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# Ensuring access to affordable, reliable, sustainable and modern energy for all

## Report of the Secretary-General

*Summary*

Submitted pursuant to General Assembly resolution 73/236, the present report provides an overview of the progress made towards ensuring access to affordable, reliable, sustainable and modern energy for all and highlights action taken by Member States to accelerate progress towards that objective. The report also presents key messages from several global platforms for sharing lessons and inspiring further action in support of Sustainable Development Goal 7. They include the high-level dialogues held in May 2019 at the midpoint of the United Nations Decade of Sustainable Energy for All 2014–2024, the session of the high-level political forum for sustainable development held in July 2019 and the preparations in connection with the Secretary-General's climate summit, which is to be held in September 2019.

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# I. Introduction

1. The present report is submitted pursuant to General Assembly resolution 73/236, in which the Assembly requested the Secretary-General to submit, at its seventy-fourth session, a report on the implementation of the resolution, including activities carried out to mark the United Nations Decade of Sustainable Energy for All 2014–2024, and decided to include in the provisional agenda of its seventy-fourth session, under the item entitled "Sustainable development", the sub-item entitled "Ensuring access to affordable, reliable, sustainable and modern energy for all".

# II. Energy in the context of the 2030 Agenda for Sustainable Development

2. Energy is central to the achievement of both the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change. Energy is inextricably interlinked to many Sustainable Development Goals, including poverty eradication, food security, clean water and sanitation, health, education, prosperity, job creation and the empowerment of youth and women. Access to affordable, reliable, sustainable and modern energy for all is fundamental to human development. A shift towards sustainable energy solutions is also essential to the achievement of the Paris Agreement as adopted under the United Nations Framework Convention on Climate Change.

3. Sustainable Development Goal 7, which is intended to "Ensure access to affordable, reliable, sustainable and modern energy for all", represents the first-ever universal goal on energy, with five targets pertaining to access, efficiency, renewables and means of implementation.

4. In July 2018, the high-level political forum on sustainable development undertook the first global review of Goal 7 under the auspices of the Economic and Social Council, providing a first critical milestone in taking stock of progress to date on Goal 7 and its interlinkages with other Sustainable Development Goals. Many Member States undertook voluntary national reviews to assess progress towards the 2030 Agenda for Sustainable Development, including Goal 7. A multi-stakeholder technical advisory group on Goal 7 was convened by the Department of Economic and Social Affairs to provide technical input for the review of Goal 7 at the high-level political forum. To support the review process at the forum, the technical advisory group coordinated the publication of two editions of policy briefs on accelerating the achievement of Goal 7, which included submissions by over 50 United Nations entities and other organizations to provide a basis for determining what was necessary to scale up progress on Goal 7 until 2030.

5. Meanwhile, UN-Energy has been revitalized as the United Nations system convener to deliver on the implementation of Goal 7 and has issued a new plan of action and vision.

# III. Progress towards ensuring access to affordable, reliable, sustainable and modern energy for all[1]

## A. Global overview

6. The achievement of Goal 7 is within reach, but global energy transformation must be accelerated to achieve both the 2030 Agenda and the Paris Agreement. The world is not on track to meet the Sustainable Development Goals or to keep the rise in the global temperature in the twenty-first century no more than 2°C above pre-industrial levels, let alone to limit the temperature increase to below 1.5°C.

7. Accelerated action on Goal 7 to harness cross-sectoral interlinkages and maximize shared benefits and synergies will significantly contribute to closing the gap in efforts to achieve the climate goals and help to enable a just and equitable transition to a climate-safe future by advancing the other Goals.

8. Significant progress has been recorded in several targets of Goal 7. The global population without access to electricity fell from about 1.2 billion in 2010 to around 840 million in 2017. Global energy intensity improved at an accelerating rate of 2.3 per cent annually between 2010 and 2016. The share of renewables in final energy consumption increased from 16.6 per cent in 2010 to 17.5 per cent in 2016.

9. Nevertheless, progress has been largely uneven, and urgent reinforced action is needed to achieve Goal 7 by 2030. Some 3 billion people, in particular women and children, are still without clean cooking solutions, and close to 4 million people die prematurely from illness attributable to household air pollution from inefficient cooking practices using polluting stoves paired with solid fuels and kerosene. This situation requires an urgent, completely revamped approach with increased funding. Further acceleration is required to achieve universal electricity access, especially in sub-Saharan Africa. Despite growth in the share of modern renewables in the power sector, deployment is lagging in end-use sectors, in particular transport, industry, heating and cooling. Energy efficiency improvements must increase to a rate of 2.7 per cent annually to meet the global target.

### Access to electricity

10. Thanks to significant efforts across the developing world, the global electrification rate reached 89 per cent in 2017, up from 83 per cent in 2010, leaving about 840 million people without access. The progress amounts to an average annual electrification rate of 0.8 percentage points, and newly gained access for more than 920 million people since 2010.

[1] The subsequent sections of the report draw on the following documents: the special edition of the report of the Secretary-General to the Economic and Social Council on progress towards the Sustainable Development Goals (E/2019/68); the analysis by the Department of Economic and Social Affairs of voluntary national reviews relating to Goal 7; the outcome document of the high-level dialogue on the implementation of the United Nations Decade of Sustainable Energy for All 2014–2024: a midpoint review, mandated by the General Assembly in its resolution 73/236, which was held in New York on 23 and 24 May 2019; the outcome document of the Global Conference on Strengthening Synergies between the Paris Agreement and the 2030 Agenda for Sustainable Development, held in Copenhagen from 1 to 3 April 2019, on maximizing shared benefits by linking implementation across the Goals and climate action; the policy briefs on accelerating the achievement of Goal 7 compiled by the technical advisory group on Goal 7 in support of the high-level political forum held in 2019; and *Tracking SDG 7: the energy progress report* (2019), a joint report of the International Energy Agency, the International Renewable Energy Agency, the Statistics Division of the Department of Economic and Social Affairs, the World Bank Group and the World Health Organization.

