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International Forum on Energy for Sustainable Development

Concept note and draft outcome document of the Ninth International Forum on Energy for Sustainable Development

Note by the secretariat

Introduction

1. Achieving Sustainable Development Goal 7 (SDG 7) of ensuring access to affordable, reliable, sustainable and modern energy for all is critically important for attaining the objectives of the 2030 Agenda on Sustainable Development (2030 Agenda). Energy is central to nearly every major challenge and opportunity the world faces today. The progress that has been made in achieving the SDGs – or lack thereof - shows that greater effort is needed on national and regional levels, including much bolder policy commitments, substantial increase in financing, and willingness to embrace the range of technology solutions on a much wider scale.[1]

2. The Ninth International Forum on Energy for Sustainable Development provides the opportunity to reflect on the challenges ahead and to agree on ambitious and concrete measures, presented to the Committee on Sustainable Energy in this document for consideration.

3. The event will take place in Kiev, Ukraine on 12-15 November 2018. It is jointly organized by the Government of Ukraine and the United Nations Regional Commissions in partnership with the United Nations Development Programme (UNDP), United Nations Institute for Training and Research (UNITAR), UN Environment, The World Bank, International Energy Agency (IEA), International Renewable Energy Agency (IRENA), International Atomic Energy Agency (IAEA), Global Environment Facility (GEF), Organization for Security and Cooperation in Europe (OSCE), International Energy

[1] Global Tracking Framework: UNECE Progress in Sustainable Energy (December 2017)

Charter, International Energy Forum (IEF), Copenhagen Centre on Energy Efficiency, International Institute for Applied Systems Analysis (IIASA), Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT, Pacific Northwest National Laboratory (PNNL), Dartmouth College, and Climate Action Network (CAN).

4. The fifth session of the Group of Experts on Energy Efficiency and the fifth session of the Group of Experts on Renewable Energy will be held in the framework of the Ninth Forum.

5. This document provides background information on the approach to the Ninth Forum in the Concept Note (Annex I). Member States are invited to comment and endorse the draft Outcome Document of the Forum (Annex II).

Annex I

Concept Note of the Ninth International Forum on Energy for Sustainable Development

I. Energy for sustainable development

1. There is no commonly agreed definition of what energy for sustainable development is or how it will be achieved. As national circumstances vary significantly, countries will choose different pathways to meet commitments they have made, including under the 2030 Agenda and the Paris Climate Agreement. Analysis to date of the progress that has been made shows that much greater effort is needed, including much bolder policy commitments, substantial financing, and a willingness to embrace the range of technology solutions on a wide scale. Countries will act in ways that reflect their unique national circumstances to meet the commitments they have made. Their choices will be made in the broader context of their economies as a whole and can be expected to be economically and socially rational, targeting quality of life and not just access to affordable, modern, and clean energy.

2. The Ninth International Forum on Energy for Sustainable Development (the Ninth Forum) is an opportunity to reflect on the implications of accelerating and re-directing change. Technology innovation and decarbonization require accompanying social innovation, so the Ninth Forum will explore measures to close the gaps between action and ambition. Emphasis will be given to the resilience of energy infrastructure and the nexus areas in the context of a circular economy to improve resource efficiency. The Forum will focus on disruptive drivers that are at play, and how they can be used favourably to shape energy for sustainable development. The event will unite all technology options with regional cooperation, investment and financing aspects.

3. The intent is to agree on a balanced set of options for countries to pursue concretely and effectively in both the near term and the longer term and to inform key political processes about collective insights on energy for sustainable development. The event will consider the solutions proposed during the Energy Ministerial at the outset of the Eighth Forum held in Astana, Kazakhstan, on 11 June 2017, and enhance the collective recommendations as a further milestone in the international forum process

A. The Forum

4. The International Forum on Energy for Sustainable Development is a platform that provides context and enables clear-sighted action. This Ninth Forum will combine an opening ministerial session with plenary sessions, parallel workshops and site visits over four days. Through a series of multi-stakeholder panels and discussions, the Forum will explore what energy for sustainable development means and how cooperation and concerted action could deliver the 2030 Agenda.

