

SUMMARY

SUSTAINABLE ENERGY FOR ALL

# GLOBAL TRACKING FRAMEWORK

*Progress toward Sustainable Energy*

# 2017



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## FOREWORD

# THE GLOBAL TRACKING FRAMEWORK

## A CLARION CALL TO LEADERS

This year's *Global Tracking Framework* (GTF) is an urgent call for leaders to take greater, more focused action to deliver sustainable energy for all.

We have just 13 years to meet the Sustainable Development Goals. Doing so will require a rapid increase in energy productivity, a new generation of institutions to manage our energy systems, an integrated approach that embraces centralized and decentralized sources, and a greater share of renewables in the mix. Securing this energy transition will be a critical contribution to the delivery of other Sustainable Development Goals (SDGs). Sustainable energy powers education and health systems, new businesses in previously unserved communities, jobs, manufacturing and industrialization, and water storage and food security.

To meet the Sustainable Development Goal for energy (SDG 7), Sustainable Energy for All and our partners are working to advance progress on three 2030 objectives: ensure universal access to modern energy services; double the share of renewable energy in the global energy mix; and double the global rate of improvement in energy efficiency.

This third edition of the GTF provides an evidence-based look at progress at the regional, country, and international level toward meeting these objectives. The report provides an overview of long-term trends since 1990

and focuses on progress achieved in the most recent period, 2012–14.

So how are we doing?

Many countries are taking action, but the world as a whole is not moving fast enough.

However, it's heartening to see that progress on energy efficiency is gaining momentum, bringing us closer to the pace needed to meet 2030 objectives. The intensity of final energy consumption in industry, agriculture, services, and transport is decreasing. But improvements in the efficiency of thermal power generation and power networks have been relatively slow and the fast-growing residential sector is becoming more energy intensive. Investment in energy efficiency needs to increase by a factor of 3 to 6 from the current \$250 billion a year in order to reach the 2030 objective.

On renewable energy, the GTF shows that despite advances in technology and falling prices in the electricity sector—particularly for solar and wind—the gains in the energy mix are a fraction of what is needed to meet global objectives. Those countries that have set aggressive targets for renewable energy are seeing rapid progress and need to be joined by others.

On closing the energy access gap, 1.06 billion people still live without electricity, and the number of people who still use traditional, solid fuels to cook rose slightly to 3.04 billion, indicating that efforts to advance clean cooking are

not keeping up with population growth. However, the report shows that countries making energy access a policy priority can accelerate rapidly, particularly as new off-grid solar technologies start to come into play.

We hope that you will read the GTF alongside another study released in February 2017, which examines the regulatory framework for sustainable energy in 111 countries. RISE (*Regulatory Indicators for Sustainable Energy*) complements the findings in this report by putting the spotlight on the adoption of policies that support more rapid progress.

As global attention increasingly focuses on sustainable energy, providing decision-makers with timely updates of progress is more urgent than ever. Next year, the Sustainable Energy for All Global Tracking Framework will move to an annual rather than a bi-annual cycle. Decision-makers will be able to access the data in a more timely manner and implement changes needed to get us to the finish line.

It's possible to secure sustainable energy for all by 2030. But we are not on track. We must rise to the challenge agreed by the international community.

We must heed the clarion call.

We must all go further, faster—together.

Rachel Kyte  
CEO for Sustainable Energy for All and Special  
Representative of the UN Secretary-General

## PARTNERS

The development of the *Global Tracking Framework* was made possible by exceptional collaboration within a specially constituted Steering Group led jointly by the World Bank, Energy Sector Management Assistance Program, and the International Energy Agency. The membership of the Steering Group was as follows.

- Food and Agricultural Organization (FAO)
- Global Alliance for Clean Cookstoves (“the Alliance”)
- Global Water Partnership (GWP)
- International Energy Agency (IEA)
- International Institute for Applied Systems Analysis (IIASA)
- International Network on Gender and Sustainable Energy (ENERGIA)
- International Partnership for Energy Efficiency Cooperation (IPEEC)
- International Renewable Energy Agency (IRENA)
- Practical Action
- Renewable Energy Policy Network for the 21st Century (REN21)
- Stockholm International Water Institute (SIWI)
- Sustainable Energy for All (SEforALL)
- United Nations Department of Economics and Social Affairs (UNDESA)
- United Nations Development Programme (UNDP)
- United Nations Economic Commission for Africa (UNECA)
- United Nations Economic Commission for Europe (UNECE)
- United Nations Economic Commission for Latin America and the Caribbean (ECLAC)
- United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)
- United Nations Economic and Social Commission for Western Asia (ESCWA)
- United Nations Environment Programme (UNEP)
- Copenhagen Centre on Energy Efficiency
- UN Energy
- United Nations Foundation (UNF)
- United Nations Industrial Development Organization (UNIDO)
- UN Statistics
- UN Women
- World Bank (WB)
- World Energy Council
- World Health Organization (WHO)

The Steering Group’s collaboration was made possible by agreement among the senior management of the member agencies. Riccardo Puliti (World Bank) and Fatih Birol (IEA), with Rohit Khanna (ESMAP), oversaw the development of the Global Tracking Framework in collaboration with Jane Olga Ebinger (SEforALL) and Minoru Takada (UNDP) and Ivan Vera (UNDESA). The technical team was managed by Vivien Foster (World Bank) and Dan Dorner and Hannah Daly (IEA). Alejandro Moreno (World Bank) coordinated inputs from multi-agency working groups and led the preparation of the report.

This work was largely funded by the participating agencies themselves. Financial support from ESMAP, to fund tasks managed by the World Bank, and from SEforALL, to fund tasks managed by the UN Regional Economic Commissions, is gratefully acknowledged.



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## SUMMARY GLOBAL SCORECARD 2014

# WHERE DO WE STAND ON SUSTAINABLE ENERGY FOR ALL OBJECTIVES?

Energy has been described as “the golden thread” connecting economic growth, social equity, and environmental sustainability. With this in mind, the United Nations General Assembly in 2012 embraced the Sustainable Energy for All (SEforALL) objectives for 2030, aiming to achieve universal access to modern energy, double the historic rate of improvement of energy efficiency, and double the share of renewable energy in the global energy mix. In 2015, Sustainable Development Goal 7 was adopted for 2030, to “ensure access to affordable, reliable, sustainable, and modern energy for all,” building further on the three SEforALL objectives. Later in 2015, at the historic Paris Climate Conference (COP21), countries from around the world committed to Nationally Determined Contributions, many calling for progress on the sustainable energy agenda.

Preparation of this third edition of the SEforALL *Global Tracking Framework* has again been co-led by the World Bank/Energy Sector Management Assistance Program and the International Energy Agency (IEA), with valuable inputs from more than 20 organizations around the world—some longstanding partners and some joining for the first time. As in previous editions, this SEforALL *Global Tracking Framework* aims to provide the international community with a global dashboard to register progress on the three pillars of sustainable energy: energy access, energy efficiency, and renewable energy. This edition covers progress

in 2012–14, collating and harmonizing official national data and providing regional and global analysis.

The findings clearly portray that the pace of progress on sustainable energy during 2012–14 fell short of what is needed to meet the global objectives by 2030. Of the three pillars of SEforALL, energy efficiency is advancing at the closest to the pace of change required to meet the 2030 objective.

Global electrification reached 85.3% in 2014, a modest improvement since 2012 and a slowdown from preceding years (figure 1). Access to clean fuels and technologies for cooking—here “clean cooking”—reached 57.4% globally in 2014, with barely any increase since 2012 (figure 2). Progress in reducing the energy intensity<sup>1</sup> of the global economy continued to accelerate, improving by a 2.1% compound average annual growth rate in 2012–14, compared with a SEforALL objective of –2.6%, and bringing global energy intensity to 5.5 MJ/2011 PPP \$ (megajoules per 2011 purchasing power parity dollar) (figure 3). In 2014, the share of renewable energy in total final energy consumption climbed to 18.3%, continuing the slight acceleration of trends evident since 2010 (figure 4). Even so, progress is nowhere near fast enough to double its share to 36% in 2010–30 as envisaged by the SEforALL objective.

Results of recent global energy modeling, by the IEA and others, confirm the view that current efforts will not reach the targets set by the international community for 2030, even after

taking into account new policy commitments made under COP21 and favorable technology trends like the steep reduction in the costs of solar PV (photovoltaic).

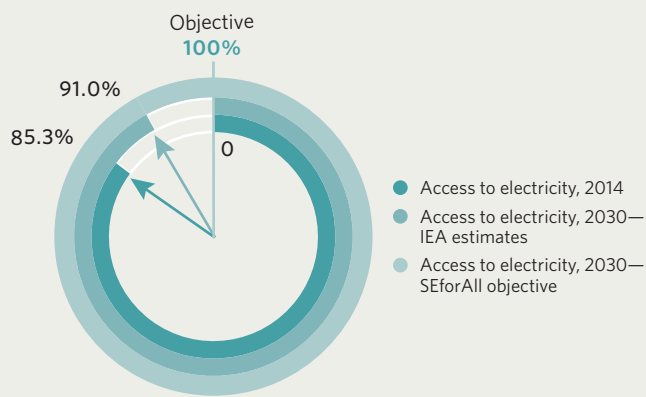
The IEA’s New Policies Scenario, reflecting the latest policy pledges, estimates that by 2030 access rates will stand at 91% for electricity (figure 1) and 72% for clean cooking (figure 2).<sup>2</sup> Improvements in energy intensity will fall short of the 2030 objective, and the share of renewable energy in total final energy consumption will reach 21% (figure 4). This coincides with recent country work by International Renewable Energy Agency (IRENA), which finds that without substantially exceeding current commitments, the world is likely to reach a renewable energy share of just 21% by 2030.

Looking at each of the dimensions of sustainable energy more closely helps in understanding why the world is not yet on track to meet its goals and what kinds of targeted efforts in which places offer the best prospects for accelerating global progress in coming years.

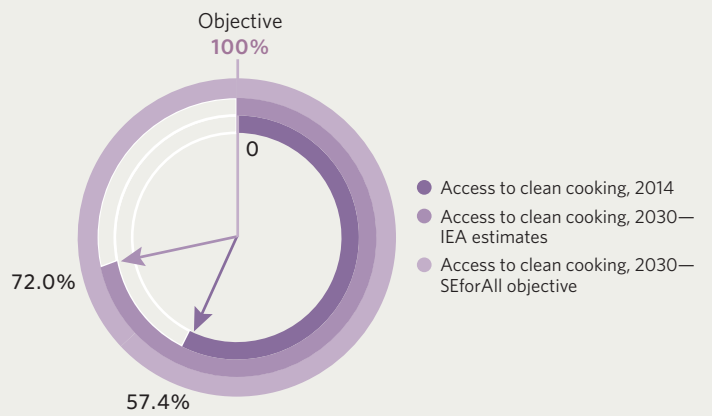
1. Primary energy intensity is a measurable proxy for energy efficiency that looks at the amount of energy needed to produce a dollar of economic output. Technically, energy intensity is defined as the ratio of total primary energy supply to gross domestic product (GDP, measured at purchasing power parity in 2011 U.S. dollars).

2. IEA Z-modeling excludes the use of coal and kerosene for cooking, which World Health Organization databases include.

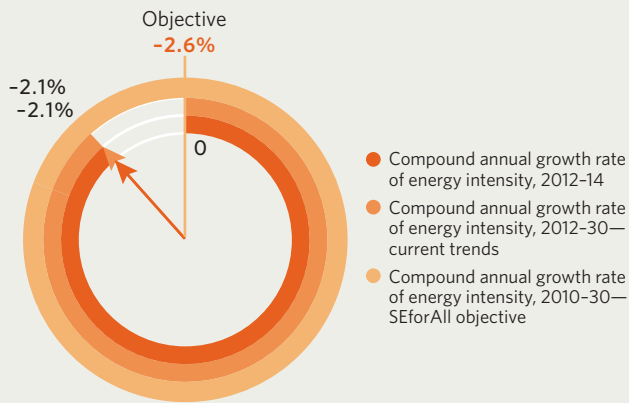
**FIGURE 1** Access to electricity



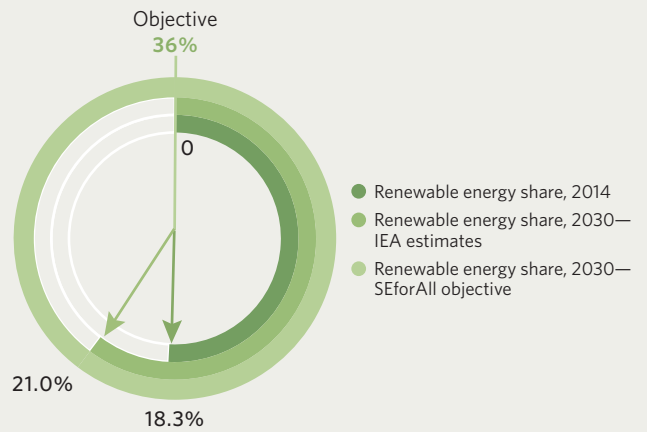
**FIGURE 2** Access to clean fuels and technologies for cooking



**FIGURE 3** Energy efficiency



**FIGURE 4** Renewable energy



## ELECTRIFICATION WHERE DID WE STAND ON ELECTRIFICATION IN 2014?

Access to electricity improves lives. Lighting a single room allows a child to read or do homework at night, while charging a single telephone can bring business to a small entrepreneur. Continuous access can keep food or vaccines cold, or power a sewing machine or a school computer.

Electrification, which stands globally at 85.3%, varies widely across continents (figure 5). In Europe, North America, and Central Asia, universal access has long been a reality, and Latin America is not far behind. Both Asia-Pacific and the Arab Region are also doing well, with access rates around 90% in 2014. Yet even advanced regions have lagging countries, such as Haiti (38%) in Latin America and Sudan (45%) in the Arab Region. By far the most severe challenge is in Africa (excluding North Africa), with access for only 37% of its population in 2014.

It is notable that electrification rates rise very steeply as countries move through the income bracket of \$500–1,000 per capita GDP (figure 6).

Access to electricity has progressed steadily since 1990. Urban areas across the world already have close to universal access at 96%, although challenges remain in the rapidly growing cities of Africa and Asia-Pacific (figure 7).

Although urban access rates have increased relatively little in the last 25 years, even sustaining those rates represents a major achievement given the rapid urbanization that has added 1.6 billion people to the world's cities during this period. Progress in rural electrification has been more evident since 1990, reaching 73% of the population in 2014, narrowing the gap in access between urban and rural populations to 20 percentage points, from 35 in 1990.

In 2014, 1.06 billion people—about three times the population of the United States—still lived without access to electricity, only a very slight improvement over 2012 (figure 8). The vast majority of those without access lived in rural areas—particularly rural Africa—where the race against demographic growth is largely being lost.

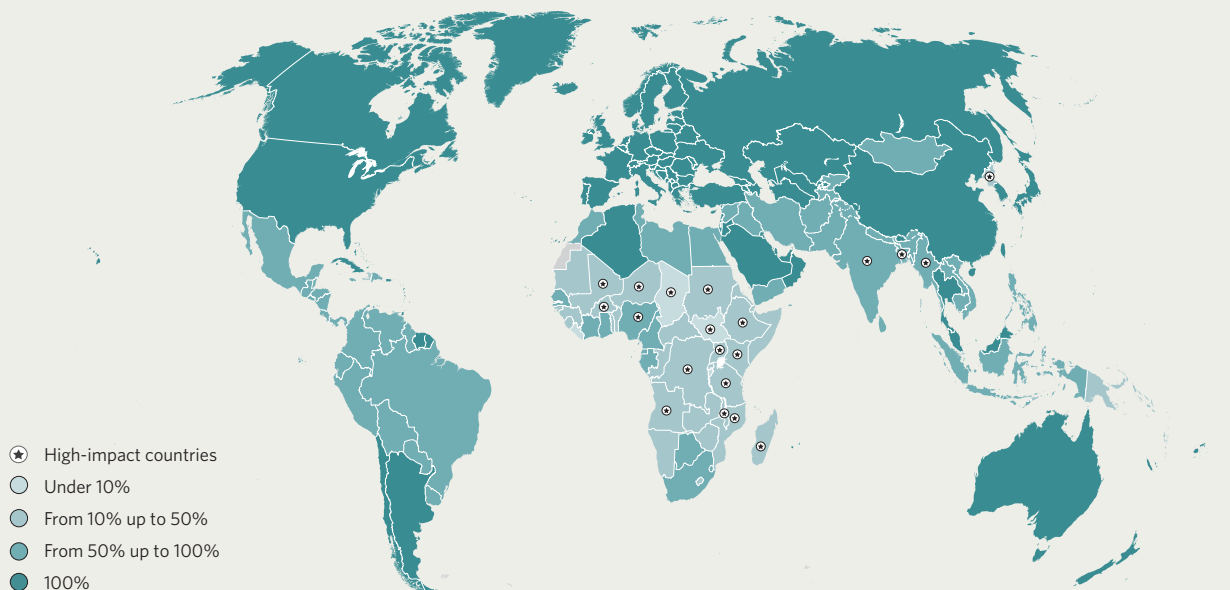
This does not reflect a lack of effort by countries: some 86 million people, equivalent to the entire population of Egypt, are newly getting electricity annually. But the global population is expanding at almost the same pace (figure 9).