11. The electrification trend began to accelerate in 2015, reaching an additional 153 million people yearly between 2015 and 2017, at an annual rate of more than 1 percentage point. However, the momentum remained uneven across regions, and many difficult-to-reach populations, in particular in sub-Saharan Africa, remain without access.

12. Electrification efforts have been particularly successful in Central and Southern Asia, where 91 per cent of the population had access to electricity in 2017. Access rates in Latin America and the Caribbean, as well as Eastern and South-Eastern Asia, climbed to 98 per cent in 2017. Among the 20 countries with the largest populations lacking access to electricity, Bangladesh, India, Kenya and Myanmar have made the most significant progress since 2010.

13. Sub-Saharan Africa remains the region with the largest access deficit, where 573 million people, more than one in two lack access to electricity. The region is also home to the 20 countries with the lowest electrification rates. Burundi, Chad, the Democratic Republic of the Congo, Malawi and the Niger were the five countries with the lowest electrification rates in 2017.

14. Progress in electrifying inner cities has been slow, and most informal settlements are still supplied through fragile distribution networks. The rural access rate of 79 per cent in 2017 was lower than the urban access rate of 97 per cent. To reach remote areas, off-grid solutions are essential, including solar lighting systems, solar home systems and, increasingly, mini-grids.

15. Target 7.1 contains a call for universal access to affordable, reliable and modern energy services. Reliability and affordability remain challenges in many countries, even as the number of household connections increases. In 2017, one third of access-deficit countries faced more than one weekly disruption in electricity supply that lasted over four minutes. A basic, subsistence level of electricity consumption, at 30 kilowatt-hours per month, was unaffordable for 40 per cent of households in about half of those countries. Access also has a gender dimension. Analysis of key access-deficit countries under the World Bank multi-tier framework for measuring energy found significant variability in household access rates based on the gender of the head of household.

16. If the rate of progress in expanding access to electricity remained at the same level as between 2015 and 2017, universal access could be achieved by 2030. However, connecting the remaining unserved populations may be more challenging than past electrification efforts, since many such populations live in remote areas or overburdened cities. A projected 650 million people are likely to remain without access to electricity in 2030, and 9 out of 10 such people will be in sub-Saharan Africa.

17. Key strategies for closing the gap will need to include data-based decision-making and advanced policy-planning frameworks, private sector financing, versatile solutions that include decentralized renewables, and efforts to both extend rural electrification and cope with urban densification.

**Access to clean cooking solutions**

18. The share of the global population with access to clean fuels and technologies for cooking increased from 57 per cent in 2010 to 61 per cent in 2017. However, because population growth is outpacing annual growth in access, especially in sub-Saharan Africa, the population without access to clean cooking remains just under 3 billion.

19. Between 2010 and 2017, the percentage of the population relying on clean cooking solutions grew by an annual average of 0.5 percentage points, though annual

progress slowed in 2008. During the period, global improvements were driven by gains in the regions of Central and Southern Asia and Eastern and South-Eastern Asia, in which average annual increases of 1.2 and 0.9 percentage points, respectively, were recorded. To reach universal targets on clean cooking by 2030 and outpace population growth, the annual average increase in access must rise to 3 percentage points, from the rate of 0.5 percentage points observed between 2010 and 2017.

20. India and China account for the largest shares of the global population without access to clean cooking, at 25 per cent and 20 per cent, respectively. Those two countries alone are home to 1.3 billion people without access to clean cooking solutions. Meanwhile, in 6 of the 20 countries with the largest access deficits – the Democratic Republic of the Congo, Ethiopia, Madagascar, Mozambique, Uganda and the United Republic of Tanzania – less than 5 per cent of the population uses clean fuels and technologies as their primary means of cooking.

21. In most access-deficit regions, the use of wood is steadily declining, but the trend is offset by an increase in charcoal usage, primarily in sub-Saharan Africa. As kerosene use declines, reliance on cleaner gaseous fuels, such as liquid petroleum gas, natural gas and biogas, for cooking increases. The uptake of cleaner fuels remains slow in rural Africa, in large part due to issues of affordability and supply.

22. The business-as-usual pathway will not meet the goal of universal access by 2030. On the basis of the projections of current and planned policies, the International Energy Agency estimates that 2.2 billion people will still be dependent on inefficient and polluting energy sources for cooking. Most of that population will reside in Asia and sub-Saharan Africa. To achieve universal access by 2030, greater use of liquid petroleum gas would be appropriate in urban areas, accounting for an estimated 92 per cent of new connections, to significantly reduce negative health impacts while also contributing to decreased greenhouse gas emissions by substituting charcoal and other non-renewable biomass. Population density in urban areas also justifies the necessary investment in infrastructure. Meanwhile, improved biomass cookstoves, which represent 37 per cent of clean cooking solutions, would be particularly suited to rural or more remote areas. In the long run, concerted efforts will be required to effect the transition to clean, affordable and sustainable solutions that dramatically reduce emissions of health-harming substances and greenhouse gases.

