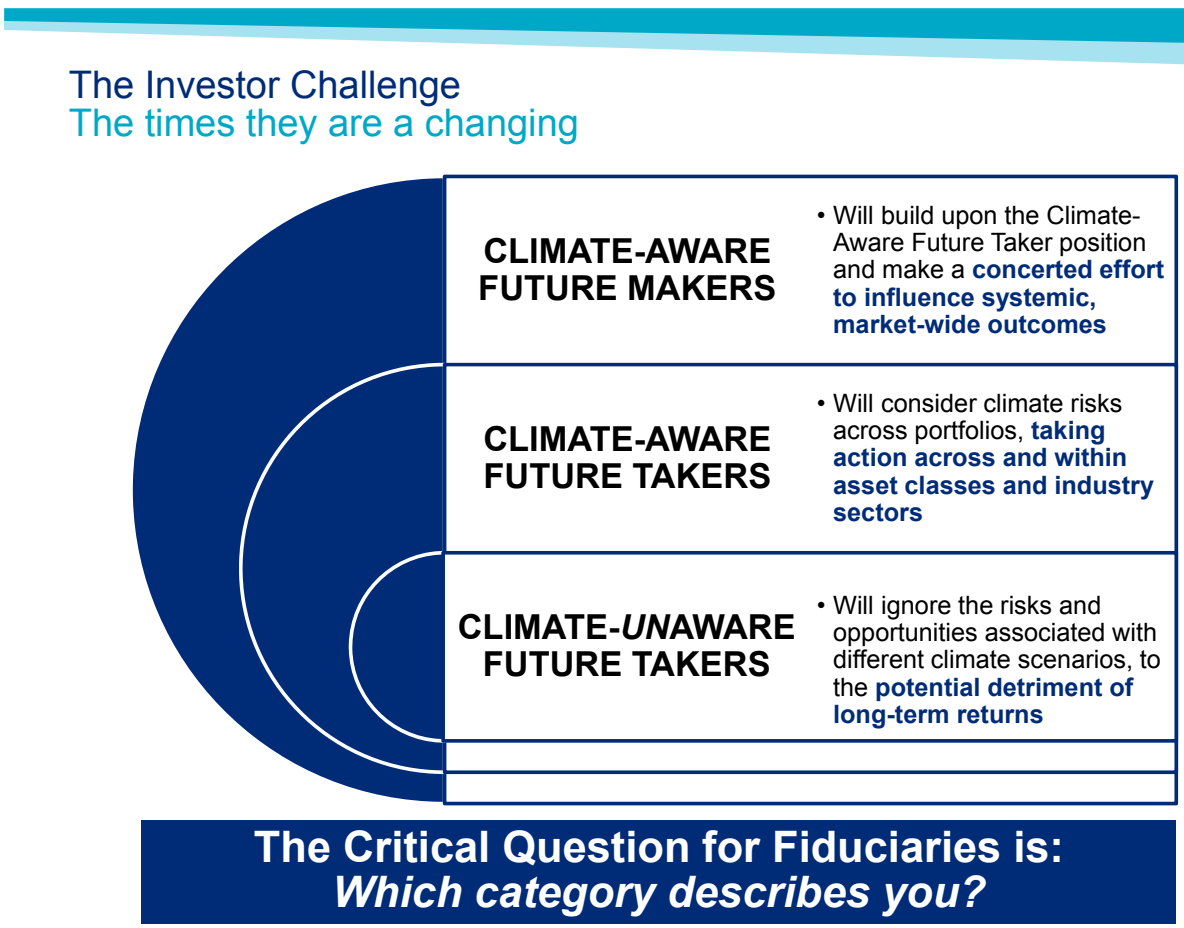
- *"What is the future business model for utilities?"*
- *"How do utilities recognize the new "prosumers," consumers who advocate for products, such as renewable energy?"*
- *"How can grid costs be distributed equitably?"*

6. CLIMATE CHANGE: INVESTMENT RISKS AND OPPORTUNITIES FOR INSTITUTIONAL INVESTORS

Karen Lockridge, Principal, Mercer

PRESENTATION

Karen Lockridge introduced a recent study by Mercer on "Climate change: Investment risks and opportunities for institutional investors," which shifts the discussion away from a stranded assets focus and toward realising investment opportunities in renewables. Lockridge described the need to assess investors in terms of whether they are climate-aware future makers, climate-aware future takers, or climate-unaware future takers.



PLENARY DISCUSSION

Participants discussed how to mobilize corporations, including non-insurance companies, that ask post-disaster cities to rebuild with climate adaptation in mind. The Montréal Carbon Pledge is an example of a strategy that emerged out of a group working toward carbon disclosure and decarbonization. Lockridge suggested champions in the financial community could go beyond the annual report in collecting, interpreting, and communicating data.

To attract investors who are risk averse, participants discussed measuring vulnerability for people who are risk averse and that clean technology needs to be understood as a solution rather than a risk. Lockridge indicated that impact investment into small startups is extremely risky, but that "the ones that survive do so well that it almost balances all the loss." Or, they stay in business just long enough to be bought by a larger company with strong management expertise. In answer to a question about why impact investors take their money to developing regions, Lockridge indicated that the social impacts are far greater.

The group considered some innovative funding models, such as the Toronto Atmospheric Fund (TAF), which is an endowment to reduce GHG emissions. Lockridge noted that being based on equity and returns, the model allows for private institutions to take the projects over. While clean tech is being de-risked, Canadian pension plans and venture markets with long time horizons are not picking them up, and B Corps (benefit corporations) are not making headway in Canada as they are in the USA. When asked about Green Bonds, Lockridge recommended tax-free municipal bonds as a model for funding municipal infrastructure.

PARTICIPANT TAKEAWAYS

The main observations that participants offered were that investment in climate change will require:

- Avoiding the "valley of death", which is the phase between initial capital investment and revenue generation in a startup
- Shifting mentality from divestment to investment in low carbon solutions
- Understanding the factors that drive investment into clean technologies
- Pushing regulatory frameworks to disclose/report climate risk and GHG emissions

7. "SMART CITIES": NOT YOUR ONLY OPTION

Mark Roseland, Director, Centre for Sustainable Community Development, Simon Fraser University

PRESENTATION

Mark Roseland presented the outcomes of an international project that researched 43 of the energy monitoring and assessment tools currently available to cities. Concerned with the effectiveness of any one tool, Roseland shared some of their limitations and challenged participants to select their planning tools based on their vision for their municipalities in the context of their local sustainability/climate change issues, and establish appropriate planning principles.

PLENARY DISCUSSION

Participants drilled down on what "local" encompasses. Roseland explained that while obtaining data at the city level is more straightforward, some communities are resisting "urban" planning and looking for neighbourhood level planning. This raised the concern that there are flaws in neighbourhood planning, and Roseland clarified that while the structure of renewable energy in cities needs to be in place, sustainability priorities and planning principles need to be established at the neighbourhood level. One participant asked if planning tools specific to industrial neighbourhoods are available, and Roseland pointed to research taking place in the Netherlands.

Participants were concerned about comparing cities and tools that are very different. Someone pointed out that comparing Vancouver to New York is likely easier than comparing Vancouver to its surrounding communities. One participant described an experience with Siemens and IBM in which they bring in startups to help solve city energy problems but cannot innovate fast enough.

Another participant described planning as conceptual and that the functionality naturally follows; for example, installing a better door to improve efficiency may achieve the same reduction in energy from the grid as installing a solar panel. This brought the discussion to

solutions that do not necessarily attract public attention and support but would go a long way to improve sustainability. More specifically, a participant indicated a need for establishing performance indicators that measure mundane but necessary upgrades, which helps in promoting them as achievements.

Concern about data collection and privacy was raised about large data companies being like "Big Brother." Democratizing or making benchmarking data public could help enable full participation in decision-making, as is done in the Netherlands.

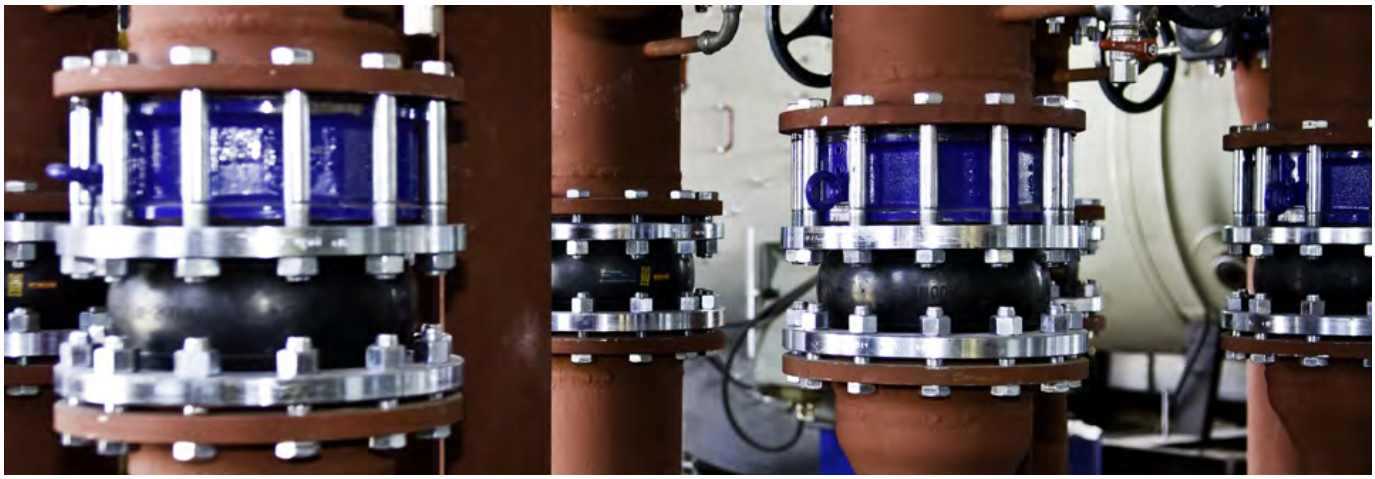
PARTICIPANT TAKEAWAYS

Participants were struck by the number of frameworks that are available as well as the number of peers wrestling with how to prioritize sustainability in city operations. Through the session dialogue, they learned that technical conversations need to keep people in focus and that planning needs to take place at the neighbourhood level. Participants also indicated a need for further discussion on:

- How to get to universal guidelines
- How to integrate sustainability goals into broader municipal objectives
- How to integrate with existing buildings
- How to get useful data (energy use, people-oriented metrics, e.g. jobs, travel, wellness) at the right scale, and make it available to all

8. OVERCOMING BARRIERS TO DISTRICT ENERGY DEVELOPMENT: EXPERIENCE FROM C40 CITIES

- **Brian Crowe, Director, Water, Sewers, and District Energy, City of Vancouver**
- **Simon Wyke, Principal Policy and Programme Officer, Greater London Authority**



PRESENTATION

This session was led by a pair of leaders from cities that capture waste heat and channel it through unique district energy (DE) systems. These not only recover waste heat, but also reduce the demand for primary heat.

Simon Wyke outlined London's goal to develop a "secure, resilient, and low/zero carbon energy supply," and more specifically, to reduce GHG emissions by 60% by 2025, decentralize its energy supply, and produce 25% of it within the city. He discussed the role of London's DE system, but also pointed out that DE is most effective in high-density areas.

Brian Crowe focused on the public outreach and education aspects of Vancouver's DE implementation strategy. In describing the public rejection of the City's first choice—a biomass Combined Heat and Power (CHP) system—Crowe highlighted the importance of public engagement from the project outset. Moving forward, Vancouver has set up an Energy Centre Advisory Group (ACEG) of stakeholders to guide planning future projects.

PARTICIPANT TAKEAWAYS

Participants were interested in the requirements for staff expertise in policy, the technology, and legal aspects of implementing DE. The session leaders emphasized that it is not the number of dedicated staff, but having knowledgeable staff that is key, and that city leadership is critical. To build internal capacity, the session leaders advised cities talk to other cities about how to leverage internal resources, and about using consultants, local industry, and grants strategically.

In a discussion about the London and Vancouver successes, it was pointed out that pilot projects lack both permanent funding and an overarching policy framework to support them. However, they attributed the system successes to being market-based, and to concentrating on customer service rather than mandatory participation. Since DE systems tend to be capital intensive, participants suggested other ownership models could be explored, such as cooperatives or through pension fund investment.

CHP systems that use alternative fuels, such as landfill gas or cattle manure, were also discussed. In those examples, the cost lies not in the fuel or operation, but in distributing it to residential landowners—in cases where no large customer is nearby—which costs more than distribution of natural gas. In Vancouver's case, while recovering waste heat from the sewers costs more than was projected for the proposed CHP system, the DE system produces lower emissions than the CHP would have.

Participants appreciated learning about the technology and that cities are implementing district energy systems, which take advantage of secondary heat sources. However, one participant raised a concern that cities committing to DE can limit opportunities for other technologies.

NEW AND UNANSWERED QUESTIONS

The discussion developed further questions about DE, such as the implications for taxes and risks, and how to work with large energy users, such as health authorities. In terms of feasibility, participants posed questions about the retrofit requirements for DE in existing building stock, the feasibility of DE in smaller communities and residential areas, and the feasibility of high versus low temperature DE systems.

"Insulating a building from an E to D rating would allow 96% of its heat demand to be met from heat supplied at 55 deg C." - Wyke in reference to low temperature DE systems

There were also many questions about the regulatory conditions that incentivize DE implementation, such as mandatory or tenant opt-in and frameworks that entice rather than force developers to connect. Pricing policy was also mentioned as a tool to encourage energy conservation and to eliminate fixed costs.

9. SOLARIZING SCHOOLS IN BRAZIL AND SHOWCASING SOCIAL BENEFITS OF RENEWABLES PROJECTS IN POOR COMMUNITIES

Bárbara Rubim, Climate and Energy Campaigner, Greenpeace Brazil

PRESENTATION

In this session, Bárbara Rubim emphasized the community development opportunities of implementing renewable energy, specifically solar PV panels, with funds generated through crowdsourcing. The outcomes not only include reduced energy prices for the schools and funds freed up for investment in student learning, but also job opportunities in green energy. In some cases, these jobs went to young people who were part of a program to keep them off drugs and safe from violence.

Greenpeace Brazil trained a group of 30 young people to be “Solar Multipliers” who spread their learnings throughout Brazil. São Paolo is in a state that now calculates the Goods and Services Tax so as to reduce the cost of microgeneration of electricity, which Rubim credits as the reason solar PV is more common there than in other states of Brazil.

PLENARY DISCUSSION

Participants focused on the funding, community, and expansion opportunities of the program. One participant suggested marketing these projects as investment opportunities to offset other carbon emissions. Another suggested a leasing be considered for

large-scale projects. One concern was raised about local governments losing a source of revenue generated by providing energy to the residents.

Reflecting on the potential for such a program to be delivered outside of Brazil, one participant indicated Bullfrog Power is collaborating on similar projects with Canada's First Nations, for whom the cost of living is highest and social mobility is the lowest. Participants viewed community engagement as a key factor in empowering people to transition from fossil fuels to renewables. Opportunities to embed education on energy and technology into the curriculum and to integrate with other endeavours in sustainability were suggested as ways to extend the benefits of the program beyond the school.

PARTICIPANT TAKEAWAYS

This session drew emotional responses from the participants about the social benefits—but also emphasized the environmental and economic benefits—of democratizing solar. It stood out among the other Global Learning Forum sessions because it focused on real community engagement and social impact.

There were lingering concerns about removing revenues from local governments who are responsible for the grid, but most participants appreciated learning about communities being empowered to implement renewable energy, especially the youth. One participant noted the value of learning to "let volunteers teach the way they think the message should get across."

10. LEADING THE WORLD: C40 SHARING SUCCESSES IN ENERGY, TRANSPORT, AND FINANCE

- **Shannon Lawrence, Head of Energy Initiative, C40**
- **Chris Derksema, Sustainability Manager, City of Sydney**

PRESENTATION

Shannon Lawrence outlined some of the many interesting, innovative strategies being developed by C40 member cities that increase implementation of renewable energy and energy efficiency. In her view there is as much to learn from failures as from successes. She pointed out that more than half of the C40 cities have improved energy policies, programs, and projects as a direct result of their participation in C40 Cities' networks.

Chris Derksema, Sustainability Manager of the City of Sydney (a C40 city) then detailed Sydney's *Renewable Energy Master Plan* and the achievements in decoupling energy use from GDP and GHG emissions. He credited much of Sydney's success to setting specific energy intensity targets. The targets were clear and easy to communicate and allowed for nuanced conversation between the City and different sectors about ways they could achieve the goals.

PLENARY DISCUSSION

The first area of discussion centred on successful examples of how cities can best work with the private sector. Derksema said that in Sydney, mapping building energy intensity meant that the sustainability department could identify the opportunities for improvement and had hard numbers from which to guide the next steps; these proved

helpful for working with both private sector and elected officials. Lawrence added that she found that the collective influence of C40, allowed individual members to push a little harder on their goals with politicians and the private sector.

Participants asked several questions to better understand the kinds of information that C40 collects and how its uses this information from its member cities. Lawrence also mentioned the CDP Cities platform, which is a source of environmental and energy information for cities. As cities need to be a certain minimum size and/or international stature to be permitted membership in C40, participants asked what smaller communities might learn from C40. Lawrence clarified that while C40 has discouraged participation from small cities, it is in the process of expanding its membership, specifically in India and China, to be a more global organization. The final question asked about financing and economic initiatives: Lawrence pointed to a C40 working group on finance and how the organization is working with cities to find and borrow funds needed for municipal projects.

PARTICIPANT TAKEAWAYS AND UNANSWERED QUESTIONS

Participant feedback from the session indicated that many were interested and inspired to learn more about the energy plans in the City of Sydney and more on the specific ways C40 networks actually operate in each city. There were some questions from participants about the limitations of the C40 model and how it mobilizes cities to actually take action and meet collective objectives.

11. STATE AND PROVINCIAL LEVEL TOOLS TO ENABLE LOCAL GOVERNMENT ACTION ON MITIGATION

- **Svend Andersen, CEO, GHG Accounting Services**
- **Ben Clark, Senior Climate Action Analyst, BC Climate Action Secretariat**

PRESENTATION

For this session, Svend Andersen drew from results of an international climate dialogue group in a Global Learning Forum pre-meeting which focused on state and provincial level policy instruments that enable renewable energy uptake. That meeting was part of a longer dialogue series convened by the German Ministry of Environment.