About 80% of the 1.06 billion people without electricity live in just 20 countries. Their progress toward electrification—or lack thereof—will have the greatest impact on global

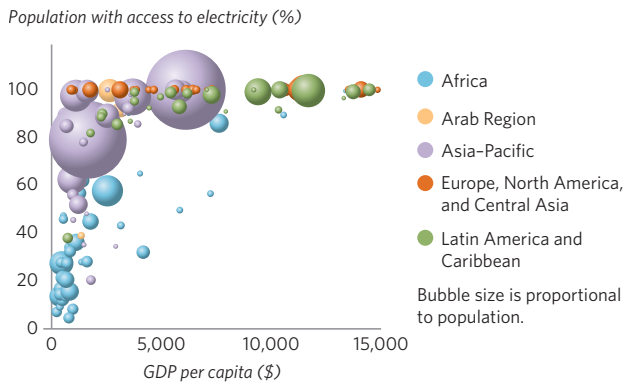
outcomes. Particularly troubling is that two of these high-impact countries, Angola and the Democratic Republic of Congo, saw their electrification rates fall by about 1 percentage point annually in 2012–14 (figure 10). More encouraging is the rapid progress in 2012–14 of a number of populous low-access countries—such as Kenya, Malawi, Sudan, Uganda, and Zambia—that increased their electrification rates by 2 to 3 percentage points annually. Results for India are inconclusive because no new household survey data on electrification have been published since 2012.

Until 1990, it was rare for countries to expand electrification faster than 2 to 3 percentage points annually. However, in 2012–14 one of the strongest performers in Africa—Rwanda—added more than 3 percentage points to its electrification rate annually, reflecting a strong policy commitment. In Asia-Pacific, Afghanistan made extraordinary progress, adding electrification for 10 percentage points of the population annually, thanks largely to off-grid rural electrification based on solar PV. Cambodia expanded by more than 7 percentage points annually through sustained grid electrification complemented by solar home systems in rural areas.

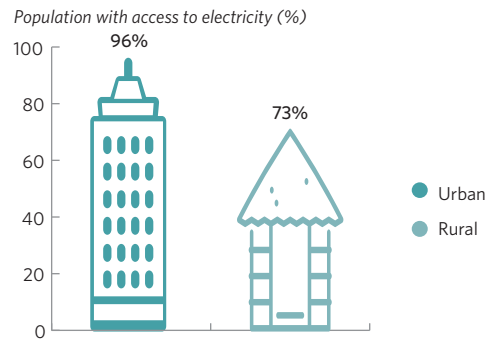
**FIGURE 5** Access to electricity, 2014



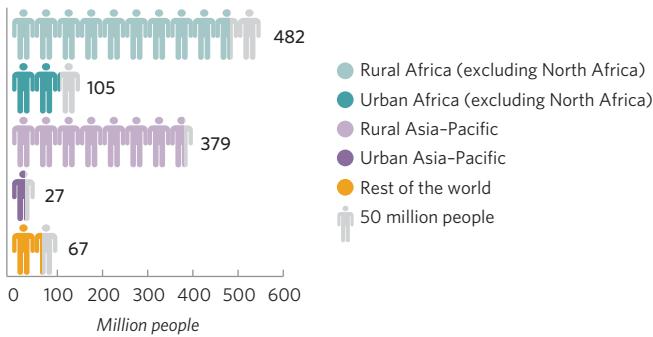
**FIGURE 6** Regional differences in access to electricity, 2014



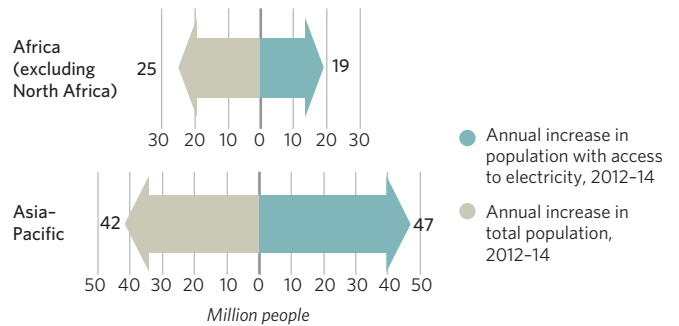
**FIGURE 7** Urban-rural differences in access to electricity, 2014



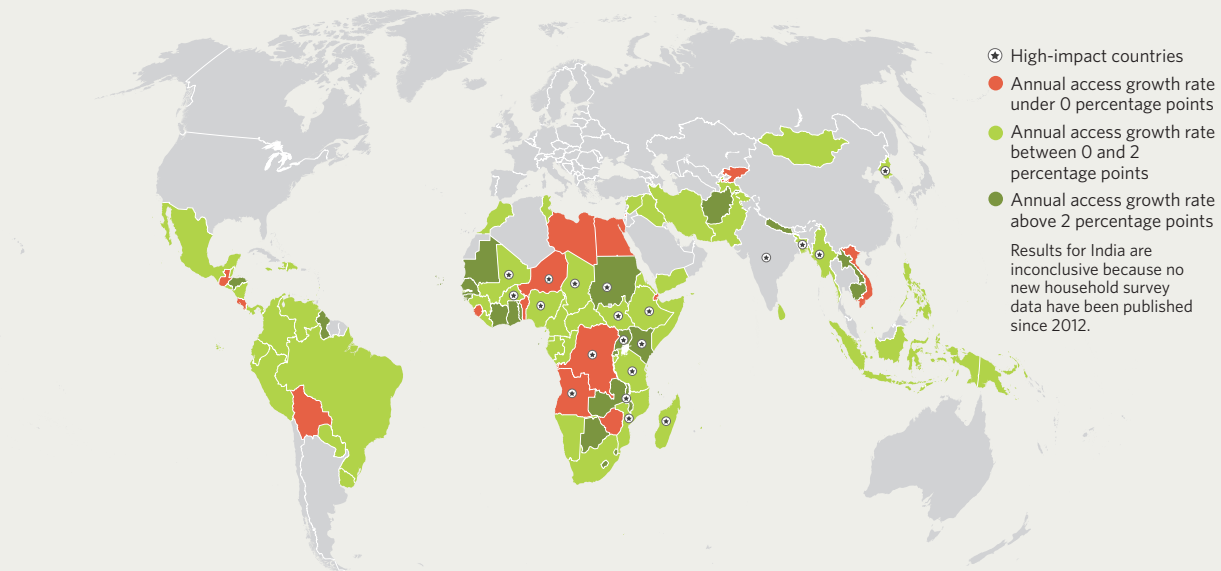
**FIGURE 8** Location of the 1.06 billion people living without electricity, 2014



**FIGURE 9** Demographic challenges for electrification



**FIGURE 10** Speed of progress toward electrification goal, 2012-14





## COOKING WHERE DID WE STAND ON ACCESS TO CLEAN COOKING IN 2014?

The fuels and technologies households use for cooking have become a major global health issue. Some 4 million premature deaths, primarily among women and children, are caused each year by inhaling carbon monoxide and particulate matter from traditional biomass cookstoves. Reducing exposure to these health risks calls for either switching to clean fuels, typically liquefied petroleum gas, or adopting advanced combustion cookstoves that burn biomass more cleanly and efficiently.

Across all continents, access to clean fuels and technologies for cooking—here “clean cooking”—tends to lag behind electrification (figure 11). In regions approaching universal access to clean cooking, such as Europe, North America, and Central Asia, Latin America, and the Arab Region, that gap is just a couple of percentage points, but for Asia-Pacific and Africa it can be very large. In Asia-Pacific, only 51% had access to clean cooking in 2014 compared with 90% for electricity, and in Africa (excluding North Africa) only 12% compared with 37% for electricity. Although many countries experience a rapid scale-up of electrification in the \$500–1,000 per capita income bracket, access to clean cooking typically takes

much longer, all the way to income levels of \$12,000 per capita (figure 12).

Reflecting these dynamics, access to clean cooking has progressed at a consistently slow rate since 1990, edging up by just half a percentage point of global population each year, to reach 57% in 2014. Even in urban areas, only 78% of the population had access (figure 13). This raises a serious concern, given the poor air quality and fire hazards associated with using traditional biomass cookstoves in crowded urban settings. In rural areas, only 22% of the population had access to clean cooking. Biomass is often freely available in the countryside, while distribution channels for modern fuels or advanced cookstoves may be nonexistent. This puts the urban–rural gap for clean cooking at close to 60 percentage points—three times the gap for electricity.

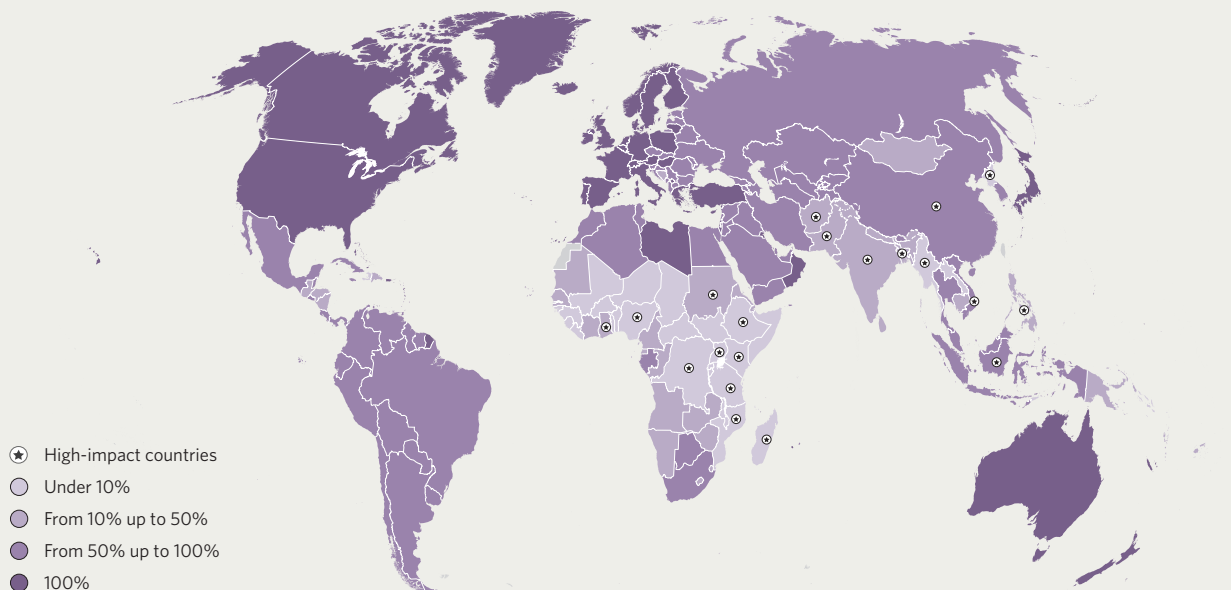
In 2014, 3.04 billion people—about nine times the population of the United States—lived without access to clean cooking, a slight increase in the deficit since 2012 (figure 14). This increase is driven by Africa, where population expands by 25 million annually while access to clean cooking increases by only 4 million (figure 15).

Some 85% of the 3.04 billion people without access to clean cooking live in just 20 countries.

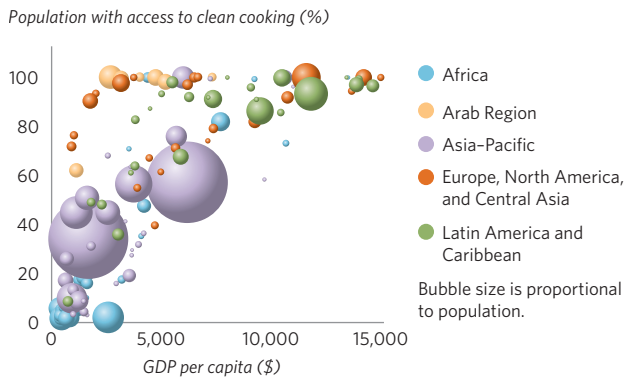
Their lack of progress toward clean cooking is a large contributor to lackluster global performance (figure 16). Among them, Afghanistan and Nigeria stand out as populous countries whose access to clean cooking fell by about 1 percentage point annually in 2012–14. At the other end of the spectrum, Indonesia made by far the greatest progress, raising its access rate by more than 4 percentage points annually during this period. Other strong performers among the larger countries are Viet Nam, which added almost 2 percentage points annually, and Sudan, which added more than 1. Particularly noteworthy were a handful of smaller countries that raised access to clean cooking by more than 4 percentage points annually, including Angola, Bhutan, Maldives, and Peru.

Overall about 25 countries worldwide expanded access to clean cooking by more than 2 percentage points annually, or at least four times faster than the world. A majority of these—though by no means all—were also natural gas producers, suggesting that the domestic availability of gas can be an advantage. This group’s achievement shows that faster progress may be possible in the future, as long as the issue is given a higher priority on the policymaking agenda.

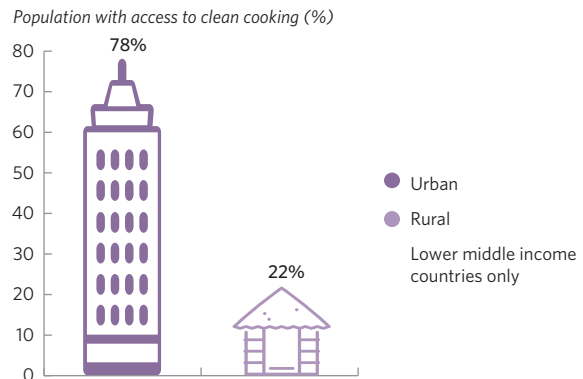
**FIGURE 11** Access to clean cooking, 2014



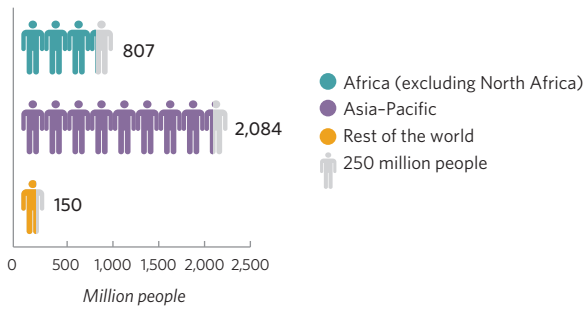
**FIGURE 12** Regional differences in access to clean cooking, 2014



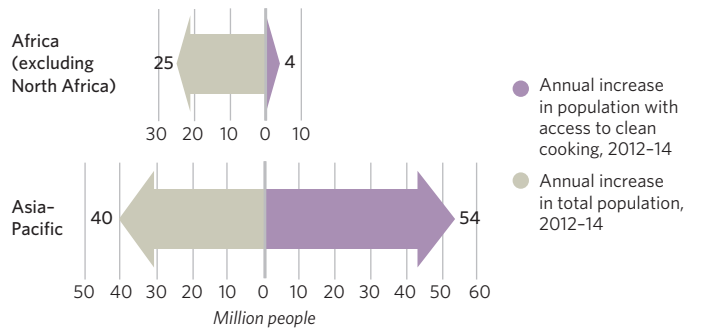
**FIGURE 13** Urban-rural differences in access to clean cooking, 2014



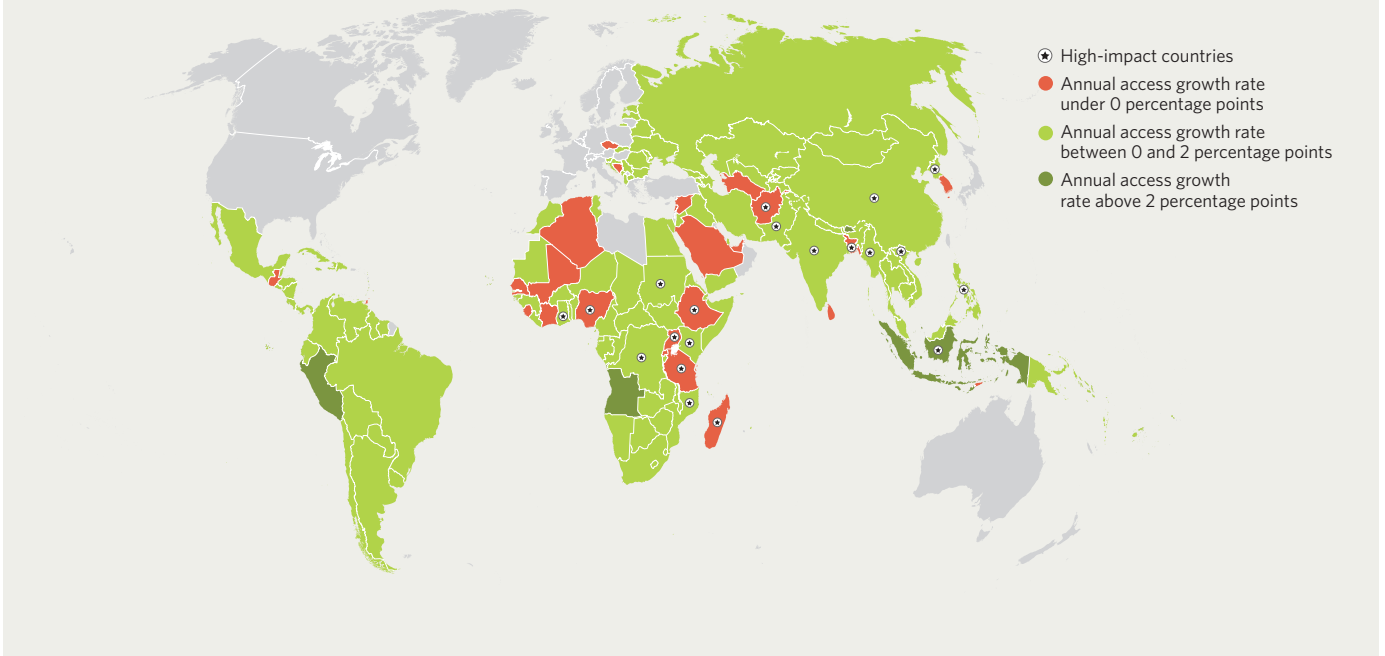
**FIGURE 14** Location of the 3.04 billion people living without access to clean cooking, 2014



**FIGURE 15** Demographic challenges for progress on access to clean cooking



**FIGURE 16** Speed of progress toward clean cooking goal, 2012-14



## ENERGY EFFICIENCY WHERE DID WE STAND ON ENERGY INTENSITY IN 2014?

Reducing energy intensity—the measurable proxy for increasing energy efficiency—means getting more economic value out of every unit of energy consumed. This helps to dampen demand for energy, reduce the environmental footprint associated with its production, improve the competitiveness of industry, and increase the affordability of energy to households (figure 17). As energy intensity comes down, GDP can grow with much lower growth in energy demand (figure 19). This effect is already evident in much of the developing world except for Latin America and Caribbean and the Arab Region, while in Europe and North America GDP continues to grow while energy demand is flat or falling.

