

OUTCOMES REPORT: NORTH AMERICAN DIALOGUE

JULY 10-12, 2016
SAN FRANCISCO

100% Renewable Energy in Cities



ACKNOWLEDGEMENTS AND CREDITS

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ABOUT US

Renewable Cities is a global program of Simon Fraser University's Centre for Dialogue in Vancouver, Canada. Our mission is to support cities through the transition to 100% renewable energy and increased energy efficiency. Using research-based dialogue, collaboration, and thought leadership we work towards urban energy solutions with cities, governments, the private sector, utilities, researchers, and civil society.

Sierra Club is the largest, oldest grassroots environmental organization in the United States with over 10,000 volunteers and 2.8 million supporters across the country. The Sierra Club is advocating for an equitable transition to 100% renewable energy in cities through its Ready for 100 Campaign (www.readyfor100.org).

ICLEI USA, a 25-year-old non-profit organization, is a vibrant network of local governments across the United States dedicated to action and solutions around climate, local economics, energy, and natural resources. ICLEI USA is intimately engaged in the ICLEI Global 100% RE network, providing support to cities with a 100% RE goal or have expressed interest in transitioning to 100% RE (icleiusa.org/programs/energy/100-renewable-energy-network).

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WRITING AND PUBLISHING CREDITS

Author: Betsy Agar, Renewable Cities, SFU Centre for Dialogue

Reviewers: Kassie Rohrbach and Jodie Van Horn, Sierra Club; Riana Ackley, ICLEI USA; Michael Small, Kathryn Sheps, and Keane Gruending, Renewable Cities, SFU Centre for Dialogue

Proofreader: Angela Paley, Renewable Cities, SFU Centre for Dialogue

Formatting and layout: Keane Gruending

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CONTACT INFORMATION

Renewable Cities Simon Fraser University Centre for Dialogue 3300-515 West Hastings Street Vancouver, British Columbia Canada V6B 5K3 | Email: info@renewablecities.ca | Telephone: 778-782-8851 | Website: www.renewablecities.ca

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OVERVIEW

Since COP21 was held in Paris in December 2015, local governments have gained greater global attention for taking bold steps in combatting climate change. These steps are critical if the nations that signed onto the Paris Agreement are to meet their commitments. Renewable energy is a powerful tool for reducing GHG emissions and local governments that make 100% renewable energy targets show political leadership and empower municipal staff to develop comprehensive plans for their community energy use in electricity, heating/cooling, and transportation.

This dialogue was the first of its kind in North America where municipalities could learn from each other and discuss the process, challenges, and opportunities of setting 100% renewable energy targets and planning how to reach them. It is the product of a partnership that combines the technical expertise of ICLEI USA, Sierra Club's experience working with American cities on 100% renewable energy and Renewable Cities' skills in dialogue facilitation. All three organizations are deeply committed to amplifying the leadership cities are showing in transitioning to renewable energy, as demonstrated by San Francisco, whose Department of Environment joined our organizations to host this dialogue.

Participants included sustainability and energy managers, city managers, city planners, economic development officers, and public officials (including mayors). They represented 19 unique municipalities that ranged from

small to large, from rural to urban centres, and came from the U.S. East Coast, West Coast, Midwest and from Canada. The list of participants is included in Appendix B.

DIALOGUE PROCESS

A three-day engagement, the dialogue began with a working dinner on July 10, 2016 and continued through the morning of July 12, 2016. San Francisco County Supervisor Scott Wiener and Deborah Raphael of San Francisco's Department of the Environment welcomed participants to San Francisco and shared their reasons for supporting this unique event.

The evening was designed to establish an inspiring, dialogic tone, but also stirred up a little city-to-city competition spurred by four participants who accepted an invitation to "pitch" the decision to transition to 100% renewable energy. Out of this playful engagement, four very diverse, equally valid rationales emerged that illustrate the reasons for shifting to renewable energy:

- *Cities have an imperative to transition to renewables because scientific evidence shows that fossil fuel combustion is a primary contributor to climate change.*
- *Cities have the power to stimulate innovation in clean technology by setting aggressive renewable energy targets.*
- *Cities are where renewable energy can become the new normal, visible in everyday*

life, as much at the public libraries and schools as in the planning departments and City Council meetings.

- *Cities cannot wait for perfect solutions; they need to be ready to test good solutions and learn from them.*

Following inspiring messages by four of their peers, participants were asked to consider the question, which would frame the dialogue process for the following day:

If you could change one thing that would allow you to set your city on the path to transitioning to 100% RE, what would that be?

The following day was devoted to plenary and small table discussions. Participants learned from industry leaders, non-governmental organizations, researchers, and representatives from cities leading the transition to 100% renewable energy. They worked in small groups to uncover the challenges and opportunities that come with a 100% renewable energy target and shared the results of their discussions in plenary for consideration by the whole group.

The dialogue converged on specific challenges brought to the table by each of participants in the “Consultant Circles” in which they reflected on the question above and presented their unique challenges and gave feedback on each other’s challenges. This method helped to reveal opportunities to learn from prior experiences of others who have already worked through similar issues, but the range of perspectives offered by the group also led to generation of novel solutions

to new problems.

At the end of the day, participants were asked to rate their experience with the dialogue planning and process and the quality of the materials and presentations provided. In their evaluations, they indicated the dialogue was very valuable and that they would welcome more dialogue opportunities like this one. More details of the analyses are provided in Appendix D.

On the final day, a small selection of the participants took the opportunity to tour some unique projects in San Francisco. The sites were selected as demonstrations of how equity can be achieved through community renewable energy projects that build local skills, create local jobs, and develop local economy. A detailed agenda is provided in Appendix A.

The following sections are presented chronologically, as the participants experienced the dialogue. They provide high-level summaries of the discussions and feedback that was collected. The report concludes with commitments the participants made to each other and the next steps the partners plan to take to build on the momentum of this unique opportunity.



“These tours are critical to the process of cities building a network. The opportunity to learn together, in addition to being able to share their expertise is exceptionally powerful—and underrated.” - Elizabeth Doris, NREL



Apple's new "Campus 2" in Cupertino, CA

LESSONS FROM THE PRIVATE SECTOR

Highlighting the importance of private-public relationships, Apple's Vice President of Environment, Policy and Social Initiatives, Lisa Jackson, opened the dialogue. Having started her career at the EPA, Jackson described her role at Apple as an indication that good business and a commitment to fight climate change are not at odds. Without the opportunities to "vote with our dollars" and choose to buy renewable energy, Apple is building its own renewable energy plants. Currently at 400 GW worldwide, the company's electricity use will be 100% powered by renewables by 2020. Key actions the company is taking include:



- Investing in energy efficiency, e.g. Apple has reduced its energy use in Japan by 200 GWh;
- Working with utilities to be able to sell renewable energy back to the grid, e.g. Duke Energy; and
- Working with partners along their supply chain to help them make the transition, e.g. Foxconn.