One of the key conversations to emerge in this session was whether to have mandatory or voluntary policy schemes in place to encourage local governments into action. Similarily, participants questioned whether or not these policy schemes should be incentivized.

Andersen noted that states and provinces play critical roles in creating the frameworks for an enabling policy environment for renewable energy.

Noting that cities sometimes do not know where to start in implementing renewable energy, Andersen suggested that cities look to underutilized assets, describing these as “hot, smelly, loud, and ugly.” Andersen advocates for cities to look at these underutilized assets as strong candidates to be tipping points in a change process: where it is hot, there is heat to be harvested; where it is smelly, there is methane to be captured; where it is loud, there are likely efficiency improvements to be made; and where it is ugly, places likely have room for solar panels.

PLENARY DISCUSSION

Participants were asked to discuss the state/provincial level policy instruments that they had personally worked with or experienced and to share whether these worked to enable higher rates of renewable energy implementation. Participants discussed how mandatory target setting from the Province

of BC started the conversation about CO2 reductions in municipalities. With clear guidelines and communication about goals, mandatory policy instruments do not have to be punitive, especially if there is some degree of freedom about how municipalities can meet mandated goals. There was agreement among participants that there may not be one-size fits all solutions in implementing renewable energy, as different municipalities have different resources and challenges. One participant noted that it is important, at the same time, to ensure that states/provinces are not discouraging innovation inadvertently through policies. Several participants would like greater opportunities to participate in dialogue with other cities to share policy success and failures, to build stronger networks and capacity.

The conversation turned to issues of equity, with participants seeing an important role for state and provincial level governments in equity of energy programs, particularly in ensuring that both the impacts and benefits of energy projects are equitably shared. Andersen observed that states and provinces play a critical role in encouraging holistic, as opposed to project-based, change.

PARTICIPANT TAKEAWAYS AND UNANSWERED QUESTIONS

The primary idea that participants took from the session was that mandatory policy requirements do not need to be one-size-fits-all; when properly designed, with clear defined goals, and adequate funding, mandatory requirements can allow cities to find innovative local solutions. Exact definitions of these concepts were among the unresolved questions.

12. UNLIKELY STORIES: COAL COUNTRY, JOBS, URBAN RENEWAL, AND RENEWABLE ENERGY

Bob Dixson, Mayor, Greensburg, Kansas

PRESENTATION

In this session, Mayor Bob Dixson told the story of Greensburg, Kansas and how it recovered from a tornado in 2006 that devastated 95% of its buildings. Greensburg was rebuilt not as it had been, but as a town powered entirely by renewable energy. In the wake of the tornado, community meetings were held to determine how the residents would reenvision the town. Dixson pointed out that one of the effects of the tornado was to equalize everyone; after the storm, everyone had nothing. In these community conversations, sustainability and resilience were values that took priority, harkening back to the spirit of the original pioneers who first settled the town. Dixson described the rebuilt Greensburg as a living laboratory for sustainable technologies.

PLENARY DISCUSSION

Participants first asked questions about how the community held its conversations about values in the wake of the storm. Dixson replied that the values that were arrived at were those shared primarily by the town as an agricultural community; most of Greensburg's residents wanted to build a community that would be there for their grandchildren, and that meant ensuring sustainability. State-level policies and politics did not play a role in these conversations.

> *"People always say we thought outside of the box, but we allowed our box to be blown away." - Mayor Bob Dixson*

Participants were also curious about how the townspeople's relationship with energy supply and management had changed since the storm. Dixson described how everyone's

view of energy changed once they saw the mechanics of renewable energy generation up close—energy generation and consumption became personal issues. The community had a familiarity with wind turbine technology, as local farmers had already been leasing land to wind investors before the tornado.

The motivation for energy efficiency and renewable energy in Greensburg was primarily cost, said Dixson. The rising costs of conventional electricity before the storm made residents receptive to switching to renewable energy if it could demonstrate cost savings. The cost-benefit analysis was sufficient to encourage sustainable building forms, including the state's first LEED-certified buildings. As soon as the town began rebuilding and the renewable sources for energy generation were implemented, savings were realized, encouraging further investment in innovative solutions. There was some education needed at local and state agencies, but institutional players—including US Federal Emergency Management Agency (FEMA), which has strict policies regulating the use of its funds—and the private sector (namely, John Deere) were supportive of the change.

PARTICIPANT TAKEAWAYS AND UNANSWERED QUESTIONS

Participants found the Greensburg story to be inspirational, especially as it shows that many values such as community engagement, and environmental conservation and stewardship are shared across the political spectrum.

13. WORKING WITH CITIZENS AND POLITICIANS FOR AMBITIOUS RENEWABLE ENERGY TARGETS: PERSPECTIVES FROM DEVELOPED AND DEVELOPING COUNTRIES

Esperanza Garcia, Founder/CEO, CleanTech Impact

PRESENTATION

Borrowing from Canada's own Marshall McLuhan, the medium was the message in this session. With only an hour to work with a group of 40 participants, Esperanza Garcia demonstrated a dynamic method for engaging people: "Brainswarming." She split participants into two groups and challenged them to brainswarm how to achieve 100% renewable energy in either developing or developed countries, or as she put it, "We have 40 minutes to solve all the world's problems. What are the solutions you will provide?"

BRAINSWARMING EXERCISE

According to the brainswarming technique, participants were invited to contribute from both top-down and bottom-up approaches—starting with sub-goals or starting with the available assets. The theory being that people think in different ways and by allowing varied approaches, participants converge on a greater number of solutions in a shorter amount of time in comparison with brainstorming.

Goal: Achieve 100% renewable energy in a developing country

The primary sub-goal was investment in education, such as building skills, mobilizing youth, gaining community buy-in, and changing the minds of policy-makers. Participants also sought to finesse the goal by adding "renewable energy for all," thereby highlighting the need for energy equality, but also the potential for coordination across socioeconomic divisions; those who can invest labour alongside those who can invest capital funding.

Goal: Achieve 100% renewable energy in a developed country

As with the group that discussed developing countries, education was identified as a key priority. In fact one participant favoured incentives over subsidies because they introduce an education component. One distinction in developed countries was a focus on infrastructure as a whole; participants pointed out that developed countries have the systems and funding already in place. On the other hand, existing infrastructure can actually slow down implementation of new innovations.

Another idea was to network households and share stored energy with the surrounding community. Participants also discussed the importance of quality information and education, but they noted this is a challenge common to both developed and developing countries. Participants also pointed to regulatory systems that inhibit rather than drive renewable energy.

PLENARY DISCUSSION

Stepping back from the brainswarming exercise and looking at the goal to achieve 100% renewable energy more generally, participants expressed innovative ideas:

- Myth busting about renewable energy
- Making renewable energy exciting and fun
- Demonstrate successful renewable energy projects
- Engaging youth through projects and mentorships

PARTICIPANT TAKEAWAYS AND UNANSWERED QUESTIONS

Participants were interested in the potential for linking the RE goals of developed and developing countries more closely, and the potential for better integration of institutions and connection across culture. More generally, one participant wondered how to ease a community's transitional period. They asked how we can develop positive, global education with "reliable information to make the case to those who hold purse strings." A few other participant questions were about how to make "stakeholder engagement" more effective: "We need to further define the goal of 100% renewable energy in terms of who benefits, why we are doing it, and so we can agree on what needs to happen first to move forward."

14. BEYOND BENCHMARKING: USING DATA TO DRIVE ENERGY EFFICIENCY ACTION

- **Christie Baumel, Energy Policy Advisor, Office of Sustainability & Environment, City of Seattle**
- **Rebecca Baker, Energy Benchmarking Program Manager, Office of Sustainability & Environment, City of Seattle**

PRESENTATION

Representing the City of Seattle, Christie Baumel and Rebecca Baker took the opportunity to discuss next steps for the City's energy consumption benchmarking program. They began with a summary of Seattle's endeavours to date, which started with a carbon neutral goal set for 2050. From assessment to incentives, through investing in energy efficiency, Seattle is tackling building energy use and GHG intensity. Now it is working on how to capitalize on the data already collected through its benchmarking program.

PLENARY DISCUSSION

Opening the discussion with clarifying questions, participants sought to drill down on details about the data being collected and the staff requirements for the program.

Interested in the chain of communication, one participant asked about Seattle's decision to share data among property managers and not tenants. This decision stems from property managers desiring to know what other similar buildings are or are not achieving. It also helps focus the call for action to address performance. Seattle recognizes that communication between tenants and property managers andowners is critical and could improve; full public disclosure is underway and will be integrated into Seattle's online tool.

Regarding analysis of the data, a participant inquired whether Seattle outsources and whether they include predictive analytics. Seattle has a consultant that also produces attractive visualization of the data. The City is developing a means of personalizing the data outputs according to parameters set by the users. Specific visualization tools were mentioned, including Tableau and the one developed for the City of Philadelphia's benchmarking program.

Suggestions about making better use of benchmarking data included:

- Identify where the energy load is
- Benchmarking of every facility can reveal shared problems among facilities designed

by the same people

- Use analytical software to share customized outputs with building operators

The discussion evolved to feedback and what the balance is between how often energy use should be assessed with the need for comprehensive information. Another participant noted that the design field—engineers and architects—should better understand how to achieve their goals, but also that there should be a feedback loop in place. Another participant described experience with individuals inviting feedback on their energy consumption, and providing feedback has served to break down barriers with customers.

NEW AND UNANSWERED QUESTIONS

Participants recognized the importance of communicating with the building occupants across sectors, whether residences or businesses, but still had questions about what engagement strategies are effective for various audiences; businesses need to know how to use the data and the results need to be showcased for the broader community.

Learning that data analysis is important and that there is relationship between motivating action and requiring disclosure of building performance were also key messages picked up by participants.

Although some participants left with questions about what resources are needed to implement a benchmarking program, many appreciated the advice on how to scale and scope a new benchmarking program according to the resources that are available to the project.

15. LESSONS FROM JAPAN: SHARING EXPERIENCE FROM THE CITY OF YOKOHAMA ON RENEWABLE ENERGY AND ENERGY MANAGEMENT

Toshinori Mishima, Assistant Manager, Climate Change Policy Headquarters, City of Yokohama

PRESENTATION

Toshinori Mishima began by introducing participants to some of notable disasters in the City of Yokohama's past, which have helped shaped the city. In the 1960s, the mayor of Yokohama began to rethink the city planning by engaging citizens and the private sector to identify municipal priorities. Mishima outlined the energy and emissions challenges faced by Yokohama, including those associated with the Great East Japan Earthquake (2011) and the introduction of ambitious government targets to reduce GHGs and implement renewable energy. Yokohama has a variety of demand-side management (DSM) programs and citizen engagement initiatives to better manage energy usage through the city.

PLENARY DISCUSSION

Collaboration was the most discussed topic in this session, with participants eager to discuss best practices between cities and between city governments and the private sector, academics, and citizens. A participant brought up the example of the City of Seattle, which has a technology sector that is quite engaged and interested in innovation, including energy. In this case, the financial power of multi-national corporations can help tie the city together, especially when they enter into partnership programs with the local community and small-medium enterprises (SMEs).

Participants from small communities wanted to discuss how they might apply lessons from Yokohama, and other larger cities, to their contexts, in that they would have to attract both investors and citizens to renewable energy projects. The discussion turned to how cities of all sizes can lead by, for example, setting up action plans with job development focus on sustainable or green energy, and by decreasing the amount of city bureaucracy that hampers innovative and new projects.

Participants also discussed how energy management affects implementation of renewable energy projects. Mishima commented that one reason European cities might be ahead of those in other regions of the world is that even if their transition to renewable energy is relatively recent, strong policies for DSM were already in place; they did not have to be reinvented for renewable energy. These policies can also be a model for other cities, even if the energy sources are quite different.

Planning for resilience in the face of natural disasters was also discussed and participants asked how the major earthquakes that shaped the City of Yokohama also affected energy planning and management. Mishima replied that power disruptions from the Great East Japan Earthquake of 2011 changed the mindset of city planners across Japan; they now prioritize decentralizing energy systems to make them more resilient.

NEW AND UNANSWERED QUESTIONS

- *"What is the role of non-profit community groups in shaping city energy plans and policies?"*
- *"What is the best way to include resilience in business planning for renewable energy?"*

16. ENERGY EFFICIENCY: WHAT THE IEA CALLS "THE FIRST FUEL" FOR CITIES

Patricia Lightburn, Former IEA Analyst

PRESENTATION

As an analyst with the International Energy Agency (IEA), Patricia Lightburn helped introduce energy efficiency as "the first fuel" in the IEA's library of annual fuel reports. This shifted energy efficiency from being regarded as an expense to being regarded as a fuel source (in terms of avoided use).

PLENARY DISCUSSION

Lightburn invited participants to comment on how they promote energy efficiency, especially to non-residential sectors, such as freight movement, that are not as far along on energy efficiency. One participant was concerned about equating energy efficiency with renewable energy because it often involves retrofits, which introduce "the hassle factor." Another participant countered that other benefits of energy efficiency retrofits need to be promoted, such as improvements in lighting or security. Changing behaviour remains a challenge; speaking about Ontario's long-term energy plan, which prioritizes conservation, a participant lamented that smart metres are installed but that customers are still not using the data.

The discussion led to financial incentives, such as pay-as-you-save or on-bill financing; one participant said the City of Dawson Creek, BC, Canada, imposed a tax to pay for its energy retrofit projects. Participants had mixed experiences with pay-as-you-save programs in Canadian cities. Where it was a success in one city it was "a dismal failure" in another, and other participants noted there is a need for more discussion about what went wrong and how to do better. On the theme of failures, a participant noted that developers gain nothing by building more efficient homes.

Concern was raised about district energy and traditional utility models having conflicting interests with the goal of energy efficiency, and participants indicated there is a need for renewable energy solutions that integrate energy efficiency strategies. Another argued that 100% renewable energy is not feasible without energy efficiency.

Instead of focusing on single buildings, one suggestion was to approach energy efficiency from a community-wide perspective. For

example, “If you look for a future land use framework that doesn’t require the same travel, the impact is much bigger.” One participant noted there are many pilot projects that struggle to scale up to citywide programs, with low interest rates given as a reason.

Referring to a community on Vancouver Island dubbed “Solar Colwood,” a participant described a well-attended community meeting about installing solar PV. It did not result in many installations, but it did result in many people investing in household energy efficiency improvements. What may have appeared as a failure actually led to ancillary benefits. Participants wondered why multiple benefits are not measured and why failures are not reported. One participant pointed out that regulators focus on economic indicators and do not want to report failures.

PARTICIPANT TAKEAWAYS

Participants were very receptive to framing energy efficiency as “the first fuel.” Many noted the importance of developing mechanisms to discuss and learn from failures. Participants called for better understanding of the multiple benefits of projects and for integrating energy efficiency strategies into renewable energy designs to ensure their objectives do not conflict. Shifting from a discussion about the energy efficiency of individual buildings toward community-based planning invites more efficient land use that avoids energy use.

PLENARY SESSION – INNOVATIVE FINANCING FOR URBAN RENEWABLES

Brock Carlton, CEO, Federation of Canadian Municipalities (FCM) argued that "city-building is nation-building. If this country is going to be economically viable, sustainable, and socially cohesive, municipal government needs to have a seat at the table." The FCM represents 90% of Canadians through their municipalities, and develops dialogue and policy from local to national levels. Local governments face a challenge in raising revenue from an antiquated taxation system. "This panel is about reality. It's about finding innovative ways to fund important projects."

Ken Nolan, Manager of Power Resources, City Electric in Burlington, Vermont, explained how his city recently achieved 100% renewable electricity through the purchase of a 7-megawatt hydroelectric plant. City Electric, the utility accountable to the municipality, financed the project through bond issuances, bond reserve funds, and power purchase agreements. Nolan quipped, "If I had to point to one innovation, it would be commodity markets—we sell RE credits to other states in New England." According to Nolan, the success of Burlington's utility can also be attributed to building momentum with small victories; the City's leadership was able to make small low-risk investments, incrementally. "Now we look at investments from a risk perspective—the true cost of fuel types over the lifespan of 25-year contracts," he explained. "Natural gas looked cheap until [Hurricane] Sandy. You get different answers when you start to look [at investments] this way. Renewable energy can reduce your costs."

Ross Beaty, Executive Chairman, Alterra Power Corporation declared, "I feel like we're in an energy revolution." Alterra is an independent power producer with run-of-river hydro, wind, and geothermal plants around the world and generates enough electricity to power a city the size of Vancouver. Alterra works with pension funds, private equity

firms, and other private partners to fund its investments and operations. He highlighted the positive finance climate for RE projects: set against a backdrop of historically low interest rates, the RE industry is attractive to capital providers because it is clean, long-term, and predictable over project life spans. Beaty returned to the theme of cities, "Cities don't need to provide this capital, they just need to make the policy frameworks to attract the private sector."

To provide a global financial services perspective, **Karen Lockridge, Principal at Mercer**, laid out the investment risks and opportunity of climate change. "We support institutional investors and have 16 investor partners who represent $1.5 trillion in assets." Lockridge said that investors should prioritize climate action over inaction. She contrasted different investor types, "'Future Takers' are climate unaware and ignore the risks and opportunities of climate change, to the detriment of future returns." On the other hand, "Climate aware 'Future Makers' build their beliefs into their portfolios and try to systematically influence markets and policy," she said. Mercer's job is to help develop investment beliefs in the reality of climate change and translate these beliefs into investment policy.

Matt Zipchen, General Manager, SolarShare, TREC Renewable Energy Cooperative asked Forum participants, "How many of you own your own home? Before you owned your own home did you care about real estate policy and trends?" He drew an analogy to Germany's Energy Transition where the biggest finance pool over the last 35 years came from individuals, co-operatives, and communities, not hedge funds or energy companies. "German citizens are demanding more renewable energy because they're owners of it," he said. Zipchen explained how the SolarShare initiative is one of TREC's greatest success stories. SolarShare leases empty rooftops or fields to generate electricity from solar PV, which they then sell to the Provincial Government of Ontario through a feed-in tariff program. He went on to point to new trends in the industry: impact investing, foundations, and crowdsourcing.