**Renewable energy**

23. In 2016, the share of renewables in total final energy consumption increased at the fastest rate since 2012 and reached almost 17.5 per cent. Renewables are essential in the drive towards universal access to affordable, sustainable, reliable and modern energy, except for the traditional uses of biomass, for example for cooking, which is linked to significant negative health impacts. In 2016, the share of modern renewables, excluding traditional uses of bioenergy, in total energy consumption reached 10.2 per cent, up from 8.6 per cent in 2010, while the share of traditional uses of biomass declined from 7.9 per cent to 7.3 per cent.

24. Of the three end uses of renewables, namely electricity, heat and transport, the use of renewables for electricity grew fastest, driven by the rapid expansion of wind and solar technologies.

25. The share of renewables in electricity consumption increased by 1 percentage point to 24 per cent in 2016. That was the fastest growth since 1990 and more than double the rate of 2015. It was driven by the following three key developments: drought recovery in Latin America and an associated increase in hydropower generation; record-level wind capacity additions in China in 2015, which became fully operational in 2016; and rapid expansion of solar capacity in China and the United States of America. Hydropower remains the largest source of renewable

electricity, accounting for 68 per cent in 2016. It is followed by wind, bioenergy, solar and geothermal energy.

26. The share of renewables used for heat remains the highest among the three end uses. That share surpassed 24 per cent in 2016, an increase of 0.5 per cent year on year. However, most of the share reflects traditional uses of biomass. Only 9 per cent of heat was generated from modern renewables in 2016.

27. The share of renewable energy in transport remains lowest, increasing by 0.1 per cent year on year to reach 3.3 per cent in 2016. Biofuels constitute the majority of renewable energy used for transport in Brazil, the United States and the European Union. Electricity generated from renewable sources also grew, linked to rail and the rapid increase in the number of electric vehicles.

28. The top 20 energy-consuming countries in 2016 were responsible for three quarters of global energy demand and two thirds of global renewable energy consumption. In the six countries where consumption of renewables was above the global average, the trend was led by traditional uses of biomass, in India, Indonesia, Nigeria and Pakistan, modern biomass, in Brazil, or hydropower, in Canada.

29. Strong policy support and the increasing cost-competitiveness of solar photovoltaic and wind technologies are projected to bolster the deployment of renewable electricity across all regions. However, according to long-term scenarios developed by both the International Energy Agency and the International Renewable Energy Agency, global renewable energy consumption needs to accelerate substantially to ensure access to affordable, reliable, sustainable and modern energy for all.

30. Despite remarkable progress over the past decade, renewables still face persistent financial, regulatory and sometimes technological barriers. Policies have so far been focused on renewable electricity, and fewer countries have implemented policies for the use of renewables for heating and transport. To foster an enabling environment, it is important that various policies work in tandem to integrate renewables into energy systems and directly support their deployment in all end uses. To ensure that the renewables-based energy transition is inclusive in all respects, gender considerations need to be mainstreamed into energy sector policies, education and training programmes and private sector practices.

**Energy efficiency**

31. Rates of improvement in global primary energy intensity, defined as the percentage drop in global total primary energy supply per unit of gross domestic product, were more sustained in the period from 2010 to 2016 than they had been from 1990 to 2010, falling by more than 10 per cent. Global primary energy intensity was 5.1 megajoules/$ in 2016, a 2.5 per cent improvement from 2015. Yet this lags behind the annual rate of improvement required to reach target 7.3 by 2030, which now exceeds 2.7 per cent. Further declines in the rate of improvement were observed in 2017 and 2018, the rate of improvement in 2018 falling to a mere 1.3 per cent.

32. To realize the significant cost savings, in addition to reduced energy consumption and carbon dioxide emissions, to be gained from improved energy efficiency, more needs to be done. Concerted policy efforts, technological change and changes in economic structure will help to improve global primary energy intensity. Recent progress has been more sustained than historical trends. From 2010 to 2016, the annual rate of primary energy intensity improvement accelerated in 16 of the 20 economies with the greatest energy demand. China saw the most significant improvement, with India, Indonesia, Japan and the United Kingdom of Great Britain and Northern Ireland also recording strong progress.

33. Energy intensity has decreased at varied rates across end-use sectors. Progress has been fastest in industry and passenger transport, in which the average annual rate of improvement exceeded 2 per cent. Rates of efficiency improvement in the services, agricultural and residential sectors exceeded 1.5 per cent. Freight transport lagged behind slightly, but a changing policy landscape following the implementation of fuel economy standards for trucks in Canada, China, India, Japan and the United States, as well as proposed standards in Europe, signal potential change in the coming years.

34. The rate of improvement in global primary energy intensity is also influenced by supply-side factors, chief among them efficiency in fossil fuel generation and reductions in the losses incurred in the transmission and distribution of electricity. The generation of fossil fuel electricity has become steadily more efficient since 2000, the efficiency level reaching nearly 40 per cent in 2016. Meanwhile, the modernization of electricity networks in the world's largest electricity-generating countries, including China and India, has reduced transmission and distribution losses.

35. In the future, improvements in energy intensity are likely to fall short of target 7.3, leaving a large portion of potential benefits unrealized. Given current and planned policies, energy intensity improvements are projected to average 2.4 per cent per year between 2017 and 2030.

36. According to an analysis based on the International Energy Agency sustainable development scenario, in which cost-effective energy efficiency potentials are maximized, the improvement rate for intensity between 2017 and 2030 could reach 3.6 per cent, demonstrating that it is still possible not only to meet but even to exceed target 7.3. Key efforts that Governments can undertake to realize this potential include strengthening mandatory energy efficiency policies, providing targeted fiscal or financial incentives, leveraging market-based mechanisms and disseminating high-quality information about energy efficiency. The spread of digital technologies will also create new ways to harness efficiency improvements through improved devices and business models.

