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Achieving the multiple benefits of a sustainable development goal for energy

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1 Introduction

This chapter provides recommendations on the national implementation of a central component of new development agenda: a sustainable development goal (SDG) for energy. An SDG for energy should ensure access to affordable, reliable, sustainable and modern forms of energy for all, which in turn could alleviate poverty, improve health and wellbeing, and mitigate climate change. Realising these multiple benefits requires that countries tailor SDGs to different national contexts. When countries set national targets they may place varying weights on energy access, energy efficiency, renewable energy and energy conservation. National targets must also reflect how to mobilise investments. Policies that shift public financing from fossil-fuel subsidies to support for energy efficiency and renewables can help greatly in this regard. Targets are likely to be more effective when embedded in enabling environments that allow local governments and businesses to introduce and scale up energy-saving innovations. Existing initiatives such as Sustainable Energy for All (SE4All) could help support these efforts, while leveraging synergies between energy and other SDGs could also contribute to implementation.

SDG for energy should ensure access to affordable, reliable, sustainable and modern forms of energy for all

The remainder of the chapter is divided into seven sections. The second section reviews the multiple benefits associated with an SDG for energy. The third section discusses how an SDG for energy can be tailored to a wide range of national contexts. The fourth section underlines the MOI and governance arrangements needed to help achieve national targets. The fifth section reflects on possible support from global initiatives such as the SE4All. The sixth section underlines that leveraging linkages between an energy SDG and other SDGs can also strengthen implementation. The final section outlines the way forward as countries get ready to implement an SDG for energy.

2 The multiple benefits of an SDG for energy

Meeting the energy SDG has the potential to also reduce poverty, and improve health and wellbeing. Access to energy enables social and economic development, offering the opportunity for improved livelihoods and economic progress (United Nations Foundation, 2013). Energy access is a key precondition for human development; indeed no country in modern times has substantially reduced poverty without a sizable increase in energy services (UNEP & WHO, 2009). Further, access to clean and affordable energy can deliver benefits ranging from longer study times for children to prevention of 800,000 premature child deaths due to exposure to indoor smoke. There are still significant numbers of people who lack access to modern sources of energy, as can been seen in Figure 8.1 below.

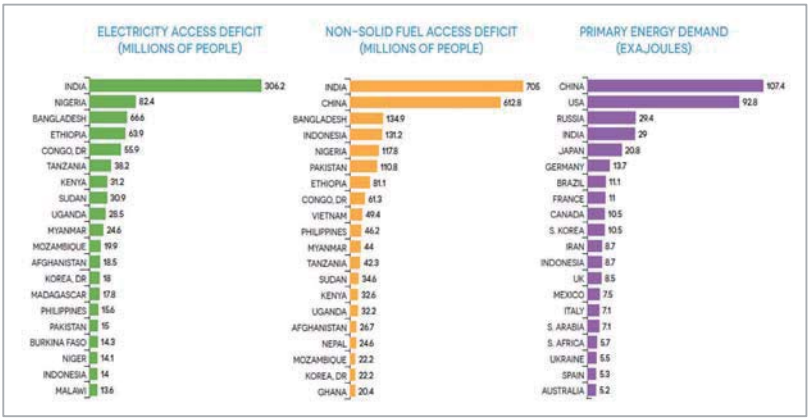

Figure 8.1 Deficits in access to electricity and non-solid fuels, and primary energy demand in selected countries

Source: World Bank 2013

Sustainable energy also plays a key role in mitigating climate change. In order to stay within safe global climate limits, populations with high per-capita fossil-fuel energy use will need to greatly reduce their greenhouse gas (GHG) emissions. The threshold of atmospheric carbon dioxide (CO_2) concentration proposed by Rockström and others as one of the planetary boundaries will soon or has already been exceeded (depending on whether one uses a 350 or 550 ppm boundary) (Rockström et al., 2009). Although improvements in energy efficiency cut

cumulative global energy demand by more than 25% over 1990- 2010 and renewable energy supplied a cumulative total of more than 1,000 exajoules globally over the same period, rapid population increase and economic growth diluted these advances (World Bank, 2014). In other words, global progress in energy efficiency and renewable energy share have been outpaced by growth in total energy consumption, which is estimated to increase rapidly in parallel with rising global populations and economies. Neither energy efficiency nor renewable energy measures alone can keep global warming to within two degrees by 2030 (Rogelj, McCollum, Reisinger, Meinshausen, & Riahi, 2013). Energy conservation is also a common feature of an integrated sustainable energy policy and a number of countries already have energy saving targets. Several EU countries have set national targets for energy saving.