PEER TO PEER SESSIONS

17. DISPELLING DOUBT: HOW 100% RE IS PRACTICAL AND ACHIEVABLE FOR MUNICIPAL POLICYMAKERS

- **José Etcheverry, Professor and Co-Chair, Sustainable Energy Initiative, York University**
- **Manuel Valdés, Deputy Manager, Infrastructures and Urban Coordination, City of Barcelona**

PRESENTATION

José Etcheverry opened this session about why switching to 100% renewable energy is an imperative for cities. Citing a global population projection of 9 billion by 2045, he argued that resources are not all created equal and that renewable energy must become "the new normal." Large well-known companies like Apple and IKEA are feeling pressure to invest in RE, and in 2013, investment in renewable energy exceeded investment in fossil fuels, said Etcheverry. He also noted that while the cost of solar is decreasing, the cost of wind has plateaued—that said, wind installations continue to increase. To encourage public desire for renewables, Etcheverry recommended improving aesthetics, and he pointed to Tesla and UBC's Centre for Interactive Research in Sustainability (CIRS) building as examples of appealing products.

Manuel Valdés then presented Barcelona's plan to become self-sufficient using 100% renewable energy, which would keep money within the City; the private sector supports the policy. Barcelona's energy systems include solar, micro-wind, and a waste-to-energy plant. Other aspects of the plan included: mobility, resilience, and investment in public spaces.

Valdés expanded on the mobility aspect, which includes active transportation (walking, biking, transit) and electric vehicles and taxis. The City is also co-developing public spaces to include charging stations through collaborations with Nissan, Renault, and BMW. Being a high-density city, solar panels are being put on rooftops and walls wherever possible. Valdés described the most important factors in Barcelona's plan: knowledge of people and a change of culture.

PLENARY DISCUSSION

Participants were then invited to explore the following guiding questions:

What are some ideas for achieving 100% RE targets for cities?

What are some suggestions for engaging politicians?

What are some suggestions for engaging citizens?

Ideas ranged from communications to finance strategies:

- Incentives for taxi drivers: establish a renting/leasing system for electric taxis
- Network of charge points: the more cities with them, the better
- Public-private partnerships: capital from public sector, but then from private sector
- Information accessibility: break down what 100% renewable energy means in each sector
- Appeal to political legacy: most politicians are motivated to do good for their cities
- Make RE beautiful to gain support

NEW AND UNANSWERED QUESTIONS

- *"Relationship between city policies (top down) and community driven initiatives (bottom up): How do policies create space for and support community initiatives?"*
- *"What are the policies implemented in Barcelona that facilitated the implementation?"*
- *"What opportunities might exist to engage schools in renewable energy?"*

18. DEVELOPING CREATIVE ENERGY CO-OPERATIVES IN AN UNCOOPERATIVE ENVIRONMENT

Ashoka Finley, Projects Facilitator, EcoCity Builders

PRESENTATION

Ashoka Finley introduced participants to this session by examining the framework under which we deal with climate change as a technological, but also a social problem, in terms of scale, speed, and risk. Rooted in justice, labour, and ecology, Finley described the rationale behind EcoCity Builders' Energy Solidarity Cooperative (ESC) and the role of renewable energy, more specifically solar.

> *"We see renewable energy as a movement and solar energy is a tactic towards solidarity in communities and energy justice."*

Out of three spheres of influence—political will, economic incentives, and social engagement—Finley designed an interactive session parsed out into three categories:

1. *Regulatory capture*: working in a century old sector where the lines between utility and regulator are blurred and the political support is for the status quo
2. *Energy literacy*: raising public awareness and understanding of the energy chain, and how to gain agency by disrupting it
3. *Incentives for cooperatives*: how to lower the barriers to cooperatives, with specific reference to California's legislative environment

Finley asked participants about their experience with energy cooperatives, and participants indicated they are rare. Several things that are illegal in California—solar gardens, virtual metering, off-set trading—are regulatory barriers to community initiatives

like cooperatives, according to Finley, and he suggested some strategies around these:

- Set up a special purpose enterprise (SPE) to gain access to certain purchasing powers and tax credits
- Community Choice Aggregation (CCA) is one methodical way of allocating energy purchasing power
- Ask insurers to force the hand of the regulatory body: Make them more accountable and transparent
- "Campaign and Shame": support the politicians who are making progress and create an environment of accountability
- Provide access to legal support to help people incorporate sustainability
- Leverage alternative lenders and motivate them to adopt non-carbon financial models with greater impact

Finley also recommend educating people about the effects of the existing energy system and about how to move toward self-sufficiency:

- Have an energy curriculum that explores efficiencies and control to chart an energy map of the relationship between physics and the political economy
- Create and train the cooperative members in operating the energy system

TAKEAWAYS AND UNANSWERED QUESTIONS

Participants appreciated learning about cooperatives as a means to democratic energy systems and about how utilities could adopt cooperative models from other sectors, such as urban agriculture. Knowing how to teach energy and cooperative literacy and find support for cooperatives were key takeaways.

19. GETTING TO A CLIMATE CHANGE COMMITMENT OF 80% BY 2050: THE ROLE OF RENEWABLE ENERGY

- **Brock Carlton, CEO, Federation of Canadian Municipalities**
- **Devin Causley, Manager, Climate Change Program, Federation of Canadian Municipalities**
- **Megan Meaney, Executive Director, ICLEI Canada**

PRESENTATION

Brock Carlton opened this session by explaining that climate change issues are a priority for the Federation of Canadian Municipalities (FCM). Devin Causley and Megan Meaney presented details on the Partners for Climate Protection (PCP) program, "A network of Canadian municipal governments that have committed to reducing greenhouse gases and acting on climate change." PCP is a FCM and ICLEI initiative that began in 1994. Key elements of the PCP include a 5-milestone framework that guides GHG emission reductions and a network of participating Canadian municipalities.

Commenting on the GHG emissions recorded by Canada's provinces over the last 20 years, Meaney highlighted the importance of understanding baselines in order to appropriately compare scenarios. For example, the Yukon has had unusually mild winters, starting in 2009, which she cautioned could give the false impression of progress. Similarly, BC reports relatively low emissions, but the

province continues to export a lot of coal to China, according to Meaney.

Representatives from two leading Canadian municipalities were then invited to present their respective case studies and participants were asked to consider the following guiding questions:

Is a target of 100% local energy generation feasible?

What is the role of renewable in meeting greenhouse gas reduction targets? Is renewable energy a significant contributor to reducing greenhouse gas emissions?

How do we balance a target of 100% renewable energy with local generation?

City of Edmonton

Mark Brostrom, Director, City of Edmonton, discussed three of Edmonton's 12 goals and the energy transition strategy the municipal government established to reach them, independent of other levels of government:

1. Sustainable sources and uses of energy
2. Resiliency of the energy system
3. Carbon neutral city

The City was determined to become a leader in finding practical ways to avoid, reduce, and replace fossil fuel use by building community capacity and establishing regulations that would drive compliance. A key challenge was financing and a key success was getting opinion leaders to declare their support, according to Brostrom. Brostrom closed with the question: "What's the best way to provide incentives to our communities to move them and the markets to community-wide uptake?" Answers included: Education, including within the school system, and engagement with the affected communities about what progress toward targets would entail; celebrating "early wins"; and promoting ideas with pilot projects and contests. One participant cited a community study that examined what motivates citizens to use high efficiency lightbulbs: while financial savings were important, long-term behaviour change emerged out of knowing "what the neighbours are doing."

City of Yellowknife

Remi Gervais, Energy Coordinator, City of Yellowknife, described Yellowknife as a Second Generation PCP, home to 50% of the Northwest Territories population, with cold and dark winters. Gervais briefly characterized the City's progress and asked participants for advice about whether to pursue a district or individual building approach. Participants recommended assembling a network around reducing demand instead, and clarifying whether the goal is to reduce GHGs or to shift to renewable energy sources.

"Efficiency is a vital, low-cost resource, but it is hard to get and keep peoples' attention on efficiency issues and targets and incentives."

One participant suggested subsidizing solar panels: "Solar is sexy, efficiency isn't!" but another pointed out that efficiency remains an important factor in reducing emissions. One participant cited an analogy where a father challenged his son to help reduce their household's energy consumption. The incentive was that the son got to pocket the financial savings, which resulted in a $35-40/ month reduction.

One participant suggested that the City could ask the health sector to weigh in on the health impacts of coal-fired plants, but Gervais explained that health falls under provincial jurisdiction.

Session Close

Brock Carlton closed the session by asking participants to advise FCM on the following:

- What is a reasonable, robust environmental agenda for FCM?
- As a convenor, what should FCM do?
- What are the federal policy issues that FCM should be tracking and preparing to respond to?

NEW AND UNANSWERED QUESTIONS

- *"Are we looking to reduce emissions or to recreate energy production?"*
- *"What role do local governments have in incentivizing businesses that contribute significantly to community emissions? Canada's Local Government Act doesn't allow local governments to provide incentives to businesses."*
- *"What's the best way to proceed in terms of either setting GHG target or renewable energy targets?"*

20. POWER WITHOUT: LOCAL AND REGIONAL GOVERNMENT STRATEGIES FOR BUILDING STAKEHOLDER ALLIANCES TO ACHIEVE 100% RENEWABLE ENERGY WHEN CITIES DO NOT CONTROL THEIR UTILITIES

Carsten Rothballer, Coordinator, Sustainable Resources, Climate and Resilience, ICLEI Europe

PRESENTATION

Carsten Rothballer started this session by describing his organization, ICLEI, which is comprised of an international membership, and some of its projects, including Urban-LEDS (Low Emissions Development Strategies). He then presented three Urban-LEDS case studies.

Guiding questions:

- *What factors enable cities/regions with limited control over the ulitity to implement 100% renewable energy?*
- *What lessons are transferable and can be replicated?*
  What are the best practices of a Solution Gateway toward 100% renewable energy?

Verified Voluntary Climate Agreements, Berlin, Germany

"Berlin is poor but sexy," Rothballer began in describing Berlin's limited control over its utility and [limited] constrained budget. Through voluntary agreements to reduce GHG emissions, energy producers have been encouraged to invest in energy efficiency and renewable energy; the impact of these actions are verified by the Berlin Energy Agency. The benefits include: financial savings through energy savings—which frees up funds for further action—and heat and lighting systems being modernized.

Participants asked some clarifying questions and reflected on their own experiences with voluntary programs having limited reach. In Berlin's case, explained Rothballer, a strong message and political support provide the push for action. A question was asked about British Columbia's context where utilities are monopolies, "How do you get your regulators to change for a more progressive approach?" Participants considered the challenges of educating and galvanizing citizens to lobby

their governments. Some ideas to motivate citizens include demonstrating that renewable energy projects create local jobs, having local celebrities champion the cause, or putting lawn signs in the yards of renewable energy households.

The group then considered the merits of independent versus community energy production, such as through Bullfrog Power (Canada) or energy cooperatives. One participant observed that Canadians move homes more often than in Europe, so energy cooperatives could work for Canadians as it has in Belgium: "Energy cooperative members have shown they decrease energy use because they are more aware." They become champions and they lobby for more renewables. There can be legal challenges for cooperatives and participants asked what role local governments can take on. Rothballer indicated that German municipalities join as shareholders and provide seed funding for cooperatives.

Low Energy Management Agency in Almada, Portugal

Drawing a parallel to Greensburg, Kansas, Rothballer described Almada's focus on both adaptation to and mitigation of climate change. The City's scenario-based climate action planning has led to developing the Low Energy Management Agency. Engaging energy, water, waste, and transportation stakeholders in open exchange has led to installing solar hot water in 100% of the municipal sports facilities, LED traffic and street lighting, and electric vehicles. The City of Almada also established a revolving fund for municipal investments in renewable energy that internalizes the costs of CO2 emissions and invests in future energy projects.

Participants discussed mixed success with revolving funds being enough, or being used at all, for green projects. One participant described a case in which the municipality collapsed the 67 different funds it had for different projects and began measuring all projects using the green fund standards, "In essence it's an internal price on carbon." Where cooperatives are challenging, another participant suggested the city act as a facilitator in helping citizens negotiate and invest in public infrastructure, such as refurbishing a school.

Regional Utility for Added Value in Südwestpfalz and Steinfurt Counties, Germany

Rothballer's final case study demonstrated a regional energy strategy for all sectors (electricity, heating and cooling, and transportation). By assessing the potential for harvesting renewable energy sources from within the region, this strategy reduced the flow of money out of the region for fossil fuels and retained investment in local energy projects; this is "opening the eyes of the politicians," Rothballer said.

Again, stakeholder engagement was vital. An alliance was formed and continues to meet occasionally, but the smaller working groups still meet regularly to identify new projects and discuss stakeholder education and communication strategies. He also noted that this strategy integrates existing infrastructure in the transformation

Rothballer invited participants to consider how this approach could transfer to their contexts. One participant indicated that BC cities can start their own utility companies, but that there may be challenges in crossing city boundaries. Another participant observed the impact of demonstrating a successful renewable energy project which a City could do on municipal lands. The project could be tied in with a public art or educational project. Participants considered the advantages and disadvantages of a municipality having an independent grid, as in Boulder, Colorado: It would be taking on risk, but it would open the opportunity to be energy independent.

COMMENTS AND QUESTIONS

- *"The grid we have now is not going to be the one we have in 20 years."*
- *"Whatever that energy of the future should look like, it should be owned by the city."*
- *"Europe is leading in terms of creative approaches to adopting renewable energy when cities do not control their utilities."*
- *"How do you engage big, slow-moving, risk-averse utilities?"*

21. POWER WITHIN: DEFINING THE GOALS, OVERCOMING THE BARRIERS AND ACHIEVING 100% RENEWABLE ELECTRICITY FOR CITIES WITH UTILITY INFLUENCE

- **Will Dolan, Renewable Energy Manager, City of Aspen**
- **Joyce McLaren, Senior Energy Analyst, Strategic Energy Analysis Centre, NREL**

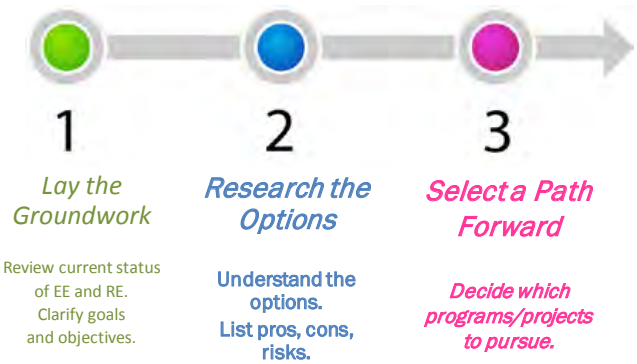
PRESENTATION

Will Dolan opened the session by describing the context of Aspen, Colorado. From its history in silver mining to its legacy hydro, from its hippies to its influential thought leaders, Dolan explained Aspen has a disproportionate amount of intellectual influence given its relatively small size. Starting in the 1980s, Aspen Council set renewable energy and GHG reduction goals which mandated achieving 100% renewable electricity by the end of 2015.

Despite apparent public support and Council approval in principle, a proposal by the city utility to build a new 1.2 MW run-of-river hydro plant encountered unexpected opposition from a well-funded negative public relations campaign. Aspen City Council started asking for alternatives and wanted to go back to first principles about how it would achieve its renewable energy goals. The city utility realized it had lost control of the message and the trust of the City Council and public, and needed a neutral third party to help it move forward.

Enter the National Renewable Energy Lab (NREL). Joyce McLaren described NREL's approach. Taking on a neutral role, NREL helped Aspen step back from its existing process and start again using NREL's three-step process:

Steps towards 100% Renewable Energy



McLaren explained that the City's goal of 100% renewable energy was well defined, but what Aspen meant by "renewable" was not well defined. For example, the City had to determine whether "renewable energy" includes landfill gas, which is not carbon free but has environmental benefits. Dolan then presented the lessons Aspen learned about planning and implementing a renewable energy project—no matter how small, even to a populace with a long history of support for renewables—and asked the participants to share their experiences.

PLENARY DISCUSSION

The participants discussed various mechanisms for engaging the community. For example, one participant referenced the SFU Centre for Dialogue for helping a municipality outside of Vancouver with designing its dialogue process to help the group reach a decision.

Factors that influence whether or not the public fully understands and appreciates council decisions include both artificial timelines and transparency.

One participant referenced a Knowledge Mobilization session led by Bob Dixson, Mayor of Greensburg, Kansas, in which he described "CAVE people", Citizens Against Virtually Everything. With a strong champion, opposition groups can influence outcomes based on falsehoods and derail "winnable" projects, the participants said.

Re-orienting to a discussion on solutions, a participant suggested developing a community movement plan: A way to enable the community to develop the project together.

> *"It is really easy to bemoan how crazy some people can get, but you have to organize things. Standing on the sidelines and shaking your head isn't going to do anything."*

Referring to the City of Vancouver's recent commitment to 100% renewable energy in all three sectors, one participant noted that, like Aspen, the City would have to be very clear about how it defines renewable energy and how its commitment is different from those of other municipalities.

A closing comment distinguished between wanting to reach the goal of 100% renewable energy versus needing additional energy supply to meet projected demand, and the participant cited a case in which the opposition deemed a project "financially irresponsible" and "environmentally destructive" when "the gap could have been fixed with efficiency alone."

22. TOWARD NET-ZERO: BC HYDRO'S INNOVATIVE DEMAND-SIDE MANAGEMENT STRATEGIES

- **Katherine King, Policy Specialist, Advanced Demand Side Management Strategies team, BC Hydro Power Smart**
- **Luke Smeaton, Acting Executive Director, Light House Sustainable Building Centre**

PRESENTATION

A team of experts from BC Hydro, Lighthouse Sustainable Building Centre, and Metro Vancouver led this peer-to-peer session on BC Hydro's energy efficiency strategy known as near net zero homes. Katherine King explained that BC Hydro's latest energy outlook prompted a focus on residential energy efficiency and Luke Smeaton explained Lighthouse's approach in consulting with industry. The project was founded on three pillars:

First pillar: Policy, Codes, and Standards

Second pillar: Consumer Education

Third pillar: Industry Capacity

More generally, Smeaton explained they are working to bring together trade associations to assemble a common voice on quality and standards, market growth, and consumer perspective, and in an advocacy role. Metro Vancouver's new home labeling program was cited as an example: it sets standards and collects performance data on household energy usage and GHG emissions. The session leaders then solicited advice on market mechanisms to increase uptake and engage the trades.

PLENARY DISCUSSION

To build participation in the program, participants advised providing incentives and ensuring they are clearly laid out and easily accessed—without administrative barriers, for example—and providing access to low-cost energy audits. One incentive to promote energy efficiency retrofits that was suggested was to not charge for the household electricity use until the payback value is reached.