### Finance and investment

37. The overall financing requirement to meet Goal 7 in relation to renewable energy, energy efficiency and universal access is estimated at $1.3 trillion to $1.4 trillion per year until 2030. While progress is being made to scale up financing, current annual financing levels are significantly below that level, at approximately $514 billion. Moreover, investment is not spread equally, and developed countries and some middle-income countries have access to finance while many developing countries are left out. In 2017, power sector investments in China and the United States were above $100 billion, while investments in sub-Saharan Africa, South-East Asia and the Middle East and North Africa region were well below $50 billion.

38. The available volumes of public and blended finance are not sufficient to meet needs. Recent data indicate that in low-income countries, for every $1 of multilateral development bank resources invested, only $0.37 in private finance is being mobilized. Interventions from public finance institutions must be targeted to support and mobilize the creation of stable and viable commercial markets through regulations, as the scale-up of private sector financing will play a central role in financing Goal 7.

### Capacity-building

39. Strengthened capacity-building is necessary to ensure the effective implementation of Goal 7. Across countries, a wide variety of capacity-building strategies and activities have been used to promote access to clean energy and the

wider deployment of energy efficiency and renewable energy technologies and services. Such lessons need to be synthesized to provide a solid basis for scaling up capacity-building efforts, including on enabling frameworks, technology cooperation, investment measures, the transfer of technical know-how and staff training activities.

### Technology and innovation

40. Digitalization could fundamentally transform the global energy system by breaking down sectoral boundaries, increasing flexibility and enabling integration across systems. Well-designed policies are crucial to unlocking the full benefits of digitalization in achieving Goal 7, while also managing potential risks relating to security, privacy and rebound effects.

### Data and monitoring

41. Innovative tracking instruments, such as the multi-tier framework for measuring energy access, can enhance decision-making. Its analysis of data on the reliability and affordability of access to electricity and clean cooking solutions offers useful input for policy formulation, investment strategies, project design, utility performance accountability and evaluations of project impacts.

## B. Regional overview

42. Strengthening cooperation at the regional and subregional levels is critical to effectively addressing the specific challenges of various areas and to promoting innovation, investment, enhanced cross-border connectivity, capacity-building, South-South cooperation and synergetic actions towards Goals on energy, climate change and the environment and other Sustainable Development Goals simultaneously.

### Africa

43. Since 2015, Africa has made significant progress with electrification, increasing the overall rate from 38 per cent in 2015 to 44 per cent in 2017. However, much more needs to be done by policymakers to create the enabling environment for investment needed to close the continuing energy deficit.

44. Mega-projects, mainly in power generation and distribution, are being implemented with support from development partners and multilateral organizations, including under the Programme for Infrastructure Development in Africa, Power Africa and the African Development Bank “New Deal on Energy” initiatives. When complete, the projects are expected to improve electricity access in many African countries. For example, the aim of Power Africa is to increase capacity by 30,000 MW and create 60 million new connections by 2030.

45. However, not all countries can achieve the targets of Goal 7 with their current policies, levels of ambition or the pace and scale of investment. Thirteen countries had electrification rates of less than 30 per cent in 2017. To be on course to achieve Goal 7, further regulatory reforms and private sector investments in energy infrastructure are needed.

46. The low level of access to clean cooking fuels and technologies is evidence of a lack of robust policies and actions to deploy them, in particular in rural areas. Only 17 per cent of sub-Saharan Africa had access to clean cooking fuels in 2017, compared with 12 per cent in 2010 and 13 per cent in 2015. The majority of rural households continue to rely mostly on traditional biomass for cooking.

47. Deployment of modern renewable energy technologies, especially solar and wind, is increasing, and providing access to millions of households. According to the

International Renewable Energy Agency, modern renewable energy technology options across sectors and countries will provide 22 per cent of total final energy consumption in Africa by 2030, up from 5 per cent in 2013.

48. Significantly, there has been an increase in private sector participation and investments in the form of independent power producers. As of 2017, 59 independent power producers' projects were under way in 18 countries in the region, excluding South Africa, totalling $11.1 billion in investments and 6.8 GW of installed generation capacity.

### Arab region

49. The electrification rate in the Arab region rose from 88.4 per cent in 2010 to 92.5 per cent in 2017, at an average annual electrification growth rate of 0.7 per cent. However, in 2017, the least developed countries in the Arab region reported that 88 per cent of their urban population had access to electricity, but only 50 per cent of the rural population did. Meanwhile, unplanned service disruption is a challenge for electricity users, irrespective of the urban-rural divide or income disparities.

50. Access to clean fuels and technologies is high in the Arab region. In 2017, 14 countries had access rates above 95 per cent. Region-wide access grew steadily at an average annual growth rate of 1.1 per cent throughout the 2000s, driven primarily by significant improvements in the least developed countries in the region, which account for most of the access deficit in the region.

51. The Arab region historically has not been one of the most energy-intensive regions, and its energy intensity has been relatively stable over the past 25 years, while other regions have reduced their energy intensity. Energy consumption, however, has more than doubled in the region since 1990, with a direct increase in greenhouse gas emissions. Transport remains by far the most energy-intensive sector in the Arab region, followed by industry and agriculture.