Although energy itself has traditionally been a highly contentious issue, the multiple benefits of sustainable energy are beginning to draw support from many actors. This is perhaps why an energy goal enjoyed such widespread support at Rio+20 (Rio+20 UN Conference on Sustainable Development 2012) and also at the Open Working Group (OWG). Previously, at the World Summit for Sustainable Development Johannesburg Summit in 2002, the EU and Brazil suggested adopting concrete renewable energy targets, but met with opposition from G77 and OPEC on the grounds that access to energy for the poor should take priority (Ohga, 2012). Thus, going forward, it will be important for the next set of universal goals to provide a long-term vision, buttressed by targets and indicators for selective use at regional, national, local and even community levels. Those targets will then need to be tailored to national circumstances.

3 Adapting targets to national circumstances

Different countries confront different challenges regarding how they should set priorities and targets for energy. Varying development levels, resource endowments and the existing energy infrastructure all influence a country's energy use. There is a need to develop national energy targets and action plans for each individual country, which are then aligned with global goals. For example, Iceland and Paraguay have already achieved 100% renewables whereas countries like Libya have almost no renewable energy. The Chinese government, to cite another case, has introduced a series of "green measures" in the 12th Five-Year Plan that set forth a 16% reduction in energy intensity target (energy

consumption per unit of GDP), a reduction in carbon intensity reduction target (carbon emissions per unit of GDP) by 17% below 2010 levels by the end of 2015, and a non-fossil energy target of 11.4% of total energy use (Lewis, 2011). To make the global goals relevant and useful in national contexts, localised energy goals based on national realities and priorities will be essential.

Appropriate ambitious targets should be set based on a bottom-up approach at local and national levels. At the same time, local circumstances should be accounted for to maintain ownership and relevance while a global goal set under a long-term vision shared by the international community (e.g. zero fossil fuels, zero nuclear energy) should encourage efforts of multiple stakeholders at various levels to raise additional finance and other supporting MOI. The translation of these global goals at the national level with adjustments made using the bottom-up approach at the country level is critical for goals to be implemented, as it requires both clear government support and local innovation. While there is no hard and fast rule on how countries approach this process, different countries may want to prioritise the following four points as they prepare for an energy SDG: 1) energy access; 2) energy efficiency; 3) renewable energy; and 4) energy conservation.

3.1 Energy access

There is a correlation between the lack of modern energy access and underdevelopment. Thus developing countries which have not achieved universal modern energy access need to prioritise access in order to improve human wellbeing. Electricity access deficits and non-solid fuel (e.g. LPG, kerosene) access deficit are predominantly issues of lower income developing countries. Further, it is still unrealistic for developing countries to achieve universal access to energy by 2030 via clean energy without significant external financial and technical support (the year 2030 is the target year for the SDGs and the development agenda). The high costs of renewable energy present a challenge, especially for developing countries. This makes it evident that in many places, especially low income countries, energy access would still need to be ensured via conventional energy sources. Enabling leapfrogging of technology in developing countries would require substantial financial and technical cooperation from developed countries, other developing countries and other stakeholders such as companies and international organisations. It would

also necessitate a keen eye for understanding what works and why in some contexts but not others.

