



OUTCOME REPORT

Kassel International Dialogue on 100% Renewable Energy Kongress Palais, Kassel, Germany **10-11 November 2015**

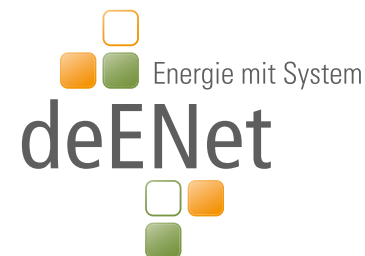
Betsy Agar (Renewable Cities, Centre for Dialogue, Simon Fraser University)
Pia Buschmann (deENet Competence Network distributed Energy Technologies e.V.)
Anna Leidreiter (World Future Council)



Organizers



Federal Environment Agency As Germany's main environmental protection agency, our task is to ensure that our fellow citizens have a healthy environment where they are protected against air, water and other pollutants to the greatest extent possible. Here at the UBA, we concern ourselves with an broad spectrum of issues, including waste avoidance, climate protection, and pesticide approvals.



deENet Competence Network distributed Energy Technologies e.V. is a network of actors in the field of technologies for decentralized energy and energy efficiency. It provides communities and regions with a platform for networking and know-how exchange to propel the regional energy transition and processes to mitigate climate change.

Partners



World Future Council brings the interests of future generations to the centre of policy-making. It addresses challenges to our common future and provides decision makers with effective policy solutions. In-depth research underpins advocacy work for international agreements, regional policy frameworks and national lawmaking, thereby producing practical and tangible results. In close collaboration with civil society, parliamentarians, governments, business, and international organizations, the WFC identifies "future just" policies around the world. The results of this research then feed into our advocacy work, supporting decision makers in implementing those policies.



Renewable Cities is a project of the Simon Fraser University Centre for Dialogues. The goal of Renewable Cities is to support cities through the transition to 100% renewable energy and energy efficiency by way of research-based dialogue, collaboration, and thought leadership.

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The partners of this KID are part of the Global 100% Renewable Energy campaign (Global 100% RE). This campaign is among the first global initiatives that advocate for 100% renewable energy. It emerged from a parliamentary workshop hosted by the World Future Council in the Danish Nordic Folkecenter in October 2012 and a side-event at COP18 in Doha, Qatar, which was hosted by the REN Alliance, and was officially founded at the beginning of 2013 at the Renewables 100 Pathways Conference in San Francisco by 10 international organisations. Today, more than 30 international, national, or regional organisations back this campaign.

Letter from Werner Niederle

Scientist - Unit Renewable Energies, German Federal Environment Agency

Whether climate change, air pollution, energy security, price volatility, or one of many other reasons to seek alternatives to fossil or nuclear fuels, renewable energy has proven to be the appropriate answer and has reached a tipping point. The United Nation's initiative, "Sustainable Energy for All," declares Renewable Energy Sources (RES) can resolve many of mankind's problems. In particular, wind and solar generated electricity shows the best promise in terms of mitigating environmental impact and overall sustainability. They are also market-ready and price competitive with conventional sources in most jurisdictions. Although the global share of these two renewable energy sources in energy deployment is still in the range of 4%, yet the growth rate in 2014 was 30% for photovoltaic and 16% for wind and should be expected to increase further. As such, even in large markets like Europe, USA, and China, wind and solar energy are the most promising. That said, the use of renewable energy sources requires a large number of relatively small units of generation. Furthermore, to meet overarching sustainability parameters—environment, resource utilization, etc.—it is necessary to reduce the overall consumption through efficiency; technology performance must evolve to minimize the number of generation units required.

Small units of heat or electricity generation from renewable energy are also more amenable to local decision-making. They also localize control over energy

production and distribution, thereby empowering local governments to make locally beneficial energy decisions. Stimulated by Germany's RES politics, the 100% RE-Regions Network now counts more than 150 members, including cities, communities, districts and counties, and many more are engaging in their own local energy transformations. Although Germany is often a frontrunner in this movement—at national and local levels, with unequivocal political direction—excellent examples of local energy plans are being developed around the world. Over and over again, we are seeing the transition to 100% renewable energy is not only feasible but happening.

But, renewable energy production needs space and cities and industrial parks don't have the space to build plants that would meet their energy demand. Already 50% of the world's population lives in cities, and it might reach 70% by 2050, raising the contribution to greenhouse gas emissions from cities even higher. To ensure a sustainable energy supply cities will require cooperation with sparsely populated neighboring regions to ensure the needed energy supply, which in turn helps develop their economies. In contrast, densely packed cities and industry parks present significant opportunities to apply technologies in energy efficiency. Decentralized, local energy generation markets will demand new ownership models that incorporate these new categories of energy producers and energy market drivers.

In this new energy world, local governments need opportunities to meet, exchange ideas, form coalitions, and learn from each other. In 2009, Germany's 100% RE-Regions Congress was created for the purpose of welcoming representatives from rural, suburban, and urban communities to gather alongside scientists and industry representatives. From the outset, the congress has always been seeking the exchange of information about international activities. Since 2012 the congress hosted international workshops dedicated to exploring local projects and experiences from a variety of contexts around the world. The growth of this international dialogue over the past years is yet another encouraging sign of rising international attention to this movement.

This year's Kassel International Dialogue (KID) offered the opportunity for peer-to-peer knowledge exchange and a dialogue between local, regional and national government representatives and legislators. The goals were to:

- Profile local and regional good-practice projects,
- Connect pioneers of 100% RE, and
- Share learnings by governments and policy makers from different governance levels.

Forty international participants were invited to join with representatives of German regional projects and industry who were attending the German 100% RE congress. KID catalysed new ideas and opportunities to build cross-border partnerships and networks between local governments.

The larger context of the work documented in this report must also be emphasized; it has been developed through a variety of occasions in 2015, including in a dialogue at UNFCCC's COP21 in Paris, and it is in the good company of 1000 mayors who have signed a pledge to support a transition to 100% renewable energy. The 100% RE movement of local energy plans is growing fast, but this also is evidence that there is urgent need to provide international platforms for exchange and network-building, similar to what KID provided.

The German Federal Environment Agency is honored to have supported the Kassel International Dialogue and the important work documented in this report would not have been possible without the facilitator, deENet e.V., and the cooperation and support of the Global 100% RE campaign, the World Future Council, and Renewable Cities. Therefore, we would like to express our gratitude for their excellent contributions toward the success of KID. Although this KID is actually still small, we hope it will grow fast so it can support local and regional energy transformation worldwide.

Werner Niederle



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1. A Global 100% Renewable Energy Movement

“The question is no longer whether the world will transition to renewable energy but rather how long the transition will take and how can the transition be carried out to maximize the benefits today and for future generations.”

With this good news, Harry Lehmann, General Director of the German Federal Environment Agency opened this year's Kassel International Dialogue (KID) which was dedicated to developing a roadmap that guides local governments—e.g. cities and regions—in transitioning their jurisdictions to 100% renewable energy.

The Kassel International Dialogue

KID brought together 40 local government representatives and practitioners from 10 countries and was part of Germany's annual 100% Cities and Regions Congress, which has been hosted by deENet and its partners in the City of Kassel since 2009. It followed up on several international policy dialogues

that have already been organized in the framework of the German congress. Eager to share Germany's local 100% renewable energy (RE) movement to the global 100% Renewable Energy community, a parallel event was launched at the fourth congress (2012), which was offered in English and designed to welcome an international audience. The 2012 international dialogue (facilitated by the World Future Council) focused on the 100% RE developments taking place in Europe, the USA, and globally at that time. Since then, international interest in 100% RE has grown yearly. The 100% RE Regions congress also benefited from the knowledge exchange and cooperation with international local governments and partners. In 2013, the congress hosted the European Renewable Energy Sources (RES) Championship, and in 2014, it served as the platform for launching the 100% RES Communities Label with representatives from local European governments. Six years after the congress first launched, the international dialogue component now draws participants from Europe,

Asia, Africa, South America, and North America. At KID 2015, participants were specifically invited to help shape a set of 12 criteria that have been developed based on the experiences of local governments that have ambitious renewable energy targets and have already begun the transition.

The fact that the international dialogue at the German 100% RE Regions Congress grew over the past years, is not a coincidence. As pointed out by Harry Lehmann, **100% Renewable Energy has become the new normal** and local governments, in particular, have been driving this hopeful transformation in recent years.

Local governments as pioneers

All over the Americas, Europe, Africa, Asia, and Oceania, jurisdictions are demonstrating that transitioning to 100% RE is a political decision and an ethical imperative. By pioneering this movement, local governments are incubators of regionally appropriate best practices and policies. Or, as Harry

Lehmann puts it: “While all these 100% RE champions have a common goal, they are all using different recipes to achieve it. Depending on whether you are in Mexico, China or Germany, local governments have different starting points.” Lehmann, the General Director of the German Federal Environment Agency also points out the importance of peer-learning and knowledge exchange: “Learning from these examples is therefore valuable not only to other local governments, but also to national governments and regional or transnational organizations, if the necessary global energy transition is to be achieved.” Speaking to the value of international collaboration, Harry Lehmann referenced the negotiations due to take place December 2015 in Paris between the Conference of Parties at the 21st United Nations Climate Change Conference (COP21). Lehmann clarified that while national governments set targets, legislate enabling policies, and measure and monitor progress, it is local governments that design strategies and take action.

Encouraging the dialogue between local governments

While no two cities are identical, nor could they implement the exact same energy plan, they do indeed tackle many of the same issues and are generally tasked with the same responsibilities: infrastructure development and maintenance, providing quality, reliable services, and ensuring a healthy, sustainable economy. Providing international local governments opportunities to gather and engage in collective dialogue allows them to draw ideas from a much wider variety of peers. Perhaps these local governments have a similar climate or geography despite their geographic distance; perhaps they are similar in their political or social contexts; or perhaps they retain similar control over their energy resources—without the opportunity to compare notes, local governments are limited to their own internal knowledge and cultural perspectives. A dialogue among a variety of international cities, towns, municipalities, etc. can lead to a holistic array of transferable learnings that individual case studies may not reveal, and local governments can adapt them to their own contexts in creative ways. This was also highlighted by Ana Marques, Senior Officer of ICLEI World

Secretariat's the Low-Carbon City Agenda: "Our experience in ICLEI clearly shows city's interest and need for more knowledge exchange, engagement and policy dialogue." To respond to this, members of the Global 100% RE campaign, including ICLEI, have initiated the Global 100% RE Cities and Regions Network.

