

HEAT MAPS

SUSTAINABLE ENERGY FOR ALL



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ABOUT THE HEAT MAPS

In many regions of the world, poor and disadvantaged populations lack access to modern energy services – specifically, clean non-solid fuels and technologies for cooking and affordable, reliable clean electricity. Achieving universal energy access for billions of people who lack these services – a core focus of SEforALL – is an enormous challenge that can be hard to navigate when deploying limited resources for maximum impact. That’s why we created the ‘heat maps.’

We have lots of information available that have helped us create four sets of ‘heat maps,’ which identify specific countries and regions with the biggest gaps and needs on key sustainable energy topics. We can then tailor our strategies and engagements to country needs which will help us meet our 2030 goal to achieve affordable, reliable, sustainable and modern energy for all (Sustainable Development Goal 7.)

For example, the Global Tracking Framework has been assessing progress towards SEforALL objectives since 2013. This Framework uses a technically rigorous approach and available data from household surveys and international databases to track access to electricity and non-solid fuels for cooking, improvements in energy intensity and increases in the share of renewable energy in total final energy consumption. The Global Tracking Framework identifies 20 “high impact” countries for each indicator.

The Regulatory Indicators for Sustainable Energy – commonly known as RISE– gives policy makers and investors detailed country-level insights for leveling the playing field for sustainable energy worldwide. It provides an overview of progress on necessary policy and regulatory frameworks in 111 countries, representing 96 percent of the world’s population and 91 percent of global energy consumption. It reports on 27 indicators and 80 sub-indicators that capture the quality of policies and regulations for energy access, renewable energy and energy efficiency.

By combining and analyzing data sets like these, as we do with the ‘heat maps,’ we can show leaders where they can make the biggest and fastest inroads towards our goals and can support these efforts accordingly. These maps also show where progress is happening so that we can replicate the success of others and help leaders in government, business and civil society make smart choices.

CLEAN COOKING



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Ensure universal access to modern energy services

QUICK FACTS

- In 2014, 3.04 billion people did not have access to clean fuels and technologies for cooking. Approximately 85 percent of those without access live in just 20 high impact countries.
- The share of the global population with access to clean fuels and technologies for cooking rose over 2012-14 from 56.5 to 57.4 percent. But due to population growth the absolute population lacking access to clean cooking grew from 3.03 billion to 3.04 billion over this period.
- Over 2012-14, Indonesia's access rate rose by more than 8 percent and Angola, Bhutan, the Maldives and Peru saw access rates grow by more than 4 percent. In contrast, access to clean fuels and technologies for cooking declined in Afghanistan and Nigeria by about 1 percent a year in the same period.
- Access rates can be as low as 22 percent in rural areas compared to highs of 78 percent in urban areas. Improved biomass cook stoves are supporting access in rural areas where natural gas distribution infrastructure does not yet exist.

CONTEXT

- Many countries showing improvements in access were natural gas producers, suggesting that domestic availability of this resource could be an advantage.
- As countries grow in wealth, clean fuels and technologies for cooking become more accessible. Access to clean cooking tends to be much higher as a country moves through the income bracket of \$12,000 per capita. However, some countries in Latin America and the Caribbean, the Middle East and East Asia are close to 90 percent access without being close to \$12,000 per capita GDP.
- Countries that prioritize clean cooking solutions and pursue policies to do so, can and do see rapid progress. For example, Indonesia's access rate rose by more than 8 percent over 2012-14 linked to government interventions and economic growth. This included a government supported Indonesian Kerosene to Liquid Propane Gas (LPG) Conversion program that converted 56 million households and microbusinesses to LPG nationally between 2007 and 2014. A results-based financing framework - the Indonesia Clean Stove Initiative - was also launched. Informed by social and gender work, it focused on cook stove delivery and included an innovative stove-testing method that incorporated local cooking practices and preferences.
- Cooking with polluting fuels is a major global health issue, with the World Health Organization estimating in 2012 that some 4.3 million premature deaths each year are linked to inhaling carbon monoxide and particulate matter from traditional biomass cook stoves, primarily among women and children. Switching to clean fuels, typically LPG, or adopting advanced combustion cook stoves that burn biomass more cleanly and efficiently, can reduce exposure to such risks.
- Under the 2016 World Energy Outlook's New Policy Scenario, around 2.3 billion people across Africa and Asia are projected to continue to rely on traditional uses of biomass for cooking in 2030.

ADDITIONAL RESOURCES

[Global Tracking Framework 2017](#)

[World Health Organization](#)

[SEforALL Africa Hub](#)

[SEforALL Asia-Pacific Hub](#)

[SEforALL Latin America and the Caribbean Hub](#)

[Global Alliance for Clean Cookstoves](#)

[World LPG Association](#)

[The Global LPG Partnership](#)

[International Energy Agency](#)

CLEAN COOKING

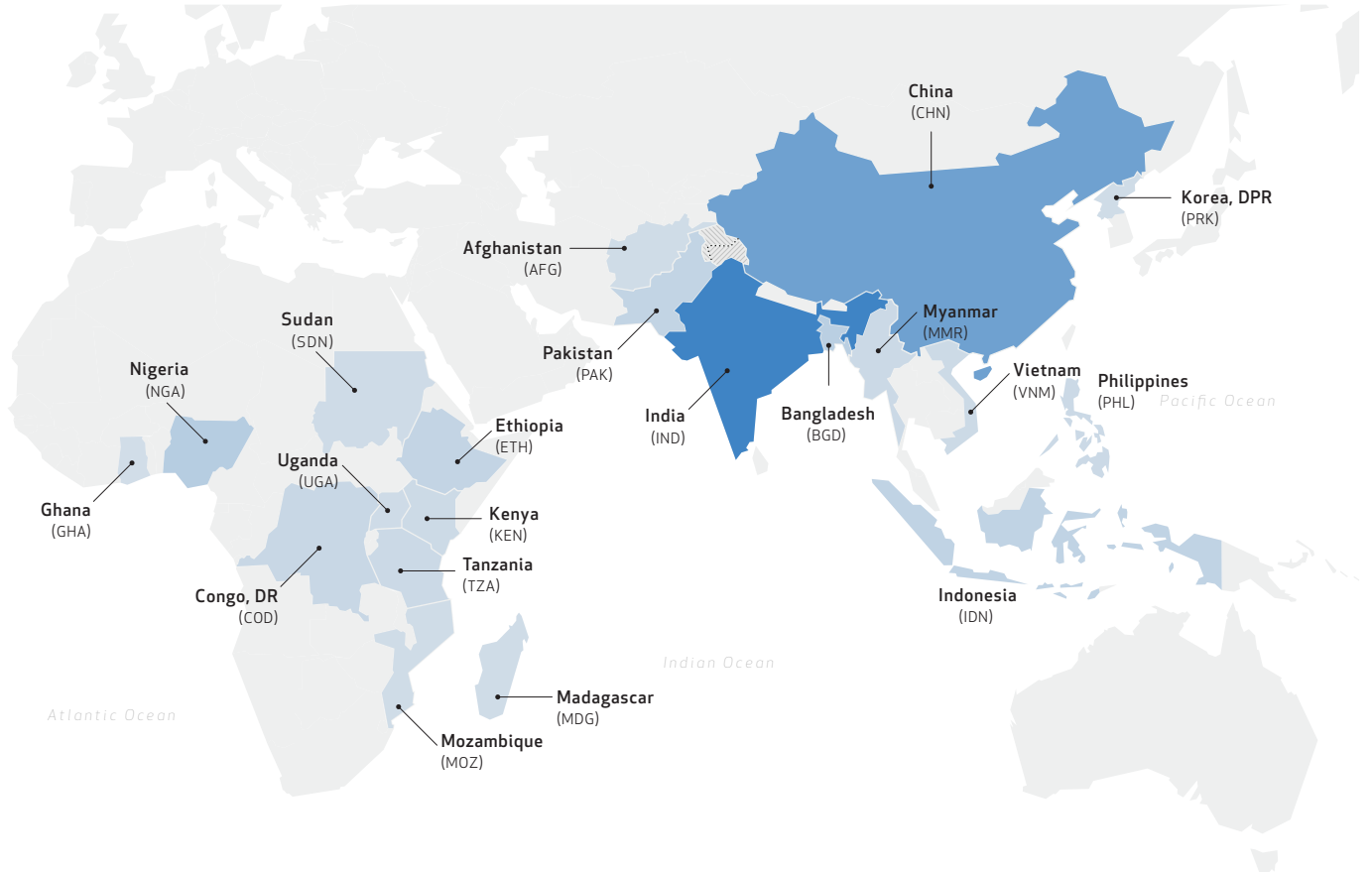
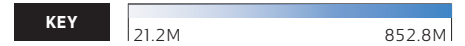


HIGH-IMPACT COUNTRIES

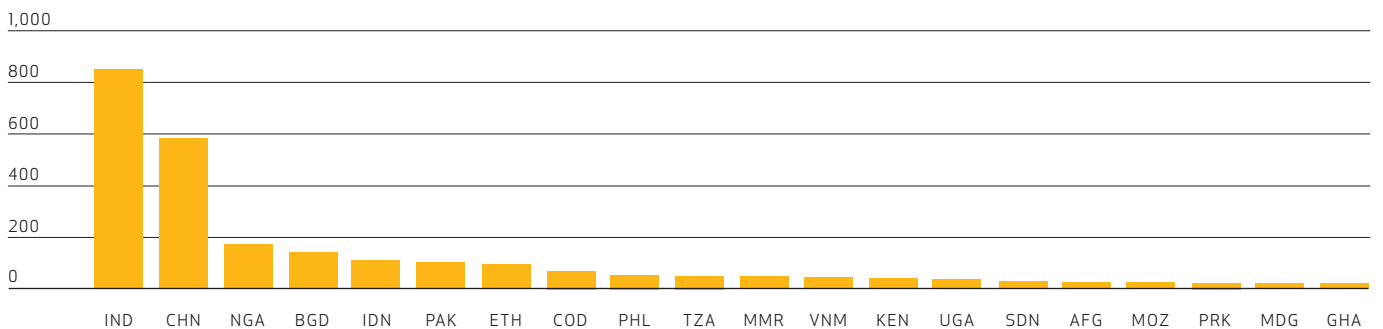
Countries whose efforts are critical to the achievement of SEforALL objectives globally

Ensure universal access to modern energy services

MILLION PEOPLE WITHOUT ACCESS TO CLEAN FUELS AND TECHNOLOGIES FOR COOKING, 2014



SEE THE NUMBERS



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.

ELECTRIFICATION



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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](#)

