



ACCELERATING SDG 7 ACHIEVEMENT

POLICY BRIEF 10

HEALTH AND ENERGY LINKAGES— MAXIMIZING HEALTH BENEFITS FROM THE SUSTAINABLE ENERGY TRANSITION

7 AFFORDABLE AND
CLEAN ENERGY



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POLICY BRIEFS IN SUPPORT OF THE FIRST SDG 7 REVIEW AT THE UN HIGH-LEVEL POLITICAL FORUM 2018

Lead Organizations



Facilitated by



With the financial support from
Governments of Norway, Netherlands, and China through the UN sub-trust fund for the 2030 Agenda for Sustainable Development
as well as the European Commission, ENERGIA and HIVOS

POLICY BRIEF #10

HEALTH AND ENERGY LINKAGES—MAXIMIZING HEALTH BENEFITS FROM THE SUSTAINABLE ENERGY TRANSITION

Developed by

World Health Organization (WHO)

In collaboration with

Climate and Clean Air Coalition, Global Alliance for Clean Cookstoves, UN Environment, UNICEF and United for Energy Efficiency

KEY MESSAGES

Status of health–energy linkages and progress towards achievement of the SDGs

- Policies designed to meet SDG 7 targets on energy access, energy efficiency and renewables have the potential to also provide vast benefits for human health (SDG 3), and spur progress across the entire Sustainable Development Agenda. However, to realize this opportunity, closer cooperation is needed at all levels between actors and decision makers, and especially between health and energy sectors.
- Lack of access to clean fuels and technologies for cooking currently has negative effects on the health of 3 billion people, and related household air pollution is a cause of some 4 million deaths from noncommunicable diseases (including heart disease, stroke and cancer), as well as childhood pneumonia. Inefficient household energy use is a particular health and livelihood risk for women, children and infants. Access to clean fuels and technologies has the potential to save millions of lives each year.
- In urban areas, air pollution (largely generated from the inefficient use of energy in homes, and in the transport, industry and building sectors) is putting over 90 per cent of the world's urban populations at increased risk of heart, brain and respiratory disease.
- Energy access challenges also affect health care delivery. Around 25 per cent of health care facilities in 11 sub-Saharan African countries have no access to electricity, a major barrier to the delivery of essential primary health care.

Priority actions

- Increase the availability of “clean for health” household energy solutions through reforms of national fuel subsidies, regulatory frameworks, and standards, elimination of market barriers, and an increased focus on building markets for clean and modern fuels and technologies (by means of innovations in financing and business models for household stove designers and distributors, including in remote locations).
- To improve urban health, promote investments in clean renewable energy, energy-efficient networks and pollution-free public transportation, and revise tax incentives and building codes to encourage energy-efficient, healthy homes.
- Facilitate collaboration between energy and health sector decision makers to ensure that health facility energy needs are adequately prioritized in national strategies, and promote the development of local industries to provide energy services for health care facilities in resource-constrained settings.

Health and Energy in the context of the Sustainable Development Goals

Energy sustains us, connects us and sometimes even saves us. We use it to cook our meals, to light and heat our homes, to get where we want to go, to produce and use most goods, and to power our medical devices and health-care systems. Having access to reliable, clean, modern energy sources enables people to live to their full potential. Conversely, living without reliable energy constrains people's possibilities, and undermines their health and well-being. A lack of electricity limits the availability of life-saving care in health-care facilities, affecting lighting, heating, ventilation and cooling systems, blood banking, cold-chain vaccine storage, and ICT services. Without reliable energy, businesses cannot operate, transport systems cannot function, and homes and workplaces cannot be heated and cooled to a comfortable level. For billions who rely on polluting fuels and devices, for example burning wood in an inefficient stove to cook meals, the resulting household air pollution poses a deadly, daily health risk.

In pursuit of SDG 7, the global community aims to meet three targets by 2030: ensure universal access to affordable, reliable and modern energy services; increase substantially the share of renewable energy in the global energy mix; and double the global rate of improvement in energy efficiency.

