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Book Review

Urban Renewable Energy on the Upswing: A Spotlight on Renewable Energy in Cities in REN21's "Renewables 2019 Global Status Report"

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Abstract: Published in June 2019, the new edition of the annually updated Renewables Global Status Report (GSR) compiles the most recent developments and trends in the adoption of renewable energies worldwide and in specific regions, countries and sectors. The report represents a rich resource for reliable and up-to-date information about individual renewable energy sources and their use. The analysis also covers a review of energy policies. Renewable energy policies still strongly concentrate on the power sector, while transport and heating and cooling are given less attention. Most investment in renewable energy today happens in developing and emerging countries, which is a major change to the situation some years ago. The 2019 edition of the GSR report includes a feature on renewable energy in cities, which highlights the importance of prioritising the urban context in order to achieve more sustainable schemes of energy supply and consumption. More than half of the global population today lives in cities, but around two-thirds of energy consumption happens in an urban environment. The GSR 2019 identifies that cities already are among the most active players in the adoption of renewable energies. One interesting finding is that in more than 100 cities worldwide at least 70% of the electricity already comes from renewables. This includes cities in both developed and developing countries.

Keywords: renewable energy; energy transition; energy policies; urban energy

1. Introduction and Background Information

The "Renewables 2019 Global Status Report" (REN21 Secretariat: Paris, France, 2019; ISBN 978-3-9818911-7-1) [1], released in June 2019, is the most recent edition of REN21's annual overview of the state of renewable energy worldwide and in specific regions and sectors. The "Renewables 2019 Global Status Report" was published 15 years after the foundation of REN21 (Renewable Energy Policy Network for the 21st Century). The foundation of REN21 had been an outcome of the government-hosted Bonn 2004 International Conference for Renewable Energies, a conference held under cooperation of governments and other actors to respond to resolutions made during the UN World Summit on Sustainable Development 2002 in Johannesburg, South Africa, in particular, the countries' commitment to foster renewable energies. Today, REN21 is an authoritative think tank and international multi-stakeholder network with more than 65 member organisations, which comprises governments, non-governmental organisations, industry associations, academic and scientific institutions [2]. REN21 is a non-profit association with its Secretariat based at UN Environment in Paris. It was part of REN21's initial mandate, and it remains part of the current mandate to collect, consolidate and synthesise data about renewable energy in order to provide a comprehensive and reliable source of information in the field, to shape the energy debate and to contribute to increasing the share of renewables in the energy mix of countries and worldwide [1,2].

In agreement with the REN21's mandate, the "Renewables 2019 Global Status Report" (GSR 2019) analyses status and trends of adoption of different renewable energies (solar, wind, water, biomass, geothermal) across countries and sectors (power, heating and cooling, transport), the related energy markets and energy policies. Contents of the report are compiled by the REN21 Secretariat based on extensive data collection. In the process, external experts contribute to the delivery and assessment of data and other information. The report undergoes extensive review by registered experts before publication. Contributors and reviewers are not necessarily affiliated with one of the REN21 member organisations. While much of the assessment uses official statistical country data, the in-depth study integrates a variety of data types.

2. Specific Benefits and Possible Limitations of the REN21 Global Status Report

The applied methodology (mentioned above), the level of detail and the annual publication schedule enable the Renewables Global Status Report to be a highly comprehensive and rich resource for academic and non-academic readers in search for up-to-date and reliable information about renewable energies. The report also formulates policy recommendations; therefore, it also aims to directly address policymakers. A very positive feature of GSR is that key figures are made available for download in high resolution on the website [2].

The report puts a strong focus on presenting the latest status of renewable energies in the annual report, and the reference year of the 2019 report usually is 2018 (in some cases earlier years). While this ensures that the information is up-to-date, the strong focus on displaying the most recent data is also a shortcoming under the lens that the development over time is not usually presented, or at least not with much detail. Key changes and developments over the last years are briefly discussed. However, to gain a more complete picture, the reader could extract and compare data published with each annual GSR. The first GSR was published in 2005. Key structural elements of the report and of the presentation style have remained unchanged over the years; therefore, it is often feasible to directly compare the data presented with the annual reports to better understand the changes over time.

3. Structure and Contents of the Renewables 2019 Global Status Report (GSR 2019)

GSR 2019 consists of eight main chapters plus additional sections to accommodate acknowledgements, a foreword, an executive summary, a compilation of Renewable Energy Indicators 2018, references, information about energy units and conversion factors, methodological notes and other information about data collection, a glossary and a list of abbreviations. The eight main chapters are as follows:

1. Global Overview
2. Policy Landscape
3. Market and Industry Trends
4. Distributed Renewables for Energy Access
5. Investment Flows
6. Energy Systems Integration and Enabling Technologies
7. Energy Efficiency
8. Feature: Renewable Energy in Cities

Chapter 1 sets the scene and presents the main findings about renewables used to deliver heating and cooling, power and mobility, with a focus on global trends and development in main regions. Renewable energy accounted for an estimated 18.1% of the total final energy consumption (TFEC) in 2017. It is remarkable that renewables in 2018 supplied more than 26% of global electricity. For the fourth consecutive year, in 2018 more renewable power capacity was installed than net additions to fossil fuel capacity. Around two-thirds of new net electricity generation capacity in 2018 was from exploiting renewables. However, while there has been a renewables boom in the power sector, their shares are lower in other energy sectors: only 10% of the energy used for heating and cooling and 3%

of the energy used for transport came from renewables in 2018. This can be linked to insufficient policy support or to changing and inconsistent policies. Chapter 2 presents and discusses policy elements implemented in different sectors. Chapter 3 explores in detail the individual renewable energies and the related market trends. Separate subchapters cover bioenergy, geothermal power and heat, hydropower, ocean power, solar photovoltaics (PV), concentrating solar thermal power (CSP), solar thermal heating and cooling, and wind power. Bioenergy remains by far the largest contributor to the global renewable energy supply, while wind and solar energy are the most dynamic markets.