Many participants prioritized education and two specific suggestions were to develop a green homes ambassador program or to gamify the information. Clarity about the objectives of the program, such as: avoiding the construction of a new power plant or to improve health, and about the challenges energy managers face in providing reliable energy, such as being able to meet peak demand, were also discussed.

"We need to create the Tesla of homes."

Participants also discussed the values at play when people are deciding to retrofit: Tenants are motivated differently than owners; interior comfort may be more important than cost savings; or aesthetics may take priority. One participant was concerned about financial motivation and suggested raising energy rates to stimulate behaviour change.

The discussion moved to regulations and compliance, and King described some of the codes and regulations in Vancouver. She solicited feedback on how to improve upon building codes given they take 3-5 years to update. One participant pointed out that the industry has been retrofitting to the same set of principles since 1988, despite rising costs. Another participant signaled that LEED certified new homes were once the most expensive option, but are now the cheapest and easiest. There was disagreement about whether retrofitting to LEED silver is achieving the level of efficiency needed.

Suggestions from the participants included: requiring net zero, net positive, or "Smart" homes or PV solar; increasing the price of energy buy-back; or developing stretch codes that allow innovations that are more advanced than are defined in the building code—although compliance and enforcement mechanisms are not well structured.

PARTICIPANT TAKEAWAYS

- Saving energy has to show the consumer how improving efficiency adds value to home and improves quality of life
- Residential labeling is potentially moving forward
- BC Hydro aims to be energy self-sufficient by 2016, which is driving efficiency

UNANSWERED QUESTIONS

- *"How can a utility, e.g. BC Hydro, effectively engage the end users?"*
- *"How do we share energy resources?"*
- *"How can we achieve net positive homes?"*

23. LAYING THE GROUNDWORK FOR DISTRICT ENERGY

Ken Church, Team Leader, Natural Resources Cananada/CanmetENERGY

PRESENTATION

The focus of this session was on introducing district energy into existing building stock. Ken Church provided background information about district energy (DE) systems. At the end of the session, Ayman Fahmy and Paul Holt provided information on a case study at the University of British Columbia.

Church highlighted that only 5% of building stock changes over time and estimated that 78% can connect to DE systems. He described the goal in converting a building is to do so cost effectively and in a way that it accepts lower temperature renewable energy, which increases the types of energy sources that can be used.

Before opening up the discussion, Church identified the key challenges to be overcome:

- Ownership: Who owns the connection and more importantly who owns the building
- Supply temperature: The impacts of supply temperature on the ability to connect
- System sizing: Based on how much energy the building actually uses, recognizing that existing boiler rooms do not provide the necessary data
- Cost effectiveness: Taking into account all costs, including those incurred during conversion, such as whether the occupants would have to move out

PLENARY DISCUSSION

The discussion began with a comparison between large DE versus multiple low temperature, hydronic mini-plants (energy transfer station or heat exchanger) running on renewables, located where boilers had originally been. Participants considered whether one large DE system reduces more GHGs than a series of mini-plants.

One participant indicated that the most important outcome is to reduce the use of

electric baseboard heating, calling it “a gross misuse of electricity.” Another participant suggested that, instead of investing in a large plant, a large-scale heat pump could be installed in each building as it would cost less to operate, allow more flexibility in energy sources, and promote energy conservation.

Some concerns were raised about municipalities allocating funds for DE systems and “squeezing out” other renewables, but one participant emphasized that energy investment decisions must be coordinated rather than put into competition. Additional concerns were raised, including DE systems not being able to provide cooling. However, another participant countered by saying there are buildings with DE systems that provide both heating and cooling. It was noted that DE systems do not encourage energy saving behaviour, but participants pointed to demand-side management (DSM) tools, such as rate structures and metering, as means to encourage energy conservation.

A participant asked about converting apartment buildings that are heated by electric baseboards rather than with a domestic hot water (DHW) or hydronic system. One participant said a hydronic heating system was successfully installed in a building in London, UK, to accommodate its connection to the local DE system. However, another participant noted that electricity in BC, for example, is so inexpensive that it is unlikely people would see value in converting to hydronic.

Even in buildings that are heated by DHW, a participant pointed out that most new hydronic heating systems are designed for high temperatures and are not compatible with low temperature alternatives, such as capturing waste heat, in cold weather climates. However, the participant suggested supplementing the conventional high temperature system for peak load periods with a lower temperature system to provide the base load. This would be an interim solution until the building heating system is due for an upgrade and a low temperature system can be installed.

Participants discussed how to calculate peak loads for buildings, which is critical in determining the size and cost of the system needed. Meters provide the best information, but buildings energy use can be modeled and most existing buildings keep utility records, participants said. However, the session leaders explained, “To get a peak, you really need no one in the building, on the coldest day of the year.”

One participant suggested that data be taken from the boilers in retrofits. While one participant indicated existing boilers are likely oversized, another suggested talking to building maintenance personnel for anecdotal feedback about how much the boiler operates and combine that information with weather data. However, gas data does not describe boiler efficiency, which “can be as low as 42.5%,” said one participant, and the performance of a building does not always reflect how it was designed to function.

To wrap up the discussion, Ayman Fahmy and

Paul Holt described the process and rationale for installing the DE system at UBC. UBC has had a steam DE system since 1925, but steam is not as efficient at heating buildings as hot water. By phasing in the project, they were able to apply lessons learned early on and improve upon the design and process.

Since the majority of buildings were already hydronic—some could not be converted from steam and are now heated by electric baseboard or still on steam—the project effectively amounts to swapping out each building's primary heat exchanger. While the underground network of pipes that network the system are being converted, a temporary steam to hot water system (STHW) heats the connected buildings until the main hot water DE system is online.

"When we started phase one it was a huge learning curve… If we continued doing whatever we were doing in phase one, the project would be double the cost that it is now."

PARTICIPANT TAKEAWAYS

- Engineers like to incorporate redundancy and overbuild—metering showed the capacity of one building's steam boiler was designed to supply 7 times the energy needed!
- Take advantage of existing infrastructure—at UBC, they maximized the use of above ground piping; likely saved at least 1 km of piping, maybe more
- Phase in stages of a project—lessons learned early on could be implemented in later phases
- Align phases with other projects, for example, put piping in some buildings two years before they could be connected and fill them with nitrogen to avoid repaving
- Do not try to solve secondary issues—"If a building didn't already have redundancy, we didn't put it in."
- Laser-scan to provide 3-D models for pre-fabrication—to reduce interruptions to the end users, for example when there were concerns about male crews working in female residential spaces, and the duration was reduced to days from weeks
- Install simplified controls

One participant asked why a lower-carbon project was not implemented. The session leaders explained that the intention is to develop renewable energy, but that the campus energy centre is intended as a peaking plant. UBC takes the philosophy of being a living lab; for example geoexchange was tried but was unsuccessful. The decision to install a high temperature system was to take advantage of the existing infrastructure and retrofit buildings operating high temperature systems.

24. URBAN GYMNASTICS: CIRCUMVENTING LAWS AND BUILDING CODES THAT ARE NOT RENEWABLE ENERGY FRIENDLY

- **Krista Milne, Manager of Sustainability, City of Melbourne**
- **Pat Bell, Manager of Planning and Director of Education, BC Community Energy Association**

PRESENTATION

This session was a collaboration between Patricia Bell of the BC Community Energy Association and Krista Milne of the City of Melbourne, Australia. Milne started the session with a brief history of Melbourne's energy strategies and Bell briefed the participants on BC's building code and new building act.

Melbourne, Australia

Brown coal is the primary energy source in Australia and the Australian Government is focused on energy efficiency and does not actively support renewable energy. Drawing on information from the renewable energy generation sector, the City of Melbourne is developing an aggregated procurement model for large energy users. Milne presented the results of the Request for Information (RFI) about building a private renewable energy generation plant.

Participants noted that the costs for renewable energy are projected to climb in the Australian context and they wondered why, given they are declining elsewhere, such as in Germany. One suggestion was that they reflect uncertainty about the federal policies.

Key learnings that emerged out of the process, according to Milne:

- Melbourne will have to enter into a 10-15-year collective contract, which is longer than the typical 3 years.
- The exercise demonstrated that there is interest, but the premium is not insignificant. That said, the City hopes sending the project to tender in July will lead to more competitive responses.

British Columbia, Canada

In contrast to Melbourne's scenario, BC's regulations support renewable energy but not energy efficiency, according to Pat Bell. Bell described the changes in the new building act that will reduce the rights of local governments to set restrictions and bylaws in the interest of maintaining consistency across jurisdictions.

Voluntary incentive programs are acceptable

under the new building act, and Bell reviewed some examples that BC municipalities currently have in place. She indicated education is needed to shift consumer priorities and increase support for energy efficiency measures. One participant suggested raising energy literacy by changing monthly bills into 30-year energy bills to illustrate the long-term pattern.

PLENARY DISCUSSION

Many participants were interested in the finer details of the changes to the building code and act. One broad concern was raised that "municipalities are responsible for 40% of GHGs" and they need to have tools to address those. Suggestions included implementing stretch codes [allow advanced building practices]; imposing rigorous requirements for greenfield development; or developing "unlikely partnerships" with groups other than state/provincial or federal governments, such as resource industries, to fund demonstration projects.

Another participant suggested cities be strategic about the aspects they do control. Sydney replaced all of it streetlights with LEDs, for example, and Melbourne is leveraging its agency to make procurement decisions. Others suggested on-site rooftop solar in cities with large roofs and crediting independent energy producers for exporting energy back into the grid.

NEW AND UNANSWERED QUESTIONS

Participants appreciated learning about the restrictions municipalities face in trying to implement climate action plans, whether in Australia, Canada, or elsewhere. The questions that remain unanswered include:

- *"How does a city work around regulatory barriers without the project becoming onerous?"*
- *"How can cities accelerate and communicate their agendas?"*
- *"How do federal and provincial/state regulations impact municipal businesses?"*
- *"How can green building be promoted in a context lacking skilled green builders/ developers?"*

PLENARY SESSION – TRENDS, INNOVATIONS, AND BARRIERS IN ELECTRIFYING TRANSPORTATION

This session brought together thought leaders on the electrification of urban transportation systems. The moderator, **Zachary Shahan, Director of CleanTechnica**, declared that his biggest claim to fame is that he is on a top 20 list of energy influencers, along with Barack Obama and Elon Musk, because he writes so much about electric vehicles (EVs). He outlined the benefits of EVs such as they are mechanically simpler, three times more efficient than conventional vehicles, easy to maintain, and less polluting. "The biggest barrier to the EV revolution is getting more people aware of these vehicles and allowing them to experience electric cars," Shahan argued. He cited a study that found only 5% of Americans are aware of the Chevrolet Volt, and other EV makes and models struggle to reach even that rate of recognition. Shahan's ultimate message: EVs are exciting and fun to own and drive.

Brian Hansen, Head of Department, Citywide Strategies, City of Copenhagen, described the transportation shift underway in cities. Copenhagen achieved its EV success by providing infrastructure for parking and charging—by allocating space from roads and sidewalks—and making them free-of-charge for EVs. EVs are also exempt from the 180% car purchase tax in Denmark, and the City of Copenhagen requires that charging infrastructure be installed in new

developments. “On electric bikes we did nothing, innovation can happen in transport without government intervention.” He speculated that there are likely 100,000 electric bikes in Denmark and that 10% of bikes sold in Holland are electric. Hansen then outlined his city’s transportation modal shift, “32% of trips in Copenhagen are by bike and our goal is 25% car trips with walking, cycling, and transit making up the rest.” The latter three modes of transportation make a city more livable not only by reducing car traffic but by ensuring citizens on the street can make eye contact with each other. At the same time, the city realizes the benefits of a lower carbon footprint.

Gil Friend, Chief Sustainability Officer, City of Palo Alto, talked about how transportation impacts his city’s climate action leadership. Palo Alto is looking at multiple pathways to carbon neutrality. “We don’t want to scare City Council, we want to show that it’s possible.” Friend argued that the City needs to increase the convenience of its transportation alternatives. He talked about mobility as a service, with all transit modes integrated into a single smart-phone app and payment point. While cities cannot drive technology policy or state and federal incentives, they can use educational, mandate, and procurement levers to push EV uptake. Specifically, Palo Alto is working on charging infrastructure and workplace charging. Friend concluded “Maybe the goal isn’t an EV in every driveway. Maybe 50-90% of us don’t need to own cars at all. We need to answer this question: How do we make it more convenient for anyone, anywhere, at any time to not have to get into a car and drive?”

Cara Clairman, President and CEO, Plug ‘n Drive, talked about the opportunity in Canada to move to electric vehicles, “We have low-emitting electricity, and transportation is one of the largest polluters in every province.” Other than giving up a car, shifting to an EV could be one of the largest single climate actions that an individual can take. She talked about her own switch from a minivan to an electric Nissan Leaf, “EVs are more expensive upfront, but now I have a $300 electric bill instead of a $2,500 fuel bill.” With Ontario generating surplus electricity at night, Clairman elaborated on the economic opportunities presented by vehicle electrification, “We give energy away and lose money in the evening, by plugging in at night we can do our province an economic favour.” Other benefits include low-emissions, local jobs, and infrastructure. She finished by talking about the growth in EV uptake and that product variety is increasing with every year. Plug ‘n Drive regards getting

people to experience EVs, installing home chargers, and mapping public charging networks as the best ways to improve EV uptake.

Eve Hou, Metro Vancouver Air Quality Planner, Plugin BC, explained the local context for transportation electrification. She said that BC has hundreds of charging stations but that they are not utilized as much as they could be. To address that mismatch, "We developed an outreach strategy as our research found that the public doesn't care about charging stations. There's a reason why Apple doesn't focus on advertising their chargers," she said. According to Hou, there are three key barriers to EV uptake. Firstly, nearly half of Canadians are not even aware of them. Secondly, people buy cars based on their emotional response to them. Thirdly, EV drivers like their cars for the driving experience and performance--many campaigns don't touch on these aspects. "Research shows that the number one reason people buy EVs is horsepower; climate, social, and environmental values are secondary," Hou said. "We had to refocus our campaign on what people most care about and [we realized] the most persuasive influencers are existing owners." With that in mind, Plugin BC set up the EV Ambassadors program to link early adopters with the public through digital campaigns and at local events.

Jonn Axsen, Assistant Professor, Simon Fraser University, shared his research on EV policy and consumer trends: "The biggest barrier to EV uptake is a fundamental misunderstanding of consumers." In contrast to Zachary Shahan, he argued that potential mainstream buyers are more interested in plug-in hybrids than pure electric vehicles. Like other panelists, he flagged low awareness as a barrier to EV adoption—only 20% of new vehicle buying households know what a plug in electric vehicle is. "Without substantial changes in policy, we will not get beyond that," Axsen lamented. He outlined that both demand-side policies that focus on the consumer (such as incentives and charging stations), as well as supply-side policies that focus on manufacturers (such as California's Zero Emission Vehicle (ZEV) mandate), are needed. In British Columbia, "demand-side policies could only get us to a 10% market share by 2030. A carbon tax won't push uptake, we need supply-focused policy like the ZEV mandate." Axsen added that his data shows that city leverage is limited over the factors that will truly drive greater uptake of EVs.

PLENARY SESSION - RENEWABLE CITIES CALL TO ACTION

Friday morning's Call to Action was designed to charge the Forum participants with inspiration. Leading experts from a range of backgrounds were invited to energize the dialogue on implementing 100% renewable energy and energy efficiency in cities.

Stefan Schurig, Climate and Energy Director, World Future Council, moderated the panel. Schurig opened the session by reminiscing on the transformations he has seen over the 25 years he has been working on renewable energy policy. He said he hopes that the next 25 years will be as transformative for renewable energy as the past for information technology and telecommunications.

Deborah Harford, Executive Director, Simon Fraser University Adaptation to Climate Change Team, started by reminding participants that one of the driving reasons for implementing renewable energy is to mitigate climate change. At the same time, changes to climate brings changes to hydrology and heat distribution, both of which have implications for renewable energy technologies. Harford's call to action was for planners to begin prioritizing implementation of renewable energy and resilience equally in urban development. She also called for higher standards in ecosystem protection and health throughout renewable energy technology development and construction.

Next, **John Robinson, Associate Provost of Sustainability, University of British Columbia and Professor, Institute for Resources, Environment and Sustainability, UBC**, called on universities to actively engage in the sustainability transition as a way to

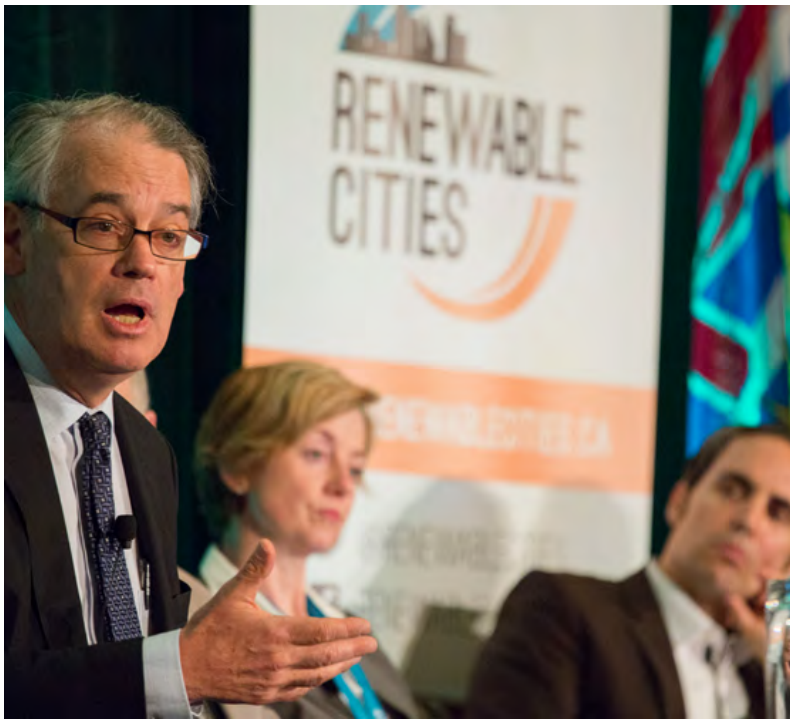
provide value beyond educating students and producing research. As single-owner occupiers of significant capital stock, universities are uniquely positioned to become living laboratories of sustainability, improving both human and environmental well-being.