Speaking about actions that lie outside of Apple's direct sphere of influence, Jackson noted the importance of:

- Putting a price on carbon to stimulate a free market push for a clean energy economy;
- Modernization of grids to be smart; and
- Enacting policies that ease access to renewable energy for businesses.

Apple's commitment to renewable energy is culminating in its new Cupertino, CA headquarters. Mike Petouhoff, Apple's Director of Renewable Energy, told participants about the company's plans to invest in hydrogen fuel cell batteries and methane capture. "This is the grid of future, not just renewable but the grids being interactive and quite responsive."

LESSONS FROM CITIES

Michael Small, Executive Director of Renewable Cities invited Andrea Reimer, Vancouver City Councillor, and Barbara Hale, Assistant General Manager of Power at the San Francisco Public Utilities Commission, to join him in a panel discussion. Reimer and Hale opened with descriptions of the strategies their respective cities designed to commit to and reach their 100% renewable energy targets.

VANCOUVER

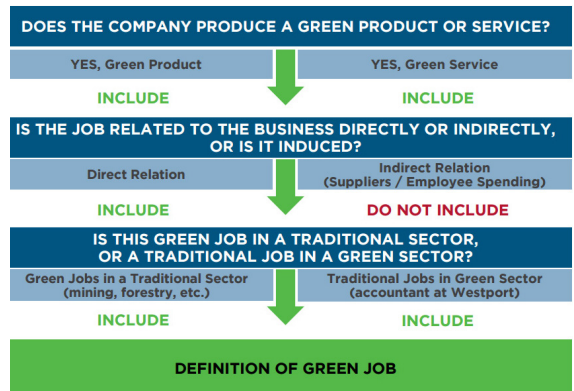
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Coming from her long experience with Vancouver’s goal to be the greenest city in the world (as laid out in the Greenest City Action Plan), Reimer briefed participants on the city’s path to its Renewable City Strategy (RCS). The RCS maps a path to 100% renewable energy used by the community within the city boundaries in all three of its primary energy use sectors: electricity, heating/cooling, and transportation. Among the challenges Vancouver faces, Reimer ranked the task of convincing other cities to transition to 100% renewable energy among the top priorities. With limited authority to mandate or finance an energy transition, Vancouver’s most important strategy is rooted in collaboration with partners and engagement with citizens.

That said, consultation was limited to how the city might reach its goal, a target of 100% was non-negotiable, according to Reimer. Reimer argued that new green jobs are the reason behind Vancouver currently being Canada’s fastest growing economy. She also argued that energy efficiency is the most important “source” of energy for a 100% renewable future, especially given the existing natural gas distribution network. This changed the perspective of one participant who reported, “My definition of energy efficiency was challenged/changed by the Vancouver interpretation.”

Vancouver’s methodology for classifying green jobs is represented by the following figure:



SAN FRANCISCO



Barbara Hale spoke from the perspective of the City’s municipal power utility (San Francisco Public Utilities Commission, SFPUC). At the outset of her presentation, she made an important distinction between being committed to a 100% renewable energy goal versus San Francisco’s stage of actively implementing projects—San Francisco is not only saying it will transition to 100% renewable energy, it is doing it. She also pointed out that the city’s airport counts among SFPUC’s customers, which adds a significant demand load on the electricity system.

SFPUC recently launched CleanPowerSF with the mandate to reduce GHGs while making sure electricity remains affordable and beneficial to the local community. One of its strengths is that the renewable energy CleanPowerSF sells is sourced from within the nine Bay Area Counties “bundled” with its renewable energy credits (RECs). According to Hale, bundling RECs insulates the City (and taxpayers) from any liability taken on by the program. Getting CleanPowerSF right meant it took a long time to implement but Hale warned other cities not to “let the perfect be the enemy of the good.”





WHAT A 100% RENEWABLE ENERGY TARGET WOULD MEAN

6

Having heard from two of North America's leading cities, Vancouver and San Francisco, the participants were invited to consider three guiding questions:

- *What would it mean to you for your city to transition to 100% renewable energy?*
- *Where are your cities in planning for 100% renewable energy relative to San Francisco and Vancouver?*
- *Where would you like to be relative to the planning of these two leading cities?*

This exercise gave the participants a chance to consider what setting a 100% renewable energy target would involve in their own jurisdictions. They discussed their current energy mixes and planning frameworks and how a 100% renewable energy target would fit. Seven priorities emerged from the conversations of the table groups:

Assessment: The participants said that cities need to understand what they are starting with and look for opportunities that will result in the greatest impacts. To begin, cities need to take stock of what is and what is not within their scope of direct and indirect control. They need to assess policy gaps and overlaps with policies at other jurisdictional levels. Participants also identified opportunities, such as working with partners along their supply chains. And, local governments need to

develop metrics and strategies that help them monitor progress along their path to 100% renewable energy. Participants also pointed out the importance of understanding how utilities and regulators relate to each other. They also said that cities need to help balance the needs of incumbent energy industries with the objectives of a 100% renewable energy target.



Collaboration: All of the table discussions participants emphasized the need for an “all sector approach” between municipalities, for example through public-private partnerships (PPPs), across jurisdictional levels, with private sector, and in cooperation with utilities and regulators. Cities make long-term decisions and they need to include their communities; participants viewed collaboration as a means to counter entrenched interests, which can lead to behaviour change.

Engagement: Frequently, participants listed demonstration projects as effective for communicating what is possible; they “make invisible choices visible,” as one

participant phrased it. They also said cities need to develop strategies for conveying their rationales for transitioning to 100% RE in a range of ways—from branding to education—that connect to a range of audiences and cultures. Some examples include providing information to low-income housing authorities about the cost savings that come from energy efficiency improvements or informing policy-makers that transitioning to 100% renewable energy creates local jobs, stabilizes energy prices, and produces health benefits.



Prioritization: Participants from cities that have 100% renewable energy targets advised that energy decisions should be made easy for consumers; to first focus on what the city controls; and to “get over the insignificant battles,” in other words fight for the actions and decisions that matter most. They said cities need to understand the values held true by their community members. For example, a city should try to understand whether equitable economic development or equitable access to renewable energy is more important and surface biases such as local loyalties or desires to maintain the status quo. They said cities need to work collaboratively to define what renewable energy sources the community is willing to accept but that they need to prioritize fuel-switching (e.g. eliminating fuel oil for heating and supporting electric vehicles and renewable fuels). Participants concluded that they need to make it easy for decision-makers to make the right decisions and to develop suitable frameworks.

