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Item 8 (b) of the provisional agenda*
High-level parallel meetings to review in depth and showcase progress made and to facilitate peer-to-peer learning in connection with the sub-themes of the Forum: affordable and clean energy

Background report on the sub-theme of affordable and clean energy

I. Introduction

1. Achieving Sustainable Development Goal 7, on ensuring access to affordable, reliable, sustainable and modern energy for all, is vital for development in Africa and the full implementation of the 2030 Agenda for Sustainable Development and Agenda 2063: The Africa We Want, of the African Union. Energy is a powerful enabler of economic growth, poverty reduction, development, transformation and climate resilience. In Africa, where energy poverty is widespread, progress on Goal 7 is linked with progress on nearly all other Goals.

2. Reliable, affordable energy is critical to social services. Electrified health facilities can refrigerate vaccines, run diagnostic and emergency equipment and support maternal care. Electrified schools enable digital learning, better teacher retention, longer study hours and access to information and communications technology. Electricity underpins water supply, sanitation and cold chains for food, medicines and agricultural inputs. In a digital world, energy is essential for connectivity, data and participation in the digital economy.

3. Reliable electricity is central to economic activity, including in agriculture, manufacturing and services, where it can facilitate mechanization, processing and storage, boost productivity, minimize losses and create jobs. The growth of small and medium-sized enterprises depends on energy reliability. At a macro level, affordable energy underpins industrialization, diversification and regional integration.

4. Despite their significance to the economy, African energy systems are characterized by persistent, interrelated structural deficits that extend beyond the absence of physical connections and include: poor reliability and quality of supply; high energy costs for households and firms; weak utility finances; and high capital costs that constrain investment. Although millions of Africans are connected to electricity networks, they may receive power for only a few hours per day, experience frequent outages and voltage instability, or face prohibitively high costs when reliance on diesel generators and other backup solutions is considered.

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Access alone is therefore an insufficient measure of progress. Energy services must be affordable, reliable and fit for purpose, in particular for productive uses and public service delivery, if they are to result in tangible development outcomes.

5. The challenge in achieving Goal 7 in Africa must therefore be understood across three interlinked dimensions: access; reliability and quality of supply; and affordability. The dimensions must be addressed simultaneously. Expanding access without improving reliability limits the impact of development. Increasing supply without addressing affordability risks excluding low-income households and undermining equity. Focusing solely on electricity access without addressing clean cooking perpetuates significant health, gender and environmental burdens.

6. At the heart of the African energy transition is the deployment of modern renewable energy sources. Every African country is endowed with abundant renewable energy resources, in particular solar, wind, geothermal and hydropower. In recent years, there has been growth in renewable energy investment and installed capacity, both grid-connected and off-grid, but the progress remains far below what is required to achieve universal access and support economic transformation. Integrating renewable energy into the continent's energy systems requires not only generation capacity but also adequate grids, financially viable utility providers, performance indicators, precise targets for service quality and regulatory environments that enable decentralized solutions.

7. The way in which energy is planned and delivered in Africa must be transformed dramatically, moving beyond plans and targets to delivery at scale. The transformation is urgent if the continent is to address its chronic energy deficits and successfully implement major development agendas. It requires accelerating the installation of new connections, improving reliability and affordability for existing customers, and prioritizing energy for productive uses and basic social services. Electrifying health facilities, schools, water systems and digital infrastructure is particularly critical. Regional assessments indicate that running health and education facilities on solar energy across East and Southern Africa alone would require investment in the order of $5 billion and an approximate 500 megawatt peak of installed solar capacity,[1] illustrating both the scale of unmet needs and the transformative potential of targeted investments.

II. Goal 7 trends and progress in Africa

8. Despite measurable progress over the past two decades, Africa remains off track to achieve all Goal 7 targets by 2030. The most fundamental challenge is demographic: population growth across the continent continues to outpace the rate of electrification. Although millions of Africans gain access to electricity each year, the absolute number of people without access remains exceptionally high. Achieving universal access by 2030 would require tripling the annual rate of new connections,[2] representing an enormous challenge in terms of investment requirements, institutional capacity and coordination across national and subnational levels.

9. Progress across Africa has been highly uneven. North Africa has achieved near-universal electricity access, reflecting decades of sustained public investment, relatively strong institutions and integrated power systems. A small group of countries, including Gabon, Ghana, Mauritius, Seychelles and South Africa, have also made substantial advances in electricity access. In contrast, many countries in Central Africa and the Sahel continue to face severe energy poverty, with electricity

[1] United Nations Children's Fund, *Regional Report on Renewable Energy for Health and Education in the Eastern and Southern Africa Region* (2024).

