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United Nations Development Programme

Delivering Sustainable Energy in a Changing Climate

Strategy Note on Sustainable Energy

2017-2021

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Cover Photo: *Wind energy replaces diesel powered electricity generation in the Galapagos islands.*

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Wind energy.
Photo: © UNDP Bangladesh

Delivering Sustainable Energy in a Changing Climate

“Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive. Development is not possible without energy, and sustainable development is not possible without sustainable energy.”

– UN Secretary-General Ban Ki-moon

The purpose of this strategy note is to articulate – for the first time – UNDP’s role, approach and focus related to sustainable energy for the period 2017-2021. The aim is to foster internal programming coherence and clear communication to UNDP partners. This note also provides an overview of UNDP’s key partners.

The target audience is a broad range of UNDP partners at global, regional, national and subnational levels, including governments, bilateral and multilateral financial and technical institutions and agencies, civil society organizations and academia. It also targets UNDP staff working on sustainable energy-related issues across the organization at HQ, regional and country offices.

Sustainable energy is at the centre of the new climate and development agendas and progress on sustainable energy is critical for progress on sustainable development. This strategy is therefore guided by the UNDP Strategic Plan 2014-2017, the 2030 Agenda for Sustainable Development, the Paris Agreement and other key global processes. It is complementary to other UNDP strategies and frameworks, mainly to those tackling climate change and disaster, livelihoods and jobs, gender equality, youth, green commodities and trade, the sustainable and equitable management of the extractive sector for human development, and the low-emission capacity-building programme. The strategy will guide UNDP’s energy work in the years to come and will help position the organization in the context of the new development and climate agendas.

The strategy comprises five sections:

Section 1: Highlights the purpose of this strategy, the target audience and a summary of the strategy’s main elements.

Section 2: Describes the linkages between energy and sustainable development and the role that sustainable energy plays in advancing the 2030 Agenda.

Section 3: Describes UNDP’s vision and mission, value proposition, theory of change, de-risking approach and guiding principles.

Section 4: Provides an overview of UNDP policy and programming support around three main action areas: energy access, energy efficiency and renewable energy.

Section 5: Highlights key partnerships and describes how UNDP works with United Nations agencies and other development actors.



Woman using a Multifunctional Platform Engine.
Photo: © UNDP Burkina Faso

I. INTRODUCTION

UNDP's more than two decades of experience in sustainable energy is evidence of the critical role of sustainable energy as an enabler for poverty eradication, social progress, gender equality, enhanced resilience, economic growth and environmental sustainability. This experience has focused UNDP's work in sustainable energy on three interrelated challenges:

Social challenges, the disparities in access to reliable energy services, including in conflict affected and fragile settings.

Economic challenges, the lack of affordable and reliable energy services, and energy's importance as a key input to job creation and economic growth.

Environmental challenges, the threat to the planet's ecological balance, biodiversity and climate.

Building on UNDP's proven ability to influence policy and develop capacity, its global country presence and a longstanding role as a trusted partner working with multiple stakeholders across sectors, UNDP will tackle these challenges by supporting and advocating for **energy market transformation**, using a suite of integrated interventions in policy, technology, finance, delivery systems, capacity development, community mobilization and awareness creation. The foundation for this work will be UNDP's core de-risking methodology to reduce and, where possible, to remove a range of barriers to policy, legislation, regulation, institutions, financing and awareness that inhibit scaled-up investments in sustainable energy at the national and local levels. Under pre-market conditions, these barriers can act as immediate 'show-stoppers' and attention will be given to early market creation through piloting new business models, promoting productive uses of energy and strengthening business development and incubation support.

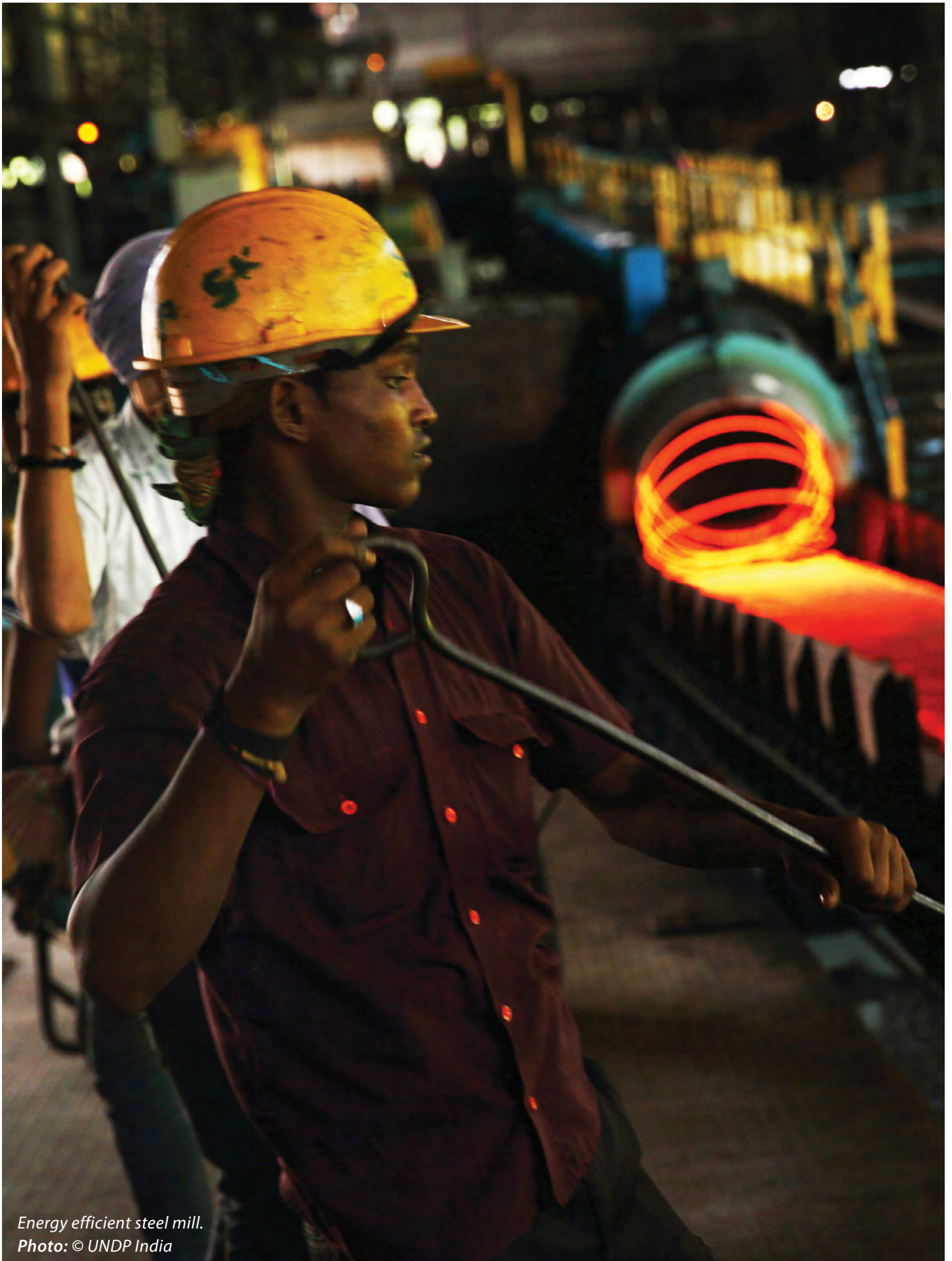
UNDP's work on sustainable energy is aligned with the Sustainable Development Goal 7 (SDG7) on "ensuring access to affordable, reliable, modern, and sustainable energy"¹ and is structured around three action areas. These three action areas are:

Energy Access: *The need for electrical, thermal and mechanical energy for households, small and medium-sized businesses and communities, with an emphasis on clean energy for the poor.*

Energy Efficiency. *The promotion of energy efficiency across sectors and the creation of strong market demand and incentives for public and private investment.*

Renewable Energy: *The increased adoption of sustainable on- and off-grid renewable energy technologies and delivery services and de-risking investment.*

UNDP works with governments and multi-stakeholder partners in all actions areas guided by a list of principles, including context-driven interventions, promotion of sustainable energy sources, deployment of appropriate technologies and applications, integration of the three pillars of sustainable development, as well as considering the need for energy security, a key driver for many countries. UNDP's barrier removal and de-risking approaches to catalysing investment will facilitate the inclusion of energy into development, expanding employment and livelihood opportunities as energy services progressively develop. UNDP's support also includes promotion of a range of technologies, but with a focus on development benefits, energy service delivery and productive uses, ensuring consumers and particularly the most vulnerable groups have access to reliable, affordable and clean energy service. Central to the entirety of UNDP's work is that **energy is a means and not an end in itself**.



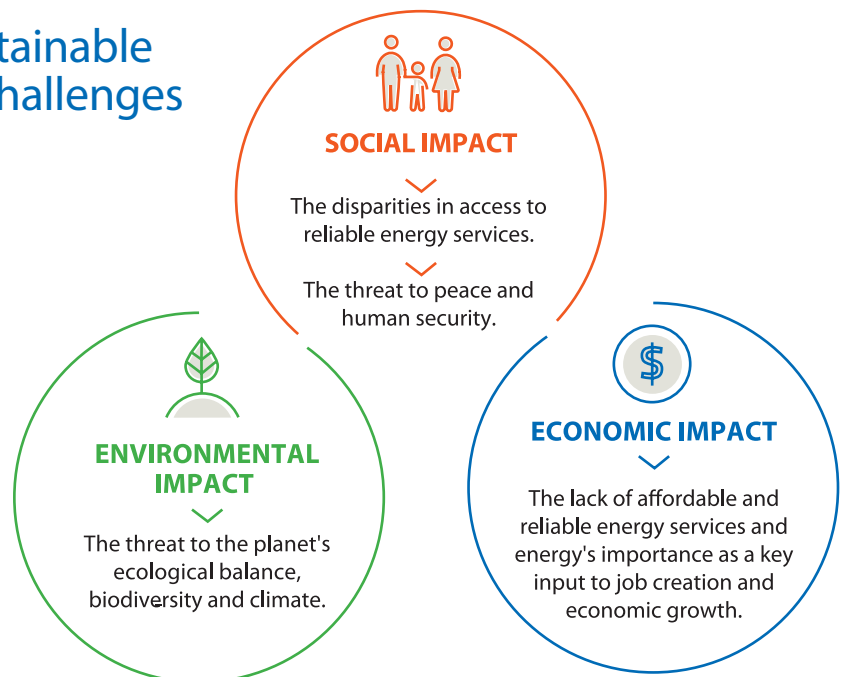
Energy efficient steel mill.
Photo: © UNDP India

Energy and sustainable development

Sustainable energy deeply influences people's lives and is an engine for poverty alleviation, social progress, women and youth empowerment, equity, enhanced resilience, economic growth and environmental sustainability. Over the centuries, energy has helped transform economies and societies, spurring industrialization and raising living standards. Energy is indispensable for fulfilling numerous basic human needs, including nutrition, warmth and light, and directly impacts people, communities and nations. It helps to realize human rights, including the right to work, the right to education and the right to better health. The global trend towards an electricity-based economy in modern society where governments, businesses and citizens rely heavily on electricity makes energy all the more relevant for accessing modern forms of communication and information technology (e.g., internet, computers, mobile phones) and engaging in economic activities such as online commerce and market places.

Despite these clear benefits, the energy challenges faced by developing countries are complex and pervasive, affecting every aspect of life. UNDP describes these challenges through the linkages between energy and the three pillars of sustainable development: social progress, economic development and environmental sustainability (Figure 1). This section describes each of these intertwined challenges.

FIGURE 1
Energy and sustainable development challenges



II. THE DEVELOPMENT ISSUE



Social progress: the need to reduce the disparities in access to clean and reliable energy services

Energy deficiencies can generate wide-reaching social consequences. Furthermore, energy consumption varies greatly in terms of the quality and quantity of access. Indeed, about 1.1 billion people lack access to any electricity whatsoever.² Nearly 2.9 billion people use solid fuels such as wood, coal, charcoal, agricultural residues or animal waste to cook their meals and heat their homes.³ This exposes families to smoke and fumes, causing serious health impacts and resulting globally in more than 4 million premature deaths each year. In fact, women and children accounted for over 60 percent of all premature deaths from household air pollution in 2012.⁴

Those who rely on inefficient and polluting energy systems also devote a disproportionately large portion of their time on other heavy burdens such as gathering fuel wood and water, cooking and agro-processing. This burden falls mainly on women and children. A recent study across 22 African countries found that women and girls spend an average of two hours each day just collecting fuel for cooking and heating.⁵ Fuel collection not only entails a physical burden, but also exposes people to other major risks, for example, health issues for women who carry wood in large bundles on their head. It also poses security issues and increases exposure to violence while women travel long distances in remote areas or out in the forest and on back roads to collect fuels. Energy access is therefore critical and positively impacts socioeconomic outcomes, particularly for women. A study conducted in Nicaragua, for example, found that electricity improves women's economic situation and increases the propensity of rural Nicaraguan women to work outside the home by about 23 percent.⁶ Lack of energy solutions in post-disaster and fragile contexts can also undermine community and government responses, delaying recovery and undercutting resilience.