3.2 Energy efficiency

Since global energy demand is estimated to grow by 33% from 2010 to 2035, energy efficiency improvements will become increasingly important over the coming decades. An energy efficiency goal is particularly important for emerging economies, which often have large-scale but inefficient industrial and utility sectors. There is usually ample room for efficiency improvements, such as building retrofits and upgrading appliances. Many of these economies use energy in the production of export commodities, which, in turn, are consumed in developed countries. This points to the need to engage consuming countries providing the right technology to help the emerging export-led economies upgrade their energy mix towards greater efficiency. Energy efficiency investments can also have many positive spillovers: they often pay for themselves, enhance energy security and are relatively easy to implement.

3.3 Renewable energy

The importance of increasing the global share of renewable energy is now widely accepted. It would offer climate change mitigation, improved air quality and increased energy security benefits. Since fossil fuels are being rapidly depleted and the nuclear option entails risks and radioactive waste, renewable energy is the only truly sustainable form of power generation. The growing popularity of renewables is reflected by the adoption by 138 countries of policy targets for increased deployment of renewable energy and the adoption by 127 countries of renewable energy support policies—more than two-thirds of which are developing countries or emerging economies (Mcginn, D., Green, D., Hinrichs-Rahlwes, & R., Sawyer, 2013).

The question is whether the new set of global goals on energy can provide the impetus for strengthening existing national policy targets and policies and lead to further implementation. The current global share of renewable energy in final energy consumption is still low—estimated at 16.7% (REN 21, 2012)—but while goals related to renewable energy can be applied to developing countries, they cannot be applied evenly throughout the world due to differences in renewable energy potential.

The costs of raising the renewable proportion of the energy mix depend greatly on the potential of renewable energy. A target of 20% renewable share of electricity is too ambitious for some countries but easily achievable or already achieved by others, and while doubling the share of renewable energy in the global energy mix may be appropriate at the global level (suggesting a global share of renewable energy of around 32–36% by the year 2030) it may not be the best starting point for some countries.

3.4 Energy conservation

Energy conservation is a common feature of energy policy in developed countries, a number of which already have such targets. Several EU countries have set national targets for energy conservation and have adopted the trading of 'white certificates' or 'energy savings certificates', which demonstrates that a certain reduction in energy consumption has been attained to meet required targets (Bertoldi & Rezessy, 2009). Goals related to energy efficiency can provide synergies with energy conservation, as the latter targets provide incentives to improve energy efficiency. On the flipside is a scenario that ignores energy conservation, in which energy demands overshadow any progress in energy efficiency and renewable energy deployment. Each of the above four priorities will not be achieved without the support of governance arrangements and MOI.

4 Governance and means of implementation

The energy sector represents the largest share of global GHG emissions (41%) (International Energy Agency, 2012), which makes it critical to the SDG agenda. National governments play an integral role in steering energy policy and setting the enabling conditions for various stakeholders to effectively participate in formulating relevant targets for the energy SDG. Successful energy policies such as financial assistance for training and capacity building on renewable energy (Sovacool, 2012), the feed-in tariff (FIT) and removal of fossil fuel subsidies may be adopted as some of the enabling targets and indicators for the energy SDG.

There is also a need to ensure that governance structures are enhanced to incorporate elements of top-down and bottom-up governance. National governments may need to be supported by international institutions to provide sufficient capacity and accountability in government institutions to drive ambitious energy targets. Governments may also be responsible for providing institutional frameworks (e.g. feed-in tariff law/policy, infrastructure such as local grids, renewable energy subsidies) where multiple stakeholders such as local governments, businesses and individual citizens could innovate and participate in the market to achieve the transformation to sustainable energy. Clear, reliable and consistent policy over the long-term is especially important to attract the necessary investments and buy-in from the private sector.

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Broader elements of the governance agenda, such as the rule of law, competent public agencies and controls on corruption, are also needed (which may be better placed under other goals/targets), to support clear, coherent energy policies (see also Chapter 2 for a review of these broader elements of governance). These are the cornerstones of sustainable development, and as such represent enabling conditions paving the way for further investment in energy.

While there are already many international actors promoting renewable energy, there is still room for improvement for international and regional organisations to provide access to green technologies and high quality advisory assistance to member states. The availability of standardised, reliable data on critical issues such as electricity prices and renewable energy potential is still scant in developing countries and would need further resources for research purposes.