[2] International Renewable Energy Agency, *World Energy Transitions Outlook 2023: 1.5 C Pathway* (2023).

access rates below 40 per cent and, in some cases, below 20 per cent,[3] as shown in figure I. Fragile and conflict-affected States are particularly disadvantaged, reflecting the compounded effects of insecurity, weak institutions, limited fiscal space and underdeveloped infrastructure.

10. The largest and fastest-growing African economies account for a substantial share of the continent's unelectrified population in absolute terms. In 2023, some 257 million people in just four countries – the Democratic Republic of the Congo, Ethiopia, Nigeria and the United Republic of Tanzania – lacked access to electricity.[4] The African energy challenge is therefore not confined to small or fragile States but is also a central development constraint for the continent's largest economies. In such contexts, rapid population growth, urbanization and rising demand place additional pressure on energy systems that are already constrained.

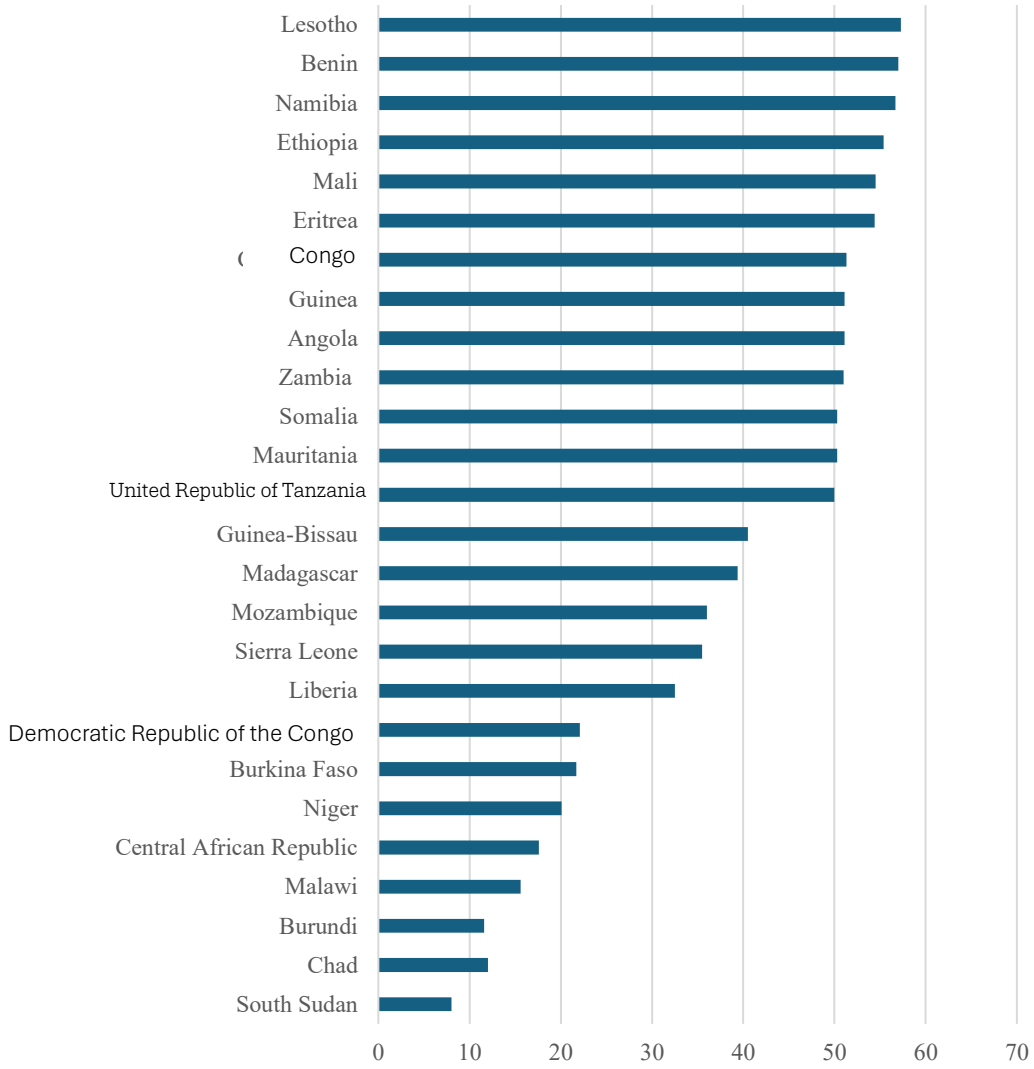
11. Crucially, progress on Goal 7 cannot be assessed solely on the basis of access rates. In many African countries, reliability constraints are severe. Power shortages, load shedding and unplanned outages are common, even in urban areas with relatively high connection rates. The constraints are driven by insufficient generation capacity relative to demand, inadequate reserve margins, fuel supply challenges, poor maintenance of generation and grid assets, and high transmission and distribution losses. Weak utility provider finances exacerbate the challenges, limiting the ability to invest in maintenance, upgrades and expansion.