Investing in energy access, renewables and energy efficiency—the three target areas of SDG 7—will be instrumental in unlocking progress across the Sustainable Development Agenda. Accelerating efforts to achieve SDG 7 will reduce poverty, contribute to more inclusive, sustainable economic growth, and generate especially great health benefits, particularly among vulnerable populations (women, children). Close to 600,000 children under age 5 die each year from respiratory infections, such as pneumonia, attributable to the joint exposure of indoor and outdoor air pollution (WHO, 2016). Women and girls are the primary procurers and users of household energy services, and bear the largest share of the health risks and other burdens associated with the reliance on polluting and inefficient home energy systems.

This briefing highlights how policies to achieve these three targets can create significant benefits for health, through focused actions in three key settings: households, cities/urban environments and health-care facilities. It summarizes recommendations for prioritizing “energy for health” policies and interventions in each of these settings, offering intermediate targets to focus efforts in the energy and health sectors.

Access to clean and modern household energy and health

Three billion people rely on polluting fuels and technologies for their daily cooking needs. Over a billion people still lack access to

Box 10.1

Achieving SDG 7 will be instrumental for achieving multiple SDG 3 targets:

- **3.2: Reducing the neonatal and under-5 mortality rates.** (“By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.”)
- **3.4: Reducing the mortality rate attributed to cardiovascular disease, cancer, chronic respiratory disease.** (“By 2030, reduce by one-third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.”)
- **3.9: Reducing the mortality rate due to household and ambient air pollution.** (“By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.”)

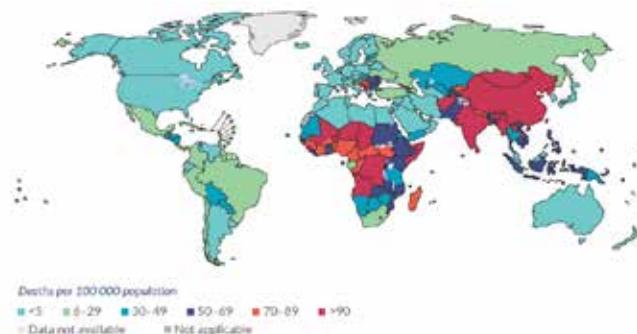
electricity, and must rely on candles and kerosene lamps to light their homes. Their homes are dangerous places to be simply because the energy sources they use release high-levels of pollutants that are harmful to their health. Achieving universal access to affordable, reliable and modern energy (SDG Target 7.1) will improve the health and well-being of some of the most vulnerable people in the world. It is the poorest countries, and within countries, the most vulnerable populations (e.g., women, children), who lack access to clean, affordable energy alternatives such as electricity, gas, biogas and other low-emission fuels and devices to meet their most basic cooking, heating and lighting needs.

Fundamental public health goals enshrined in SDG 3, such as improving child survival and preventing noncommunicable diseases, simply cannot be achieved without expanding access to clean household energy. Household air pollution resulting from the inefficient use of clean fuels and technologies for cooking alone is responsible for some 4 million deaths and over 146 million disability-adjusted life years (DALYs) each year (WHO, 2016); more than the total number of deaths from HIV/AIDS, malaria, and tuberculosis combined. Household air pollution is the leading risk factor for childhood pneumonia, accounting for over 50 per cent of all childhood pneumonia deaths or about 530,000 deaths each year. It is also responsible for a substantial fraction of deaths from noncommunicable diseases: about one-third of all premature deaths from chronic obstructive pulmonary disease; one quarter of deaths from stroke; and close to one-fifth of deaths from lung cancer and ischemic heart disease. (See figure 10.1)

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Figure 10.1

Deaths per 100,000 population from household air pollution caused by using mainly polluting fuels and technologies for cooking, 2012 (WHO, 2016)



Components of household air pollution (i.e., black carbon, methane) are also major climate drivers. Inefficient use of energy in the home is responsible is a major source of black carbon emissions (the second most important climate-forcing pollutant after carbon dioxide) and is a major source of methane, which contributes to the formation of ground-level ozone or smog.

