

Ensure universal access to modern energy services

### **QUICK FACTS**

- In 2014, 1.06 billion people lacked access to electricity about three times the population of the United States. This is only a very slight improvement from 2012, when 1.1 billion people lacked access to electricity.
- Of the 20 high impact countries for electrification, Kenya, Malawi, Sudan and Uganda, made rapid progress from 2012-14, increasing electrification rates by 2-3 percent annually. Angola and the Democratic Republic of Congo saw electrification rates fall by 1 percent annually during the same period.
- In 2000, Afghanistan's electrification rate was close to zero percent. By 2010, this had risen to 43 percent and by 2014 to about 90 percent. Progress has been primarily driven by the rollout of off-grid renewable energy solutions.
- Progress in electrification needs to advance four times faster
  if the world is to meet 2030 objectives. The global access rate
  needs to rise from the 2012-14 rate of 0.19 percent to 0.92
  percent a year from 2015-30.

#### CONTEXT

- In 2014, 80 percent of people without access to electricity were living in just 20 high impact countries, all of them in Sub-Saharan Africa and Asia. Most of those living without access reside in rural areas across the world, with urban areas already having close to universal access at 96 percent.
- In Sub-Saharan Africa, progress in closing the electricity access gap is not keeping pace with population growth in urban and rural areas. Under the 2016 World Energy Outlook's New Policy Scenario around 780 million people are projected to remain without electricity in 2030, increasingly concentrated in Sub-Saharan Africa (80 percent).
- Electrification rates rise very steeply as countries move through the income bracket of \$500-\$1,000 per capita GDP.
- By embracing new integrated approaches to electricity access, swift progress can be achieved in reducing energy poverty and closing the energy access gap cleanly and resiliently. Advancements in technologies, business models and new pools of finance mean countries can access decentralized renewable energy solutions that are cleaner and more affordable than ever before.
- Reaching universal energy access at tier 5 (full grid power, all day, every day) by 2030 would require a five-fold increase in finance, to approximately \$50 billion annually.

### ADDITIONAL RESOURCES

Global Tracking Framework 2017
State of Electricity Access Report 2017
Regulatory Indicators for Sustainable Energy 2017
SEforALL Africa Hub
SEforALL Asia-Pacific Hub
SEforALL Latin America and the Caribbean Hub

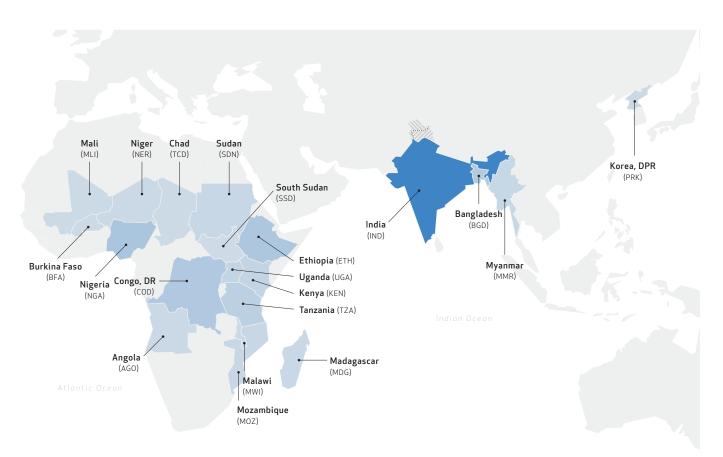
Clean Energy Mini-Grids HIO
International Energy Agency
The OPEC Fund for International Development
Regional Economic Commissions
GOGLA
ARE

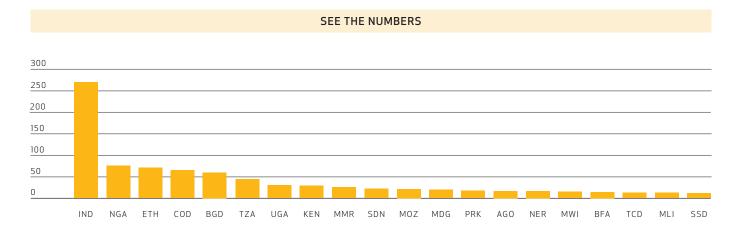


Ensure universal access to modern energy services

### **MILLION PEOPLE WITHOUT ACCESS TO ELECTRICITY, 2014**

**KEY** 11.4M 269.8M





Notes: 1. The dotted line represents approximately the Line of Control in Jammu and Kashmir by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. 2. This map was produced by SEforALL. It is based on the UN Map of the World, which can be found here: http://www.un.org/Depts/Cartographic/map/profile/world.pdf. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of SEforALL, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

Sources: International Energy Agency (IEA) and the World Bank. 2017. "Progress Towards Sustainable Energy: Global Tracking Framework 2017" (April), World Bank, Washington, DC. Data extracted from http://gtf.esmap.org/ on 06/20/2017.