12. Affordability further complicates the picture. Even when electricity tariffs appear low, households and firms often face high total energy costs owing to the need to use diesel generators or other backup systems. For businesses, unreliable and expensive energy raises production costs, reduces competitiveness and discourages investment. For households, it limits the use of amenities that improve the quality of life, such as refrigeration, lighting and digital devices. These dynamics underscore the need for a more comprehensive and nuanced assessment of Goal 7 progress that goes beyond headline access figures and reflects service quality, affordability and productive use.

[3] ECA analysis of data provided directly by the World Bank.

[4] International Energy Agency, International Renewable Energy Agency, United Nations, World Bank and World Health Organization, *Tracking SDG7: The Energy Progress Report* (Washington, D.C., World Bank, 2025).

Figure I
African countries with less than 60 per cent electricity access, 2023
(Percentage of population with access)



Source: ECA analysis of data provided directly by the World Bank.

A. Electricity access (target 7.1)

1. Proportion of the population with access (indicator 7.1.1)

13. Across Africa, electricity access has increased steadily since 2000, reflecting investments in generation, transmission and distribution, and the rapid growth of decentralized energy solutions. Nevertheless, some 600 million Africans remain without access to electricity,[5] and current connection trajectories are insufficient to achieve universal access by 2030.

14. Rural areas are disproportionately affected, more than 450 million people do not have access to electricity. In many countries, urban access rates exceed 60 or 70

[5] United Nations Sustainable Development Group, "Decoding Africa's energy journey: three key numbers", 27 January 2025.

per cent, while rural access remains below 30 per cent.[6] Such spatial inequality reinforces broader development disparities, given that rural communities are often excluded from opportunities in the modern economy, good-quality healthcare, education services and digital connectivity. The rural energy gap sustains cycles of poverty and limits the effectiveness of investments in agriculture, education and health. More information on rural electrification is provided in the box.

Rural electrification and energy for public service infrastructure

Rural electrification remains one of the most significant obstacles to achieving Goal 7 in Africa. Traditional grid extension approaches are often expensive and slow when applied to sparsely populated rural areas, in particular in countries with limited fiscal space and challenging geography. As a result, decentralized solutions, including solar home systems, mini-grids and hybrid systems, are increasingly recognized as the least-cost options for a substantial share of new rural connections.

Decentralized energy solutions have several advantages. They can be deployed more rapidly than grid extensions, are well-suited to dispersed populations and can leverage renewable resources. Falling technology costs, innovative financing models and the widespread adoption of mobile payment systems have further improved their viability. Decentralized solutions have their drawbacks, however, such as issues relating to affordability, quality assurance, long-term sustainability and integration with future grid expansion. Transparent and predictable regulatory frameworks are needed to address tariff-setting, service standards, consumer protection and the treatment of mini-grids once connecting to the primary grid becomes feasible.

Crucially, rural electrification must go beyond household connections. Energy services are essential for powering public service infrastructure, including health facilities, schools, water systems and digital connectivity. Clinics without reliable electricity cannot refrigerate vaccines, operate diagnostic equipment or provide safe maternal and neonatal care. Schools without power struggle to offer digital learning, attract qualified teachers or extend study hours. Water systems without electricity cannot reliably pump, treat or distribute safe water. In rural contexts, electrifying such infrastructure often has a greater impact on development than household connections alone.

Source: ECA.

15. Electricity access challenges are not limited to the presence or absence of a connection. In many contexts, households and enterprises that are counted as connected receive electricity for only a few hours per day. Reliability constraints undermine the value of access and force households and businesses to rely on costly and polluting alternatives. Small and medium-sized enterprises are particularly affected, given that unreliable electricity disrupts production schedules, increases operating costs and limits job creation. For households, an unreliable supply limits the effective use of lighting, refrigeration, communication technologies and other amenities that support education, health and livelihoods.