Ensuring universal access to clean and energy in the home can save lives now and in the future, helping to accelerate the achievement of SDGs on health (especially targets 3.2, 3.4 and 3.9—see box 10.1). The International Energy Agency (IEA) estimates that 1.8 million lives a year could be saved between now and 2030 from strong and concerted actions taken to achieve the universal energy access target. (IEA, 2017a)

Beyond SDG 3 and SDG 7, accelerating access to clean household energy will unlock progress towards multiple SDGs, like SDG 5 on gender, SDG 11 on cities and SDG 13 on climate . In addition to gender, health and well-being benefits for children, and, in particular, girls, can be significant. Available survey data from 13 countries showed that girls in sub-Saharan African homes using mainly inefficient biomass cookstoves spend about 18 hours weekly collecting fuel or water, while boys spend 15 hours; in homes mainly using cleaner stoves and fuels, girls spend only 5 hours weekly collecting fuel or water, and boys just 2 hours. (WHO, 2016) use of modern and clean energy in the home can alleviate the drudgery and safety risks associated with traditional household energy use and the resulting time savings provide the opportunity

Box 10.2

Support for accelerating universal energy access: examples of global initiatives and partnerships

Sustainable for Energy for All is a non-profit organization working with leaders in government, the private sector and civil society to drive action toward achievement of SDG 7 and the Paris Climate Agreement, which calls for reducing greenhouse gas emissions to limit climate warming to below 2 degrees Celsius. SEforAll provides a knowledge hub, hosted by the World Bank in collaboration with other partners, to benchmark progress towards SEforAll's objectives through its Global Tracking Framework and other knowledge products. More than 100 countries have engaged with SEforAll, providing financial or in-kind contributions or working on tailored national strategies and investment plans to deliver on SEforAll's objectives.

Global Alliance for Clean Cookstoves is a public-private partnership hosted by the UN Foundation to save lives, improve livelihoods, empower women and protect the environment by creating a thriving global market for clean and efficient household cooking solutions. The Alliance's "100 by 20" goal calls for 100 million households to adopt clean and efficient cookstoves and fuels by 2020. It works with a strong network of public, private and non-profit partners to accelerate the production, deployment, and use of clean and efficient cookstoves and fuels in developing countries.

United for Efficiency (U4E) is a global public-private partnership, led by UN Environment, supporting countries to save up to 20 per cent of their electricity usage by moving their markets to high-efficiency appliances and equipment. U4E works to inform policymakers of the significant environmental and economic savings and benefits available as well as promoting global best practices. <http://united4efficiency.org/accelerating-the-transition-to-high-efficiency-products/>

Energy Sector Management Assistance Program (ESMAP) of the World Bank is a global knowledge and technical assistance program. ESMAP's mission is to assist low- and middle-income countries to increase know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP's current activities are organized around energy access, renewable energy, and energy efficiency with specific thematic work on: energy subsidy reforms; energy sector governance, markets, and planning; and providing knowledge as a global public good through the SEforAll Knowledge Hub. Gender dimensions are mainstreamed across the entire work program.

for more schooling, income generation and/or leisure for women and children.

Lack of access to clean and modern energy services in the home is not limited to rural areas. On average, around 22 per cent of households in urban areas lack access to clean fuels and technologies for cooking, and 5 per cent still lack access to electricity (WHO, 2016; World Bank, 2017). In many cities and peri-urban areas, inefficient household fuel combustion is a major source of air pollution and related health impacts. A recent study shows that much of the air pollution in New Delhi, around one-fifth, is actually caused by the air pollution generated from inefficient cookstoves in and around the mega-city (Aman et al. 2017)

The adoption of clean and modern energy services in the home also presents an unparalleled opportunity to realize climate and health co-benefits. Inefficient household fuel combustion is a significant source of both greenhouse gases and short-lived climate pollutants. Globally, residential biomass combustion is thought to account for around 25 per cent of global black carbon emissions (a health-damaging pollutant) in the air (WHO, 2016) and is a major cause of glacier melting. Affordable and reliable sources of clean and modern energy services in the home present an opportunity for climate change mitigation and reduce the health impacts from climate-sensitive diseases.