5. The importance of collaboration to achieve sustainability cannot be overstated. Partnerships and multi-stakeholder collaboration at scale at all levels are essential for achieving the 2030 Agenda. A collaboration among the United Nations system, governments, civil society, financial institutions, and the private sector is needed to leverage expertise and resources to address the complex and interlinked challenges of energy for sustainable development.

6. The Forum is organized jointly by the Government of Ukraine and the United Nations Regional Commissions in partnership with the United Nations Development Programme (UNDP), United Nations Institute for Training and Research (UNITAR), UN Environment, The World Bank, International Energy Agency (IEA), International Renewable Energy Agency (IRENA), International Atomic Energy Agency (IAEA), Global Environment Facility (GEF), Organization for Security and Cooperation in Europe (OSCE), International Energy Charter, International Energy Forum (IEF), and the Copenhagen Centre on Energy Efficiency, International Institute for Applied Systems Analysis (IIASA), Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT, Pacific Northwest National Laboratory (PNNL), Dartmouth College, and Climate Action Network (CAN). The Forum will attract international energy experts, government officials, and representatives from the business community, financial sector, academia and civil society to share perspectives on how sustainable energy systems can be designed and implemented. It will also include the annual sessions of the UNECE Groups of Experts on Energy Efficiency and on Renewable Energy. Among the planned parallel workshops are a regional workshop on Pathways to Sustainable Energy and the fourth meeting of the Joint Task Force on Energy Efficiency Standards in Buildings

7. In 2017, the five Regional Commissions worked with the World Bank and the International Energy Agency to assess the world's progress on sustainable energy. The conclusion was that the energy sector's support for the 2030 Agenda is at risk of faltering because the rate of improvement in energy efficiency, deployment of net low carbon energy solutions, and provision of sustainable access to modern energy services are insufficient. Accelerated and concrete measures are needed to improve energy productivity, rationalize energy use, optimize energy resources, and deploy sustainable energy technology and infrastructure. The Ninth Forum will feature an honest and rational conversation about key challenges including energy security, fossil fuel dependency, lack of information, and inadequate capabilities to effect change. Attaining the objectives of the 2030 Agenda will require full engagement of industry to transform energy. It is essential to monitor progress on energy for sustainable development in ways that reflect the cross-cutting interconnections among the Sustainable Development Goals (SDGs), at a minimum, linkages among SDG 6, 7, 11, 12, 13, 15, and 17.[2]

8. Certain options for improving the overall performance of today's energy system often are excluded for reasons of public perception and emotions, politics, imposed market distortions, or environmental and safety concerns. Truly transforming the energy system will require creative shifts in policy and regulation including treating energy as a series of services rather than as a series of commodities. In many countries, the current political, regulatory, and industrial infrastructure is not yet ready for such a transformation and countries are not yet alert to challenges that will emerge with the 2030 Agenda. Today's economic infrastructure is not ready to embrace the implications of the new normal.

9. The Ninth Forum will deliberate on emerging opportunities and concerns. The Forum proposes activities grouped in four parallel pillars:

(a) Energy transition and decarbonization;

(b) Robust energy systems and infrastructure resilience;

(c) Matchmaking and investor confidence;

(d) Hot topics and deep dives.