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ELECTRIFICATION

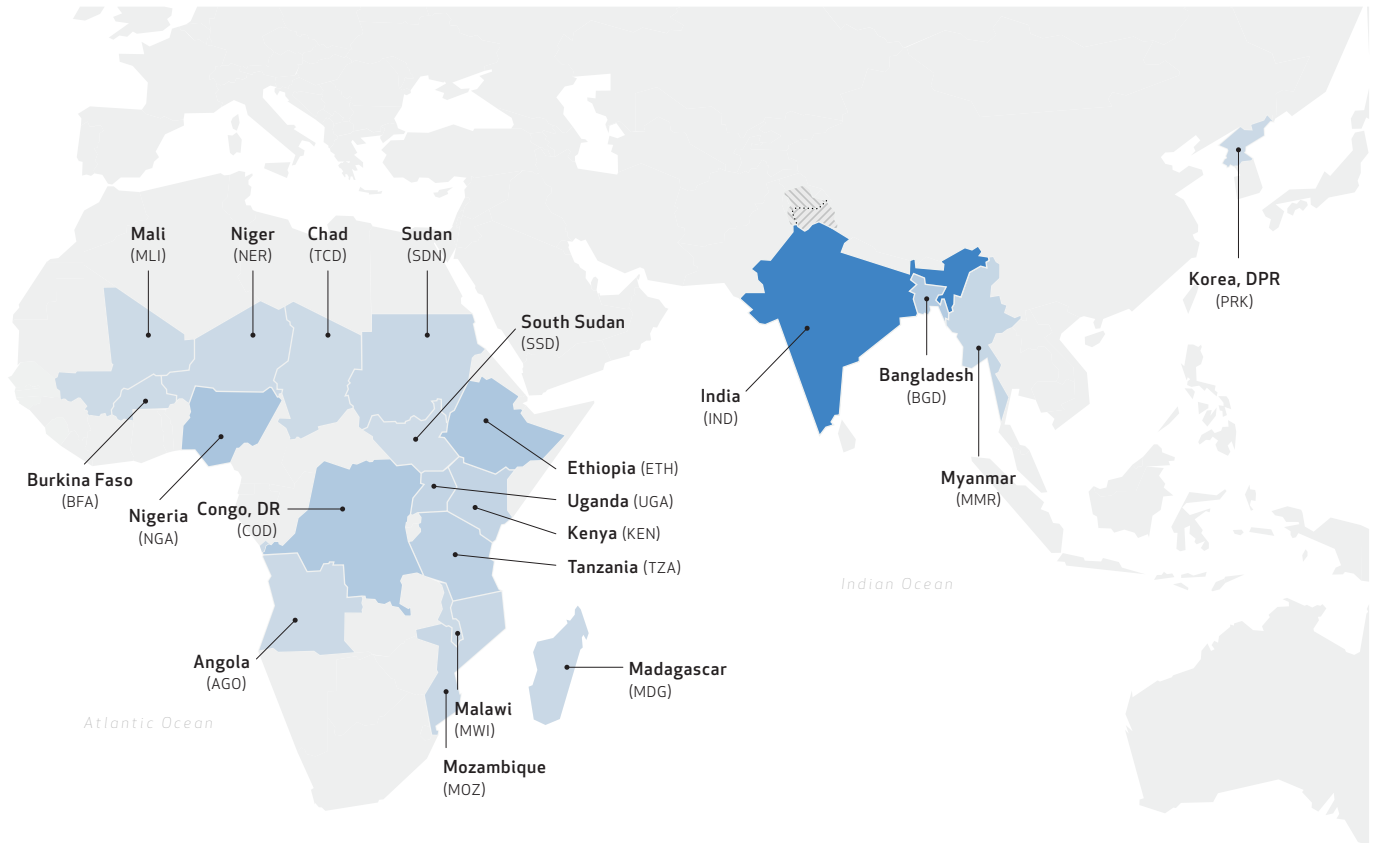


HIGH-IMPACT COUNTRIES

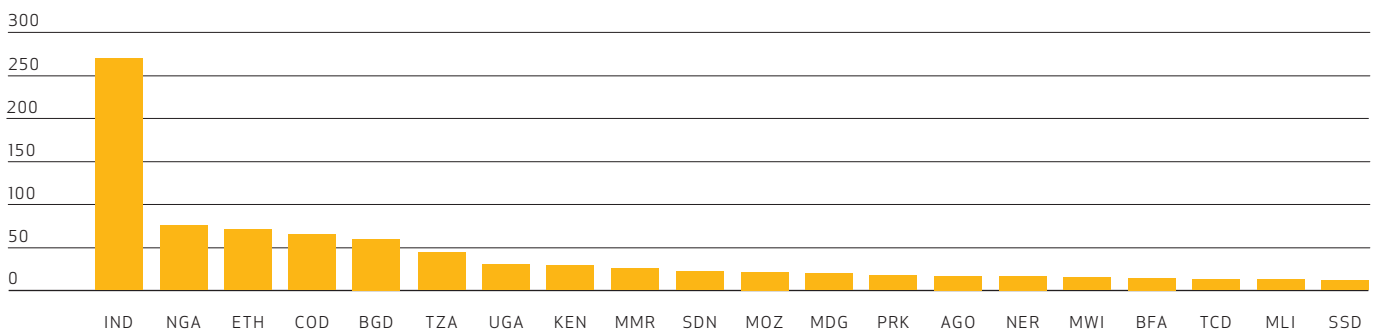
Countries whose efforts are critical to the achievement of SEforALL objectives globally

Ensure universal access to modern energy services

MILLION PEOPLE WITHOUT ACCESS TO ELECTRICITY, 2014



SEE THE NUMBERS



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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



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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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ELECTRIFICATION

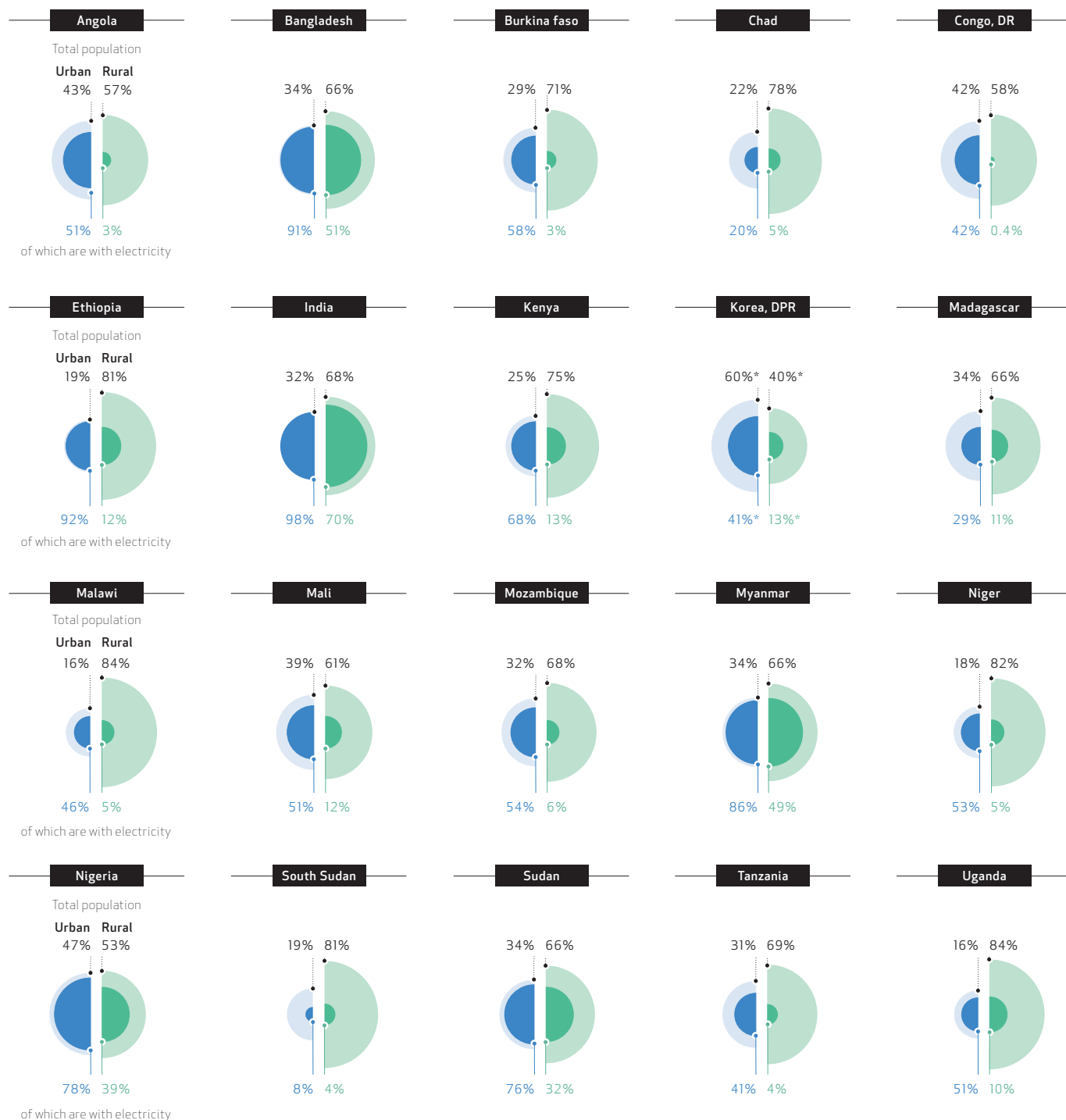


HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

How many people in rural and urban areas have access to electricity?

PERCENTAGE OF POPULATION WITH ACCESS TO ELECTRICITY, 2014



* 2012 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



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

[Regulatory Indicators for Sustainable Energy 2017](#)

[Global Tracking Framework 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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ELECTRIFICATION



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

KEY

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

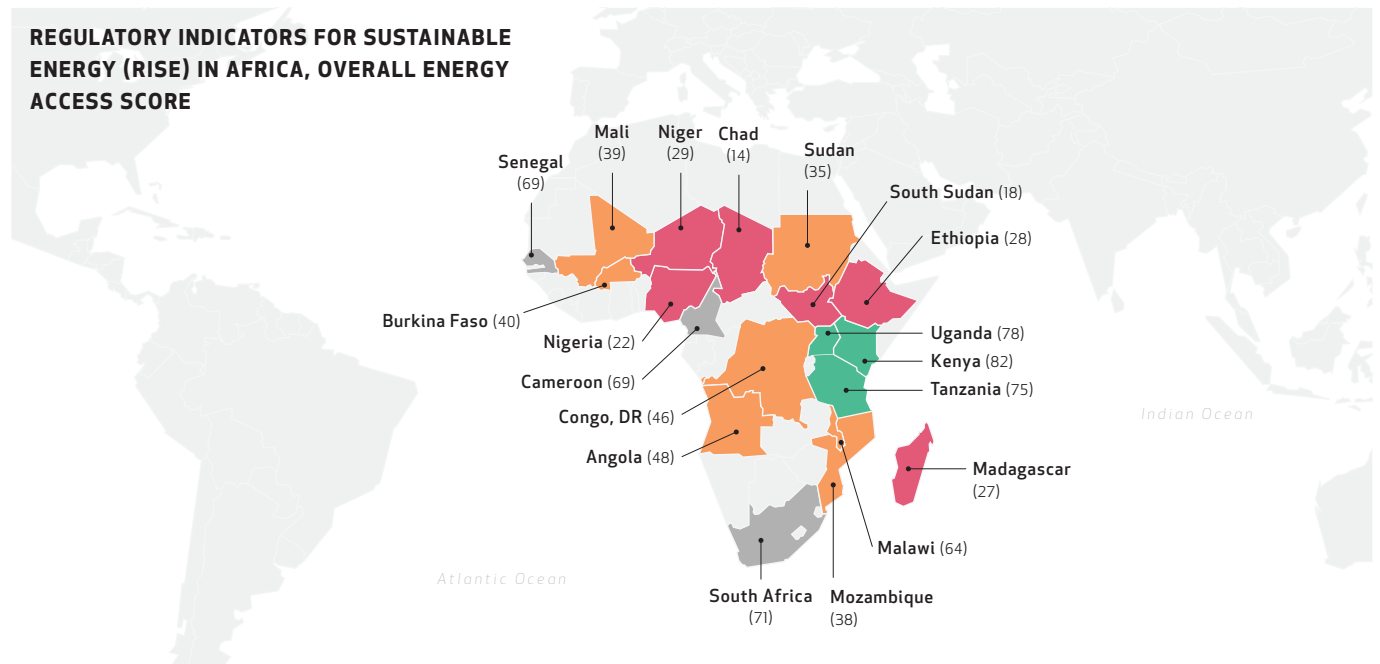
LOW SCORE (33-0)

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

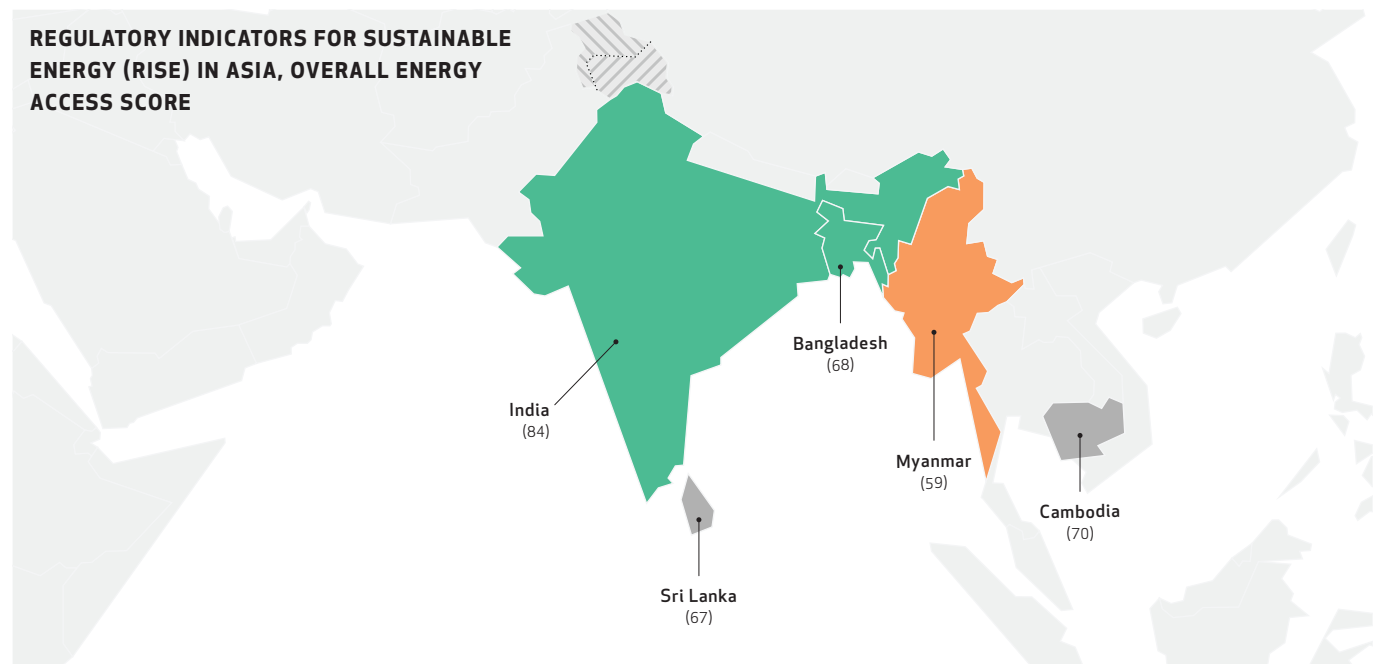
OTHER HIGH SCORES

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

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE) IN AFRICA, OVERALL ENERGY ACCESS SCORE



REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE) IN ASIA, OVERALL ENERGY ACCESS SCORE



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



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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, mini-grids 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](#)

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ELECTRIFICATION



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

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

KEY

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.