# RURAL/URBAN DIVIDE



How many people have access to electricity and how does this vary between rural and urban populations?

#### **QUICK FACTS**

- The urban access rate was 96.3 percent in 2014, and the rural rate 73.0 percent.
- Electricity access advanced faster in urban than rural areas over the period 2012-14. An additional 81 million people a year in urban areas were provided with access to electricity over 2012-14. In contrast, only 6 million people in rural areas gained access annually, a number outpaced by population growth of 7 million.
- As of 2014, most cities in the Asia-Pacific region have reached universal access to electricity. In contrast, almost 390 million people living in rural areas of Asia remain unserved.
- Afghanistan, China, and Pakistan all made good progress in electrifying rural areas, increasing access for around 2.5 million more people than the annual population increase over 2012-14. Decentralized solar photovoltaic systems are beginning to have an impact in hard to reach rural settings.
- As of 2014, 482 million of the 1.06 billion people without access to electricity lived in rural parts of Africa, with most of them residing in Sub-Saharan Africa. In Malawi, Tanzania, Uganda and Niger, four high impact countries, 80 percent of the population lived in rural areas with electrification rates as low as 4-5 percent over the period 2012-14.
- In urban parts of Africa, the electricity access rate increased from 70.4% in 1991 to 76.0 percent in 2014. But about 110.6 million people still lacked electricity in 2014, as urban population growth had offset access gains.

#### CONTEXT

- Urban access rates have increased only marginally in the 25 years from 1990 to 2014. However, sustaining those rates represents a major achievement given rapid urbanization that has added 1.6 billion people to the world's cities during this period.
- Progress in rural electrification has been improving albeit not fast enough. The access gap between urban and rural populations narrowed to 20 percentage points in 2014, from 35 percentage points in 1990. Most of those without access to electricity live in rural areas, particularly in rural Africa where electrification access lags population growth.

#### ADDITIONAL RESOURCES

Global Tracking Framework 2017
Regulatory Indicators for Sustainable Energy 2017
State of Electricity Access Report
SEforALL Africa Hub
SEforALL Asia-Pacific Hub
SEforALL Latin America and the Caribbean Hub

Clean Energy Mini-Grids HIO
International Energy Agency
The OPEC Fund for International Development
Regional Economic Commissions
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How many people in rural and urban areas have access to electricity?

#### PERCENTAGE OF POPULATION WITH ACCESS TO ELECTRICITY, 2014



<sup>\* 2012</sup> data

Sources: International Energy Agency (IEA) and the World Bank. 2017. "Progress Towards Sustainable Energy: Global Tracking Framework 2017" (April), World Bank, Washington, DC. International Energy Agency (IEA) and the World Bank, 2015. "Sustainable Energy for All 2015 - Progress Toward Sustainable Energy". Data extracted from http://gtf.esmap.org/on 06/22/2017.

# **ENABLING POLICIES**



Which African and Asian countries have an enabling environment for investment in energy access?

#### **QUICK FACTS**

- Of the high-impact countries, only five provide widespread policy support for energy access. These include Bangladesh, India, Kenya, Tanzania and Uganda.
- Sub-Saharan Africa—the least electrified region with over 600 million people without electricity—has one of the least developed policy environments to support energy access. Ethiopia, Nigeria, and Sudan are three of the most populous energy deficit countries, with a total unserved population of 116 million people.
- Kenya, Tanzania and Uganda have put in place enabling policy and regulatory environments for energy access in the Sub-Saharan African region. Kenya aims to achieve universal access by 2020, and is focused on grid electrification. Attractive investment incentives and mini-grid standards have encouraged private sector engagement. Last mile connectivity (grid densification program) is funded through connection fee subsidies.
- India aims for universal access by 2019. Its electrification plan is regularly updated and monitored by the Rural Electrification Corporation Ltd. Central and the State Governments provide capital subsidies of up to 90 percent for grid extension, support connection fees, and set performance standards. The Remote Village Electrification Programme promotes mini-grids and supports capital costs for solar photovoltaic system facilities. Technical and quality standards are in place for mini-grids and stand-alone systems.