[2] http://www.un.org/sustainabledevelopment/sustainable-development-goals/

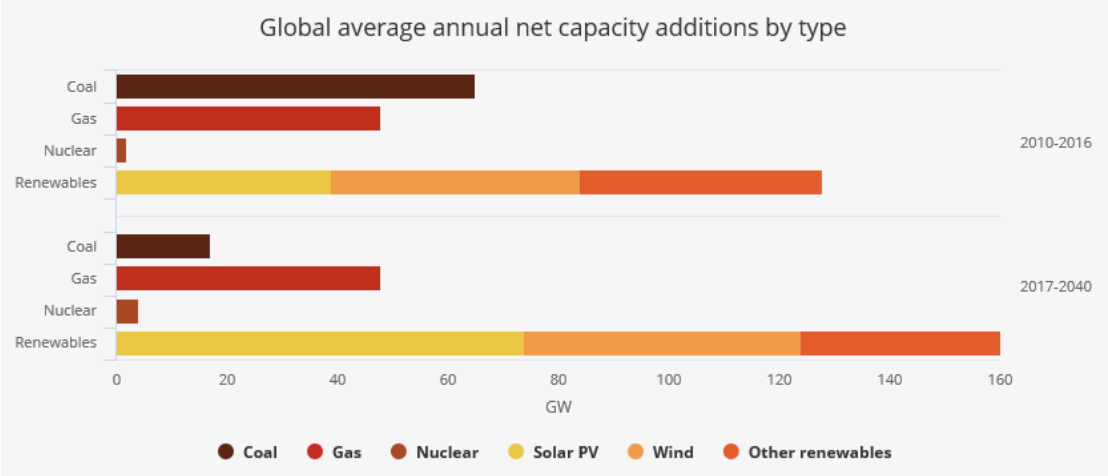
B. Energy transition and de-carbonization

10. The first pillar of the Ninth Forum will explore cost-effective decarbonization of energy. International cooperation can reinforce national actions and thereby accelerate transformation. The nexus among energy and other key development areas (e.g. water, air, food, health, education, and gender) suggests that opportunity lies in cross-sector perspectives and holistic decision-making.

11. The development and deployment of clean technologies and their interplay with existing infrastructure lie at the heart of options that are available to build the future energy system over the medium term, especially as 80% of today's energy is fossil-based. For instance, as of January 2018 more than 656 GW of new coal capacity has been in construction worldwide (but net additions from 2017 to 2040, i.e. considering the decommissioning, is expected only at the level of around 400 GW).

Figure I

Global average annual net capacity additions by type. Source: World Energy Outlook 2017, International Energy Agency



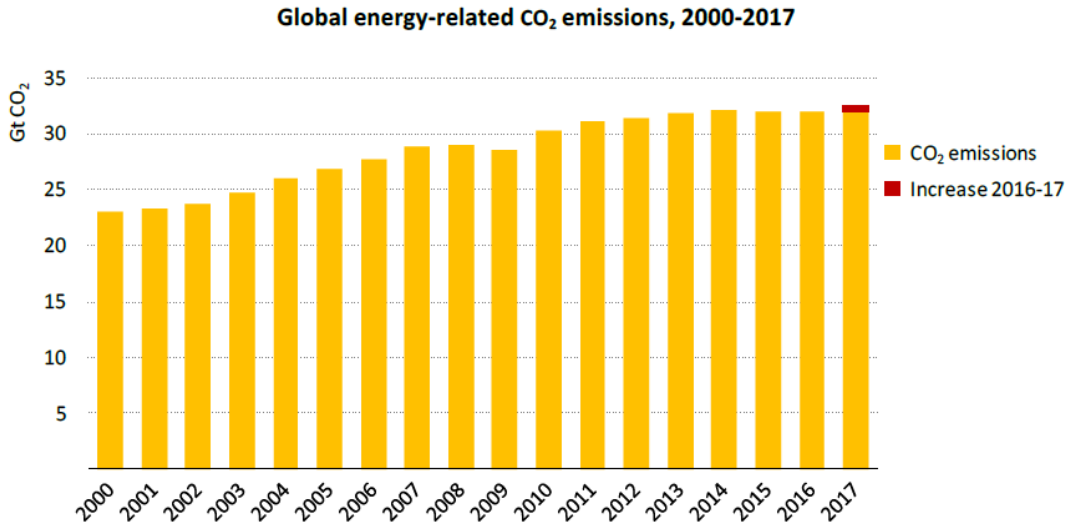
12. The number of people whose national incomes and livelihoods depend on fossil energy is important. As a consequence, the energy transition requires rapid but careful management – enhancing quality of life as the central objective obliges connected policy approaches that optimize across the entire 2030 Agenda, including notably decarbonization and climate, energy access, water and environment, and health.