Economic development: how to increase the affordability and reliability of energy services, recognizing energy's importance as a key input to job creation and economic growth

Energy is an input for nearly all goods and services and most economic activity would be impaired without it. Energy use tends to increase as incomes rise: high-income countries consume more than 14 times as much energy per capita as Least Developed Countries (LDCs) and seven times as much as lower-middle-income countries.⁷ It must be noted that the links between global economic growth, energy demand and energy-related emissions are projected to weaken, particularly in developed countries such as those in Europe and North America. Many developing countries, however, will likely see a rapid increase in energy demand due to higher economic growth, population growth and improvements in the quality of life. Recent estimates of the world's future energy outlook show that energy demand will grow by nearly one third between 2013 and 2040, with all of the net growth coming from developing countries.⁸

A key challenge for developing countries is therefore to cost-effectively – and sustainably – meet rising energy demand and to reduce the inequality in supply. The poorest in society spend the largest proportion of household income on energy; they are most harmed by rising costs and energy price fluctuations. For small and medium-sized enterprises (SMEs), which make up more than 90 percent of global businesses and provide the main source of jobs for the poor, access to reliable, affordable energy services is vital for efficient and profitable operation.⁹ Yet such access does not exist in many countries.

At the macroeconomic level, the unreliability of energy production, supply and distribution, and the cost of fossil fuel affect country finances greatly. Regular power blackouts disrupt all societal activities and industry, reducing production and increasing expenses. The dependence on fossil fuels, particularly for LDCs and Small Island Developing States (SIDS), makes them vulnerable to volatile prices, supply shocks and political turbulence.

In many developing countries, fuel and retail electricity subsidies consume high proportions of government budgets, diverting scarce public funds away from other more important public policy goals, including the transition to a greener economy. The International Monetary Fund (IMF) estimated the cost of energy subsidies in 2015 to be US\$5.3 trillion, or 6.5 percent of global GDP.¹⁰ The IMF's estimate takes into account the cost of externalities such as local air pollution, traffic congestion and accidents, and damages from carbon dioxide emissions or global warming. Just over half of the figure, for example, is related to the cost of treating the victims of air pollution and the income lost because of ill health and premature deaths. Fossil fuel subsidies are justified in the short to medium terms and, if well targeted, can provide energy access to the poorest of society at an affordable cost. But analysis of the current fossil fuel subsidies shows that only a small proportion of the poor population benefits and the long-run macroeconomic impacts cost developing countries significantly, distorting markets whilst contributing to social, economic and environmental losses.¹¹



Environmental sustainability: reducing the threat to the planet's ecological balance, biodiversity and climate

Climate change concerns are escalating. Two thirds of global greenhouse gas emissions are from the energy sector alone, which makes energy a key sector for mitigating global warming.¹² Global energy production is dominated by fossil-based energy sources, such as coal, oil and natural gas, which are finite resources. On one hand, energy sector carbon dioxide emissions are more than 40 percent higher now compared with 1997 levels and contribute significantly to climate change.¹³ On the other hand, climate change also presents increasing challenges to the energy sector. Changes in temperature, precipitation and sea level and an increase in number and severity of extreme weather events, such as droughts, coastal flooding or storms, will not only affect energy demand, but can also impact energy production and supply. In countries relying on hydropower, for example, a decline in rainfall and a rise in temperature can result in loss of water and ultimately in less ability to generate electricity and an increased vulnerability to power outages. Overall, the scale of water use for energy production is tremendous. Some 580 billion cubic metres of freshwater are withdrawn for energy production every year.¹⁴

Environmental impacts of polluting and inefficient energy systems are becoming hard to ignore. Traditional biomass is a significant source of energy in many developing countries, particularly for cooking and heating, but is often harvested and used unsustainably, leading or contributing to significant degradation of land and forests and to a loss of biodiversity and wildlife habitat. Household combustion of fossil fuels is a source of greenhouse gas emission and short-lived climate pollutants such as black carbon. Air pollution also affects crop yields, with ground-level ozone linked to reduced yield of four major staple crops by 3 percent to 16 percent globally, particularly in South and East Asia.¹⁵

Addressing these challenges and improving natural resource management will increase the likelihood of limiting global temperature rise to well below 2°C above pre-industrial levels while building resilience against adverse impacts of climate change. In the long term, a complete de-carbonization of the world's energy system is needed.¹⁶



Large scale visual message made by hundreds of people promoting 100% renewable energy during the COP21 climate summit. Photo: © Yann Arthus-Bertrand / Spectra

Energy in the context of post-2015 global frameworks

2015 was a landmark year for sustainable development, when UN Member States reached historic agreements and set global agendas that will guide development priorities for a generation. Sustainable energy provides a huge opportunity to make real progress on these new and closely linked agendas around the world.

The **2030 Agenda for Sustainable Development** recognizes energy as a stand-alone goal, particularly SDG7, which aims to “ensure access to affordable, reliable, and sustainable modern energy for all”. Progress towards many of the other SDGs – including poverty eradication, inequality, better health and education, women’s empowerment, clean water and food security – depends on the energy goal being achieved ([Box 1](#)).

The **Paris Agreement** calls for urgent and ambitious climate action to stabilize the global increase in average temperature well below 2 degrees and to try to limit the increase to 1.5 degrees.¹⁷ Achieving this global commitment makes energy-sector de-carbonization an absolute prerequisite. Most of the Intended Nationally Determined Contributions (INDCs) submitted from more than 190 countries ahead of the adoption of the Paris Agreement in December 2015 refer to action in the energy sector.¹⁸

Transforming the world’s energy systems will also contribute to progress toward the **Sendai Framework for Disaster Risk Reduction**¹⁹ and adaptation to climate change impacts. Because access to sustainable energy touches all facets of life, it is critical for helping communities to reduce their vulnerability and to build resilience to withstand shocks and hazards and to better recover from natural and climate-related disasters. The scaling up of renewable energy solutions is central to risk-informed and zero-carbon development pathways and will build countries’ resilience to better prepare, respond and recover from impacts of disasters while creating opportunities for private sector investment, green growth and jobs.

Sustainable energy is also a recurring theme in the outcome document of the third international conference on financing for development: the **Addis Ababa Action Agenda**.²⁰ This Agenda includes a call for promotion of public and private investment in energy infrastructure, and clean and efficient energy technologies. The world needs to invest about US\$90 trillion in infrastructure alone in the next 15 years; at least 60 percent of it will be made in the energy and transport sectors.²¹ This will provide countries with an opportunity to build robust energy systems that are resilient to future market volatility, air pollution and other environmental and social stresses. Investing in energy efficiency and low-carbon technologies will also bring multiple climate and development benefits.

The **New Urban Agenda** to be adopted at the Third UN Conference on Housing and Sustainable Urban Development in Quito, Ecuador, in October 2016, is also a major milestone that charts a path to address urbanization as a global challenge. By 2040, the world’s energy systems will need to serve 9 billion people, with two thirds of them in urban areas.²² The Intergovernmental Panel on Climate Change (IPCC) estimates that, in 2010, urban areas accounted for 67 percent to 76 percent of global energy use. Urban areas account for 71 percent to 76 percent of global CO₂ emissions from final energy use.²³ The urban challenge for the energy sector therefore lies in meeting the increasing energy demand while ensuring sustainability and resiliency of energy systems and supply. Access to energy can also contribute to improvements in rural-urban migration patterns. The ‘[Luz para Todos](#)’ (Light for All) programme in Brazil, for example, increased the rate of rural households with electricity from 71 percent in 2000 to 92.6 percent in 2010 and reached 15 million people. With this increase came not only a decrease in urban-rural migration, but in some cases even reversed migration flows back to rural areas.²⁴

BOX 1

Energy and the Sustainable Development Goals

In 2012, the Secretary-General launched 'Sustainable Energy for All' (SE4ALL) as a global initiative to accelerate the transformation of the world's energy systems, pursue the elimination of energy poverty and enhance prosperity. The initiative provides a global, multi-stakeholder platform for scaling up efforts to deliver on three critical SE4All objectives by 2030: (1) ensuring universal access to modern energy services; (2) doubling the global rate of improvement in energy efficiency; and (3) doubling the share of renewable energy in the global energy mix.

In the lead-up to discussions on the SDGs and as a big advocacy effort from the United Nations, the UN General Assembly declared 2014-2024 as the decade of sustainable energy for all (SE4All).

In September 2015, the UN General Assembly approved the 2030 Agenda for Sustainable Development, with SDG7 seeking to "ensure access to affordable, reliable, sustainable and modern energy for all". Therefore, sustainable energy has been elevated to a priority in the development agenda, which recognizes its role in scaling up sustainable development endeavours and achieving more inclusive growth.



The link between SDG 7 and other SDGs



SDG 1 Poverty - End poverty in all its forms everywhere. Despite the important role that sustainable energy plays in poverty reduction, about 1.2 billion people still lack access to electricity and nearly 40 percent of world's population still rely on solid fuels for cooking and heating. Poor people also pay a high price - in cash or in labour - for the energy they use. Moreover, they spend a much greater share of their household income on energy than do wealthy people - not only because their incomes are so much smaller, but also because the fuels they use are so much less efficient than modern fuels. No country has managed to substantially reduce poverty without greatly increasing the use of energy.



SDG 2 Food - End hunger, achieve food security and improved nutrition and promote sustainable agriculture. Energy is needed in all steps along the agri-food chain: in the production of crops, fish, livestock and forestry products; in post-harvest operations; in food storage and processing; in food transport and distribution; and in food preparation.



SDG 3 Health - Ensure healthy lives and promote well-being for all at all ages. Modern energy helps improve health in many ways. By powering equipment for pumping and treating raw water, it helps ensure a clean water supply, reducing the incidence of waterborne diseases. By boosting agricultural production and household incomes, it helps reduce the malnutrition that is a big factor in child mortality. And by allowing households to switch to modern fuels, it enables the poor to avoid cooking with biomass fuels like wood and dung, whose emissions cause respiratory ailments that are a major health risk in developing countries. Modern energy also helps improve health indirectly. Electricity enables health clinics to refrigerate vaccines, operate medical equipment, and provide treatment after sunset. It allows the use of modern tools of mass communication needed to fight the spread of HIV/AIDS and other preventable diseases. And through its benefits for education, it leads to higher literacy among women, which translates into better health for children.



SDG 4 Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. For poor people everywhere, access to modern energy services frees time for education - time that would otherwise be spent collecting traditional fuels or in other menial work. It also frees children to attend school, by boosting productivity and thus allowing adult labour to substitute for child labour. For adults and children, electric lighting in homes enables them to study after their daytime activities. And in rural areas, modern energy helps retain teachers by improving their quality of life.



*This farmer uses energy efficient technology to grow tomatoes in Uzbekistan.
Photo: © UNDP Uzbekistan*



SDG 5 Women - Achieve gender equality and empower all women and girls. Clean energy access is critical for women's health, education and productive activities - since in many parts of the world women spend more time than men cooking and collecting water and fuel. Modern cooking fuels free women from the burden of collecting and carrying large loads of fuel-wood and from exposure to smoke from inefficient cooking stoves, which have detrimental health implications. Indoor air pollution due to toxic smoke from burning traditional and solid fuels kills over 4 million people a year, most of whom are women and their children. Not only does modern energy mitigate this risk, but it can also enable women to develop businesses, for example, in agro-processing industry that can increase their incomes.



SDG 6 Water - Ensure availability and sustainable management of water and sanitation for all. Energy and water are intricately connected. All sources of energy (including electricity) require water in their production processes: the extraction of raw materials, cooling in thermal processes, in cleaning processes, cultivation of crops for biofuels, and powering turbines. Energy is itself required to make water resources available for human use and consumption (including irrigation) through pumping, transportation, treatment, and desalination.



SDG 8 Economy - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Modern energy has the biggest effect on poverty by boosting poor people's productivity and thus their income. Most economic activity would be impossible without energy, even the small and medium-scale enterprises that are the main source of jobs for the poor. The kind of economic growth that creates jobs and raises incomes depends on greater and more efficient use of energy. Energy security and resilience against economic shocks due to volatile fuel prices is also key to sustained economic growth.



SDG 9 Infrastructure - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Expanding energy infrastructure and upgrading technology to provide clean and efficient energy services is crucial and can encourage economic growth, induce cost-savings and help the environment. Promoting access to modern forms of energy can also stimulate local innovation and entrepreneurship. Access to information technology and communication (ICT) including internet, computers and mobile phones offer more opportunities for innovation. Without electricity, people would be cut off from taking advantage of these opportunities.