Primary energy intensity has been falling significantly since the beginning of the data series in 1990, and it has been converging across geographic regions toward the current global average of 5.5 MJ/2011 PPP \$ in 2014 (figure 18). Low-income countries have by far the highest energy intensity due to reliance on inefficient traditional biomass. By contrast, some high-income countries in Europe—Denmark, Italy, and the United Kingdom—are already reporting energy intensities below 3.4 MJ/2011 PPP \$, the global energy intensity if the world target for

2030 is met. Globally, recent improvements in energy intensity in 2012–14 really add up, presenting energy savings equivalent to the entire energy consumption of both Brazil and Pakistan in 2014.

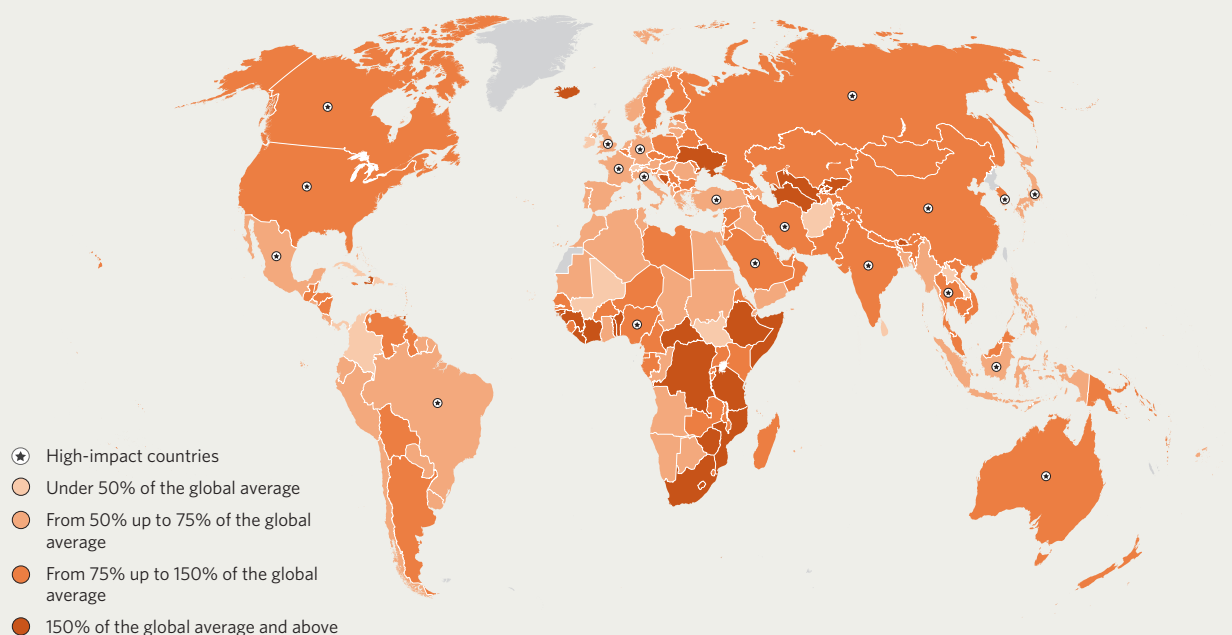
Driving progress on energy intensity are actions in key energy consuming sectors and, to much less extent, in key energy supply sectors. The major energy consuming sectors are industry, residential, and transport. Industry has contributed much to declining global energy intensity, with an annual reduction of 2.2% in 2012–14, but the residential sector had a small increase in energy intensity (measured in energy consumption per capita) (figure 20). In transport, widespread diffusion of fuel efficiency standards helped accelerate reductions in energy intensity (measured in energy consumption per passenger-km or ton-km), with passenger transport progressing at 2.8% a year, compared with just 1.1% a year for freight transport. The strongest improvements have been in passenger buses (4.8% a year since 2010) and sea freight (3.7%).

The electricity supply industry is itself a major consumer of energy, in part due to losses both in thermal generation and in the transmission and distribution network. The average

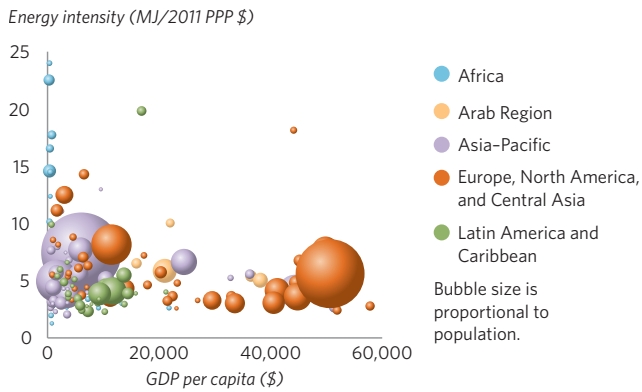
efficiency of thermal generation has been edging up very slowly since 1990 to reach 39% in 2014. But average efficiency rates of 45% are already being achieved for natural gas electricity plants. Network losses were coming down very slowly, to 9% in 2014, but with wide variation between high-income countries (at 7%) and low-income countries (at 16%) (figure 21).

About three-quarters of the world's energy supply is concentrated in just 20 countries, mainly high-income and upper-middle-income (figure 22). How rapidly these countries reduce their energy intensity has a major impact on the global outcome. Not only did 15 of these high energy consumers reduce their energy intensity in 2012–14, but 7 of them reduced it by more than 2.6% annually: Australia, China, Italy, Mexico, Nigeria, the Russian Federation, and the United Kingdom. Even so, 5 countries also saw their energy intensity increase in 2012–14 (Brazil, Iran, Saudi Arabia, South Africa, and Thailand), while 5 still have energy intensities significantly above the global average (Canada, China, Iran, the Russian Federation, and South Africa). And the recent experience of some smaller countries shows that it is sometimes possible to improve energy intensity by more than 5% annually, at least for short periods.

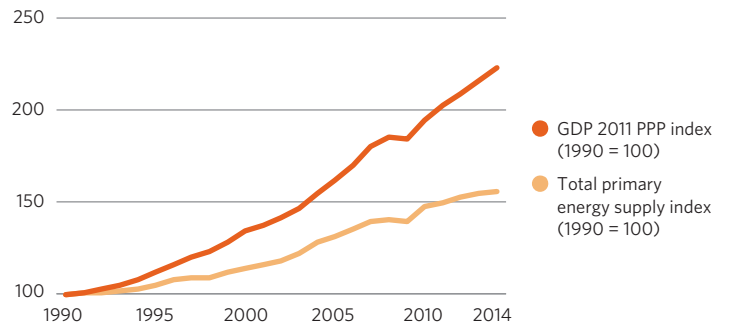
**FIGURE 17** Primary energy intensity, 2014



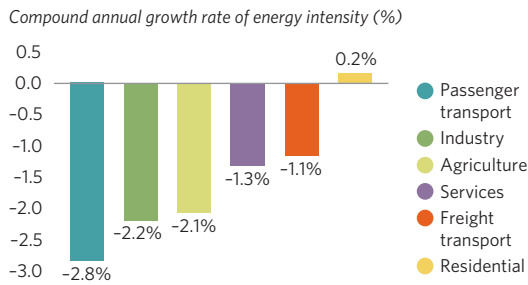
**FIGURE 18** Regional differences in primary energy intensity, 2014



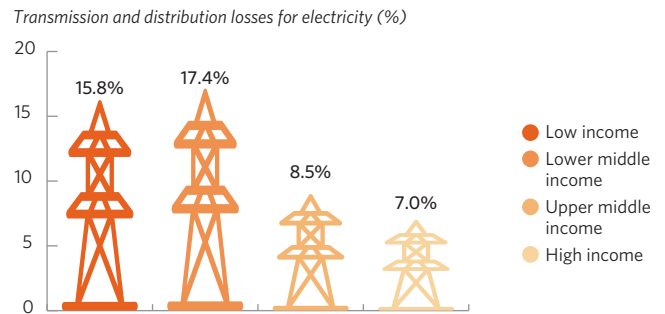
**FIGURE 19** Relative growth of GDP and energy supply, 1990-2014



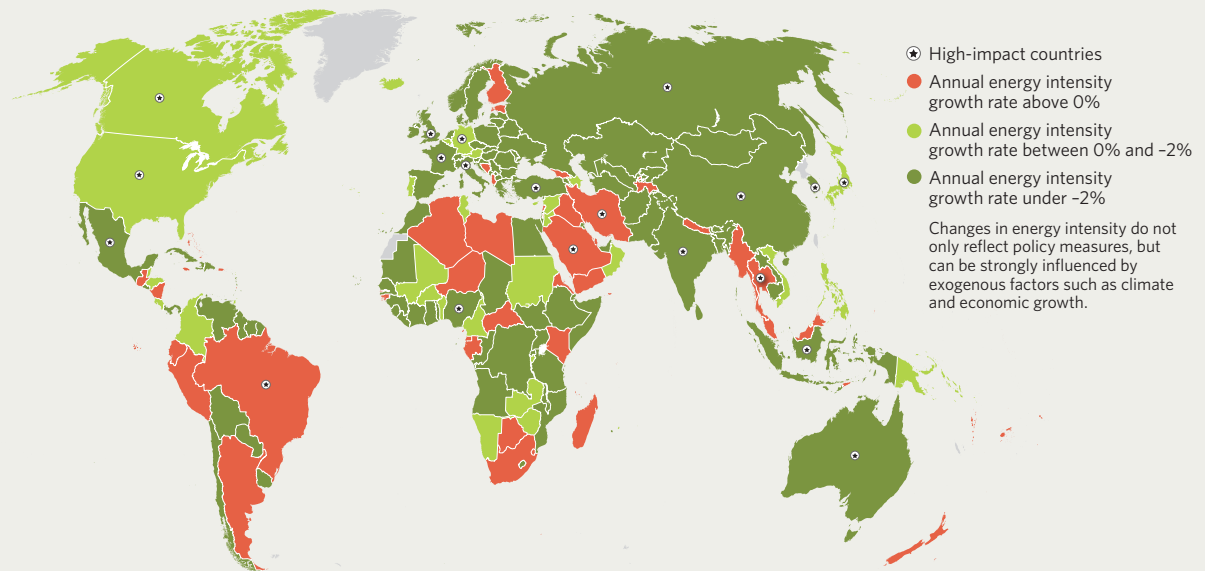
**FIGURE 20** Relative improvement in final energy intensity by end-use sectors, 2012-14



**FIGURE 21** Income group differences in supply-side efficiency, 2014



**FIGURE 22** Speed of progress toward goal of reducing primary energy intensity, 2012-14



## RENEWABLE ENERGY WHERE DID WE STAND ON RENEWABLE ENERGY IN 2014?

Renewable energy shares vary widely around the world (figures 23 and 24). Despite significant growth in renewable energy consumption, continued rapid growth in total final energy consumption has meant that the overall share of renewable energy has been moving more slowly (figure 25).

The narrative for renewable energy is complex because it interweaves two distinct stories. The first relates to the traditional uses of biomass—minimally processed wood, charcoal, dung, or agricultural waste—which is still in widespread use for cooking and heating across the developing world. While biomass is technically renewable, its traditional uses are responsible for serious health effects and, sometimes, deforestation. So reduced dependence on traditional biomass is considered desirable even though it reduces the share of renewable energy overall.

Developing regions, due to their continuing reliance on traditional uses of biomass, show particularly high renewable energy shares, most notably in Africa (excluding North Africa) at 70%, and South-East Asia and South and South-West Asia at around 30%. But these shares are steadily falling as incomes rise, economies modernize, and

households and small enterprises switch to modern fuels (figure 24).

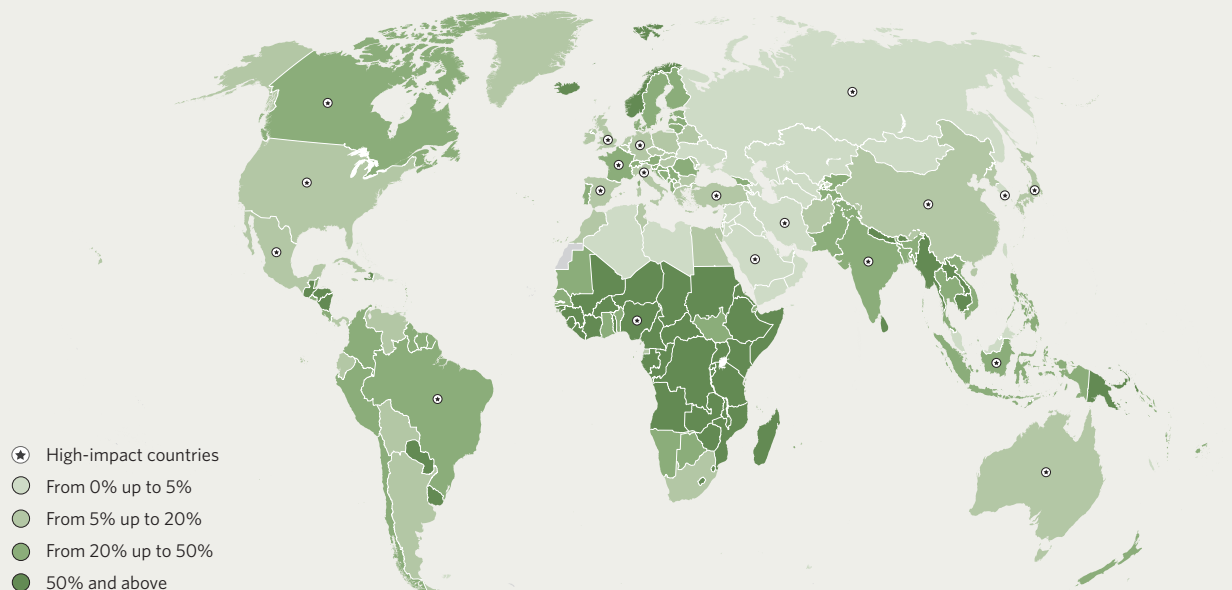
The second story relates to modern renewable energy, which includes processed wood fuels, biofuels for transportation, and renewable power generation technologies (figure 27). In Latin America and Caribbean, the share of modern renewable energy has long been high at 23%, reflecting early use of abundant biomass and hydropower resources. In 1990, all other regions were achieving only 5% of their total final energy consumption through modern renewable energy sources. But Asia-Pacific, Europe, and North America have seen strong growth, reaching around the 10% mark in 2014 (figure 24). The major exceptions are the Arab Region and Eastern Europe, Caucasus, and Central Asia. Uptake has been largely policy-driven as more and more countries, particularly at higher incomes, adopt renewable energy targets and incentives.

The story of the advance of renewable energy differs greatly for the three main end-use sectors: electricity, transport, and heat. Electricity and transport represented relatively small shares of total renewable energy consumption in 2012, at 23% and 4% respectively (figure 26). But the penetration of renewable energy in

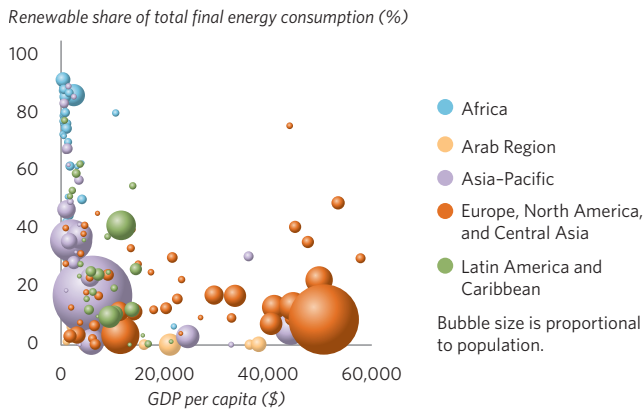
these applications has been growing relatively rapidly. Electricity contributed 49% of the progress in renewable energy in 2012-14 thanks to the steep growth of wind and solar power, while transport contributed 9% of progress in 2012-14 thanks to continued uptake of biofuels. More problematic is the heat sector, which accounted for the bulk of renewable energy consumption, 73% in 2012, but contributed only 42% of progress in 2012-14, reflecting less policy focus as well as greater technological challenges in applying renewable energy to high temperature industrial processes.

How rapidly the world's 20 largest energy consumers are able to meet demand with modern renewables will have a major impact on global outcomes. Just 13 of the large consumers succeeded in increasing their modern renewable energy share in 2012-14 (figure 28). In fact, three of these large consumers saw a significant decline in their modern renewable energy share: particularly Nigeria, and to a lesser extent Brazil and Turkey, where hydropower production suffered due to low rainfall. Worldwide, only a handful of smaller countries managed to grow their renewable energy share by more than two percentage points, indicating the challenging nature of this target.