13. The world's carbon intensity of energy has remained mainly flat over the past twenty years with minor increase in 2017.

14. Additions of renewable energy capacity have yet to deliver the needed and expected decarbonization. Recent studies show no correlation between additions of power from renewable energy sources and the overall net carbon intensity of energy. While "energy for sustainable development" is about more than just energy and climate, energy is the key sector for meeting climate objectives. However, action to reduce energy-related emissions is not currently included in about half of the nationally determined contributions (NDCs) submitted to UNFCCC. When such actions are included, they do not necessarily cover emissions from all sources of energy and it is not always clear that pledges in NDCs are consistent with existing national energy policies and plans.

Figure II

Global energy-related CO_2 emissions, 2000-2017. Source: Global Energy & CO_2 Status Report 2017, International Energy Agency



C. Robust energy systems and infrastructure resilience

15. This pillar will examine energy infrastructure, resilience and planning and proposes to provide a platform to explore various angles. The adequate integration of climate risks in the planning of climate sensitive investments requires a change in mindset away from conventional behaviour and practices to an integrated framework approach that brings together climate information, climate impact assessment and decision-making for investment. Such a paradigm shift requires credible climate information used with appropriate modelling tools and supported by dedicated institutions to better inform policy and development planning.

16. For example, the recent World Bank/UNECA study on "Enhancing the climate resilience of Africa's infrastructure" (ECRAI) showed that proper integration of climate change in the planning and design of infrastructure investments can reduce considerably the risk posed by the climate of the future to the physical and economic performance of hydropower and irrigation investments.[3] To sustain Africa's growth and accelerate the eradication of extreme poverty, investment in infrastructure is fundamental. The 2010 Africa Infrastructure Country Diagnostic found that investment of some US$ 93 billion per year for the next decade will need to be invested to enable Africa to fill its infrastructure gap. The Program for Infrastructure Development in Africa (PIDA), endorsed in 2012 by the continent's Heads of State and Government, lays out an ambitious long-term plan for closing Africa's infrastructure gap, including through major increases in hydroelectric power generation and water storage capacity. Much of this investment will support the construction of long-lived infrastructure (e.g. dams, power stations, irrigation canals, etc.) that may be vulnerable to changes in climatic patterns though the direction and magnitude of the climatic changes remain uncertain.

[3] https://openknowledge.worldbank.org/handle/10986/21875

17. The more profound the transition that is undertaken towards low-carbon energy and green economy, the more competitive and sustainable a country's economy will be in the future. For example, great potential lies in the transformation of large industrial complexes and modernizing energy infrastructure comprehensively. There are a number of industrial complexes around the world where mining, power generation, metallurgy, manufacturing and shipping facilities have been integrated into dense, interrelated businesses. Cities and populated areas have grown around these large industrial complexes with their employment opportunities, and they are now vulnerable to environmental impacts and social upheaval. When countries modernize their mining and energy sectors it is in their best interest do so sustainably. Cities and regions around the globe are key contributors with innovative solutions. When done in partnership and developed transparently and openly, modernization of large industrial complexes can lead to innovation-led, socially and environmentally responsible sustainable national energy strategies.

18. There is also a great challenge across the globe in renovating existing buildings, especially multi-apartment residential ones. Poor maintenance of these buildings in cities has resulted in poor energy performance and also led to social burdens, aging housing stock, common spaces in poor technical condition, safety hazards, and energy poverty. In many countries, multiple demonstration projects showcase modern technology for energy efficient renovation. However, many of the high-technology buildings do not sustain their performance over time as there is poor understanding of the required technical expertise. The human factor presents a huge challenge in organizing energy-efficient renovation of residential multi-apartment buildings in addition to the technological, managerial and financial challenges.