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

QUICK 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 country-level 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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ELECTRIFICATION



HIGH-IMPACT COUNTRIES

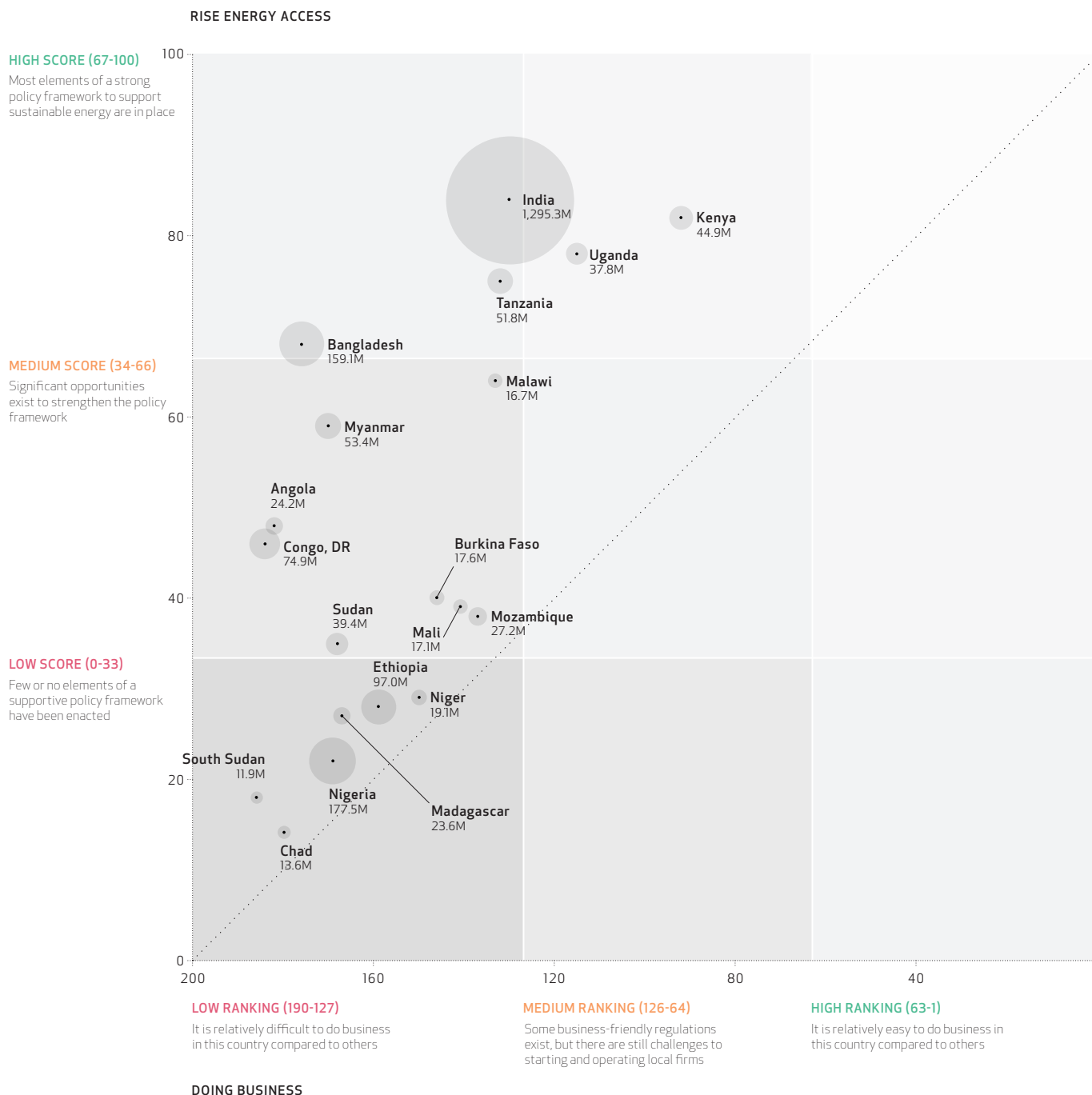
Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY AND DOING BUSINESS RANKING

KEY

Population, 2014 values (relative to countries shown)



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/SP.POP.TOTL?end=2014&name_desc=false&view=chart on 06/20/2017.

ENERGY ACCESS



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

QUICK 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 high-powered 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](#)

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ENERGY ACCESS



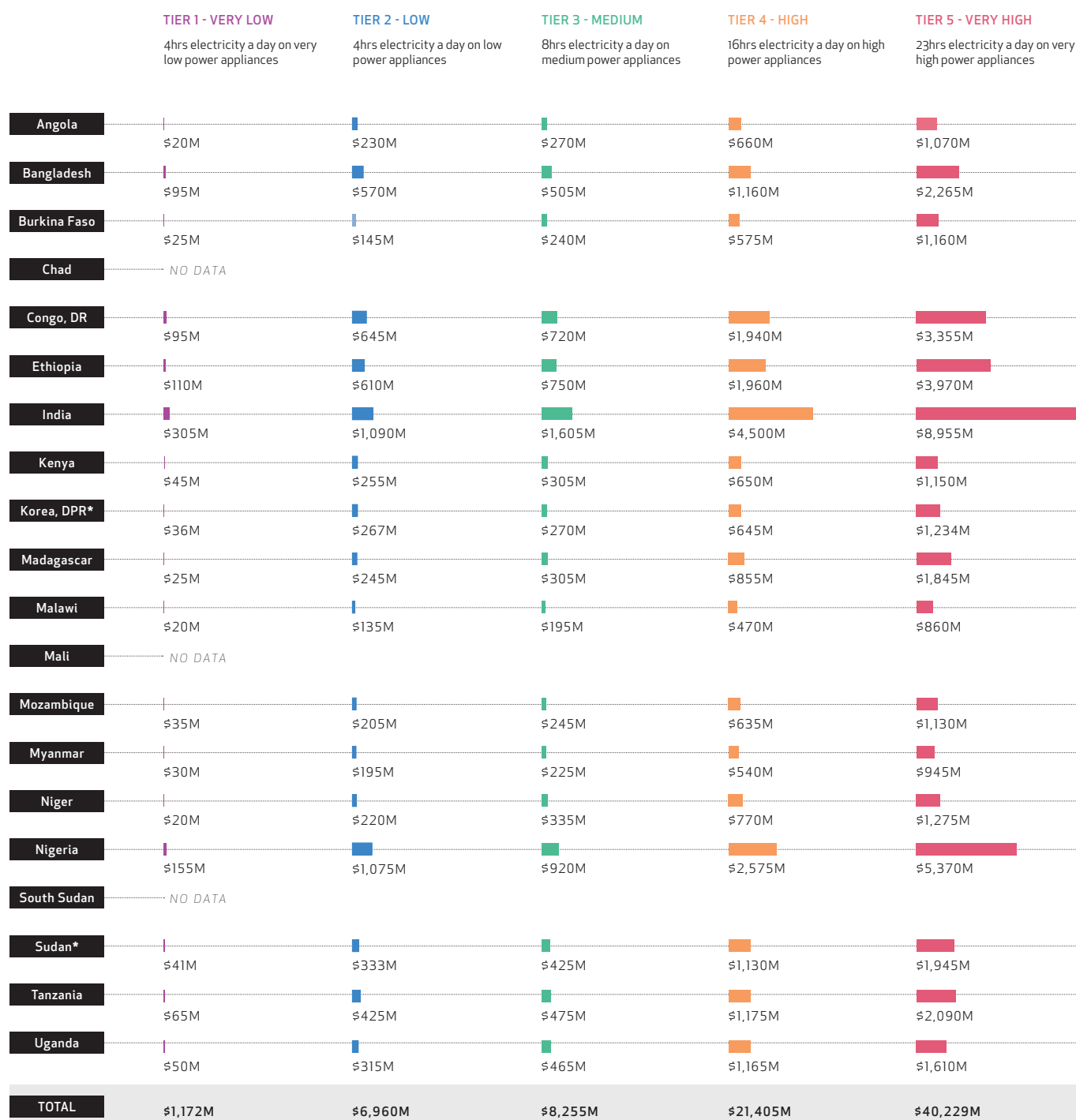
HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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)



*Estimate

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'.

ELECTRIFICATION



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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 high-impact 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.

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.

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%

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](#)

[International Energy Agency](#)

[The OPEC Fund for International Development](#)

[Regional Economic Commissions](#)

[GOGLA](#)

[ARE](#)

ELECTRIFICATION



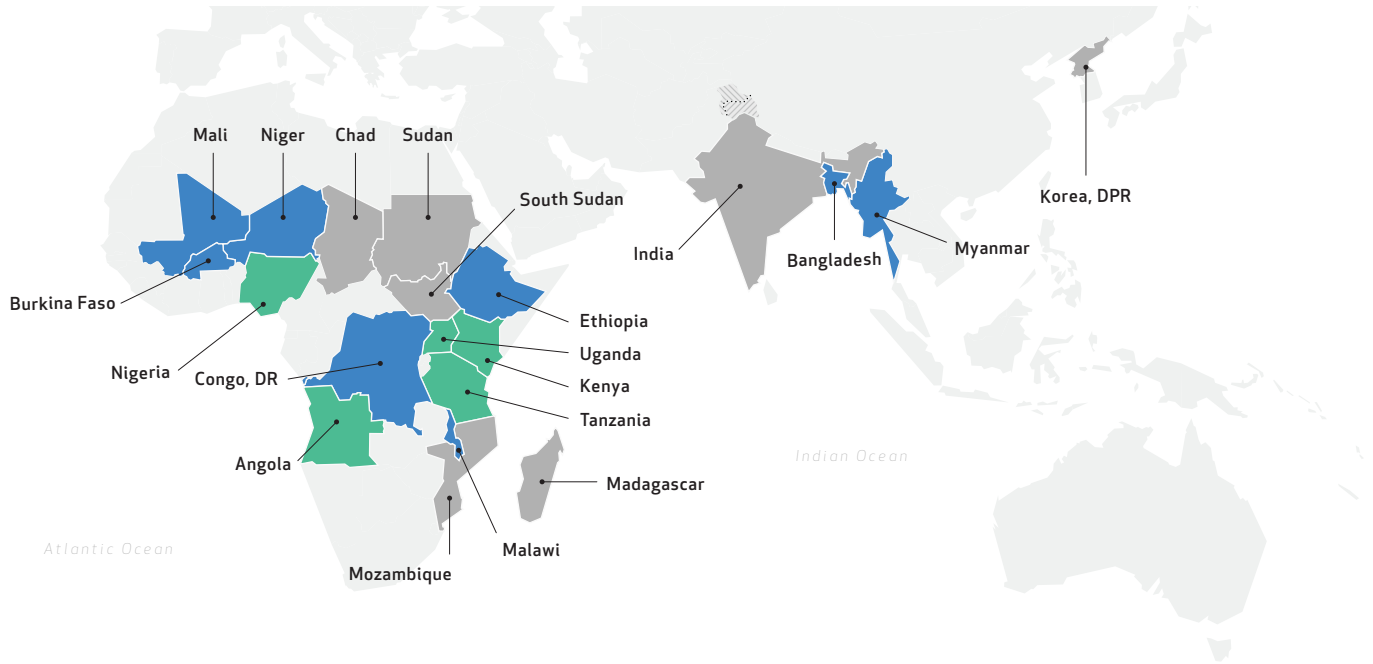
HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

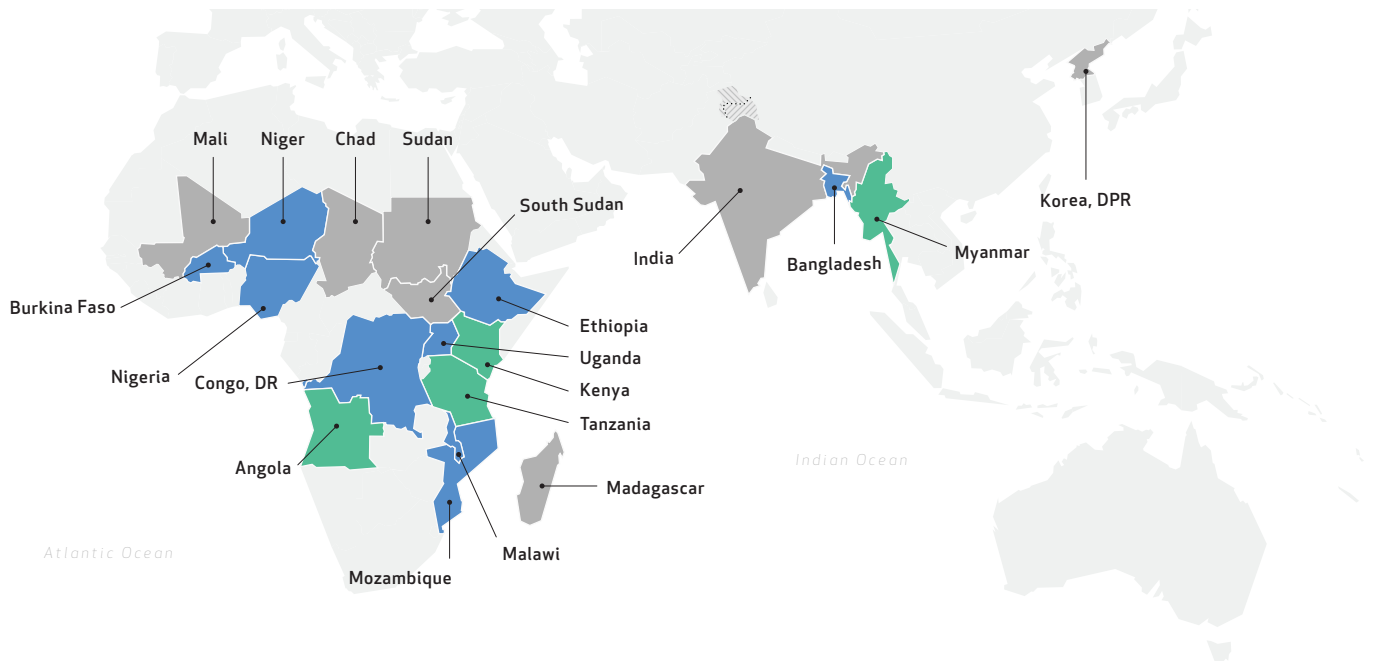
What country-led planning efforts are underway to address the Sustainable Energy for All goal?