Sean Kidney, CEO and Co-founder, Climate Bonds Initiative, said that we have spent too long negotiating international climate agreements and that the time for action is long overdue. He advocated for a green infrastructure revolution, arguing that the capital is available, interests rates are at all-time lows, and investors are searching for opportunities to invest. His call to action for cities was to create the opportunities for investors by building the kind of infrastructure needed for green, livable, climate change-resilient cities.

French Senator Ronan Dantec (Loire-Atlantique) and **Councillor, City of Nantes,** described the preparations underway for COP21 in Paris, December 2015. His call to action was for non-state actors to speak with a common voice and make themselves heard in the official climate negotiations, and to show national governments that they are taking necessary action against climate change, regardless of the status of international negotiations and agreements.

Closing the session, **José Etcheverry, Professor, York University, and Co-Chair, Sustainable Energy Initiative**, pointed to examples around the world that are proving that 100% renewable energy is not only possible but happening. It is being implemented in different contexts and diverse communities around the world. Etcheverry posited that the variability of renewable energy technologies allows communities flexibility and the freedom to develop context-specific solutions. Etcheverry called for collaboration and for renewable energy solutions that reflect the community context.

Schurig closed the panel by thanking the panelists and by recalling a quote credited to Mahatma Gandhi that he said accurately describes the reaction to the ongoing energy sector transformation: “First they ignore you, then they laugh at you, then they fight you, then you win”.



INTENT TO ACTION SESSIONS

25. CREATING 100% RE LAWS THAT ARE DIFFICULT TO REPEAL

- **Anna Leidreiter, Senior Program Manager, Climate and Energy, World Future Council**
- **Pia Buschmann, Project Leader, deENet**

PRESENTATION

The focus of this workshop was on the development of clear criteria for a global network of cities looking to achieve 100% renewable energy targets. Anna Leidreiter and Pia Buschmann began their presentation by making a case for committing to a 100% renewable energy goal, which demonstrates the political will of the government. This mandate for action can then catalyze change and streamline processes towards achieving milestones; it reflects true vision and leadership, and concentrates local government resources.

When a city sets a 100% renewable energy goal, this effectively means no resources are going into fossil fuel infrastructure. Local governments are on board, but Leidreiter and Buschmann wondered whether the political will is lacking at the provincial and national levels and how we can build it. The World Future Council and deENet held workshops with local government representatives and other community members and came up with five recommendations for developing senior government buy-in. Additionally, Leidreiter and Buschmann reviewed five lessons learned from pioneering 100% RE cities and regions about

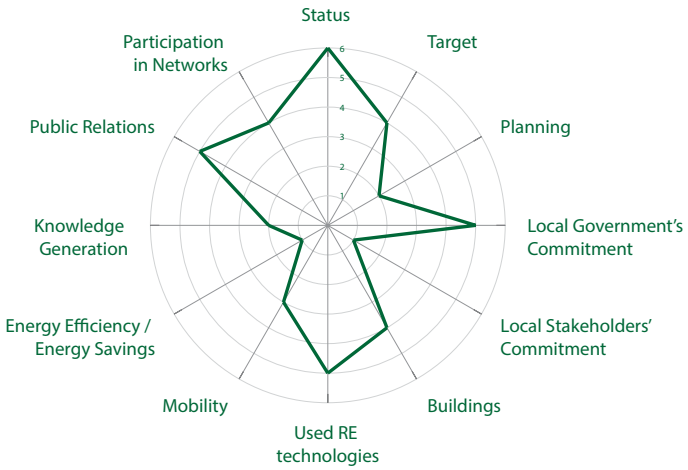
what makes policies robust in helping achieve targets.

Policy Principles for 100% RE

1. Make energy efficiency a top priority
2. Electrify the heating/cooling and transport sectors
3. Maximize opportunities for citizen participation and the development of new business models
4. Educate and inform citizens and businesses
5. Adopt an integrated approach to fiscal, economic, and energy policy

Leidreiter and Buschmann then reviewed the guidelines and indicators the World Future Council is developing to support local government in achieving 100% renewable energy. Over the next few months, they will be presenting these guidelines and asking for feedback on how to ensure they are useful for local governments globally.

Quality Guidelines for 100% RE



SMALL GROUP WORK

This workshop was carried out in the "world café" style; each table had 20 minutes to address a question, before moving on to two more rounds with two more questions. Each group was tasked with considering the following questions:

- Are you aware of any 100% RE examples (local, regional, or national level) in your country? If yes, what do they have in common?
- What enabled the success of the 100% RE examples that you are aware of? If there are no 100% RE examples in your country, what hinders local governments to join this global movement?
- Looking at the guidelines for 100% RE that were presented: What would you add or change in order to make this a useful instrument for local governments to develop robust 100% RE policy frameworks?

PLENARY DISCUSSION

Following the small group work, table hosts reported what they heard to the larger group, and identified commonalities or differences between the table groups.

Discussing cases studies brought one group very quickly to defining renewables and 100%, and what resources are needed to achieve the goal. There was some consensus in the second group that the brand is confusing, and

that it should perhaps come from a central organization. They asked for a hierarchy or toolbox of energy targets to achieve rather than an ill-defined goal that different people interpret differently. The third group referenced local government discussions in Ontario concerning which sectors to include, how to frame the economic argument and climate benefits, and how to reflect the values that citizens care about.

With respect to enabling conditions or barriers, the first group identified clear economic thinking as both an enabler and a barrier. The high cost of non-renewable electricity in some jurisdictions could be an enabler for renewables, whereas low cost in others can deter investment. However, they wondered what is included in the price of energy and what is being externalized. Similarly, subsidies that encourage fossil fuel use can prevent renewables uptake, which needs to be better communicated. Another key enabler noted was leadership, which drives action.

The second group identified some enablers beyond leadership, including building capacity and dispelling ignorance with different approaches that depend on the stakeholder group. Each stakeholder needs different language and examples of successes that dispel fears about renewables.

The third group laid out three drivers, or strategies: 1) highlight the economic value to help in visualizing and building the argument for renewables; 2) state the energy security benefits and the promise of energy independence for both cities and remote locations; and 3) create a positive co-operation between the city and surrounding areas (periphery) to tap the natural potential in the region.

Participants then considered how the criteria presented for local governments with 100% RE targets could be improved. One group immediately identified that they should be developed to fit into a sustainability framework as there are critical questions around conservation and the ecological impact of certain renewable technologies that need to be addressed. Additionally, the group recommended evaluating the effectiveness of public engagement processes—not just including the public to satisfy a criterion. The second group emphasized the importance of including energy efficiency, as well as the need for a supportive policy framework that is both vertical and horizontal across different levels of government. The third group asserted the need for developing the business case for different levels of government: Different regions have different sources of energy, how can you help people switch? Additionally, how do regular citizens engage with the political movement towards ambitious renewable energy targets?

CLOSING WORDS

Leidereiter and Buschmann closed the session by introducing the project they are now spearheading through the World Future

Council and deENet, in partnership with Renewable Cities and ICLEI. The project will develop a global network of local governments with 100% renewable energy targets and a platform through which they can access tools, record their progress, and engage in dialogue to share learnings with each other and accelerate effective action.

NEW AND UNANSWERED QUESTIONS

- *"How to integrate 100% renewable energy targets within the sustainability framework? How do we assess waste to energy, or solar with high ecological impacts?"*
- *"Will setting the goal inspire citizens and politicians to get beyond incrementalism to radical transformation?"*
- *"How do you create the business case in jurisdictions where energy (electricity and gas) prices are low?"*
- *"How do you really mobilize the public in areas where "business as usual" is entrenched and aligned with existing community values?"*

26. COMMUNICATING RENEWABLE ENERGY: POSITIONING, PERSUADING, AND POPULARIZING

- **Zachary Shahan, Director, CleanTechnica**
- **Cara Pike, Executive Director, Climate Access**

PRESENTATION

Cara Pike

To begin the workshop with some context, Pike presented some key communications strategies that address: communication challenges and opportunities when looking at renewables; Canada/US polling on renewables; outdated notions of the economics of renewables; and, recommendations for message framing.

She emphasized that we are living in a period of energy transition that the public largely does not know it is happening. Pike outlined that widespread acceptance of climate science has not led to action and that talking about climate change can depress people.

There are strong cultural ties to forms of energy across North America, and this can be a major barrier to communicating the benefits of renewable energy and the practicalities of existing RE projects. However, the inevitability of fossil fuel use is finally being questioned and people are starting to see businesses talking about the riskiness of investing in fossil fuels. "When it comes out of financial opinions, people pay attention." Pike emphasized that when President Obama started to talk about taking action, it affected the global conversation. This leadership is very important and should be amplified. What is needed now is an aggressive communications strategy promoting the benefits of renewable energy. She closed her presentation by giving the participants some communications tips:

- When we talk about the story, we need to think about framing the conversation to touch people's values
- Convey existing benefits, and not only in dollars and cents
- Emphasize the potential of competition and inspire an exciting race to the top
- Address energy justice and access issues
- Influence the people who decision-makers listen to

- Connect to what people care about; what do they value? People in rural communities are concerned about economics, but they are more influenced by the fact that they want to keep young people in the rural community. How do the solutions integrate into what people need?

GROUP WORK

Pike asked participants to identify a challenge they are facing in communicating renewables and energy efficiency to a particular audience. She told the group to keep the following questions in mind:

- What are your goals and objectives?
- Who are your decision-makers and who are your target audiences?
- What are the values that they hold? What are the themes that resonate with them?

Zachary Shahan

Zachary Shahan gave a presentation on how to communicate renewable energy to diverse audiences, the many benefits of RE, and the economic argument for RE investment. He asserted that communications on any topic need to center on what people care about, whether it's money, entertainment, sports, or family, "If jobs are what people care about, make the point: Solar creates 5 times more jobs per dollar invested than natural gas. Wind creates twice as many as solar." He emphasized the need to get people excited about the energy revolution, entertain their imaginations, present data in a fun and visual way, tell compelling stories, creating rankings so people can strive to be "the best," and make new technology hot and cool. He noted, "The quickest, best, safest, car that consumers are happiest with is the Tesla." Shahan encouraged thinking creatively and highlighting benefits of solar (and wind) such as independence, self-reliance, and "taking your power back." He also recommended bringing in allies from the educational sector (schools), and using humour and figures of speech to get a message across, "There's nothing that entertains better than humour. It is a barrier breaker."

GROUP WORK

Participants were then asked to work in groups of three to discuss how to best overcome their individual RE and energy efficiency communications challenges. When the groups reported back, the discussion touched upon what each group learned through the process and any insights they gleaned for communicating RE solutions.

Participants emphasized adopting different approaches for different audiences, being inclusive of diverse stakeholders, and providing opportunities for citizens to engage with energy—becoming prosumers and thereby beneficiaries of RE implementation. One group noted that the City of Seattle has an interesting engagement model that brings diverse sectors together to discuss sustainability and energy efficiency. These stakeholders are then trained to educate their respective communities; this turns them into effective communicators and champions of the new policies. Other groups identified the effectiveness of highlighting real-life examples to show what is possible, including oppositional voices so that they have an opportunity to speak and have their concerns addressed, tapping into people working outside of the sector for fresh ideas, using gamification (e.g., Portland's energy efficiency champions), and framing messages with a future-oriented, positive approach.

Shahan and Pike closed the session by summarizing what they heard and what they would be taking away. They echoed many of the participants in highlighting the need to "make it personal and talk at a heart level," employing repetition to drive home a message, getting people excited about RE through using superlatives, and emphasizing ambitious targets such as 100%. They invited participants to access more resources on the Climate Access and CleanTechnica websites and closed with the statement: "Diversity of thinking helps draw more solutions."

UNANSWERED QUESTIONS

- *"How can messaging and business case development in renewable energy apply to a retrofit example? So much focus is on new development."*
- *"How can we keep learning from each other after this forum ends? How to be positive in our message and respect other peoples' beliefs."*
- *"How do you speak to those who aren't in the discussion?"*
- *"How do you get past the challenge of 'over-information' for the public, government, and private sector? They are bombarded with statistics and facts, but how do you stand out?"*

27. INTERACTIVE TOOLS TO ENGAGE THE PUBLIC IN COMMUNITY ENERGY PLANNING

Stephen Sheppard, Professor, UBC Collaborative for Advanced Landscape Planning

PRESENTATION

Stephen Sheppard began the workshop by presenting background information on recent social mobilization research from the Pacific Institute for Climate Solutions (PICS), which evaluated a range of digital tools for community energy engagement, including the Community Energy Explorer (CEE) platform. Sheppard first provided a definition of social mobilization as community-based collective action that can take various forms ultimately leading to policy change.

He noted that the report draws on seven major projects across BC, with 3,000 people engaged by the PICS study. Sheppard asserted that when the social mobilization projects are compared, they produce real, short-term GHG reduction strategies. The projects were quick, small, effective, and easy to control, and most of them attracted participants beyond the "usual suspects."

GROUP WORK

Following the presentation, participants were introduced to the Community Energy Explorer (CEE), a tool that presents the energy use of a community in an easily understandable visual format. Sheppard explained that there has never been a map to measure the potential of renewable energy for Metro Vancouver, which would have enormous potential for driving discussion. The tool gives the user the freedom to scale down to even the neighbourhood level, a function specifically designed to enable non-experts. The tool also allows users to explore the possibility of different energy usages and to cater them specifically to the type of land use.

Participants were divided into small groups and given iPads to play around with the CEE. After they became familiar with the tool, they were asked to address the following challenge and develop a community energy engagement process.

Challenge: How can interactive tools like CEE strengthen public engagement processes to implement Community Energy and Emission Plans?

PLENARY REPORT BACK

Each group of participants was assigned a role-play as one of three user types in addressing the challenge. Groups then reported back on the engagement processes they designed:

Local government staff/practitioners seeking to meet GHG targets (city scale)

This group chose to first engage teenagers with the tool. They proposed presenting energy as cool and fun; showing young participants what they can do, and engaging their imagination, as young people and children will hold onto the information learned and have a lasting impression.

Another target they identified was the uninterested/unengaged: how can we get them to think individually and about their own homes in relationship with their neighbours? The group discussed the importance of social pressure in spurring action, while trying to stay away from the concept of shame. They suggested using the tool at popular public events such as car-free days. The tool could be used to show participants the gaps that exist, which could generate benefits for them, in savings or energy efficiency. The group indicated that there are issues in fostering energy conservation behaviour where the city holds no jurisdiction in energy supply and can only directly influence building codes. This makes it important to collaborate with the energy supplier and create a joint overarching responsibility. They recommended engaging the staff of both the government and energy supplier in any interactive engagement process.

NGO seeking to mobilize climate/energy action in the community (neighbourhood/ community scale)

This group developed the idea of using the tool to create friendly energy competitions (such as among schools) and to make the program fun. Competitors could regularly compare results and identify actions. They noted a need for neighbourhood champions, making the topic of energy emotive, and connecting it to people's everyday lives.

Grassroots citizen group working to mobilize neighbours on energy issues (block scale)

This group proposed the idea of getting homeowners involved in existing grants and programs, and gathering data by reaching out to people at local coffee shops. They suggested running scenarios that show the average person the benefits of a retrofit such as energy savings, ease of use, and customization. They developed a plan with steps including: 1) defining the neighbourhood

networks (including online communities), as well as champions/leaders; 2) choosing the type of data to self-report (such a gas usage or temperature); 3) comparing the data; 4) consulting other case studies; 5) identifying action plans (a practical way to achieve goals); and 6) celebrating the achievements. The group emphasized creating a comparative program that recognizes achievements, not shaming or penalizing the deficiencies, to develop positive reinforcement.

To close the workshop, Sheppard summarized what he heard and what he would take away. He stated that he detected a real pattern of increasing public input into the database and was interested to hear about the nuances of staying away from “shaming” others and focusing on positive reinforcement. He also noted that it might be a good idea to develop more generic templates that people can use for different cities, taking into account the size of the city. There was a lot of discussion about games, and generating fun, which he noted ties into a related project, an educational climate change video game Future Delta 2.0 currently under development.

28. PATHWAYS TO PARIS: LOCAL GOVERNMENTS' ROLES IN NATIONAL PLANS

- **Megan Meaney, Executive Director, ICLEI Canada**
- **Senator Ronan Dantec, Councillor, City of Nantes and Spokesperson, United Cities and Local Governments (UCLG)**

PRESENTATION

Senator Dantec provided an overview of why the Paris COP21 meeting is important and outlined the strategy of mobilizing non-state actors on the road to COP21.

"We want to make sure local governments are well represented. Canadian local governments have been working on emission reductions targets and plans, implementing programs, monitoring results, and providing a strong sense of what local governments can do."

Dantec emphasized the advocacy role that UCLG and ICLEI can play in making sure local governments are represented at COP21. He asserted that, in Paris, local governments need to collectively call for enhanced vertical integration of green initiatives, to push for significant progress in global negotiations, and to show an acceleration of local and sub-national climate action. In particular, local governments should push for: clear goals and policies; common emissions reporting systems; and regulatory frameworks and financing for local action on both mitigation and adaptation. He then answered questions from participants about the logistics and priorities at upcoming COP21 negotiations, and highlighted the importance of ensuring that urban planning is included in the negotiated text to activate financing for local projects.

Megan Meaney then reiterated the need for local governments to show national actors that they are committed to keeping to the "2 degrees Celsius" limit, and to pledge ambitious climate action regardless of the outcome in Paris. She emphasized that climate change mitigation policies should be central to every city's development: "If you want your urban areas to be competitive, you need to do these things. We act with or without Paris." She noted that local governments play a crucial role, often as conduits between national governments and businesses. The role of provinces and sub-national governments will be featured at a special meeting in Paris with the hope that it will result in strong commitments. She mentioned that this is already having an impact on how Canadian provinces are assessing potential climate policies leading up to COP21.

GROUP WORK

The facilitator asked participants to break into four small groups representing different sectors (civil society, business, city council, and the media) to think about creative ways to contribute to Paris, as well as what can be done at the local level. After the small group discussions, participants posted their responses on the wall, and a large group discussion ensued. These included creating platforms for businesses to sign up to the 2 degrees Celsius target through: economic commissions, linking economic development agencies in different cities to develop an action alliance; creating a local government-focused viral video in partnership with environmental non-profits, such as the David Suzuki Foundation; and encouraging cities to commit to 100% renewable energy in the time leading up to Paris.