SDG 10 Inequality - Reduce inequality within and among countries. Reducing the global disparity in energy is key to reducing income inequalities, gender inequalities and inequalities in other dimensions such as rural/urban income disparities. A lack of adequate, reliable and affordable supplies of modern energy disproportionately impacts women and children. It is also more severe in rural communities and it limits their productive opportunities, enterprise growth and employment, and exacerbates income inequality and persistent poverty. In addition, some regions with the lowest energy consumption and greenhouse gas emissions, for example, countries in sub-Saharan Africa and South Asia, are the most vulnerable to climate change impacts and will suffer the most. Sustainable energy can help build resilience of these communities against climate change impacts and reduce inequality between and among nations.



SDG 11 Cities - Make cities and human settlements inclusive, safe, resilient and sustainable. About two thirds of the global primary energy supply is consumed in cities and over 70 percent of the global energy-related carbon dioxide emissions are generated from cities. As urbanization accelerates, demand for energy services will drastically increase. Therefore, providing clean, reliable and affordable electricity, heating and cooling, and other sustainable energy services will be critical. Sustainable energy can also contribute to other urban issues such as air quality, waste management, sustainable and more efficient transport, safety and resilience against climate and natural disasters.



SDG 12 Consumption - Ensure sustainable consumption and production patterns. The production, distribution and consumption of energy have environmental implications. At the global level, the choice of fuels in energy systems is a major determinant in the generation of greenhouse gas (GHG) emissions. More efficient energy production patterns and reducing energy consumption across sectors and appliances, such as in buildings, industries and households, will not only have benefits for the global environment, but also accrue cost-savings and benefit the economy.



SDG 13 Climate - Take urgent action to combat climate change and its impacts. Energy production and use account for two thirds of the world's greenhouse gas (GHG) emissions, meaning that reaching the global goal of the Paris Agreement must include bringing deep cuts in these emissions and using energy more efficiently. Modern energy and clean energy technology also contributes to adaptation and a host of productive uses. Diversification of livelihoods, for example, is a key factor in building resilience to adverse events, including the impacts of climate change. Energy also allows access to knowledge and information technology that powers innovation and enables experimentation and testing of different adaptation options for better decision-making.



SDG 14 Oceans and Seas - Conserve and sustainably use the oceans, seas, and marine resources. Tides, waves, currents and offshore wind are emerging sources of energy that have significant potential to contribute to low-carbon energy in many coastal countries. Oceans also act as carbon sinks and absorb carbon dioxide produced by the energy sector. Increased level of GHG emissions is also leading to a rise in ocean acidification.



SDG 15 Ecosystems - Protect, restore and promote sustainable use of terrestrial ecosystems. A substantial share of today's energy consumption for cooking and heating comes from the use of wood and charcoal by households in the developing world, which can be associated with unsustainable forestry practices and deforestation. This often has knock-on effects such as loss of wildlife, soil erosion and increased flooding.



SDG 16 Peace, Justice and Effective Institutions - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. Sustainable energy requires effective, inclusive, transparent and non-corrupt institutions that have the capacities to manage processes (for example, renewable electricity licenses and permit processes) in a timely and adequate manner and need the ability to deploy efficient energy management information systems. Governments need to be able to design and adopt energy efficiency policies, legislation and building codes in an inclusive manner and to enforce these policies. Public access to information and citizen-led accountability, in particular youth-led accountability, should allow all people to get informed about sustainable energy matters.



Rooftop PV panels provide access to electricity in a remote village in Croatia.
Photo: © UNDP Croatia

Energy in the context of UNDP's Strategic Plan



Photo: © UNDP Perú

This strategy note builds on the UNDP Strategic Plan for 2014-2017,²⁵ which focuses on supporting countries in planning and implementing more inclusive, resilient and sustainable development pathways. The overarching vision of the current Strategic Plan is to “help countries achieve the simultaneous eradication of poverty and significant reduction of inequalities and exclusion” based on three key areas of work:

Sustainable Development Pathways: Tackling the connected issues of poverty, inequality and exclusion by transforming productive capacities and improving prospects for employment and livelihoods, while avoiding the irreversible depletion of social and natural capital by integrating environmental considerations into development plans and strategies, including through managing and sustainably using natural resources.

Inclusive and Effective Democratic Governance: Helping governance institutions deliver clear benefits to citizens, be those benefits better services, improved access to resources needed for employment and livelihoods, or greater security of persons and property, ensuring such approaches are informed by an understanding of the local context (and are conflict-sensitive).

Building Resilience: Supporting countries in lowering risks arising from shocks, rapid and effective recovery from conflict-induced crises and helping countries to prepare for and deal with the consequences of natural disasters.

Sustainable energy is firmly embedded in the Strategic Plan, where “**access to sustainable energy and improved energy efficiency**” is explicitly mentioned as a scalable intervention under the work area “Sustainable Development Pathways”. Sustainable energy is also related to most of the Strategic Plan’s outcomes, including inclusive and sustainable growth, rule of law, gender equality and women empowerment, reducing vulnerability and building resilience.

The process for the development of the next UNDP Strategic Plan for the four coming years is expected to be finalized in 2017. This strategy note on sustainable energy will therefore help inform that process. Given the undeniable importance of sustainable energy as a development issue and its critical role in enabling the achievement of UNDP’s current and future strategic plans and intended development impacts, UNDP adopts the following vision and mission, guiding its overall work in sustainable energy.

Vision and mission



Family trying the new biomass stove for the first time.

Photo: © UNDP Lebanon

Vision: Developing countries increasingly adopt sustainable energy solutions, embarking on an energy transition by creating the enabling conditions that will catalyse public and private investment to scale up action on energy access, renewable energy and energy efficiency. By making their energy sectors more sustainable, their economies can follow a more equitable growth path, contributing to poverty eradication while combating climate change and increasing their resilience.

Mission: UNDP will leverage its country presence, expertise and experience to enable its government partners to implement sustainable energy measures, catalysing investments from the public, private and financial sectors to scale up action on energy access, renewable energy and energy efficiency, contributing to poverty eradication, equitable economic growth, and climate change mitigation and adaptation.

To deliver its mission and achieve its part of the vision, UNDP will focus on a sector-wide transformation of energy systems in developing countries, one that is based on market principles, but that takes into account the needs of the poor and pays specific attention to advancing gender equality, social inclusion, youth empowerment and protection of the environment. It will promote equity, fairness and affordability, and robust policy by supporting countries to create the needed regulatory and institutional enabling environment. This approach will enable governments to overcome the range of technical, informational, financial and regulatory barriers to investment in sustainable energy and will help tackle the three interrelated energy challenges.

In its support to countries, UNDP advocates for moving away from stand-alone technology and engineering interventions to comprehensive solutions and integrated approaches where energy plays a key role as one among several enablers of sustainable development and poverty eradication. The focus of UNDP's support is mostly on energy service delivery rather than on supply of energy technologies; energy is seen as a means, not as an end in itself.

Theory of change

The logical and desired progression for all countries is to first define the needs for energy services and to provide universal energy access (electricity and thermal needs) to their people in line with the development stage of the country in question; then to provide this energy as efficiently as possible; and finally to shift progressively to renewable energy by substituting fossil-based sources and to eventually reach a fully decarbonized system. However, the reality appears to be more complex and the energy transition does not occur in a series of predefined and sequential steps. In addition, considering the high contribution of the energy sector to the level of greenhouse gas emissions at present and the projected increase in energy needs in the next couple of decades (due to overall population increase and economic development), reducing the use of fossil fuels, improving energy productivity and decarbonizing the world's energy systems are all the more urgent. The transformation of the world's energy systems and ensuring the climate target of well below 2 degrees will therefore require a significant scale-up and acceleration of the response to achieve universal access while at the same time drastically increase the share of renewable energy in the global energy mix and considerably improve the global rate of energy efficiency. The investment needs for this transition are enormous and can only be achieved by transforming markets.

According to recent estimates in order to achieve universal access to electricity, depending on the range of services, between US\$2 billion and US\$55 billion will be required annually,²⁶ while to double the global share of renewables will require an average annual investment of US\$770 billion up to 2030, noting that reaching the ideal target of 1.5 degrees as outlined in the Paris Agreement requires more than a doubling of the renewable energy share and therefore higher levels of investment.²⁷ This will require private sector investment at the forefront and the use of limited public funds to catalyse far greater sums of private finance.

Sustainable energy technologies have shown steady advances in innovation and reductions in cost and can make a compelling case for private sector investment. As an illustration, since 2009, prices for solar PV modules and wind turbines have fallen by 80 percent and by 30 percent to 40 percent, respectively.²⁸ Despite this progress, the share of renewable energy in the global mix is around 20 percent. To limit global warming to well below 2 degrees, a much faster transition is needed not only in decarbonizing the energy sector, but also in all other sectors that heavily rely on energy. This will require reshaping transport systems, improving buildings and urban design and making industrial processes, waste management and agricultural activities less carbon-intensive. Radical improvements in energy productivity as well as more integrated solutions across sectors are also required.²⁹ The SDGs and the Paris Agreement's national climate targets, which are now referred to as the Nationally Determined Contributions (NDCs), provide opportunities to drive such a transition. However, sustainable energy in developing countries often faces technical, informational, financial and regulatory barriers that create associated investment risks (be they real or merely so perceived).

In pre-market conditions, as in many of the poorest countries and communities, these barriers to sustainable energy can act as immediate 'show-stoppers'. For example, informational or behavioural barriers about new sustainable energy technologies may contribute to continued use of traditional, polluting technologies. Here, special attention needs to be given to early market creation through piloting new business models, promoting productive uses of energy and strengthening business development and incubation support. This can lay the foundation for an emerging, functioning energy market and has the greatest potential for poverty reduction and economic and human development.³⁰

III. UNDP'S ROLE



In other cases, investment is impeded by a lack of access to affordable financing and capital scarcity due to lack of legal frameworks, underdeveloped economies and weak financial sectors. This presents a challenge for scaling up sustainable energy solutions, as higher returns are needed to compensate for the greater investment risks found in early-stage markets. Under these conditions, sustainable energy interventions become very sensitive to financing costs, making them less attractive and less cost-competitive than conventional solutions.

UNDP's market transformation approach seeks to assist governments to implement combinations of public instruments that systematically target these barriers and investment risks, with the aim of cost-effectively achieving risk-return profiles that attract investment in sustainable

energy at scale. **The objective is to create the investment conditions in which developing countries can access large quantities of low-cost financing for sustainable energy.**

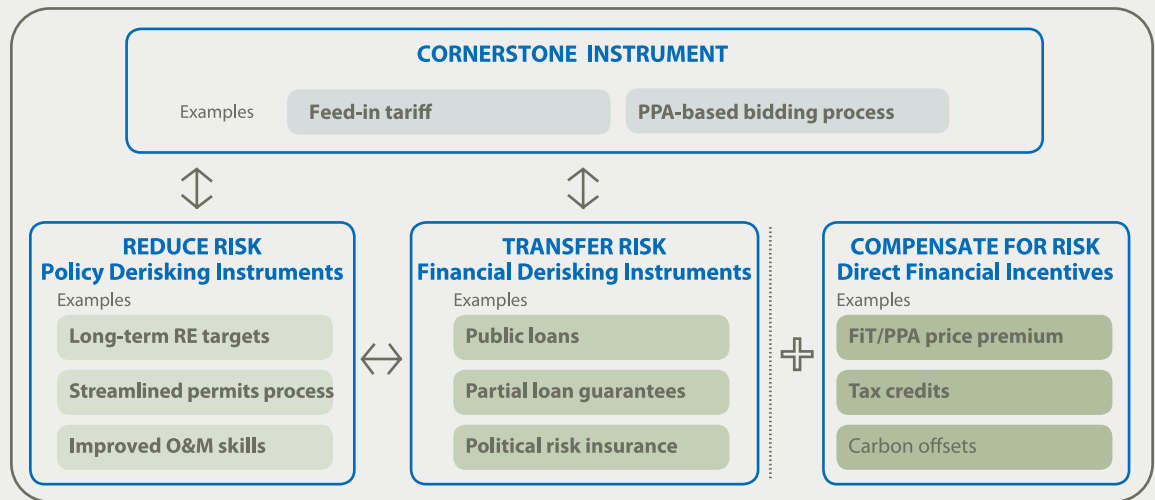
UNDP's theory of change for sustainable energy identifies three ways through which government measures can improve an investment's risk-return profile: through *reducing* risk, *transferring* risk or *compensating* for risk. Measures that reduce or transfer risk result in lower financing costs. Any residual risk may then be addressed by measures that compensate for risk. All public interventions to promote sustainable energy act in one or a combination of these three ways (Box 2).

UNDP's comparative advantage lies with assisting developing countries with the first approach, reducing risk, which typically involves policy and programmatic interventions that remove the underlying barriers to investment risk. UNDP will work with its partners to coordinate its support in this area, with necessary interventions in the other two areas (i.e., transferring risk, which typically involves financial products supplied by development banks, and compensating for risk, which typically involves subsidies and financial incentives for sustainable energy). UNDP's experience is that instruments that reduce or transfer investment risks are the most cost-efficient.³¹

With limited public resources, a key challenge for governments is to select a public instrument package that can most efficiently catalyse investment. A combination of all three instrument types is often needed. Different development and public actors can support each of the three instrument types. This approach presents a clear role for UNDP. Through well-designed public instrument packages such as these, governments can achieve their objectives in attracting investment and give their citizens access to affordable and sustainable energy.