16. Reliability constraints are less a product of power plant inefficiency than of systemic weaknesses across the electricity value chain, including: insufficient generation capacity relative to demand; inadequate reserve margins; weak transmission and distribution networks; high technical and commercial losses; fuel supply constraints; and financial stress resulting from the application of tariffs that do not sufficiently cover costs. Addressing electricity access, therefore, requires a

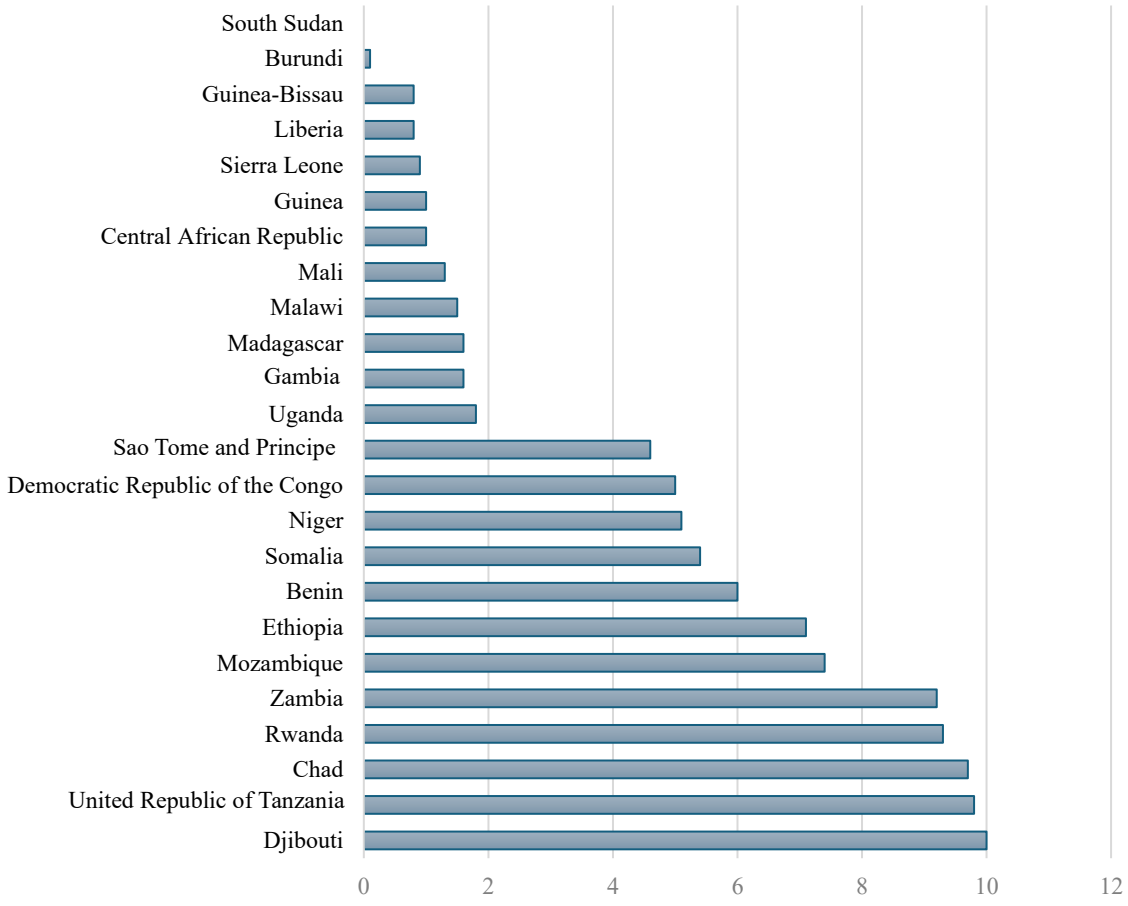
[6] *Tracking SDG7: The Energy Progress Report.*

holistic approach in which new connections are combined with investments in reliability, grid reinforcement, utility provider reform and improvements to service quality.

2. Access to clean fuels and technology (indicator 7.1.2)

17. Access to clean cooking is one of the most neglected yet impactful focus areas of Goal 7 in Africa. Approximately 900 million Africans continue to rely primarily on traditional biomass – wood, charcoal and agricultural residues – for cooking.[7] In many countries, clean cooking access rates remain below 10 per cent, as shown in figure II, and progress has been significantly slower than for electricity access.