A discussion then developed on messaging ahead of Paris, including concerns about fatalism, and how to use a positive narrative to gain momentum after the negotiations, regardless of the outcome. One participant quipped, "If the national and global levels are not going to do something, we won't let them be a roadblock." Participants emphasized the need for multi-sectoral cooperation including businesses, First Nations, and cities and provinces, in galvanizing national governments to take action.

29. LEVERAGING CONSUMER POWER TO FINANCE RENEWABLE ENERGY

Sean Magee, Director, Community Renewable Projects, Bullfrog Power

PRESENTATION

Sean Magee began by presenting a history of developing the company's unique consumer-powered business model, as well as the major barriers to creating a 100% renewable economy. He then posed the question: Is solving the renewables issue a technical or social problem? Before Bullfrog was created, he said, the 2005 market did not provide alternative energy choices for consumers.

"A few entrepreneurs realized that in Ontario there were many renewable energy projects looking for financing. But how could we leverage beyond our small community of angel investors? If you could crowd source the general population, would they pay a little more to know that the money is supporting the growth of the renewable energy industry?"

The company was founded on the idea that consumers would pay for sustainable energy, even if they could not see its physical generation. Instead, through community-based social marketing, consumers were recognized for their investments with the Bullfrog logo. "Now some of the biggest brands are Bullfrog customers. We have 1000 corporate customers, and 14,000 residential." The company has expanded across Canada, and is currently looking into providing renewable natural gas in BC where electricity is already very green and inexpensive.

"Our energy system is like a sink; all electrons are poured into the same grid. Our electricity is a mix of everything going into it. If you are

choosing renewable energy certificates, you are influencing the grid!"

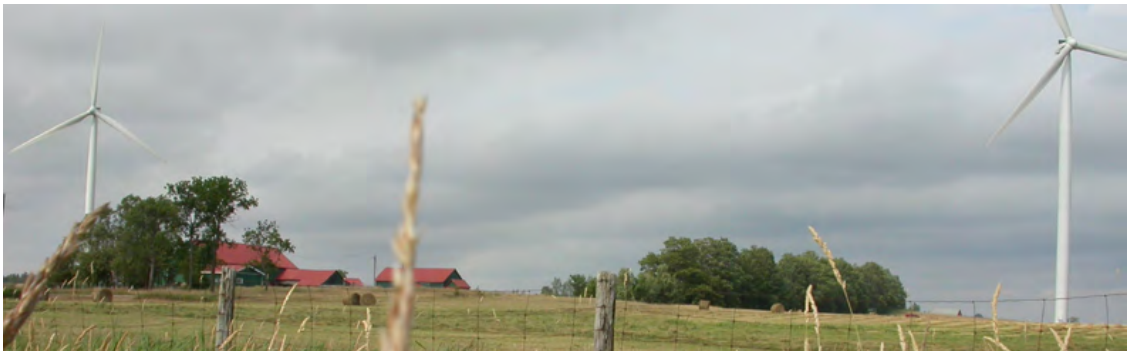
SMALL GROUP WORK

Each table was given one of three examples of energy markets (BC, Alberta, and Ontario).

Participants were asked to create a business case for initiatives that leverage the existing customer base of a Bullfrog-like company to accelerate each region towards a future powered by renewable energy. Guiding questions for the activity included:

- What are the main factors that influence consumer choices about energy?
- How can you create a sense of urgency to act among your customers?
- How can you reach the largest audience in a meaningful way?
- What partners, outside of a traditional business model, can help inspire the average consumer to support green energy?
- How can you create a sense of trust and legitimacy about an industry that is still largely unknown and in some cases not trusted by consumers?

After working in small groups on the three separate scenarios, participants reported back to the larger group. The British Columbia energy market group focused on developing sustainable transport solutions and considered the Bullfrog model for financing electric vehicle (EV) infrastructure in small BC cities that have poor transit service. The Alberta energy market group determined that early adoption by municipalities, universities, and other big organizations could be an important opportunity for a Bullfrog-like business, in particular helping turn over existing large vehicle fleets to EVs. The Ontario energy market group decided to consider working on supporting international RE projects through the crowdfunding model.



PAIR WORK

Magee then asked participants to pair off with someone who tackled different energy markets.

How did the solutions differ? What is driving the business case for each market? Pairs were asked to develop key principles that are common across the four energy markets and write them down on flipchart sheets. The principles listed included:

- People respond to emotion and the human connection
- People also respond to hope; ultimately people want to buy hope that there's an affordable future that's clean
- Cost competitiveness
- Energy stability; reduce price volatility by investing in renewable energy
- Providing examples of successful initiatives in your region
- Community ownership
- An integrated approach
- Transparency with respect to project development
- Reducing our reliance on fossil fuels

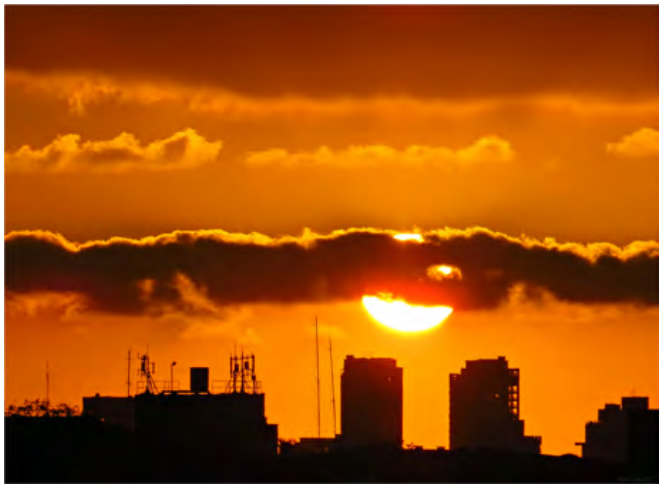
A conversation then ensued about remote and small communities crowd-sourcing donations and shifting from energy buyers to energy suppliers; affordability of renewable energy and potential cost savings through solar; and price volatility issues across the country. Participants referred to examples from earlier Forum sessions such as the community solar projects in Brazilian schools.

As the workshop closed, the conversation shifted to creating energy charities in remote communities, and comparing that to the social enterprise that Bullfrog has created. Magee closed with some clarifying comments:

"We do this as a business; we raised the funds for these projects. Everyone has contributed a little to all of our projects. We're not just providing grants, we're providing debt. We have a pool that's continuously cycled out. None of the money acts as revenue, it stays in the pot, growing to support these projects."

30. OPPORTUNITIES WITH GREEN CITY BONDS

- **Sean Kidney, CEO and Co-founder, Climate Bonds Initiative**
- **Katie Walsh, Manager, Cities, CDP North America**



INTRODUCTION

"Green bonds" is a label for bonds created to fund projects that have positive environmental and/or climate benefits, according to Sean Kidney. They enable municipalities to utilize the debt capital markets to fund climate solutions. This session allowed participants to benefit from Sean Kidney's deep expertise in finance and green bonds markets, as well as the city-based finance knowledge of Katie Walsh of the Carbon Disclosure Project (CDP). The goal, as stated by Kidney, was for participants to leave with concrete ideas for pursuing green bond issuances in their home cities.

PRESENTATIONS

Katie Walsh began by calling attention to the forthcoming Green Bonds Playbook by the Green City Bonds Coalition (of which both CDP and Climate Bonds Initiative are members). Walsh explained to participants that the Playbook will serve as a guide to green municipal finance.

She then set the context for the morning's conversation by noting that 80% of global GDP is generated in cities and that assets at risk from climate change in the next 15 years are estimated at a value of over $4 trillion. She went on to explain that CDP aggregates data from cities around the world about their governance, climate risks, economic opportunities, emissions, emissions reductions actions, renewable energy, and water. Participating cities disclose this information and agree to make the data publically available; the data can then be used to track and assess risks and opportunities. In numerical terms, the CDP participant cities represent about 28% of global GDP, or about $21 trillion.

CDP data can be used to assess risks to cities posed by climate change, which are serious

and widespread: 60% of CDP cities have completed a carbon risk assessment, and of these more than half report facing serious and near-term risks due to climate change. Furthermore, 76% of CDP cities report that businesses in their environs are susceptible to climate risk. CDP data are a wealth of information for investors and municipal governments in assessing long-term climate risks and investing in avoiding them.

Walsh described CDP's mandate to help facilitate communication between private and public sectors. In fact, CDP mapped out the risks that private-sector companies reported to the cities in which they were located and found that businesses were planning for risks that municipal governments had not even considered and vice-versa. Yet, communication between private and public sectors is crucial for proper risk management and to ensure both sides channel their investments properly.

Next, Sean Kidney engaged participants in a dynamic conversation on municipal finance, economic decision-making and opportunities, and how municipalities can respond to and mitigate the worst risks of climate change. As of 2014, public sector issuers made up only 13% of the green bond market, yet green bonds are growing rapidly and the market is expected to reach $70 billion in 2015.

Public sector risk assessment is a critical part of planning. Making the right infrastructure decisions moving forward is one of the main ways to keep cities livable, especially when faced with climate challenges. Kidney argued that bonds are safe investment vehicles in times of financial uncertainty.

PLENARY DISCUSSION

Participants spent some time discussing what 'green' means for bonds such as the variety of projects that can be financed through green bonds: renewable energy (with some caveats), efficient infrastructure, green building and retrofits, transportation projects including infrastructure, and clean water. They discussed "second opinions" programs that assess environmental impacts of planned projects and rate the climate and environmental science quality of the investment. These assessments increase investor confidence—especially for issuers that are new to this kind of market—but are not required for issuing bonds.

Kidney countered that green is really just a label and what matters is that the right kinds of projects are being incentivized and the wrong projects are being disincentivized.

The green bonds label is a marketing tool to ensure people understand that responding to climate change does not have to be disruptive

or costly; green bonds can engage politicians in opportunities they may have otherwise dismissed. Labeling bonds as green also signals to the global marketplace an appetite for climate investments.

Participants had questions about the size and scale requirements of a project for bond issuance. Kidney answered that it depends on each green bond, but that municipal treasuries would know the scale necessary for bond issuance. Generally, there is a high transaction cost for small projects, and there are likely minimums for a project to remain marketable. Small towns and small-sized projects might aggregate or pool projects to reach necessary thresholds. Primarily, asset-backed securities need a credit rating—hence, the issuers of bonds might not be individual small towns, but instead several towns together, or a regional or provincial government that shares the proceeds.

Innovation is also possible at smaller scales, Kidney suggested. At these smaller scales, bond issuance becomes a community engagement strategy that gives a local community the chance to invest in amenities of its choosing. Where there is not a big appetite for risk, bond issuance can be positioned as a subscription for community ownership of an asset, and this model is gaining traction in the UK and Europe. Interest in certifying the kind of projects that will not necessarily play on the global markets is growing, and it becomes much more about community re-investment and local decision-making. Green bonds can also be seen as a form of political engagement strategy, a government commitment to climate leadership that can lead to concrete and meaningful difference in people's lives.

Regarding technical issues related to bond issuance, a participant asked whether green bonds must fund infrastructure, or can a city issue a bond to fund RE subsidies, for example, like a feed-in tariff. Yes, in principle, according to Kidney, but the key principle should be about the asset and support for that asset. RE subsidies would be about use of proceeds, not asset banking. Kidney suggested there are likely a number of other tools to lower the capital cost of a subsidy and a bond issuance may not be the correct tool.

The need for more dialogue was recognized—both to energize municipal

treasury departments and to better connect municipal finance staff with programmatic staff, especially among those tasked with sustainability or resilience. Kidney argued that this dialogue could invigorate staff by allowing them to reenvision their work as contributing expertise to building more resilient cities. Kidney asserted there is a duty for municipal staff to get involved in complex global issues, and to bring their expertise to bear.

Connecting sustainability departments, who often have lists of projects that need to be done, as well as lists of project that perhaps should be done, with financiers who have the technical expertise to innovate funds for these projects is an immediate task. Kidney projected that we are moving into an era where the expertise of sustainability departments needs to be centred in civic processes.

Kidney pointed to historically low interest rates colliding with the need for massive re-investment in infrastructure and called it the golden age of municipal finance. Participants had concerns about the risks of municipalities participating in international finance markets, but Kidney maintained that without deep decarbonization, climate change is a much greater threat than participating in international markets.

31. CRASH COURSE IN RATE SETTING: INTEGRATING DISTRIBUTED ENERGY INTO THE GRID, NOT JUST A TECHNICAL CHALLENGE

Danielle Murray, Manager, Solar Energy Services, Austin Energy

PRESENTATION

The focus of Danielle Murray's presentation was on addressing potential inequities in rate structures for residential solar generation. Murray walked the participants through the rate setting process and pointed out that the costs of household solar system are typically borne by residential owners, or "prosumers."

However, the utility also incurs costs, such as debt service, regulatory, and environmental costs, and may fund customer assistance programs and provide efficiency incentives. On top of the costs of the traditional system, integrating solar requires the utility to finance integration studies, reactive power management, weather monitoring, performance modeling, and metering costs, all while losing revenue from reduced sales in volumetric charges.

Murray reviewed the various solar tariffs currently in use. She indicated that the most common kind is a low, fixed customer charge for volumetric energy along with transmission, volumetric, standby, and regulator charges, and taxes for residential customers. A recent proposal is to set a bi-directional distribution rate where the customer is credited for energy sent to the grid, but still pays for the distribution.

There are challenges with all rate structures. For example, utilities run the risk of not recovering their costs from individual households within some net metering rate structures. Those costs are then distributed to other customers, especially in a tiered rate system.

SMALL GROUP WORK

Participants were split into four stakeholder groups. Each group was given a hypothetical scenario and asked to consider a rate and compensation structure, and describe the benefits to the stakeholder group they represented. The components of each proposal are tabulated in the following table, along with summaries of the principles that drove each group's decisions.

Stakeholder	Compensation structure	Rate structure	Benefits
Low-income ratepayer advocate	Value of solar including adders for location, orientation, and avoided cost	Volumetric and fixed rates set to encourage both energy efficiency and solar uptake	Fund PV for low-income households and stabilize rates
Commercial or large residential customer (not solar supporters)	Bidirectional Distribution Rate (BDR), exempting transmission costs	Transmission rates are built into the power generator's rates rather than the distribution rates	Solar and non-solar customers pay for transmission costs
Apartment renter with low electric use	N/A	Volumetric charge with fixed distribution and regulatory charges built-in	Only pay for what is used
Residential customers who owns a solar PV system	Feed in Tariff (FIT) fixed at the peak rate, plus adders	Time of Use (TOU) charges with small metering charge (plus billing and distribution fees)	Encourage conservation and reduce peak power load

Low-income ratepayer advocates were concerned with equitable access to solar installations and long-term rate stability. The group also recommended regular updates on the compensation formula to increase certainty in the market.

Commercial customers wanted to avoid non-solar users unfairly subsidizing the grid. They suggested setting the volumetric rates high and the fixed distribution rates low to encourage energy conservation but ensure affordability for low-income users. The group cautioned that the system could become underfunded if a large number of wealthy users were to opt out entirely.

Apartment renters with low electric use supported volumetric charges, but they were concerned about the potential for a sudden increase in electricity use (for example, a growing family) incurring a sudden rise in costs. They felt that the decision to install solar panels was the landlord's and assumed the cost of installing solar would be passed onto the tenants. They did not support subsidizing solar users.

Residential customers who own a solar PV system recommended installing two meters, one traditional and the other measuring the solar electricity that is exported to the grid. This group also recommended long-term fixed contracts with solar producers to assure households they will recuperate their capital costs.

PLENARY DISCUSSION

Participants returned to plenary and discussed the rate structure proposals. One person observed that taking on a singular perspective limits the applicability of the proposal; a rate structure that achieves the goals of the apartment renter may not be feasible for the utility. Other participants noted missing perspectives, such as the utility or condominium owners who would have vested interest in the costs of installing solar generating systems in their buildings.

There were further questions, such as why an additional FIT would be needed in a compensation structure that pays the top marginal rate. Another participant pointed out that volumetric tariffs can send conflicting messages and that, ideally, tariffs are cost-reflective but the addition of subsidies and incentives can make them inefficient. Another participant noted that incentives work in a cost-reflective rate structure, as long as they are recognized for what they are. One participant described a net metering system that offers solar produces $0.107/kWh within a five-tiered pricing range of $0.09-0.17/kWh. In response to a participant's concern that under such a compensation and rate structure solar producers would effectively be subsidizing higher energy users, another participant explained that the upper tier rates are market signals to encourage conservation.

"It's not as simple as putting solar on and net metering forever."

CLOSING WORDS

Following the rate-setting activity, Murray shared a case study in which Austin Energy developed a residential Value of Solar (VoS) rate structure. Set in a city that had long embraced green energy, Austin Energy stimulated overwhelming support for utility-scale solar generation through incentive

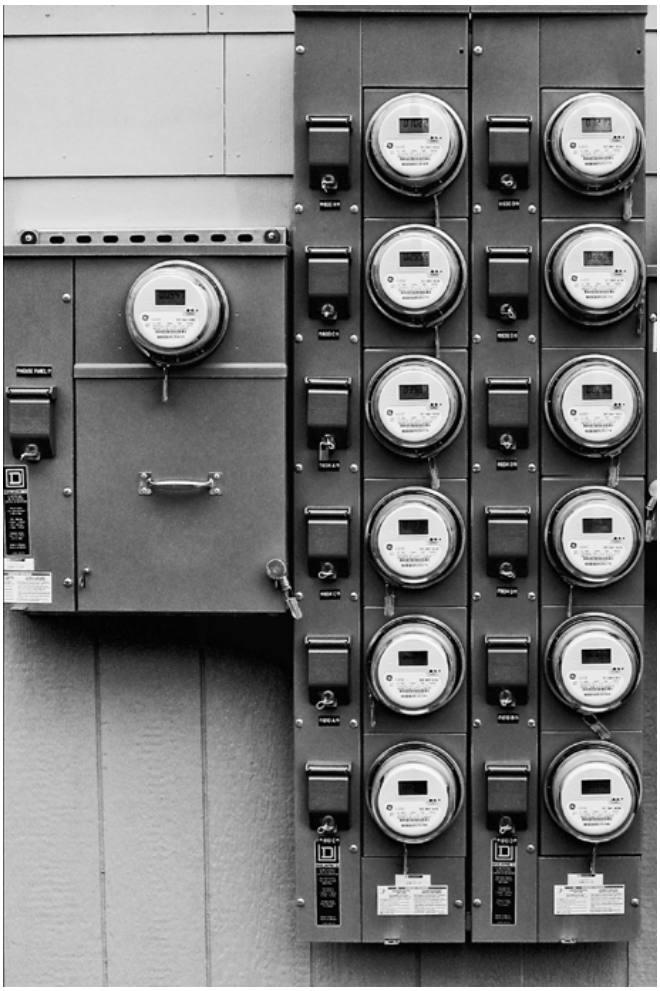
programs. Having ambitious green energy targets, the utility wanted to support on-site residential solar generation but not at the risk of losing funding for the grid.