UNDP's de-risking approach – public instrument packages that reduce, transfer or compensate for risk

UNDP assists governments to implement combinations of public instruments, each of which targets a specific barrier or investment risk. The figure below illustrates such a public instrument package, in this case for on-grid residential solar photovoltaic (PV).



The main feature of any public instrument package is the cornerstone instrument. Cornerstone instruments are especially effective public instruments that directly target the core barrier or investment risk holding back investment and that thereby create markets. For on-grid solar PV, an example might be a feed-in tariff or net-metering policy.

Given the range of investment risks that sustainable energy faces, a cornerstone instrument can then be complemented by three core types of additional public instrument. These consist of:

Public measures that *reduce* investment risk by removing the underlying barriers that create investment risk. An example might involve implementing national quality standards for technologies for solar panels, reducing risk around the future performance and quality of the solar panels. Recognizing these lower risks, banks can then lend to the businesses at lower rates. This type of instrument is called 'policy de-risking'.

Public measures that *transfer* investment risk by shifting risk from the private sector to the public sector. An example might be a credit line that a domestic development bank offers to a commercial bank that makes loans to residential homeowners seeking to install solar PV systems. With a credit line in place, local banks will be more comfortable lending. This type of instrument is called 'financial de-risking'.

Public measures that *compensate* for investment risk by providing a financial incentive to the individual or business investing in the sustainable energy activity. An example here may be a feed-in tariff for solar PV system owners, where a premium electricity price can make the risk/return profile more attractive. These instruments are called 'direct financial incentives'.

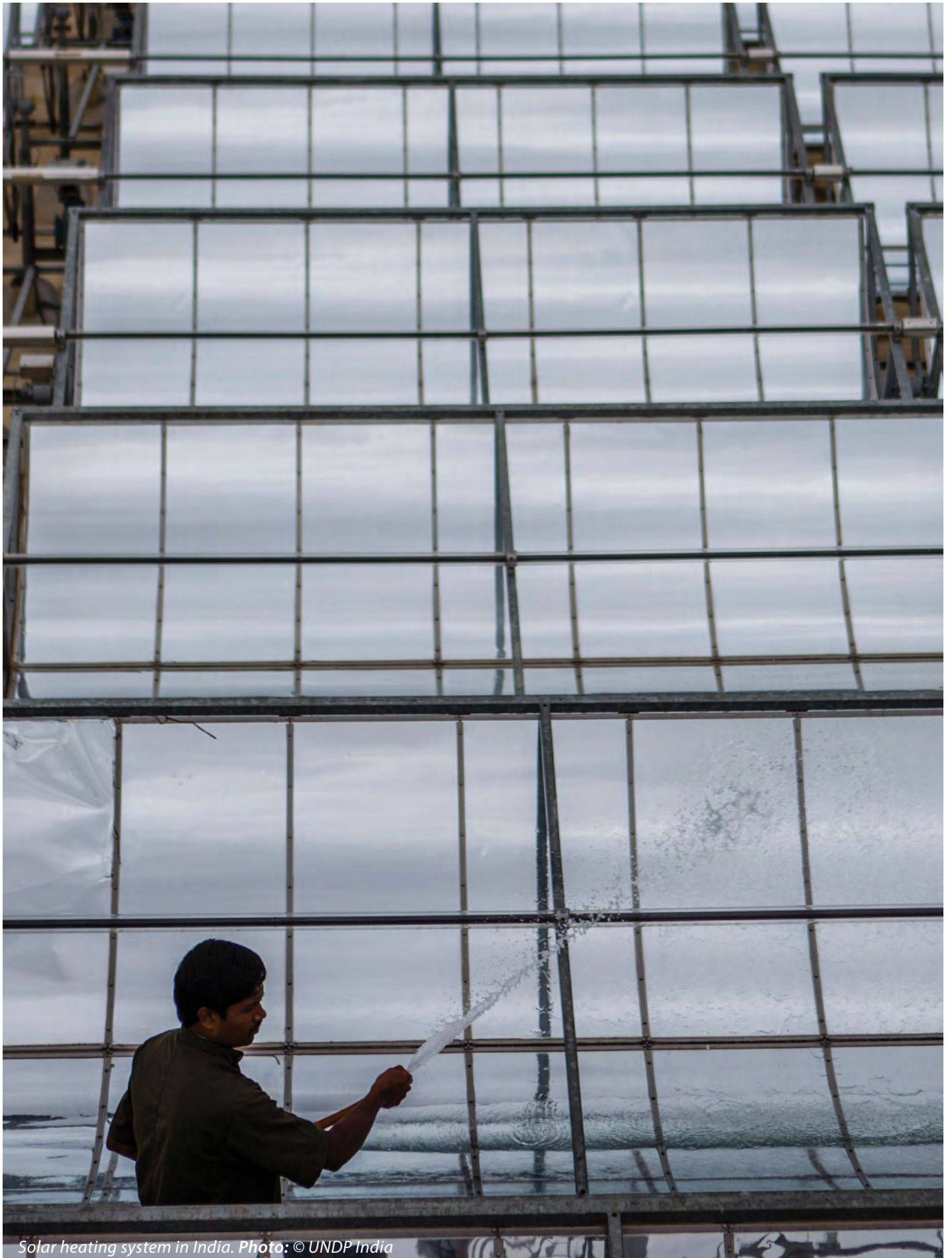
UNDP's de-risking approach and methodology was first developed for utility-scale renewable energy. Currently, the framework is being applied in Tunisia, Lebanon, Belarus, Nigeria and Kazakhstan. Methodologies and financial tools are now also being developed for small-scale renewable energy (solar home kits (off-grid); mini-grids (off-grid); rooftop solar PV (on-grid)) and energy efficiency (buildings). For more information, please visit <http://www.undp.org/DREI>

Value proposition

As described in previous sections, the need to rapidly transition to more sustainable energy systems is clear. UNDP is committed to intensifying and accelerating its sustainable energy engagements at local, national, regional and global levels. Building on its proven ability to influence policy and build capacity, its worldwide country presence and a longstanding role as a trusted partner working with multiple stakeholders across sectors, UNDP will support countries to transform their energy systems.

As of mid-2016, UNDP's current sustainable energy portfolio spans more than 110 countries, making their energy sector more sustainable by implementing sustainable energy solutions at different scales – from community-level projects to medium-sized and large initiatives. UNDP's current sustainable energy portfolio includes close to 260 sustainable energy projects (excluding small projects) representing a portfolio of around US\$1 billion in grant financing and leveraging close to US\$6 billion in co-financing from the public and private sectors. Over the past 20 years, UNDP has mobilized around US\$2 billion in grant financing for sustainable energy projects in addition to 4,000 community-level small grant projects, totalling more than US\$130 million in grant financing. This 20-year track record has created a unique base of institutional knowledge on identifying and addressing a range of barriers that developing countries face as they aspire to transform their energy sectors and achieve their development goals.

UNDP's global network is on the ground in some 170 countries and territories, which enables provision of support to countries based on their own solutions to energy challenges and the development of national and local capacities by connecting them to knowledge, experience and resources that help achieve a transformation in their energy sector. At the global level, UNDP chairs the United Nations Development Group (UNDG), which includes the UN's key players in development. At the country level, UNDP plays two important roles, one as a partner for development work and the other as manager of the Resident Coordinator system. Through such coordination and global reach, UNDP seeks to ensure integrated solutions and a comprehensive stakeholder engagement process. This is grounded in bringing together various stakeholders and breaking the silos across sectors to advance the implementation of national energy and climate-related targets in line with the NDCs and the SDGs in a way that can generate significant mutual benefits to achieve the transformation goals that these two frameworks share.



Solar heating system in India. Photo: © UNDP India

Guiding principles

UNDP's work on sustainable energy will be guided by the following principles:

Context matters: UNDP recognizes that each country faces unique energy challenges to its development objectives. We will work closely with partner countries to advance their national energy priorities in line with their development objectives and offer a suite of services tailored to each country's context. This includes an understanding of the local context and responding to the needs of a range of countries in a variety of settings, including the LDCs, SIDS, disaster- and conflict-affected states and middle-income countries (MICs). UNDP's unmatched presence in nearly 170 countries is key to its work.

Deployment policies for technologies and applications: UNDP will focus on clean energy technologies with an emphasis on scaling up renewable and energy efficient solutions and creating the required enabling conditions. We recognize that the technology mix needed to decarbonize the energy sector will evolve as technological innovations mature and move to market readiness. Depending on the context and technology hierarchy level, deployment policies and applications can vary from neutral to increasingly specific. UNDP will support countries in diversifying their energy technology mix as they transition to zero-carbon energy pathways in line with their national climate and development targets. Technologies for carbon capture and storage or emerging 'negative emission' technologies that are still in the research and development stage may also be supported if the appropriate environmental and social safeguards can be met and if they are considered to be cost-effective.

Promotion of sustainable energy sources: UNDP will support countries to make their energy systems more sustainable by promoting the use of renewable primary sources of energy such as wind, solar, geothermal, biomass and small hydropower. While the overall emphasis will be predominantly on promoting the use of renewable energy, UNDP will be pragmatic and provide support for making existing systems cleaner and more efficient by promoting increased energy efficiency and fuel switching. Changes in energy use that lead to an environmentally more sustainable pathway, including a change from solid to liquid or gaseous fuels, as a bridge to a zero-carbon system in the future, will be supported. Use of coal – for example, coal-fired power plants – will not be supported. UNDP defers all interest from Member States on nuclear energy to the International Atomic Energy Agency (IAEA), the UN agency best equipped to provide guidance to countries on the use of nuclear technologies.

Integration of social, economic and environmental dimensions: UNDP's work on sustainable energy will focus on integrated solutions to ensure: inclusion of the most marginalized and vulnerable groups, including women, young people and children and leaving no one behind; addressing of equity and reduction of inequality in income and disparities in gender and urban/rural divides; and protection of the environment and our natural resources, including forests, lands, oceans and biodiversity. UNDP will ensure diligent adherence to its social and environmental standards and integration of gender equality across all sustainable energy efforts ([Box 3](#)).

Climate and disaster risk-informed: UNDP promotes risk-informed development. The degree to which populations are at risk of disasters depends on a combination of factors including location and geography, exposure, vulnerability and capacity. We recognize that natural hazards, such as storms or earthquakes, and the actual impact of disasters are also directly linked to poor development choices that increase



Photo: © UNDP Mali

BOX 3:

Integrating gender equality in sustainable energy

UNDP recognizes that communities and nations are more resilient and likely to achieve sustainable growth when the voices of all women and men are heard, regardless of income levels, social status, ethnicity, disability or indigenous status. Understanding and recognizing the perceptions, experiences, differences and inequalities between the most vulnerable groups can help to advocate and design interventions that will lead to better and more sustainable development results. To ensure this, UNDP includes gender as one of the key criteria in the Quality Assurance Standards and uses tools, such as the gender marker, to analyse and monitor gender-responsiveness of projects and programmes. In addition, bringing gender analysis into each energy project is critical for advancing gender equality through sustainable energy.

vulnerabilities and expose people and communities to risk. As climate change worsens, the incidence of climate-related disasters is expected to rise even higher. These risks have impacts on energy production, supply and services. UNDP will work with countries to integrate climate and disaster risk into energy sector interventions to build resilience and to safeguard future gains.

Technical excellence: The field of sustainable energy is complex and multifaceted, mixing public-private partnerships, technological change and innovative finance. UNDP is committed to providing governments with best-in-class technical support and expertise, marrying thought-leadership with high-quality methodologies. UNDP's de-risking methodology is a case in point: a transparent, quantitative methodology that systematically identifies cost-effective public instruments to address investment risks, supporting governments to achieve improved development outcomes.

From global to local: UNDP's strength is its long-term, sustained engagement at the country level, with decades of implementation experience, supported by its convening role and responsibility that stretch from local to global levels. UNDP will continue to support countries through a comprehensive multi-stakeholder and cross-sectoral process and will facilitate sharing of knowledge and lessons learned across regions, including through South-South and triangular co-operation.



*Windmills provide electricity
to remote communities.
Photo: © UNDP Croatia*

IV. OVERVIEW OF UNDP POLICY AND PROGRAMME SUPPORT

UNDP's policy and programme support in the area of sustainable energy for the period of 2017-2021 encompasses three interlinked action areas: reducing the energy access gap, increasing the share of renewable energy in the energy mix and improving the rate of energy efficiency. Across all three areas, UNDP's support to national governments will include a comprehensive package of technical assistance to remove barriers to market transformation and to create enabling conditions to de-risk investment and scale up sustainable energy solutions. UNDP's support covers upstream (policy, institutional level) and downstream activities with on the ground investments, ranging from local community-level support to nationwide efforts.

Lessons learned

A number of lessons are drawn from UNDP's engagement in sustainable energy over the last two decades that have informed the current approach to policy and programming support outlined in this note.