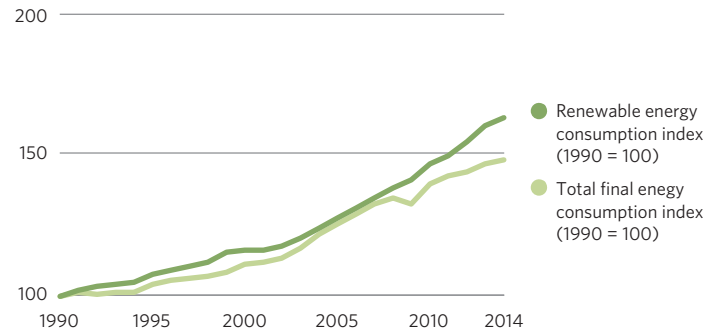
**FIGURE 23** Share of renewable energy in total final energy consumption, 2014



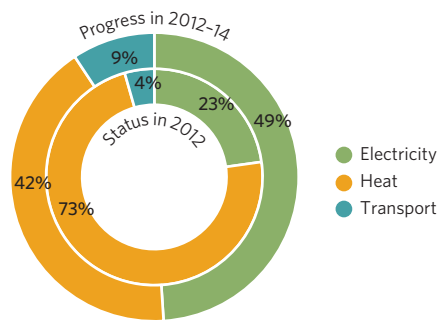
**FIGURE 24** Regional differences in renewable energy share, 2014



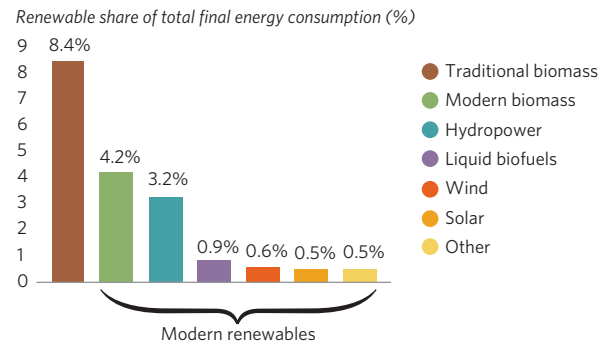
**FIGURE 25** Relative growth of renewable and total energy consumption, 1990-2014



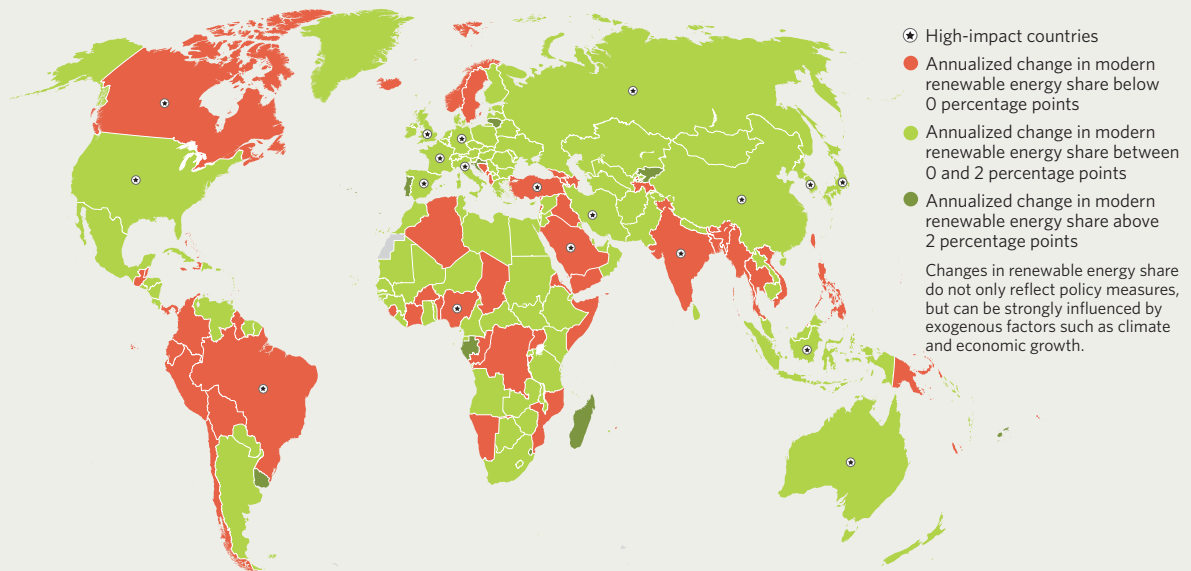
**FIGURE 26** Sectoral contribution to renewable energy growth, 2012-14



**FIGURE 27** Technology differences in renewable energy share, 2014



**FIGURE 28** Speed of progress toward renewable energy goal, 2012-14



## CONCLUSION

The overall progress toward sustainable energy in 2012–14 was not commensurate with the SEforALL goals. Modeling projections indicate that the 2030 objectives are unlikely to be met on current trends or even on the basis of recently enhanced policy commitments.

Much more encouraging than the global trends, however, are the experiences of individual countries demonstrating the feasibility of moving faster toward sustainable energy objectives. In just about every area of sustainable energy, significant numbers of countries are outperforming the world. Equally useful, the findings point to countries and sectors that are not doing so well, where greater policy attention could produce significant payoffs.

On electrification, while Africa is not expanding access as rapidly as its population is growing, Kenya, Malawi, Sudan, Uganda, Zambia, and particularly Rwanda are accelerating at a pace that looks rapid relative to the pace observed around the world since 1990. Moreover, the recent experience of some Asian countries such as Afghanistan and Cambodia making more determined use of off-grid solar energy provides an early indication that new technologies may make it possible to expand electrification much faster than was previously thought.

A particular focus on electrification is needed in low-access countries where growth in population outstrips progress in electrification, so that electrification rates actually decline. Benin and Zimbabwe stand out in the 2012–14 assessment.

On clean cooking, some 20 countries were able to progress at four times the modest pace of the world. Indonesia stands out as by far the fastest moving country, with Angola, Bhutan, Maldives, and Peru also advancing rapidly. The main concern about clean cooking is that it often seems to be given lower priority than other parts of the energy agenda. In particular, Afghanistan and Nigeria stand out in the 2012–14 assessment as two populous countries where access to clean cooking is in decline.

On energy efficiency, the strong improvement in industrial energy intensity is particularly encouraging, as are improvements in the fuel efficiency of passenger road transport and aviation and a trend toward larger freight ships. Moreover, some of the largest energy consumers that already have low energy intensities, such as Italy and the United Kingdom, continue to make further progress.

A key area of focus for energy efficiency is the residential sector, a large and fast-growing segment of energy consumption, especially in developing countries. Another challenge is the electricity supply industry, where improvements in the efficiency of thermal power generation and power networks have been relatively slow. Among countries, some of the largest energy consumers remain very energy intensive, and a couple of them—the Islamic Republic of Iran and South Africa—even saw their intensities increase in 2012–14.

On renewable energy, the rapid expansion of wind and solar generation for electricity is a well-known positive story. The problem is that electricity represents only 20% of energy consumption. Without an equivalent breakthrough for renewable heat technologies and a continuing acceleration of progress in renewable transport, it will be difficult to accelerate the ramp-up of renewable energy as a whole.

What is striking about renewable energy, compared with other dimensions of sustainable energy, is the relatively small number of countries managing to progress as rapidly as the world as a whole would need to move to meet its target for 2030. Only two of the large energy consumers—again, Italy and the United Kingdom—increased their renewable energy share by more than 1 percentage point annually in 2012–14.

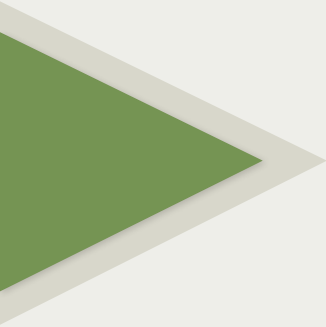
Further improvement on these steady, but still inadequate, levels of progress in the years to 2030 will require greater financing flows and bolder policy commitments, as well as the willingness to embrace new technologies on a much wider scale. Investments in renewable

energy and energy efficiency globally have each climbed to an estimated \$250 billion a year. But to meet the SEforALL objectives, renewable energy investment would need to increase by a factor of 2 to 3, and energy efficiency investment by a factor of 3 to 6. Investments in energy access are less well understood, but estimates suggest that a fivefold increase would be needed to reach universal access by 2030.

On the policy environment, the 2016 publication of *Regulatory Indicators for Sustainable Energy* maps out the adoption of good practice policies for energy access, energy efficiency, and renewable energy around the world. That report helps to identify where good policies have already been adopted and points to helpful measures that may have been neglected. For example, it shows that many low-access African countries have yet to create a supportive policy environment for energy access, particular for off-grid solar home systems. More broadly, energy efficiency policies are being systematically neglected by policymakers, who have not yet taken many simple regulatory measures. While targets and incentives for renewable electricity have swept across the globe, major challenges remain in regulating the full integration of renewable resources into the grid.

Last, understanding and learning from the evolution and implementation of sustainable energy policies globally requires improved data. All the indicators presented here have conceptual shortcomings, and many are prejudiced by infrequent or incomplete data collection. Capacity building for improved data collection and curation remains a pressing need in many developing countries. Work to develop improved indicators is also critical—to capture the affordability and reliability of energy access, provide a more accurate understanding of traditional uses of biomass, and drill down into the energy efficiency of key economic sectors. Some efforts are already under way, but more needs to be done.





## DATA ANNEX

## 1 ACCESS TO ELECTRICITY AND CLEAN COOKING

	Access to electricity (% of population <sup>a</sup> )							Access to clean fuels and technologies for cooking <sup>c</sup> (% of population)			
	Total			Urban <sup>b</sup>		Rural		Total			
	1990	2000	2010	2012	2014	2014	2014	2000	2010	2012	2014 <sup>c</sup>
Afghanistan			43 <sup>d</sup>	69 <sup>d</sup>	90 <sup>d</sup>	99 <sup>d</sup>	88 <sup>d</sup>	23	19	18	17
Albania	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	48	62	64	67
Algeria			100	100	100	100	100	93	100	100	100
American Samoa											
Andorra	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Angola			35	34	32 <sup>f</sup>	51 <sup>f</sup>	3 <sup>f</sup>	18	39	44	48
Anguilla		96	100	100	100						
Antigua and Barbuda				95	96	85	100 <sup>e</sup>	94	100	100	100
Argentina			99 <sup>g</sup>	100	100			92	98	99	100
Armenia		99 <sup>g</sup>	100 <sup>g</sup>	100	100	100	100	80	97	99	100
Aruba		92 <sup>g</sup>	93	94	94	87	100 <sup>e</sup>				
Australia	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Austria	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Azerbaijan		98	100	100	100	100	100	71	90	93	97
Bahamas			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Bahrain			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Bangladesh		32 <sup>h</sup>	55 <sup>h</sup>	59	62 <sup>h</sup>	91 <sup>h</sup>	51 <sup>h</sup>	11	10	10	10
Barbados		100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	87	98	100	100
Belarus	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	92	99	100	100
Belgium	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Belize			90 <sup>g</sup>	91	92	100	86	80	85	86	87
Benin		21	34 <sup>i</sup>	38 <sup>i</sup>	34 <sup>i</sup>	58	16	2	5	6	7
Bermuda	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
BES Islands											
Bhutan			82	92 <sup>g</sup>	100	100	96	38	60	64	68
Bolivia (Plurinational State of)		70 <sup>j</sup>	84	90 <sup>j</sup>	90 <sup>j</sup>	99 <sup>j</sup>	71 <sup>j</sup>	64	75	77	79
Bosnia and Herzegovina			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	51	43	41	40
Botswana		27	48	52	56	71	38	46	58	60	63
Brazil	87 <sup>j</sup>	94	99	100 <sup>j</sup>	100 <sup>j</sup>	100 <sup>j</sup>	98 <sup>j</sup>	86	91	92	93
British Virgin Islands	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Brunei Darussalam	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Bulgaria	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	69	76	78	79
Burkina Faso		9	13 <sup>h</sup>	16	19 <sup>h</sup>	58 <sup>h</sup>	3 <sup>h</sup>	3	6	6	7
Burundi		4	5 <sup>k</sup>	7 <sup>k</sup>	7 <sup>k</sup>	52 <sup>k</sup>	2 <sup>k</sup>	2	2	2	2
Cabo Verde			81 <sup>g</sup>	85	90	96	79	58	67	69	71
Cambodia		17 <sup>h</sup>	31 <sup>h</sup>	41	56 <sup>h</sup>	97 <sup>h</sup>	49 <sup>h</sup>	5	11	12	13
Cameroon		41 <sup>i</sup>	53	55	57 <sup>i</sup>	87	22	14	17	17	18
Canada	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Cayman Islands	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Central African Republic		6 <sup>g</sup>	10 <sup>g</sup>	11	12	26	3	2	2	2	2
Chad		3	6 <sup>g</sup>	7	8	20	5	2	3	3	4
Chile	92 <sup>g</sup>	98 <sup>g</sup>	100	100	100	100	100	86	94	95	97
China			100 <sup>g</sup>	100	100	100	100	46	54	56	57
Chinese Taipei											
Colombia	90 <sup>j</sup>	95 <sup>j</sup>	97 <sup>j</sup>	97 <sup>j</sup>	98 <sup>j</sup>	100 <sup>j</sup>	90 <sup>j</sup>	77	87	89	91
Comoros		39	64	69 <sup>g</sup>	74	96	65	2	5	6	7
Congo (Dem. Rep. of)		7 <sup>h</sup>	13	15 <sup>h</sup>	14 <sup>h</sup>	42 <sup>h</sup>	0 <sup>h</sup>	2	5	5	6
Congo (Rep. of)			39	42 <sup>g</sup>	43	61	10	11	16	17	18
Cook Islands			99	100	100	100	100	83	81	81	80
Costa Rica			99 <sup>j</sup>	100 <sup>j</sup>	99 <sup>j</sup>	100 <sup>j</sup>	98 <sup>j</sup>	87	93	95	96
Côte d'Ivoire		48	58	56 <sup>f</sup>	62 <sup>f</sup>	84	37	18	19	19	18
Croatia	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	84	92	93	94
Cuba		97 <sup>g</sup>	100	100	100	100	98	69	82	85	87
Curacao	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Cyprus	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Czech Republic	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	94	100	100	100
Denmark	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Djibouti		57	49	48	47	57	10	2	7	9	10
Dominica		81	95	98	100			81	89	90	92
Dominican Republic		89 <sup>j</sup>	98 <sup>j</sup>	98 <sup>j</sup>	98 <sup>j</sup>	100 <sup>j</sup>	96 <sup>j</sup>	81	89	90	92
Ecuador		93	97 <sup>j</sup>	97 <sup>j</sup>	99 <sup>j</sup>	100 <sup>j</sup>	97 <sup>j</sup>	87	95	97	98
Egypt		98 <sup>h</sup>	100	100	100 <sup>h</sup>	100 <sup>h</sup>	100 <sup>h</sup>	88	99	100	100
El Salvador		85 <sup>j</sup>	92 <sup>j</sup>	94 <sup>j</sup>	95 <sup>j</sup>	98 <sup>j</sup>	90 <sup>j</sup>	60	76	80	83
Equatorial Guinea				66	68	100	45	14	19	20	22
Eritrea		29	41	43	46	100	7	4	11	12	14
Estonia	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	82	89	90	92
Ethiopia		13 <sup>j</sup>	22	24	27 <sup>j</sup>	92 <sup>j</sup>	12 <sup>j</sup>	3	2	2	2
Faeroe Islands	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				

	Access to electricity (% of population <sup>a</sup> )							Access to clean fuels and technologies for cooking <sup>c</sup> (% of population)			
	Total					Urban <sup>b</sup>	Rural	Total			
	1990	2000	2010	2012	2014	2014	2014	2000	2010	2012	2014 <sup>c</sup>
Falkland Islands (Malvinas)											
Fiji		75	94	98	100	100	76	31	35	36	37
Finland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
France	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
French Guiana											
French Polynesia	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Gabon		74 <sup>g</sup>	85	89 <sup>g</sup>	89	97	42	53	68	70	73
Gambia		34 <sup>g</sup>	42	45	47	71	13	3	4	4	4
Georgia			100	100 <sup>m</sup>	100 <sup>m</sup>	100 <sup>m</sup>	100 <sup>m</sup>	51	54	55	55
Germany	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Ghana		45	65	69	78 <sup>h</sup>	91 <sup>h</sup>	63 <sup>h</sup>	6	17	19	21
Gibraltar	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Greece	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Greenland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Grenada			90	91				91	98	100	100
Guadeloupe											
Guam		100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Guatemala		73 <sup>i</sup>	84	87	85 <sup>j</sup>	94 <sup>j</sup>	75 <sup>j</sup>	40	37	37	36
Guinea		17	24	26 <sup>g</sup>	28	69	4	2	5	5	6
Guinea-Bissau			6 <sup>i</sup>	12	17 <sup>i</sup>	33 <sup>i</sup>	4 <sup>i</sup>	2	2	3	3
Guyana		76	81	83	87 <sup>i</sup>	94 <sup>i</sup>	84 <sup>i</sup>	45	57	59	61
Haiti		34 <sup>g</sup>	36	38 <sup>g</sup>	38	53	17	6	8	8	9
Honduras		68	81 <sup>j</sup>	84 <sup>j</sup>	89 <sup>j</sup>	99 <sup>j</sup>	76 <sup>j</sup>	35	45	46	48
Hong Kong (SAR, China)	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Hungary	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Iceland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
India		60	76	80 <sup>g</sup>	79	98	70	24	32	33	34
Indonesia		86 <sup>n</sup>	94 <sup>n</sup>	96 <sup>n</sup>	97 <sup>n</sup>	100 <sup>n</sup>	94 <sup>n</sup>	2	40	48	57
Iran (Islamic Rep. of)		98 <sup>g</sup>	99	99	99	100	95	89	98	99	100
Iraq			98	98	99	100	96	83	94	96	98
Ireland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Isle of Man	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Israel	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Italy	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Jamaica	70 <sup>g</sup>	85	93	95	97	95	100	72	87	90	93
Japan	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Jordan	97 <sup>g</sup>	99	100	100 <sup>g</sup>	100	100	100	96	100	100	100
Kazakhstan		99	100	100	100	100	100	83	89	91	92
Kenya		16	19 <sup>h</sup>	27	36 <sup>h</sup>	68 <sup>h</sup>	13 <sup>h</sup>	3	5	6	6
Kiribati			63 <sup>g</sup>	52	48	81	22	6	4	4	3
Korea (Dem. People's Rep. of)			28	30	32			3	6	6	7
Korea (Rep. of)		100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Kosovo			99 <sup>g</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Kuwait	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Kyrgyzstan		100	99 <sup>j</sup>	100 <sup>j</sup>	100 <sup>j</sup>	100 <sup>j</sup>	100 <sup>j</sup>	61	72	74	76
Lao PDR		43	68	73	78	95	68	2	4	4	5
Latvia	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	87	95	96	97
Lebanon			100	100	100	100	100	95	100	100	100
Lesotho			19	23	28 <sup>h</sup>	62 <sup>h</sup>	12 <sup>h</sup>	19	28	30	32
Liberia			5	7	9	17	2	2	2	2	2
Libya		100 <sup>g</sup>	99	99	98	100	92				
Liechtenstein	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Lithuania	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Luxembourg	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Macao (SAR, China)		100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Macedonia (The former Yugoslav Rep. of)			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	60	61	61	61
Madagascar		13	16	16	17	29	11	2	2	2	2
Malawi		5 <sup>h</sup>	9 <sup>h</sup>	7 <sup>h</sup>	12 <sup>h</sup>	46 <sup>h</sup>	5 <sup>h</sup>	2	3	3	3
Malaysia			99	100 <sup>g</sup>	100	100	100	93	100	100	100
Maldives		84 <sup>f</sup>	97	99	100 <sup>f</sup>	100 <sup>f</sup>	100 <sup>f</sup>	41	87	95	99
Mali		10	22	26 <sup>g</sup>	27	51	12	3	2	2	2
Malta	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Marshall Islands		68	84	87	90	94	81	32	39	40	41
Martinique											
Mauritania			32	35	39 <sup>o</sup>	77 <sup>o</sup>	2 <sup>o</sup>	31	41	43	45
Mauritius		99 <sup>g</sup>	99	99	99	100	79	90	97	98	99
Mayotte											
Mexico		98 <sup>i</sup>	99 <sup>i</sup>	99 <sup>i</sup>	99 <sup>i</sup>	100 <sup>i</sup>	98 <sup>i</sup>	82	85	86	86