Current trends suggest that the global community is moving too slowly, and needs to act with more urgency (IEA, 2017; World Bank, 2017). The International Energy Agency's projections show that at the current rate of progress, only 91 per cent of the world's people will have electricity access in 2030, while only 72 per cent will have access to clean cooking energy by 2030. (More financial resources are applied to electricity access.) While technology advances and falling costs are bringing clean energy within reach of more households, significant policy and finance gaps remain. A 2017 IEA report estimates that an additional US\$ 786 billion cumulative investment is needed in the period to 2030 to meet the universal energy access target, or increase of 3.4 per cent in current energy expenditure. Policymakers have an opportunity to remove some of the barriers (e.g., cost, supply, tariffs, market expansion) for the long-term of adoption of clean cooking, heating and lighting services and products. Paired with the important and substantive work of both global and local energy access initiatives, we have the opportunity and partnerships (see box 10.2) to save millions of lives and improve the livelihoods of billions of people. (IEA, 2017; WHO, 2016).

Figure 10.2

Clean and modern household energy linkages with other SDGs



Policy recommendations on access to energy and health:

- “Making the clean available” (Smith and Sagar, 2014) Improve the availability and affordability of suitable household energy solutions that are clean for health at the point-of-use (such as LPG, electricity, ethanol and biogas) through policy levers such as national subsidy reform (e.g., removing kerosene subsidies); increasing availability of clean fuels and technologies including to remote locations and refugee settings; facilitating behavioural changes by developing fuel and technologies with the end user in mind; eliminating barriers to establish a market for clean and renewable energy solutions; and enacting regulatory frameworks and standards that promote clean household energy.
- “Making the available clean” New technologies are being developed that can burn widely available renewable fuels such as wood and dung almost as cleanly as gas, but further technical development of the next generation of scalable and affordable low-emissions stoves is needed. Energy and health sector policymakers can help spur the rate of development, dissemination and sustained adoption of these cleaner-burning biomass stoves and devices through incentives to support innovation, market promotion, national standards for clean household energy solutions, behavioural change and awareness programmes, and regulatory frameworks that enable investments in, and penetration of, clean fuels and technologies.
- Mobilizing significant monetary resources will enable the clean cooking sector to scale up. Funding should advance innovative finance and business models that support household consumers, stove designers, and distributors.

SDG 7 and urban population health

More than half of the world's people now live in cities, and by 2030, almost 60 per cent of the world's population will dwell in cities (UN Habitat, 2016). In particular the urban populations in low-income countries are projected almost to triple, increasing by over 500 million, by 2050. The number of megacities has been increasing, and 47 cities have more than 10 million inhabitants in 2018. This rapid and often unplanned urbanization is associated with the rise of several environmental burdens, for example air pollution and unsustainable mobility that contribute to increases in noncommunicable diseases, such as heart disease, cancer and diabetes.

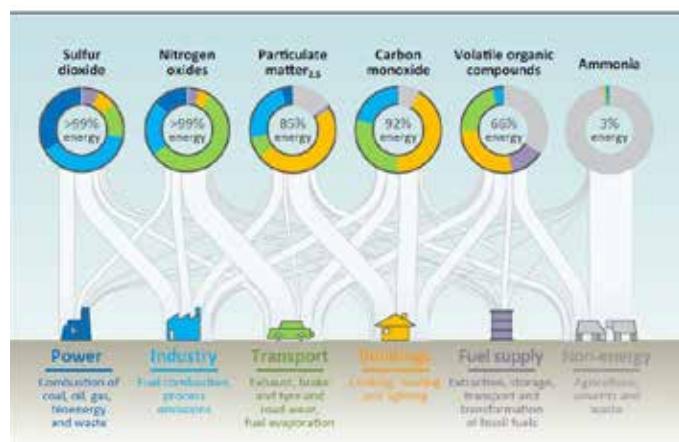
Cities are responsible for more than 70 per cent of global CO₂ emissions and only 12 per cent of the cities in the global WHO database meet the WHO air quality guidelines values (air quality levels designed to protect public health from ambient air pollution). (WHO, 2016)

Inefficient energy use by industry, transport, waste burning, construction activities and buildings represents a major cause of air pollution and related ill health in urban and peri-urban areas (figure 10.3). While in the EU and some countries and cities in the Americas measures have been adopted that have contributed to substantial reductions in the levels of air pollution—although exposure is still on average above the WHO guidelines—the trend has been the opposite in most low- and middle-income settings, in particular in Africa and Asia. Current trends suggest that energy demand is expected to increase in almost all key economic sectors in cities, particularly in developing cities with rapid growth. For instance, the International Energy Agency's projections show that energy demand and emissions from the transport sector alone will continue to increase by 2050 unless a

substantial set of avoid/shift/improve measures are put in place in the years to come (IEA, 2016).