A review of our work on transforming on-grid renewable energy markets³² showed the importance of detailed risk and barrier analysis frameworks and that, with the recent dramatic cost reductions of technologies, the main barrier to increased investment in many developing countries is the cost of financing. The review revealed that, in order to de-risk energy investments, there is a distinction between policy de-risking and financial de-risking. In UNDP's experience, investing in policy de-risking instruments, often in tandem with financial de-risking instruments, appears to be cost-efficient when measured against paying higher financial incentives to compensate investors for above-average risk.

In a review of UNDP's large portfolio on energy-efficient building projects undertaken jointly with the International Energy Agency (IEA),³³ the approach of introducing minimum energy performance standards and building codes proved to be very effective in transforming the sector. While the introduction of codes was in general achieved, the recommendation was to shift increasingly the focus and attention to the effective enforcement of such legislation.

In the area of energy access, the falling costs of renewable energy technologies have also opened up completely new opportunities, given that, in many situations, renewables have now become the least-cost option. Many of UNDP's projects in this area are exploring the use of new business models that can help bring electricity to unserved and underserved communities, including by promoting productive uses of energy to spur economic activities and other development benefits.³⁴ In terms of cooking fuels, a number of interventions in the charcoal sector have demonstrated the need to use a value chain approach, from the sustainable/renewable production of biomass, through more efficient conversion technologies and distribution networks, to more efficient end-use by promoting the use of improved cook stoves.³⁵

An overview of three priority areas, informed by two decades of lessons learned, is described in this section. These three areas are closely linked and work in one area will often affect the other areas. Increasing access to energy, for example, can be achieved through renewable energy technologies. Similarly, energy efficiency can lead to economic savings and therefore improve affordability of energy access.



ACTION AREA 1

Increasing access to affordable, reliable and sustainable energy

Electrical, thermal and mechanical energy needs for households, businesses and communities, with an emphasis on affordability, reliability and sustainability of energy access for the poor. This includes decentralized energy solutions and the use of mini-grid and off-grid options. It also includes the role of energy access in conflict and disaster recovery efforts, improved livelihoods and social inclusion.

Worldwide, more than 1.1 billion people are without access to safe, affordable and reliable electricity³⁶. Populations that are not connected to the electricity grid are often forced to rely on electricity generation via expensive and environmentally hazardous diesel or oil-fired power generators or they use harmful fuels such as kerosene for their lighting needs.

One in five people, primarily in rural areas of Africa and South Asia, lacks access to electricity. However, the dominant model of electricity service delivery in these regions remains centralized power generation connected to extensive national grids for transmission and delivery purposes. While this model has worked well for more than a century in many developed countries, it has drawbacks that penalize developing countries that are yet to provide access to a large part of their population through extension of the grid. The high investment cost involved, combined with the need to deliver the service in a commercially viable way, means economics dictates coverage. People living in remote areas, or in areas without general infrastructure, often spend their entire lives without access to electricity and the cumulative benefits it brings. With the emergence of distributed generation models, however, and recent dramatic cost reductions of several renewable energy technologies, and more efficient end-use appliances, decentralized, renewable, energy-based distributed power generation is becoming an increasingly viable option. The IEA estimates that, by 2030, 70 percent of rural areas will be connected either to mini-grid (65 percent) or stand-alone off-grid solutions (35 percent).³⁷ However, access to finance remains as a bottleneck due to the high-risk investment environment. Supporting governments in creating an enabling environment that is conducive to private sector investment and enhancing business and entrepreneurial dimensions for market creation and transformation are critical to tap lower cost capital.

On the other hand, the urban poor in many developing countries who typically have access to some electricity face a number of other challenges. They experience irregular supply, frequent blackouts and quality problems associated with the grid electricity such as low or fluctuating voltage. Affordability is another key aspect, which may force households to remain without electricity due to high connection fees and tariffs.³⁸ Informal or illegal connections are also a common practice in many urban centres that can impact the overall supply of electricity to the city. Electricity theft may result in significant financial losses for



Micro hydro provides the electricity at non-formal education school in Pinthali.
Photo: © UNDP Nepal

BOX 4:

Promoting and scaling up energy access around the world

In **Nepal**, UNDP, in collaboration with the Government of Nepal and the World Bank, has helped install and operate 445 micro-hydropower plants, providing access to electricity for more than 98,000 households. In addition to improved lighting, it has increased enrollment of children in schools from 63 percent to 75 percent, mainly through increased rates of girls' attendance; it has reduced kerosene consumption by 90 percent and diesel usage by 23 percent; and more than 670 micro-enterprises have been established, creating more than 1,500 jobs. This project has also contributed to recovery efforts following the devastating earthquake in 2015.

In **Chile**, through the Renewable Energy Electrification project financed by the Global Environment Facility, more than 10,300 households gained access to electricity through 250 small power projects using PV systems, mini-hydropower plants, wind, micro hybrid systems and biomass gasifiers.

In **West Africa**, UNDP, in partnership with the Bill and Melinda Gates Foundation and others, has supported expansion of decentralized energy solutions to communities throughout 12 countries, establishing multifunctional platform-based energy enterprises serving more than 4 million people, many of whom are women. In Mali alone, this initiative has created at least 28,000 jobs.

In **Egypt**, through the Bioenergy for Sustainable Rural Development project, UNDP is promoting the use of agricultural waste as a source of energy by introducing more than 1,000 household biogas digesters and more than 200 community-sized digesters. Using a new business and operational model, new jobs have been created, high consumer satisfaction has been recorded and the programme is being expanded to many other parts of the country.

In the **Gaza Strip**, UNDP, with funds from the OPEC Fund for International Development (OFID), has installed solar PV in schools, health care and water facilities, benefiting more than 100,000 people as part of the Renewable Energy Generation project. The project is part of UNDP's support to the Palestinian Solar Initiative, which aims to meet 30 percent of energy demands in the Occupied Palestinian Territories from renewable sources by 2020.

IV. OVERVIEW OF UNDP POLICY AND PROGRAMME SUPPORT



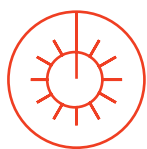
the utility and cause overloading of the supply infrastructure. Thus, the viability of services is compromised, leading to deterioration in reliability and quality of supply and consequently to reduced resilience in the face of disasters. Legal consumers end up subsidizing illegal users as electricity charges increase to compensate for the losses, while those accessing electricity illegally do not have any ongoing security of supply. These illegal connections also often pose a significant safety hazard due to poor wiring and absence of safety devices.³⁹ Increasing access to electricity, therefore, requires going beyond electricity connection rate as a sole measure of electricity access and taking into account issues of quantity, quality, reliability, affordability and sustainability of the electricity supply.

In terms of thermal energy needs, 2.9 billion people have to rely on biomass and coal for cooking and heating.⁴⁰ Inefficient usage and conversion devices for cooking and heating produce high levels of indoor pollution, causing severe health problems and premature deaths.^{41, 42} Women and children are often disproportionately affected and suffer greater drudgery. Biomass for cooking is often harvested unsustainably, causing environmental degradation such as deforestation, forest degradation, floods, landslides, topsoil erosion and low land productivity. This local land degradation, combined with increasing climate variability, increases the social, environmental and economic vulnerability of the poor.

Key UNDP services include policy and programme support on: [\(Box 4\)](#)

- Supporting development of energy access plans, including assessment of gaps and opportunities in achieving universal access, identification of accelerator initiatives and development of investment plans and action agendas.

- Promoting access to clean, affordable and reliable energy services for households, communities and businesses in rural, urban and peri-urban settings. Energy access, combined with renewable energy and energy efficiency, often results in the most appropriate and affordable technology solutions.
- Project and programme design support through integrated solutions that combine access to distributed renewable electricity services with measures that generate cash incomes or improve livelihoods. Supporting the creation of enabling environment and de-risking investment to unleash domestic and international resources and to drive business development and entrepreneurship, particularly for off-grid solutions in hard-to-reach communities.
- Mainstreaming of gender perspectives in energy access policy and programming, recognizing women's work and roles and building on their expertise and influence within households and communities can increase the effectiveness of access to sustainable energy solutions for all.
- Promoting off-grid and mini-grid renewable energy solutions, engaging on the design and implementation of programmes and projects, mobilization of financial resources and the documentation and sharing of good practices. Renewable energy technologies most suitable for distributed generation include solar PV, mini-hydropower plants, solar water heaters, hybrid renewable energy systems and electricity generation via biomass and biogas generators.
- Supporting households and communities to enhance access to efficient thermal biomass, biogas and liquefied petroleum gas (LPG) solutions for cooking, heating, lighting and productive uses in rural, urban and peri-urban areas. Activities include programmatic assistance in implementing improved cook stoves and biogas projects, sustainable production of biomass and charcoal value chains, and integrated systems combining agriculture with renewable and efficient energy solutions. Assisting national and tailor-made strategies to make local bioenergy use more efficient, cleaner and sustainable. This will require the maintained use of local bioenergy resources in the most efficient way through downstream flows such as implementation of biogas digesters and wood stoves, and upstream policy support (e.g., afforestation schemes, agroforestry).
- Supporting countries in preparedness and recovery processes in disaster- and conflict-affected states. Increasingly, UNDP is being requested to address the energy access needs and challenges of communities impacted by conflict and disasters where refugees and internally displaced communities are among the poorest and most vulnerable. Preparedness measures are especially important to ensure uninterrupted access to energy in crisis settings; they allow for the continuity of health and education services as well as business and livelihoods activities. Off-grid and portable technologies, for example, solar lamps, are particularly effective.



ACTION AREA 2:

Increasing the global rate of improvements in energy efficiency

Promoting energy efficiency across sectors, creating strong market demand and incentives for public and private investment in energy efficiency via a combination of policy, financial de-risking and direct incentives.

Energy efficiency is key to the transformation of energy systems. It is a proven, immediate and cost-effective option that can provide long-term benefits. It is estimated that energy efficiency will play a critical role in limiting world energy demand growth to one third by 2040, while the global economy grows by 150 percent.⁴³ It offers a unique opportunity to reconcile economic competitiveness with sustainable development and provides the added benefits of reducing the cost of energy and increasing energy productivity.

Energy efficiency improvements, in particular in residential and public sectors, have delivered a wide range of social, environmental and economic benefits to society, including energy security, job creation, energy poverty alleviation, improved health and greenhouse gas emissions reduction. It can, for example, help reduce energy expenditure and increase the affordability of energy in poorer households by bringing down the per-unit cost of lighting, heating, refrigeration and other services. It can also help reduce pollution by lowering the need for generation and associated emissions. Energy efficiency retrofits in buildings (e.g., insulation retrofits) create conditions that support improved health and well-being. The potential benefits include reduced symptoms of respiratory and cardiovascular conditions, rheumatism, arthritis and allergies, particularly among vulnerable groups such as children, the elderly and those with pre-existing illnesses.⁴⁴

Key UNDP services include policy and programme support for: [\(Box 5\)](#)

- Promoting energy efficiency in households, public and municipal facilities, residential and commercial buildings, SMEs, industry and the transport sector.
- Assisting government partners to address barriers to investment via a combination of policy and financial de-risking instruments and targeted financial incentives to consumers and key energy market players, such as the providers of appliances, equipment and services.
- Supporting national and local governments to design and adopt efficiency policies and legislation, building codes, energy rating systems and deploying energy management information systems and capacity-building for policy enforcement among authorities and relevant market stakeholders.
- Assisting governments with integrated solutions. This includes energy efficiency and disaster risk reduction as well as transport in urban and peri-urban areas. Where appropriate, UNDP's experience elevates opportunities and building code development to combine energy efficiency and disaster

BOX 5:

Making the case for energy efficiency*

Cost-effective development of energy Efficiency Standards and Labelling (BRESL). Photo: © UNDP Indonesia



In **Brazil**, UNDP, together with IADB, is implementing a programme to improve energy efficiency in buildings, transforming the market for Energy Service Companies (ESCOs), and to put in place a partial credit guarantee mechanism to leverage investment in the sector.

In **Armenia**, building on an earlier Global Environment Facility (GEF) project, UNDP aims at creating a favourable market environment and scalable business model for investment in energy-efficient building retrofits with recently approved funding from the Green Climate Fund (GCF). Direct beneficiaries include: 30,000 people living in single-family individual buildings and 52,200 in multi-family apartment buildings, including at least 6,000 members of women-headed households; and 23,000 users of large public buildings and 105,000 users of small public buildings, including at least 90,000 women.

In the **Western Balkan** countries, **Turkey** and **Russia**, UNDP has supported the introduction of Energy Management Information Systems (EMIS) in public buildings and their use to monitor and improve the efficiency of energy use. EMIS now cover thousands of buildings across the region.

In **Central Asian** countries (Kazakhstan, Uzbekistan, Turkmenistan), Russia, Belarus and Armenia, UNDP has supported the reform of building codes to introduce stringent energy performance requirements. In Uzbekistan, UNDP is also helping to introduce green mortgages for rural housing, ensuring increased energy performance and helping future homeowners save money.