	Access to electricity (% of population <sup>a</sup> )							Access to clean fuels and technologies for cooking <sup>c</sup> (% of population)			
	Total				Urban <sup>b</sup>		Rural	Total			
	1990	2000	2010	2012	2014	2014	2014	2000	2010	2012	2014 <sup>c</sup>
Micronesia (Federated States of)		46 <sup>e</sup>	65 <sup>e</sup>	68	72	57	76	15	22	24	25
Moldova (Rep. of)			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	83	91	92	93
Monaco	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Mongolia		67 <sup>e</sup>	82	84	86	100	51	27	31	31	32
Montenegro	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	65	72	73	74
Montserrat											
Morocco		67	86	90	92 <sup>f</sup>	95 <sup>f</sup>	85 <sup>f</sup>	90	97	98	99
Mozambique		7	17	19	21	54	6	2	4	4	4
Myanmar			49 <sup>f</sup>	51	52 <sup>f</sup>	86 <sup>f</sup>	49 <sup>f</sup>	4	8	8	9
Namibia		37 <sup>e</sup>	45	48	50	83	21	34	43	44	46
Nauru			99	99	99			76	91	93	96
Nepal		27	67	76	85 <sup>i</sup>	98 <sup>i</sup>	82 <sup>i</sup>	7	21	23	26
Netherlands	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
New Caledonia		100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
New Zealand	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Nicaragua		73	78	79	82 <sup>j</sup>	98 <sup>j</sup>	57 <sup>j</sup>	35	45	47	49
Niger		8	12	14 <sup>k</sup>	14	53	5	2	2	3	3
Nigeria	27 <sup>e</sup>	43	48 <sup>e</sup>	55	58	78	39	13	5	4	2
Niue											
Northern Mariana Islands		100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Norway <sup>p</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Oman			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Pakistan		75	91	94	98	100	96	24	39	42	45
Palau			99	98 <sup>q</sup>	100 <sup>q</sup>	100 <sup>q</sup>	99 <sup>q</sup>	55	57	58	58
Palestine (State of)		100 <sup>i</sup>	100 <sup>i</sup>	99	100 <sup>i</sup>	100 <sup>i</sup>	100 <sup>i</sup>				
Panama	70 <sup>e</sup>	81 <sup>e</sup>	87 <sup>e</sup>	90	92	100	66	81	84	85	86
Papua New Guinea		12	20 <sup>s</sup>	19	20	76	12	13	26	29	31
Paraguay		89	97 <sup>j</sup>	98 <sup>j</sup>	99 <sup>j</sup>	100 <sup>j</sup>	98 <sup>j</sup>	41	57	61	64
Peru		72 <sup>j</sup>	88 <sup>j</sup>	91 <sup>j</sup>	93 <sup>j</sup>	99 <sup>j</sup>	75 <sup>j</sup>	38	59	63	68
Philippines		74	85	87	89	97	83	39	43	44	45
Poland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Portugal	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Puerto Rico			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Qatar	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	90	99	100	100
Reunion											
Romania	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	72	79	81	82
Russian Federation	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	92	99	100	100
Rwanda		6 <sup>r</sup>	10 <sup>r</sup>	13	20 <sup>r</sup>	72 <sup>r</sup>	9 <sup>r</sup>	2	2	2	2
Saint Barthelemy											
Saint Helena											
Saint Kitts and Nevis			98	99	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Saint Lucia			96	97	98	100	97	82	96	99	100
Saint Martin (French part)	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Saint Pierre and Miquelon											
Saint Vincent and the Grenadines		80	93	96	99	100	95	91	99	100	100
Samoa		87	96	98	98 <sup>h</sup>	99 <sup>h</sup>	98 <sup>h</sup>	25	27	27	27
San Marino	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Sao Tome and Principe		53 <sup>i</sup>	60	58 <sup>i</sup>	69 <sup>i</sup>	76 <sup>i</sup>	55 <sup>i</sup>	18	27	29	30
Saudi Arabia			100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	98	100	100	100
Senegal		37	53	57	61 <sup>h</sup>	85 <sup>h</sup>	33 <sup>h</sup>	39	37	36	36
Serbia			100	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	63	69	70	71
Seychelles		94	97 <sup>e</sup>	99	100 <sup>e</sup>	100 <sup>e</sup>	99	76	96	99	100
Sierra Leone			14	14	13	32	1	3	2	2	2
Singapore	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Sint Maarten (Dutch part)	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Slovak Republic	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	93	100	100	100
Slovenia	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	88	95	97	98
Solomon Islands		10	28	31	35	39	34	7	8	9	9
Somalia			15	17	19	31	11	2	6	8	9
South Africa		71	83 <sup>s</sup>	85 <sup>s</sup>	86 <sup>s</sup>	94	71	56	75	78	82
South Sudan			2 <sup>e</sup>	4	5	8	4	2	2	2	3
Spain	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Sri Lanka			85 <sup>e</sup>	89	92	98	91	20	20	19	19
Sudan	33 <sup>i</sup>	35	37	38	45 <sup>i</sup>	76 <sup>i</sup>	32 <sup>i</sup>	6	18	21	23
Suriname		100	100	100	100	100	97	79	88	89	91
Swaziland			51	57	65 <sup>i</sup>	100	27	27	33	34	35
Sweden	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
Switzerland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100

	Access to electricity (% of population <sup>a</sup> )							Access to clean fuels and technologies for cooking <sup>c</sup> (% of population)			
	Total			Urban <sup>b</sup>		Rural		Total			
	1990	2000	2010	2012	2014	2014	2014	2000	2010	2012	2014 <sup>c</sup>
Syrian Arab Republic			93 <sup>e</sup>	94	96	100	86	95	100	100	100
Tajikistan		98	99	99 <sup>e</sup>	100	100	99	62	69	70	72
Tanzania (United Rep. of)		10	15 <sup>e</sup>	15 <sup>e</sup>	16	41	4	2	2	2	2
Thailand		82 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100	60	72	74	76
Timor-Leste			38 <sup>e</sup>	42	45	63	37	5	4	4	4
Togo		17 <sup>h</sup>	37	41	46 <sup>h</sup>	83 <sup>h</sup>	16 <sup>h</sup>	2	4	5	6
Tonga		85	92	93 <sup>e</sup>	95	100	91	50	60	62	63
Trinidad and Tobago		91 <sup>e</sup>	99	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	96	100	100	100
Tunisia		95 <sup>f</sup>	100 <sup>f</sup>	100 <sup>f</sup>	100 <sup>f</sup>	100	100	91	99	100	100
Turkey			100 <sup>e</sup>	100	100	100	100				
Turkmenistan		100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100	98	100	100	100
Turks and Caicos Islands	89 <sup>e</sup>	96	94	93	95	95	100 <sup>e</sup>				
Tuvalu			97	98 <sup>e</sup>	99	99	97	23	28	29	30
Uganda		8	13	14	20 <sup>f</sup>	51 <sup>f</sup>	10 <sup>f</sup>	2	2	2	2
Ukraine			100 <sup>e</sup>	100	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	90	95	97	98
United Arab Emirates	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	96	100	100	100
United Kingdom of Great Britain and Northern Ireland	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
United States of America	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100	100	100	100
United States Virgin Islands	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>	100 <sup>e</sup>				
Uruguay			99	99	100 <sup>e</sup>	100 <sup>e</sup>	97	94	98	99	99
Uzbekistan		100	100	100	100	100	100	81	88	89	90
Vanuatu		22	31	33	34	100	12	13	15	16	16
Venezuela (Bolivarian Rep. of)		98	99	99	99	100	92	94	96	97	97
Viet Nam		86	98	100	99 <sup>i</sup>	100 <sup>i</sup>	99 <sup>i</sup>	24	43	47	51
Wallis and Futuna Islands											
Yemen		51	66	69	72	97	59	61	62	62	62
Zambia	14 <sup>h</sup>	17 <sup>h</sup>	22 <sup>h</sup>	23	28 <sup>h</sup>	62 <sup>h</sup>	4 <sup>h</sup>	13	15	16	16
Zimbabwe		33	36	36	32 <sup>i</sup>	83 <sup>i</sup>	10 <sup>i</sup>	28	31	31	31
<b>World</b>	<b>73</b>	<b>78</b>	<b>84</b>	<b>85</b>	<b>85</b>	<b>96</b>	<b>73</b>	<b>50</b>	<b>56</b>	<b>56</b>	<b>57</b>
<b>Africa</b>	<b>38</b>	<b>38</b>	<b>43</b>	<b>45</b>	<b>47</b>	<b>76</b>	<b>27</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>
Africa (excluding North Africa)	23	26	32	35	37	70	17	11	12	12	12
North Africa	75	81	85	86	88	95	80	75	83	84	85
<b>Arab region</b>	<b>76</b>	<b>82</b>	<b>88</b>	<b>89</b>	<b>90</b>	<b>97</b>	<b>81</b>	<b>79</b>	<b>80</b>	<b>81</b>	<b>82</b>
Arab Least Developed Countries (LDCs)	32	40	48	49	55	80	41	28	36	37	39
Arab North Africa	75	85	94	96	97	99	93	91	98	99	100
Gulf Cooperation Council Countries	100	100	100	100	100	100	100	98	100	100	100
Mashreq	92	96	98	99	99	100	98	88	98	99	100
<b>Asia Pacific</b>	<b>70</b>	<b>79</b>	<b>88</b>	<b>90</b>	<b>90</b>	<b>99</b>	<b>83</b>	<b>40</b>	<b>41</b>	<b>41</b>	<b>42</b>
East and North-East Asia	89	94	99	99	99	100	100	52	59	60	61
North and Central Asia	99	100	100	100	100	100	100	87	94	95	96
South and South-West Asia	47	61	77	81	82	98	73	26	33	34	35
South-East Asia	63	79	88	90	91	96	87	23	44	48	53
The Pacific	83	82	83	83	83	99	44	80	81	81	82
<b>Europe, North America, and Central Asia</b>	<b>99</b>	<b>99</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>95</b>	<b>96</b>	<b>96</b>	<b>96</b>
Eastern Europe, Caucasus, and Central Asia	96	98	100	100	100	100	100	88	94	95	96
North America	100	100	100	100	100	100	100	100	100	100	100
South-East Europe	98	100	100	100	100	100	100	68	74	75	76
Western and Central Europe	100	100	100	100	100	100	100	100	100	100	100
<b>Latin America and Caribbean</b>	<b>85</b>	<b>92</b>	<b>96</b>	<b>97</b>	<b>97</b>	<b>99</b>	<b>89</b>	<b>78</b>	<b>79</b>	<b>80</b>	<b>80</b>
Caribbean	71	77	81	82	82	88	69	58	65	67	68
Latin America	87	93	97	98	98	100	91	79	86	87	88
<b>Low income</b>	<b>8</b>	<b>12</b>	<b>22</b>	<b>25</b>	<b>28</b>	<b>55</b>	<b>17</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Lower middle income</b>	<b>49</b>	<b>63</b>	<b>76</b>	<b>79</b>	<b>80</b>	<b>95</b>	<b>70</b>	<b>26</b>	<b>35</b>	<b>37</b>	<b>38</b>
<b>Upper middle income</b>	<b>88</b>	<b>94</b>	<b>98</b>	<b>98</b>	<b>99</b>	<b>100</b>	<b>97</b>	<b>58</b>	<b>66</b>	<b>68</b>	<b>70</b>
<b>High income</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>98</b>	<b>99</b>	<b>99</b>	<b>99</b>

Note: Unless otherwise noted, data are World Bank estimates based on the statistical model described in chapter 2, annex 2, in the main report.

- a. Most surveys report data on the percentage of households with access to electricity rather than on the percentage of the population with access.
- b. Data are calculated based on the rural and total population with access and are not based on a statistical model.
- c. Data are from the World Health Organization's Global Health Observatory (<http://apps.who.int/gho/data/node.main.134>, updated April 6, 2016).
- d. From the National Risk and Vulnerability Assessment.

- e. Based on the assumption of universal access in countries that are either part of a region classified by the United Nations as developed or classified as high income by the World Bank (see chapter 2, annex 2, in the main report).
- f. Based on census data.
- g. Based on household survey data.
- h. Based on Demographic and Health Survey data.
- i. Based on Multiple Indicator Cluster Survey data.
- j. From the Socio-Economic Database for Latin America and the Caribbean.
- k. From the Enquête sur les conditions de vie des ménages du Burundi 2013/14.

- l. Based on Living Standards Measurement Study data.
- m. From the ECAPOV database.
- n. From the National Socioeconomic Survey.
- o. From the Enquête permanente sur les conditions de vie.
- p. Includes Svalbard and Jan Mayen Islands.
- q. Based on Household Income and Expenditure Survey data.
- r. From the Enquête intégrale sur les conditions de vie des ménages 4 2013/14.
- s. Based on General Household Survey data.