#### CONTEXT

- Regulatory Indicators for Sustainable Energy (RISE) offers
  policy makers and investors detailed country-level insights on
  the policy and regulatory environment for sustainable energy
  across 111 countries globally.
- A number of countries in Sub-Saharan Africa and the Asia Pacific region received a high score for energy access on RISE but are not high-impact countries for electrification.
- RISE shows that policy frameworks for access are lagging behind, especially in populous countries of Sub-Saharan Africa and those with particularly low electrification rates.
- The top RISE scorers in energy access do well across all three
  possible energy supply solutions—grids, mini-grids, and
  stand-alone systems— suggesting they are being pursued not
  as substitutes but as complements. Countries in South Asia—
  specifically India and Bangladesh—are emerging as leaders in
  the access agenda with an innovative mix of grid and off-grid
  solutions.

### ADDITIONAL RESOURCES

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Global Tracking Framework 2017
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Which African and Asian countries have an enabling environment for investment in energy access?



#### MEDIUM SCORE (66-34)

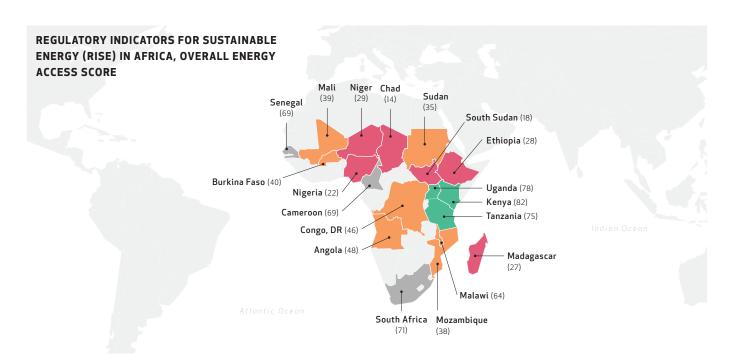
Significant opportunities exist to strengthen the policy framework

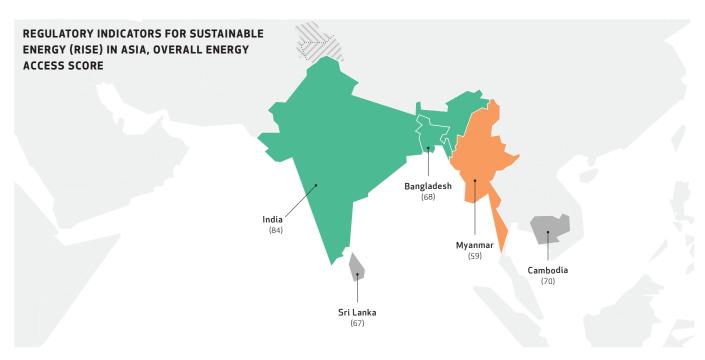
#### LOW SCORE (33-0)

Few or no elements of a supportive policy framework have been enacted

OTHER HIGH SCORES

Country received a high score on RISE but is not a high-impact country for electrification





Notes: 1. Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy. 2. Korea, DPR is a high-impact country but it is not shown because there is no RISE data available. 3. The dotted line represents approximately the Line of Control in Jammu and Kashmir by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. 4. These maps were produced by SEforALL. They are based on the UN Map of the World, which can be found here: http://www.un.org/Depts/Cartographic/map/profile/world.pdf. The boundaries, colors, denominations and any other information shown on these maps do not imply, on the part of SEforALL, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

Source: Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 2017. Data extracted from http://rise.esmap.org/ on 06/23/2017.

# **ENABLING POLICIES**



Which countries have an enabling environment for investment in energy access?

#### **QUICK FACTS**

- Of the high-impact countries, only five provide widespread policy support for energy access. These include Bangladesh, India, Kenya, Tanzania and Uganda.
- 70 percent of Africa's least electrified nations—with access rates below 20 percent—have barely begun to establish an enabling environment for access.
- Electrification plans that help define boundaries between utility and decentralized solutions are generally lacking. 45 percent of high-impact countries do not have electrification plans yet.
- In the Asia Pacific region, the policy framework for access to electricity is more favorable and this is reflected in access rates of 90.3 percent in 2014 compared to 37 percent in Sub-Saharan Africa. Countries in the Asia Pacific region score an average of 90 percent on the RISE policy environment indicating that most elements of a strong policy framework are in place, in contrast to 35 percent in Sub-Saharan Africa.