In **India**, as part of efforts to scale up the energy-efficient productions in small-scale steel re-rolling mills, more than 300 mills benefited from energy efficiency measures, resulting in annual energy consumption savings of 15 percent (or US\$15 million), enough to provide electricity for 300 villages.

In **Ghana**, the introduction of minimum energy performance standards for refrigerators, combined with an appliance-labeling regime and a buyer rebate scheme (providing rebates upon turning in old appliances), is transforming the market, the first country to do so in West Africa. The annual energy savings achieved are enough to power more than 11,000 households for a year, resulting in average savings of US\$50 to US\$100 per household on their annual energy bill, a significant sum of money in a country where the average annual income is US\$1,900.

*Unless stated otherwise, these projects receive partial funding from the GEF.

resistance solutions, such as double-paned windows and seals on exterior openings. Combining these two goals within UNDP programmes creates more cost-effective solutions for home hazard mitigation and energy conservation, addressing exposures to natural hazards such as earthquakes, windstorms and floods and establishing whole-building performance standards. UNDP's sustainable transport initiatives also often combine improvements in fuel efficiency and fuel quality standards with measures to reduce demand for travel (e.g., compact city planning) and expansion of more efficient transport services, promoting modal shifts, while addressing local environmental issues and other problems such as urban air pollution and congestion.

- In partnership with international and national financial institutions and the private sector, UNDP also supports implementation of business models and financing mechanisms for energy-efficient investment and provides targeted financial assistance to vulnerable groups when the affordability of up-front investment is a particular concern. Taken collectively, these measures lay the foundation for transforming the market, ensuring that demand for energy efficiency is in place along with required technical capacity and affordable financing to realize and scale up energy saving measures in priority sectors.



ACTION AREA 3:

Increasing the share of renewable energy in the global energy mix

The development of on- and off-grid renewable energy technologies and delivery services through technical, policy and financial de-risking

The heavy reliance on inefficient and outdated coal-fired power plants is one of the main reasons for the energy sector's high contribution to global greenhouse gas (GHG) emissions, not only causing serious impacts on air quality and human health, but also contributing to the changing climate. In many contexts, even where access to electricity does exist, insufficient supply and deteriorating transmission infrastructure often force households, local businesses and industries to continue their reliance on traditional fossil-based energy sources. Unreliable power harms local businesses and economic productivity and adds substantial risks to investment. The issue of reliability also applies to renewable energy technologies such as solar and wind, which only produce energy when the conditions are right (i.e., sun is shining or wind is blowing). These technologies can also face fluctuations and variation in power output, for example, when there are changes in wind speed or when cloud cover increases. As the share of renewable energy sources increases in the global energy mix, addressing this challenge and meeting energy demands consistently and without any fluctuation will become even more important. Energy storage (via pumped storage, batteries, thermal storage and other means) can provide a solution by holding the surplus energy produced when generation exceeds demand and releasing it while supply is insufficient to satisfy the demand.

Energy storage can also be instrumental for emergency preparedness because of the ability to provide backup power as well as stabilization of energy services when disasters strike.⁴⁵ It is also transforming the transport sector. This sector accounts for about a quarter (23%) of global energy-related GHG emissions.⁴⁶ The reduction in cost of lithium-ion batteries, for example, has contributed significantly to the uptake of electric vehicles (EVs), with electric car sales worldwide reaching some 462,000 in 2015, up from 290,000 in 2014.⁴⁷ The increased electrification of vehicles in the future would enable decarbonization of the sector (provided that power came from increasingly low-carbon sources). It would probably also go hand in hand with greater residential use of energy storage and distributed generation capacity.

The role of renewable energy solutions in climate mitigation is proven. However, the contribution of renewable energy to adaptation and resilience against increasing climate and disaster risks is not often recognized. While all energy systems are susceptible to climate variability and extremes, renewable energy solutions have certain qualities such as modularity and scalability, distributed and decentralized deployment, local availability and diversity of fuel source that make them suitable for reinforcing the resilience of the wider energy infrastructure and for ensuring the provision of energy services under changing climatic conditions.⁴⁸



*Introducing PV
into farming communities.
Photo: © UNDP Moldova*

BOX 6: Catalysing investment for renewable energy and building resilience*

In **São Tomé**, UNDP is supporting the rehabilitation and expansion of the capacity of small hydro-based power generation for on-grid electricity. In **Republic of Congo, Democratic Republic of Congo, Equatorial Guinea** and **Central African Republic**, UNDP is supporting the promotion of mini-grids, testing new business models that facilitate private sector participation.

UNDP is active in many SIDS: In the **Seychelles**, a PV rebate scheme provides financial incentives to commercial and residential owners, managed by the Development Bank of the Seychelles. A net metering scheme has also been established. In **Mauritius**, a feed-in tariff was developed and introduced for smaller rooftop PV systems, which reached 4 MW of installed capacity by 2014. UNDP is helping **Comoros** develop its geothermal resources. UNDP is also assisting many **Caribbean SIDS** (e.g., Barbados, St Vincent, Jamaica, Dominica) and **Pacific Island Countries** (e.g., Samoa, Fiji, Cook Islands and Palau, to name but a few) to develop their RE resources and introduce energy-efficient measures.

In **Moldova**, an EU-UNDP energy and biomass project is establishing a sustainable biomass market, having already led to the creation of more than 100 briquette- and pellet-producing companies, producing an estimated 120,000 tonnes annually; more than 600 boilers have been installed in households and microenterprises; and more than 170 schools, kindergartens and community centres have been connected to biomass-fuelled heating systems.

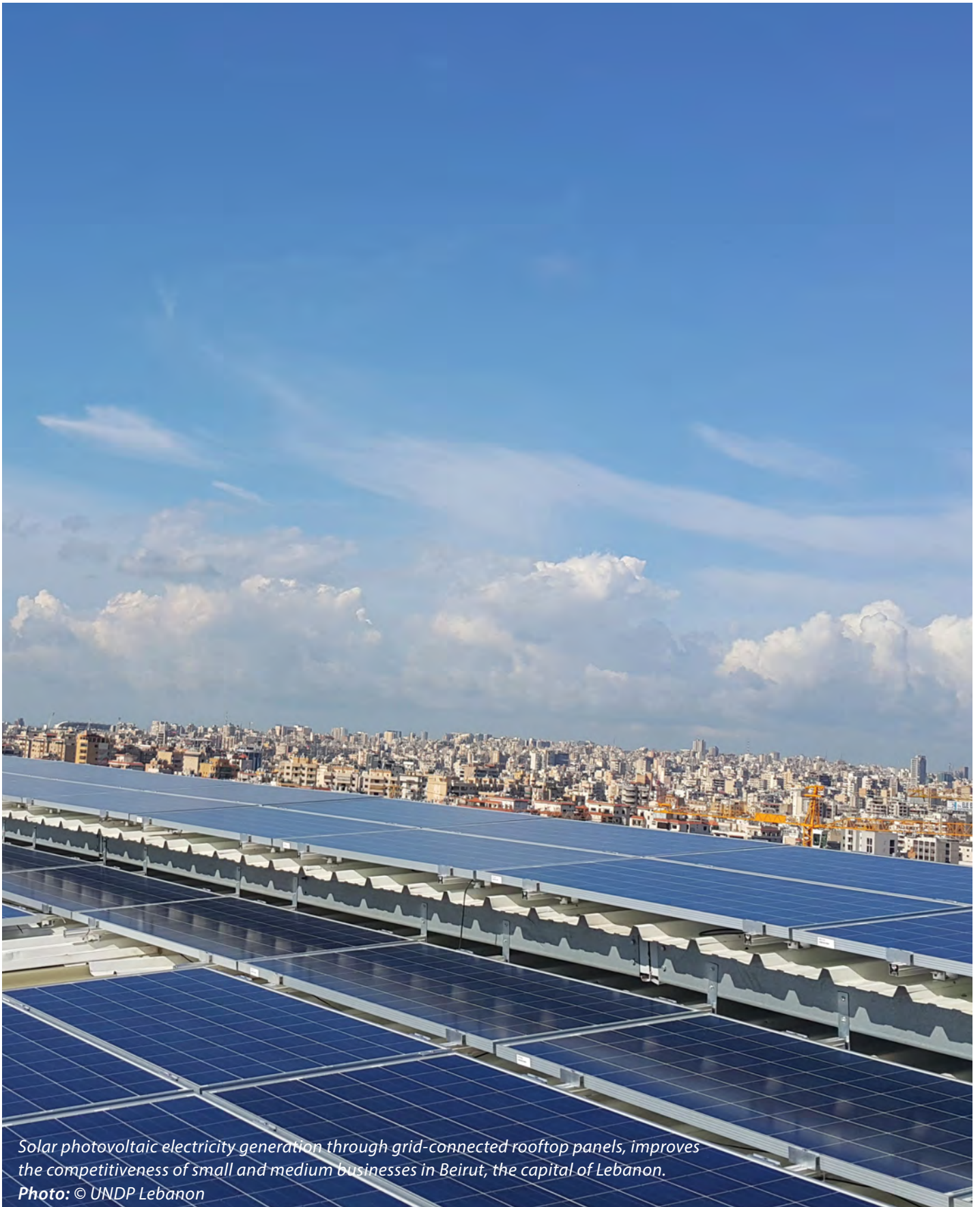
In **Tunisia**, UNDP is supporting the government to implement energy de-risking measures that are predicted to leverage EUR 935 million in private sector investment and to significantly lower the cost of solar power for consumers, from EUR 9.9 cents to EUR 7.7 cents per kWh. This is expected to be key to Tunisia's objective of achieving 30 percent of its power generation from renewables by 2030, a core part of Tunisia's INDC under the Paris Agreement.

In **Sudan** and **Morocco**, UNDP is supporting market development of solar-powered irrigation and water pumping, solar-powered desalination and renewable energy-aided agro-processing, including drying, cooling, refrigerating and other value addition. In addition to improved social and economic opportunities, the resulting sustainable agriculture techniques allow populations vulnerable to environmental risks and climate change to become more resilient and also contribute to reduced GHG emissions.

In **Bangladesh**, with UNDP support to the Parliamentarian Action for Renewable Energy (PARE), the Members of Parliament (MPs) helped secure the passage of the Sustainable and Renewable Energy Development Authority (SREDA) Act, mandating the creation of a new high-level agency to oversee all renewable energy development and financing. Executive support for SREDA was not immediately forthcoming. The PARE MPs, therefore, launched a campaign towards into allocating sufficient funds for the new agency by the Ministry of Power and the Finance Ministry. As a result of the PARE group's interventions, a new 4-billion Taka (US\$50 million) Clean Energy Fund was launched and new budget provisions were made to support SREDA.

*Unless stated otherwise, the above projects receive partial funding from the GEF.

IV. OVERVIEW OF UNDP POLICY AND PROGRAMME SUPPORT



Solar photovoltaic electricity generation through grid-connected rooftop panels, improves the competitiveness of small and medium businesses in Beirut, the capital of Lebanon.

Photo: © UNDP Lebanon

As described in previous sections of this strategy, the renewable energy industry is evolving rapidly and the combination of a number of elements creates a match to increase clean energy supply in many markets. These elements include: a) local governments in many parts of the world still face power supply deficits and costly generation base; b) recognition of the role of renewable energy in mitigating climate change, building cleaner and more resilient cities and increasing energy security; c) decline in renewable technology costs such as wind and solar PV, and advancements in technologies such as energy storage; d) increasing interest from global and local energy companies in hunt of growth markets (and the associated financiers); and e) support from international organizations such as UNDP to create an enabling environment for investment through de-risking.

Key UNDP services include policy and programme support: [\(Box 6\)](#)

- Assisting governments in transforming their renewable energy markets and building capacity of utilities and increasing their readiness by identifying and implementing policy and financial de-risking instruments that catalyse public and private sector investment in renewable energy technologies.⁴⁹ Energy technologies under this segment include on-grid and off-grid renewable electricity generation from wind, solar PV, biomass (including biogas), geothermal and small hydropower plants as well as de-risking investment for energy storage solutions.
- Supporting governments in development and adoption of renewable energy policies and legislation to integrate renewable energy capacity in the current power market structure, including supporting governments to clarify institutional structures through legislation and decrees. Grid management and energy sector planning will be supported in anticipation of higher penetration of variable renewables and their smooth integration.
- Supporting governments in developing clear, simplified and transparent renewable electricity license and permits processes.
- Enhancing energy governance and support for grid management and energy sector planning, including in post-disaster and post-crisis situations to strengthen the capacities and resilience of energy managers in maintenance and restoration of energy supply for affected populations.
- Supporting business and entrepreneurial skills development and enhancing access to small-scale financing for renewable energy solutions, particularly for women. Involving women in the design, maintenance and dissemination of locally appropriate renewable energy technologies and services can increase their employment opportunities and provide other socio-economic benefits.
- Promoting integrated solutions. All renewable energy solutions supported by UNDP focus on integrated approaches that benefit climate and development. Most renewable energy projects (e.g., distributed and decentralized systems) also support provision of energy to populations without access and have socioeconomic outcomes. UNDP also seeks to integrate risk-informed sustainable energy solutions across other development arenas, for example, supporting solutions that combine sustainable energy and agriculture. These initiatives are targeted at improving resilience and productivity as well as reducing drudgery for smallholder farmers and larger agricultural cooperatives. UNDP's support to sustainable cities also includes integrated solutions that combine renewable energy and efficiency measures with other aspects of urban design such as sustainable mobility and transport and waste management.