52. Renewable energy plays a marginal role in energy consumption in the region, reflecting its globally unparalleled reliance on non-renewable fossil fuel sources. In 2016, renewable energy, including biomass, accounted for about 10 per cent of final energy consumption in the region.

### Asia and the Pacific

53. Although the Asia and Pacific region made remarkable progress on electricity access in the past decade, over 231 million people, around 5 per cent of the region's population, still have no access to electricity. The region is on track to nearly reach universal access to electricity by 2030, but there are some countries with acutely low access rates, mainly Pacific Island countries.

54. Around 2 billion people, nearly half the population, rely on polluting and unhealthy cooking fuels and technologies, and the region is far from being on track to achieve universal access to clean cooking by 2030.

55. The share of renewable energy, including both traditional and modern forms, reached 16 per cent of total final energy consumption in the region in 2016, down from 44.5 per cent in 1990, though up from a low of 15.8 per cent in 2011.

56. The region has demonstrated a long-term steep decline in energy intensity, falling from 9 megajoules per United States dollar at 2011 purchasing power parity in 1990 to 5.4 megajoules per United States dollar at 2011 purchasing power parity in 2016, converging with the global average.

### Latin America and the Caribbean

57. The number of people in Latin America and the Caribbean region without access to electricity fell from 44 million to 12 million between 2000 and 2017. In urban areas, the degree of coverage in 2017 remained at 99 per cent while in rural areas it reached 92 per cent, a large increase compared with 2014, when it had reached only 88 per cent. If current growth rates are maintained, this objective can be achieved. However, greater efforts must be devoted to supporting the countries that are lagging furthest behind, namely Guyana, Haiti, Honduras, Nicaragua and Suriname. Access to modern and healthy cooking and refrigeration technologies is still lagging behind, despite the efforts made, and around 83 million people lack access to such sources, so it is unlikely that the target will be met by 2030 unless electrification policies are focused on covering this dimension by electrifying cooking and refrigeration.

58. The region continues to make progress on the issue and it is expected that in the short term a large MW capacity will be installed in the region. The significant share of renewable sources represents 27.6 per cent of total final energy consumption, and modern renewable energies represent five sixths of that share, which places the region in a privileged situation. The region had an installed renewable energy capacity of 218.2 GW in 2017. Capacity expansion rates show significant gains after 2014, since when increases greater than 5 per cent have been observed. That will increase thanks to policies that promote the use of renewable energies. In this area, the mechanisms of bidding and auctions stand out, where values for wind energy of $0.06 kWh and for photovoltaic solar energy of $0.13 kWh were achieved in 2017.

59. The region has historically had the lowest energy intensity in the world. In recent years, this indicator has not changed, limiting the region’s advantage over other regions of the world. Although the indicator has decreased in the past decade, given the trend in the past five years, improving efficiency will require efforts in addition to those that have been made if the target is to be met.

### States members of the Economic Commission for Europe

60. Access to electricity in the States members of the Economic Commission for Europe is at almost 100 per cent, though this figure does not reflect differences in quality and cost, or the energy poverty affecting poor and rural populations during winter months when heating is essential. The region as a whole has 98 per cent access to clean fuels and technologies for cooking. Ensuring physical and economic access to quality energy services, however, requires investments throughout the energy value chain, and government policies and regulations that address a dynamically changing energy market while also protecting vulnerable groups.

61. Most countries in the region have national energy efficiency action plans, but have shown limited progress in implementing them. Improving energy efficiency is one of the most cost-effective options for meeting growing energy demand and attaining climate commitments, and there is a largely untapped potential for energy productivity improvements in the industry and transport sectors. Policies that create market-entry barriers, artificially lower energy prices (encouraging wasteful consumption), or maintain production and consumption subsidies that distort markets need to be eliminated from national policy frameworks.

62. Renewable energy represented 12 per cent of total final consumption in 2016. The region has almost half of the installed renewable electricity capacity in the world (869 GW in 2016), close to half of which, 388 GW, comes from large hydropower stations, 254 GW from wind and 140 GW from solar photovoltaic systems.

**Least developed countries, landlocked developing countries and small island developing States**

63. The least developed countries, landlocked developing countries and small island developing States together comprise 91 countries with a total population of about 1.1 billion. Access to energy in those vulnerable countries remains a major challenge.

64. The average proportion of the population of landlocked developing countries with access to electricity rose from 34.5 per cent in 2000 to 56.3 per cent in 2017, but with wide disparities between urban and rural areas and between countries in Africa and those in the Latin America, European and Asian regions.

65. Investments in renewable energy infrastructure, along with information and communications technology, are priorities for landlocked developing countries to structurally transform their economies in favour of growth and sustainable development. The renewable energy share in total final energy consumption is close to 62 per cent. However, about 350 million people out of a total population of 500 million rely on biomass for cooking, underscoring the urgent need for improved access to clean and modern cooking energy.

66. The sustainable energy sector, in terms of renewable energy and energy efficiency, offers considerable potential for small island developing States, given that their dependence on fossil fuel imports leads to some of the highest electricity tariffs in the world, making them extremely vulnerable to fluctuating global energy prices and high transportation costs. Such States have a large potential to use renewable energy sources such as solar, wind, geothermal, hydropower and tidal power and to improve their generation, transmission and demand-side efficiency.

67. The deployment of sustainable energy technologies is considered an effective tool for raising productivity, competitiveness, energy security, energy access and affordability and in addressing the negative externalities of conventional energy systems, such as greenhouse gas emissions, in an integrated way. However, looking at the moderate growth rates of sustainable energy in recent years, the overall share remains low in a number of small island developing States. Therefore, Goals 7 and 13 cannot be attained by 2030 in business-as-usual scenarios.