#### CONTEXT

- Regulatory Indicators for Sustainable Energy (RISE) offers
  policy makers and investors detailed country-level insights on
  the policy and regulatory environment for sustainable energy
  across 111 countries globally.
- The top RISE scorers in energy access generally do well across all three possible energy supply solutions—grids, minigrids and stand-alone systems—suggesting they are being pursued not as substitutes but as complements as part of comprehensive national energy access strategies.
- High scorers for RISE on access tend to do well across policies for grids, mini-grids, and stand-alone systems suggesting efforts are complementary. Countries like India and Bangladesh are emerging as leaders with an innovative mix of grid and off-grid solutions.
- Utilities play an important role in improving access but RISE shows that many utilities in the developing world are not creditworthy and struggle to make the investments needed to expand electricity networks to the unserved. Dedicated government budget lines to support electrification are often missing and improvements are needed in utility transparency and monitoring. This includes the collection, reporting to regulators and public availability of key information about utility financial and technical performance that can provide a basis for investors and developers to assess investment opportunities. By monitoring the reliability of electricity services utilities can also ensure the high operating efficiency and financial viability of their core business.
- The full cost of connecting to the grid, which varies from US\$22 in Bangladesh to US\$500 in several Sub-Saharan African countries, exceeds US\$100 in the vast majority of countries. The biggest driver of connection costs is capital investment for buying materials, including poles, cables, and transformers. Sub-Saharan Africa has the highest fees, in most cases because customers have to pay for electrical equipment (circuit breakers, meters, cables).

### ADDITIONAL RESOURCES

Regulatory Indicators for Sustainable Energy 2017

**Global Tracking Framework 2017** 

State of Electricity Access Report

**SEforALL Africa Hub** 

SEforALL Asia-Pacific Hub

SEforALL Latin America and the Caribbean Hub

Clean Energy Mini-Grids HIO

**International Energy Agency** 

**The OPEC Fund for International Development** 

**Regional Economic Commissions** 

**GOGLA** 

**ARE** 

Source: International Energy Agency (IEA) and the World Bank. 2017. "Progress Towards Sustainable Energy: Global Tracking Framework 2017" (April), World Bank, Washington, DC.

Which countries have an enabling environment for investment in energy access?

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE), BY ENERGY ACCESS INDICATOR

КЕҮ

#### HIGH SCORE (100-67)

Most elements of a strong policy framework to support sustainable energy are in place

#### MEDIUM SCORE (66-34)

Significant opportunities exist to strengthen the policy framework

#### LOW SCORE (33-0)

Few or no elements of a supportive policy framework have been enacted



Notes: 1. Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy. 2. Electrification plan approved and monitored' refers to the existence and monitoring of officially approved electrification plans. 3. Quality of electrification plan' refers to the quality of officially approved electrification plans.

 $Source: Regulatory\ Indicators\ for\ Sustainable\ Energy\ (RISE),\ World\ Bank\ Group,\ 2017.\ Data\ extracted\ from\ http://rise.esmap.org\ on\ 06/23/2017.$ 

# **DOING BUSINESS**



Which countries have an enabling environment for investment in energy access?

#### **OUICK FACTS**

- Of the world's 20 countries with the largest number of people without electricity, only five - Bangladesh, India, Kenya, Tanzania and Uganda - provide comprehensive policy support for energy access according to the Regulatory Indicators for Sustainable Energy (RISE).
- Sub-Saharan Africa—the least electrified region with over 600 million people without electricity in 2014—has one of the least developed policy environments to support energy access. This includes, for example, Ethiopia, Nigeria and Sudan, three countries with a consumed unserved population of 116 million in 2014.
- Kenya received a high score for energy access in RISE and showed one of the most notable improvements in performance on Doing Business indicators in 2015/16. Kenya streamlined the process of getting electricity by introducing a geographic information system that allows the utility to provide price quotes to customers without conducting a site visit. This reduced the time and interactions needed to obtain an electricity connection as well as its cost. Attractive investment incentives and mini-grid standards have also encouraged private sector engagement.
- In India in 2015/16 the utility in Delhi streamlined the connection process for new commercial electricity connections: the time needed to connect commercial consumers to electricity was reduced from 138 days in 2013/14, to 45 days in 2015/16. Connection costs were also reduced from 846 percent of income per capita in 2013/14 to 187 percent in 2015/16.