Policy positioning and advocacy

The overwhelming majority of UNDP's assistance is provided through national-level efforts via country-specific interventions focused on programming and policy support in the three priority areas highlighted previously. In addition, UNDP is engaged initiatives at the national, regional and global levels that focus on policy positioning and advocacy and that, in some cases, guide a number of country-level projects.

Examples of global initiatives include:

- Clean Light for Life supports the transition away from kerosene-based lighting.
- UNDP's De-risking Renewable Energy Investments⁵⁰ is a quantitative methodology, with an accompanying suite of financial tools, to assist policymakers to cost-effectively identify public instruments to promote energy investment. The methodology is being applied in some countries (Tunisia, Lebanon, Belarus, Nigeria and Kazakhstan) and is currently being expanded to a greater range of technologies (<http://www.undp.org/DRIE>).
- The [United for Efficiency \(U4E\) platform](#) is a joint initiative with UNEP, International Copper Association (ICA), the environmental and energy-efficiency NGO CLASP, and the Natural Resources Defense Council (NRDC) as well as private sector partners from the appliance manufacturers industry including ABB, Arçelik, BSH Hausgeräte GmbH, Electrolux, MABE, OSRAM, Philips, and Whirlpool Corporation. Funded by the Global Environment Facility (GEF), U4E is accelerating the transition to efficient lighting worldwide by promoting the leapfrogging of high-efficiency product categories such as motors, refrigerators, air conditioning and transformers. UNDP and UNEP with support from U4E and private and public sector partners are now implementing a series of energy efficiency programmes in Costa Rica, Kazakhstan, Sudan, Myanmar, Indonesia, South Africa, Tunisia and Chile.
- Support for transformational change in the civil aviation maritime shipping sectors in collaboration with the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), respectively.
- Launched in 2008, the UNDP-led and GEF-financed Global Programmatic Framework for Low-Carbon Buildings focuses on removing barriers, creating enabling market environments and catalysing financing for increased investment in energy efficient buildings in more than 40 countries. Under this initiative, UNDP assists countries in creating favourable market environments for investment in energy efficiency via a combination of policy and financial de-risking instruments and targeted financial incentives to key energy efficiency market players, such as consumers and providers of energy efficient appliances, equipment and services. Among policy de-risking instruments, stringent, continuously updated and well-enforced building codes have emerged most prominently and proved to be most effective in achieving energy efficiency improvements in buildings at large scale and at low cost. UNDP also supports the implementation of business models (ESCO, public-private partnerships) and financing mechanisms for energy efficiency investment and provides targeted financial assistance to the vulnerable groups in cases when affordability of up-front investment is a particular concern. Taken collectively, these measures ensure that market demand for energy efficiency is in place along with required technical capacity and affordable financing to realize and scale up energy-saving measures in buildings.

- UNDP is an active participant of the global UNEP-led [en.lighten](#) initiative, aimed at promoting energy efficient lighting. For example, in the Russian Federation and Kazakhstan, UNDP supported the implementation of a comprehensive policy package aimed at gradual phase-out of incandescent lamps and market transformation towards more efficient lighting technologies, such as light-emitting diodes (LEDs).
- The UNEP-UNDP joint partnership Reducing Black Carbon Emissions by Transitioning to Clean and Sustainable Lighting aims to scale up existing work of current lighting programmes to new target areas. Nigeria has been selected as a pilot for the first phase and this initiative will be expanded to other regions/countries in the follow-up phase. The initiative will accelerate access to clean lighting and reduction of indoor air pollution, improved health and safety and increased livelihood opportunities.
- An ongoing partnership with the World Bank on SIDS DOCK and a new joint initiative – Global SIDS Transition Initiative – in collaboration with the Rocky Mountain Institute-Carbon War Room (RMI-CWR), the Clinton Climate Initiative (CCI) and the SE4All Secretariat to enhance energy security in SIDS.
- The Climate Aggregation Platform (CAP), a joint initiative with the Climate Bonds Initiative and the Inter-American Development Bank (IDB), seeks to accelerate the transition to the energy systems of the future, supporting innovative asset-backed finance models for distributed renewable energy and consumer-driven energy efficiency.
- The Parliamentary Action for Renewable Energy (PARE) has been supporting the capacity of members of parliament in Africa, Asia and the Arab region to promote renewable energy through constitutional and legal amendments, increasing national budgets for renewable energy and providing oversight of governments' renewable energy policy and programmes.
- The International Solar Alliance includes around 120 countries dedicated to the promotion of solar energy. It provides a collaborative platform for increased deployment of solar energy technologies to enhance energy security and sustainable development, to improve access to energy and opportunities for better livelihoods in rural and remote areas and to increase the standard of living.

Examples of regional initiatives include:

- Several sustainable charcoal value chain projects throughout Africa, covering not only end-use through improved cook stoves, but also the sustainable production of woodlots and improved kilns for more efficient charcoal production.
- The Islands Energy Programme, jointly with RMI-CWR and CCI and partially funded by the GEF, provides technical assistance to island governments, utilities and private companies to help develop and negotiate the execution of renewable energy projects with the aim of reducing dependency on expensive imported fossil fuels and transition to renewable energy based systems and improving energy security.
- The ARECA initiative (Accelerating Renewable Energy in Central America) is a good example of collaboration with a subregional development bank, the Central American Bank for Economic Integration (CABEI), which provides support to design, capitalize and operationalize a partial-credit guarantee mechanism. This effort has catalysed new investments estimated at some US\$180 million, funding 29 small renewable energy projects for a combined installed capacity of 65 MW in several Central American countries, leading to an estimated direct annual reduction in GHG emissions of almost 170,000 tons of CO₂. Due to its success in leveraging resources (no guarantees have been

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executed so far), the PRG fund has now been transferred to CABEL and will continue to operate beyond the project duration.

- UNDP is working with the Economic Community of West African States (ECOWAS) Regional Centre for Renewable Energy and Energy Efficiency (ECREEE) to promote renewable energy and energy efficiency in the ECOWAS region. UNDP provided technical and financial support to ECREEE in developing a bioenergy policy and implementation plan for the region to enhance energy security and access without compromising food security or rural development in West Africa. In collaboration with 15 members of ECOWAS, UNDP also supported the development of the 'White Paper on increasing access to energy services' as well as the 'Roadmap of the ECOWAS Renewable Energy and Energy Efficiency Access Programme' (EREAP), which will focus on small-scale, mini-grid and off-grid solutions to support productive uses in rural and peri-urban areas by considering important cross-cutting issues such as gender and human rights.
- UNDP supports partnerships under the [Africa Energy Leaders Group \(AELG\)](#). The AELG was launched in January 2015 and aims to place energy issues high on the agenda of African policy- and/or decision-makers in building a community of energy leaders from the public and private sectors. It aims to unblock transboundary energy projects, build regional and thematic collaborations and push the agenda of regional economic integration ultimately to achieve a sustainable energy transition in Africa and to pursue the SE4All goals. UNDP is closely working with the African Development Bank (AfDB), which is hosting and coordinating the AELG Secretariat as well as the SE4All Africa Region Hub.

UNDP support also covers subnational and local levels ([Box 7](#)). Examples include:

- Sustainable cities initiatives support cities and subnational and local municipalities to focus on more integrated energy, waste management and transport and mobility solutions. This is an emerging area of focus, with an increasing number of projects around the world, including in Bosnia and Herzegovina, Bangladesh, Jordan, Turkmenistan, Serbia, Ethiopia, Moldova, Paraguay, Georgia, Thailand, Moldova, Kazakhstan, Maldives, Belarus and Malaysia.
- UNDP's energy-related portfolio in urban areas also includes a growing number of sustainable transport projects in cities around the world. These projects support the uptake of innovative sustainable transport technologies and systems such as bus rapid transit, fuel cell bus and light rail as well as biofuels and contribute to several SDGs, including SDG9 on resilient infrastructure and SDG11 on sustainable cities. They also contribute to a reduction in transport-related GHG emissions and improvement of living quality standards in urban areas through avoided congestion and reduced commuting times.
- A large portfolio of community-level projects, funded mainly through the Small Grants Programme of the GEF, which support implementation of renewable energy and energy efficiency measures with benefits to local populations.

BOX 7:

Integrated approaches to sustainable cities and transport*



Fuel-cell vehicles in Beijing, using alternative forms of energy and lower emissions of major air pollutants and greenhouse gases. Photo: © UNDP China

In **Malaysia**, UNDP's support through the 'Malaysia Green Technology Application for the Development of Low-Carbon Cities (GTALCC)' project will facilitate the implementation of low-carbon initiatives in at least five Malaysian cities. Over a period of five years, it aims to showcase a clear and integrated approach to low-carbon development by removing barriers to integrated low-carbon urban planning and development such as by supporting cities to implement and adopt integrated low-carbon urban development plans and programmes.

In **Kazakhstan**, UNDP, with financial support from the GEF, is implementing the 'City of Almaty Sustainable Transport (CAST)' project, which supports the municipality of Almaty in the development of a long-lasting,

fast, affordable, accessible, sustainable and financially stable transportation system. The project has supported the introduction of a light rail tram line, the development of rapid transit bus lines and a city master plan. As a result of the CAST project interventions, air pollution and greenhouse gas emissions will be reduced by 32 percent by 2023. Sustainable transport modes such as public transport, walking and cycling will increase from current 42 percent to 55 percent and the daily number of trips by car will drop from 1.75 million to 1.22 million per day.

In **Tajikistan**, UNDP supported the Government of Tajikistan with promoting sustainable mobility practices in the capital Dushanbe such as by improving the quality of public transport services and promoting soft mobility modes (walking and cycling). Dedicated bus lanes for public transport covering 15 km have been put in place and are accompanied by fuel efficiency standards adopted by the government. The project also supported the establishment of a GPS-based Single Dispatch Control Center (SDCC) to control public transport routes along the central Rudaki Avenue in Dushanbe. Information boards were installed at bus stops, as were GPS trackers on buses or trolleys.

In **Egypt**, UNDP is supporting the city of Cairo in the development of new, integrated transport services. This also includes the promotion of non-motorized transport in medium-sized provincial cities, the introduction of new traffic demand management measures and the improvement of energy efficiency in freight transport. For example, the project has supported the installation of variable sign message systems around the city center of Cairo to direct car drivers to vacant places in multi-level parking areas.

In **India**, through a joint programme, UNDP together with the World Bank is supporting the Government of India to reduce the growth trajectory of GHG emissions from the transport sector through the promotion of environmentally sustainable urban transport, strengthening government capacity to plan, finance, implement, operate and manage climate-friendly and sustainable urban transport interventions at national, state and city levels and increasing the modal share of environmentally friendly transport modes in project cities.

*Unless stated otherwise, the above projects receive partial funding from the GEF



*PV panels provide basic electricity services to rural people in Tarialan soum, Uvs Aimag, allowing traditional nomadic lifestyles to persist without having to forego modern energy solutions.
Photo: © Eskender Debebe / UNDP Mongolia / United Nations Information Centres*

Key sustainable energy partners

UNDP's longstanding role as a trusted partner working across sectors and stakeholders provides a solid foundation for its sustainable energy programming. UNDP recognizes that the mission to help countries embark on a transition of their energy systems driven by a market transformation approach is a complex one. UNDP's core de-risking methodology that guides and underpins this process makes it clear that, in most cases, a combination of risk reduction (policy de-risking), risk transfer (financial de-risking) and/or compensation for risk (direct financial incentives) is required. UNDP cannot do this alone and there is a strong rationale for building partnerships to provide fully comprehensive solutions to countries that are more likely to yield sustainable results and impacts.

A very important and critical partnership for UNDP is the Global Environment Facility. As one of its implementing agencies, UNDP is brokering access to these climate finance sources for its client countries. This has been and continues to be a very strong, mutually beneficial partnership that has allowed action on the ground and funds many innovative and transformative initiatives. Many of the examples presented in this strategy are from projects that have been partially funded by the GEF. UNDP was also recently accredited to the new Green Climate Fund (GCF) and plans to play a similar role as in the GEF, assisting countries to obtain access to climate finance that can help scale up clean energy/climate mitigation interventions. UNDP will continue to play a leading role in the GEF.

UNDP will continue to work with key institutions and agencies that complement UNDP's core expertise of policy de-risking in the energy field. In particular, partnerships with financial actors will be vital to offering complementary financial de-risking services, including with the following multilateral development banks: the World Bank (WB), African Development Bank (AfDB), Asian Development Bank (ADB), Inter-American Development Bank (IADB), Islamic Development Bank (IsDB), Asian Infrastructure Investment Bank (AIIB), New Development Bank (NDB), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Central American Bank for Economic Integration (CABEI), OPEC Fund for International Development (OFID), Development Bank for South Africa (DBSA) and West African Development Bank (BOAD).