Figure II
African countries with less than 10 per cent access to clean cooking, 2024
(Percentage of population with access)



Source: ECA analysis based on data provided by the World Health Organization.

18. The consequences of reliance on traditional cooking fuels are severe and multidimensional. Household air pollution from biomass combustion is a leading cause of premature death, in particular among women and children who are exposed to smoke for prolonged periods. Furthermore, fuelwood collection is time-consuming and physically strenuous for women and girls, who often bear that burden and whose opportunities for education and income generation are consequently limited. In addition, biomass combustion contributes significantly to climate change, through the emissions of black carbon, a short-lived climate pollutant with a warming effect

[7] International Energy Agency, *Universal Access to Clean Cooking in Africa: Progress Update and Road Map for Implementation* (2025).

that is far greater than that of carbon dioxide, and the unsustainable harvesting of fuelwood contributes to deforestation and ecosystem degradation.

19. If the adequate investment in clean cooking is not achieved, the cost of inaction—driven by negative externalities in terms of health, gender and climate–could reach an estimated $2.4 trillion a year.[8] The underinvestment persists even though clean cooking interventions often deliver high returns for health, gender equality and climate-change mitigation per dollar invested. Scaling up clean cooking solutions requires more than financing alone; it depends on the development of reliable supply chains for such fuels as liquefied petroleum gas, ethanol and biogas, last-mile distribution networks, after-sales services, safety standards and effective regulation. Affordability remains a significant barrier, given that many clean cooking solutions have higher upfront costs than traditional fuel, despite their lower lifetime costs.

20. Clean cooking should be treated as a development and public health priority, not merely an energy issue. Integrating clean cooking initiatives into health programmes, gender strategies and social protection systems can amplify their impact and improve uptake. Targeted subsidies, innovative financing mechanisms and communication to encourage behaviour change are critical to accelerating adoption while protecting low-income households.

B. Renewable energy and the energy mix (target 7.2)

21. A paradox of abundance and underutilization characterizes the renewable energy landscape of Africa: the continent has some of the world's richest renewable energy resources, in particular solar energy, but accounts for only a small share of global deployment. Although renewable energy represents a significant share of total primary energy supply in Africa, the supply derives predominantly from traditional biomass rather than modern renewable technologies. In the electricity sector, renewable generation remains below the global average, and Africa accounts for less than 1 per cent of global installed solar and wind capacity.[9] Hydropower continues to dominate renewable electricity generation in many countries, and the deployment of solar and wind power has accelerated only in a limited number of markets.

22. It is therefore important to distinguish between traditional biomass and modern renewable energy when assessing progress under target 7.2, which is aimed at substantially increasing the share of renewable energy in the global energy mix. A high share of biomass in that mix can coexist with severe energy poverty, environmental degradation and health risks. Accordingly, priority should be given in policy frameworks to modern renewable technologies, such as solar, wind, geothermal and sustainable hydropower, and to transitioning away from traditional biomass, in particular for cooking.

C. Energy efficiency (target 7.3)

23. Improving energy efficiency, and thereby enhancing capacity, is widely recognized as one of the most cost-effective and immediately deployable strategies for advancing energy access, yet it is not highly prioritized across Africa. Although the continent's per capita energy consumption is among the lowest globally, its energy intensity remains high relative to its economic output, reflecting structural inefficiencies rather than excessive consumption. High transmission and distribution

[8] World Bank, *The State of Access to Modern Energy Cooking Services* (Washington, D.C., World Bank, 2020).

[9] REGlobal, "Renewables remain critically underfunded in Africa: zero carbon analytics", 11 December 2023.

losses, inefficient appliances and equipment, outdated industrial processes and, in the absence of reliable grids, widespread reliance on alternative generation solutions, all contribute to wasted energy and higher costs.

24. Recent data indicate that energy intensity in Africa declined modestly in 2023, but the rate of improvement remains well below what is required to meet target 7.3. Average annual improvement in energy intensity in Africa is falling short of the 4 per cent annual average that is required worldwide to meet this target by 2030.[10] Without a significant acceleration in energy efficiency measures, the continent risks locking in inefficient energy systems that raise costs, strain public budgets and increase emissions.