As an alternative to net metering, Austin Energy began metering consumption and production separately. Customers are billed for their metered consumption but are credited for the metered value of solar they export to the grid. This is different from FIT as it is "behind the meter," Murray explained, which also leads to tax and regulation implications. In this way, the utility remains revenue neutral even in cases where the customer has a net-zero bill—a customer can even have a negative bill.

The algorithm Austin Energy uses to assess the VoS is based on: avoided fuel (from 20 years of natural gas prices); avoided power plant operating and maintenance costs; avoided peaker costs; transmission value (for avoided line losses); and environmental compliance value. The VoS has been dropping with natural gas futures decreasing, explained Murray, meaning VoS does not offer the price certainty that FIT would.

NEW AND UNANSWERED QUESTIONS

- *"What is the best way to establish "energy justice" in rate structures?"*
- *"What happens if people put batteries in their houses and all of the sudden the grid has no income?"*



32. MORE THAN ELECTRONS: DESIGNING SMALL HYDRO PROJECTS TO BENEFIT FIRST NATIONS, RECREATIONAL USERS, AND THE LOCAL ENVIRONMENT

Colleen Giroux-Schmidt, Senior Director, Innergex

PRESENTATION

The session leader, Colleen Giroux-Schmidt, welcomed a diverse group of participants to this workshop. She began by delivering a presentation on her experience working on small hydro projects (run-of-river) in BC. Giroux-Schmidt explained that project development was traditionally all about how to get the most energy for the least investment, and building as cost effectively as possible. The project development process has evolved to incorporate environmental considerations and assessment, as part of project development. Tradeoffs between the physical location of a plant, and environmental values are part of redefining projects to get the right balance. The trend is now towards increasing the social benefits of projects; for example, Innergex is a leader in developing sustainable energy while taking into account the triple bottom line.

GROUP WORK

After her introductory presentation, Giroux-Schmidt explained the first small group activity: A hypothetical scenario with a community that is considering a small hydro energy project. She divided the participants into small groups and handed out worksheets with details of key values and a scoring system. Giroux-Schmidt then asked the groups to talk about the values of community and potential tradeoffs and to fill in the score sheet as a basis for further discussion. After the discussion, groups then compared the scenarios they had built and how they had scored the activity. Notably, one group developed a project proposal that included partnering with First Nations, building a platform for tourism to increase revenue, developing a hatchery for fish on the river, and providing support for grizzly bear habitat in the region.

Giroux-Schmidt then revealed that the

scenario was based on a real example and presented the details of the Ashlu Creek run-of-river hydroelectric generating power plant in BC. This project site has high interest and value for kayaking, serves as grizzly bear habitat, and is within the traditional territory of the Squamish First Nation. Giroux-Schmidt gave an overview of how Innergex was able to balance a multitude of interests—from recreational to community to environmental—while developing the project. She emphasized the importance of engaging the community early on in a project to determine what it needed to support the project, and how the plant should be designed and managed on an ongoing basis. Participants asked Giroux-Schmidt some pointed questions about how to deal with NIMBYism and onerous environmental assessment processes, and how to communicate the greater social good of sustainable energy projects, while reconciling local impacts.

Giroux-Schmidt then presented a second case study, the Hydro Ottawa's Chaudière Falls Hydroelectric expansion project in Ontario.[3] She provided specifications for the scenario and detailed social and environmental constraints on the project, including statements from the Algonquin First Nations. Based on this case study, participants worked in small groups through an in-depth exercise on the real trade-offs involved in the Chaudière project. The groups then shared their solutions for developing a social license for the project with each other, including:

- Redesigning the engagement process to build trust with the local First Nations
- Developing affordable housing options on the land
- Developing a multi-stakeholder consensus process to steer the project
- Considering lessening the impact through submerged marine current turbines for power generation while reconstructing the falls
- Assessing the full cost of legacy hydro in comparison to new hydro, which needs to take into account social and environmental aspects
- Adopting the consumer power model where energy users pay a little more to get sustainable, ethical electricity

[3] This case study was developed by Chris Henderson, President, Lumos Power

CLOSING PLENARY

Michael Small, Executive Director, Renewable Cities, as the moderator for this plenary, invited all the Forum participants to reflect on what had struck them the most during the Forum and to share the ideas that they would be taking home to their communities. Small asked **Margery Moore, Director, Environmental Strategic Alliances, Bloomberg BNA**, and **Tom Pedersen, Director, Pacific Institute of Climate Solutions (PICS)** to start this open discussion.

Margery Moore opened with the comment that the Global Learning Forum was one of the most uplifting conferences that she has attended. Her first takeaway from the Forum was that we are ready for this renewable energy revolution; the tipping point is here. However, Moore heard clearly that several conditions need to be met for success. For example, while we have sufficient technology and financing available to implement 100% renewable energy, there is still work to do on the regulatory and policy frameworks necessary for incenting and accelerating the transition. Most sobering to Moore, as a Canadian, was the sense that Canadian cities are ready to lead in 100% renewable energy, but that there is a lack of federal and provincial cooperation and collaboration. In closing, Moore asked participants to consider that the Forum might itself be considered a renewable resource—providing energy and optimism to all participants.

Next, Tom Pedersen commented that the stage for the Forum was well set at the PechaKucha event. The energy and buzz in the room set a standard that carried on throughout the rest of the event. He shared some of the ideas he had heard that stood out for him; in particular, implementing 100% renewable energy is not only an economic opportunity, providing hundreds of thousands of jobs, but also a moral obligation. Pedersen was inspired by the energy strategies of Copenhagen and Greensburg, Kansas, as well as by messages from the youth like Esperanza Garcia and from

Sean Kidney, specifically Kidney's forecast of $100 billion market for green bonds. Pedersen closed by paraphrasing John Kerry speaking about climate change, "We are looking at a $6 trillion opportunity, but we lack political will power." Pedersen hoped all participants would go home and help create the push for political willpower.

Following Moore's and Pedersen's remarks, Small opened the session to comments, specifically calling on participants from different sectors.

ELECTED OFFICIALS

Nils Jensen, Mayor, Oak Bay, BC and Chair, Regional Capital District: "This Forum was incredibly inspirational. I hear Barcelona can do it, Copenhagen can do it, Burlington can do it, so there's no reason that Greater Victoria can't do it, and I'm going to take that message back."

Matthew Bond, Councillor, District of North Vancouver: "Here's the message I'm taking: If your current framework isn't working, make a new one; if you can't get through to them, go around them; and it's not our renewable energy future, it is renewable energy now."

CITY STAFF

Brian Hansen, Head of Citywide Strategies, City of Copenhagen, said his best advice to other city staff was: "To not get stuck in what's difficult." Speaking specifically about cities that already have ambitious energy goals, "We should allow ourselves to find places like this where we can go and learn from each other."

Ruth Stokes, Councillor, Dunedin City, New Zealand declared: "It doesn't matter whether you're in a town of 5,000 or 1.5 million or a city of 17 million. We all face the same challenges."

PRIVATE SECTOR

J.M. Toriel, President, Big Green Island Transportation: "This is the first conference I've been to in a long time where I haven't had to scream and shout about including transportation when we talk about renewables."

Sean Magee, Director, Community Renewable Projects, Bullfrog Power: "We're not selling renewable energy or technology, we are communicating hope. Green transportation, renewable energy, energy efficiency—these things make life better."

NGOS

Bárbara Rubim, Campaigner, Climate and Energy, Greenpeace Brazil: "Coming from Brazil, we have the idea that we have nothing in common with northern economies, that we can only learn from developed cities, but this conference showed me this is not true; we can all learn from each other."

Small concluded by calling upon two leaders in Vancouver, **Deputy Mayor Andrea Reimer** and **former president of ICLEI, David Cadman**, to share their perspectives.

Andrea Reimer said climate change is not so much a call to action as it is a call to arms. We know we can't keep burning fossil fuels and she positioned Vancouver's decision to transition to 100% renewable energy as a fight for the future that we want to see.

David Cadman commented that although 100% renewables is on the cusp of becoming reality, most of the energy transformation has taken place in OECD countries. Cadman called for cities that have implemented ambitious renewable energy policies to partner with cities in the Global South so that they do not repeat the mistakes; the 100% renewable energy transition must be accessible to all. Cadman also argued that the most powerful way to share and replicate the 100% renewable energy transition is through community ownership of energy generation.

Small asked Andrea Reimer for a final comment. Reimer spoke of Vancouver's upcoming city plan for 100% renewable energy and of her experiences at the ICLEI world congress in Seoul. She remarked that although international gatherings are usually good for discovering how people disagree, in Seoul, renewable energy seemed to be the answer to many different problems; renewables might also lead to solutions for other social and environmental problems.

ACKNOWLEDGEMENT AND CREDITS

In 2014, Renewable Cities' staff conducted an exhaustive set of scoping interviews with over 150 city staff, key thought leaders, researchers, and members of civil society. Their insights were used to design both the Global Learning Forum and longer-term program for Renewable Cities. We would like to thank all those who participated in our scoping interviews which made it possible for us to conceive this event.

In particular, we would like to express our gratitude to the more than sixty panelists, moderators, and session leaders who came to the Global Learning Forum from across North America and around the world. Their breadth of expertise made it possible to conduct so many and such wide ranging dialogues.

Equally, we would like to thank all the participants of the Global Learning Forum for the expertise they brought to this event. We hope that they will be able to build on the ideas and contacts generated by the Forum to support the implementation of renewable energy and energy efficiency in cities.

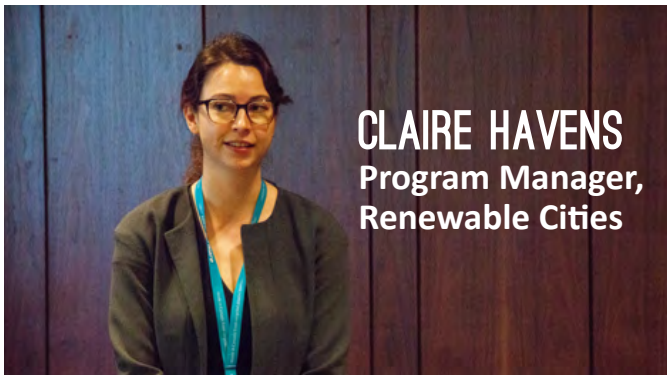
We are also deeply grateful to the dedicated team of volunteers who donated their time and keen interest in these subjects to help make the Global Learning Forum happen. Their names, as well as a list of other SFU Centre for Dialogue staff who assisted with the execution of the event, can be found in Appendix 4.

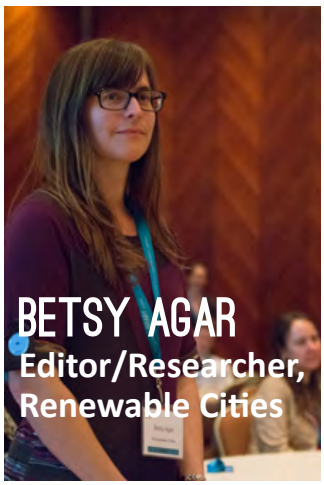
A special thanks is due to our funders. Without their support we could not have succeeded in scoping, designing, and launching a global program or the Global Learning Forum. They were: North Growth Foundation, Sitka Foundation, Alterra Power Corporation, Pacific Institute for Climate Solutions, the City of Vancouver, VanCity, the US Consulate General in Vancouver and RBC. This list must also include Simon Fraser University for housing and supporting our program through the SFU Centre for Dialogue.

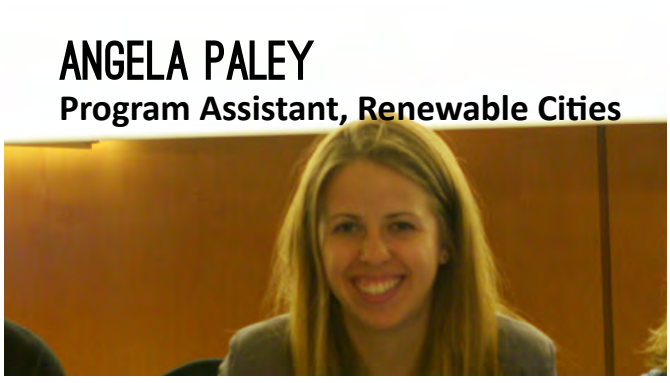
Last, but not least, we would like to thank our partners and other affiliated organizations including: Clean Energy Canada, CleanTechnica, Climate Access, City of Vancouver, Federation of Canadian Municipalities, ICLEI, Pacific Institute for Climate Solutions, The Solutions Project, Urban Sustainability Directors Network, and World Future Council.

This report was written by Betsy Agar, Kathryn Sheps, Claire Havens, and Keane Gruending of Renewable Cities at the SFU Centre for Dialogue. It was reviewed by Michael Small, Angela Paley, and Molly Henry of Renewable Cities. Keane Gruending designed and formatted the report with Forum photographs by Zack Embree. Other image credits can be found in Appendix 6.

RENEWABLE CITIES STAFF





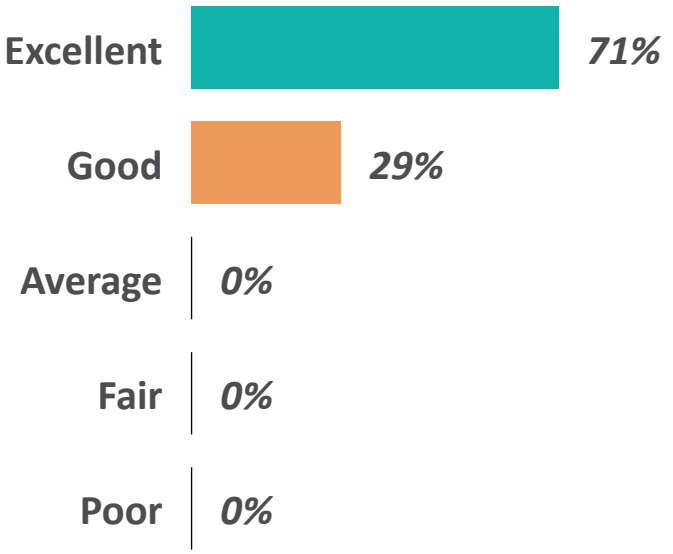


SFU | CENTRE FOR DIALOGUE
SIMON FRASER UNIVERSITY

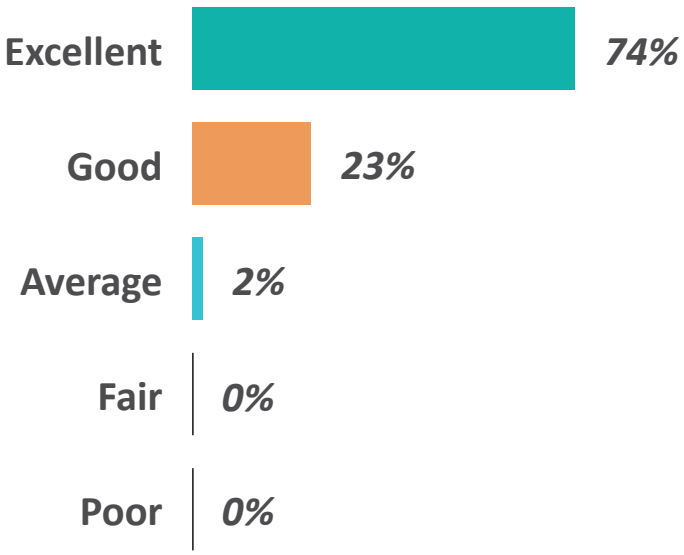
APPENDIX 1 - EVALUATION

In order to evaluate the Global Learning Forum we asked participants to complete an electronic survey following the event. Quantitative results are included below.

Q1. Overall, how would you rate the overall content of the Global Learning Forum?



Q2. How would you rate the overall organization of the Global Learning Forum?



APPENDIX 2 - MEDIA REPORT

Renewable Cities' work leading up, during, and following the Global Learning Forum attracted significant media attention. This section includes major media pieces, including newspaper articles, radio interviews, and industry blogs that resulted from our program's work. For more information, see our website.