68. Despite growing investments over the past decade, sustainable energy markets have not reached economies of scale in small island developing States. The deployment of renewable energy and energy efficiency solutions remains hindered by a broad range of barriers and shortcomings related to inadequate policy and regulation, namely a lack of fiscal and non-fiscal incentives, technical limitations, economic challenges, a lack of access to affordable finance, limited human and institutional capacity, and inadequate infrastructure, research and development and innovation frameworks.

## C. Best practices of Member States

69. For the high-level political forum on sustainable development, held in July 2018, 46 countries undertook voluntary national reviews of their progress in the implementation of the 2030 Agenda. The national reviews were aimed at facilitating the sharing of experiences, including successes, challenges and lessons learned, with a view to accelerating the implementation of the 2030 Agenda. Based on the reviews submitted to the high-level forum, and for illustrative purposes only, some examples of country-level best practices related to Goal 7 are highlighted below.

### Australia

70. In Australia, the use of renewable energy continues to rise and currently provides around 16 per cent of electricity in the country. In 2017, clean energy investment was the highest on record for Australia, placing it seventh in the world. Several state and territory governments are undertaking procurements for grid-scale battery storage facilities in South Australia, and the world's largest lithium ion battery (100 MW/129 MWh) has been installed there, providing grid stability to the network in South Australia, where close to 50 per cent of energy generation is from wind and solar.

### Cabo Verde

71. The Government of Cabo Verde launched its household energy strategy to address the interlinkages between clean cooking solutions, health and gender equality, supporting the dissemination of enhanced stoves and promoting the use of locally manufactured stoves at affordable prices.

### Canada

72. Canada launched the Clean Energy, Education and Empowerment initiative to promote gender equality in the clean energy sector, increasing education and employment opportunities. It also launched the Equal by 30 campaign, which is aimed at bringing together leaders from across the energy sector to find common ground for action to achieve equal pay, equal leadership and equal opportunities by 2030.

### Egypt

73. Egypt has made significant progress in cutting inefficient fossil fuel subsidies and redirecting funds to better targeted conditional and unconditional cash transfer programmes.

### Greece

74. Greece has an energy efficiency obligation programme that has been in place since January 2017, requiring energy suppliers to make savings against an annual target, based on the market share of the obligated entity, targeting oil suppliers and the transport sector. In the building sector, which accounts for almost half of energy consumption, the focus has been on the refurbishment and renovation of the existing building stock in line with new efficiency obligations to improve thermal insulation, among other factors. The "Home Savings II" public-private venture, coupled with the State energy audit policy, operates with the active participation of the banking sector, with 10 partner banks providing no- or low-interest loans to homeowners and shop owners to replace door and window frames, boiler and heating systems and external wall insulation to ensure optimal heating and cooling performance and insulation, resulting in considerable energy savings. The programme is expected to result in annual energy savings of up to 1 billion kWh.

### Hungary

75. In 2014, the Government of Hungary launched the Warm Homes programme, financed with €102 million from the national budget. The purpose of the programme is to provide households throughout the country with non-refundable financial support to increase their energy efficiency. The programme has contributed to the modernization of more than 200,000 homes, totalling approximately €98 million in investment. The programme has reached 5 per cent of Hungarian households over the past three years. The grants have resulted in the reduction of carbon dioxide emissions by 99,000 tons per year and energy savings of 260 million kWh per year.

### Ireland

76. Ireland will allocate some €20 billion in capital funding for energy efficiency, renewable energy and energy security projects over the next 10 years. Specifically, projects will include support for changing oil-fired boilers to heat pumps, along with the provision of roof solar heating, in at least 170,000 homes; a new renewable electricity support scheme to support up to 4,500 MW of additional renewable electricity by 2030; and energy research funding to accelerate diversification away from fossil fuels to green energy, including wind, wave, solar, biomass, biofuels and biogas and hydrogen. Ireland is also showing exemplary leadership in supporting the targets of Goal 7 globally. It is committed to supporting developing countries in their transition from the inefficient use of traditional energy supplies towards the use of modern, cleaner sources of energy, such as solar energy and energy-efficient cookstoves. A number of small-scale pilot projects have been supported to explore off-grid household energy solutions for rural communities in sub-Saharan African countries, such as Malawi and Uganda, and offer options to be considered for scale-up as part of an overall energy solution.

### Jamaica

77. The nationally determined contributions of Jamaica in the context of the Paris Agreement will be achieved primarily through actions in the energy sector. The country is developing a renewable energy nationally appropriate mitigation action, through which the expansion of electricity generation from renewable resources will be facilitated.

### Lithuania

78. Lithuania is seeking to increase the share of renewables with the ambition that they will reach 45 per cent by 2030 and 80 per cent by 2050, with renewables dominating in the electricity, heating and cooling and transport sectors.

### Malta

79. Malta is participating in the “Greening the Islands” web platform to connect innovators to promote sustainable island projects. It encourages the replication of such projects in as many locations as possible, including through a web-based application.

### Mexico

80. Mexico is making considerable progress towards reaching its target of 35 per cent of electricity generated by clean sources by 2024. The use of clean energy certificates to accredit production from sustainable sources, coupled with competitive auctions for solar and wind energy, boosted the share of renewables and resulted in low prices. Furthermore, the use of renewable energy resources is promoted thanks to a national atlas of areas with high energy and renewable energy potential.