## 2 ENERGY EFFICIENCY

	Primary energy intensity <sup>a</sup> (megajoules per 2011 PPP \$)				Change in energy intensity <sup>b</sup> (%)								Avoided energy consumption (petajoules)				
					Final energy												
					Primary energy		Agricultural		Industrial		Services				Residential		
1990	2010	2012	2014	1990- 2010	2010- 12	2012- 14	2010- 12	2012- 14	2010- 12	2012- 14	2010- 12	2012- 14	2010- 12	2012- 14	2012- 13	2013- 14	
Afghanistan <sup>c</sup>	1.88	2.94	2.98	2.64	2.25	0.76	-6.00	-4.33	4.93	12.51	5.69	52.33	5.19	-0.08	0.30	-15.83	-4.59
Albania <sup>d</sup>	7.91	3.26	2.94	3.34	-4.34	-4.97	6.54	1.29	4.28	1.08	7.42	-3.13	2.61	2.31	4.64	6.29	2.30
Algeria <sup>d</sup>	3.50	3.61	3.89	4.10	0.15	3.81	2.64	-1.75	5.48	4.06	7.16	8.80		10.40	4.15	33.17	37.00
American Samoa <sup>c</sup>														-5.80	0.33		
Andorra <sup>c</sup>														-4.71	0.91		
Angola <sup>d</sup>	4.61	3.70	3.86	3.65	-1.09	2.13	-2.78							0.11	0.29	-1.75	-12.94
Anguilla <sup>c</sup>																	
Antigua and Barbuda <sup>c</sup>	3.95	4.18	4.14	4.01	0.28	-0.52	-1.54			9.63	-1.43	1.52	-2.10	1.58	0.18	0.02	-0.14
Argentina <sup>d</sup>	5.44	4.25	4.16	4.47	-1.22	-1.09	3.68	-4.46	6.39	-1.54	3.87	-3.98	4.59	2.00	1.56	-54.72	171.81
Armenia <sup>d</sup>	24.37	5.39	5.75	5.35	-7.27	3.24	-3.48	-3.59	4.49	6.95	-1.51	4.26	38.84	10.92	3.63	-3.09	-6.69
Aruba <sup>c</sup>																	
Australia <sup>d</sup>	7.42	5.86	5.49	5.16	-1.17	-3.25	-2.99	0.62	0.67	-2.07	-0.97	-2.83	0.05	-0.58	-2.17	3.24	-93.39
Austria <sup>d</sup>	4.36	3.95	3.69	3.59	-0.50	-3.38	-1.26	5.78	-2.16	-3.05	-0.79	-6.97	-2.10	-2.54	-4.23	31.22	-47.73
Azerbaijan <sup>d</sup>	15.57	3.36	3.88	3.76	-7.38	7.50	-1.54	-0.31	-0.11	12.88	0.43	52.88	-9.73	-6.80	2.72	-4.33	12.44
Bahamas <sup>c</sup>	4.34	2.94	3.39	4.03	-1.94	7.40	9.02	10.72		33.44	32.39	41.12		-2.55	15.92	10.87	-8.04
Bahrain <sup>d</sup>	12.48	10.45	9.79	10.03	-0.89	-3.18	1.18	-5.84	-2.84	-0.99	6.24	-6.70	6.65	0.09	3.87	21.83	6.69
Bangladesh <sup>d</sup>	3.90	3.44	3.30	3.13	-0.63	-2.02	-2.61	12.30	-5.82	-3.19	-4.28	-7.05	-1.04	1.04	1.79	-47.78	-13.45
Barbados <sup>c</sup>	4.65	4.74	4.56	3.88	0.10	-1.90	-7.79							-4.60	-2.14	-0.89	0.05
Belarus <sup>d</sup>	23.13	7.73	7.98	7.06	-5.33	1.59	-5.93	1.70	1.45	-4.98	-1.36	1.51	-6.06	0.68	-3.62	-5.33	-38.30
Belgium <sup>d</sup>	6.62	5.70	4.98	4.82	-0.75	-6.48	-1.61	-2.35	4.79	-5.26	-1.23	-6.19	-4.08	-5.91	-6.40	52.12	-109.32
Belize <sup>c</sup>	8.56	5.06	4.69	4.53	-2.59	-3.65	-1.77	-3.87	-1.13	6.00	2.13	-6.58	-3.80	-4.13	-10.68	0.20	-0.47
Benin <sup>d</sup>	9.55	9.14	9.03	8.74	-0.22	-0.61	-1.60			2.90	24.63	-3.35	-2.69	0.22	0.96	-2.98	-1.04
Bermuda <sup>c</sup>	2.94	2.31	2.04	2.30	-1.20	-6.03	6.20			-12.01	17.85	1.26	-7.90	6.83	8.77	-1.91	0.68
BES Islands <sup>c</sup>																	
Bhutan <sup>c</sup>	30.02	12.55	11.56	11.06	-4.27	-4.03	-2.19		2.71	-5.15	8.01		2.92	-1.11	-1.41	0.29	-2.94
Bolivia (Plurinational State of) <sup>d</sup>	4.30	4.99	5.48	5.22	0.75	4.78	-2.37	1.85	1.20	2.07	-2.42	3.31	2.59	2.82	2.82	-7.21	1.28
Bosnia and Herzegovina <sup>d</sup>	47.11	7.58	7.82	8.85	-8.73	1.57	6.35	0.61	28.98	3.27	7.93			-0.56	57.28	-8.09	49.75
Botswana <sup>d</sup>	4.56	3.36	3.30	3.37	-1.53	-0.82	1.04	5.12	1.02	-3.10	4.07	-2.75	1.15	0.13	0.06	-4.74	1.29
Brazil <sup>d</sup>	3.81	3.89	3.89	4.06	0.11	0.03	2.16	-0.29	-1.10	-0.82	0.41	2.15	3.39	-0.75	1.24	-83.78	173.03
British Virgin Islands <sup>c</sup>																	
Brunei Darussalam <sup>d</sup>	3.65	4.79	5.43	5.25	1.37	6.40	-1.66			-3.72	1.05	-1.93	1.57	2.97	-2.88	-0.90	1.14
Bulgaria <sup>d</sup>	14.60	6.63	6.69	6.34	-3.87	0.45	-2.65	6.46	-6.18	-2.10	-1.27	0.35	-4.94	3.03	-3.52	-23.89	3.87
Burkina Faso <sup>c</sup>	12.92	6.44	6.17	5.95	-3.42	-2.09	-1.82	4.53	23.40	-6.69	11.55			-1.70	-1.89	2.35	-9.86
Burundi <sup>c</sup>	9.79	13.30	7.93	7.83	1.55	-22.78	-0.66			3.61	-10.54			-23.98	-6.14	-5.52	-0.20
Cabo Verde <sup>c</sup>	4.03	3.16	2.84	2.70	-1.21	-5.24	-2.57			-0.17	6.06	-6.18	4.42	1.29	0.01	-0.23	-0.33
Cambodia <sup>d</sup>	14.28	6.15	5.83	5.59	-4.13	-2.58	-2.13			-5.70	-3.48	16.55	6.91	2.01	1.09	-7.45	-2.86
Cameroon <sup>d</sup>	6.24	5.50	5.02	4.93	-0.63	-4.47	-0.91	4.71	1.35	-4.85	12.18	-2.11	-2.30	0.02	-0.02	-5.85	-6.74
Canada <sup>d</sup>	10.17	8.01	7.74	7.70	-1.19	-1.72	-0.24	-3.33	-0.54	0.97	0.31	-8.03	0.11	-0.36	2.83	25.13	-79.31
Cayman Islands <sup>c</sup>																	
Central African Republic <sup>c</sup>	11.19	5.71	5.47	8.87	-3.31	-2.10	27.32			3.58	16.77	-3.67	9.32	-3.86	-4.23	8.14	0.18
Chad <sup>c</sup>	6.78	3.18	3.01	2.79	-3.72	-2.59	-3.84			-6.58	-2.88	-4.43	-0.27	-1.89	-1.85	-1.82	-3.19
Chile <sup>d</sup>	4.83	3.92	4.24	3.88	-1.04	3.95	-4.29	1.70	-15.00	-1.18	3.19	-3.63	2.43	4.82	-18.22	33.39	-95.04
China <sup>d</sup>	21.18	8.68	8.19	7.43	-4.36	-2.86	-4.74	-0.32	0.50	-4.62	-4.95	1.51	-3.58	2.41	2.68	-2,593.15	-2,906.04
Chinese Taipei <sup>d</sup>																	
Colombia <sup>d</sup>	3.93	2.61	2.38	2.34	-2.02	-4.52	-0.76	1.82	-0.58	-3.27	-4.51	2.82	-5.16	-0.45	-1.22	-27.62	-24.94
Comoros <sup>c</sup>	3.35	4.94	4.64	4.66	1.97	-3.08	0.20							1.08	0.45	0.25	-0.18
Congo (Dem. Rep. of) <sup>d</sup>	11.14	21.13	24.32	22.59	3.25	7.27	-3.63			-19.00	-5.45			-26.28	-8.74	40.02	27.20
Congo (Rep. of) <sup>d</sup>	2.63	3.09	4.39	4.08	0.81	19.23	-3.57			54.18	-9.62			-17.94	25.53	0.07	2.61
Cook Islands <sup>c</sup>																	
Costa Rica <sup>d</sup>	3.11	3.38	3.13	3.03	0.42	-3.74	-1.60	-1.15	-0.08	-4.45	2.63	-1.08	-1.79	-11.56	-3.27	-2.37	-4.46
Côte d'Ivoire <sup>d</sup>	4.64	7.75	9.10	8.43	2.60	8.37	-3.75	13.13	-0.65	10.44	6.58	3.45	12.26	6.17	0.86	-7.94	-10.71
Croatia <sup>d</sup>	4.90	4.45	4.19	3.97	-0.48	-2.95	-2.73	5.22	1.23	-2.65	0.32	-3.27	-1.12	-2.17	-7.08	-0.88	-12.90
Cuba <sup>d</sup>	5.03	2.48	2.27	2.13	-3.48	-4.21	-3.18	-5.96	6.16	-4.06	-1.45	-0.37	1.75	2.06	2.53	-19.73	4.47
Curacao <sup>d</sup>																	
Cyprus <sup>d</sup>	4.15	3.66	3.41	3.29	-0.63	-3.52	-1.71	10.77	3.96	-1.77	26.44	-6.37	-2.11	0.77	-9.35	-1.31	1.63
Czech Republic <sup>d</sup>	10.12	6.31	6.00	5.72	-2.33	-2.53	-2.36	1.55	-1.42	-2.41	-1.90	-4.41	-5.24	-3.80	-4.35	10.66	-47.66
Denmark <sup>d</sup>	4.25	3.42	3.00	2.79	-1.08	-6.29	-3.65	-0.82	-1.22	-4.49	-3.40	-3.29	-3.79	-6.39	-4.97	-5.40	-32.47
Djibouti <sup>c</sup>	3.53	4.76	4.42	4.13	1.50	-3.69	-3.33							0.12	0.19	-0.20	-0.31
Dominica <sup>c</sup>	2.03	2.87	2.91	2.78	1.74	0.64	-2.18			2.80	0.23	3.34	-4.06	0.32	-0.11	0.03	-0.05
Dominican Republic <sup>d</sup>	4.40	2.84	2.90	2.43	-2.16	0.95	-8.40	-1.89	-6.98	-2.08	-8.29	3.26	8.19	-1.53	-0.16	-21.03	-19.00
Ecuador <sup>d</sup>	3.47	3.53	3.24	3.44	0.08	-4.22	3.11	7.17	-0.59	-2.32	0.01	2.60	0.52	1.06	1.73	-2.54	19.87
Egypt <sup>d</sup>	3.98	3.66	3.80	3.48	-0.41	1.83	-4.29	-0.72	-8.88	-3.96	-1.24	6.94	-0.53	1.64	-2.45	-208.15	-56.41
El Salvador <sup>d</sup>	4.34	3.95	3.77	3.52	-0.47	-2.30	-3.48	-100.00		-9.06	-9.54	62.44	-1.53	-7.70	-0.45	-6.92	1.56
Equatorial Guinea <sup>c</sup>	12.66	2.53	2.61	2.63	-7.73	1.52	0.39							1.29	-3.05	-2.66	2.95
Eritrea <sup>d</sup>		4.99	4.81	4.95		-1.81	1.44							0.94	0.02	0.31	0.37
Estonia <sup>d</sup>	17.99	7.96	6.91	7.23	-3.99	-6.84	2.28	4.04	2.36	-5.87	-3.10	-4.15	3.80	-2.45	-4.06	-1.54	-5.83





	Primary energy intensity <sup>a</sup> (megajoules per 2011 PPP \$)				Change in energy intensity <sup>b</sup> (%)										Avoided energy consumption (petajoules)		
					Final energy												
					Primary energy		Agricultural		Industrial		Services		Residential				
1990	2010	2012	2014	1990-2010	2010-12	2012-14	2010-12	2012-14	2010-12	2012-14	2010-12	2012-14	2010-12	2012-14	2012-13	2013-14	
Mauritania <sup>c</sup>	4.01	3.73	3.82	3.50	-0.35	1.16	-4.21	-1.41	-1.95	7.91	-5.85	-2.25	50.17	3.53	-1.43	-2.40	-0.86
Mauritius <sup>d</sup>	3.48	2.83	2.68	2.62	-1.04	-2.57	-1.14	0.23	-0.05	-3.90	-1.77	-0.30	0.60	0.79	2.78	-0.55	-0.50
Mayotte <sup>c</sup>																	
Mexico <sup>d</sup>	4.82	4.01	4.07	3.85	-0.91	0.68	-2.73	2.10	-5.25	0.42	-5.76	-2.10	0.67	-0.81	-2.11	-58.95	-188.16
Micronesia (Federated States of) <sup>c</sup>		5.01	5.77	6.84		7.34	8.89			-6.10	32.86	-4.67	1.53	2.07	1.73	0.23	0.18
Moldova (Rep. of) <sup>d</sup>	17.40	10.50	9.68	8.16	-2.49	-4.00	-8.18	-15.14	-17.84	-7.95	-13.40	-5.43	-5.22	2.13	1.06	-12.45	-1.13
Monaco <sup>c</sup>																	
Mongolia <sup>d</sup>	12.75	7.89	7.25	6.78	-2.37	-4.14	-3.31	-6.27	-12.58	2.87	-12.98	-2.57	-4.68	-1.67	-1.00	-7.73	-17.58
Montenegro <sup>d</sup>		5.77	5.19	4.43		-5.15	-7.57	-4.37	26.52	3.10	-23.63	129.79	173.59	-8.72	-4.63	-3.64	-0.99
Montserrat <sup>c</sup>																	
Morocco <sup>d</sup>	3.25	3.37	3.40	3.23	0.19	0.40	-2.63	1.16	-4.29	2.33	-5.33	-2.42	4.08	2.08	0.76	-22.55	-6.53
Mozambique <sup>d</sup>	49.44	18.76	17.31	16.58	-4.73	-3.94	-2.13	4.88	9.65	-1.64	-2.01	-7.85	5.02	-1.95	0.51	-15.04	-9.96
Myanmar <sup>d</sup>	14.89	3.15	3.10	3.24	-7.48	-0.74	2.29	20.44	27.03					0.36	0.16	-16.65	15.12
Namibia <sup>d</sup>		3.50	3.39	3.32		-1.56	-1.18	9.94	12.18	3.67	-0.57	-5.23	-6.95	-0.18	4.08	0.78	-1.12
Nauru <sup>c</sup>														1.89	2.61		
Nepal <sup>d</sup>	10.79	7.97	7.27	7.67	-1.51	-4.45	2.69	0.88	6.06	10.46	1.33	3.35	-0.25	-3.21	6.02	29.02	-7.31
Netherlands <sup>d</sup>	5.69	4.59	4.25	3.97	-1.07	-3.73	-3.44	-4.56	-5.88	-0.57	-1.15	-5.09	-7.02	-7.05	-8.63	12.76	-205.46
New Caledonia <sup>c</sup>														2.74	-2.22		
New Zealand <sup>d</sup>	6.66	5.51	5.46	5.57	-0.94	-0.48	1.07	3.97	-5.38	-1.95	2.28	-0.61	-2.53	-1.18	-1.52	1.36	5.07
Nicaragua <sup>d</sup>	6.75	5.36	5.31	5.42	-1.15	-0.44	0.97	38.45	6.99	-6.19	-4.64	-2.32	6.76	0.18	0.38	-2.79	0.28
Niger <sup>d</sup>	6.58	6.98	6.23	7.01	0.30	-5.51	6.08	2.46	-12.35	-3.78	-7.81	-11.00	6.95	-7.78	12.13	15.35	-2.36
Nigeria <sup>d</sup>	9.60	6.15	6.26	5.64	-2.20	0.92	-5.12	-39.72	-3.48	12.11	-15.16	26.82	-11.55	0.34	-0.19	-217.48	-333.28
Niue <sup>c</sup>																	
Northern Mariana Islands <sup>c</sup>														1.25	-0.16		
Norway <sup>d,g</sup>	4.80	4.61	3.89	3.65	-0.20	-8.20	-3.08	0.69	-10.21	-1.30	0.41	-3.10	-7.03	-4.45	-4.92	-1.11	-43.29
Oman <sup>d</sup>	2.78	5.68	6.79	6.52	3.64	9.28	-1.96	3.74	4.70		3.58		-0.37	0.54	0.56	10.49	21.85
Pakistan <sup>d</sup>	5.46	4.87	4.67	4.43	-0.57	-2.11	-2.58	-10.41	4.50	-4.55	-3.42	-3.10	-2.03	1.32	-0.77	-109.27	-84.83
Palau <sup>c</sup>		13.88	12.70	12.99		-4.31	1.10					-4.76	-3.97	-4.94	-0.57	0.06	-0.05
Palestine (State of) <sup>c</sup>	4.69	3.38	2.96	3.70	-1.63	-6.37	11.82	77.25	31.10	4.13	-16.54	15.38	-9.63	0.19	-0.37	3.86	14.79
Panama <sup>d</sup>	3.28	2.69	2.47	2.27	-0.99	-4.22	-4.00	1.51	10.04	-1.16	-12.62	-6.04	4.98	0.66	1.67	-6.68	-1.32
Papua New Guinea <sup>c</sup>	13.19	9.50	8.16	7.94	-1.63	-7.31	-1.33					27.36	45.39	-2.05	-1.72	5.12	-8.60
Paraguay <sup>d</sup>	5.06	4.45	4.49	3.88	-0.64	0.43	-6.94			-3.25	-3.21	3.18	2.57	-0.55	-0.80	-25.95	0.62
Peru <sup>d</sup>	3.55	2.69	2.62	2.81	-1.36	-1.45	3.59	12.82	-23.85	-1.97	5.31	3.13	4.05	-5.16	-0.31	9.84	-21.27
Philippines <sup>d</sup>	4.84	3.22	3.12	3.03	-2.01	-1.60	-1.51	-6.33	4.63	-5.25	-2.45	-2.83	2.95	-0.43	0.46	-14.39	-19.15
Poland <sup>d</sup>	11.17	5.15	4.70	4.32	-3.80	-4.50	-4.07	-0.28	-7.73	-4.02	-2.53	-4.20	-5.30	-2.82	-4.38	-81.05	-158.91
Portugal <sup>d</sup>	3.47	3.40	3.29	3.25	-0.11	-1.60	-0.54	-6.47	-1.22	-3.38	0.27	0.86	1.42	-4.48	-1.92	-1.27	-10.30
Puerto Rico <sup>c</sup>	0.01	0.21	0.39	0.49	15.86	35.63	11.56	-5.56	5.56	3.71	-15.35			-1.84	3.94	0.86	0.03
Qatar <sup>d</sup>	8.03	5.13	5.95	6.32	-2.21	7.65	3.05			5.93	0.12	-3.77	6.29	-1.39	15.40	-6.83	44.36
Reunion <sup>c</sup>																	
Romania <sup>d</sup>	10.05	4.17	4.09	3.48	-4.30	-0.97	-7.75	13.82	-22.13	3.60	-5.89	-11.15	-0.69	0.22	-3.83	-74.49	-32.50
Russian Federation <sup>d</sup>	12.03	8.73	8.70	8.19	-1.59	-0.21	-2.95	9.95	-11.48	-2.33	-2.84	-4.32	-0.26	-0.82	1.43	-468.47	9.82
Rwanda <sup>c</sup>	5.73	6.14	5.69	5.34	0.35	-3.74	-3.16							0.72	-0.64	-1.22	-4.18
Saint Barthelemy <sup>c</sup>																	
Saint Helena <sup>c</sup>																	
Saint Kitts and Nevis <sup>c</sup>	3.69	2.96	2.99	2.68	-1.10	0.47	-5.21	6.17	9.93	11.40	-10.11	-4.22	-4.90	-0.91	0.03	-0.09	-0.10
Saint Lucia <sup>c</sup>	2.24	3.14	3.19	3.19	1.71	0.71	0.03			-0.06	7.88	1.84	2.18	-1.86	0.00	0.00	0.03
Saint Martin (French part) <sup>c</sup>																	
Saint Pierre and Miquelon <sup>c</sup>																	
Saint Vincent and the Grenadines <sup>c</sup>	2.19	3.10	3.46	2.83	1.75	5.62	-9.48			1.40	16.23	-7.15	12.34	8.83	9.49	-0.39	0.11
Samoa <sup>c</sup>	4.34	4.53	4.06	4.26	0.21	-5.37	2.45	-43.02	-2.46	2.42	83.18	-6.96	-2.41	-5.71	3.23	0.16	-0.03
San Marino <sup>c</sup>																	
Sao Tome and Principe <sup>c</sup>	5.71	5.08	5.00	4.61	-0.58	-0.86	-3.98					5.48	-5.33	-0.37	-1.90	-0.07	
Saudi Arabia <sup>d</sup>	4.20	6.25	5.82	5.83	2.01	-3.45	0.08	5.91	2.61	-5.40	2.90	3.05	0.22	2.35	2.26	-59.60	122.96
Senegal <sup>d</sup>	5.04	5.66	5.60	5.10	0.58	-0.56	-4.56	1.67	-55.20	4.70	0.04	2.59	-9.54	-1.06	-10.30	-10.16	-0.31
Serbia <sup>d</sup>	7.23	7.29	6.76	6.12	0.04	-3.65	-4.85	24.20	-16.09	-1.95	-6.49	-4.68	-5.56	1.33	-5.64	-17.28	-15.72
Seychelles <sup>c</sup>	2.23	3.34	2.87	2.98	2.05	-7.35	1.86			-4.24	17.07	3.57	-11.90	1.49	-2.12	-0.88	1.01
Sierra Leone <sup>c</sup>	9.32	7.62	6.72	5.73	-1.00	-6.10	-7.71			-38.77	-9.76	-4.65	-15.02	-2.67	-2.92	-7.83	-0.68
Singapore <sup>d</sup>	4.62	2.91	2.71	2.70	-2.28	-3.57	-0.20			-0.46	-2.33	-2.58	-2.83	-2.25	0.41	-6.51	-17.80
Sint Maarten (Dutch part) <sup>c</sup>																	
Slovak Republic <sup>d</sup>	11.83	5.65	5.06	4.66	-3.63	-5.40	-4.05	-6.17	-16.80	-3.62	-2.84	-17.37	-4.55	-5.51	-3.00	4.84	-35.67
Slovenia <sup>d</sup>	6.40	5.28	5.18	4.81	-0.96	-0.95	-3.61	5.88	-4.77	-0.55	-1.05	-7.17	-3.86	-4.24	-8.04	-2.34	-13.78
Solomon Islands <sup>c</sup>	9.40	6.39	5.47	5.33	-1.91	-7.51	-1.29							-1.76	-1.24	-0.13	-0.02
Somalia <sup>c</sup>	23.57	43.35	41.94	40.07	3.09	-1.65	-2.25							-1.39	0.32	-2.43	-0.44
South Africa <sup>d</sup>	10.44	9.67	9.00	9.16	-0.38	-3.50	0.84	8.40	1.50	-2.68	1.98	3.86	-0.63	3.63	-0.51	79.36	-51.76
South Sudan <sup>d</sup>			1.37	1.28			-3.57								-4.55	-3.45	-0.01
Spain <sup>d</sup>	4.03	3.48	3.55	3.25	-0.72	0.95	-4.30	8.14	-4.47	6.92	1.30	1.07	-6.63	-4.41	-2.36	-54.61	-106.90
Sri Lanka <sup>d</sup>	3.69	2.37	2.31	2.03	-2.19	-1.18	-6.32	-47.69	26.89	-5.40	-1.55	-2.47	-6.73	6.82	-10.31	-45.16	-9.36