PROGRESS MADE ON ACTION AGENDAS (AS OF JUNE 2017)

KEY NOT YET PLANNED PLANNED AND DRAFTING PUBLISHED



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.

ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Double the global rate of improvement in energy efficiency

QUICK FACTS

- Energy efficiency is the only area that came moderately close to the pace of improvement to meet 2030 objectives but progress remains short of what is needed. Global primary energy intensity improved at 2.1 percent a year in 2012–14, still short of the SEforALL objective of a 2.6 percent compound annual growth rate (CAGR) over 2010–30. Given the underperformance in energy intensity improvement since 2010, the effective target rate for 2014–30 is now higher, at 2.8 percent a year.
- The top 20 energy consuming economies globally –or high impact countries –accounted for more than 75 percent of global Total Primary Energy Supply (TPES). Four countries, China, the United States, India and Russia, accounted for nearly 50 percent of global TPES, with 22 percent attributed to China alone.
- 15 out of 20 high impact countries reduced their intensity over 2012–14. The United Kingdom, Nigeria, China, Italy, Australia, Russia and Mexico reduced their energy intensity by more than 2 percent annually.
- Low Income Countries in Sub-Saharan Africa have the highest energy intensity in the world at 10.3 MJ/2011 PPP\$ in 2014 due to their strong reliance on inefficient traditional biomass. This is compared to the SEforALL objective for global energy intensity of 5.5 MJ/2011 PPP\$.
- Estimates suggest that energy efficiency investment would need to increase by a factor of 3–6 from current levels of \$250 billion a year to reach the 2030 objective.

CONTEXT

- Energy efficiency offers a huge and growing opportunity for the world to reduce emissions of greenhouse gases. The International Energy Agency estimates that global investment in energy efficiency was \$221 billion in 2015, an increase of 6 percent from 2014 and 60 percent greater than investment in conventional power generation.
- Investing in energy conservation measures has the potential to cut fuel import bills, boost the economy and create numerous jobs, and is also essential to address climate change. Energy efficiency measures in International Energy Agency member countries generated energy savings of 450 million tonnes of oil equivalent in 2015 and reduced total energy expenditure by \$540 billion. Even for the least developed countries increasing energy productivity now is a smart concept, as emphasized by multiple Nationally Determined Contributions including Bangladesh, Burkina Faso or Uganda.
- There has been some decoupling of growth and energy demand over 2012–14. In North America, GDP continued to grow while energy demand was falling, notably because of fuel switching from coal to more efficient natural gas in the US power sector. This decoupling effect was evident in the European Union as well as much of the developing world, except for Latin American and the Arab region.
- The intensity of final energy consumption in industry, agriculture, services, and transport are on a long-term downward trend with energy savings seen across the board. The residential sector on the other hand is a large and fast growing segment of energy consumption and is becoming more energy intensive. Improvements in the efficiency of thermal power generation and power networks have been relatively slow.

ADDITIONAL RESOURCES

[Global Tracking Framework 2017](#)

[Regulatory Indicators for Sustainable Energy 2017](#)

[SEforALL Africa Hub](#)

[SEforALL Asia-Pacific Hub](#)

[SEforALL Latin America and the Caribbean Hub](#)

[Copenhagen Centre on Energy Efficiency](#)

[Appliances and Equipment Accelerator](#)

[Building Efficiency Accelerator](#)

[District Energy Accelerator](#)

[Lighting Accelerator](#)

[Transport and Motor Vehicle Fuel Efficiency Accelerator](#)

[Industrial Energy Efficiency Accelerator](#)

[International Energy Agency](#)

ENERGY EFFICIENCY

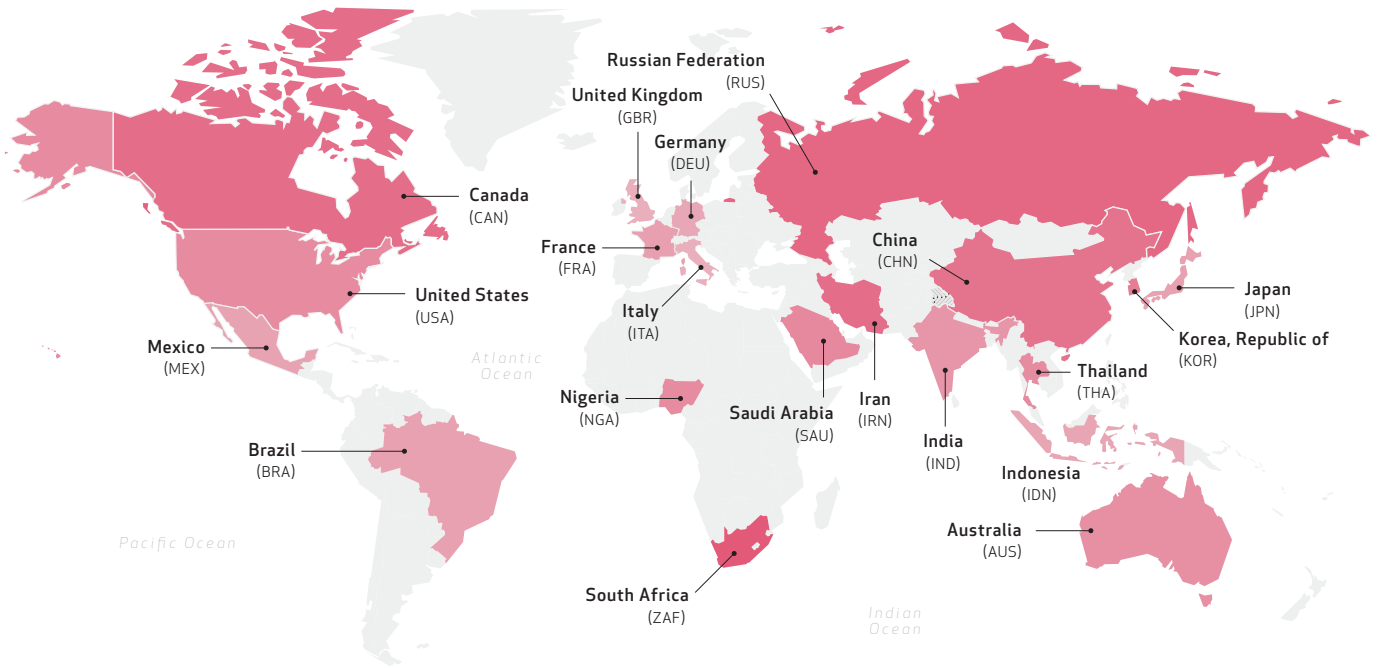


HIGH-IMPACT COUNTRIES

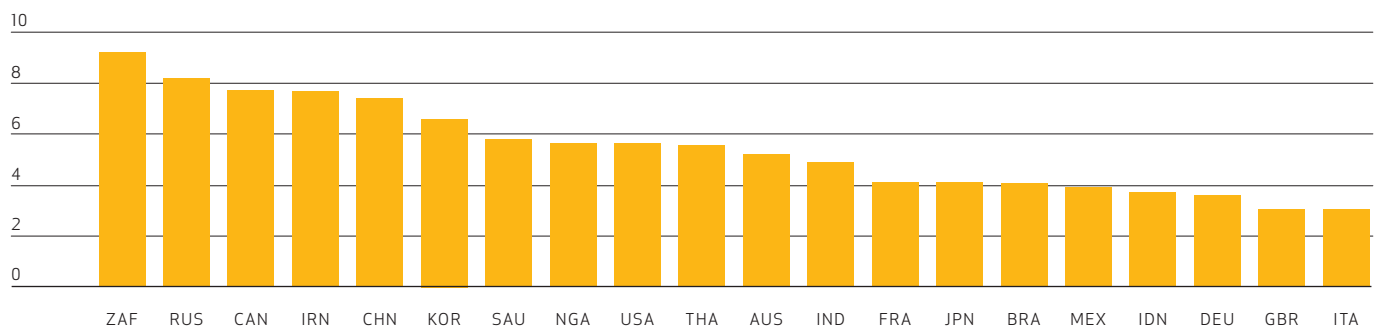
Countries whose efforts are critical to the achievement of SEforALL objectives globally

Double the global rate of improvement in energy efficiency

PRIMARY ENERGY INTENSITY (MJ/PPP \$), 2014



SEE THE NUMBERS



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.

ENABLING POLICIES



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

QUICK FACTS

- In 2015, about three-quarters of the countries surveyed in Regulatory Indicators for Sustainable energy (RISE) had legislation or an action plan in place to pursue energy efficiency but only two-thirds had fixed precise targets.
- Barely a third of countries have made serious progress in labeling energy-efficient appliances—or establishing building energy codes for construction or minimum energy performance standards for industry.
- In over three-quarters of countries worldwide, the utility is not a creditworthy entity, and most likely unable to fund new investments from its own balance sheet.
- In a context of fast economic growth and sound nationwide electrification plan in the 1990s, Vietnam had successfully implemented load-shedding incentives in order to avoid a shortage of electrical capacity, in collaboration with the public utility as well as large consumers. Vietnam now scores the highest in the energy efficiency pillar among all developing countries.

CONTEXT

- RISE offers policy makers and investors detailed country-level insights on the policy and regulatory environment for sustainable energy across 111 countries globally. It shines light on the need to attach greater political and policy priority to energy efficiency. Many countries have few or no policies in place to support energy efficiency.
- Energy security concerns among high income countries in the 1970s spurred efforts to address wasteful energy consumption. Most of those countries now have ambitious policies and incentivizing regulatory environments in place. Leading scorers among developing countries are in Central Asia, in compliance with ambition levels of the EU Energy Efficiency Directive.
- China started introducing energy efficiency measures in the 1980s to minimize energy imports as the economy expanded rapidly. Ambitious targets were set in its 12th Five Year Plan. The Thousand Companies Energy Conservation Action Plan mandates large energy users to conduct energy audits and report regularly. A mandatory labeling system covers products such as refrigerators, air conditioners, lighting equipment and industrial electric motors. Tax incentives, green bonds, and energy service contracts have been important drivers or consumers.
- RISE suggests an important role for utilities in meeting efficiency, as well as access, objectives because of utilities' in-depth knowledge of electricity consumers' habits and because of their own power consumption. Yet only half of RISE countries require their utilities to undertake energy efficiency measures. There is a clear correlation between scoring well on the utilities indicator and scoring well across the board on all other energy efficiency indicators.
- Since the 2011 Arab Spring, Egypt, Iran, Jordan, Morocco, and Tunisia have undertaken major energy subsidy reforms so as to reduce their fuel dependency and are beginning to let stronger price signals incentivize energy savings.