25. Energy efficiency should be understood as an enabler of development rather than a constraint on growth. In African contexts, efficiency improvements can support economic expansion by reducing energy costs, improving reliability and freeing up capacity within constrained systems. Priority efficiency measures with rapid payback include reducing technical and commercial losses in distribution networks, deploying efficient cooling appliances through standards and labelling programmes, improving building performance and upgrading industrial equipment and processes.

26. Public service infrastructure offers particularly impactful opportunities for energy efficiency. Health facilities, schools, water pumping systems and administrative buildings often operate inefficient equipment and face high energy costs relative to limited budgets. Improving efficiency in such facilities would reduce operating costs, improve service reliability and lower the required size of generation and storage systems for electrification projects. Treating energy efficiency as a core component of energy access strategies, rather than an optional measure, is essential to delivering affordable, reliable and sustainable energy services at scale.

D. International cooperation and financing (target 7.a)

27. Achieving Goal 7 in Africa will require a substantial increase in investment across the energy value chain. Current levels of energy investment are insufficient to meet universal access targets or support economic transformation. To achieve universal electricity access by 2030, Africa requires annual energy investments of approximately $25 billion, which is two to three times current levels.[11] Those figures do not include the additional investments required for clean cooking, grid reinforcement, energy efficiency and the electrification of public service infrastructure.

28. Despite accounting for approximately 18 per cent of the world's population and possessing some of the most significant renewable energy resources globally, Africa receives only about 2 per cent of global clean energy investment.[12] The persistent financing gap is not primarily a reflection of limited resource potential or lack of demand, but instead of financial, institutional and risk-related barriers that deter investment.

29. One of the most binding constraints is the high cost of capital. In many African countries, the weighted average cost of capital for renewable energy projects exceeds 15 per cent, compared to approximately 2–5 per cent in advanced economies.[13] In

[10] Sustainable Energy for All, "SEforALL analysis of SDG7 progress – 2024", 16 October 2024.

[11] International Energy Agency and African Development Bank Group, *Financing Clean Energy in Africa* (2023).

[12] Institute of Sustainability Studies, "Africa accounts for just 2 percent of clean energy investment globally", 16 January 2024.

[13] Clean Air Task Force, "High capital costs are stalling clean energy investment across Africa, new report finds", 24 October 2024.

addition to offtake risk, regulatory uncertainty and weak balance sheets of utility providers, one of the drivers of the high cost of capital is currency risk. Many energy projects in Africa generate revenue in local currency, whereas financing and equipment procurement are denominated in foreign currency. Exchange rate volatility, therefore, exposes investors and lenders to significant risk, which is priced into financing terms. For utility providers and governments, currency depreciation can rapidly increase debt servicing costs, undermining financial sustainability and investor confidence.

30. As a result of high financing costs, delivered electricity costs remain high, even when technology costs decline sharply, as they have done for solar and wind, undermining affordability for consumers and public service providers and constraining the scalability of both grid-connected and decentralized energy solutions.

31. The affordability challenge is particularly acute for public service delivery and productive uses of energy. Health facilities, schools, water systems and small enterprises are vulnerable to high electricity costs and unreliable supplies. High tariffs or inconsistent supply can negate the development benefits of electrification by limiting equipment use, increasing operating costs or forcing reliance on diesel generators. Financing strategies for Goal 7 must, therefore, explicitly link reductions in capital prices to affordability objectives, in particular for social infrastructure and productive sectors.

32. Closing the financing gap will require enhanced international cooperation and the strategic use of concessional finance, guarantees and blended finance instruments. De-risking mechanisms, such as partial risk guarantees, political risk insurance, first-loss tranches and financing facilities in local currencies, can help to attract private capital by reducing perceived and real risks. Such tools must be deployed strategically, however, to address the most pressing risks – currency volatility, offtake risk and policy uncertainty – rather than simply to increase finance volumes. Equally important is strengthening domestic financial markets and mobilizing African private sector capital, including through national and regional development banks. Without sustained efforts to lower the cost of capital, the energy transition in Africa risks being slower, more expensive and less inclusive than necessary.

E. Infrastructure expansion and technology upgrades (target 7.b)

33. Target 7.b is focused on expanding infrastructure and upgrading technology to provide modern, sustainable energy services in developing countries. Africa has made modest progress in expanding renewable energy capacity over the past decade. Several countries have emerged as regional leaders in renewable energy deployment, including Egypt, Ethiopia, Kenya, Morocco and South Africa.