Creativity: The groups generated a range of ideas for innovation. One recommendation was to embed the 100% renewable energy

narrative into existing climate action, deep decarbonization, transportation, zero waste, and other sustainability-related plans. Participants also suggested cities revise their building codes (those that have them) such that they require net-zero energy construction. Developing new finance mechanisms, such as impact investment for community projects or operating revolving loans, was also suggested, but more generally, participants said cities need to “make the economics work” and include climate action in their economic development plans. Participants also noted that cities could look for innovative ideas from the private sector, which is increasingly implementing renewable energy projects.

Leveraging: Participants listed tools that are already available to cities and can be used towards achieving 100% renewable energy. Some of these tools include the capacity to:

- Issue building ordinances
- Bundle programs and apply them to existing building stock
- Develop Community Choice Aggregation (CCA) programs (in states where possible)
- Design incentive programs that target behaviour change by renters
- Participants suggested cities need to support local energy generation and technology development, in general.

Taking action: Participants want cities to “take the wheel,” to take back control and ownership. They said cities need to set hard deadlines, write the business plan *and* framework based on what they want to achieve, and believe that “the technology will get there.” Knowing that cities face many competing issues, participants encouraged each other to put the target at the forefront.



100% RE IS NOT ONLY POSSIBLE BUT BETTER

Once the participants had a chance to voice their municipality's planning goals and frameworks and generate ideas for transitioning to 100% renewable energy, a panel of experts shared their ideas for implementing renewables. Jodie Van Horn, Director of the Ready for 100 campaign, moderated a discussion with Mark Z. Jacobson, Director, Atmosphere/Energy Program and Professor at Stanford University; Susannah Churchill, West Coast Regional Director, Vote Solar; and Renée Sharp, Bay Area Regional Director, GRID Alternatives.

Innovations that enable renewable energy:

Mark Jacobson's key message was that the notion of 100% renewable energy as a target is not complicated—the challenge lies in the timeline. He also noted that the sophistication of the natural gas network will complicate the transition away from the fuel and suggested cities focus on district energy as a way to break down the problem. Fleshing out compelling arguments for electrification, Jacobson posited that such measures would cut power demand by 32% in fossil fuel mining, refining and transporting and would temper fluctuating demand loads.

Energy storage is key to meeting peak loads and he argued that the expense of batteries is offset by the health and social benefits of transitioning away from combusting fuels.

Jacobson pointed to the Drake Landing Solar

Community¹, just outside of Calgary, AB, where homes are heated with solar energy that is stored underground until needed. He described a related solution in operation at Stanford in which solar energy is stored underground as ice and used to cool building spaces when needed.

What about biofuels? Recognizing that rooftop solar can only meet 15% of our energy needs, Mark Jacobson argues in favour of both renewable and clean energy; he says that excludes biofuels because of their contributions of GHGs and air pollutants. Not all participants agree; in the post-dialogue surveys, six participants explicitly listed some form of biofuel in their city's 100% renewable energy profile. Apple is interested in anaerobic digestion of bio-matter as a solution to reduce solid waste and to capture and sequester the methane released. Vancouver uses the UN definition of renewable energy, which classifies biofuels as renewable.

One participant asked whether impact investing is an effective means to facilitate implementation, and the panel referred the participant to the DOE's Sunshot Initiative that was launched recently to make the market more solar-friendly. Another asked how to electrify heavy-duty transport, and

1- <http://news.stanford.edu/2015/11/23/plan-energy-storage-112315/>

the answer may have come as a surprise to some: It is technologically straightforward—hydrogen fuel cells for trucks, trains, and electric trucks—but according to Jacobson it is the cities that need to mandate the shift and port authorities to favour clean, renewably powered transport.



Renewable energy that enables people:

Renée Sharp of GRID Alternatives and Susannah Churchill of Vote Solar shared their expertise in developing renewable energy systems that benefit low-income communities and communities most detrimentally impacted by the current energy system.

GRID Alternatives brings together community partners, volunteers, and job trainees to install solar power for low-income families, providing energy cost savings, valuable hands-on experience, and a source of clean, local energy. GRID's model is also designed to help connect people from underserved communities to jobs in the burgeoning solar industry, according to Sharp. She also commended San Francisco for requiring a minimum proportion of locally-hired workforce.

Vote Solar's primary role is to advocate for beneficial rate structures, net-metering, and community-shared solar resources. Among the social and environmental benefits of solar energy, Churchill listed the benefit of saving water when natural gas plants are shut down because they are water-intensive.

The panellists suggested several actions cities could take to accelerate renewable energy implementation, many of which highlight San Francisco's leadership. Some of San Francisco's notable actions include:

- Streamline the permitting process: The State of California has published a guidebook to help cities streamline their permitting processes for solar²; the DOE's SolSmart program also provides assistance with permitting;
- Develop a CCA: In states where CCAs are legal, communities can choose to apply them to procure 100% renewable energy;
- Create a solar incentive program, such as GoSolarSF, which provides incentives for low income and not-for-profit customers; and
- Issue an ordinance that requires solar on the rooftops of new buildings.

According to the US Department of Energy: "CCA is a state policy that enables local governments to aggregate electricity demand within their jurisdictions in order to procure alternative energy supplies while maintaining the existing electricity provider for transmission and distribution services."³ Or, as one participant put it, "CCA provides the opportunity to reimagine the electric grid."

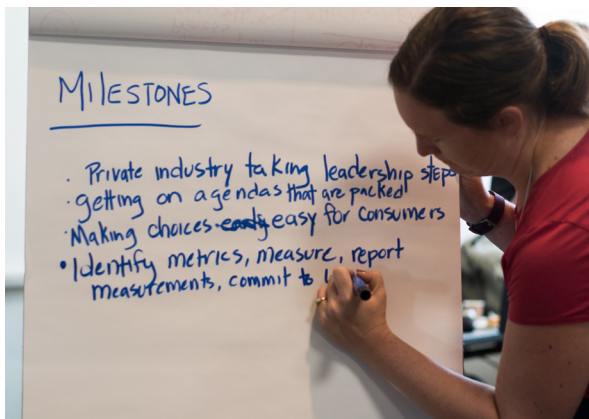
Citing a recent win by a broad coalition of tribes, schools, businesses, and farmers that Vote Solar led, Churchill encouraged the participants to write letters to the energy regulators and other levels of government and be interveners in hearings to ensure their cities' perspectives are included in the public record of the decision.

3- <https://energycenter.org/permitting/guidebook>
2- http://apps3.eere.energy.gov/greenpower/markets/community_choice.shtml

CONSULTANT CIRCLES

Recognizing the wealth of experience in the room, participants were invited to consult with their peers and expert panellists. Each participant presented a challenge to others at their table who took on a “consultant” role and gave feedback and advice on the challenge. The consultant circles were useful to participants because they were able to discuss their own projects and learn from the other challenges brought to their tables.