ADDITIONAL RESOURCES

[Global Tracking Framework 2017](#)

[Regulatory Indicators for Sustainable Energy 2017](#)

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ENERGY EFFICIENCY



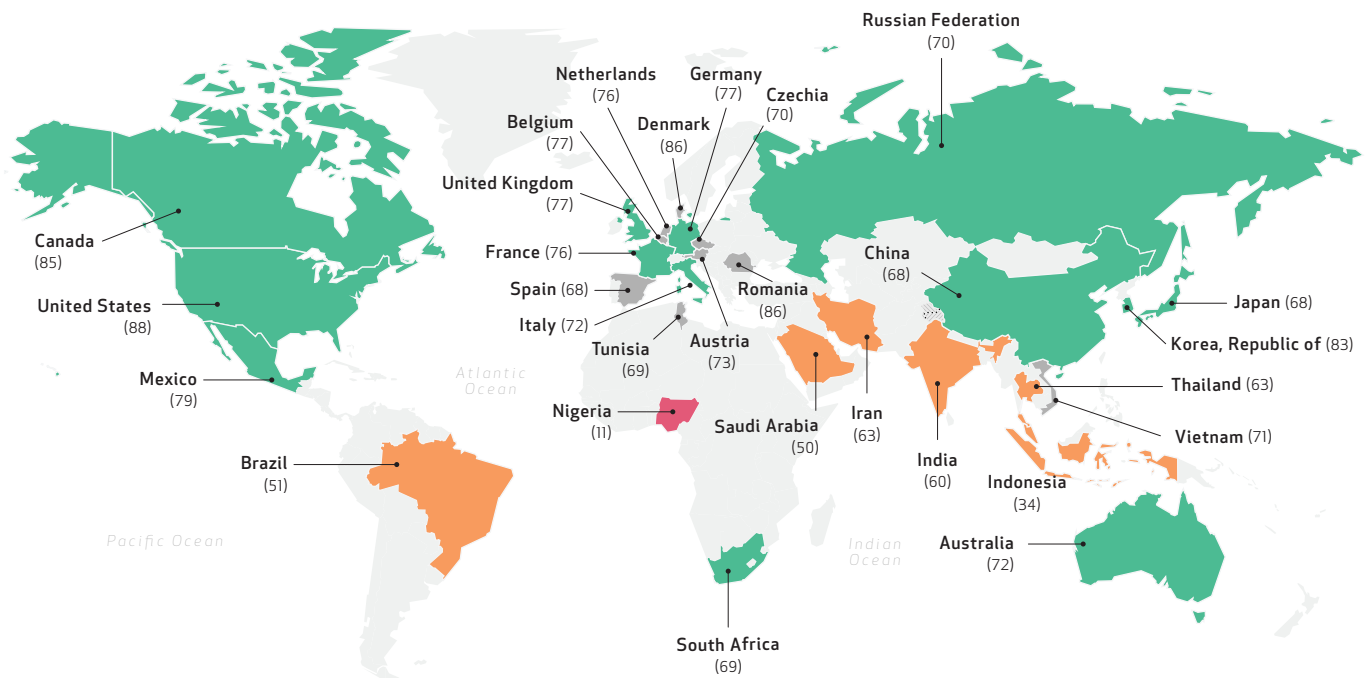
HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

KEY	HIGH SCORE (100-67)	MEDIUM SCORE (66-34)	LOW SCORE (33-0)	OTHER HIGH SCORES
	Most elements of a strong policy framework to support sustainable energy are in place	Significant opportunities exist to strengthen the policy framework	Few or no elements of a supportive policy framework have been enacted	Country received a high score on RISE but is not a high-impact country for energy efficiency

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE), OVERALL ENERGY EFFICIENCY SCORE



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

ENABLING POLICIES



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

QUICK FACTS

- Regulatory frameworks in the largest energy consumers in the world, measured in terms of primary energy consumption, tend to be more advanced than average as they have strong incentives to harness energy conservation measures.
- Countries scoring the highest on Regulatory Indicators for Sustainable Energy (RISE) energy efficiency indicators are not necessarily the wealthiest or those that have pursued energy efficiency policies the longest, as suggested by the example of Vietnam. However, Sub-Saharan African countries scored very low for all indicators.
- Among low-income countries, only Ethiopia, Haiti, Tanzania, and Uganda offer financing mechanisms for energy efficiency, with all four offering tax or duty incentives across sectors.

CONTEXT

- RISE offers policy makers and investors detailed country-level insights on the policy and regulatory environment for sustainable energy across 111 countries globally.
- Most countries have integrated energy efficiency in their national energy strategies, have established basic institutions to promote energy efficiency and encourage consumers to use electricity more efficiently. However, more efforts are needed to inform customers on their electricity consumption habits and to regulate activities of energy consumers and suppliers.
- Financing mechanisms in place, including credit lines from banks, energy service agreements, and tax incentives, are distinctive policy elements for high-scoring countries. There is generally a strong relationship between wealth and deployment of energy efficiency financing mechanisms.
- There is considerable scope for energy savings through the deployment and enforcement of minimum energy performance standards, particularly for electrical appliances. Building energy codes, which require deep expertise to build and high level capacity among local governments to enforce, are also in place in top scoring, generally high-income, countries only.

ADDITIONAL RESOURCES

[Regulatory Indicators for Sustainable Energy 2017](#)

[Global Tracking Framework 2017](#)

[Copenhagen Centre on Energy Efficiency](#)

[SEforALL Africa Hub](#)

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[International Energy Agency](#)

[Energy Efficiency Facilitating Hub \(ECCJ\)](#)

[Regional Economic Commissions](#)

ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL energy efficiency objectives globally

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

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY, BY ENERGY EFFICIENCY INDICATOR

KEY

HIGH SCORE (100-67)

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

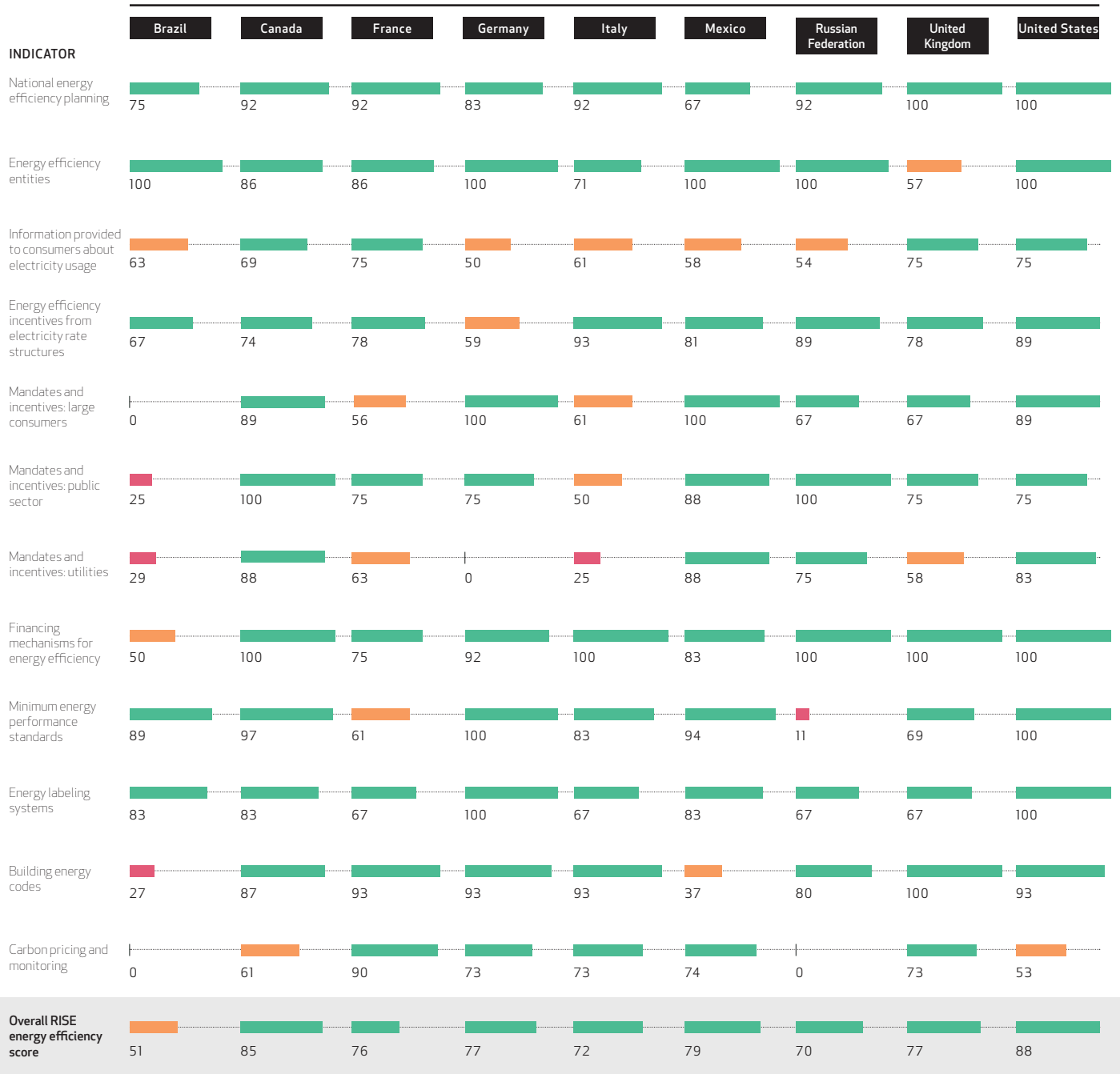
MEDIUM SCORE (66-34)

Significant opportunities exist to strengthen the policy framework

LOW SCORE (33-0)

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

EUROPE AND THE AMERICAS



Note: Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy.

Source: Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 2017.

ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL energy efficiency objectives globally

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

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY, BY ENERGY EFFICIENCY INDICATOR

KEY

HIGH SCORE (100-67)

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

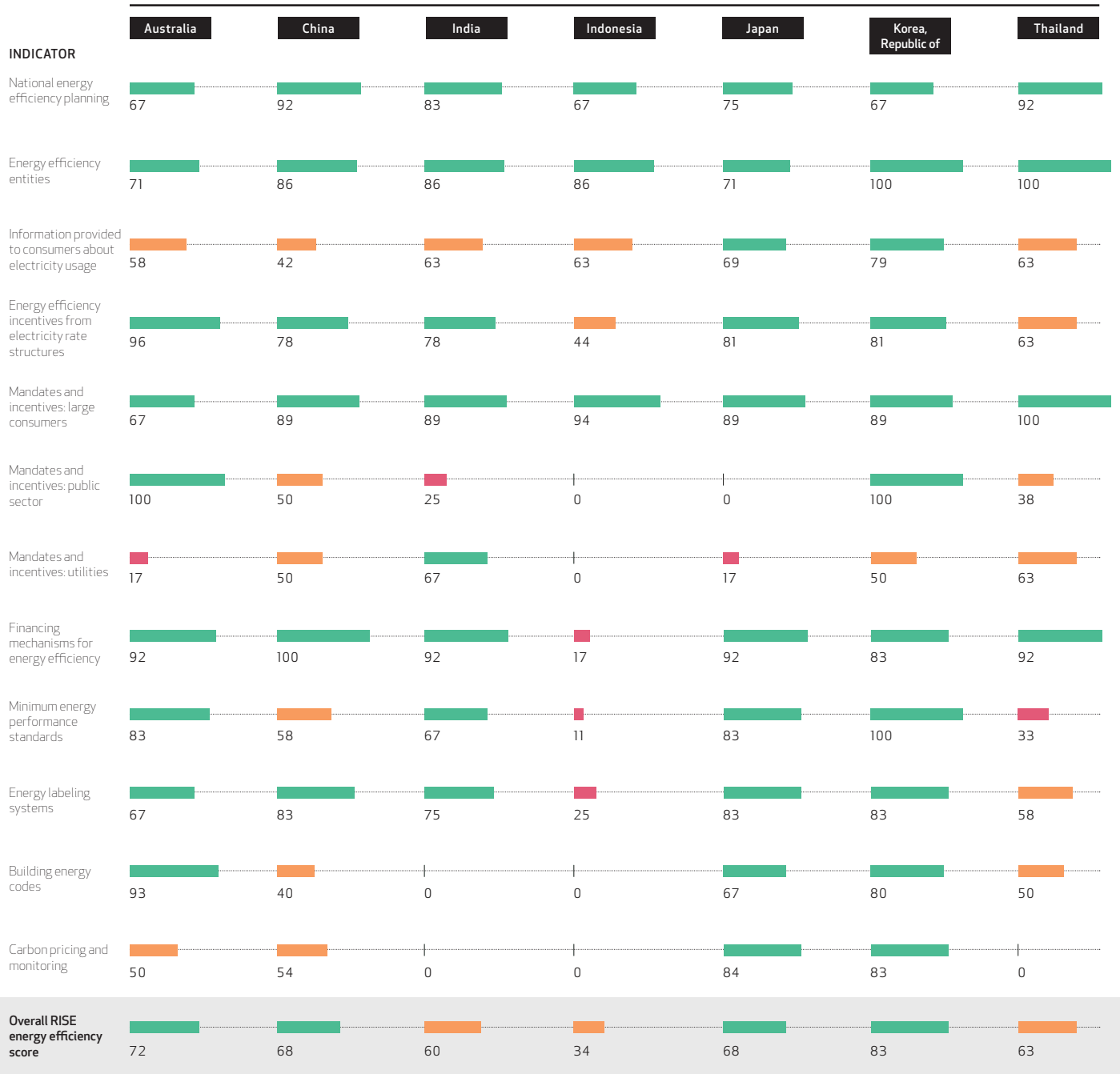
MEDIUM SCORE (66-34)

Significant opportunities exist to strengthen the policy framework

LOW SCORE (33-0)

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

ASIA PACIFIC



Note: Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy.

Source: Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 2017.

ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL energy efficiency objectives globally

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

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY, BY ENERGY EFFICIENCY INDICATOR

KEY

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

AFRICA AND THE MIDDLE EAST



Note: Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy.

Source: Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 2017.

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

QUICK FACTS

- Some of the most energy intensive economies, including Canada, China, the Russian Federation, South Africa or the United States, are now harnessing energy efficiency measures with enabling regulatory environments and favorable business environments.
- Doing Business rankings suggest that Europe and Central Asia have consistently been the regions with the highest average number of reforms per economy; the region is now close to having the same good practices in place as the OECD high-income economies.
- Despite significant progress realized for business development in Indonesia in recent years, notably due to the introduction of regulatory initiatives to improve overall power reliability, the regulatory environment still lacks energy efficiency standards, building codes or mandates for the public sector and utilities.