34. Installed capacity alone does not guarantee reliable energy services, however. In many contexts, new generation capacity fails to translate into improved reliability or access, owing to constraints in transmission and distribution networks, limited grid flexibility and weak system management. High technical and commercial losses, inadequate maintenance and insufficient connections further reduce the adequate availability of electricity.

35. The integration of variable renewable energy sources, such as solar and wind, places additional demands on power systems. Grid reinforcement, storage, forecasting and intra-regional connections are essential for managing variability and maintaining system stability. Without investment in those areas, renewable energy deployment risks being constrained or underutilized, even where resource potential is high.

36. Per capita indicators are significant for assessing progress under target 7.b. Although some countries have added considerable capacity in absolute terms, per capita capacity remains low across much of the continent. Moreover, progress must be assessed not only in terms of generation capacity but also in terms of connection capacity, grid readiness and the speed with which new investments translate into reliable service delivery for households, firms and public institutions.

III. Cross-cutting challenges and binding constraints

37. Progress towards achieving universal energy access in Africa is constrained by a set of interrelated, mutually reinforcing challenges. At a macroeconomic level, high debt levels, currency depreciation and rising global interest rates have reduced fiscal space and increased the cost of capital for energy projects. Such pressures underscore the importance of risk mitigation, local currency solutions and utility reform as prerequisites for scaling up energy investment.

38. At the local level, weak and fragmented policies and regulatory frameworks undermine investor confidence and slow project development. In many countries, responsibilities for energy planning, regulation, finance and implementation are spread across multiple institutions with limited coordination, resulting in policy incoherence and implementation delays.

39. Moreover, inadequate transmission and distribution infrastructure remains a significant bottleneck. High losses, frequent outages and limited grid coverage constrain both access expansion and the integration of renewable energy. Tariffs that do not sufficiently reflect costs further weaken utility providers' finances, reducing incentives and capacity to invest in maintenance, upgrades and new connections. Although tariff reform is politically sensitive, maintaining tariffs below cost without adequate compensation undermines service quality and long-term sustainability.

40. Risks in the early stages of project development can limit progress. The lack of funding and capacity for feasibility studies, environmental and social assessments, grid studies and project preparation constrains the pipeline of bankable projects, in particular in frontier and underserved markets. Without sustained support for early-stage development, many countries struggle to attract private investment, even where resource potential is substantial.

41. Operations and maintenance represent another critical, yet often overlooked, constraint. Many energy investments, in particular in decentralized systems and public facilities, are designed as one-off capital projects with limited provision for recurrent costs, including preventive maintenance, repairs, spare parts, battery replacement and technician time. The consequences of inadequate operations and maintenance are significant. Systems experience high downtime, premature component failure, safety risks and rapid degradation of service quality. In public facilities, such as health centres and schools, the failures directly undermine service delivery. Vaccine cold chains, medical equipment, water pumping systems and digital learning infrastructure are all susceptible to power interruptions. When energy systems fail, the credibility of electrification programmes is weakened, and communities may revert to polluting and costly alternatives.

42. Challenges in operations and maintenance are compounded by fragmented ownership and unclear accountability. In many cases, it is unclear where responsibility for system performance lies: it could be within a government ministry, a utility provider, a local authority, a community operator or a private service provider. Weak after-sales networks, limited local technical capacity and delays in procuring spare parts further exacerbate system failures. Such issues are particularly acute in rural and remote areas, where the provision of services is underdeveloped.

43. It is therefore essential to strengthen the overall local service environment. Training technicians, establishing supply chains for spare parts, enforcing quality

standards and building contract management capacity should be treated as core infrastructure investments, not optional add-ons, and should be systematically integrated with operations and maintenance.

44. Addressing operations, maintenance and life cycle sustainability requires a shift in the way that energy projects are designed and procured. Life cycle costing should be mainstreamed in procurement processes, with explicit requirements for funded operations and maintenance plans, minimum service levels, response times and performance monitoring. Service-based delivery models, such as energy-as-a-service arrangements, multi-year operations and maintenance contracts, and performance-based payments, can improve sustainability by linking revenue with system uptime and service quality rather than with installation alone. Overall, progress towards Goal 7 should be measured in terms of reliable, durable energy services rather than installed capacity.

IV. Productive use of energy and development outcomes

45. There is a clear disconnect between energy access and development outcomes. Although the expansion of physical access is necessary and can improve welfare and the quality of life, it is not sufficient to drive poverty reduction or economic transformation. Energy investments deliver their most significant impact when they are explicitly linked with productive uses that generate income, create jobs, strengthen local economies and support structural transformation.