The participants presented a range of challenges that their cities face in transitioning to 100% renewable energy, but the most frequently cited challenge was about working with public utility commissions (PUCs). The following summaries organize the individual challenges according to common themes that emerged across the five table discussions.



CCAs and PUCs: At multiple tables, participants discussed how to work with PUCs and how they could be modernized so as to accelerate a clean energy transition. They were concerned with how Customer Choice Aggregation can thrive under the governing authorities of public utility commissions (or regulatory bodies, more generally). Currently, cities lack the legal capacity needed to navigate PUC processes but PUCs also lack technological capacity to regulate emerging renewable energy systems, according to one group of participants.

Another challenge discussed was about the cost of Power Charge Indifference Adjustments (PCIA, also known as “exit fees”), which are applied to the bills of CCA customers, and the lack of transparency in how they are calculated by the utilities. PUCs have the opportunity to play a more active role in the rulemaking process by enabling transparent communications around charges and fees for energy providers.

Although PCIA's were often raised as barriers during the dialogue, one participant pointed out that although “CCA's are building [exit fees] into their business models but their rates are still working out to be less than those of the utility.”

Ideas for easing the transition to CCAs included allowing a mix of short through long-term contracts, more specifically, by holding unbundled renewable energy certificates until a contract is prepared. The recently reformed Pennsylvania PUC model was noted as a good example for transitioning CCAs in. Resources that the groups discussed included: Nonproliferation Policy Education Center (NPEC); The Utility Reform Network (TURN); Natural Resources Defense Council (NRDC); American Council for Energy Efficient Economy (ACEEE); and Mayors National Climate Action Agenda (MNCAA).

Measuring progress: One of the challenges presented to the consultants was how to develop a common framework to measure progress in a way that is replicable. Participants suggested the municipality engage researchers and recognize the institutional barriers to clean energy. For example, one suggestion was that “cooperation” with utilities equates to forcing utilities into a CCA model. An idea to counter an apparent lack of consistency between state and regional

leadership is to reframe the apparent discord as a form of energy independence.

Improving building regulations: Two different regulatory strategies were suggested for improving energy efficiency and decreasing building emissions:

- *Change the building code to reflect the principles of “green carbon”*
- *Redesign the efficiency standard (example given was California Title 24) to require least-cost GHG reduction (currently least-cost energy use)*

In pursuit of green buildings, the participants recommended designing outreach and incentive programs for the local builders. For example, cities could host building competitions that could meet certain energy efficiency standards such as those set by Green Globes, a green building rating system.

Another suggestion was to redesign efficiency standards in terms of GHG reduction instead of energy reduction (one participant suggested first studying the impacts of this shift). They recommended developing a scoring system to support it and giving legislative sanction to building a demonstration project.

Transitioning the heating sector to 100%:

One participant brought forward the challenge of how to mandate zero natural gas by 2050 in the heating sector. One suggestion was to frame the transition away from natural gas in terms of being strategy to improve safety (e.g. to prevent another explosion like in San Bruno, CA, to eliminate the impacts of fracking, methane leaks, etc.). They also suggested conducting a survey to better understand who uses gas, how much and for what purposes and legislating higher premiums for insurance against gas leaks. One alternative to using natural gas is using waste heat captured from sewer lines, for example.

Another participant asked for ideas on how to electrify heating systems. The participants suggested incentives to encourage a switch to

electric cooking appliances and recommended building microgrids to manage the burden of the additional load. They also noted that the Urban Sustainability Directors Network (USDN) has innovation funds.

Resource allocation: One participant indicated that a recent review by the city staff revealed a much greater proportion of emissions was attributable to buildings and transportation than to waste. This prompted a discussion about transitioning some of the solid waste and recycling staff to the sustainability team and a suggestion to investigate how other cities allocate their staff, potentially with the help of USDN resources.

Collaboration and communication: Another participant presented the challenge of how to get entities that have different priorities working together rather than in opposition. Suggestions ranged from mandating collaboration, such as through city-corporate financing, to forming an internal green team that includes representatives from every department.

In a related challenge, a participant asked how to raise the sense of urgency about the need to transition to 100% renewable energy and inspire political and public will. Some communications ideas included making a documentary, hosting focused discussions tailored to the interests of various groups (such as affordable housing advocates), and hosting friendly competitions. Engagement with the major energy users in the city was also raised as a strategy. Rochester, MN and Oxford, ON were offered as examples.