At KID, Marques presented information about this inclusive network, highlighting that it is open to all cities, towns, and regions setting course towards 100% renewable energy and demonstrating that it is possible to realize this vision. She also noted the value of cities gauging where they are right now in an ambitious pursuit of renewable energy as a starting point for planning for 100% RE, "With ever more cities, communities, islands, states and countries joining the global 100% RE movement, there is a need for criteria and indicators that allow for measurement and assessment of policies and implementation, thereby providing guidance on what a sustainable transition to 100% RE entails."

Marques highlights that tools like carbon climate registry already provide a platform for local governments to report on local actions which can be further developed regarding the topic of 100% Renewable Energy.



2. 100% RE Champions and Local Government Leadership

Examples from around the world show that making the transition to 100% renewable energy is a political — not a technical — decision. The necessary technologies and knowledge already exist today. In a panel discussion, five local government representatives from four different continents discussed why local governments are transitioning to 100% Renewable Energy and what different approaches and strategies have been tested to achieve this transformation.

Panellists:

Detlef Gerdts of **Osnabrück, Germany**
Ian Neville of **Vancouver, Canada**
Kaoru Kobayashi of **Fukushima, Japan**
Kacia Bockman of **San Francisco, USA**
Aase Nyegaard of **Sønderborg, Denmark**

Each panellist delivered a short presentation on the policies and actions their respective governments are planning or have implemented for taking their 100% renewable energy

strategies from pledge to action.

Detlef Gerdts heads the Environment and Climate Protection department for the City of Osnabrück, Germany. Osnabrück's target of 100% renewable energy dates back to 2010 and has been part of municipal policy-making ever since. Currently more than 50 unique projects and planning or research endeavors are conducted and coordinated through the local Energy and Climate Protection Department. Gerdts explained how renewable energy production, energy efficiency and an overall sustainable economy have already become an important part of the 350,000 residents' everyday decision-making. More than 8,000 renewable energy plants are located all over the area. The region combines the strength of a rural landscape with plenty of natural resources, a robust economy, and modern agriculture. Indeed, Gerdts points out, the cooperation between the City of Osnabrück and its surrounding municipalities is crucial to achieve the 100% RE target: "To meet the energy needs of buildings, we must collaborate on developing energy projects with neighboring municipalities." As a city, Osnabrück has a rather dense infrastructure and does not have the capacity to generate enough energy to

meet its own demand. By investing in a rural neighbor that has great energy generation potential but lacks the necessary financial and human capital, a mutually beneficial cooperation helped to implement the vision. The key points Gerdts brought out in his introduction to Osnabrück centered around engagement and implementation. He acknowledged the importance of involving the public but spoke to the difficulty of reaching the general population about energy decisions. On implementation, Gerdts reported that transportation is the most difficult energy use sector to convert to renewable energy.

Echoing the Osnabrück example, Kacia Brockman, Renewable Energy Coordinator from the City of San Francisco, emphasized the need for San Francisco to collaborate with its surrounding local governments because the resources within the city are insufficient for meeting its own energy demand. The City's 100% Renewable Energy target was set thanks to the leadership of former Mayor Newsom and Mayor Lee. Kacia Brockman pointed to climate impacts that are already visible in San Francisco as motivating the city's





pledge to use 100% RE with the goal of reducing GHG emissions. Recognizing that transportation contributes 50% of the city's GHGs, San Francisco is focused on the built environment with patient anticipation that electric vehicle technology is still emerging. One of the key policy tools for the City to achieve its target is the CleanPowerSF, which is a community choice aggregation (CCA) program offering a 100% renewable option. "We are lucky to be situated in California which is one of the few states in the US that implemented CCA and hereby enables us as a local government to aggregate electricity demand within our jurisdictions in order to procure alternative energy supplies." Brockman highlighted the importance of coherence among national, regional and local policies and that there is a clear need for more policy integration across governance levels.

This was seconded by Ian Neville, a climate policy analyst for the City of Vancouver. He described BC's carbon tax as a very effective behavior change tool. After the City Council made the unanimous decision in April 2015 to go 100% RE in all sectors by 2050, the city adopted its Renewable City Strategy just a week before KID. According to Neville, Vancouver's strategic approach to fully transition to RE is to a) reduce energy

use, as it is the most cost-effective way to a renewable energy future; b) increase the use of renewable energy; and finally c) increase the supply of renewable energy. To implement this, the City must work in partnership with the private sector, civil society, and the Provincial government. "As a local government, we have some regulatory power, for example to regulate building standards and land use or zoning. However, we need the Provincial government of British Columbia to work with us, especially on grid and infrastructure issues. Currently, there is only one electrical and one natural gas utility serving the city, both of which are regulated by the BC Utilities Commission, which falls under Provincial oversight." Thirty-one percent of the energy Vancouver uses is already from renewables and the mode-share of alternative transportation, such as car sharing, is already quite high. However, Ian Neville highlighted that there are many other factors, including food security, that must be considered in a plan to shift to 100% RE, especially from an environmental perspective. The 100% RE target is part of Vancouver's plan to be the greenest city.

The Danish municipality of Sønderborg also committed to 100% RE as a starting point to achieve something

even bigger. It is on pace to be carbon neutral by 2029, according to Deputy Mayor Aase Nyegaard. In Sønderborg, it is the citizens who initiated change. In fact, it was a joint venture between the people, politicians, and businesses of the municipality of Sønderborg (an area including the towns of Nordborg, Broager and Sydals, as well as Sønderborg town itself). This is summarized in the ProjectZero plan, launched in 2007 that enables the region of approximately 77,000 to become carbon neutral by 2029. "What was really important for the ProjectZero plan to be successful is that it made the connection to economic growth. An impact assessment proved that implementing our vision has created about 800 new green jobs since 2007. This is the best argument that we are on the right track." Nyegaard further highlighted that "cities cannot wait for big political shifts to start this transition." Building a consensus across sectors and political parties enabled Sønderborg to progress ahead of their own timeline. As of 2014, the Danish municipality had reduced its CO2 emission by 30%, well beyond the first sub-goal of 25% emission reduction by 2015: "Even after the election of a new major, we stuck to our goals." She argued that education is important and that the energy shift can be done anywhere in the world.

The Mayor of Fukushima City, Kaoru Kobayashi, proudly presented his city's natural beauty and demonstrated Fukushima City's progress since the nuclear accident of 2011 by drinking a bottle of city-sourced water. Like San Francisco, Fukushima's renewable energy plan is well-supported by upper levels of government. The Great East Japan earthquake, the subsequent tsunami, and the disaster at the Fukushima-Daiichi nuclear power plant in March 2011 encouraged the people of Fukushima to reassess their energy system and to revitalize industry in the shattered region. "This led to a vision to transition to renewable energy as a pathway forward", said Kaoru Kobayashi. The City of Fukushima has a population of about 280,000 people and aims to use renewable electricity for 50% of the community's demand by

2040. It is the capital city of Fukushima Prefecture (the Regional Government), which is aiming for 100% renewable energy by 2040. To reach its target, the local government has prioritized distributed renewable energy sources. "To stimulate investment in renewables, local stakeholder commitment and public engagement is very important. We therefore build a lot of local community power projects", explained the Mayor. Projects that were highlighted include a subsidy to supplement the national solar PV feed-in-tariff (FIT) program, the introduction of solar PV with battery storage in municipal shelters, the integration of small hydro projects into the municipal water supply system, as well as building a biomass power generator at the municipal waste facility.





What moves politicians to act? „People [in Fukushima] don't trust nuclear power, they hope that nuclear power will be abolished—the mayor has the task to change the energy system.“ ~ Mayor Kaoru Kobayashi, City of Fukushima

How is renewable energy connected with social enterprise? „Build a sense of ownership in the citizens. This does not come from above; start from kindergarten.“
~ Deputy Mayor Aase Nyegaard, Sønderborg

How do you envision your city in 2050? „I especially see changes regarding mobility—more public transport, bicycles, car sharing.“ ~ Detlef Gerds, Head of Environment and Climate Protection, Osnabrück

„Improvements in transport system, especially to reduce greenhouse gas emissions, a more walkable city.“ ~ Kacia Brockman, Renewable Energy Coordinator, San Francisco

How are the targets financed? „Establish local energy suppliers in each region and work together with government and investors.“ ~ Unknown



100% RE Champion - Ashton Hayes

Located in rural Cheshire in the United Kingdom, Ashton Hayes is a well knit community of about 1000 people that is aiming to become England's first carbon neutral community. The community started its journey in January 2006 and since then has already cut carbon dioxide emissions by 40% - by working together, sharing ideas and through behavioural change. The actions of Ashton Hayes have inspired hundreds of other communities across the UK and worldwide. Eden Mills in Ontario, Canada, started a Carbon Neutral project 8 years ago after visiting Ashton Hayes.

To become "carbon neutral", Ashton Hayes is investing in 100% Renewable Energy. To manage renewable energy generation for the benefit of the community, the residents have set up a "Community Interest Company (CIC)". The intention is to build up renewable energy capacity and produce green energy and generate profits that can be

ploughed back into projects that make the community more sustainable and resilient."

Ashton Hayes community has won many awards for its pioneering efforts and has made a series of films about the carbon neutral project. The latest film "Our Journey, Our Footprint – 10 years on" was shown in January 2016 to celebrate a decade of action. It can be seen [online here](#).

A recent community survey by the University of Chester revealed that 98% of the residents feel proud to live in the village and that 50% volunteer their time for community projects each week.

Ashton Hayes was also a pilot project used during the development of the London based [Pure Leapfrog](#) charity concept – an organisation that now supports over 100 community initiatives across the UK and overseas.

More information about the decade of community action can be seen on [Ashton Hayes Going Carbon Neutral website](#).

100% RE Champion - Oxford County

Oxford County is a rural area covering 2,039 km² that encompasses 2 towns, 5 townships, and 1 city. With a population of 111,700, the county's density ranges between 15 - 942 people/km². In addition to having long roots in farming, Oxford is rich in entrepreneurship and innovation, is located along highly accessible transportation routes. On June 24, 2015, the Council unanimously committed to 100% renewable energy by 2050. This commitment is for community-wide use of renewable energy not only for electricity, heating/cooling, and transportation, but also the primary industry, agriculture.