D. Matchmaking and investor confidence

19. The Ninth Forum represents a renewed opportunity for the financial and energy communities to network and explore partnerships in the wider context of the 2030 Agenda. Building on last year's demand, matchmaking activities are offered to facilitate a dialogue about possibilities for developing sustainable energy and promoting transformational investment and about lingering issues that might hamper investments. Participants have the opportunity to discuss key issues, identify priorities and propose concrete recommendations for policy changes needed to overcome political, legal, regulatory, technical barriers and take advantage of clean energy potential.

20. With respect to renewable energy, over the past decades most countries adopted detailed renewable energy strategies with ambitious goals and financial support mechanisms to facilitate investment. Global new investments in renewable power and fuels marked new records in 2017. However, these measures have not proven sufficient to foster renewable energy investment and deployment in all countries alike, and the level of investments on renewable energy projects is far from sufficient to reach the ambitious climate change and sustainable development goals. While the costs of renewable energy may be falling, the cost of integrating intermittent sources of energy into the grid is not. Therefore, the challenge goes beyond financing investments and involves approaching a sustainable energy mix from a broader angle and applying broad thinking to a net zero-carbon energy system.

21. However, it is not only the renewable energy community that is facing difficulties to access financing. It is equally challenging to operate to the highest standards in existing power plants with limited access to finance for modernization and grid integration. The Forum offers a platform to voice concerns about fossil fuel financing for those that attempt to provide populations with electricity access, grid stability and a diversified energy mix. Full transformation of the energy system requires alignment of investment incentives with

the objectives of the 2030 Agenda. The Forum will offer opportunities to improve confidence in transformational, long-term investments in energy for sustainable development as a whole. The workshops and activities proposed in this pillar are intended to support all actors participating in the energy development and deployment process.

E. Hot topics and deep dives

22. The approach taken for the first time in the forum process is a pillar designed for deeper dives into selected topics of interest. The topics at the Ninth Forum include the impact of digitalization, sustainable resource management, and other topics of unique impact to drive change.

23. Digitalization lies at the heart of change in modern society, how we live, travel, and do business. In modern economies, without a digital infrastructure there would be no energy production, distribution or use. Questions of security, dependency, privacy and disruption are arising as industrial players and utilities invest in digitalization in a major way. There is little information on the value digital technology provides to the energy industry. This deep dive will discuss where are the biggest pay-offs lie, which services are growing fastest, which technologies show the biggest promise, and how business models are evolving in response.

24. Few institutions have made resource productivity a priority. The global economy is increasingly characterized by greater resource scarcity and a desire to reduce waste. Adopting innovative approaches and taking the lead on resource productivity would strengthen competitiveness and improve economic robustness.

25. Improving energy efficiency in buildings is the single largest opportunity to save resources and address climate change, it also makes good business sense to develop improved building envelopes, insulation, more efficient heating and cooling systems and the like. The transition to sustainable energy consumption requires action on different scales, from installation of equipment in individual buildings to development of infrastructure on district, city and regional levels. Some energy solutions are complementary (e.g., a building can be equipped with different types of energy efficient equipment from lighting to heating, ventilation and air conditioning (HVAC) systems), while other solutions are alternative (e.g., a building can be heated by an individual heating system or connected to a district heating network). In practice, implementation of energy efficiency and renewable energy solutions involves a multitude of stakeholders, from energy consumers and installers to utilities, energy program administrators and government authorities. In this context, effective coordination between the stakeholders based on high quality data is an important success factor.

26. Many countries and cities have started to use big and geo-spatial data for the successful implementation of sustainable energy projects, e.g. for the estimation of the renewable energy potential on country level, the development of city energy infrastructure plans or the identification of energy saving potentials for individual energy consumers. Events around this topic will introduce participants to the underlying thought process and technology as well as facilitate an international experience exchange based on case studies, as the respective data management and analysis methods can be easily applied in different locations.

F. Ambition

27. The Ninth Forum provides a unique opportunity to build upon the achievements of previous fora and develop a roadmap for what participants would like to achieve in the short- and medium-term with regards to the 2030 Agenda.