RESOURCES THAT CAN HELP CITIES MAKE AND MEET 100% RE COMMITMENTS

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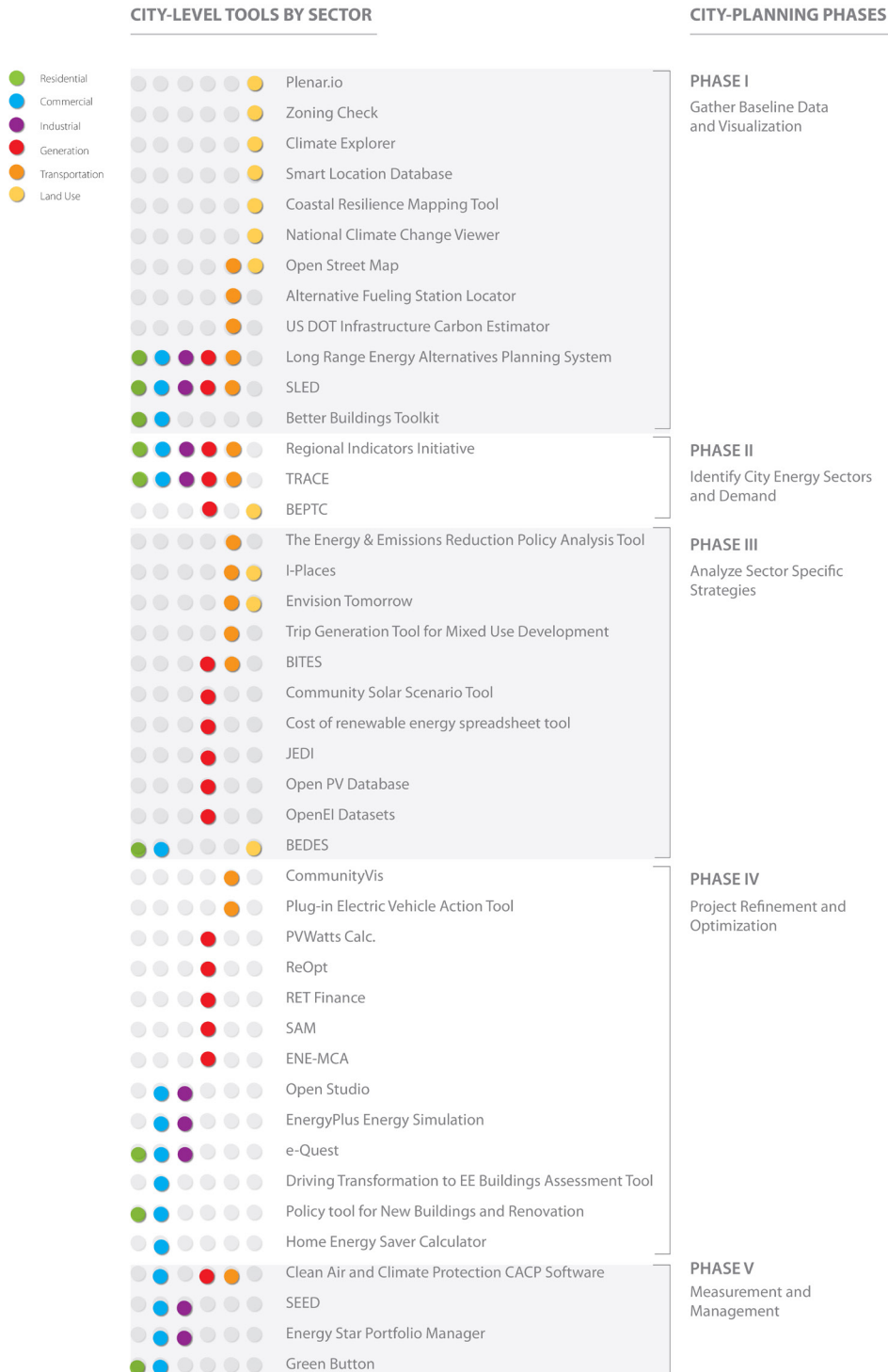
Leading up to the dialogue, participants received a brief outline (see Appendix C) of the myriad resources available to them by: ICLEI Local Governments for Sustainability and ICLEI USA; the Carbon Neutral Cities Alliance (CNCA); the GO100RE campaign; the US Department of Energy (DOE); and STAR Communities (where STAR stands for Sustainability Tools for Assessing and Rating). From a local to global focus, these tools serve a variety of purposes as collaboration networks, planning frameworks, energy and emissions inventories/reports, databases and data analysis, and a community rating system. One of the dialogue panels was dedicated to discussing these with the participants. All of the materials presented during the dialogue are accessible online, as noted in their respective summaries below.

ICLEI: Riana Ackley highlighted ICLEI USA's technical assistance capacity and just a few of its online tools, including Clearpath, carbonn Climate Registry, and Solutions Gateway. Ackley also shared information about ICLEI International's 100% Renewable Energy Cities & Regions Network. For further information and learn about other program's ICLEI offers refer to: <http://www.iclei.org/activities/agendas/low-carbon-city/iclei-100re-cities-regions-network.html> and <http://www.iclei.org/activities/agendas/low-carbon-city.html>.



National Renewable Energy Laboratory (NREL): Liz Doris spoke on both NREL and US DOE data, analysis, and technical assistance. Data available includes the state and local energy data website, in which 23,400 cities can gain access to sector specific energy use data (and what other cities are doing) and the Utility Rate Database. Tools available include ReOpt (evaluating the economics of RE projects across large areas), SAM (evaluating financing and technology options for clean energy), and a set of technical assistance tools (Solsmart, the Solar Technical Assistance Team, Clean Cities, DOE Tribal Technical Assistance, and WINDEXchange). Figure 1 on the next page summarizes the primary tools available at NREL and the US DOE.

Figure 1: Summary of NREL’s city-level tools by sector. For full program names and descriptions, refer to: <http://www.nrel.gov/research/publications.html> and <http://energy.gov/eere/slsc/state-and-local-solution-center> available at NREL and the US DOE.



CNCA: Johanna Partin described the CNCA as a peer network. Having carried out interviews with 20 cities and conducted an extensive review of their sustainability plans, CNCA produced infographics that outline each city's transition to a "clean energy future" available at <http://carbonneutralcities.org>

In her presentation, Partin highlighted the impact cities and large customers are having on traditional utilities, which haven't changed in 100 years. She recommended Track 0 (<http://track0.org/>) for tracking city and regional renewable energy targets.

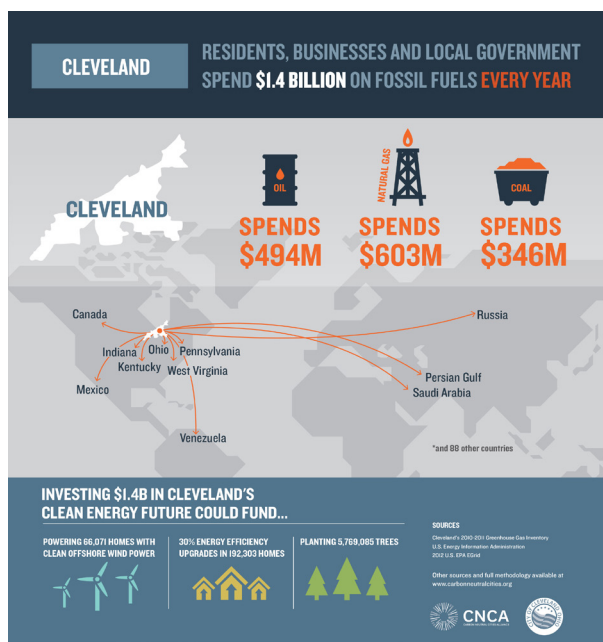
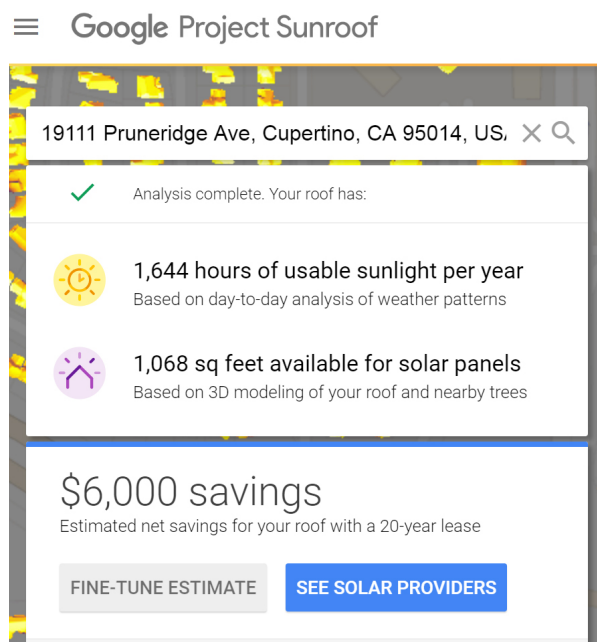