Further, governments in developing countries are often unsure of which renewable options to choose and tend to replicate technologies promoted elsewhere, despite differing implementing contexts and conditions. International organisations with expertise in energy efficiency and renewable energy could assist developing countries by helping them

choose appropriate renewable technologies, sharing information on context-appropriate good practices and the latest renewable technologies (e.g. via expert and practitioner workshops), compiling and sharing essential data on websites, and providing technical and policy advice. One of the more important initiatives that could contribute to and benefit from an energy SDG is Sustainable Energy for All (SE4All).

5 Sustainable energy for all

The energy SDG shares much common ground with the UN Secretary-General's existing SE4All objectives of energy access, energy efficiency and share of renewable energy—with the exception that the former attaches no specific figure to the share of renewable energy due to worldwide variations. SE4All is a voluntary initiative based on the Year of Sustainable Energy for All in 2012, as designated by the UN General Assembly and offers many potential synergies with the Energy SDG (the Secretary-General's High-Level Group on Sustainable Energy for All 2012).

There have been no official globally-agreed goals or legal instruments on energy access, energy efficiency and the share of renewable energy, thus an SDG on energy would help contribute to and raise the profile of the existing work of SE4All and other energy-related initiatives undertaken by governments, the United Nations, businesses and civil society organisations. The initiative may further support an ambitious energy SDG by presenting a long-term vision to the whole world, such as "Achieving 100% renewable energy" and spur countries which have already achieved the targets to be even more ambitious. The additional attention given to energy through the SDGs may also help proponents in SE4All build new coalitions with similar interests in enabling greater access to sustainable sources of energy. This will also require recognising interlinkages between energy and other SDGs.

6 Interlinkages between the energy SDG and other SDGs

There are a number of positive interlinkages between energy and other SDG goal areas such as water, education, health and climate change mitigation, but there are also possible tradeoffs with energy, e.g. the 'overdraft' of water by water pumping and the competing use of water for drinking, agriculture and energy generation. As the largest single consumer of water, agriculture competes directly with the energy sector for water resources (U.S. Department of Energy, 2014), and this is a particular concern in many parts of the world that are short of water (Bhattacharya & Mitra, 2013). Many of these places would benefit directly from renewable energy generation such as solar photovoltaics (PV) and wind since no water is involved, unlike the large quantities required for fossil fuel and nuclear energy generation. It may not be possible to address all interlinkages since targets and indicators need to be simple to be effective, but identifying and then weighing the costs and benefits of implementing policies in line with these linkages will be important for all countries. Chapter 6 of this book on the water SDG expands on some of the considerations necessary for taking a similarly integrated approach to a water goal.

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7 The way forward

It is important to consider that there will be differences in how individual countries develop their energy sector sustainably. Effective institutions and policies as well as good governance are the cornerstones of sustainable development because they ensure the efficient use of financial resources and enhance transparency (United Nations, 2014). Sound public policy, strong institutions and effective governance—identified in Chapter 2 as enablers for the implementation of SDGs—will play a crucial role in achieving an energy SDG.

Policymakers need to carefully consider MOI and governance reforms, with the aim of achieving the four goals of energy access, energy efficiency, renewable energy and energy conservation highlighted above. In particular, energy-related issues are typically handled by several government ministries and departments so inter-ministerial coordination and cross-sectoral working groups will be key for effective implementation as will engagement of private companies in the energy sector. Possible reforms supporting greater integration would include strengthening interagency coordination mechanisms, cross-training between officials with overlapping administrative portfolios, and piloting multi-criteria for budgeting decisions and programme evaluation. Building the capacity and knowledge of government institutions and key stakeholders to raise awareness and to share information can encourage greater acceptance from the public.

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A number of countries have already set domestic targets on energy efficiency and renewable energy and are working towards them, thus for the SDGs to add value they need to be more ambitious than countries' existing targets. Governments around the world are already taking action on sustainable energy—the role of the SDGs is to strengthen these efforts further, especially to ensure that the needs of the poor are in focus and that new energy systems are environmentally sustainable and compatible with a stable global climate.

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