28. Outcome documents from the previous two fora[4] called for a deep long-term transition to a sustainable energy future and set out concrete steps the United Nations Regional Commissions and their member States could take. The actions were discussed at the Eighth International Forum on Energy for Sustainable Development and Energy Ministerial and were endorsed by participating ministers:

- Accelerating the transition to a sustainable energy system;
- Improving energy efficiency in buildings;
- Improving energy efficiency in industry;
- Accelerating the uptake of renewables;
- Understanding the role of natural gas;
- Valuing coal mine methane;
- Extending deployment of United Nations Framework Classification for Resources;
- Reducing the environmental footprint of fossil energy through deployment of high efficiency, low emissions technology and carbon capture use and storage;
- Building on international cooperation and collaboration; and
- Improving data quality and indicators.

29. The Ninth Forum and its energy ministerial will provide a reality check on the real state of the energy transition through an honest and informed debate on the need to modernize fossil-based economies and the drive towards a green economy.

30. Such a system notably would address all aspects of sustainable development in line with national priorities and concerns, including climate change and natural resource use, job creation and energy security, social tolerance, health and energy access, among others. All nations are committed and are in the process of developing or implementing their approach to achieving their interpretation of sustainable energy and the 2030 Agenda. It is necessary that each country recognizes the perspectives and the drivers of the others, that there is not a single approach to the transition but a multitude of approaches. What truly matters is that the collective outcome delivers the needed results and that this collective approach can achieve these targets faster than individual national or sectoral actions.

[4] See:
http://www.unece.org/fileadmin/DAM/energy/se/pdfs/eneff/7th_Forum_Baku_Oct.2016/Joint_Statement_IFESD.5_2014.pdf
andhttp://www.unece.org/fileadmin/DAM/energy/se/pdfs/eneff/7th_Forum_Baku_Oct.2016/Statement_of_CommonAction_IFESD.6_2015.pdf

Annex II

Outcome Document of the Ninth International Forum on Energy for Sustainable Development (Draft for consideration)

I. Key Messages

1. The vital role that energy plays as an enabler for improving quality of life must be recognized, and its links to other sectors such as water, climate, health, and agriculture must be strengthened through integrative policies. Without energy, attainment of the 2030 Agenda for Sustainable Development is at risk.

2. Coherent policies and enabling environments must be in place to mobilize necessary investments, and best practices and experiences should be shared and promoted. The current political, regulatory, and industrial infrastructure is not ready for deep transformation.

3. 80% of today's energy mix is fossil-based, and fossil energy will remain important, a reality that makes it imperative to address the environmental footprint of fossil fuels immediately.

A. Recommendations for priority action:

4. Some options for addressing energy for sustainable development are sensible economically, environmentally, and socially under all circumstances and should be pursued aggressively and diligently. These include sustainable resource management, energy efficiency improvements in buildings, industry, and transport and methane management in the extractive industries.

5. Energy prices must reflect full costs, including externalities, to enable sustainable management of energy resources and accelerated uptake of energy efficiency and clean energy technology. Energy subsidies must be rationalised to remove market distortions while protecting vulnerable groups and should be focused on overcoming short-term obstacles.

6. Reductions in the costs of renewables present an opportunity to meet energy demand with renewable energy sources:

(a) For Latin America and the Caribbean region, it is important to mainstream renewables in policies, programmes and projects to improve energy access, particularly in rural areas, and to attract investment. Governments can support renewables by reducing risks, extending fiscal and non-fiscal incentives, and providing more conducive legal frameworks and regulatory stability;

(b) For Africa and the Arab region, the promotion of local content enhancement across the full renewable energy value chain can catalyse longer term enhanced deployment of renewables with wider socio-economic benefits.

7. It is important to ensure that climate resilience is fully integrated into planning energy infrastructure and investments that are at risk from climate change and variability. Investment in power grids and promotion of cross-border interconnections will accelerate access to electricity, improve efficiency, and accelerate penetration of variable renewable power

8. Improving the performance of the transport sector, incorporating cleaner and more efficient technologies, multi-modality and greater use of renewable energies is of high importance.