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 while Doing Business measures aspects of regulation that enable or prevent private sector businesses from starting, operating and expanding.
- Dedicated entities are the necessary building blocks for governments to develop and implement energy efficiency measures, and encourage the private sector engagement. Minimum energy performance standards, appliance labels and building codes are prime candidates for near-term action. Other policy elements are also important but remain often neglected: sectoral-targeted policies for large consumers, the public sector and utilities as well as the development of financing mechanisms.
- The top twenty high-impact countries for energy efficiency show a strong correlation between a high overall RISE Energy Efficiency score and a high ranking on the Ease of Doing Business. Nigeria received its lowest RISE score in Energy Efficiency at 11, with low scores in 11 out of 12 efficiency indicators. Nigeria was ranked 169 out of 190 countries in Doing Business, making improvements in 2015/16 in starting a business and getting credit.

ADDITIONAL RESOURCES

[Global Tracking Framework 2017](#)

[Regulatory Indicators for Sustainable Energy 2017](#)

[Doing Business 2017](#)

[Copenhagen Centre on Energy Efficiency](#)

[SEforALL Africa Hub](#)

[SEforALL Asia-Pacific Hub](#)

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[International Energy Agency](#)

[Energy Efficiency Facilitating Hub \(ECCJ\)](#)

[Regional Economic Commissions](#)

ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Which high-impact countries have an enabling environment for investment in energy efficiency?

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE) AND DOING BUSINESS RANKING

KEY

● Population, 2014 values (relative to countries shown)



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. 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/SP.POP.TOTL?end=2014&name_desc=false&view=chart on 06/20/2017.

ENABLING POLICIES



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Which high-impact countries have an enabling environment for investment in energy efficiency and renewable energy?

QUICK FACTS

- More than three-quarters of all countries covered by Regulatory Indicators for Sustainable Energy (RISE) score well on the legal framework for renewable energy, compared to 9 percent that score well on having energy efficiency mandates and incentives for utilities in place.
- High performers on RISE's energy efficiency indicator often have strong regulations in place to support renewable energy deployment. However, the average RISE score for energy efficiency is more than ten percentage points below that for renewable energy.
- Official renewable energy targets have become nearly universal, with some form of public commitment in 93 percent of countries covered by the RISE indicators.
- Most of the world's largest energy consumers score in the top tier of the RISE renewable energy indicator indicating strong policy frameworks are in place.

CONTEXT

- RISE offers policy makers and investors detailed country-level insights on the policy and regulatory environment for sustainable energy across 111 countries globally.
- RISE shines a light on the need to attach greater political and policy priority to energy efficiency. With the exception of the highest income countries, many countries have few or no policies in place to support the adoption of ambitious energy efficiency measures. In contrast, RISE highlights strong progress and broad uptake in advancing renewables policy across many countries.
- Among the countries where wind and solar power account for at least 5 percent of total electricity generated in 2014, more than 80 percent have completed a grid integration study to understand how to integrate variable renewable energy.
- India and China together represent more than a third of the global population. Driven in part by clean air imperatives and low-carbon development ambitions they both have high scores on RISE for renewable energy and energy efficiency. China's 13th Five-Year Plan sets a 15 percent target of non-fossil energy as a share of total final energy consumption by 2020, and a 15 percent reduction in energy intensity compared to 2015 levels. India has placed energy conservation at the heart of its development strategy through multiple initiatives such as "Unnat Jeevan By Affordable LEDs and Appliances for All", the world's largest zero-subsidy LED bulb program for domestic consumers.

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](#)

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[International Energy Agency](#)

[Energy Efficiency Facilitating Hub \(ECCJ\)](#)

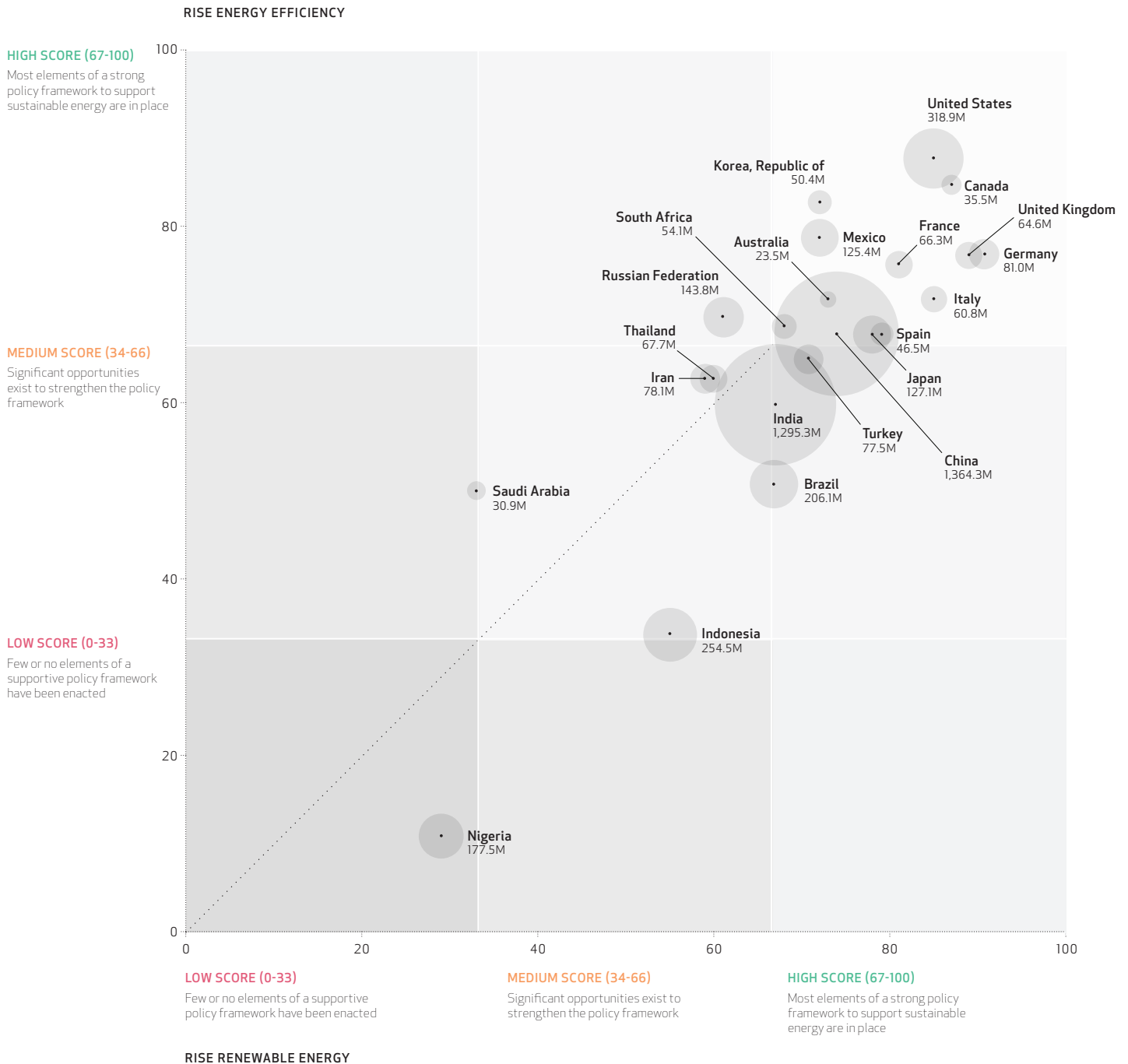
[Regional Economic Commissions](#)

Which high-impact countries have an enabling environment for investment in energy efficiency and renewable energy?

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE) FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY

KEY

Population, 2014 values (relative to countries shown)



Note: Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy.

Source: Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 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/SP.POP.TOTL?end=2014&name_desc=false&view=chart on 06/20/2017.

ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

QUICK FACTS

- The top 20 energy consuming economies globally – high-impact countries – accounted for more than 75 percent of global total primary energy supply (TPES). Four countries alone, China, the United States, India and the Russian Federation, accounted for nearly 50 percent of TPES.
- Energy savings realized globally between 2012–14 were equivalent to the entire energy consumption of Brazil and Pakistan combined in 2014.
- Brazil, Iran, Saudi Arabia, South Africa, and Thailand saw their energy intensities increase over 2012–14.
- Industry has contributed much to declining global energy intensity, with an annual reduction of 2.2 percent in 2012–14 while the residential sector saw a small increase in energy intensity.

CONTEXT

- Energy efficiency offers a huge opportunity to embark on a sustainable development path and for the industrialized world and fast growing economies this should be top of the to do list. Reducing energy intensity, which measures the amount of energy needed to produce a dollar of gross domestic product (GDP), is smart growth even for the least developed economies.
- Since 1990, primary energy intensities have been decreasing worldwide to converge towards 5.5 megajoules per dollar of GDP. Some high-income European countries, Denmark, Italy and the United Kingdom, have already gone as low as 3.4 megajoules per dollar of GDP, which corresponds to the 2030 global target for energy efficiency.
- The intensity of final energy consumption in industry, agriculture, services, and transport sectors are on a long-term downward trend. Improvements in the efficiency of thermal power generation and power networks losses have been relatively slow. Widespread diffusion of fuel efficiency standards helped accelerate reductions in energy intensity of the transport sector. The residential sector is a large and fast growing segment of energy consumption and is becoming more energy intensive.
- To reach the 2030 objective for energy efficiency, we must focus on the sectors with significant room for improvement, starting with the transport sector which concentrates two-thirds of global oil consumption. The switch from coal to gas in industrial processes, together with the electrification of energy use and the adoption of super-efficient appliances in the buildings sector also offer sizeable potential for energy savings.

ADDITIONAL RESOURCES

[Global Tracking Framework 2017](#)

[Regulatory Indicators for Sustainable Energy 2017](#)

[Doing Business 2017](#)

[Copenhagen Centre on Energy Efficiency](#)

[SEforALL Africa Hub](#)

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[Regional Economic Commissions](#)

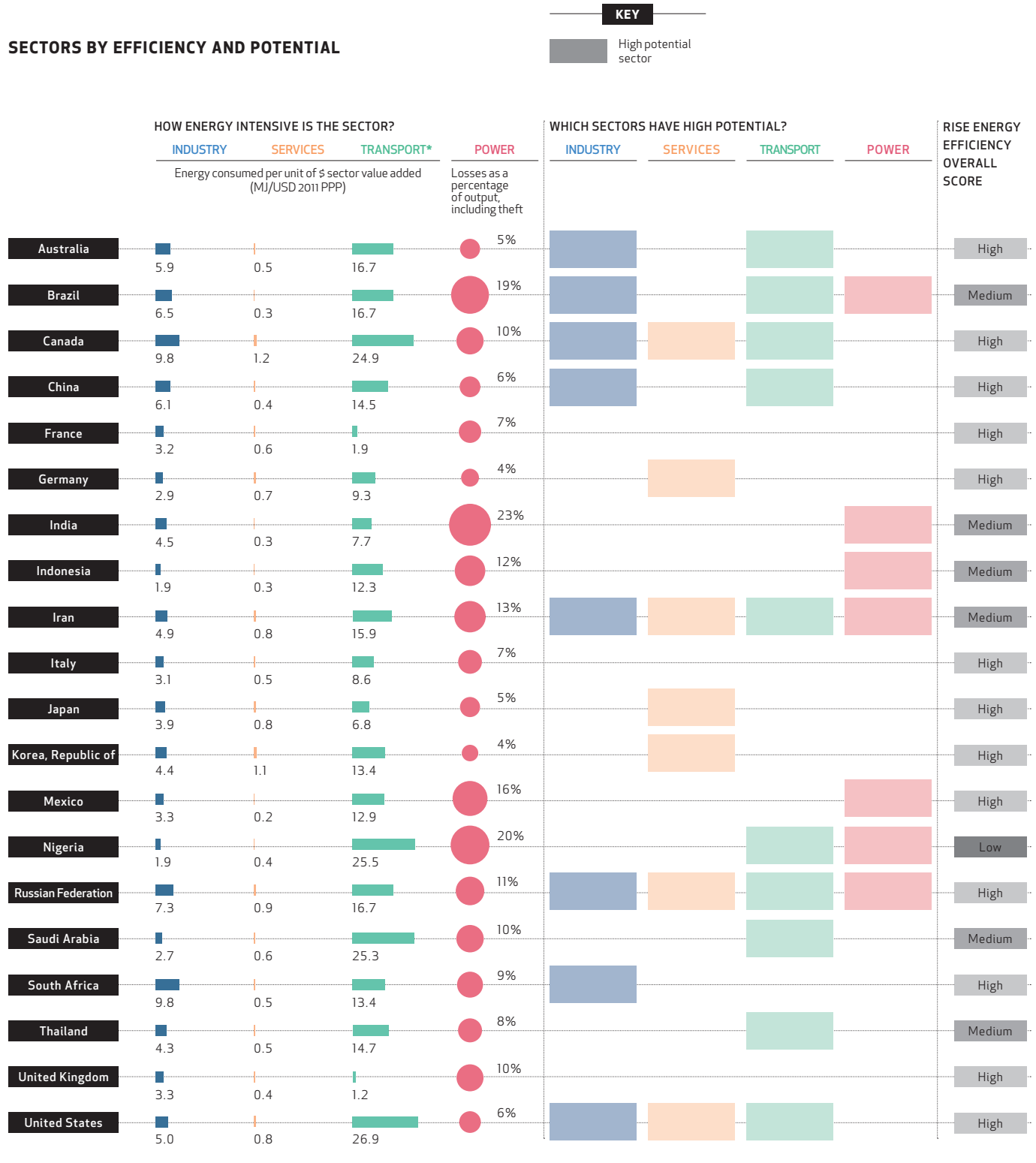
ENERGY EFFICIENCY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Which sectors have the largest potential for energy efficiency improvement?