#### CONTEXT

- RISE offers policy makers and investors detailed countrylevel insights on the policy and regulatory environment for sustainable energy across 111 countries globally.
- To enable private sector businesses to start, operate and expand their activities, and eventually deliver clean, affordable and reliable energy, an enabling business environment is required. Doing Business ranks economies from 1-190. A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm.
- By looking at how countries perform on RISE and Doing Business, it is possible to get a sense of where progress is needed on the enabling environments to support energy access and energy market development.
- Those high-impact countries that score in the upper range on RISE tend to also rank higher on Doing Business, however progress is still needed on the regulatory environment for businesses.

### ADDITIONAL RESOURCES

Global Tracking Framework 2017
Regulatory Indicators for Sustainable Energy 2017
Doing Business 2017
State of Electricity Access Report
SEforALL Africa Hub

SEforALL Asia-Pacific Hub

SEforALL Latin America and the Caribbean Hub

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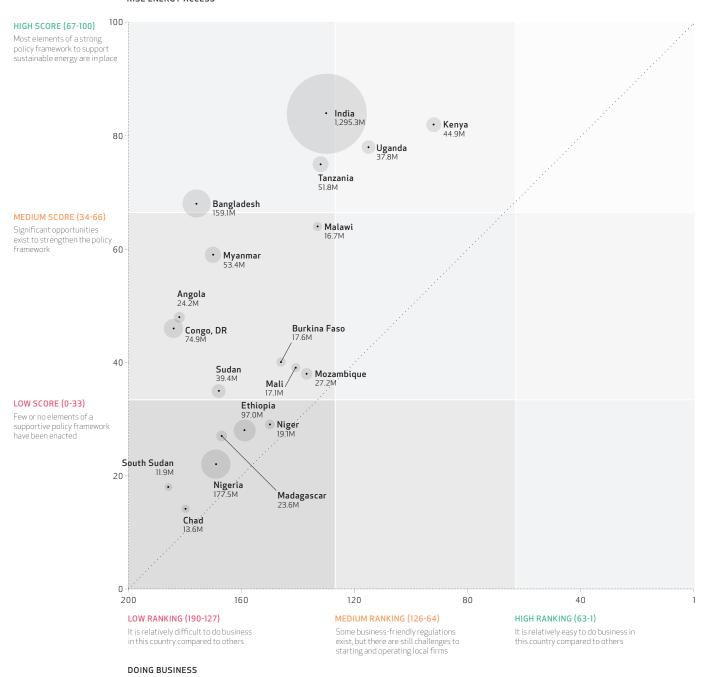


Which countries have an enabling environment for investment in energy access?

### REGULATORY INDICATORS FOR SUSTAINABLE ENERGY AND DOING BUSINESS RANKING

Population, 2014
values (relative to countries shown)

#### RISE ENERGY ACCESS



Notes: 1. No data available for Korea, DPR. 2. Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy. 3. Doing Business is a relative ranking of 190 economies based on the regulatory environment. It does this by sorting the aggregate scores of 11 topics, each consisting of several indicators, giving equal weight to each topic. Sources: Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 2017. "Doing Business 2017: Equal Opportunity for All", http://www.doingbusiness.org/rankings, 2017. Data extracted from http://rise.esmap.org/ on 06/23/2017. World Development Indicators, World Bank Group, 2014. Data extracted from http://data.worldbank.org/indicator/SPPORTOTL?end=2014&name\_desc=false&wiew=chart on 06/20/2017.

### **ENERGY ACCESS**



How much investment would be needed to reach 100 percent electricity access over 2010-2030?

#### **OUICK FACTS**

 The annual average investment needed over 2010-30 to ensure everyone has access to electricity in the 17 high-impact countries covered by the Access Investment Model (AIM) ranges from just over \$1 billion to provide everyone with access to 24 hours of electricity a day on very low-powered appliances (i.e tier 1) to around \$40 billion to provide everyone with access to 23 hours of electricity a day on very highpowered appliances (i.e. tier 5).