UNDP will also continue to collaborate closely with other thought leaders in energy such as the IEA, the International Renewable Energy Agency (IRENA), the Renewable Energy Policy Network for the 21st Century (REN21), the World Resource Institute (WRI), the Organization for Economic Cooperation and Development (OECD), the International Partnership for Energy Efficiency Cooperation (IPEEC) and academic institutions such as ETH Zurich to draw on their analytical capacity to exchange experiences and to engage in policy dialogue and formulation. For example, UNDP is actively collaborating with IRENA on a number of initiatives, including REMap and finance, and will continue to deepen its collaboration. UNDP is also a member of the steering committee of REN21.

UNDP is part of UN-Energy, created after the 2002 World Summit on Sustainable Development in Johannesburg as an interagency mechanism within the system of the related to energy. Through joint programmes and a variety of activities implemented by its individual members, UN-Energy contributed significantly to a coherent UN approach in support of the inclusion and adoption of SDG7. UNDP will

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continue to play an important role within UN-Energy, being the largest of all such UN agencies and having the biggest programme in energy-related activities at the country level.

Most UN agencies/programmes have at least some focus on energy issues as part of their mandate. Some key ones include:

- The United Nations Environment Programme (UNEP): Provides a normative role and supports countries' low-emission and resource-efficient development pathways and provides tools that comprise and combine the areas of policy, technology and finance to improve energy efficiency in key sectors and increase renewable energy in the energy mix. UNDP's ongoing partnership on energy with UNEP, as mentioned previously, centres around the United for Efficiency (U4E) platform.
- The World Health Organization (WHO): Monitors the effects of indoor and outdoor air pollution, provides health-based guidance for policymakers and implementers on fuels and technologies used in the home and tracks access to reliable electricity and energy in health care facilities in sub-Saharan Africa. UNDP and WHO have together assessed the energy access situation in LDCs and sub-Saharan Africa.⁵¹
- The World Meteorological Organization (WMO): Provides climate information critical for the safety and basic operations of hydropower and other energy sources such as fossil fuels, wind, solar and fuel wood.
- The Food and Agriculture Organization (FAO): FAO is championing the sustainable use of bioenergy in agriculture value chains and focusing on energy and water issues in all stages of the agri-food chain to achieve food security and sustainable development. UNDP is working with FAO in a number of countries – for example, in Sri Lanka to promote the use of biomass for on-grid electricity generation.
- The United Nations Industrial Development Organization (UNIDO): Promotes productive, or income- and growth-generating activities, through mainstreaming the use of renewable energy and energy efficiency in industrial applications and increasing access to energy through renewable energy mini-grids. UNDP partners with UNIDO in a number of projects, including in Turkey to promote increased energy efficiency in several industrial sectors.
- UN Women: Promotes the integration of the gender dimension in sustainable energy. The Women's Sustainable Energy, Entrepreneurship and Access, for example, is supporting Morocco, Indonesia, India, Myanmar, Senegal and Bolivia to remove the barriers that women entrepreneurs face. UN Women and UNEP will work with the governments of these six countries to systematically and sustainably remove those barriers.
- The United Nations Children's Fund (UNICEF): UNICEF is increasingly exploring policy advocacy and programming to provide sustainable energy solutions for all children, especially the most vulnerable and disadvantaged.
- The United Nations Department of Economic and Social Affairs (UN-DESA): UN-DESA supports the intergovernmental process by facilitating the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges, including those related to sustainable energy. It also generates and analyses a wide range of economic, social and environmental information on energy issues to review common problems and take stock of policy options.

The Secretary General's Sustainable Energy for All (SE4All) initiative and the new SDGs continue the broad UN engagement on energy issues. UNDP has been a partner of SE4ALL since its inception in 2011. UNDP has funded the large majority of country-driven rapid assessments and gap analyses in all regions – a major contribution to the success of the initial stage of SE4ALL. At the regional level, UNDP has been working

closely with existing regional entities including with regional development banks and SE4ALL regional hubs in Africa, Asia Pacific and Latin American countries to advance SE4ALL objectives based on regional context and priorities. UNDP helped, for example, design the African response to SE4All in partnership with the African Development Bank (AfDB), African Union Commission (AUC) and NEPAD Planning and Coordination Agency (NPCA), which was endorsed by the Energy Ministers of Africa (CEMA) in 2012 and led to establishment of the SE4All Regional Hub in Africa in 2013.

UNDP will continue to be engaged, as a member of the Executive Committee on Energy Access, as a member of the Advisory Board and in regional and thematic hubs. With the recent adoption of SE4All's new Strategic Framework for Results for the period 2017-2021 and its focus on implementation, UNDP's sustainable energy strategy is fully aligned with the SE4All strategy and the post-2015 development agenda.

Within the SE4All Partnership Platform, UNDP's focus will be on strengthening its involvement in three regional hubs in Africa, Asia, Latin America and the Caribbean – supported by AfDB, ADB and IADB, respectively – to promote the energy access agenda, including by building a new coalition of partners to help close the energy access gap and by engaging in the Global Tracking Framework. UNDP will also contribute to other areas, such as renewable energy, energy efficiency and finance, through participation in the relevant hubs and committees.

The World Bank has always been a key partner and will continue to be so. Ongoing collaboration in the energy arena involves work with the Energy Sector Management Assistance Programme (ESMAP) on SIDS and the Global Tracking Framework led by the WB and the IEA. As an international financial institution, the WB is also a natural partner for providing financial de-risking support, complementing our policy de-risking assistance to countries.

Several major bilateral and multilateral donors have vigorous programmes on sustainable energy and UNDP will partner with them where appropriate and where doing so will add value for the clients being served. Such donors include the European Commission, Germany, France, Norway, Denmark, Japan, Canada, Sweden and others.

UNDP works with the private sector, civil society and foundations, which are very diverse stakeholder groups.⁵² The United Nations Foundation (UNF), the Bill and Melinda Gates Foundation, Practical Action and the Global Alliance for Cook Stoves are amongst the foundations vigorously engaged in sustainable energy. UNDP draws on their perspectives, insights and technical expertise. Civil society organizations and their people-centred development efforts are critical to UNDP's work on sustainable energy and to ensuring a service-focused understanding of energy planning based on beneficiary needs. Through the GEF Small Grants Programme (SGP), for example, UNDP provides financial and technical support to civil society groups, community-based organizations, non-governmental organizations and indigenous people to design and implement community-driven solutions to mitigate climate change and expand energy access.

UNDP's engagement with the private sector is direct and indirect. Directly, the private sector – ranging from large domestic companies, small and medium-sized enterprises, associations, industry stakeholders and cooperatives – is a key partner in implementing many UNDP supported projects. Indirectly, UNDP's overall approach to sustainable energy facilitates and strengthens private sector involvement by creating a conducive business environment.

SUGGESTED UNDP REPORTS

Energy Access

EnergyPlus Guidelines: Planning for Improved Energy Access and Productive Uses of Energy

http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/energyplus-guidelines.html

Multi-Function Platforms

Burkina Faso: The Multi-Functional Platform, An Enterprise for Rural Development Tool: <https://www.youtube.com/watch?v=LpAAJcGPU>

Mali: The Multi-Functional Platform for Sustainable Development - biofuel and agricultural value chain: <https://www.youtube.com/watch?v=sW2XGPRG8rw>

Senegal: The Multi-Functional Platform: a Micro Industrialization and Rural Development Tool: <https://www.youtube.com/watch?v=wo2ES0XCDtQ>

Link to pictures via FLICKR: <https://www.flickr.com/photos/134655478@N06/>

Achieving Sustainable Energy for All in the Asia-Pacific

<http://www.snap-undp.org/elibrary/Publications/APRC-EE-2013-SE4ALL.pdf>

Towards an EnergyPlus Approach for the Poor: A Review of Good Practices and Lessons Learned from Asia and the Pacific

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/towards_an_energyplusapproachforthepoorareviewofgoodpracticesand/

Integrating Energy Access and Employment Creation to Accelerate Progress on the MDGs in Sub-Saharan Africa

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/energy-access-employment-creation-sub-saharan-africa/

Energy Access in Developing Countries: A Review focusing on Least Developed Countries in Sub-Saharan Africa

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/energy-access-in-developing-countries/

Towards an 'Energy Plus' Approach for the Poor: A Review of Good Practices and Lessons Learned from Asia and the Pacific

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/towards_an_energyplusapproachforthepoorareviewofgoodpracticesand.html

Integrated Sustainable Rural Development: Renewable Energy Electrification and Rural Productivity Zones:

<http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/integrated-sustainable-rural-development--renewable-energy-elect.html>

Rural development through electrification with renewables in Gambia, Namibia, Lao PDR and Vanuatu:

Gambia: <http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/NAMAs/rural-electrification-with-renewable-energy-in-the-gambia.html>

Namibia: <http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/NAMAs/nama-on-rural-development-in-namibia-through-electrification-wit.html>

Lao PDR: <http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/NAMAs/nama-for-the-renewable-energy-sector-of-lao-pdr.html>

Vanuatu: <http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/NAMAs/nama-on-rural-electrification-in-vanuatu.html>

Renewable Energy

De-risking Renewable Energy Investment (Original Report)

<http://www.undp.org/DREI>

Tunisia: De-risking Renewable Energy Investment http://www.undp.org/content/undp/en/home/librarypage/environment-energy/low_emission_climateresilientdevelopment/derisking-renewable-energy-investment/drei-tunisia.html

Transforming On Grid Renewable Energy Markets

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/low_emission_climateresilient-development/transforming-on-grid-renewable-energy-markets/

Sustainable Energy Investment Snapshots

http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/renewable-energy-snapshots.html

Policy Guidance for Investment in Clean Energy

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/investment-in-clean-energy-infrastructure/

South Africa Wind Energy Programme (SAWEP) Technical Evaluation Report:

<http://www.undp.org/content/dam/undp/documents/projects/ZAF/TE%20SAWEP%20evaluation%20230811%20reduced.pdf>

Renewable Energy for Parliamentarians: How-to-Guide

http://www.undp.org/content/undp/en/home/librarypage/democratic-governance/parliamentary_development/renewable-energy-for-parliamentarians--a-how-to-guide.html

Energy Efficiency

Best Policy Practices for Promoting Energy Efficiency by the United Nations underserCommission for Europe

http://www.unece.org/fileadmin/DAM/energy/se/pdfs/geee/pub/ECE_Best_Practices_in_EE_publication.pdf

EU-UNDP Moldova Energy and Biomass Project

http://www.md.undp.org/content/moldova/en/home/operations/projects/environment_and_energy/moldova-energy-and-biomass-project0.html

Modernizing Building Energy Codes to Secure our Global Energy Future

http://www.tr.undp.org/content/dam/turkey/docs/povreddoc/PP7_Building_Codes_2013_WEB.pdf

General

Sustainable Energy for All – A Brief Guide to Advocacy Planning

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/sustainable_energy/SEFA-resources/SEFA-advocacy-planning-guide/

UNDP Strategic Plan 2014 - 2017

http://www.undp.org/content/dam/undp/library/corporate/UNDP_strategic-plan_14-17_v9_web.pdf

UNDP Gender Equality Strategy 2014 – 2017

<http://www.undp.org/content/dam/undp/library/gender/GenderEqualityStrategy2014-17.pdf>

Will Tomorrow Be Brighter Than Today

http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/sustainable-energy/will-tomorrow-be-brighter-than-today/Will%20tomorrow%20be%20brighter%20-Gender_and_Energy_2007.pdf

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ABBREVIATIONS

AfDB	African Development Bank
AIIB	Asian Infrastructure Investment Bank
ARECA	Accelerating Renewable Energy in Central America
AsDB	Asian Development Bank
BOAD	West African Development Bank
CABEI	Central American Bank for Economic Integration
DBSA	Development Bank of South Africa
DREI	De-risking Renewable Energy Investment
DRR	Disaster Risk Reduction
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
ESMAP	Energy Sector Management Assistance Programme
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
IADB	Inter-American Development Bank
ICA	International Cooperation Association
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
IMF	International Monetary Fund
IMO	International Maritime Organization
IRENA	International Renewable Energy Agency
IsDB	Islamic Development Bank
LDCs	Least-Developed Countries
MDGs	Millennium Development Goals
MICs	Middle-Income Countries
NDB	New Development Bank
OECD	Organization for Economic Cooperation and Development
OFID	OPEC Fund for International Development
PV	Photovoltaics
REN21	Renewable Energy Network 21
SDGs	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SIDS	Small Island Developing States
SIDS DOCK	Small Island Developing States Dock
SMEs	Small and Medium-Size Enterprises
U4E	United for Efficiency
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WB	World Bank
WHO	World Health Organization
WMO	World Meteorological Organization
WRI	World Resources Institute



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