Figure 10.3

Selected primary air pollutants and their sources (IEA, 2016)



Human activities can be planned and designed in ways that promote public health, for example minimizing the production of air pollution. Other sectoral policies should take into account the significant health benefits that the transition to a sustainable, energy-efficient economy offers. Policies and interventions aimed at promoting smart energy system controls, waste-to-energy approaches and strategies to efficiently manage industrial emissions and excess heat can create sustainable urban energy systems, ensuring access to energy for all while decoupling development from emissions of air and climate pollutants (box 10.3).

Box 10.3

Global action for sustainable urban environments

The WHO and CCAC Urban Health Initiative is working to improve air quality in cities and countries to reduce the health burden and health costs from air pollution-related diseases and support sustainable growth. Actions to reduce air pollution can also bring added climate benefits, as many of the air pollution sources are also heavy emitters of short-lived climate pollutants (SLCPs), such as black carbon and methane, as well as carbon dioxide. Over the next five years, the Urban Health Initiative aims to increase public demand for action to reduce SLCPs and other air pollutants. At the same time the initiative is supporting national, city and subregional efforts to improve air quality, strengthening capacity of the health sector, and creating health and cost evidence for rapid mitigation action.

Sustainable Mobility for All (SuM4All) is building from the successful experience of the energy sector (SE4All), the SuM4All brings together a diverse and influential group of stakeholders—multilateral development banks, United Nations agencies, bilateral donor organizations, non-governmental organizations, civil society and academic institutions—with a commitment to speak with one global voice and act collectively to implement the Sustainable Development Goals (SDGs) and achieve a world in which people and goods move equitably, efficiently, safely and in an environment-friendly way. SuM4All provides knowledge, advocacy, guidance and financing mechanisms to achieve the four global objectives, tracked through its Global Tracking Framework and Global Roadmap of Actions.

Policy recommendations on urban population health

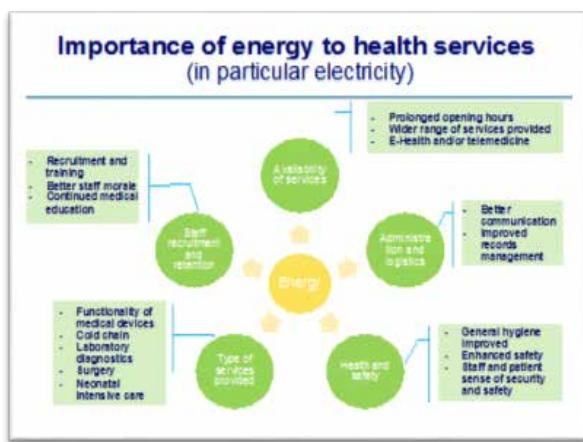
- Prioritize investments in energy-efficient networks, building codes and waste management systems to enable and promote healthier cities.
- Adopt holistic, innovative land use planning (e.g., compact cities, energy efficient public transport, walking and cycling networks, green spaces) to improve population health and reduce health inequities while saving energy.
- Scale up renewable energy technologies in cities (e.g., solar street lamps) to increase safety and liveability of cities.
- Use tax-incentives, innovative financing, stringent building energy codes and other mechanisms to encourage more energy-efficient and healthier housing.
- Soot-free buses, electric mobility and other public transport related initiatives also offer opportunities to reduce energy intensity, increase efficiency while at the same time providing benefits for public health.