The County reinforced its 100% RE goals with the adoption of [The Future Oxford Community Sustainability Plan](#). It is a community-based plan to develop a vibrant economy that is rooted in a

healthy community and environment. With the sustainability groundwork in place, Oxford takes every opportunity to visit and learn from other 100% RE cities, continually asking: How can these innovations be adapted to Oxford's context? These learnings will form the basis for its 100% Renewable Energy Action Plan to:

- Catalyze environmental change in Oxford;
- Create opportunities for renewable energy investment in the county; and
- Become a living laboratory for education, research, and development of cutting-edge renewable energy solutions for local governments.

Steeped in a history of innovation and entrepreneurial leadership, Oxford is positioning itself to become a centre of excellence in renewable energy.





100% RE Champion - East Hampton

East Hampton Town is a coastal resort community at the eastern end of Long Island, New York, US. Every summer its population more than doubles and meeting the peak energy requirements is both difficult and expensive. The town was looking for ways to address its energy needs without having the local utility build additional fossil fuel based peaker plants or install high capacity overhead power lines to transport the needed electricity.

In addition, the Town Board recognized that as a beach community, finding a way to mitigate climate change and sea level rise is of vital importance. To this end, in 2012 the Town Board created the East Hampton Town Energy Sustainability Committee with the task of addressing energy issues. Motivated by the major blackouts caused by storm “Sandy”, over the course of two years, the not-for-profit organization Renewable Energy Long Island (“reLI”) worked with the town committee and the Town’s Department of Natural Resources in setting the community wide goal of 100% renewable in the electricity sector by 2020 and 100% renewable in all energy sectors (electricity, heat, and transportation) by 2030. The five-member Town Board unanimously adopted these goals on May 20th, 2014.

An offshore wind farm, to be located 30 miles east of Montauk Point, could provide

the five East End Towns including East Hampton with the power to meet their existing and projected energy needs. The original wind farm project proposed in 2014 and initially rejected by the Long Island Power Authority (“LIPA”), has been revised to provide wind energy from 15 turbines, on an offshore site leased from the US Interior Department. Currently under LIPA/PSEG-LI review, a decision is expected in May, 2016. If approved this wind farm will have the capacity to provide a clean energy alternative to 50,000 homes on Long Island’s East End.

With a heritage which speaks to a stewardship of land and sea, the East Hampton community has begun, under the supervision of “reLI”, a grass roots campaign in support of the wind farm proposal. The campaign launch: “Let’s Bring Windmills Back To East Hampton,” is a Wind Energy Forum planned at the public high school in mid-March. Supported by the on-line “reLI” website requesting letters be sent directly to the NY Governor, Forum presentations will be made by the offshore wind and transmission developer in the context of a community that must prepare for further extreme weather events, rising sea levels and eroding coastlines. Attendees will have the opportunity to sign petitions, addressed to LIPA/PSEG-LI in support of the wind project. These petitions will be collected for hand delivery to the LIPA Trustees by community residents attending their May Meeting.

3. Exploring what it means for local governments to be 100% renewable

Learning about the different strategies and “recipes” that local governments are testing in different parts of the world, the panel discussion showed a need for criteria and indicators that can measure and assess policies and implementation. While the 100% RE movement gains momentum, new questions arise: What does 100% RE actually mean? How do we measure success? And, how do we ensure that the transition to 100% RE is an instrument that leads to sustainable development?

At the Kassel International Dialogue, participants were invited to transition from thinking about the broader goals of setting 100% RE targets to the specifics of laying the groundwork and designing a strategy to take action. As

the presented case studies already proved, converting our energy systems from conventional to renewable resources amounts to more than just fuel switching; this shift is about equitable energy planning, local wealth distribution, social wellbeing, healthy ecosystems, and long-term resilience. A set of international criteria would provide guidance on what a sustainable transition to 100% RE might entail.

As the Global 100% RE campaign presents an actionable opportunity for local governments to extend their scope of action on crosscutting environmental, social, and economic challenges, a diverse group of Global 100% RE campaign members and supporters have spent the last year

developing a first iteration of a set of criteria and issue areas. KID was a continuation of this process, whose overarching goal can be described as follows.

“To establish a reasonable and practicable set of criteria and indicators to measure and assess progress by local governments, from all parts of the world, in implementing sustainable 100% Renewable Energy strategies.”
(Global 100% RE 2015)

The intention of the criteria is to capture the full array of energy policy actions made by local governments—from small villages, counties, and municipalities, through to large cities, prefectures, and

regional departments—around the world. It does not refer to any specific technology, but “renewable energy” generally refers to solar, wind, hydro, biomass, and geothermal resources. All of that said, energy efficiency is the key to renewable energy success. The International Energy Agency (IEA) dubs it “the first fuel” and has actually begun to evaluate the economic contributions by the energy efficiency industry to energy markets, for creating jobs, and for the value of the drop in costs incurred by emissions that harm human and ecological health. In truth, the importance of energy efficiency is actually a point of empowerment for local governments because regulation and compliance of energy efficiency typically fall within their mandate.





Finally, the principles that underpin the development of the Global 100% RE criteria are as follows:

- They describe the full scope of energy used in communities and cities: electricity, heating and cooling, and transportation;
- They must link 100% Renewable Energy to the vision of sustainable development;
- They must not overburden local governments with intensive data collection and reporting.

The criteria would serve as guideposts for local governments to help them navigate their unique paths to 100% RE. They will have to be updated through recurring consultation and as they are tested through a range of global cases. This iteration is structured according to three levels, of which levels 2 and 3 are both based on qualitative considerations at this stage:

1. Implementation (one criterion that is mainly quantitatively oriented),

2. Target-setting (one criterion), and
3. The enabling the framework (ten criteria).

The 12 criteria were proposed to the participants as a starting point for KID. They resulted from an 18-month consultation process with Global 100% RE campaign members and supporters as well as with practitioners and local government representatives; in preparation for this dialogue, participants were sent a discussion guide, which outlined the process but also provided background information on the topic of discussion, the 100% Renewable Energy criteria. Participants were also sent a [final draft of a discussion paper](#)¹ developed through a long series of face-to-face and online meetings. The results of a survey soliciting information about their RE strategies and impacts of various cities were also integrated into the discussion paper. The participants were reminded of the key concepts the 12 criteria attempt to capture and were asked to join a roundtable according to which criterion most interested them.

¹Buschmann, Pia and Leidreiter, Anna (2015). [Criteria for a Sustainable Transformation towards 100% Renewable Energy: Starting an International Dialogue](#), Global 100% Renewable Energy Campaign.

Overview on criteria

Criterion 1 – Implementation status and outcomes

considers the current status of 100% RE target implementation in terms of the final territorial consumption and its production. It also accounts for the socioeconomic value created in the region through the transition towards 100% RE.

Criterion 2 – 100% RE target

gathers the key features of the 100% RE target (timeline and scope, energy sector(s) covered, degree of political obligation and commitment, etc.).

Criterion 3 – Planning & orientation

investigates how far the local government has engaged in strategic cooperation with surrounding areas. Furthermore, it verifies the scope of the background analysis on which the 100% RE strategy has been based, as well as other aspects such as the availability of a concrete action plan.

Criterion 4 – Institutionalisation

assesses the extent to which the local government has helped institutionalize actions towards the 100% RE target (e.g. human and financial resources dedicated, initialization of projects, coordination of activities, etc.).

Criterion 5 – Local stakeholders' engagement

maps the 100% RE target commitment of a diversity of local stakeholders.

Criterion 6 – Renewable energy technologies in use

collects information on the types of renewable energy technologies and sources used as part of the 100% RE strategy.

Criterion 7 – Buildings

identifies activities undertaken within the building sector that support the overall 100% RE target.

Criterion 8 – Mobility and Transport

gathers information about the scope of activities undertaken in the mobility sector.

Criterion 9 – Energy efficiency in utility-scale generation

evaluates the scope of measures implemented to improve performance in energy efficiency and energy savings with respect to energy generation and utility activities in achieving 100% RE.

Criterion 10 – Knowledge generation

surveys the sorts of activities, projects, and research partnerships that generate further knowledge on RE development by the local government.

Criterion 11 – Public engagement

assesses the scope of public engagement activities aiming to support the 100% RE strategy and target via different communications channels and platforms.

Criterion 12 – Participation in Networks

collects information on the local government's involvement in networks and other partnerships at regional, national, and international levels.

Roundtables

For each table, a case study was drafted from the perspective of the subject criterion using the experience of a feature city. To support these discussions, topic leads sat at each roundtable and provided any additional information needed by the participants to make sure they fully understood the scenario. A table facilitator then led a discussion about the criterion (or in some cases, about the criteria) based on a template asking each group to consider the following questions:

- What are the most important aspects of this criterion in the transition to 100% RE?
- Can this criterion be applied to various settlement sizes? Is it transferable to international settings? Is it fair to evaluate a local government transition to 100% RE?
- Would you add anything to this criterion? Would you remove anything from this criterion? Would you change anything about this criterion?
- Are there potential ways to measure this criterion? Is measurement important for this criterion?