	Primary energy intensity <sup>a</sup> (megajoules per 2011 PPP \$)				Change in energy intensity <sup>b</sup> (%)										Avoided energy consumption (petajoules)		
					Final energy												
					Primary energy		Agricultural		Industrial		Services		Residential				
1990	2010	2012	2014	1990-2010	2010-12	2012-14	2010-12	2012-14	2010-12	2012-14	2010-12	2012-14	2010-12	2012-14	2012-13	2013-14	
Sudan <sup>d</sup>	9.85	4.68	4.18	4.11	-3.66	-5.45	-0.87	-14.97	2.31	-14.81	-4.76	-3.71	-1.63	-9.59	0.46	-8.91	-4.59
Suriname <sup>d</sup>	5.11	3.99	4.00	3.38	-1.22	0.09	-8.07	7.74	-4.49	5.11	0.87	3.63	-1.04	5.55	2.18	-2.52	0.87
Swaziland <sup>c</sup>	3.65	4.80	4.87	5.00	1.38	0.71	1.30	-1.32	-5.88	-1.71	10.21	-18.85	31.46	3.22	3.08	1.70	-0.43
Sweden <sup>d</sup>	7.47	5.30	5.10	4.73	-1.70	-1.89	-3.71	-17.89	-10.12	-0.48	-0.62	-7.14	0.87	-2.03	-8.80	-49.77	-45.15
Switzerland <sup>d</sup>	3.26	2.59	2.46	2.32	-1.15	-2.54	-2.87	13.73	-13.10	-4.93	-1.33	-4.29	-7.53	-4.99	-6.21	5.38	-84.66
Syrian Arab Republic <sup>d</sup>	9.61	6.93	6.53	6.29	-1.62	-2.91	-1.89	2.87	0.98			-29.68	-25.19	-14.81	-12.22	30.09	-12.81
Tajikistan <sup>d</sup>	11.54	5.66	5.29	5.51	-3.50	-3.35	2.12	-6.29	-3.41	-10.40	-24.82	142.09	5.57	-6.16	7.97	3.46	1.08
Tanzania (United Rep. of) <sup>d</sup>	11.18	9.24	9.14	8.54	-0.95	-0.56	-3.37	0.05	-0.09	0.51	0.12	-4.67	-1.23	-0.19	-0.28	-31.02	-25.01
Thailand <sup>d</sup>	4.67	5.45	5.39	5.56	0.78	-0.48	1.55	3.26	0.87	5.01	0.54	-1.92	-9.67	2.38	-0.93	-72.93	-15.17
Timor-Leste <sup>c</sup>		2.20	2.19	3.00		-0.40	17.15					-12.64	15.03	-7.39	2.33	0.56	0.34
Togo <sup>d</sup>	10.34	16.60	15.14	14.53	2.39	-4.51	-2.03			7.72	2.86	-16.14	-1.47	0.46	0.11	-0.90	-2.44
Tonga <sup>c</sup>	3.26	3.24	2.94	3.07	-0.04	-4.81	2.29					0.68	2.71	-18.54	3.04	0.12	-0.01
Trinidad and Tobago <sup>d</sup>	16.92	21.15	20.01	19.83	1.12	-2.73	-0.44			1.91	4.83	-2.60	0.28	-2.77	5.20	2.85	13.38
Tunisia <sup>d</sup>	4.46	3.86	3.80	3.72	-0.72	-0.79	-0.96	-2.86	5.48	4.15	3.06	-0.02	-1.60	1.02	1.20	-6.29	3.64
Turkey <sup>d</sup>	3.83	3.71	3.70	3.55	-0.16	-0.11	-2.13	-6.47	-1.74	0.29	-3.57	30.05	-5.58	-2.85	-8.24	-222.27	-9.60
Turkmenistan <sup>d</sup>	23.94	18.78	16.59	14.29	-1.21	-6.01	-7.17							-5.98	4.07	-44.41	-51.89
Turks and Caicos Islands <sup>c</sup>													0.59	-0.08			
Tuvalu <sup>c</sup>	3.45	3.88	3.69	3.70	0.59	-2.45	0.09	100.36	-0.74			-10.21	1.19	-4.34	-0.17		0.00
Uganda <sup>c</sup>	20.88	8.25	7.51	7.03	-4.54	-4.58	-3.27	-6.84	3.71	-3.59	-16.67	7.52	9.29	-0.72	-3.20	-4.68	-28.14
Ukraine <sup>d</sup>	19.38	15.41	13.52	12.49	-1.14	-6.32	-3.90	-0.31	-10.87	-2.94	0.89	0.67	-1.52	-0.51	-6.53	-52.92	-125.97
United Arab Emirates <sup>d</sup>	4.12	5.40	5.32	5.03	1.36	-0.71	-2.81			-1.98	-5.51	2.31	-3.59	0.16	3.99	-8.93	-146.17
United Kingdom of Great Britain and Northern Ireland <sup>d</sup>	5.66	3.74	3.47	3.05	-2.05	-3.75	-6.14	1.96	-2.71	-2.14	-3.72	-2.36	-6.54	-5.71	-7.97	-74.84	-447.03
United States of America <sup>d</sup>	8.67	6.07	5.69	5.63	-1.76	-3.18	-0.58	-8.48	-8.36	-3.24	-0.95	-3.96	2.54	-4.86	4.96	643.88	-154.19
United States Virgin Islands <sup>c</sup>													-2.60	-5.64			
Uruguay <sup>d</sup>	3.08	2.97	3.09	2.91	-0.18	2.08	-3.00	-1.41	-0.29	2.57	7.07	-1.00	-4.93	1.00	0.88	0.04	4.58
Uzbekistan <sup>d</sup>	31.22	15.13	14.47	11.18	-3.56	-2.22	-12.09	-6.74	-5.68	-1.86	-13.30	2.07	-15.73	7.32	-10.47	-306.01	-76.01
Vanuatu <sup>c</sup>	3.13	3.87	3.69	4.30	1.07	-2.38	7.91							-2.32	-2.41	-0.16	0.60
Venezuela (Bolivarian Rep. of) <sup>d</sup>	5.77	6.31	5.79	5.49	0.44	-4.22	-2.60	4.71	2.15	-8.81	-4.54	-2.19	-5.65	-0.33	-0.77	-161.79	14.24
Viet Nam <sup>d</sup>	7.55	6.32	5.74	5.72	-0.88	-4.70	-0.17	-2.41	2.08	-3.64	0.59	-4.35	4.23	0.99	2.44	-42.74	21.45
Wallis and Futuna Islands <sup>c</sup>																	
Yemen <sup>d</sup>	2.59	3.17	2.79	3.33	1.00	-6.11	9.24							-13.72	6.58	70.79	-24.49
Zambia <sup>d</sup>	12.08	7.77	7.58	7.40	-2.18	-1.23	-1.17	11.49	1.08	11.01	0.93	-1.08	-6.17	-0.50	-0.84	-4.21	-7.16
Zimbabwe <sup>d</sup>	14.70	20.71	18.44	17.76	1.73	-5.65	-1.86	-8.26	-10.65	-0.82	-12.49	-25.97	-13.55	0.43	0.25	-16.64	-11.15
<b>World</b>	<b>7.83</b>	<b>5.95</b>	<b>5.73</b>	<b>5.49</b>	<b>-1.36</b>	<b>-1.92</b>	<b>-2.06</b>	<b>-0.97</b>	<b>-2.07</b>	<b>-2.36</b>	<b>-2.18</b>	<b>-3.19</b>	<b>-1.30</b>	<b>-0.91</b>	<b>0.16</b>	<b>-4,365.63</b>	<b>-7,460.32</b>
Africa	7.49	6.17	6.12	5.97	-0.96	-0.42	-1.17	-0.55	-2.48	-1.52	-0.99	4.57	1.41	-0.61	0.20	-217.73	-379.61
Africa (excluding North Africa)	9.95	7.93	7.64	7.32	-1.13	-1.82	-2.15	0.98	-0.16	-2.73	-2.54	7.25	-4.30	-1.01	0.14	-206.64	-546.78
North Africa	4.15	3.81	3.90	3.88	-0.43	1.10	-0.25	-2.48	-5.25	-1.13	0.66	0.16	12.98	1.52	0.06	-134.08	29.88
Arab Region	4.38	4.91	4.91	4.90	0.58	-0.02	-0.15	-1.44	-4.04	-0.11	0.54	0.38	4.33	0.62	0.04	-193.40	34.97
Arab Least Developed Countries (LDCs)	6.27	4.04	3.65	3.80	-2.17	-4.94	1.91	-12.44	1.44	-12.91	-4.88	-4.08	-1.25	-9.77	1.42	59.22	-29.38
Arab North Africa	3.77	3.80	3.94	4.21	0.05	1.77	3.34	-2.02	-0.97	3.81	3.89	-2.15	41.73	5.36	2.08	85.23	95.37
Gulf Cooperation Council Countries (GCC)	4.42	6.00	5.88	5.80	1.54	-1.04	-0.62	5.64	2.70	-1.08	0.83	1.70	-0.52	1.18	2.64	-54.49	123.69
Mashreq	4.52	4.07	4.06	3.89	-0.52	-0.15	-2.19	0.52	-0.70	-1.86	-1.50	-0.95	-1.51	-0.46	-4.44	-296.43	-179.42
Asia Pacific	9.07	6.61	6.38	6.00	-1.57	-1.80	-2.98	0.96	-1.32	-2.37	-3.20	-2.31	-2.49	0.83	1.03	-4,130.32	-4,027.93
East and North-East Asia	9.76	7.48	7.13	6.63	-1.32	-2.32	-3.63	-0.45	-0.33	-3.40	-4.23	-2.10	-2.27	1.75	1.80	-2,379.56	-2,677.37
North and Central Asia	12.74	8.77	8.73	8.15	-1.85	-0.24	-3.40	6.33	-10.06	-2.38	-4.03	-4.36	0.24	0.08	0.37	-819.28	-382.45
South and South-West Asia	6.36	5.15	5.08	4.92	-1.05	-0.70	-1.60	1.80	1.55	0.64	0.17	1.25	-4.33	-0.19	0.77	-727.97	-653.31
South-East Asia	5.24	4.53	4.22	4.18	-0.72	-3.48	-0.48	-3.20	-4.89	-3.39	-1.01	-3.68	-3.01	2.28	0.93	-188.92	-117.26
The Pacific	7.35	5.85	5.51	5.25	-1.13	-2.95	-2.37	1.20	-1.20	-2.02	-0.58	-2.51	-0.27	-0.88	-2.03	13.08	-92.82
Europe, North America, and Central Asia	8.03	5.59	5.33	5.12	-1.80	-2.31	-2.01	-2.08	-6.44	-1.70	-1.84	-3.37	-0.39	-3.06	-0.88	-406.45	-3,482.34
Eastern Europe, Caucasus, and Central Asia	12.48	7.97	7.79	7.21	-2.22	-1.09	-3.84	2.33	-7.66	-2.53	-4.21	0.18	-1.34	-0.39	-1.89	-1,251.66	-680.23
North America	8.80	6.23	5.86	5.80	-1.71	-3.01	-0.53	-7.06	-7.40	-2.33	-0.63	-4.40	2.31	-4.37	4.72	682.12	-232.70
South-East Europe	9.60	5.14	5.01	4.57	-3.07	-1.29	-4.51	9.04	-12.57	1.42	-4.18	-6.46	-2.33	0.12	-0.87	-129.56	-14.75
Western and Central Europe	5.53	4.17	3.91	3.67	-1.40	-3.13	-3.17	-1.14	-4.73	-1.80	-1.59	-3.33	-4.16	-3.73	-5.99	51.00	-2,640.20
Latin America and Caribbean	4.48	4.03	3.98	3.96	-0.53	-0.65	-0.26	0.99	-0.32	-2.19	-1.65	0.19	1.42	-0.03	-0.70	-420.17	-6.33
Caribbean	5.71	4.86	4.62	4.33	-0.81	-2.46	-3.20	2.53	-5.00	-0.97	-1.09	3.34	-0.76	0.31	0.46	-28.11	-11.14
Latin America	4.41	3.98	3.94	3.94	-0.50	-0.51	-0.09	0.97	-0.25	-2.23	-1.70	0.07	1.51	-0.06	-0.78	-391.74	9.94
Low income	12.63	10.52	9.83	9.34	-0.91	-3.35	-2.53	-2.67	-0.93	-5.03	-3.29	-3.05	-2.58	-2.88	1.12	-258.43	-138.98
Lower middle income	8.44	5.28	5.05	4.75	-2.32	-2.25	-3.00	1.56	-0.93	-3.34	-1.81	-0.16	-4.05	1.06	0.11	-1,776.68	-1,530.70
Upper middle income	8.76	6.64	6.47	6.17	-1.38	-1.23	-2.40	-0.24	-0.67	-2.17	-3.42	0.95	-1.36	1.36	1.61	-2,211.87	-2,753.82
High income	7.10	5.42	5.16	4.99	-1.34	-2.42	-1.62	-1.58	-5.31	-2.03	-1.14	-3.75	-0.14	-3.08	-0.63	-123.99	-3,027.52

a. For some countries no energy intensity value is shown because GDP data were not available.

b. All changes refer to compound annual rates.

c. Based on data from the United Nations Statistics Division's Energy Statistics Database and the World Bank's World Development Indicators database.

d. Based on data from the International Energy Agency's World Energy Statistics and Balances database and the World Bank's World Development Indicators database.

e. Includes Monaco.

f. Includes San Marino.

g. Includes Svalbard and Jan Mayen Islands.

