Tenth session of the IRENA Assembly

Renewable Energy in Cities

10 January 2020, 14:00 – 15:30, Room B1
St. Regis Hotel, Saadiyat Island, Abu Dhabi

Background

The global energy transition must be accelerated in order to decarbonise the energy sector by the middle of this century and meet the climate objectives of the Paris Agreement. To make the transition a reality, the deployment of renewable energy technologies combined with energy efficiency improvement and enhanced electrification needs to be scaled up through innovative policies, strategic energy planning and modernised energy infrastructure for every end-use sector, at national, as well as at the local level.

More than half of the world's population (4.8 billion people in 2018) now lives in cities. By 2050, two-thirds of the world population are expected to live in cities. Cities, engines of the economy and migration magnets, already account for 67-76% of global final energy use and for 71-76% of energy-related CO_2 emissions. Urban-level energy planning decision-making is therefore critical to the success of the overall energy transformation. In addition to addressing the climate mitigation challenge, renewable energy offers solutions to several other issues, including air pollution, geopolitical energy security, supply risks and price volatility, local and regional economic development objectives, and enhancing resilience against climate vulnerability.

In a variety of roles, cities are uniquely positioned to promote renewable energy. Municipal authorities are often energy planners and regulators (e.g., with regard to urban zoning, building permits, and minimum renewable energy requirements in new and refurbished building). They also have a financial role to play (e.g., levying local taxes and fees, providing low-interest loans, or issuing municipal green bonds), and they are often important owners or operators of urban infrastructure. More importantly, they are also in the position to empower their citizens to pursue a low-carbon and sustainable future.

IRENA has examined policies for renewable energy deployment in cities and has developed urban renewables assessment tools. In collaboration with ICLEI – Local Governments for Sustainability and GIZ, IRENA has also published case studies for 12 cities around the world. Current analytical work is examining the roles of stakeholders and distilling policy guidelines in the power generation, buildings and transport sectors.

The findings from IRENA's "Energy Solutions for Cities of the Future" project, carried out with the support of the International Climate Initiative (IKI), highlights policy experiences and includes case studies of renewable energy-powered initiatives, programmes and policies in medium-sized cities in China, Costa Rica, and Uganda. The scope of the project also includes technologies and innovations that can be transferred to developing countries, such as the rooftop *Solar City Simulator*: a web-based solution designed for use in developing countries to explore opportunities for solar photovoltaic (PV) power deployment in local municipal jurisdictions, and to help policy-makers with target setting and policy design.

The "Energy Solutions for Cities of the Future" project also involves capacity building to improve the enabling environment for the adoption of renewable energy sources in district heating and cooling systems. District energy networks have traditionally used fossil fuels such as coal, fuel oil, and natural gas. Although bioenergy and high and medium temperature geothermal resources play an important role in some regions, the overall share of renewable energy in district heating worldwide remains negligible to date. Technology innovation, current trends towards more energy efficient buildings, and the development of low-temperature district energy technology may enable the wider deployment of low-temperature renewable energy sources such as geothermal energy, which may not immediately be compatible with conventional district heating networks and existing buildings and may therefore remain unexploited. In this framework, IRENA is working on developing guidelines and capacity building activities to enhance the knowledge base available to decision-makers and relevant stakeholders on best practices and options available worldwide.

As part of the IKI project, IRENA, in collaboration with the China National Renewable Energy Center and People's Government of Zhangjiakou, has developed and launched the *Zhangjiakou Energy Transformation Strategy 2050*. As the first of its kind in China, it sets a new paradigm for many other Chinese cities that are eager to wean their energy systems off coal and to take advantage of the uptake of renewable energy technologies and other enabling technologies. Furthermore, through this project a suite of urban energy system planning tools and knowledge products have been identified or are being developed to enable local decision-makers, urban energy planners and key stakeholders to scale up the use of renewables in various urban contexts.

The session will provide policy-makers and urban energy planners with examples of policy options, and technical solutions that can support the development of the renewable energy sector at a city-level depending on local circumstances, state of the national energy markets, and specific objectives. The discussion will also include planning tools and renewable energy solutions.

Objectives

- Discuss suitable policy instruments and technologies, as well as strategy development for urban energy transformation that allow cities to foster a renewable energy future, drawing on examples of municipal authorities acting as planners, regulators, financiers and operators of urban infrastructure.

- Preview findings emerging from the "Energy Solution for Cities of the Future" programme and highlight applications of the rooftop *Solar City Simulator*. IRENA will showcase the example of Kasese (Uganda) that can be adapted and easily scaled for new cities.

- Showcase the development of *Zhangjiakou Energy Transformation Strategy 2050* as a paradigm changer in China and present a preview of IRENA's guidelines to improve enabling frameworks for the integration of low-temperature renewable energy sources such as geothermal energy in district heating and cooling systems.

- Offer members an opportunity to provide feedback on, and further engage in, the Agency's urban-level work.

Guiding Questions

- What are the key challenges and opportunities for local governments to deploy greater levels of renewable energy technologies?
- What are leading examples of local governments that have successfully strengthened policy frameworks and increased deployment in end-use sectors?
- What are the key elements in developing an urban energy transformation strategy toward a low-carbon and sustainable future?
- How can IRENA use its analytical and advisory capacity to support city-level decision-makers in the energy transition?

Associated Publications

- Zhangjiakou Energy Transformation Strategy 2050 (2019)
- Solar Simulators: Application to Developing Cities (2019)
- Scaling up Renewables in Cities: Opportunities for Municipal Governments (2018)
- Renewable energy in district heating and cooling: A sector roadmap for Remap (2017)
- Renewable Energy in Cities (2016)
- Renewable Energy Policy in Cities: Selected Case Studies (2013)

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