9. For Asia and the Pacific region, clean cooking must be better integrated into energy policy frameworks. In Africa region and in Latin America and the Caribbean region, the gradual replacement of traditional biomass fuels for cooking and heating with modern energy sources should be promoted. New employment opportunities for women are also important: with greater economic value attributed to women's time, households are more likely to choose more efficient technologies with reduced fuel gathering requirements.

10. The United Nations Economic Commission for Europe (ECE) is exploring alternative pathways countries might consider achieving their national targets while contributing to global and regional objectives. The project is an important vehicle for understanding the gaps that exist in meeting the energy-related objectives of the 2030 Agenda and the opportunities available to close the gaps. The other regional commissions might consider undertaking similar assessments and interested agencies might join the process.

11. In every region there is a need for human and institutional capacity for energy planning and management and greater engagement with the private sector, transparency and accountability, monitoring and data collection systems, dissemination and information-sharing between institutions and a stronger role for science and research. Efforts to encourage innovation in energy services and promote collaborative research and development at the regional level should be planned and introduced.

12. The SDG 7 indicators/targets reflect a limited view of energy's contribution. Indicators with explicit links to other sectors and SDGs need to be developed to track movement towards the desired target – a low-carbon energy system that provides affordable access to sustainable energy services for all. Data sources and data gathering/analytical capacity of countries do not meet requirements. The tracking reports of the regional commissions in collaboration with the World Bank and the IEA have highlighted the shortcomings. The reports provide important information for policy makers. The reports should be updated regularly on a three-year cycle. Data gaps and reliability should be addressed to inform investment planning, develop greater capacity to collect and analyse energy data, harmonize data-collection methodologies and strengthen existing data-collection systems.

13. Development and implementation of suitable policies and institutional frameworks to manage natural resources more sustainably, boost energy efficiency measures and practices, and address barriers preventing progress in energy efficiency and renewable energy deployment is inevitable.

B. Africa is unlikely to achieve SDG 7 by 2030

14. While countries in North Africa have attained nearly universal access to electricity and clean cooking and some countries in the rest of Africa are progressing towards universal access by 2030, most of the continent is unlikely to achieve SDG 7 with existing policies and commitments.

15. *Access:* Due to future projected population growth (from 1.3 billion people in 2017 to 1.7 billion in 2030), roughly the same number of people are likely to be without access to electricity in 2030 as in 2016 (590 million). The number of people without access to clean cooking fuels will reach 900 million by 2030.

16. *Efficiency:* Energy intensity remains high (6.0 MJ/USD in 2014), largely as a result of overreliance on inefficient biomass and weak energy efficiency policies and programmes.

17. *Renewable Energy:* Renewable electricity capacity exceeded 38 GW in 2016 (about 23 percent of the total), driven mainly by developments in wind, solar PV, geothermal and large hydropower. However, the region has ambitious targets that will require substantial political will and innovative and ambitious policies, including an enabling environment for mobilizing private sector finance from foreign direct investment and domestic resources.

C. For Latin America and the Caribbean region SDG7 is unachievable

18. *Access:* The number of people without access to electricity fell from 44 million in 2000 to 18 million in 2014. If current growth rates are maintained and if additional resources are provided for the countries with the largest deficits, 100% access could be attained by 2030. Access to modern energy sources for cooking has been improving, but over 84 million people still lacked access as of 2014. Annual rates of expansion have declined in recent years, and at current rates of progress (roughly 0.5 percent per year) the SDG 7 target will not be achieved.

19. *Electricity:* The region is the least energy intensive in the world. However, it also has the lowest annual rates of improvement (approximately 0.5 percent per year on average between 1990 and 2010). Although the energy intensity indicator has been trending down, driven mainly by efficiency gains in the industrial sector, at the current pace of progress it will be impossible to achieve the target set for 2030.