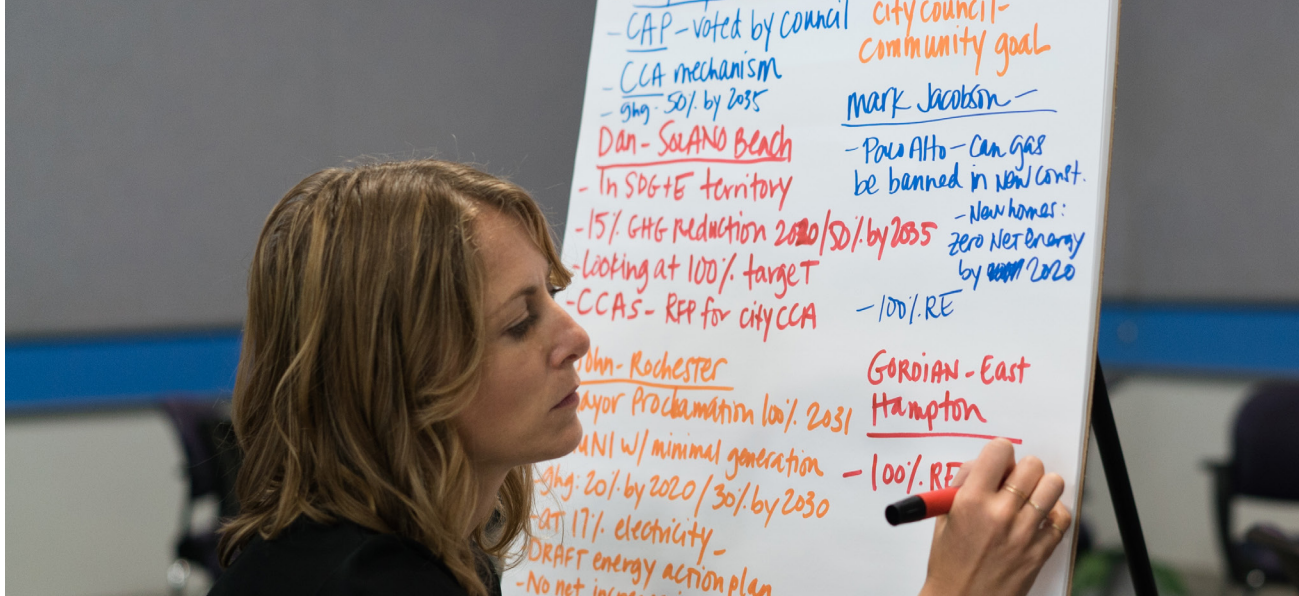
Figure 2: CNCA infographic to communicate the rationale for Cleveland, OH to invest in clean energy.

Project Sunroof: Nicole Lombardo described the project, explaining that it is based on Google's 3D data, which allows the program to project the size, shape, and direction of the shadows cast onto roofs throughout the day. Layered onto local information about energy costs, cities could use the tool to aggregate energy savings of installing rooftop solar. Google is interested in partnering with cities for their input into how to develop the tool in a way that is most useful for cities. An interactive demonstration is available at: <https://www.google.com/get/sunroof>.



Graphic: According to the Project Sunroof demo, the solar prospects look good for Apple's new Headquarters!

"What Project Sunroof does is make solar way more accessible for a large number of people. So important because it slashes "soft" costs that can make solar inaccessible to potential customers."
- Elizabeth Doris, NREL



CLOSING WORDS

This dialogue was designed to help participants explore what it would mean for their cities to be powered by 100% renewable energy. They worked through the hurdles and opportunities that come with making a political commitment, legislating a target, and finally implementing a 100% renewable energy plan. Participants were given the opportunity to discuss the challenges specific to their cities and helped each other work towards clean, equitable energy systems, and learned about programs, research, data, and resources available to support them. They also heard about corporate innovations and their reasons for transitioning to 100% renewable energy.

Participants reported interesting shifts in their knowledge and thinking that took place as a result of the dialogue through a combination of pre- and post-dialogue surveys. To follow are some of the observations they shared:

Has your definition of renewable energy changed?

“Clean ‘comma’ renewable!”

“Yes, and I have even more questions about renewable now!”

“Not the definition, but saw more paths to employing it.”

“Yes, I was focused on electricity only and

learned there is more to it than that. It was a great learning experience.”

“My definition of energy efficiency was challenged/changed by the Vancouver interpretation.”

How has your understanding about what it would mean for your city to shift to 100% RE changed?

“A better understanding of the need to phase out natural gas.”

“I saw several new tools, but mostly the dialogue provided new connections and ideas about how to realize the goal.”

“We’re not alone. It’s an opportunity to be a leader.”

“It seems realistic given time and mental shifts.”

“The shift seems more likely in the long run. The complexity of getting there is maybe clearer.”

“It was good to talk to other people from across the country and Canada to get their perspectives and struggles/successes.”

“When I arrived, I felt it was an unachievable goal. I now see there are possible ways, although they won’t be easy.”

Peer commitments

During the final round, participants were asked to name what they can give to each other and what they need from the community of practice that was emerging from the dialogue. Participants frequently commented that they saw value in this dialogue workshop, where they could not only hear fresh ideas, but also understand the work that has still to be done.

Participants pledged to:

- *Work together to help each other*
- *Pressure other stakeholders to become allies*
- *Continue to learn from each other through future meetings and other communications*
- *“Spread the Gospel,” as one participant described the frequent pledge to share with others what they learned through the dialogue*
- *Apply their passion and commitment to inspire others*



Participants expressed the need for:

- *Ways to stay in touch through a network or communications, but also future dialogues.*
- *Case studies, such as what other cities are doing but also consumer market innovator stories and “never shy away from sharing mistakes!”*
- *Help to pressure federal governments to take actions such as putting a price on carbon that reflects its true cost*
- *Equity to remain top of mind, “this isn’t an accounting exercise, this is about human beings, how do we keep them at the fore.”*

In his closing words, Barry Hooper, Green Built Environment Manager, City of San Francisco, commented on how different the day was from his normal milieu and described his dialogue experience as inspiring.



“At the city level, the buck stops here. There aren’t really excuses, we can’t run off to a state or federal legislator as we have to be responsive immediately.”



“Crystallizing a vision of 100% RE but it’s daunting to think about turning that vision into an implementation plan; we will need a lot of help.”





Partner commitments

To continue the momentum of this dialogue, the organizing partners will continue to work together to keep participants connected to enable continued peer learning and support as their cities progress in transitioning their energy systems. In addition, each partner is committed to doing the following to assist cities in making the transition to 100% Renewable Energy.