Following the discussion, each group chose a spokesperson to present highlights

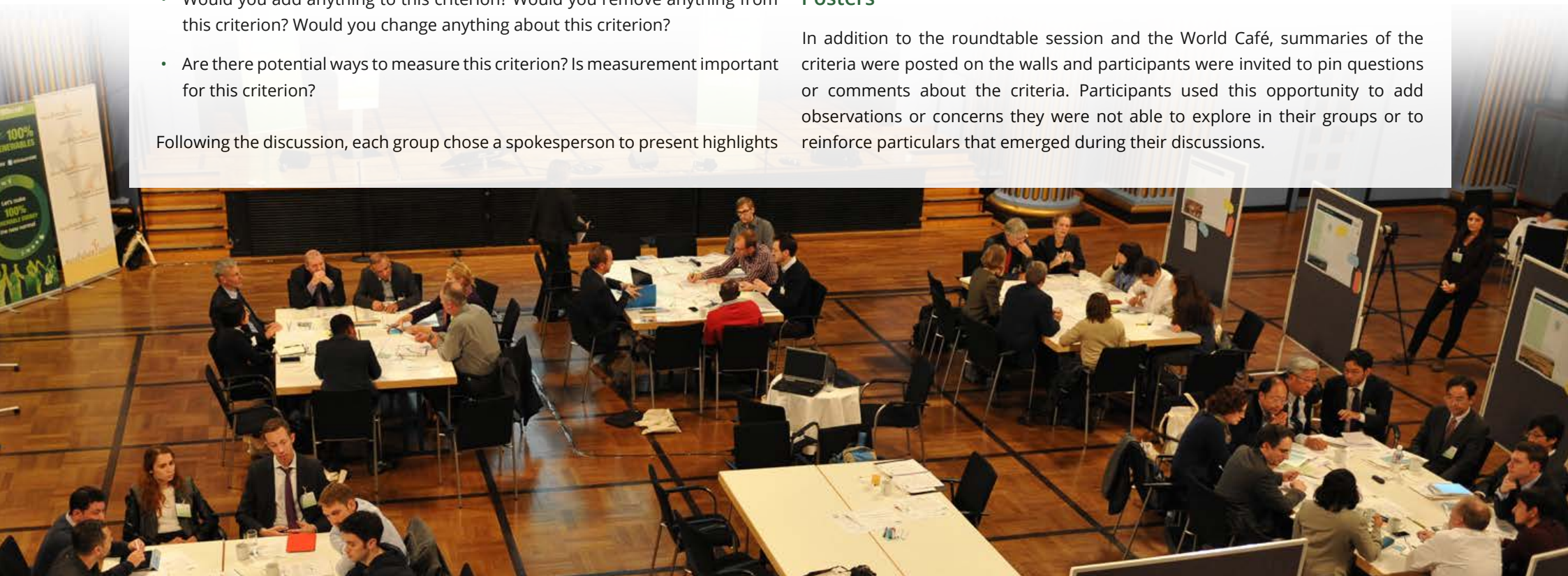
of their outcomes, which are also included in this report, in plenary.

World Café

After having the opportunity to delve into a specific criterion, participants were invited to fill out the survey used to solicit feedback on the current iteration of criteria. They were asked to comment on the relative ease or difficulty they expect it would be for their respective cities to answer the questions. The tables were covered in paper with concentric circles drawn on them. In the outer ring, each participant noted which aspect of the survey would be the most difficult to answer. Each group then discussed their answers and converged on the top issues, which they wrote in the centre circle, and finally, they discussed potential solutions or amendments to resolve the challenges they had listed and wrote those down in the middle ring. The groups rotated tables to read and discuss the results of another group discussion.

Posters

In addition to the roundtable session and the World Café, summaries of the criteria were posted on the walls and participants were invited to pin questions or comments about the criteria. Participants used this opportunity to add observations or concerns they were not able to explore in their groups or to reinforce particulars that emerged during their discussions.



4. Feedback on Criteria for 100% RE in Local Governments

Criterion 1: Assessing the level of implementation

Regarding implementation, participants generally restated the concepts laid out in the current iteration of the criterion, confirming a renewable energy plan is about more than emissions and kilowatt-hours—**“quality of life is the thing we have to measure.”** They also suggested that the monetary amount of energy imports avoided and the value of poverty eradication and access to energy needs to be calculated. Further, participants indicated that the focus should remain firmly on the implementation of RE, arguing that externalities are at the core of and should be captured by sustainable development plans. In terms of transferability, the starting point was that the energy transition is a universal challenge, that the specific indices or aspects would be the same, but that they might be weighted differently.

Through the World Café session, a small number of participants indicated that the requirements of this criterion are the most difficult to report. There was concern that city data would be hard to come by and that the outcomes depend on the governance systems in place,

for example, the local government may not control the energy decisions; one participant speculated that cities that have made the most progress on 100% RE enjoy an alignment with national energy goals. There were also concerns that other aspects like energy resiliency, grid reliability, net change in social wellbeing, knowledge sharing, and related economic gains are not captured by the present iteration and that they would be difficult to measure. With collection of data, one participant suggested the degree of security should also be evaluated.

For this criterion, participants suggested tracking the rate and severity of extreme weather events, rate of lung diseases, and the rate of acceptance. Also, they suggested taking a baseline of the status quo condition to measure against and ensuring the data are accessible and that capacity in data management is built. They would want clear statements about who benefits from the data and to ensure implementation reflects a bottom-up process. Finally, they recommended integrating measurement agencies such as the World Health Organization, the Canadian Index of Well-being, the Rauch Foundation Long Island Index, and others.



CASE STUDY

Criterion 1 – Assessing the Level of Implementation

This indicator considers the socio-economic value created through the transition to a 100% RE. This is anchored in the idea that a 100% RE system should be based on features such as ownership over operation of plants, regional value creation chains, and regional markets. The assessment includes different aspects ranging from creation of local jobs, a benefit over and above the additional income generated for local governments from RE and money saved through avoiding the cost of importing energy, to lower energy prices benefitting local industries, citizens, and vulnerable groups of citizens.

Frederikshavn Municipality, Denmark

With a population of 61,158 living in an area of 648.6 km² (94 people/km²), Frederikshavn Municipality is implementing the following community-wide renewable energy plan:

- 100% Renewable electricity by 2030
- 100% Renewable heating and cooling by 2030
- 21.5% Renewable energy powered transportation by 2030

Frederikshavn Municipality has defined the transition to renewable energy as a “growth track.” With heavy emphasis on the importance of public involvement, such as through constructive citizen dialogue, the municipality has reached multiple levels of implementation by:

- Developing a sustainable community,
- Reducing CO2 emissions,

- Developing local competence and creating local jobs by growing the green sector of the economy, and
- Developing an overall settlement policy to facilitate systems like district energy in suitable areas.

To support its master renewable energy plan, Frederikshavn Municipality has mapped all of the energy industries within the municipality and is working with each company to build capacity. The municipality is also helping develop clusters of expertise in local energy companies so they can offer larger renewable energy projects as a collective.

Despite its success in implementation, Frederikshavn Municipality still lacks venture capital for investment in generation facilities. The municipality is working with local and national banks in pursuit of offering more favorable loans for energy renovation of buildings, but has yet to attract sufficient interest for investments in renewable energy.

Criteria 2 and 4: Elements of the target and institutionalization

During the roundtable session, Criteria 2 and 4 were discussed in tandem and participants raised concerns that 100% RE targets leave out other important goals, like reducing pollution. They highlight the importance of connecting a global target—which they suggested is too abstract—to smaller individual targets. One example that was offered was that Vienna's 30% renewable energy target should be conveyed in relation to the capacity of surrounding areas, which can produce 500% of the renewable energy that they can use themselves. Also, the group noted not all regions can achieve 100%, so recommended a region's performance be measured relative to its potential.

Drawing from the Austrian model, participants recommended setting up juries in every region around the world to audit regional renewable energy progress. In this model, regions would also set interim targets and a climate manager would be responsible for coordinating and monitoring implementation, which the participants

regarded as an effective way to support implementation. Subsidies would be awarded according to a region's "100% point rating" (see case study on the next page); that is to say, a region's performance would be measured relative to its potential. Participants described the Austrian case study as transferable for all settlement sizes and international settings because it recognizes the limitations of regional contexts and keeps local governments on track by rewarding progress with subsidies.

More concerns and recommendations specific to Criteria 2 and 4 that were expressed during the World Café are reported in the following paragraphs.

Criterion 2: 100% RE target

One participant noted how difficult it is to collect socioeconomic impact data given they require drawing from various sectors. Another was concerned that as a small community too many factors lie outside of its control for it to set a renewable energy target, despite already having a goal to

be carbon neutral. Finally, a participant suggested Criterion 2 should ask for specifics on what commitments are binding or non-binding. **Additional comments participants posted on the wall included:**

- **"RE target should include an efficiency target."**
- **"Achieving 100% targets is about more than box-ticking."**
- **"What about other targets, e.g. CO2?"**

Criterion 4: Institutionalization

By a show of hands, the participants indicated that the most difficult criteria to answer would be Criterion 4: Institutionalization because there are many practitioners working in siloes and it is difficult to integrate work across sectors, which is necessary to ensure accuracy. Also concerned about the challenge of embedding renewable energy strategies or other climate change issues into existing administration, participants suggested

local governments need to mainstream and integrate planning and regulation and make full use of their leverage points, especially across sectors.

"How could we make it simple?"

Several comments were made about government continuity and how to ensure a renewable energy strategy outlasts elected terms. One participant pointed to the Danish bipartisan agreement on implementing renewable energy as a model to overcome the impacts of government turnover. Various suggestions to ensure permanence included qualifying characteristics of the human resource and budget commitments with information about how much and for how long and by whom they funded. The responses submitted by several participants suggest this Criterion should ask for information about planned commitments, not just those already in place, and one participant called monitoring and verification "critical." Finally, a participant recommended basing the national target on locally determined contributions.

¹Due to time and resource constraints, some criteria were paired (2 and 4, 5 and 11, and 7 and 9) and others were excluded (6, 10, and 12).

CASE STUDY

Criterion 2 and 4 – Elements of the Target & Institutionalization

Renewable energy targets have become a defining feature of the global energy landscape. In the past two years, the number of jurisdictions that pursue 100% Renewable Energy has increased substantially. Even though a 100% RE target might appear to state quite obviously what is encompassed, a closer look reveals that it's meaning is indeed very diverse. A 100% RE target may address different sectors, have different scopes, be time-bound (or not), and be backed by different levels of political commitment. Beyond that, local governments choose to implement different conceptual targets, including "climate neutrality," "zero emission," "fossil-free," "energy independence," or "energy autarky."

Austria

Austria has a population of 8.5 million. Currently Austria is supplying 34% of the country's energy demand with renewable energy. As of 2013, the country was being powered by:

- 67% Renewable electricity
- 30.3% Renewable heating and cooling
- 7.3% Renewable energy for transportation

Austria runs a voluntary "Climate and Energy Pilot Region Programme." In that program around 50% of Austria's regions are participating. Operating from the premise that no single target suits every region, the program has set up a jury system through which the targets of each region are judged for whether they are ambitious enough. That said, setting a particular target for all regions to meet is under consideration. In shaping its energy strategy, Austria helped regions **institutionalize RE planning** and

set **suitable RE targets** by:

- Requiring every region to set mid-term and ultimate RE targets,
- Providing each region a climate manager to coordinate and monitor implementation,
- Designing a common methodology for collecting data, and
- Auditing each region every three years based on a 100-point rating system.