#### CONTEXT

- The Multi-Tier Framework (MTF) redefines energy access to fill the gaps in the traditional binary access measurement, which assesses whether someone has an electricity connection or not. The MTF classifies energy access into tiers to reflect a spectrum of service levels. These range from tier 1 access that supports two light bulbs and a phone charger at a capacity of 20 Watts per hour, to tier 3 access that supports productive uses and a minimum consumption of 1kW per hour, to tier 5 access that allows multiple uses of electricity in a household at a minimum consumption of 8.2 kW per hour. The MTF captures the granularity of energy access attributes such as capacity, duration of supply, reliability, quality, affordability, legality, and safety.
- The World Bank's Access Investment Model (AIM) provides detailed bottom-up estimates of the average annual cost of reaching universal access to electricity over the period 2010-2030. It calculates the investment, operating, and fuel costs to provide enough on-grid, mini-grid, or off-grid electricity according to the MTF. It assumes that all people without access are provided with the same level of energy service and calculates costs for the five energy service levels (or tiers) defined in the MTF. AIM covers 17 high-impact countries. At present, it does not include data for Chad, Mali and Zambia.
- The World Bank/ESMAP, in partnership with the Scaling up Renewable Energy Program, is undertaking a global MTF survey to collect baseline data on energy services in 15 countries, including: Kenya, Rwanda, Uganda, Zambia, Ethiopia, Nigeria, Niger, Liberia, India (7 low access states), Bangladesh, Myanmar, Cambodia, Nepal, Honduras, Haiti. The survey, covering household access to electricity and clean cooking, is carried out through a household questionnaire applied to a nationally representative sample of households. The survey will be extended to cover another 10 to 15 countries in 2018–19.

### ADDITIONAL RESOURCES

Global Tracking Framework 2017

Beyond Connections: Energy Access Redefined

Regulatory Indicators for Sustainable Energy 2017

State of Electricity Access Report 2017

SEforALL Africa Hub

SEforALL Asia-Pacific Hub

SEforALL Latin America and the Caribbean Hub

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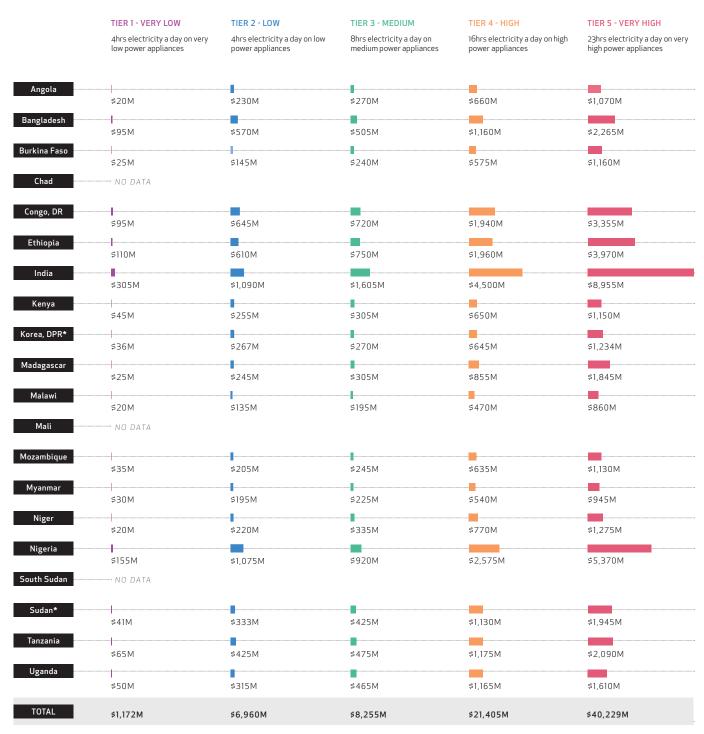
 $Sources: World Bank\ 2017.\ "Regulatory Indicators for Sustainable Energy.\ A\ Global\ Scoreboard\ for\ Policy-Makers",\ World\ Bank,\ Washington,\ DC.$ 

# **ENERGY ACCESS**

How much investment is needed to reach 100% electricity access over 2010-2030?

### INVESTMENT NEEDED TO ENSURE EVERYONE HAS ACCESS TO ELECTRICITY FOR 2010-2030 BY TIER, US\$ (2012 DATA)

THE AVERAGE ANNUAL COST OF ENSURING EVERYONE HAS ELECTRICITY ACCESS FOR 2010-2030, FOR FIVE SCENARIOS WHERE ALL NEW ACCESS CONNECTIONS ARE IN A GIVEN TIER (US \$ MILLION)



<sup>\*</sup>Estimat

Note: World Bank's Access Investment Model (AIM) calculates the investment, operating, and fuel costs to provide enough on-grid, mini-grid or off-grid electrification for meeting a specified scenario for energy access based on a multi-tier access framework.