* 2012 data

Note: A sector is considered high potential in a country if the energy intensity is at or above the average of the 20 high impact countries.

Sources: International Energy Agency (IEA) and the World Bank. 2017. "Progress Towards Sustainable Energy: Global Tracking Framework 2017" (April), World Bank, Washington, DC. Regulatory Indicators for Sustainable Energy (RISE), World Bank Group, 2017.

RENEWABLE ENERGY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Double the share of renewable energy in the global energy mix

QUICK FACTS

- To meet the SEforALL objective to double the share of renewable energy in the global energy mix requires the share of renewables to rise from 18.3 percent of Total Final Energy Consumption (TFEC) in 2014 to 36 percent by 2030.
- Almost half of the current share of renewable energy in TFEC or 8.4 percent is linked to the traditional use of biomass. Discrepancies in data collection suggest that traditional biomass use may be up to 50 percent lower than what was reported in the Global Tracking Framework 2017.
- Over 2012-14, 13 out of 20 high impact countries improved their share of renewable energy in TFEC, primarily by accelerating modern renewables. Italy and the United Kingdom added over 1 percent to their renewable energy share annually.
- The share of renewable energy in TFEC exceeded 30 percent in four of the 20 high impact countries - Nigeria, Brazil, Indonesia and India. With the exception of Brazil, this is largely linked to traditional uses of biomass.
- Meeting the SEforALL objective by 2030 will require the widespread adoption of more ambitious policies, such as a large-scale shift toward the electrification of transport.

CONTEXT

- Despite rapid growth in renewable energy consumption, the overall share of renewable energy has been moving more slowly due to continued rapid growth in TFEC.
- Recent growth in the share of renewables in TFEC globally has been concentrated in the power sector. It has proved harder to increase the share of renewables for heat and transport applications that represent 50 percent and 30 percent of TFEC respectively.
- Policy developments that address the heating and transport sectors continue to be slow and have been primarily focused on solar thermal heating systems and further support to biofuels. Policy measures have not yet caught up with rapid deployment of electric vehicles and their possible role as an enabler for better integration of variable renewable energy sources.

ADDITIONAL RESOURCES

[The Global Tracking Framework 2017](#)

[Regulatory Indicators for Sustainable Energy 2017](#)

[SEforALL Africa Hub](#)

[SEforALL Asia-Pacific Hub](#)

[SEforALL Latin America and the Caribbean Hub](#)

[International Renewable Energy Agency](#)

[International Energy Agency](#)

[REN21](#)

[Bloomberg New Energy Finance](#)

RENEWABLE ENERGY

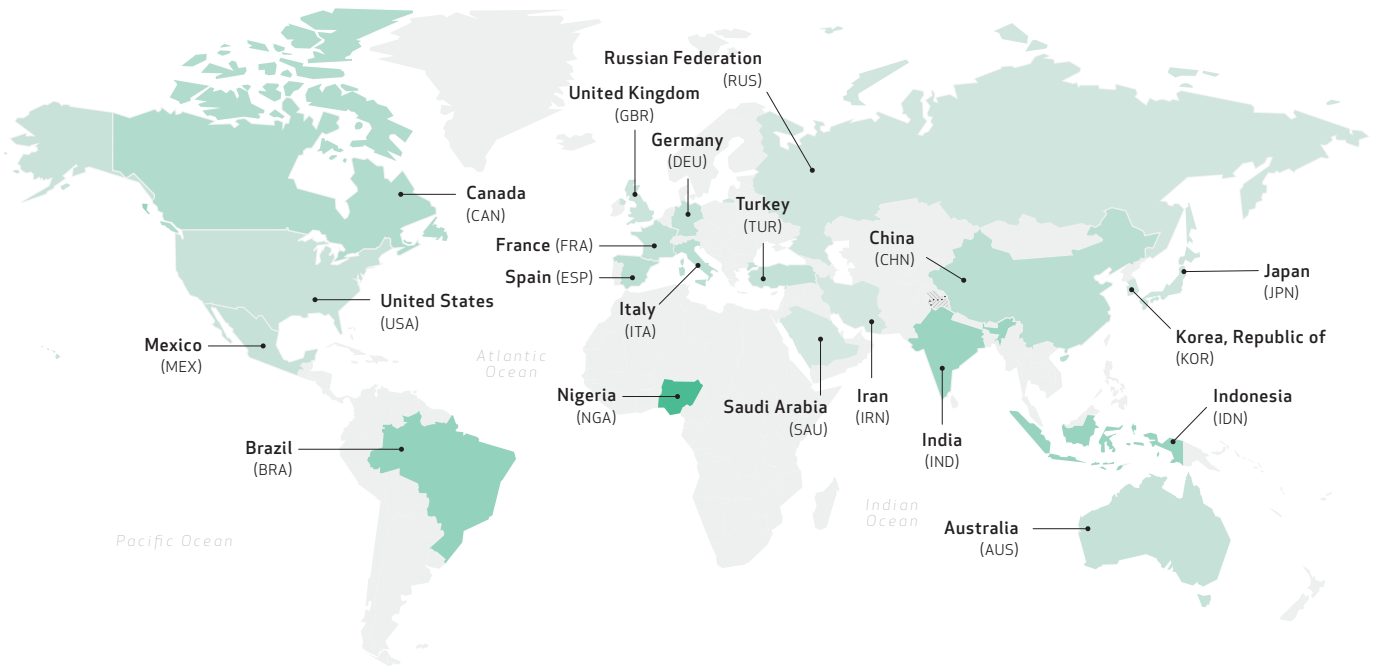


HIGH-IMPACT COUNTRIES

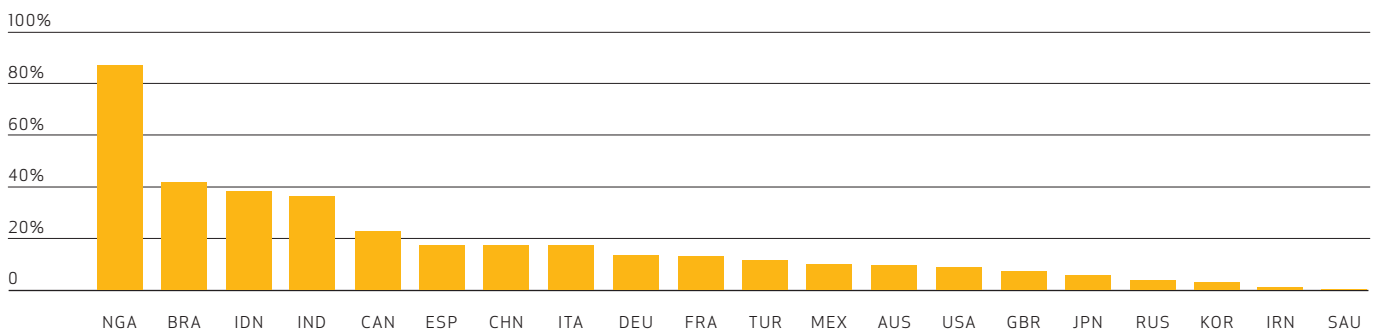
Countries whose efforts are critical to the achievement of SEforALL objectives globally

Double the share of renewable energy in the global energy mix

PERCENTAGE OF RENEWABLE ENERGY IN TOTAL FINAL ENERGY CONSUMPTION, 2014



SEE THE NUMBERS



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 06/22/2017.

ENABLING POLICIES



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

QUICK FACTS

- Globally, three quarters of countries covered by Regulatory Indicators for Sustainable Energy (RISE) have adopted legislation and strategic plans and assigned responsible institutions to achieve those targets. Almost all countries have a renewable energy target.
- Where wind and solar power account for at least 5 percent of total electricity generated in 2014, more than 80 percent of countries globally have completed a grid integration study to understand how to bring variable renewable energy into the grid.
- The average permitting time for a renewable energy project for the 111 countries covered by RISE is about 500 days. Small-scale, grid-connected, solar and wind projects usually benefit from quicker procedures.
- In 2015, India announced an ambitious goal to increase its renewable power capacity fivefold in seven years. Of this increase, 57 percent would be solar power and 34 percent wind power.
- China's Renewable Energy Law (2005) set ambitious renewable energy targets underpinned with clear strategies and investment plans. The target for non-fossil fuel energy is 15 percent of national total energy consumption by 2020. There are technology-specific targets for solar power, wind power, hydropower and geothermal energy. Investment incentives and feed-in tariffs are in place for wind and solar power.
- Twenty-three countries have a carbon pricing mechanism in place to accompany the deployment of renewable energy. This includes 15 countries that subscribe to the European Union's Emission Trading Scheme (EU-ETS), a key tool to meet EU climate and energy targets. Australia and Turkey are the only countries that have introduced mandatory reporting of greenhouse gas emissions by emitters while still considering the implementation of a carbon pricing mechanism.

CONTEXT

- RISE offers policy makers and investors detailed country-level insights on the policy and regulatory environment for sustainable energy across 111 countries globally.
- 77 percent of the 111 countries covered by RISE do not have carbon pricing and monitoring schemes in place or require mandatory reporting of greenhouse gas emissions. Where carbon pricing mechanisms are in place they almost always form part of the policy framework for renewable energy and climate action, as reflected in countries' Nationally Determined Contributions.

ADDITIONAL RESOURCES

[Regulatory Indicators for Sustainable Energy 2017](#)
[Global Tracking Framework 2017](#)
[International Renewable Energy Agency](#)
[SEforALL Africa Hub](#)
[SEforALL Asia-Pacific Hub](#)

[SEforALL Latin America and the Caribbean Hub](#)
[International Energy Agency](#)
[REN21](#)
[Bloomberg New Energy Finance](#)

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

RENEWABLE ENERGY



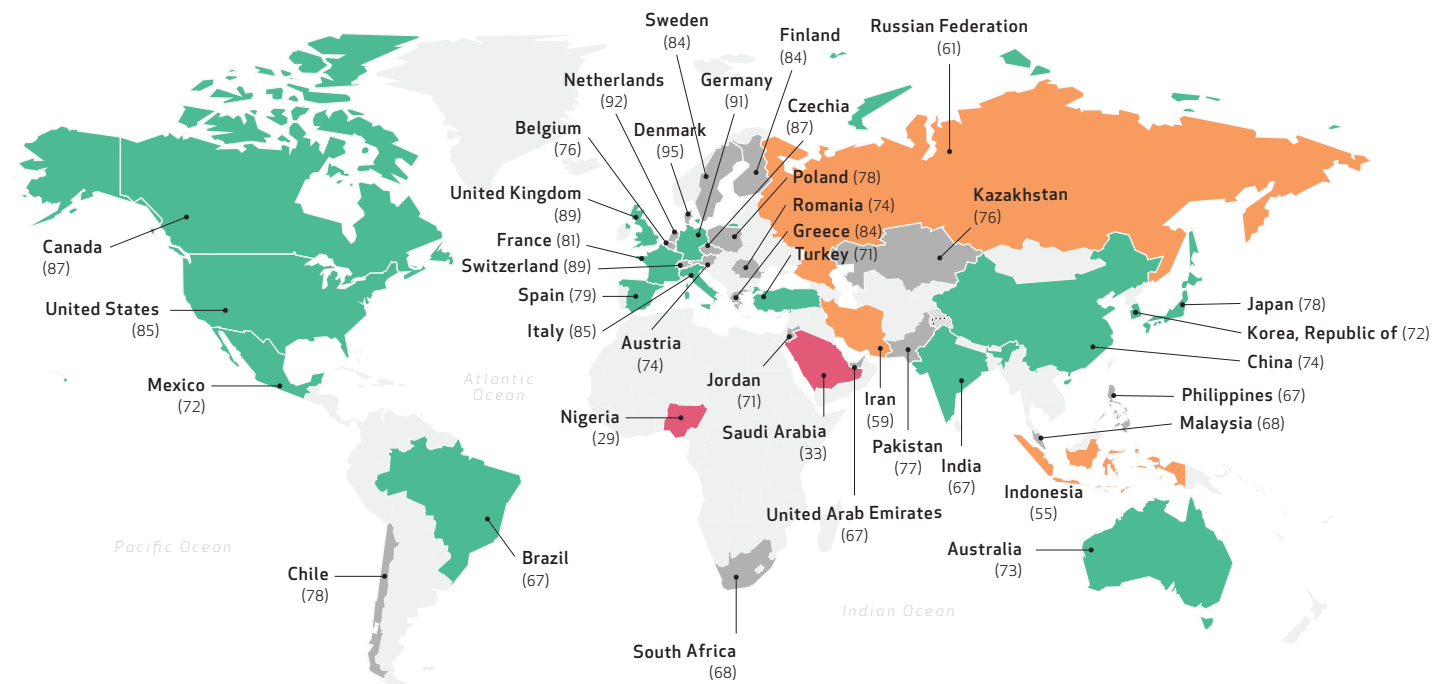
HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

Which high-impact countries have an enabling environment for investment in renewable energy?