Data collection is an integral component in achieving RE goals and convincing local decision makers the programme is worthwhile. However, data collection is time-consuming and not always done well. Despite a defined methodology, the climate managers are not typically trained scientists and do not have enough time to spend on ensuring quality data. Also, utility-scale power plants present challenges in attributing their energy to the regions they serve.

Criterion 3: Orientation and planning

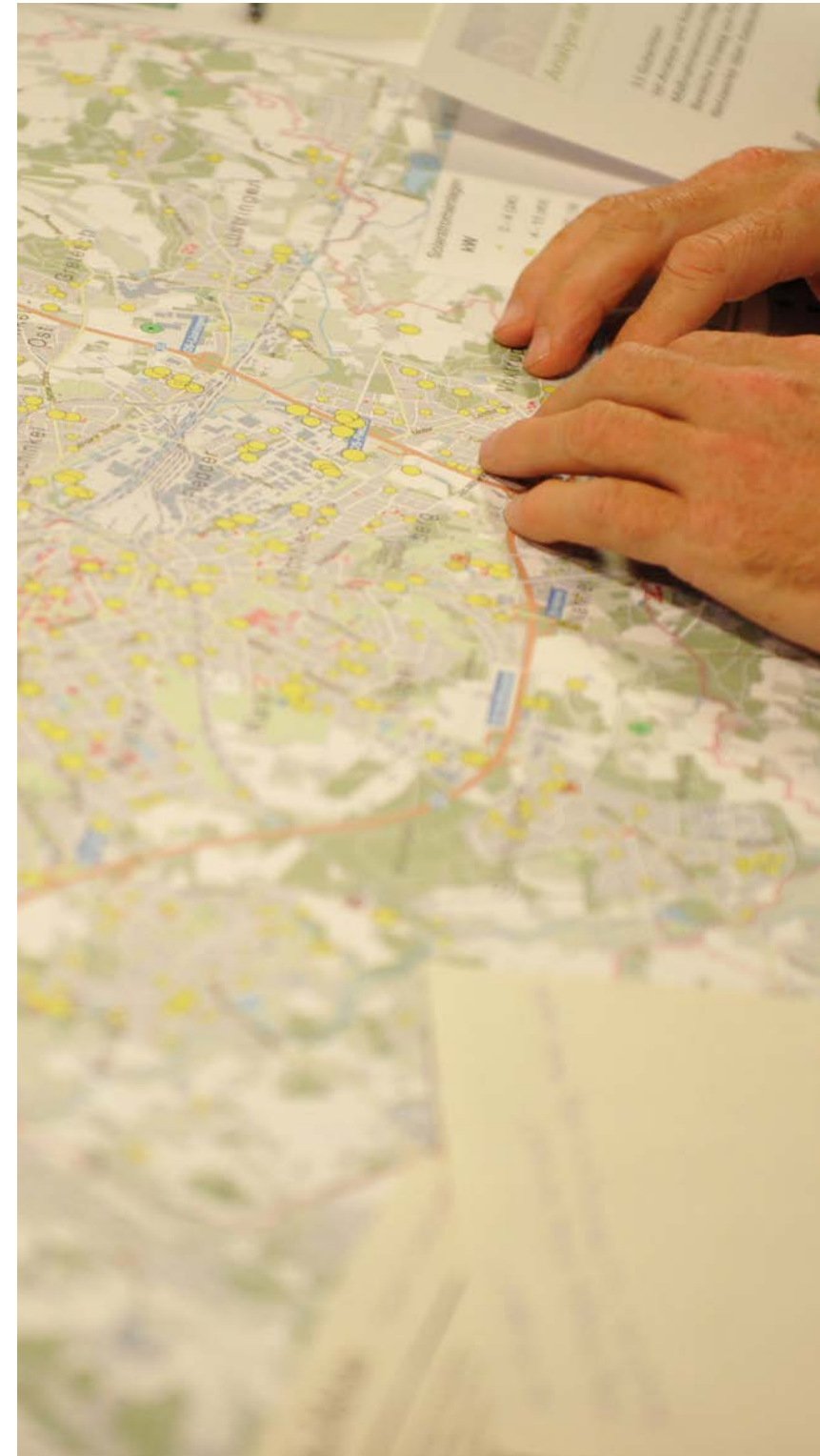
For this criterion, participants emphasized the need to be data-driven and specific when drafting renewable energy plans. They called for assessment of the current and potential state of resources, describing this information as essential for planning, decision-making, and collaborating with neighboring regions. Recognizing that communities have different factors to consider, they noted that while the criterion needs to accommodate those differences, planners need to define internal goals and factors explicitly. Speaking from the perspective of African cities, where local governments do not have planning and budgeting authority over energy, one participant indicated this criterion would be the most difficult to satisfy.

The participants recommended setting interim goals that define the path to 100% RE by 2050 and updating them regularly to maintain political and popular support, but also to

identify necessary course corrections as conditions change and new data become available. They would also amend the criterion as it is presently written to include:

- **What are your neighboring communities doing?**
- **Can multiple communities benefit from regional cooperation?**
- **How often do you update your analysis?**
- **How can you maximise local ownership of RE generation? What barriers exist to local ownership today?**
- **What interim goals will get you to your end goal?**

Finally, they suggested being explicit about factors that are excluded is important. For example, state whether a region is accounting for transient student populations or transportation that is only temporarily in the region.



CASE STUDY

Criterion 3 – Orientation & Planning

Without having a bold vision of the future, one cannot release and bundle all positive energies required to get there. However, a vision remains powerless if it is not well informed by the particularities of the initial situation in a local government. Therefore, a thorough analysis of the situation is indispensable. Examining the resource potential that would enable a jurisdiction to achieve 100% RE could unveil new forms of regional cooperation between cities and their hinterland, as well as with different municipalities. The 100% RE concept is not to be confused with the concept of energy autarky, in the narrow sense. Rural and urban areas face different challenges and opportunities in addressing an energy transition and climate change. Often a closer look at these challenges and opportunities reveals that they complement each other, unlocking a great potential that lies in the relationship between cities and regions.

City of Osnabrück, Germany

With a population of 161,000 and an area of 119.8 km² (1,344 people/km²), Osnabrück is implementing the following renewable energy plan, community-wide:

- 100% Renewable electricity by 2050
 - 22% within city limits
 - 78% from the city's hinterland
- 90% Renewable heating and cooling by 2050
 - Based on a 50% reduction in demand
- 60% Renewable energy powered transportation by 2050
 - 10% biofuel
 - 50% renewable electricity

The City of Osnabrück joined the County of Osnabrück, the County of Steinfurt, and the City of Rheine, forming Germany's largest "Masterplan 100% Climate Protection" region. Through offsets and shared accounting (combined kWh), the City of Osnabrück and its partners have set an ambitious target of meeting 95% of the region's energy demand

by renewable energy.

In shaping its renewable energy strategy, Osnabrück planned around its physical orientation realizing individual projects through cross-border cooperation (especially in transportation) between urban centres and their hinterlands. Beyond the City of Osnabrück offsetting its RE-production deficit with its hinterland's RE-production surplus, this partnership:

- Shares the principle of learning and benefitting from one another,
- Recognizes each local authority takes on key activities, which are all considered in developing the entire region, and
- Coordinates political and administrative development strategies, among other things.

To ensure ongoing coordination of their activities, the partners meet regularly but also co-host public events, such as an annual regional climate "summit." Some of the projects that are in place include combined heat and power (CHP) systems, energy savings in schools and daycares, EV infrastructure, cycling "superhighways," skills training, and many more.

Criteria 5 and 11: Local stakeholder commitment and public engagement

In discussing these criteria, participants reaffirmed the importance of earning public support and stakeholder commitment. They also indicated they would evaluate the community's sense of ownership over the energy system and whether the benefits are well distributed. They drew a connection between keeping generated wealth within the community and the community having the confidence and freedom to make decisions.

This group also remarked on the role of governments in supporting RE goals, noting that although commitment should not be made from the top down, government has the responsibility of removing barriers. The roles for government include enabling investment and supporting innovations like smart grids. The participants

emphasized that criteria 5 and 11 can and should be measured, and they discussed whether it is possible to measure progress between nations.

There was some discussion on whether Criterion 5 should be combined with 11, as some participants were concerned there is too much overlap between them; a majority of participants supported this proposal. However, participants argued they each have unique challenges that deserve dedicated attention. When asked which of the criteria is the most difficult criterion, 5 was not identified by any of the participants and, as stated earlier, 11 earned second-place.