20. *Renewable Energy:* Renewable energy sources are used widely in the region, with modern renewable energies representing 22.9 percent of TFC in 2014. There has been a slight downward trend in both indicators, which could be reversed with more non-conventional renewable energy and hydropower plants and stronger policies for sustainable use of firewood.

D. Asia and the Pacific region is moving forward but unlikely to achieve SDG7

21. *Access:* Although the region made remarkable progress on electricity access in the last decade almost 10 percent of the region's population still have no access to electricity. The region is on track to reach nearly universal access to electricity by 2030, however there are some countries with acutely low access rates. Almost half of the population rely on polluting and unhealthy cooking fuels and technology, therefore the region is far from being on track to achieve universal access to clean cooking by 2030.

22. *Efficiency:* The region has demonstrated a long-term steep decline in energy intensity, falling from 9.1 MJ/2011 USD (PPP) in 1990 to 6.0 MJ/2011 USD (PPP) in 2014, and progressing towards convergence with the 2014 global average of 5.4 MJ/ USD (PPP).

23. *Renewable Energy:* The share of renewable energy, including both traditional and modern forms, reached 18.3 percent of the region's TFC in 2014, down from 23 percent in 1990, though up from a low of 17.9 percent in 2011. Modern renewables comprised 6.8 percent of TFC in 2014, up from 6.2 percent in 2012. In absolute terms, renewable energy consumption increased from 29.3 EJ in 2012 to 31.1 EJ in 2014.

E. Progress in the ECE region is falling short

24. Attainment of SDG 7 is falling short in the ECE region, except for the target on 100% access to electricity, and if "access" is defined more broadly, challenges remain on access to heating services and on reliability, affordability and quality of service. The region has specific climatic, economic, environmental and political circumstances leading in parts of the region to inefficient use of energy, power cuts, increasing energy costs, and unsustainable and unaffordable heating in winter. ECE falls short as well on the other energy-related SDGs that support improving quality of life. On current trends, energy will not deliver needed support to the 2030 Agenda, notably in the area of climate.

25. *Access:* ECE officially has achieved 100% access to power networks and 98% access to clean cooking fuels, but there are significant quality and affordability challenges. Access to distributed generation sources or to alternative energy networks must be considered.

26. *Efficiency:* The rate of progress in improving energy intensity is insufficient to meet the 2030 goal. Improvements in energy intensity in the region recently have been around -2 percent per annum since 2012.

27. *Renewable Energy:* Annual renewable energy investments in the region need to more than double to achieve the 2030 target. The ECE region has an increasing share of renewable energy in total final consumption (TFC) but certain sub-regions have low and declining investment rates in renewable energy.

F. Arab region overall progress is challenged

28. *Access:* Overall, access to electricity is close to universal in cities across the Arab region but remains fixed at approximately 80 percent in rural areas, with a total of around 36 million people lacking access to electricity in 2014. Planned and unplanned service disruptions in many countries in the region are a challenge for electricity users, irrespective of the urban–rural divide or income disparities. In some areas, war, regional instability and mass migration also present significant challenges in providing energy access to millions of people. The share of the population using clean cooking fuels and technologies has risen continuously since the 2000s, and stood at 88 percent in 2014, with intra-regional differences.

29. *Electricity:* While the Arab region has historically not been one of the most energy-intensive regions in the world, it has been the only one to have no reduction in its energy intensity over the past 25 years, while energy consumption has more than doubled since 1990. Residential and service sectors combined accounted for at least two-thirds of total annual electricity consumption in the region, of which around 73 percent was consumed by the residential sector alone. A recent study by the World Bank estimated the potential savings from energy efficiency at 21 percent of projected total primary energy supply (TPES) in the Middle East and North African countries by 2025.

30. *Renewable Energy:* Despite a considerable potential for use of modern renewable energy technologies, such as wind and solar power, renewable energy still plays a marginal role in most Arab countries, at 4 percent of TFC in 2014, including biomass. Its overall low contribution to the energy mix reflects the region's globally unparalleled reliance on non-renewable sources.