Chapter 4 of the report presents progress and challenges in ensuring access to clean energy for all and highlights the essential role of decentralised energy solutions. In 2017, the global population without access to electricity fell below 1 billion, but 2.7 billion people still did not have access to clean cooking, most of them in sub-Saharan Africa and in developing Asia. Chapter 5 presents investment patterns and trends. It is interesting to note that developing and emerging economies overtook developed countries in renewable energy investment for the first time in 2015, and this leadership in financial flows remained in 2018. Overall, in 2018, renewables accounted for about two-thirds of global investment in power generation. Chapter 6 highlights that energy storage has a major role to play in enabling energy transition. Electric vehicles are becoming important elements to be considered in energy management, although there is a very mixed picture across countries. Chapter 7 addresses energy efficiency and discusses the existing status in four specific areas, namely electricity generation, the building sector, the industrial sector and the transport sector. Clearly, energy efficiency is one of the central pillars to decarbonise the energy system; therefore, strategies for more efficient use of energy and the corresponding achievements and challenges merit high attention.

4. A GSR 2019 Special Feature: Renewable Energy in Cities

A most remarkable element of GSR 2019 is a focus devoted to renewable energies in cities, compiled with Chapter 8. This focus on urban renewable energy is unique in the series of GSR publications since 2005. Putting a spotlight on the urban context acknowledges that cities are increasingly becoming important actors in renewable energy deployment. They are among the main drivers for accelerated adoption of renewables, but cities also hold key responsibility to advance energy transition. Referencing the International Energy Agency [3], GSR 2019 points out that more than half of the global population is urban, however, cities account for two-thirds of global energy demand.

GSR 2019 provides evidence that cities today are among the most active players towards more widespread implementation of renewable energy. One interesting finding of the assessment is that more than 100 cities worldwide already use at least 70% renewable electricity. This is not limited to cities in developed countries but includes, for example, Nairobi in Kenya and Dar es Salaam in Tanzania. In numerous cases, commitments and actions of cities have exceeded commitments at the national level. By end of 2018, more than 230 cities worldwide had adopted targets for 100% renewables in at least one sector. One opportunity for increasing the share of renewables while at the same time reducing energy dependence are community energy projects. As an example, Paris (France), under its commitment to generate 20% of its electricity demand locally by 2050, is making public spaces and rooftops available to a local co-operative for the installation of solar photovoltaic plants [4].

Climate change is a major driver for renewables in cities. Notably, 70% of the 96 cities that belonged to the C40 Cities network reported already having experienced negative effects linked to climate change [5]. However, GSR 2019 identifies that other key drivers complement climate change in terms of achieving more renewable energy in cities. These drivers partially belong to environmental and health categories (air pollution, public health concerns), but also socio-economic implications are of major importance (e.g., job creation, energy security and self-supply, access to energy for all, urban development patterns and future prosperity of the city).

5. Concluding Remarks

Since its start 15 years ago and with its annual release of an updated edition, REN21's Renewables Global Status Report (GSR) has grown to become one of the most respected and highly referenced resources for reporting the situation of renewable energies. The above discussed "Renewables 2019 Global Status Report" (GSR 2019) [1] is the most recent edition of REN21's GSR. In addition to providing data and analyses about the different renewable energies across different sectors and policies, the GSR 2019, as a unique feature, presents insightful observations about renewable energy in urban environments. This GSR 2019 feature stresses the need for understanding the specific challenges that cities face and for learning from best practice cases. To complement the GSR 2019 special feature about urban renewable energy, a special REN21 report about the status of renewables in cities across different countries is currently in preparation and has been announced for September 2019, with selected preliminary findings already available via the dedicated website [6].

Environmental impacts of cities, including from the emission of greenhouse gases linked to energy supply and consumption, are of high concern and are further increasing in scope and severity [7,8]. Making the urban area more sustainable is a prerequisite to enabling future prosperous societies. To achieve this goal, city leadership in energy transition is urgently needed. At the same time, renewable energy in cities remains an underutilised resource, and in this context more efforts are required to institutionalise local decision-making schemes and arrangements that support decentralised policy outcomes [9]. Innovative governance and financial arrangements along with collective action by local government have significant potential to accelerate the transformation of urban energy systems [10]. It is very timely that the "Renewables 2019 Global Status Report" has put a spotlight on renewable energy in cities. This special feature is an important response to understanding that cities have a key role to play in making the energy sector more sustainable and already are often frontrunners in adopting and advancing innovative solutions.

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