### Paraguay

81. Paraguay is the largest producer and exporter of clean renewable electricity per capita in the world. The country supports the agreement on sustainable water and energy solutions concluded by the Department of Economic and Social Affairs and Itaipu Binacional to promote the sustainability of water and energy in line with Goals 6 and 7. Under the partnership, a model office was established on the Paraguayan side of the Itaipu dam with the aim of creating a global sustainability network to provide a platform to support the implementation of the Sustainable Development Goals.

**Senegal**

82. The pilot project in Senegal to install light-emitting diode (LED) lights in Dakar is an encouraging example of the ambitious deployment of a modern and efficient energy access solution. The pilot project is undertaken in the context of the ambitions of the country's Economic and Energy Agency to launch a programme to replace 3 million inefficient incandescent lights with LED lights, which consume between 80 per cent and 92 per cent less electricity, in households, government offices and on public streets by 2025.

**Singapore**

83. The Government of Singapore pays special attention to developing a steady pool of well-trained workers to manage the country's electrical system. It instituted a vocational training programme in schools to build the technical competency of the local workforce.

**Togo**

84. The solar street lights programme in Togo is an inspiring example of urban electrification relying on modern energy technologies. Some 10,000 solar-powered street lights were installed in the five regions of Togo, including 7,000 standard solar street lights, 2,000 solar street lights with five outlets for charging appliances and 1,000 solar street lights with five outlets for charging devices and a Wi-Fi hotspot for Internet connection.

**United Arab Emirates**

85. Masdar, an energy innovation company in the United Arab Emirates, excels in renewable energy innovation and sustainable urban development. It also manages the $4 million Zayed Future Energy Prize, which rewards pioneering innovators and visionaries whose achievements have furthered the proliferation of renewable energy solutions. In addition, its Clean Energy division is a leading developer and operator of utility-scale, grid-tied projects, small-scale applications providing energy access to communities away from the electricity grid, and carbon abatement projects. Since 2006, Masdar has invested in renewable energy projects with a combined value of $8.5 billion. Its share of the investment is $2.7 billion.

**Viet Nam**

86. The dynamic policies and stable legal and regulatory framework of Viet Nam resulted in major progress in closing the access gap, and the country is on track to ensuring that most rural households have access to electricity by 2020.

## D. Interlinkages between energy and other Sustainable Development Goals

87. Advancement in achieving Goal 7 has the potential to spur progress on all of the Sustainable Development Goals, including those on poverty eradication, gender equality, mitigation of and adaptation to climate change, food security, health, education, sustainable cities and communities, clean water and sanitation, jobs, innovation, transport and refugees and other situations of displacement. To realize this opportunity, closer cross-sectoral cooperation is needed at all levels between actors and decision makers, as well as measures to address the following important areas of sustainable development practice:

(a) Over 230 million children attend primary schools without any electricity, compromising educational and development outcomes (Goal 4). Electrification at primary schools stands at a mere 69 per cent. Enabling policies are needed to incentivize and facilitate a more coordinated approach, along with investments in sustainable and clean energy and education infrastructure and services, in order to close the electricity access gap in education and also drastically improve girl-to-boy ratios in schools;

(b) Energy efficiency and renewable energy investments continue to act as robust socioeconomic drivers, including through net employment gains (Goal 8). Employment in renewable energy stood at 10.3 million in 2017 and could potentially reach about 24 million by 2030. However, it is necessary to ensure that the global energy transformation is accompanied by policies enabling a just transition that will take into account the loss of jobs in the fossil fuel sector and leave no one behind. There are also significant opportunities for achieving a greater gender balance in global energy transformation. Gender considerations must be mainstreamed into job creation efforts, including through building enabling environments for women entrepreneurs;

(c) Ensuring access to affordable, reliable, sustainable and modern energy for all is a key condition for reducing inequalities, achieving the principle of leaving no one behind and ensuring a just and inclusive energy transition (Goal 10). Policymakers should address the interlinkages between energy, climate change, poverty and inequality by promoting productive uses of energy, while enhancing gender equality and health equity, acknowledging the special vulnerability of women, addressing conditions of fuel poverty and supporting renewable energy and energy efficiency investments by low-income households;

(d) Updated nationally determined contributions due in 2020 should fully reflect the ambitious goals of countries for renewable energy and energy efficiency (Goal 13). Decarbonization of the world's energy systems and attainment of the targets of Goal 7, including ensuring universal access to modern energy, are mutually reinforcing and must be advanced at the same time. A unified approach, including on finance, is required to achieve Goal 7 and the Paris Agreement simultaneously. The rapid deployment of renewables, coupled with energy efficiency, can achieve most of the emission reductions and decarbonization in the energy sector needed by 2050, while at the same time advancing economic growth and development. Special emphasis should be placed on mainstreaming gender considerations into all actions related to the Goals, including responses to climate change. Renewable energy targets at the country level should also be linked to their adaptation strategies;

(e) The potential benefits of the global energy transition will contribute to greater peace and security by fostering more inclusive, climate-resilient and sustainable societies (Goal 16). The global energy transformation will have new and far-reaching geopolitical implications, which will need to be carefully managed. Developing effective, accountable and transparent institutions at all levels can help to achieve the potential benefits of the transformation;

(f) The first Global Conference on Strengthening Synergies between the Paris Agreement and the 2030 Agenda for Sustainable Development, jointly organized by the Department of Economic and Social Affairs and the secretariat of the United Nations Framework Convention on Climate Change, was held in Copenhagen from 1 to 3 April 2019 and provided a unique platform to deepen discussions on the interlinkages between all Goals, including Goal 7, and climate change, which should be strengthened.