46. In many contexts, the productivity gains from powering a small number of productive users can exceed those from many low-consumption household connections. Productive uses of energy include powering irrigation systems, agroprocessing equipment, cold storage, milling, refrigeration and small-scale manufacturing. Electrified cold chains are crucial for food security, good nutrition and positive health outcomes, given that they minimize spoilage and enable the storage and distribution of perishable goods, including vaccines and medicines.

47. In rural areas, access to reliable electricity can enable farmers to move up the value chain, reduce losses after harvests and access new markets. In urban and peri-urban areas, reliable energy supports services, digital activities, and small and medium-sized enterprises, which are major employers. Frequent outages and high energy costs force many businesses to rely on diesel generators, increasing operating costs and emissions, and reducing competitiveness.

48. Many electrification programmes are focused primarily, however, on installing connections rather than on enabling productive use. Connections are provided without complementary interventions, such as access to finance for equipment, skills training, market linkages and business development services. Addressing that gap requires integrating energy planning into agricultural, industrial and enterprise development policies, in coordination with relevant ministries, such as those responsible for energy, agriculture, industry, finance and labour. It also requires ensuring that energy services are reliable, affordable and appropriately sized for productive activities. Without such integration, energy access risks remaining underutilized, limiting its contribution to development.

49. In the context of a just transition, decentralized renewable energy solutions for commercial and industrial users offer opportunities to improve reliability, reduce costs and decarbonize production, provided that regulatory frameworks allow for on-site generation, the transmission of power from one system to another using a third-party network, known as “wheeling”, and grid interconnection.

50. In addition, a just energy transition can create opportunities for employment in installation, operations, maintenance, manufacturing and service provision. Tapping into the opportunities requires deliberate policies to build local skills, support local enterprises and develop domestic value chains. Without such measures,

Africa risks remaining primarily a consumer of imported technologies rather than a producer and innovator within the global energy transition.

V. Systems thinking, digitalization and institutional capacity

51. A systems-thinking approach is needed in order to address African energy challenges. Energy systems are deeply interconnected with agriculture, industry, digital infrastructure, water management and social services. Decisions in the energy sector ripple through the economy, influencing productivity, employment and resilience.

52. Digitalization offers significant opportunities to improve energy system planning, operation and efficiency. Digital tools, such as smart meters, remote monitoring systems, demand-side management platforms and digital planning tools can reduce losses, improve reliability and support the integration of renewable energy. Furthermore, planning tools can standardize data collection, improve demand estimation and strengthen project bankability.

53. Digitalization also presents new challenges, however, including skills shortages, cybersecurity risks and regulatory gaps. Institutionalizing digital tools across ministries, utility providers and implementing partners requires investment in capacity-building, data governance and regulatory frameworks. Without adequate institutional capacity, it may not be possible to maximize the benefits of digitalization.

54. Skills development is therefore a critical component of the energy transition. Transforming energy systems requires new skills in renewable energy, energy efficiency, digital management, regulation, project finance, operations and maintenance. Building such skills locally, through universities, vocational training centres and professional development programmes, is essential to ensuring a just and inclusive energy transition.

VI. Opportunities, transformative actions and main messages

55. Despite the scale of the challenges, Africa faces unprecedented opportunities to build a clean, inclusive and resilient energy future. Falling technology costs, abundant renewable resources and growing global momentum for climate action create a favourable context for accelerating progress towards the achievement of Goal 7.

56. Transformative actions include developing pipelines of bankable energy projects aligned with national development goals; expanding decentralized renewable energy solutions; embedding life cycle sustainability in all investments; and mobilizing both international and domestic capital. Strengthening regional power pools and cross-border connections can improve resource sharing, reduce costs and enhance reliability for industry and large consumers.

57. Energy efficiency and digitalization should be treated as system-wide enablers, integrated into all aspects of energy planning and implementation. Clean cooking must be elevated as a core development and public health priority, with dedicated financing and institutional support. In addition, all energy investments should be guided by principles of a just transition, ensuring that benefits are broadly shared and that vulnerable populations are protected.

58. Achieving universal energy access in Africa requires coherent policies, strong institutions, realistic timelines and ongoing investment. Governments, partners and the private sector must collaborate to turn ambitions into reliable, affordable and sustainable energy for households, businesses and public services. Energy is a means to drive broader development in Africa, in alignment with the 2030 Agenda and Agenda 2063.