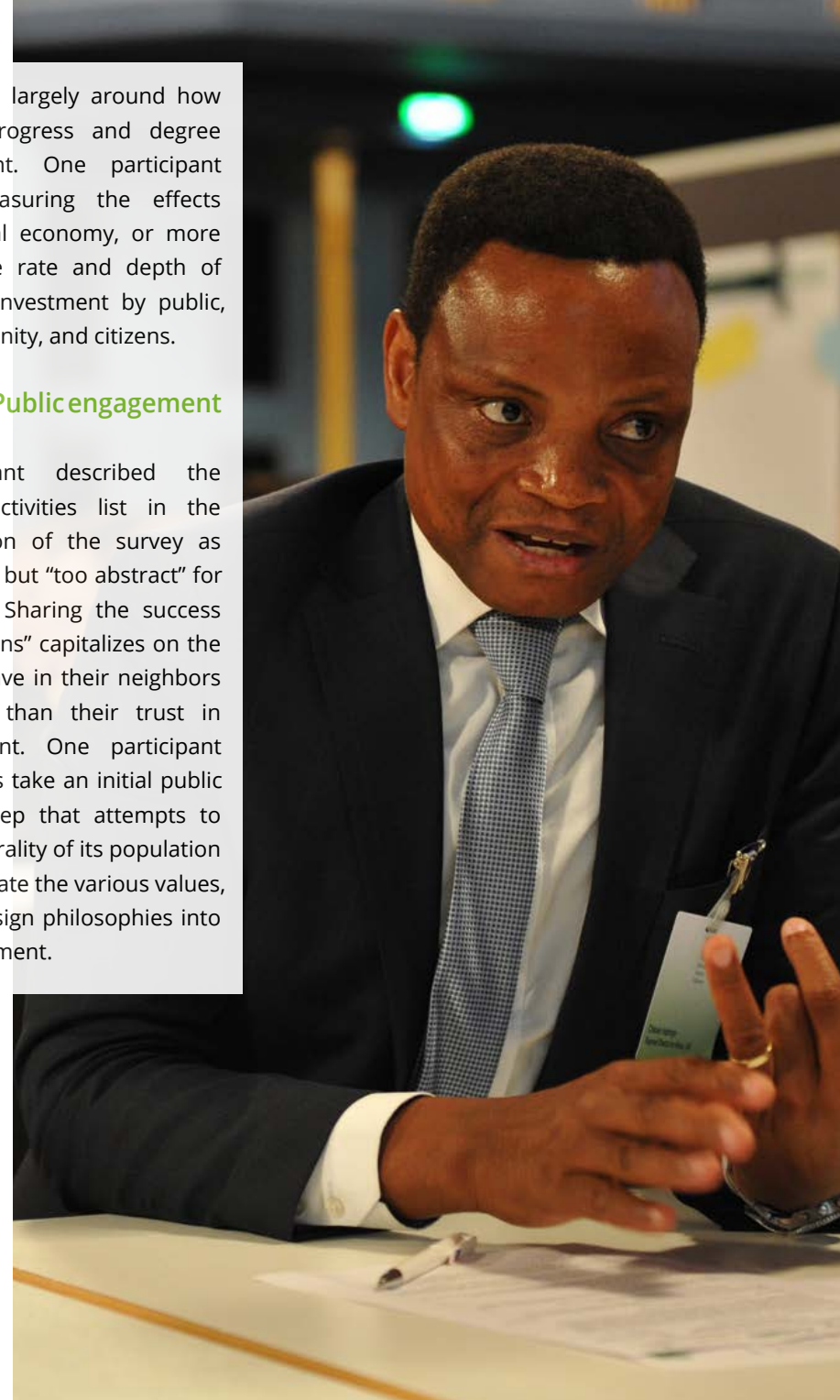
Criterion 5: Local stakeholders' engagement

Aspects of Criterion 5 that would be unique from Criterion 11 were not discussed by the participants during the dialogue. However, a number of comments were pinned to the poster

for Criterion 5, largely around how to evaluate progress and degree of engagement. One participant suggested measuring the effects on the regional economy, or more specifically, the rate and depth of ownership or investment by public, private, community, and citizens.

Criterion 11: Public engagement

One participant described the engagement activities list in the current iteration of the survey as comprehensive but "too abstract" for some citizens. Sharing the success of "model citizens" capitalizes on the trust people have in their neighbors being greater than their trust in the government. One participant suggested cities take an initial public engagement step that attempts to capture the plurality of its population and then integrate the various values, beliefs, and design philosophies into further engagement.



CASE STUDY

Criteria 5 and 11 - Local Stakeholder Commitment & Public Engagement

True transformation starts in the fundamental way an energy system is structured. With that transformation comes a battle, as power and profits shift hands from the few to the many. Our current fossil fuel-based energy system is characterized by complex centralized infrastructures where a) the fuel is transported to the power plant, and b) energy production and distribution is held in one hand. The supply chain is vertical, and the benefits are shared only among a few stakeholders. In the necessary transformation towards 100% renewable energy, this is changing. Renewable energy technology is decentralized, has a horizontal supply chain, and requires an entirely different infrastructure and market. New actors and stakeholders - including individual citizens and small businesses - enter the system, claim rights, and directly impact the implementation process. New ownership models are required as different stakeholders become directly involved in the transformation. A sustainable energy transformation to 100% renewables therefore must ensure wide participation by all stakeholders. Case studies from around the world show that community and people-centered solutions enable society to convert the energy production and supply industry at the required speed and scale.

Fukushima City, Japan

With a population of 283,415 over an area of 746.4 km² (380 people/km²), the City of Fukushima aims to use renewable electricity for 50% of the community's demand by 2040. It is the capital city of Fukushima Prefecture (the Regional Government), which is aiming for 100% renewable energy by 2040.

Since the Fukushima nuclear power plant disaster, the City has prioritized distributed RE, and local stakeholder commitment and public engagement, particularly in stimulating investment in RE and local community power projects. To that end, the City has implemented policies that:

- Leverage the regional characteristics to increase energy self-sufficiency,

- Promote distributed renewable energy production facilities,
- Establish clarify around the roles city staff, citizens, and businesses operators can play in working collaboratively together.

Some of the projects Fukushima City is implementing are:

- Adding a subsidy to supplement the national solar PV feed-in-tariff (FIT) program,
- Introducing solar PV with battery storage in municipal shelters,
- Integrating small hydro projects into the municipal water supply system, and
- Building a biomass power generator at the municipal waste facility.

CASE STUDY: WOLFHAGEN

Wolfhagen's Story

Wolfhagen is a small, idyllic German town of 13,500 residents in a space of 112 km² located in the Kassel District of the Federal State of Hesse. For the last ten years, it has become increasingly known nationally and internationally for its success in implementing 100% RE. An increasing number of energy mandates, expenditures, and challenges has created an additional financial burden for Wolfhagen. RE projects provided a solution to this problem and resulted in the creation of new jobs in this field. A strong motivation behind Wolfhagen's RE strategy has been to eliminate its dependence on fossil fuels and external energy suppliers, and in turn for the energy transition to keep revenues within the region and benefit citizens directly.

Wolfhagen's strategy and its success

A primary milestone for Wolfhagen's energy transition was reached in 2003 when the council decided to repurchase the electricity grid; three years later this decision led to "remunicipalization" of the grid by the municipally owned utility, *Stadtwerke Wolfhagen*. In 2008, *Stadtwerke* organised an excursion to

a wind farm for representatives of all of the local political parties—less than four weeks later the sitting council officially adopted the goal of 100% RE electricity supply by 2015.

"The actors' ability to see alternatives to mainstream energy production and their motivation for change were crucial for setting the 100% RE target." *Reinhard Schaaake, Mayor of Wolfhagen*

A broad participatory process was launched by the municipal administration with several stakeholders from the local forestry industry and businesses, as well as with conservationists. Over the following months and years, this process matured and was institutionalised as an intimate collaboration between governmental and non-governmental actors, bolstered by the strength of a cross-party alliance.

Wolfhagen's engagement process launched with an education campaign that examined different aspects of the decision (environmental benefits, economic value creation, local responsibility, local ability to act, and technical feasibility) and would resonate with the motivations of various local actors. It also aimed

to encourage active and direct citizen participation. In keeping with the political commitment to ensure citizens directly benefit from RE investments, the citizen-based energy cooperative *BürgerEnergieGenossenschaft Wolfhagen* was founded in 2012; the cooperative holds a 25% share in *Stadtwerke Wolfhagen*.

The 100% RE strategy was built around mutual trust, support, and the sound technical expertise of the *Stadtwerke*, the energy agency of the District of Kassel (Energie 2000 e.V., the citizen cooperative), and the City of Wolfhagen. The German Renewable Energy Act, the national legal framework, also enabled rapid realisation of the projects.

In terms of technology, Wolfhagen's 100% RE strategy is centred around a newly installed *Windpark Rödeser Berg* and *Solarpark Gasterfeld*, a biomass and biogas plant owned by local farmers, and many private household production systems. However, Wolfhagen is looking not only at how and where the energy is generated, but also how it is used. As such, energy efficiency measures, such as retrofitting 80% of the streetlights by the end of 2012 and reducing power consumption by more than 60% by 2009, comprise key components of the 100% RE strategy.





Citizen financed Solarpark Gasterfeld

The solar park in Wolfhagen was completed in 2012 and covers 0.18km². It is composed of 42,000 solar modules stretching 2 km and generates electricity for 3,000 households. Each year it saves an estimated 5,700 metric tons of CO₂. A preliminary analysis showed that PV production would be more effective than other renewables, such as biomass, in this case. Located along a buffer strip beside the railway, the park is eligible for Germany's feed-in tariff. The solarpark is expected to create about 24.5 million Euros in regional economic value over a span of 20 years.

Windpark with citizen participation

The windpark project was initiated in 2008. Although it was selected in a transparent process—detailed construction proposals were displayed for citizen review several times, regular excursions to the wind park location were arranged, and 13 meetings were held with stakeholders—it was controversial and was met with public resistance. For example, the location deemed most suitable was sited in the middle of a nature park where a rare species of bird nests nearby, which drew protest from conservationists. Eventually, the transparency of the process, an encompassing education campaign, and an open dialogue with windpark opponents led to a positive attitude towards the project among the majority of citizens. However, conflict mediation with the deepest opposition remained unsuccessful. The four turbines that comprised the windpark were finalized in December 2014, adding a generating capacity of 3MW each, or a total of 12MW, to the town's overall electrical production.



Democratization of energy production and fair distribution of benefits

A nationally unique feature of Wolfhagen's energy portfolio is that the local citizen energy cooperative holds a 25% share in the municipally owned utility *Stadtwerke Wolfhagen*. The unusual partnership between cooperative and municipal utility is mutually beneficial. The utility gained additional capital from the cooperative towards realization of the RE projects and, since energy customers of the utility were the only ones who could become cooperative members, the customer loyalty with *Stadtwerke* was strengthened. At the same time, the resident members of the cooperative earned a place on the utility's supervisory board, thereby gaining direct influence over the utility's decision-making. Last but not least, every member of the cooperative benefitted directly from the financial success of *Stadtwerke*—even residents who were not members of the cooperative derived indirect benefits such as infrastructure improvements.



"As a service company that is owned 75% by the city of Wolfhagen and 25% by the citizen energy cooperative Wolfhagen, we feel particularly connected to the citizens of Wolfhagen." *Martin Rühl, Stadtwerke Wolfhagen.*

"A ground-breaking change has been that the role of energy customers as passive consumers and observers was transformed into the active role of co-owners of RE plants, co-designers of the energy transition, and consequently co-beneficiaries. That sense of ownership over the local energy transition was invaluable in the success of the local 100% RE strategy." *Wilfried Steinbock, Executive Chairman of the Citizen Cooperative Wolfhagen.*

Today the cooperative consists of more than 700 members. A portion of the cooperative revenues is re-invested through a fund that finances energy efficiency projects, while the remaining dividend is distributed among its members.