Renewable Cities will be hosting its signature event, Global Learning Forum 2017, May 17-19 in Vancouver. The Forum gathers 400 participants from around the world to discuss how cities can meet their electricity, heating/cooling, and transportation needs with 100% renewable energy. This Forum will allow North American cities to pursue the same issues raised in this dialogue at greater length with an international group of peers and experts.

Sierra Club plans to continue working to achieve a 100% renewable energy economy by activating widespread public demand and engaging energy decision-makers at all levels. Through its Ready for 100 campaign, Sierra Club and its members will continue to

work with cities ready to commit to 100% renewable energy or that are implementing projects towards that target.

ICLEI International provides technical support to members of its Global 100% RE Network and welcomes new members to join. As discussed in this report, ICLEI has many programs and online tools that are open to use by municipalities around the world.

Final thoughts

This community of practice represents a commitment that the partners are prepared to support to the best of our abilities. We look forward to watching this group of leaders grow as more and more cities commit to and implement 100% renewable, clean, equitable energy. For further information about this event or other activities being carried out by the partners or cities, please contact them directly.



APPENDIX A: AGENDA

Day 1: Welcome and Working Dinner

- 4:30 PM—Registration and reception
- 5:00 PM—Welcome to San Francisco by Supervisor Scott Wiener and Deborah Raphael, SF Environment
- 5:20 PM—Sierra Club’s opening words by Michael Brune
- 5:30 PM—Renewable Cities’ opening words by Michael Small and round of introductions
- 7:15 PM—ICLEI USA’s opening words by Riana Ackley
- 7:20 PM—4 City Pitches for 100% Renewable Energy (3 minutes each):
- Rochester, MN
 - Oxford County, ON
 - Del Mar, CA
 - San Diego, CA
- 8:15 PM—Final Thoughts and Parting Challenge (Facilitator: Betsy Agar)

Day 2: Dialogue at the PG&E Pacific Energy Center

- 08:25 AM—Session Opening (Gordian Raacke, East Hampton, NY)
- 08:30 AM—Opening Remarks (Lisa Jackson, Vice President of Environment, Policy and Social Initiatives, Apple Inc.)
- 09:05 AM—Introduction to the day by Betsy Agar
- 09:25 AM—Leadership panel moderated by Michael Small. Including: Barbara Hale, Assistant GM, Power at SF Public Utilities Commission and Councillor Andrea Reimer, City of Vancouver, Canada

- 10:00 AM—Small table discussions
Guiding Questions:

- *What would it mean to you for your city to transition to 100% renewable energy?*
- *Where are your cities relative to San Francisco and Vancouver?*
- *Where would you like to be on that scale?*

- 10:45 AM—Break

- 11:00 AM—Panel: 100% RE is not only possible but also better. With Mark Jacobson, Director, Atmosphere and Energy Program, Stanford University; Renée Sharp, Bay Area Regional Director, GRID Alternatives; and Susannah Churchill, Regional Director – West Coast, Vote solar

- 01:30 PM—Peer-to-peer learning: Exploring strategic Issues
Guiding Question: If you could change one thing that would allow you to set your city on the path to transitioning to 100% RE, what would that be?

- 03:15 PM—Tools and resources available to cities moderated by Riana Ackley
ICLEI: tools and network (Riana Ackley)
NREL: technical support/financial resources (Liz Doris, NREL)
CNCA: tools (Johanna Partin, CNCA)Google: Project Sunroof (Nicole Lombardo)

- 04:00 PM—Plenary and closing round facilitated by Betsy Agar

- 05:00 PM—Next steps facilitated by Kassie Rohrbach

- 05:10 PM—Closing words

Day 3: Mobile Workshops

09:30 AM—Energy equity example:

Features: 20-unit multifamily building. PV, batteries, and 2 EV charging stations. Creative ownership and financing approach developed by Power Tree to bundle solar, batteries and EV chargers for multiple benefits and revenue streams.

11:00 AM—San Francisco Public Utilities Commission

Features: LEED Platinum high-rise new construction, PV, onsite wastewater treatment and reuse, kinetic sculpture on vertical façade above entry.

12:00 PM—Closing facilitated by Kathryn Sheps

APPENDIX B: PARTICIPANT LIST

Name	Position	City/Organization
Rachel Bigby	Sustainability Coordinator	Beaverton, OR
Ben Bartlett	Director, Strategic Partnerships	CalCEF
Johanna Partin	Director	Carbon Neutral Cities Alliance
Margaret Hansbrough	Energy Engagement Manager	Chicago, IL
Oliver Kroner	Sustainability Coordinator	Cincinnati, OH
Daniel Hamilton	Sustainability Manager	City of Oakland, CA
Matthew Gray	Director, Mayor's Office of Sustainability	Cleveland, OH
Donald Mosier	City Councilmember	Del Mar, CA
Thomas Herrod	Climate & GHG Policy Analyst	Denver, CO
Norm Weaver	Sr. Energy Services Engineer	Fort Collins, CO
Nicole Lombardo	Business Development, Project Sunroof	Google
Yolanda Baumgartner	Chair, Sustainable Hanover	Hanover, NH
Robert Houseman	Director of Planning and Zoning	Hanover, NH
Peter Kulbacki	Director of Public Works	Hanover, NH
Elizabeth (Liz) Doris	Senior Project Leader, Policy and Technical Assistance	National Renewable Energy Laboratory
Jamila A. English	Sr. Policy Analyst- Office of Oakland Vice Mayor Annie Campbell Washington	Oakland, CA
Kiran Jain	Chief Resilience Officer	Oakland, CA
Alexandra McGee	Community Power Organizer, MCE	Marin County Energy
Renée Sharp	Bay Area Regional Director	GRID Alternatives
Trevor Birtch	Councillor	Oxford County, ON
Jay Heaman	Special Projects	Oxford County, ON
Ariel Lattanzi	Resilience Analyst	Pittsburgh, PA
Gordian Raacke	Executive Director	Renewable Energy Long Island
Samantha Carr	Sustainability Specialist	Richmond, CA
Adam Lenz	Environmental Manager	Richmond, CA
John Helmers	Director of Olmsted County Environmental Resources	Rochester, MN
Erik Caldwell	Director of Economic Development	San Diego, CA
Kacia Brockman	Renewable Energy, San Francisco Department of the Environment	San Francisco, CA