- **Cities Today – March 20 – ICLEI partners with new city energy programme**
  http://cities-today.com/2015/03/iclei-partners-new-city-energy-programme/
- **The Vancouver Sun – March 26 – Opinion: Vancouver ups the ante on urban sustainability**
  http://www.vancouversun.com/business/Opinion+Vancouver+ante+urban+sustainability/10923343/story.html
- **CKNW Jill Bennett Show – April 18 – Discussion with Shauna Sylvester on Vancouvers 100% RE Goal**
- **Business in Vancouver – April 21 – How cheap gas could hobble quest for greenest-city title**
  https://www.biv.com/article/2015/4/how-cheap-gas-could-hobble-quest-greenest-city-tit/
- **Georgia Straight – April 29 – Gregor Robertson will tell French National Assembly president about Vancouver's quest to become greenest city**
  http://www.straight.com/news/440206/gregor-robertson-will-tell-french-national-assembly-president-about-vancouvers-quest
- **News 1130 – May 8, 2015 – Cities at the forefront of 'renewable' movement converging in Vancouver**
  http://www.news1130.com/2015/05/08/cities-at-the-forefront-of-renewable-movement-converging-in-vancouver/
- **Vancouver Sun – May 8 – Opinion: Cities take lead in renewable energy**
  http://www.vancouversun.com/technology/Opinion+Cities+take+lead+renewable+energy/11041188/story.html
- **Vancouver Sun – May 11 – Opinion: 100-per-cent renewable energy a paradigm shift**
  http://www.vancouversun.com/business/Opinion+cent+renewable+energy+paradigm+shift/11047314/story.html
- **CleanTechnica – May 11 – Global Learning Forum: 8 New Experts In Green Bonds, Clean Energy, & Urban Sustainability Confirmed**
  https://cleantechnica.com/2015/05/11/global-learning-forum-8-new-experts-in-green-bonds-clean-energy-urban-sustainability-confirmed/
- **Global BC1 – May 12 – Shauna Sylvester speaks on Renewable Cities**
- **Vancouver 24 Hours – May 13 – Developers need sustainability incentives: expert**
  http://vancouver.24hrs.ca/2015/05/13/developers-need-sustainability-incentives-expert

- **CBC Radio Early Edition – May 13 – Discussion on Renewable Cities conference with Rick Cluff**
- **RJ1200 – May 13 – Discussion with Shauna Sylvester on the morning show re: Renewable Cities**
- **CFAX Radio – May 13 – Interview on the Drive with Terry Moore with Shauna Sylvester and Mark Jacobson**
- **Squamish Chief – May 13 – Making Squamish Renewable**
  https://www.biv.com/article/2015/4/how-cheap-gas-could-hobble-quest-greenest-city-tit/
- **Joyce Murray – May 14 – MP Joyce Murray speaks on the Renewable Cities Program Forum in Vancouver**
  https://joycemurray.parl.liberal.ca/mp-joyce-murray-speaks-on-the-renewable-cities-program-forum-in-vancouver/
- **Huffington Post – May 14 – Renewables Driving the Energy Transformation**
  http://www.huffingtonpost.com/jakob-von-uexkull/renewables-driving-the-en_b_7269792.html
- **Truth Dig - May 14 – Green City Vancouver Offers Clean Alternative to Tar Sands Boom**
  http://www.truthdig.com/report/item/green_city_vancouver_offers_clean_alternative_to_tar_sands_boom_20150513
- **News 1130 – May 14 – Experts gather in Vancouver to discuss running cities on renewable energy**
  http://www.news1130.com/2015/05/14/experts-from-around-the-world-gather-to-discuss-running-cities-on-renewable/
- **Global BC1 – Unfiltered with Jill Krop – May 14 – Interview with Mark Jacobson**
- **Vancouver Observer – May 14 – Vancouver kicks off Global Renewable Cities Initiative event**
  http://www.vancouverobserver.com/news/vancouver-kicks-global-renewable-cities-initiative-event
- **Vancouver Sun – May 14 – Effective government policies would ease shift to renewable energy, conference hears**
  http://www.vancouversun.com/touch/story.html?id=11056705
- **CBC On the Coast – May 15 – Mayor of one of the greenest cities in the world has advice for Vancouver**
  http://www.cbc.ca/news/canada/british-columbia/mayor-of-one-of-the-greenest-cities-in-the-world-has-advice-for-vancouver-1.3075300
- **The Georgia Straight – May 17 – 350.org founder Bill Mckibben Show how Denmark Leads the World in Promoting Renewable Energy**
  http://www.straight.com/blogra/452771/350org-founder-bill-mckibben-shows-how-denmark-leads-world-promoting-renewable-energy
- **The Tyee – May 18 – The Suits Are Flocking to Renewables**
  http://www.thetyee.ca/News/2015/05/18/Suits-Flocking-to-Renewables/

- **The Nelson Daily – May 18 – A Change is Gonna Come**
  http://thenelsondaily.com/news/change-gonna-come-37949#.VV4gT1PF_y4
- **CleanTechnica – May 19 – Vancouver Gets An "F" For Solar Policy**
  https://cleantechnica.com/2015/05/19/vancouver-gets-f-solar-policy-canada/
- **Bloomberg BNA – May 20 – Can Regions, Cities become 100% Dependant on Renewable Energy? Absurd? Not Anymore**
  http://www.bna.com/regions-cities-become-b17179926957/
- **The Province – May 20 – Clean, renewable energy should be B.C's focus, conference hears**
  http://www.theprovince.com/business/energy-resources/Clean+renewable+energy+should+focus+conference+hears/11069669/story.html
- **CleanTechnica – May 24 – The Human Side of Cleantech**
  http://cleantechnica.com/2015/05/24/the-human-side-of-cleantech/
- **CleanTechnica – May 25 – Renewable Cities Highlights**
  http://cleantechnica.com/2015/05/25/renewable-cities-highlights/
- **Business in Vancouver – May 26 – Clinging to the carbon economy is a bad business plan for B.C.**
  https://www.biv.com/article/2015/5/clinging-carbon-economy-bad-business-plan-bc/
- **The Squamish Chief- May 27 – Buzzing about Renewable Energy**
  http://www.squamishchief.com/buzzing-about-renewable-energy-1.1948596
- **Woodstock Sentinel Review – May 28 – County looks at proposal to run solely on renewable energy by 2050**
  http://www.woodstocksentinelreview.com/2015/05/28/county-looks-at-proposal-to-run-solely-on-renewable-energy-by-2050
- **Business in Vancouver – June 1 – Market slowly plugging into the advantages of electric vehicles**
  https://www.biv.com/article/2015/6/market-slowly-plugging-advantages-electric-vehicle/
- **Nelson Star – June 16 – Is it just me or is it hot in here?**
  http://www.nelsonstar.com/opinion/307638641.html

APPENDIX 3 - FORUM SCHEDULE

RENEWABLE CITIES

SCHEDULE
GLOBAL LEARNING FORUM
MAY 13-15
VANCOUVER, BC

FORUM.RENEWABLECITIES.CA #RECITIES

MAY 13

3:00PM	REGISTRATION	FOUR SEASONS
7:00PM	OPENING NIGHT EVENT	DJAVAD MOWAFAGHIAN CINEMA

Renewable Cities Powered By PechaKucha

- Shauna Sylvester, Director, Centre for Dialogue, *Simon Fraser University*
- Ross Beaty, Executive Chairman, *Alterra Power*
- Mark Jacobson, Director, Atmosphere and Energy Program, *Stanford University*
- Esperanza Garcia, Founder and CEO, *Clean Tech Impact*
- Harry Lehmann, Head of Division, *Environmental Planning and Sustainability Strategies, German Federal Environment Agency (UBA)*
- Bárbara Rubim, Campaigner, Climate and Energy, *Greenpeace Brazil*
- Merran Smith, Executive Director, *Clean Energy Canada*
- Chris Henderson, President, *Lumos Energy* & Board Chair, *Globe Conference and Exposition*
- Zachary Shahan, Director, *Cleantechnica*
- Robert Ferry & Elizabeth Monoian, Founders, *Land Art Generator Initiative*
- Sadhu Johnston, Deputy City Manager, *City of Vancouver*

POWERED BY PechaKucha 20×20 IMAGES SECONDS
PechaKucha.org
DEVISED & SHARED BY KLEIN DYTHAM ARCHITECTURE

8:40PM	OPENING NIGHT RECEPTION	WORLD ARTS CENTRE

SFU | CENTRE FOR DIALOGUE
SIMON FRASER UNIVERSITY

MAY 14

7:00AM	BREAKFAST	PAVILLON ROOM
8:00AM	WELCOME	BALLROOM
8:10AM	PLENARY SESSIONS	BALLROOM

Renewable Energy Global Status Update and Trends

This panel of global experts will share their experiences and host a discussion with forum participants about the latest trends in renewable energy and energy efficiency.

9:00AM

Vancouver's Story: Energy and the Greenest City Action Plan

A Renewable Cities partner and the host city for the Global Learning Forum, the City of Vancouver recently announced a commitment to 100% renewable energy in electricity, heating and cooling, and transportation. Mayor Gregor Robertson and Deputy City Manager Sadhu Johnston will seek your advice on how Vancouver should plan to meet this goal.

10:00AM	COFFEE BREAK	3RD FLOOR/ SEASONS ROOM
10:30AM	KNOWLEDGE MOBILIZATION SESSIONS	

	1. Walk the talk: The City of Copenhagen as a leader in the green transition	Oak Room
	2. Life is an electric highway: A review of successful EV uptake policies globally	Aspen Room
	3. Aesthetics, integration, and building public support for urban renewables	Shuswap Room
	4. Building citizen and political will for 100% renewable energy: Global learnings from Germany's energy transition	Arbutus Room
	5. Realities of renewable energy implementation in cities: A financing and policy perspective	Garibaldi Room
	6. Climate change: Investment risks and opportunities for institutional investors	Okanagan Room
	7. "Smart Cities": Not your only option	Strathcona Room
	8. Overcoming barriers to district energy development: Experience from C40 cities	Seasons Room
11:30AM	9. Solarizing schools in Brazil and showcasing social benefits of renewables projects in poor communities	Arbutus Room
	10. Leading the world: C40 city successes in energy, transport, and finance	Aspen Room
	11. State/provincial level tools to enable local government action on mitigation	Shuswap Room
	12. Unlikely stories: Coal country, jobs, urban renewal, and renewable energy	Garibaldi Room
	13. Working with citizens and politicians for ambitious renewable energy targets: Perspectives from developed and developing countries	Seasons Room
	14. Beyond benchmarking: Using data to drive energy efficiency action	Oak Room
	15. Lessons from Japan: Sharing experiences from the City of Yokohama on renewable energy	Okanagan Room
	16. Energy efficiency: What the IEA calls "the first fuel" for cities	Strathcona Room

12:30PM	BUFFET LUNCH	BALLROOM
1:00PM	PLENARY SESSION (LUNCH PANEL)	BALLROOM

Innovative Financing for Urban Renewables

The technology is available and cities are ready, but how are they to pay for new energy infrastructure? What are the financial risks and who takes them on? How do citizens and governments adapt their decisions about new and existing infrastructure to accommodate renewable energy? In this session, experts from a city-owned utility, a global finance group, an energy cooperative, and a private energy producer will host a discussion with participants about the business case for renewable energy.

2:00PM	PEER TO PEER SESSIONS	
	17. Dispelling doubt: How 100% RE is practical and achievable for municipal policymakers	Arbutus Room
	18. Developing creative energy cooperatives in an uncooperative environment	Oak Room
	19. Getting to a climate change commitment of 80% by 2050: The role of renewable energy	Seasons Room
	20. Power without: Local and regional government strategies for building stakeholder alliances to achieve 100% renewable energy when cities do not control their utilities	Garibaldi Room
	21. Power within: Defining the goals, overcoming the barriers, and achieving 100% renewable electricity for cities with utility influence	Shuswap Room
	22. Toward net-zero: BC Hydro's innovative demand-side management strategies	Strathcona Room
	23. Laying the groundwork for district energy	Aspen Room
	24. Urban gymnastics: Circumventing laws and building codes that are not renewable energy friendly	Okanagan Room
3:30PM	COFFEE BREAK	BALLROOM FOYER
4:00PM	PLENARY SESSION	BALLROOM

Trends, Innovations, and Barriers in Electrifying Transportation

Focused on the role of renewable energy in transportation, this panel will explore how cities can tap into new trends:

- Reducing energy demand by designing for more cycling and walking;
- Electrifying entire transportation systems, from single occupancy vehicles to mass transit;
- Using EVs for energy storage;
- Mobilizing EV owners to increase EV uptake; and
- Learning what global policies have actually worked.

4:00PM	ONE TO ONE NETWORKING	RENEWABLE CITIES CAFE
5:30PM	NETWORKING RECEPTION (ENDS 7:30PM)	BALLROOM FOYER

MAY 15

7:30AM	**BREAKFAST**	**PAVILLON ROOM**
9:00AM	**PLENARY**	**BALLROOM**

Renewable Cities - Call to Action

Leading up to the intent to action workshop sessions, this is a panel of leaders among leaders who will remind participants: Why these dialogues are so important; How far renewable energy has already come; and Where work is still needed.

This panel will inspire participants to dig deep into solving the lingering challenges cities face and finding ways practitioners from cities around the world can move forward with progressive energy strategies.

10:00AM	**INTENT TO ACTION SESSIONS**	
Coffee served in sessions	25. Creating 100% RE laws that are difficult to repeal	Garibaldi Room
	26. Communicating renewable energy: Positioning, persuading, and popularizing	Arbutus Room
	27. Interactive tools to engage the public in community energy planning	Aspen Room
	28. Pathways to Paris: Local governments' roles in national plans	Seasons Room
	29. Leveraging consumer power to finance renewable energy	Okanagan Room
	30. Opportunities with green city bonds	Shuswap Room
	31. Crash course in rate setting: Integrating distributed energy into the grid, not just a technical challenge	Oak Room
	32. More than electrons: Designing small hydro projects to benefit First Nations, recreational users, and the local environment	Strathcona Room
12:30PM	**LUNCH**	**BALLROOM FOYER**
2:00PM	**PLENARY SESSION (CLOSING)**	**BALLROOM**
3:00PM	**OPTIONAL: SITE VISITS**	

False Creek District Energy Centre

Centre for Interactive Research on Sustainability (CIRS) at UBC

SPEC-MEC Solar Panel Installation

APPENDIX 4 - SUPPORT STAFF, FACILITATORS, AND VOLUNTEERS

The Global Learning Forum would not have been possible without the support of SFU Centre for Dialogue and other partner organization staff. Furthermore, dozens of skilled and enthusiastic volunteers came together to make the event a success.

SFU Centre for Dialogue staff who assisted: Averyl Bancroft, Linda Bannister, Kelvin Chen, Jason Kim, Shea O'Neil, Brenda Tang, and Janet Webber

Dialogue Facilitators (includes Renewable Cities, SFU Centre for Dialogue, and other partner organization staff as well as volunteers): Betsy Agar, Yuri Artibise, James Glave, Suzanne Goldberg, Keane Gruending, Claire Havens, Bill McIntosh, Robin Prest, Sebastian Merz, Pamela Rogalski, Kathryn Sheps, Michael Small, and Shauna Sylvester

Volunteers

Helen Allen, Dominica Babicki, Luc Bagneres, David Barrie, Sarah Beley, Ray Belmonte, Oliver Boekbinder, Audrey Brassel-Day, Trevor Bruce, Andrew Burns, Veronika Bylicki, Ran Chen, Daniel Drugge, Amy Farahbakhsh, Melissa Ferguson, Eryn Fitzgerald, Sophie Fung, Lana Goratsky, Tanishka Gupta, Elizabeth Hand, Amelia Huang, Adam Kebede, Sydney Kjellander, Kitty Liu, Jorge Martinez-Gallego, Katelyn McDougall, Bill McIntosh, Kirsten Meng, Brian Militmore, Javad Modon Haghighi, Negar Naghshinehpour, Daviel Oleksiuk, Avis Petersen, Maria Spiliotopoulou, Matthew Strand, Tessica Truong, Tiffany Vass, Carla Visscher Hensel, Mike Wakely, and Jeff Wint

Special mention to Kristin Johannsen and Charling Li

APPENDIX 5 - PHOTO CREDITS

This page includes images credits for Flickr images, which are part of the Creative Commons, and other image sources. Any report photo not indicated in the photo credits is copyright of Renewable Cities.

Cover- husseinabdallah (Flickr)
Introduction- glotmansimpson (Flickr)

Sessions:

1. Walk the talk: The City of Copenhagen as a leader in the green transition- blueviking (Flickr), 16nine (Flickr)
2. Life is an electric highway: A review of successful EV uptake policies globally- mgillet (Flickr)
3. Aesthetics, integration and building public support for urban renewables- Land Art Generator
4. Building Citizen and political will for 100% renewable energy: global learnings from Germany's energy transition- campact (Flickr)
5. Realities of renewable energy implementation in cities: A financing and policy perspective- mister-e (Flickr)
6. Climate change: Investment risks and opportunities for institutional investors- Mercer
7. "Smart Cities": Not your only option- Streetline, caribb (Flickr)
8. Overcoming barriers to district energy development: Experience from C40 cities- europedistrict (Flickr)
9. Solarizing schools in Brazil and showcasing social benefits of renewables projects in poor communities- Bárbara Rubim, solaraid (Flickr)
10. Leading the world: C40 sharing successes in energy, transport, and finance- 10047629@N04 (Flickr), jasewong (Flickr)
11. State and provincial level tools to enable local government action on mitigation- rchou (Flickr)
12. Unlikely Stories: Coal country, jobs, urban renewal, and renewable energy- Bob Dixson, tynigh (Flickr)
13. Working with citizens and politicians for ambitious renewable energy targets: Perspectives from developed and developing countries- Kitty Liu
14. Beyond benchmarking: Using data to drive energy efficiency action- City of Seattle
15. Lessons from Japan: Sharing experience from the City of Yokohama on renewable energy chibitomu (Flickr), tosh (argyle-street)
16. Energy efficiency: What the IEA calls "the first fuel" for cities- redmoonsanctuary (Flickr)
17. Dispelling doubt: How 100% RE is practical and achievable for municipal policymakers- José

Etcheverry and Manuel Valdés, slapbcn (Flickr)

18. Developing creative energy co-operatives in an uncooperative environment- demmbatz (Flickr)
19. Getting to a climate change commitment of 80% by 2050: The role of renewable energy- pwkrueger (Flickr), City of Edmonton, City of Yellowknife
20. Power without: Local and regional government strategies for building stakeholder alliances to achieve 100% renewable energy when cities do not control their utilities- Carsten Rothballer, coltgroup (Flickr)
21. Power within: Defining the goals, overcoming the barriers and achieving 100% renewable electricity for cities with utility influence- NREL, City of Apsen
22. Toward net-zero: BC Hydro's innovative demand-side management strategies- theentiremikey (Flickr)
23. Laying the groundwork for district energy- guelph (Flickr)
24. Urban gymnastics: Circumventing laws and building codes that are not renewable energy friendly- slaclab (Flickr)
25. Creating 100% RE laws that are difficult to repeal- aidanmorgan (Flickr), Anna Leidreiter, 129472585@N03 (Flickr)
26. Communicating renewable energy: Positioning, persuading, and popularizing
27. Interactive tools to engage the public in community energy planning
28. Pathways to Paris: Local governments' roles in national plans- UBC Energy Explorer
29. Leveraging consumer power to accelerate renewable energy- dawn (Flickr)
30. Opportunities with green city bonds- allg (Flickr), Tandem Health Partners, 50989081@N07 (Flickr)
31. Crash course in rate setting: Integrating distributed energy into the grid, not just a technical challenge- presidencymaldives (Flickr), four12 (Flickr)
32. More than electrons: Designing small hydro projects to benefit First Nations, recreational users, and the local environment- Innergex

FORUM.RENEWABLECITIES.CA
RENEWABLECITIES.CA

TWITTER
@RENEWABLECITIES
#RECITIES

FACEBOOK
RENEWABLECITIES

LINKEDIN
RENEWABLECITIES

SFU | CENTRE FOR DIALOGUE
SIMON FRASER UNIVERSITY