What are future challenges and opportunities regarding Wolfhagen's 100% RE strategy?

Harmonizing supply with demand will be a key focus in Wolfhagen's mid-term 100% renewable energy strategy. The goal is to establish a smart network that links households to the municipal utility, which would optimize household devices; for example, at times when a lot of wind and sun energy is transmitted to the grid, *Stadtwerke Wolfhagen* would signal to household devices that they should start up and take advantage of lower-priced wind and sun-generated electricity. A pilot project of 35 households is underway with the intention of developing an evidence-based business model.

Further mid- and long-term efforts for Wolfhagen to reach its 100% RE goal expand implementation to the town's other energy-use sectors, heat consumption, and mobility and transportation.

Criterion 6: Renewable energy technologies in use

In answering the survey, one participant recommended the term **“volatile”** be clarified as meaning the same as non-dispatchable or variable in describing energy sources that can deliver power on demand. In one case, a participant qualified the use of renewables as **“co-firing with coal in coal power plants”**; co-firing is not specifically identified by any of the current version of the criteria. Another participant indicated that the answers to both questions in Criterion 6 should be more specific in asking about the RE technologies being used in energy production or in industry. Additions that participants suggested for this criterion include:

- **Asking what kinds of data are being collected/analyzed/monitored, and how it is being used, and**
- **Including conservation technologies “as a first step towards implementation of RE technologies.”**

Finally, one of the comments posted to Criterion 6 suggested the use of **“living labs”** be included as a technology that contributes to a city's renewable energy goals.



Criterion 7: Buildings

Unfortunately, the table lead designate for this subject was unable to attend the session. However, the case study on Bologna, Italy that was written to support discussion about this criterion is provided in this report. The following contributions came from comments made on individual criteria surveys. In the list of measures in place that constitute this criterion, one participant recommended that **“restoration”** be replaced with **“retrofit,”** which is the appropriate term to reference improvements made to a building for the purpose of improving its performance. One measure of activities taking place in this sector is to gauge the transition to PassivHaus or other similar construction strategies. One participant suggested evaluating programs designed to help residents understand the long-term benefits of reduced energy requirements.

Criterion 9: Energy efficiency in utility-scale generation

The title of this criterion drew attention, as the participants were concerned **“utility-scale generation”** is only one aspect of energy efficiency. Again, a participant suggested qualifying the list of actions with the sector in which they are being applied: In the energy sector or in industry, or both? One participant added sewer waste heat to the list of energy recovery options and another recommended energy savings be questioned separately from energy efficiency.



CASE STUDY

Criterion 7 and 9 - Building Sector & Energy Efficiency Savings

Energy efficiency and energy savings are key priorities for implementing sustainable 100% RE strategies. Prior to considering how much energy can be generated from renewable energy sources on site, ways the current energy demand can be significantly reduced should be assessed. Examples for enhancing energy efficiency and energy savings include cogeneration, district heating and cooling, energy efficient infrastructure, and the use of industrial waste heat, as well as general integration of sectors, such as through power-to-heat and power-to-gas solutions. Non-technological measures like sharing economies (e.g. so-called repair cafés and swap meet tables) and approaches to creating cultures of energy saving behaviour, complement the strategy at deeper, cultural dimensions of the desired system change. The building sector is one of the key areas for leveraging energy efficiency improvements and energy savings in heating and cooling and electricity. To enhance energy efficiency and energy savings in the building sector, a range of activities can raise awareness among homeowners and businesses leaders and employees. Such activities include demand side management (DSM) approaches, such as smart metering, incentivizing use of energy efficient appliances, lighting, and energy systems (e.g. ventilation, heating, cooling, and local district energy), as well as offering to provide energy consultancy and training.

Bologna, Italy

With a population of 386,298 and an area of 140.7 km² (2,746 people/km²), Bologna is concentrating its efforts in its building sector and energy efficiency savings and has modest a modest renewable energy target of 3% for the community.

Bologna prioritizes public buy-in through education about climate change, renewables as a means of mitigation, and on energy savings. One education project that grabs the attention of citizens, including children, is the Energy and Environment Showroom where visitors gain hands-on experience with global

warming and renewable energy and energy efficient technologies. The city also helps citizens develop energy performance contracts (EPCs) with a private consultant for condominiums as well as for purchase groups” to enable small-scale projects.

The city is installing renewable energy systems, such as photovoltaics and biogas, and installing heat pumps on public properties, all while respecting cultural heritage constraints. Again, these installations are complemented with a “solar community” engagement program and the savings from the district energy and heating systems are passed on to the customers.

Criterion 8: Mobility and transportation

This group expressed concern about the scope of this criterion, noting it encompasses a range of potential fuels, such as hydrogen, biofuel, and electricity. Along with this broad range of fuels, participants also discussed the infrastructure necessary to underpin alternative transportation.

They specified that electric transportation and mobility must be powered by renewables exclusively and that the associated CO2 must be tracked (although they recognized how difficult this would be). Concluding that evaluation of progress on 100% RE should be based on more than just reducing carbon or greenhouse gas emissions, they would evaluate the full cradle to grave lifecycle of vehicles with consideration of the carbon content of their materials and other potential impacts, such as from battery minerals, but also they would:

- **Include large industrial bases in the evaluation,**
- **Identify various local standards,**

- **Consider transition to biofuel for accurate evaluation of the impact of hybrids,**
- **Recognize steps taken to reduce single occupancy vehicle trips, and**
- **Encourage local governments to try to understand how people perceive the need for change.**

In terms of measuring this criterion, participants recognized the value but had concerns about the feasibility of creating a standard that can span different local through national contexts. That said, the group suggested public transportation and goods movement offer common baselines. In addition to measuring the number of pedestrian, bicycle and vehicle trips and distances travelled by each mode, they would have the associated CO2 and air pollutant emissions tracked and the energy storage needed to displace non-renewable energy generation. And a leadership strategy for cities that one participant offered: **“Encourage municipal fleet conversion and smaller range requirement—lead by example.”**

Criterion 10: Knowledge generation

For Criterion 10, participants suggested adding **“communication with private companies”** as a measure worth monitoring and asking cities to clarify who is responsible for administering each knowledge generation program. One participant suggested changing the question to read, **“Which measures contribute actively to generate further knowledge on RE development in the administration of your local authority?”** One participant saw value in sharing the results of Criterion 1 for all cities and regions as case studies from which other local governments can learn.

Criterion 12: Participation in networks

There was general agreement that there is value in participating in networks. One participant indicated online engagement opportunities for global cities to share their strategies, challenges, and successes would be valuable.

CASE STUDY

Criterion 8 – Mobility and Transportation

The transport sector is one of the key challenges in realizing a 100% RE vision. To date, the share of renewable energy plays only a minor role in this sector, as appropriate technologies to replace fossil fuel-based technologies have still to be tested and further developed. Such technologies range from electric vehicles (or electric transportation) and hydrogen cars to biogas and biofuel-based solutions. With respect to the latter two, the challenge of ensuring regional and sustainable production remains unresolved. Alongside this technological challenge, it is equally important to address those that are structural and cultural. One way is to develop, improve, and spread concepts and strategies that help reduce traffic (e.g. carsharing, improving local supply structures, providing dense, smart public transportation, land-use planning that reduces the need for personal vehicles and increases cycling and walking).

City of Vancouver, Canada

With a population of 603,500 and an area of 115 km² (5,248 people/km²), the City of Vancouver is implementing the following renewable energy plan, community-wide:

- 100% Renewable electricity by 2050
- 100% Renewable heating and cooling by 2050
- 100% Renewable energy powered transportation by 2050

The City of Vancouver considers mobility a key pillar of its 100% renewable energy strategy. Its “complete communities” framework focuses on active transportation and electric vehicle (EV) uptake. Vancouver’s Greenest City Action Plan already lays out a plan to improve transportation efficiency and reduce travel by personal automobiles:

- To achieve greater than 50% mode share by foot/bike/transit by 2020 (achieved in 2015),

- To reduce average distance driven per resident by 20% from 2007 levels by 2020.

Vancouver recently released its Renewable City Strategy, which builds on the accomplishments of the Greenest City Action Plan by:

- Leveraging opportunities in land-use planning, transit expansion, and new mobility trends like carsharing;
- Ensuring EV charging infrastructure is well distributed and becomes part of standard development processes; and
- Amending the municipal building code and working with other levels of government.

Travel is currently measured in vehicle kilometers traveled (VKT) and bike and vehicle counts, however a switch to gCO₂e/person/km is being considered so as to capture environmental impacts. In Vancouver’s case, vehicle and fuel regulations lie outside its jurisdiction.

What's missing?

Under the “other” category, participants offered many ideas about how to improve the criteria so they can tell a city's story about transitioning to 100% renewable energy. They showed resounding support for adding a new criterion dedicated to finance. Participants were very concerned about renewables not being able to compete with **“unrealistically”** low fossil fuel and nuclear energy prices, or because of the **“sheer momentum of existing energy source use, e.g. transport and heating”** or the **“legacy monopolies of utilities.”** One participant recommended adding a criterion dedicated to conservation to make a stronger link between supply and demand, and others were concerned there was a lack of connection between the 100% RE goals and carbon or climate targets.

There was also a suggestion to measure social well-being (noting that **“relation to GDP is difficult”**), which could be captured in part by Criterion 8: Mobility and Transportation. Concern about **“public ambivalence”** and **“unreliable political processes”** were some of the more general sentiments participants shared. Participants suggested the criteria tease out details about jurisdictional control, for example whether a local government could take an advocacy role in or only hope to influence higher government policies.



“How do we measure social justice in the different criteria?”

Throughout the dialogue, discussions ebbed and flowed between helping cities transition to 100% RE and measuring the transition to 100% RE. Participants had general advice for future iterations of the criteria:

- Allow flexibility for different sectors,
- Provide questions that measure the scale of action (yes/no options do not give full picture),
- Document actions with common language for policies and technologies,

- Ask for scope of action,
- Goal ownership/Accountability,
- Define RE sources (only local or from the whole grid area?), and
- Provide comparability and guidance for self-assessment.