# IV. Midpoint review of the United Nations Decade of Sustainable Energy for All 2014–2024

88. In 2012, the General Assembly adopted resolution 67/215, by which it declared the Decade of Sustainable Energy for All 2014–2024, underscoring the importance of energy issues for sustainable development. As 2019 marks the midpoint of the Decade, the dialogue mandated by the Assembly in its resolution 73/236 adopted in December 2018 provided an opportunity for energy policymakers and other relevant stakeholders to not only discuss the implementation of the Decade, but also assess progress and identify challenges and solutions.

89. The participants in the high-level dialogue on the implementation of the United Nations Decade of Sustainable Energy for All 2014–2024, marking the midpoint review, which offered a platform to discuss major issues and demonstrate action related to the implementation of the Decade, reviewed the implementation of the global plan of action for the Decade, shared best practices, lessons learned, new challenges and emerging opportunities on Goal 7 and discussed ideas to accelerate the implementation of Goal 7 in support of the ministerial meeting of the high-level political forum on sustainable development, held in July 2019, and the Sustainable Development Goals Summit, the Secretary-General's climate summit, and the high-level midterm review of the SAMOA Pathway, all of which are to be held in September 2019. The linkages between Goal 7, the other Goals and the Paris Agreement were addressed as part of the dialogue, and actions, commitments and synergetic action between the Goals and climate action were discussed.

90. Participants in the dialogue welcomed the significant progress that has been recorded in several targets of Goal 7 but concluded that global energy transformation must be accelerated to achieve both the 2030 Agenda and the Paris Agreement.

91. Participants emphasized that the Decade should play a significant role in bringing together all stakeholders to respond to the call for accelerated action towards the achievement of Goal 7, as declared at the high-level political forum held in 2018.

92. In order to ensure the strategic alignment of the global plan of action for the Decade with the 2030 Agenda, including by building on technical inputs such as the proposed global agenda for accelerated action towards the achievement of Goal 7 and the outcomes of the review of Goal 7 at the high-level political forum held in 2018, participants reiterated that the strategic objectives of the global plan of action serve as a framework for multi-stakeholder action.

93. Turning the strategic objectives into action will require increased international cooperation among all stakeholders on specific, strategic, bold and time-bound plans of action and partnerships, including through the facilitation of efforts by the Secretariat and the regional commissions, in coordination with the United Nations development system, international organizations, multilateral development banks, businesses, civil society and other stakeholders.

94. Participants welcomed the revitalization of UN-Energy, including its new vision and plan of action, as the main coordination mechanism on energy issues within the United Nations system. Its principal mission continues to be as the primary agent within the United Nations for promoting system-wide collaboration on energy-related issues. It acts as the main mechanism that brings the United Nations system together for more integrated and coherent delivery of policy and normative support, with the aim of improving the overall delivery of the Organization's support and services on energy-related issues and improving the evidence base for system-wide results and impacts. UN-Energy should further increase coherence and coordination across the United Nations system, as well as its collaboration with stakeholders.

95. In its action plan, UN-Energy sets out to drive action towards the Secretary-General's climate summit to be held in 2019; move forward on the implementation of Goal 7 through high-impact targeted interventions on the ground; address the interlinkages between energy and health, including to ensure access to clean cooking and sustainable energy services for health-care facilities; advance sustainable energy solutions for refugees and displaced people; and help to make the United Nations system greener.

96. The midpoint review mandated in resolution 73/236 proved to be particularly useful in convening key stakeholders to discuss accelerating the implementation of Goal 7. Similar annual dialogues supported by the Department of Economic and Social Affairs, within existing resources, should be considered to maintain momentum and scale up ambition levels to deliver on the global plan of action as part of the Decade and the targets of Goal 7 set out in Agenda 2030. The priorities identified in the ministerial declaration of the high-level political forum, such as clean cooking, require urgent attention as part of such annual dialogues.

97. The Department of Economic and Social Affairs will continue to support the Secretary-General in coordinating the activities of the Decade, facilitate UN-Energy as its secretariat and convene the multi-stakeholder technical advisory group on Goal 7.

# V. Greening the blue: reaching United Nations system-wide environmental and social sustainability

98. The General Assembly, in its resolution 73/236, called upon the Secretary-General to promote renewable energy, energy efficiency and related sustainable practices in all United Nations facilities and operations around the world, set implementation targets and timelines by the end of 2019, building on and avoiding duplication with existing initiatives, and report on progress, within the most relevant existing reporting frameworks.

99. The United Nations system is committed to raising its own ambition and developing a system-wide environmental and social sustainability strategy for the period from 2020 to 2030, addressing the full picture of environmental and social sustainability in its policies, strategies, programmes, projects, facilities and operations. At the climate summit to be held in September 2019, the system-wide efforts towards reaching climate neutrality in internal operations by 2020, including specific indicators on the use of renewable energy at United Nations facilities, will be presented.

# VI. Conclusion

100. **In order to support the implementation of the 2030 Agenda for Sustainable Development, including Goal 7, all stakeholders need to step up and scale up their actions. Upcoming global milestones, such as the Secretary-General's climate summit and the sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change, present key opportunities. The United Nations Decade of Sustainable Energy for All 2014–2024 should continue to be leveraged to facilitate the rapid implementation of the strategic objectives described in the present report. UN-Energy should play a vital role in enhancing coherence and coordination. Such actions can help to build sustainable and resilient societies, ensuring that no one is left behind.**