Name	Position	City/Organization
Jason Fried	Executive Officer	San Francisco Local Agency Formation Commission (SFLAFCo)
Barbara Hale	Assistant General Manager, Power	San Francisco, CA
Barry Hooper	Green Built Environment Manager	San Francisco, CA
Debbie Raphael	Director, San Francisco Department of the Environment	San Francisco, CA
Scott Wiener	County Supervisor	San Francisco, CA
Dan King	Assistant City Manager	Solana Beach, CA
Peter Zahn	Deputy Mayor	Solana Beach, CA
Mark Z. Jacobson	Director, Atmosphere/Energy Program	Stanford University
Josh Huneycutt	Analyst for the SunShot Initiative, Solar Energy Technologies Program	U.S. Department of Energy
Jonah Steinbuck	Policy Advisor	U.S. Department of Energy
Andrea Reimer	City Councillor, Chair of Policy and Strategic Priorities	Vancouver, BC
Susannah Churchill	West Coast Regional Director	Vote Solar
Darryl Young	Director	Sustainable Cities Program

APPENDIX C: RESOURCE SUMMARY

Resource / Organization / Description	Further information
<p>100% Renewable Energy Cities and Regions Network</p> <p>ICLEI – Local Governments for Sustainability, member of GO100RE</p> <p>An inclusive, global community of practice that is open to leading cities, towns and regions working to realize the 100% Renewable Energy vision. Participating local governments commit to a transition to 100% RE, especially in electricity, heating/cooling, transportation and local government operations and ambitious energy efficiency measures. They systematically replace fossil fuels and/or nuclear energy with RE through a participatory, people-centered approach. These local governments also monitor and report their progress towards 100% RE using tools such as GRIP scenario modeling.</p>	<p>Type and scope:</p> <p>Network; Renewable energy and energy efficiency; Local governments, Global</p> <p>Site: iclei.org/activities/agendas/low-carbon-city/iclei-100re-cities-regions-network.html</p>
<p>Local Renewables Initiative and Model Communities</p> <p>ICLEI</p> <p>Network of model communities, resource communities, and observer communities. Members have access to a “10 Step” roadmap for successful action towards renewable energy and energy efficiency, as well as experts, the energy status report, and demonstration projects. Observer communities also have opportunities to showcase their work. Specific resources include the: Local Renewables Conference Series and Local Renewables Guide.</p>	<p>Type and scope:</p> <p>Network; Renewable energy and energy efficiency; Local governments, Global</p> <p>Sites: local-renewables.iclei.org; local-renewables-conference.org</p>
<p>CNCA Framework for long-term deep carbon reduction planning</p> <p>CNCA (Carbon Neutral Cities Alliance)</p> <p>Members of the CNCA have identified energy supply, building energy efficiency, transportation, and waste as the urban systems key to achieving deep decarbonization. This resource is an exhaustive study of processes, strategies, practices, tools, and institutional structures cities have implemented, globally, and teased out specific decisions and actions that cities can take. Although the document is largely based on the work of CNCA members, it is publicly available for all municipal leaders.</p>	<p>Type and scope:</p> <p>Framework; Decarbonization of urban energy systems; Local governments, Global</p> <p>Site: usdn.org/uploads/cms/documents/cnca-framework-12-16-15.pdf</p>
<p>Criteria for a Sustainable Transformation to 100% Renewable Energy</p> <p>GO100RE</p> <p>Guide for broader planning strategies associated with transitioning to 100% renewable energy, community-wide. Both quantitative and qualitative, the criteria address: target-setting, implementation, and local institutions that enable the transition.</p>	<p>Type and scope:</p> <p>Framework; Renewable energy and energy efficiency; Local governments, Global</p> <p>Site: go100re.net</p>

Resource / Organization / Description	Further information
<p>Clearpath</p> <p>ICLEI USA</p> <p>ClearPath is a powerful, advanced web application for energy and emissions management. A cloud-based tool for cities to store data and collaborate with colleagues, with new features available as soon as they are online. Being free and having hundreds of nation-wide users of the community-scale inventory module, it is the most widely-used software tool for managing local climate mitigation efforts in America.</p>	<p>Type and scope:</p> <p>Inventory; Climate and energy action plans; Local governments, USA</p> <p>Site: icleiusa.org/clearpath</p>
<p>Cities-LEAP (Cities Leading through Energy Analysis and Planning)</p> <p>US DOE, Office of Energy Efficiency and Renewable Energy</p> <p>Standardized, localized energy data and analysis to enable clean energy innovation and integration of strategic energy analysis into decision making. Through Cities-LEAP, cities: set climate or energy goals and prioritize and implement energy strategies. Cities see the impacts of energy action plans, learn from peers about city energy planning and best practices; and access credible data and analysis methodologies; which help them make data-driven energy decisions.</p>	<p>Type and scope:</p> <p>Data collection and analysis; Climate and energy action plans; Local governments, USA</p> <p>Site: energy.gov/eere/cities-leading-through-energy-analysis-and-planning</p>
<p>Shining Cities 2016</p> <p>Frontier Group</p> <p>Annual report on how smart local policies are expanding solar power in America. This is a resource that outlines the benefits of solar energy to and potential for cities, ranks US cities by their uptake (“stars” or “beginners”), provides case studies of policies in action, and lists specific policies decision-makers can use.</p>	<p>Type and scope:</p> <p>Annual report on solar in cities; Solar energy; Local governments, other government levels, USA</p> <p>Site: energy.gov/eere/cities-leading-through-energy-analysis-and-planning</p>
<p>STAR Communities (Sustainability Tools for Assessing and Rating)</p> <p>STAR Communities</p> <p>Used by local governments to assess their sustainability, this program addresses seven areas for achieving community sustainability: Built Environment, Climate & Energy, Economy & Jobs, Education, Arts & Community, Equity & Empowerment, Health & Safety, Natural systems, and Innovation and Process. Communities retain the rating for three years.</p>	<p>Type and scope:</p> <p>Rating system; Sustainability with specific components for green energy, energy efficiency in the built environment and transportation; Local governments, USA</p> <p>Site: starcommunities.org/certification</p>

APPENDIX D: DIALOGUE EVALUATION

Our purpose in asking these questions is to improve the process for future dialogues. Please indicate the extent to which you agree or disagree (1 = totally disagree, 7 = totally agree).

Please indicate your satisfaction with the practicalities of hosting this event:

Phone calls and emails during recruitment	1	2	3	4	5	6	7
Registration process was efficient and friendly	1	2	3	4	5	6	7
The food and facilities were satisfactory	1	2	3	4	5	6	7

Please indicate how well we prepared you for participating in this dialogue:

Dialogue materials provided clear, relevant, useful information	1	2	3	4	5	6	7
Facilitator provided clear explanations, guidance, and support	1	2	3	4	5	6	7
Presentations were clear and relevant	1	2	3	4	5	6	7

Please indicate your satisfaction with your experience participating in this dialogue:

Was there opportunity for learning and participating in groups?	1	2	3	4	5	6	7
Are you likely to participate in similar consultations?	1	2	3	4	5	6	7
Overall, the dialogue was worthwhile to me.	1	2	3	4	5	6	7



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