They also had suggestions for helping cities through the transition, such as maintaining a database of best practice examples, having climate ambassadors in governments and on finance and legal issues, but also city case studies like those included in this report. Local governments would also benefit from help with gaining access to data (fuel consumption, etc.) that can be held by private corporations.

Closing round

The information presented in this section helps the organizers make improvements to future events. Participants were asked to fill out an evaluation of the event and share advice for moving forward with the 100% RE criteria and network.

The results of the evaluations (provided in Appendix A) show that the participants found the dialogue valuable and would be in favour of future engagement through dialogue.

To the question, “What is the most important piece of advice that you have for developing criteria for a 100% RE Cities Network?” multiple participants questioned the use of the term “criterion/criteria” and offered alternatives like “action areas” or “issues.” There were also several who recommended: “Keep it simple!” reasoning that the approach

needs to be practicable and adaptable to local contexts. Participants also reiterated the need for more discussion and information on financing and gaining public support.

To the second question, “What is the most important piece of advice that you would offer for forming a 100% RE Cities Network?” participants encouraged continued communication and engagement. One specific suggestion was to develop online engagement, starting with the Kassel participants. They also would invite more engagement with local governments already committed to 100% RE and more opportunities to learn from case studies, such as through a database that cities update. In the interest of optimizing communication opportunities, one participant advised the network to standardize its process of documentation and use of terminology.



Next Steps

Based on the comprehensive and fruitful feedback that was gathered during the Kassel International Dialogue, the 12 criteria will be modified and amended. Members and supporters of the Global 100% RE campaign will complement the current set with the suggestions outlined in this report. Hereby, KID has informed the process constructively and will help to improve the criteria by:

- Assessing the status and progress towards 100% RE at the local government level comprehensively and exhaustively,
- Making the criteria applicable to local governments in differing geographical areas and political environments,

- Making the criteria applicable to different sizes and set-ups of local governments (metropolitan areas, urban centres/cities, regions/ countries, rural towns etc.), and
- Making the criteria sufficient in accounting for all dimensions of sustainable development, including social and intergenerational justice, planetary resource limits and economic prosperity.

Furthermore, several participants indicated their interest in staying engaged in this process and offered opportunities to generate further input for the criteria. This may include follow-up dialogues in different parts of the world, including Fukushima, Japan and Cape Town, South Africa as well as coalescing cities around monthly webinar on progress updates

by a designated host city. Within the framework of the Global 100% RE cities and regions network, local governments will have the opportunity to engage in peer-learning activities on- and offline. Benefits for cities and communities to join this network include the following:

- Learning and cooperation opportunities with other leading cities,
- Thematic guidance and workshops,
- Access to experts on renewable energy and energy efficiency,
- Globally promote local solutions and service providers,
- Worldwide recognition of the progress achieved locally, and
- Visibility to champion local and

regional leaders on a global level.

Through an inclusive, international, and intercultural consultation process, members of the Global 100% RE campaign will continue to gather feedback and build expertise to further develop, test and improve the criteria.

By the end of 2016, the overall goal is to establish a comprehensive and relevant set of criteria with related indicators that measure and assess the status and progress of a sustainable transition to 100% Renewable Energy by local governments in all parts of the world. Ultimately, the aim is to create the first 100% RE label that reflects sustainability principles for local government action, and potentially for actions by other entities, including businesses, national governments, institutions, etc.



To that end, the global network of 100% RE regions and cities will be instrumental in bringing together local governments that are leading the sustainable transition towards 100% RE and inspire others by their example. The criteria will help measurement and assessment of the actions undertaken by local governments that engage in this network. They also identify local gaps or relevant focus areas that may have been overlooked, to help improve the effectiveness of a defined strategy. The pioneering group of cities, municipalities, and regions first to use this framework will be able to influence the shaping of the framework for applying the 100% RE label.

This tool will:

1. Provide a common framework for assessing 100% RE actions in cities and regions,
2. Profile local government achievements and initiatives on 100% RE, and
3. Contribute to the development and dissemination of common tools and methods that support local governments in achieving sustainable development.

The Global 100% RE campaign aims to address the lack of common understanding, standards and guidance on what 100% RE means and how it can be achieved sustainably. Furthermore, it attempts to connect scattered local RE initiatives. Pioneering local governments often see themselves alone in their context where the political climate, legal, and economic conditions are unfavorable to embarking on a transition to sustainable energy. This network will serve as a platform for policy dialogue and knowledge exchange specifically on 100% RE. Finally, it should serve to inspire learning regions and cities to envision how their own energy systems can be transformed in sustainable and equitable ways. The criteria can therefore be regarded as guides for local policy makers wanting to embark on the sustainable pathway to 100% RE.

Resources

Buschmann, Pia and Leidreiter, Anna (2015), Criteria for a Sustainable Transformation towards 100% Renewable Energy: Starting an International Dialogue, Global 100% Renewable Energy Campaign.



5. Appendix

Appendix A: Dialogue Evaluation

Our purpose in asking these questions is so that we can improve the process for future dialogues. Please take a few moments to indicate the extent to which you agree or disagree with each of the following statements on a scale of 1 to 7 (1 = totally disagree, 7 = totally agree). We appreciate your feedback.

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. The phone calls and emails during recruitment and after agreeing to participate gave helpful information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The registration process was efficient and friendly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The dialogue handbook provided for the discussions was clear and contained relevant and useful information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The facilitator provided clear explanations, guidance, and support throughout the day. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The presentations were clear and comprehensive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The food and facilities were satisfactory. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. There was adequate opportunity for me to learn and to participate in group discussions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Overall, the dialogue was worthwhile to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Based on this experience, I am more likely to become involved with similar consultations | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Appendix B: Agenda

Kongress Palais Kassel, Friedrich-Ebert-Straße 152 Agenda for Tuesday, November 10, 2015

- **14:00 – 14:10** Opening and welcome
- **14:10 – 14:20** Keynote
Harry Lehmann, Federal Environment Agency
"Approaching Paris: How national governments can learn from regions and cities"
- **14:20 – 14:30** Presentation
Ana Marques, ICLEI and Global 100% RE Campaign
"A global network for 100% renewable energy in local governments"
- **14:30 – 15:15** Panel Discussion
"100% Renewable energy in cities"
 - Detlef Gerds, Osnabrück, Germany
 - Kaoru Kobayashi, Fukushima, Japan
 - Aase Nyegaard, Sønderborg, Denmark
 - Ian Neville, Vancouver, Canada
 - Kacia Brockman, San Francisco, USA
- **15:15 – 15:30** Coffee Break
- **15:30 – 17:00** Round Table Discussions
"Exploring 12 criteria for international standards in 100% renewable energy"
- **17:00 – 19:00** Face-to-face meetings and group tours of the exhibition (English)
- **19:00** Networking reception for all congress participants

Kongress Palais Kassel, Friedrich-Ebert-Straße 152 Agenda for Wednesday, November 11, 2015

- **9:00 – 10:30** World Café
"Applying the criteria to local government commitments to 100% RE"
- **10:10 – 10:20** Plenary discussion
- **10:20 – 10:30** Closing remarks
- **10:30 – 12:00** Face-to-face meetings and group tours of the exhibition (English)
- **12:00 – 12:45** Lunch
- **12:45 – 13:00** Board bus to Wolfhagen
- **13:00 – 16:00** Site tour: Wolfhagen – Energy Transition 2.0
- **16:00 – 16:15** Coffee Break
- **16:15 – 16:30** Reflection
- **16:30 – 17:10** Plenary: Wolfhagen's story
- **17:10 – 17:30** Closing round
- **17:30 – 18:30** Return to Kassel

Appendix C: International participants

Mark Agana University of Arkansas, United States

Betsy Agar Renewable Cities, Centre for Dialogue, Simon Fraser University, Canada

Alexander Basse Volunteer, Germany

Kacia Brockman City of San Francisco, United States

Pia Buschmann deENet Competence Network distributed Energy Technologies e.V., Germany

Garry Charnock Ashton Heyes, United Kingdom

Toby Couture Founder of E3 Analytics, Germany/ Canada

Joey Dabell Centre for Applied Research & Innovation (CARI) | BC Institute of Technology, Canada

Mark Dabell Centre for Applied Research & Innovation (CARI) | BC Institute of Technology, Canada

Bahram Dehghan Frederikshavn Municipality, Denmark

Christopher Doll United Nations University Institute for the Advanced Study of Sustainability, Japan

Detlef Gerdtz City of Osnabrück, Germany

Shinobu Gotoh Fukushima University, Faculty of Symbiotic Systems Science, Japan

Fumihiko Hasegawa Tohoku University New Industry Creation Hatchery Center, Japan

Chikoko Hastings C40, South Africa

Jay Heaman Oxford County, Canada

Tetsu Iida Institute for Sustainable Energy Policy (ISEP), Japan

Mikael Jentsch Frederikshavn Municipality, Denmark

Camille Josse World Future Council, Germany

Kaoru Kobayashi Fukushima City, Japan

Harry Lehmann German Federal Environment Agency, Germany

Anna Leidreiter World Future Council/ Global 100% RE campaign, Germany

Waseem Malik FTM SOLAR LTD, Community Energy, Feltham, United Kingdom

Ana Marques ICLEI, Germany

Hironao Matsubara Institute for Sustainable Energy Policies (ISEP), Japan

Yuko Matsumura Global 100% RE Campaign, Japan

Dave Mayberry Oxford County, Canada

Takahiro Meguro Fukushima City, Japan

Rostislav Neveceral CHMI - Air Quality Control Division, Komorany, Czech Republic

Ian Neville City of Vancouver, Canada

Werner Niederle German Federal Environment Agency, Germany

Kensuke Nishimura Interpreter, Japanese Delegation, Japan

Aase Nyegaard Sønderborg Municipality, Denmark

Gordian Raacke Renewable Energy Long Island, United States

Patrycja Rogalska Center for Renewable Energy Sources, Poland

Yauemon Satoh Aizu Electric Power Company, Japan

Ryo Shishido Fukushima City, Japan

Christoph Wolfsegger Klimafonds Austria, Austria

Takayuki Yamaura Fukushima City, Japan

Daniel Zahn Volunteer, Germany