Energy in health-care facilities:

Each of the three target areas addressed under of SDG 7—access, renewables and efficiency—are critical enablers of expanding and ensuring access for quality health care. In the absence of power, many basic life-saving interventions in health facilities cannot be performed safely or at all: lighting operating and examination rooms, sterilizing equipment to prevent infection, refrigerating vaccines and medicines and blood for transfusions, powering medical devices for diagnosis and treatment, hygiene and infection control measures. These, and many more critical health-care functions, require a reliable electricity supply. In the absence of power, many basic life-saving interventions in health facilities cannot be performed safely or at all (figure 10.4).

Figure 10.4

Examples of energy links with health services



Powering health facilities with clean sources of energy, when coupled with energy efficiency measures, will reduce health-sector dependency on fossil fuels, lower carbon emissions and reduce operating costs. It may also promote energy independence and resilience in the health sector, particularly in the face of wider disruptions to the energy grid or energy supply chain.

It will not be possible to meet SDG 3 and realize universal health coverage if the health facilities providing essential services do not have reliable electricity.

Available data on electricity supply in health facilities in low-income settings is limited. Findings from a WHO analysis of health survey data from 11 sub-Saharan countries suggest that as many as one in three health facilities do not have electricity at all. While nearly all hospitals included in the survey data were connected to the central grid, only about 30 per cent reported that they had reliable power and did not experience regular electricity outages (*Adair-Rohani, 2013*).

Resolving the energy gap in health facilities will require that decision makers from the energy and health sectors work closer together to ensure that health facility energy needs are adequately prioritized in national energy sector strategies, as well as in health sector development plans.

The costs of solar PV and other renewable energy technologies are declining, making them increasingly affordable even in low- and middle-income settings. But the falling costs of technology alone will not ensure energy security and resilience for health facilities. Simply installing solar panels, batteries and some LED lights in a rural clinic is not sufficient on its own. The health sector must make energy services an essential service and commodity, and correspondingly dedicate resources towards ensuring the sustained availability of energy services.

Health facility staff need to be trained to operate and maintain these systems. Energy services need to be integrated into health facility management plans so that there is an appropriate delegation of responsibility and resources to ensure the sustained operation and maintenance of these services. And, perhaps most importantly, market-based service delivery models should be used to provide energy services to health facilities, as this will better ensure the development of a robust local supply chain and service sector that can provide maintenance and after-sales services, particularly for off-grid and renewable energy installations.

Policy Recommendations on energy in health care facilities:

- Ensure that health facility energy needs are appropriately articulated in the context of national energy plans and strategies, in particular those aimed at addressing critical industries and end users of energy services.

Box 10.4

Contribution of SDG 7 to the realization of universal health coverage and other SDG 3 targets in a health facility context

Relevant SDG 3 target(s)	Contribution of SDG 7
3.1: "By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births."	A key pillar of the Global Strategy for Women's, Children's and Adolescent's Health aimed at reducing maternal and newborn mortality is to bring pregnant mothers into health facilities and improve the quality of care provided to them at the time of birth. Ensuring that these facilities have reliable electricity will ensure that the core operating conditions needed to provide safe, quality maternal and newborn care are in place.
3.2: "By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births."	
3.8: Achieve universal health coverage (UHC), including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.	Health facilities are a key service delivery platform that will be used by countries to realize UHC and related health targets. Health facilities must have an appropriate infrastructure, including a reliable power supply, in order to provide this basic package of essential health services (Sternberg et al., 2017)
3.12: Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing states.	Health workers will remain in and will be more motivated to work in remote health facilities that have reliable power. In such context, off-grid renewable energy technologies therefore have significant potential to contribute to this SDG3 target.

- Develop and implement clean energy policies to promote increased health-sector reliance on clean energy, promote energy efficiency and ensure that appropriate resources and responsibilities are allocated to the management (and maintenance) of health facility energy resources.
IEA (2017a), *Energy Access Outlook 2017: From Poverty to Prosperity*; International Energy Agency, Paris.
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- Identify incentives and market-based service delivery models to ensure energy security in health facilities and encourage the development of local service industries to sell, support and service energy services targeted for health care facilities, especially for primary care facilities in resource constrained settings.
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Published by the United Nations

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