Source: International Energy Agency (IEA) and the World Bank, 2015. 'Sustainable Energy for All 2015 - Progress Toward Sustainable Energy'.



What country-led planning efforts are underway to address the Sustainable Energy for All goal?

#### **QUICK FACTS**

- Almost 30 Sub-Saharan African countries, of which 11 are highimpact countries, are in the process of completing their Action Agendas.
- Four countries in Latin America and the Caribbean and six countries in the Asia-Pacific Region are in the process of developing Action Agendas. These include Bangladesh and Myanmar, two high-impact countries for electrification.
- 13 of 20 high-impact countries have an Investment Prospectus planned, in development or finalized.

EXAMPLE OF NATIONAL TARGETS FOR ENERGY ACCESS, PUBLISHED ACTION AGENDAS IN SUB-SAHARAN AFRICA		
High-Impact Country	2030 Access target – Electricity	2030 Access target - Clean Cooking
Angola	100%	100%
Kenya	100% by 2022	100%
Nigeria	95%	80%
Tanzania	>75%	>75%
Uganda	>98%	>99%

#### CONTEXT

- SEforALL has three regional hubs in Africa, Asia-Pacific and Latin America and the Caribbean which help countries to realize the SEforALL objectives
- Action Agendas lay out a nationally tailored approach to deliver SEforALL objectives.
- Investment Prospectuses identify a pipeline of investment projects and programs for financing that help meet SEforALL objectives.

### ADDITIONAL RESOURCES

SEforALL Africa Hub
SEforALL Asia-Pacific Hub
Regulatory Indicators for Sustainable Energy 2017
State of Electricity Access Report
Global Tracking Framework 2017
Clean Energy Mini-Grids HIO
African Development Bank
Asian Development Bank

United Nations Economic and Social Commission for Asia and the Pacific

African Union Commission

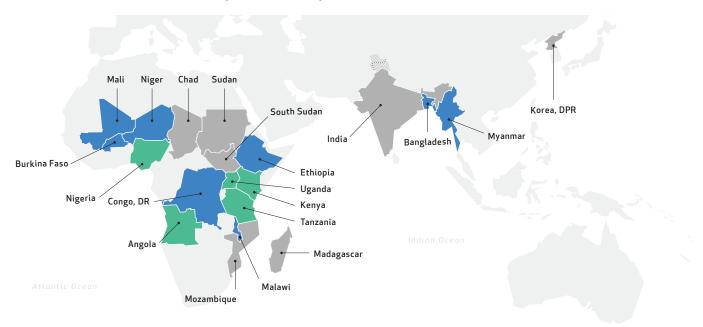
NEPAD Planning and Coordinating Agency
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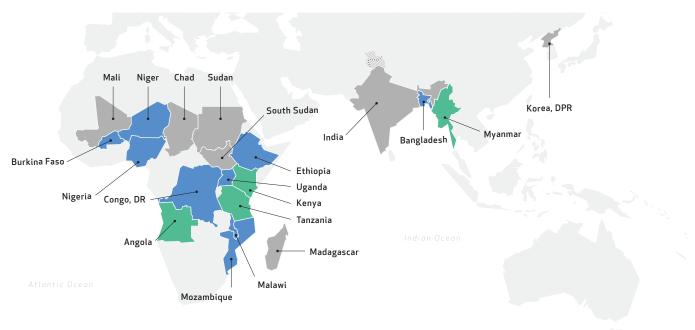
What country-led planning efforts are underway to address the Sustainable Energy for All goal?

### PROGRESS MADE ON ACTION AGENDAS (AS OF JUNE 2017)





### PROGRESS MADE ON INVESTMENT PROSPECTUSES (AS OF JUNE 2017)



Notes: 1. Action Agendas lay out a nationally tailored approach to deliver SEforALL objectives. 2. Investment Prospectuses identify pipelines of investment projects and programs for financing. 3. The dotted line represents approximately the Line of Control in Jammu and Kashmir by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. 4. These maps were produced by SEforALL. They are based on the UN Map of the World, which can be found here: http://www.un.org/Depts/Cartographic/map/profile/world.pdf. The boundaries, colors, denominations and any other information shown on these maps do not imply, on the part of SEforALL, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

Source: Sustainable Energy for All.