KEY	HIGH SCORE (100-67)	MEDIUM SCORE (66-34)	LOW SCORE (33-0)	OTHER HIGH SCORES
	Most elements of a strong policy framework to support sustainable energy are in place	Significant opportunities exist to strengthen the policy framework	Few or no elements of a supportive policy framework have been enacted	Country received a high score on RISE but is not in the high-impact country for renewable energy

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE), OVERALL RENEWABLE ENERGY SCORE



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. 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. 3. 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 does 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



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

QUICK FACTS

- About three quarters of the 111 countries covered in Regulatory Indicators for Sustainable Energy (RISE) have adopted legislation and strategic plans governing the renewable energy sector and assigned responsible institutions to achieve them. However, primary legislation is less common in Sub-Saharan Africa, North Africa and the Middle East.
- While a strong enabling environment alone does not guarantee investment flows at scale, countries that have developed sizeable renewable energy capacity (above 100 MW) tend to have stronger legislation in place.
- Thirty eight percent of countries covered by RISE have conducted an integration study to understand how to bring variable renewable energy into the grid. Germany, the United States, Spain and the United Kingdom feature some of the most advanced renewable energy integration frameworks.
- The number of procedures necessary to set up a grid-connected renewable energy facility ranges from two in the Netherlands to 17 in the Russian Federation.

CONTEXT

- RISE offers policy makers and investors detailed country-level insights on the policy and regulatory environment for sustainable energy across 111 countries globally.
- Many important elements of policy support for renewable energy are common across all regions and incomes, including renewable energy targets and action plans, primary legislation and legal private ownership of generation, and financial and regulatory incentives like feed-in tariffs or competitive tenders.
- Technically sophisticated studies, such as those needed to evaluate the integration of variable renewable energy capacity in the grid, are becoming more important as the share of renewable capacity grows in the power mix.

ADDITIONAL RESOURCES

[Regulatory Indicators for Sustainable Energy 2017](#)

[Global Tracking Framework 2017](#)

[SEforALL Africa Hub](#)

[SEforALL Asia-Pacific Hub](#)

[SEforALL Latin America and the Caribbean Hub](#)

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RENEWABLE ENERGY



HIGH-IMPACT COUNTRIES

Countries whose efforts are critical to the achievement of SEforALL objectives globally

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

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

KEY

HIGH SCORE (100-67)

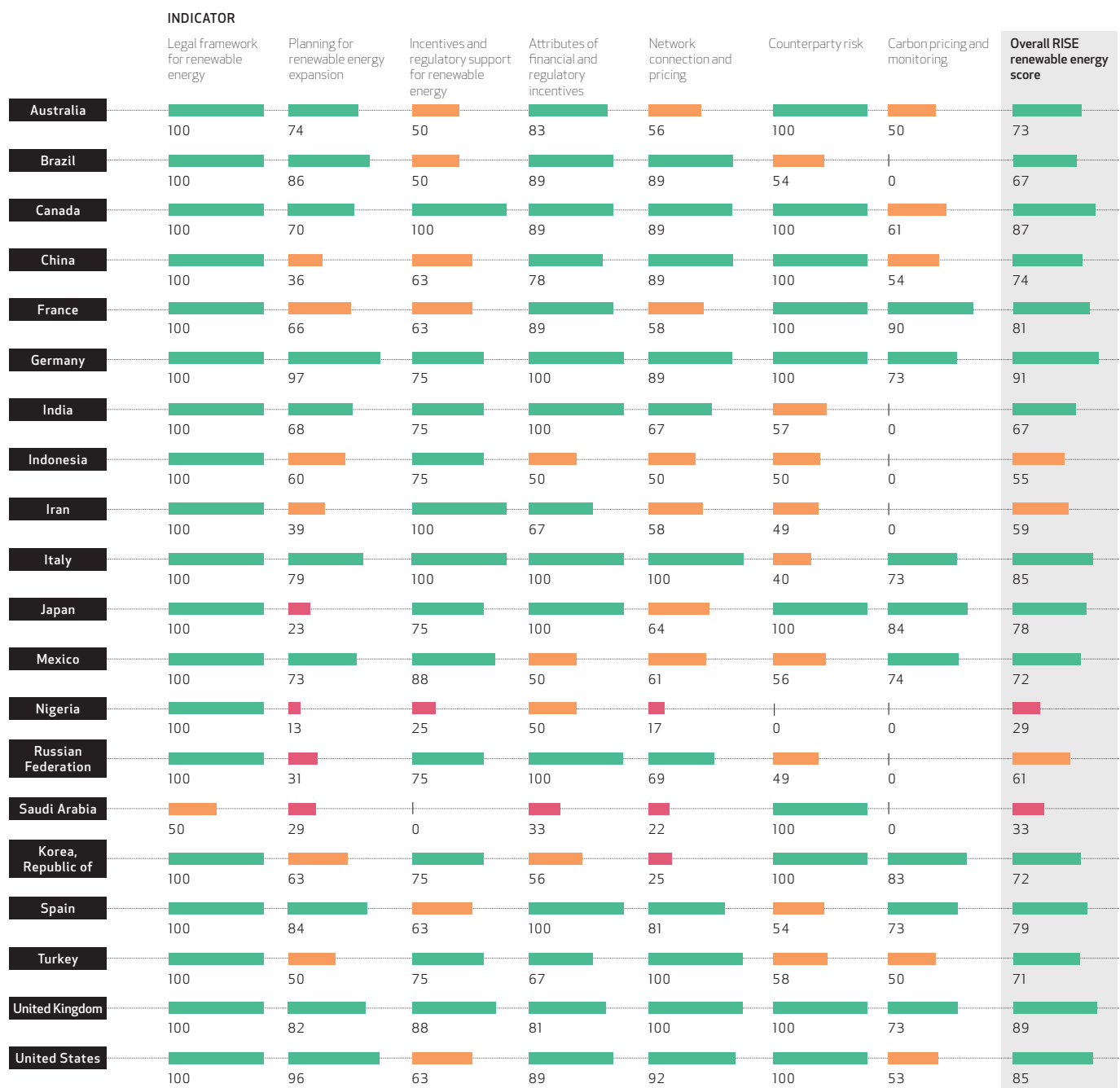
Most elements of a strong policy framework to support sustainable energy are in place

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



Note: Regulatory Indicators for Sustainable Energy (RISE) is a suite of indicators that assesses the legal and regulatory environment for investment in sustainable energy.

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

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

QUICK FACTS

- The six top-performing high-impact countries for renewable energy in Regulatory Indicators for Sustainable Energy (RISE) – including Germany, the United Kingdom, France, Spain, Japan and South Korea - also score highly for reliable power supplies and transparent electricity tariffs.
- Doing Business' Getting Electricity indicator highlights the Republic of Korea for the fast process – 3 procedures and 18 days - to get access to a quality electricity services.
- With strong policies and regulatory incentives, as well as a plentiful and skilled labor force across the full supply chain, China has invested more in renewable energy than any other country in the world, according to RISE. Over 2010–15, investment renewable energy investment - for solar, wind, geothermal, small hydropower, and biomass - reached \$377 billion, more than the next two countries combined, the United States and Germany.

CONTEXT

- RISE offers policymakers and investors detailed country-level insight on the policy and regulatory environment for sustainable energy across 111 countries globally.
- Doing Business measures aspects of regulation that enable or prevent private sector businesses from starting, operating and expanding. It ranks economies from 1-190 based on the regulatory environment by sorting aggregate scores on 10 topics and giving equal weight to each topic.
- Doing Business' Getting Electricity indicator highlights the importance of a reliable power supply and transparent tariffs structures to support effective business activity and the deployment of renewable energy at scale.
- The high renewable energy penetration rates observed in high-impact countries such as Germany, the United Kingdom, Spain or Australia, generally result from a combination of favorable policy, regulatory and business environments.
- Doing Business's Getting Electricity indicators shows that India, Indonesia and Kenya improved the administrative processes needed to get a connection to an electricity network while also reducing the cost of connection. Further effort is needed to mitigate the risks of payment delays or defaults, reduce delays for obtaining construction permits, and meet domestic renewable targets in a timely manner.

ADDITIONAL RESOURCES

[Regulatory Indicators for Sustainable Energy 2017](#)

[Global Tracking Framework 2017](#)

[Doing Business 2017](#)

[SEforALL Africa Hub](#)

[SEforALL Asia-Pacific Hub](#)

[SEforALL Latin America and the Caribbean Hub](#)

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RENEWABLE ENERGY



HIGH-IMPACT COUNTRIES

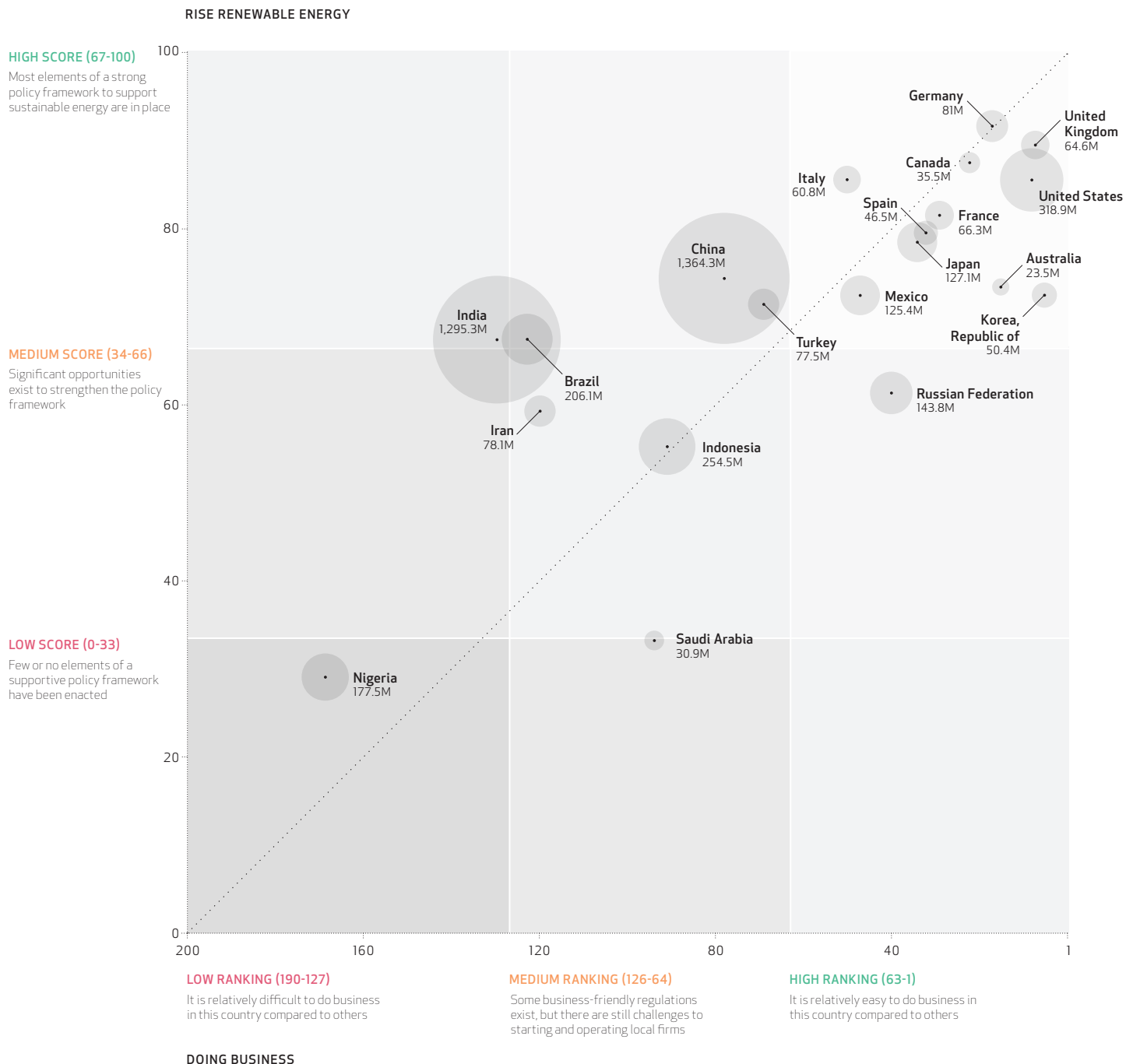
Countries whose efforts are critical to the achievement of SEforALL objectives globally

Which high-impact countries have an enabling environment for investment in renewable energy?

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE) AND DOING BUSINESS

KEY

● Population, 2014 values (relative to countries shown)



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. 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, <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/SP.POPTOTL?end=2014&name_desc=false&view=chart on 06/20/2017.