### 3 RENEWABLE ENERGY

	Share in total final energy consumption (%)													Final use of renewable energy (petajoules)			Total final energy consumption (petajoules)
	Solid biofuels																
	Renewable energy				Traditional use		Modern use		Liquid biofuels	Wind	Solar	Geo-thermal	Other (biogas, renewable waste, marine)	Elec-tricity	Heat	Trans- port	
	1990	2010	2012	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014				
Afghanistan <sup>a</sup>	15.92	14.84	13.97	16.75	8.82	0.00	7.93	0.00	0.00	0.00	0.00	0.00	11.57	12.88	0.00	145.97	
Albania <sup>b</sup>	25.52	37.12	40.05	38.69	7.81	1.62	27.40	1.25	0.00	0.61	0.00	0.00	23.49	8.61	1.07	85.71	
Algeria <sup>b</sup>	0.18	0.26	0.19	0.07	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.65	0.25	0.00	1,311.92	
American Samoa <sup>a</sup>	0.00	0.00	0.70	0.70	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.49	
Andorra <sup>a</sup>	14.27	19.09	19.20	19.89	0.28	0.00	18.52	0.00	0.00	0.00	0.00	1.09	1.53	0.11	0.00	8.25	
Angola <sup>b</sup>	72.26	54.19	52.25	50.80	46.35	1.12	3.33	0.00	0.00	0.00	0.00	0.00	15.66	223.47	0.00	470.74	
Anguilla <sup>a</sup>	0.30	0.12	0.13	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	
Antigua and Barbuda <sup>a</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.53	
Argentina <sup>b</sup>	8.92	8.96	9.87	10.77	0.45	2.52	5.55	2.15	0.10	0.00	0.00	0.00	143.93	62.10	51.48	2,390.30	
Armenia <sup>b</sup>	2.12	9.36	6.57	7.72	1.72	0.00	6.00	0.00	0.01	0.00	0.00	0.00	4.96	1.42	0.00	82.62	
Aruba <sup>a</sup>	0.20	5.46	6.86	6.92	0.32	0.00	0.00	0.00	6.60	0.00	0.00	0.00	0.43	0.02	0.00	6.43	
Australia <sup>b</sup>	8.01	8.55	8.44	9.50	0.00	5.38	1.74	0.31	0.97	0.87	0.00	0.23	111.67	181.34	9.75	3,187.79	
Austria <sup>b</sup>	25.14	30.95	33.70	35.78	0.00	16.13	14.01	2.55	1.31	1.00	0.07	0.70	176.64	168.64	24.87	1,034.41	
Azerbaijan <sup>b</sup>	0.72	4.45	2.85	2.12	0.74	0.34	0.97	0.00	0.00	0.00	0.00	0.06	3.43	3.56	0.01	330.64	
Bahamas <sup>a</sup>		1.78	1.23	1.10	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	25.70	
Bahrain <sup>b</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	184.58	
Bangladesh <sup>b</sup>	71.66	41.07	38.63	37.49	37.26	0.00	0.18	0.00	0.00	0.04	0.00	0.00	2.32	379.32	0.00	1,018.14	
Barbados <sup>a</sup>	18.94	9.03	4.13	3.17	0.08	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	11.59	
Belarus <sup>b</sup>	0.82	7.02	7.25	6.63	2.24	4.17	0.05	0.14	0.00	0.00	0.00	0.03	0.79	46.36	0.11	712.31	
Belgium <sup>b</sup>	1.27	5.67	7.79	9.04	0.00	4.43	0.08	1.29	1.41	0.95	0.00	0.87	49.40	53.81	16.64	1,326.02	
Belize <sup>a</sup>	38.01	33.71	37.11	36.54	0.20	26.84	9.50	0.00	0.00	0.00	0.00	0.00	1.02	2.90	0.00	10.72	
Benin <sup>b</sup>	93.70	51.55	51.08	48.60	40.45	8.15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	77.16	0.00	158.81	
Bermuda <sup>a</sup>		2.39	1.57	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	0.00	0.12	0.00	4.71	
BES Islands <sup>a</sup>			0.11	0.27	0.11	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.01	0.00	0.00	3.61	
Bhutan <sup>a</sup>	95.90	90.89	87.85	86.66	74.81	0.15	11.70	0.00	0.00	0.00	0.00	0.00	7.21	46.22	0.00	61.65	
Bolivia (Plurinational State of) <sup>b</sup>	37.36	20.08	17.92	16.82	6.86	7.43	2.52	0.00	0.01	0.01	0.00	0.00	7.45	38.30	0.00	272.03	
Bosnia and Herzegovina <sup>b</sup>	7.30	19.57	15.28	41.75	32.44	1.23	8.08	0.00	0.00	0.00	0.00	0.00	14.00	58.37	0.00	173.37	
Botswana <sup>b</sup>	47.58	30.19	30.28	29.17	29.16	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	22.72	0.00	77.92	
Brazil <sup>b</sup>	49.86	47.01	43.62	41.81	3.04	18.47	12.57	7.02	0.41	0.28	0.00	0.02	1,317.74	1,837.32	636.58	9,068.53	
British Virgin Islands <sup>a</sup>	1.45	0.85	0.87	0.87	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.50	
Brunei Darussalam <sup>b</sup>	0.67	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	38.39	
Bulgaria <sup>b</sup>	1.92	14.37	15.75	16.97	8.28	2.62	2.64	1.22	0.76	0.94	0.38	0.13	15.69	42.68	4.52	370.63	
Burkina Faso <sup>a</sup>	93.16	83.68	77.62	76.48	75.72	0.45	0.30	0.00	0.00	0.00	0.00	0.00	0.42	106.13	0.00	139.31	
Burundi <sup>a</sup>	95.20	96.76	93.96	90.05	87.66	0.99	1.40	0.00	0.00	0.00	0.00	0.00	0.77	48.65	0.00	54.88	
Cabo Verde <sup>a</sup>	36.63	21.74	24.40	26.20	23.06	0.26	0.00	0.00	2.67	0.20	0.00	0.00	0.18	1.49	0.00	6.39	
Cambodia <sup>b</sup>		68.47	68.31	67.95	48.95	15.10	3.90	0.00	0.00	0.01	0.00	0.00	9.04	147.19	0.00	229.91	
Cameroon <sup>b</sup>	81.59	78.60	78.14	77.39	65.46	6.63	5.29	0.00	0.00	0.00	0.00	0.00	14.67	196.79	0.00	273.25	
Canada <sup>b</sup>	22.02	22.14	23.10	22.58	0.00	6.74	13.75	1.05	0.81	0.09	0.00	0.14	1,106.26	501.10	78.37	7,466.99	
Cayman Islands <sup>a</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	
Central African Republic <sup>a</sup>	93.49	79.81	78.02	77.19	39.57	34.75	2.87	0.00	0.00	0.00	0.00	0.00	0.50	13.04	0.00	17.54	
Chad <sup>a</sup>	98.16	90.79	90.65	89.24	87.97	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.42	0.00	65.47	
Chile <sup>b</sup>	34.03	27.03	30.33	26.42	0.00	18.30	7.40	0.00	0.46	0.23	0.00	0.02	98.54	169.17	0.00	1,013.48	
China <sup>b</sup>	34.08	17.41	16.83	17.10	10.21	0.19	4.12	0.09	0.61	1.20	0.26	0.42	3,839.05	9,178.92	71.00	76,546.09	
Chinese Taipei <sup>b</sup>	1.94	1.55	2.26	2.04	0.00	0.29	0.72	0.18	0.25	0.31	0.00	0.29	27.37	11.25	1.47	1,962.33	
Colombia <sup>b</sup>	38.25	27.93	26.64	24.52	5.72	6.23	12.42	0.12	0.01	0.00	0.00	0.00	137.06	120.77	1.15	1,056.34	
Comoros <sup>a</sup>	49.84	46.41	48.01	46.49	46.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56	0.00	3.37	
Congo (Dem. Rep. of) <sup>b</sup>	92.05	96.83	95.53	92.87	75.96	13.75	3.15	0.00	0.00	0.00	0.00	0.00	28.41	807.99	0.00	900.59	
Congo (Rep. of) <sup>b</sup>	65.41	55.15	65.51	62.37	59.74	0.74	1.89	0.00	0.00	0.00	0.00	0.00	1.57	50.28	0.00	83.13	
Cook Islands <sup>a</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	
Costa Rica <sup>b</sup>	45.38	42.31	38.62	37.87	3.78	14.02	14.99	0.00	1.64	0.01	3.43	0.00	29.77	25.30	0.00	145.41	
Côte d'Ivoire <sup>b</sup>	73.58	75.49	74.90	70.84	62.07	7.26	1.50	0.00	0.00	0.00	0.00	0.00	5.00	223.34	0.00	322.35	
Croatia <sup>b</sup>	21.92	29.78	29.42	33.65	16.58	0.86	14.00	0.47	1.13	0.20	0.17	0.22	39.50	45.34	1.21	255.77	
Cuba <sup>b</sup>	42.89	13.16	17.10	18.75	0.19	15.26	0.10	3.16	0.02	0.02	0.00	0.00	2.23	53.90	0.00	299.35	
Curacao <sup>b</sup>		0.24	0.36	0.35	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.09	0.00	0.00	24.60	
Cyprus <sup>b</sup>	0.50	6.35	8.35	9.39	0.45	0.99	0.00	0.71	1.05	5.39	0.11	0.70	1.04	3.91	0.40	57.02	
Czech Republic <sup>b</sup>	2.88	9.74	11.13	12.75	0.00	8.49	0.49	1.44	0.12	0.62	0.00	1.58	21.84	82.50	13.26	922.19	
Denmark <sup>b</sup>	7.04	21.35	27.28	30.22	0.00	15.66	0.01	1.93	8.48	0.59	0.01	3.53	61.61	88.38	9.67	528.35	
Djibouti <sup>a</sup>	26.59	34.43	34.07	34.15	34.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.00	6.33	
Dominica <sup>a</sup>	14.60	8.66	9.40	9.87	3.80	0.00	6.07	0.00	0.00	0.00	0.00	0.00	0.10	0.06	0.00	1.62	
Dominican Republic <sup>b</sup>	28.06	18.00	17.71	18.38	9.77	4.93	2.23	0.26	0.86	0.33	0.00	0.00	7.22	30.57	0.55	208.67	
Ecuador <sup>b</sup>	24.20	12.11	13.10	12.22	1.96	2.85	7.27	0.06	0.05	0.01	0.02	0.00	38.05	22.95	0.32	501.88	
Egypt <sup>b</sup>	8.50	5.72	5.69	6.41	1.88	1.96	2.31	0.00	0.22	0.04	0.00	0.00	47.75	71.70	0.00	1,862.77	
El Salvador <sup>b</sup>	67.14	34.30	27.26	28.17	13.12	3.93	5.77	0.00	0.00	0.00	5.23	0.11	11.87	14.92	0.00	95.15	
Equatorial Guinea <sup>a</sup>	84.71	5.92	6.00	6.38	5.54	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.58	3.83	0.00	69.12	
Eritrea <sup>b</sup>		81.25	80.15	80.30	76.53	3.75	0.00	0.00	0.00	0.03	0.00	0.00	0.01	18.06	0.00	22.50	
Estonia <sup>b</sup>	3.36	25.13	24.91	25.25	0.00	23.70	0.05	0.21	1.03	0.00	0.00	0.26	2.78	26.44	0.24	116.66	

	Share in total final energy consumption (%)												Final use of renewable energy (petajoules)			Total final energy consumption (petajoules)
	Solid biofuels												Electricity	Heat	Transport	
	Renewable energy		Traditional use		Modern use		Hydro	Liquid biofuels	Wind	Solar	Geothermal	Other (biogas, renewable waste, marine)				
	1990	2010	2012	2014	2014	2014							2014	2014	2014	
Ethiopia <sup>b</sup>	96.64	94.53	93.76	92.72	90.46	0.83	1.36	0.01	0.06	0.00	0.00	0.00	23.49	1,505.27	0.21	1,649.04
Faeroe Islands <sup>a</sup>	2.54	3.38	4.70	6.54	0.00	0.00	5.08	0.00	1.45	0.00	0.00	0.00	0.52	0.00	0.00	7.95
Falkland Islands (Malvinas) <sup>a</sup>	1.13	3.71	3.79	3.87	0.82	0.00	0.00	0.00	3.06	0.00	0.00	0.00	0.02	0.01	0.00	0.67
Fiji <sup>a</sup>	53.09	29.77	32.94	37.57	1.37	29.64	6.49	0.00	0.07	0.00	0.00	0.00	1.33	6.28	0.00	20.25
Finland <sup>b</sup>	24.51	33.61	38.83	41.19	0.00	31.70	5.72	2.15	0.47	0.01	0.00	1.14	109.93	272.70	20.84	979.51
France <sup>b,c</sup>	10.41	11.87	12.37	13.13	0.00	6.19	3.01	2.17	0.83	0.36	0.08	0.49	245.42	367.76	121.68	5,595.64
French Guiana <sup>a</sup>	5.50	28.88	33.79	30.61	8.92	2.72	17.21	0.00	0.00	1.76	0.00	0.00	1.69	1.04	0.00	8.91
French Polynesia <sup>a</sup>	4.73	11.57	9.34	10.15	0.42	0.00	9.30	0.00	0.00	0.43	0.00	0.00	0.73	0.03	0.00	7.53
Gabon <sup>b</sup>	78.28	85.85	75.63	81.05	21.76	58.01	1.28	0.00	0.00	0.00	0.00	0.00	2.54	156.50	0.00	196.24
Gambia <sup>a</sup>	61.44	50.17	49.83	48.06	48.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.21	0.00	10.83
Georgia <sup>b</sup>	12.77	39.15	28.69	31.89	12.60	0.22	18.66	0.00	0.00	0.05	0.36	0.00	28.32	20.09	0.00	151.78
Germany <sup>b</sup>	2.10	10.29	12.02	13.38	0.00	4.71	0.72	1.52	2.09	1.64	0.05	2.65	482.50	488.53	116.79	8,130.88
Ghana <sup>b</sup>	80.63	49.86	44.34	45.22	28.58	8.08	8.55	0.00	0.00	0.00	0.00	0.00	23.73	101.65	0.00	277.28
Gibraltar <sup>b</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00
Greece <sup>b</sup>	7.81	11.09	13.86	16.09	0.00	6.57	2.57	1.05	2.12	3.47	0.08	0.23	43.11	50.40	5.81	617.46
Greenland <sup>a</sup>		7.74	8.30	10.66	0.00	0.00	10.49	0.00	0.00	0.00	0.00	0.18	0.81	0.01	0.00	7.76
Grenada <sup>a</sup>	7.24	9.35	10.13	9.88	9.16	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	2.76
Guadeloupe <sup>a</sup>	6.75	3.52	3.97	4.55	0.48	0.00	0.36	0.00	0.89	1.57	1.24	0.00	0.96		0.00	18.13
Guam <sup>a</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.68
Guatemala <sup>b</sup>	74.97	66.59	66.22	59.90	53.43	3.21	3.10	0.00	0.00	0.00	0.16	0.00	20.47	240.36	0.00	435.42
Guinea <sup>a</sup>	89.30	79.10	78.45	80.01	78.66	0.35	1.00	0.00	0.00	0.00	0.00	0.00	1.29	102.04	0.00	129.15
Guinea-Bissau <sup>a</sup>	88.58	87.81	87.61	87.06	79.34	7.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.36	0.00	26.83
Guyana <sup>a</sup>	42.41	33.84	28.26	24.02	4.58	19.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.40	0.00	26.67
Haiti <sup>b</sup>	81.12	79.02	83.16	78.39	74.36	3.94	0.10	0.00	0.00	0.00	0.00	0.00	0.13	102.53	0.00	130.96
Honduras <sup>b</sup>	70.13	53.16	48.78	54.04	43.38	6.45	3.65	0.00	0.56	0.00	0.00	0.00	8.76	87.02	0.00	177.23
Hong Kong (SAR, China) <sup>b</sup>	1.07	0.83	0.82	1.79	0.60	0.06	0.00	1.03	0.00	0.00	0.00	0.10	0.39	2.48	3.86	375.77
Hungary <sup>b</sup>	3.86	9.04	10.15	10.36	0.00	7.14	0.20	1.25	0.44	0.08	0.80	0.45	13.35	44.35	7.89	632.99
Iceland <sup>b</sup>	54.67	75.42	77.36	76.42	0.00	0.00	37.73	0.15	0.02	0.00	38.43	0.09	60.59	26.33	0.27	114.08
India <sup>b</sup>	58.65	39.48	38.39	36.54	26.60	7.60	1.62	0.07	0.46	0.17	0.00	0.02	525.51	7,333.72	14.32	21,550.03
Indonesia <sup>b</sup>	58.60	38.38	39.10	38.07	31.82	4.33	0.72	0.73	0.00	0.00	0.48	0.00	81.78	2,383.59	45.67	6,596.51
Iran (Islamic Rep. of) <sup>b</sup>	1.24	0.90	0.93	0.94	0.16	0.16	0.60	0.00	0.02	0.00	0.00	0.00	41.42	21.00	0.00	6,654.53
Iraq <sup>b</sup>	1.60	1.71	1.26	0.91	0.00	0.12	0.79	0.00	0.00	0.00	0.00	0.00	6.85	1.04	0.00	865.47
Ireland <sup>b</sup>	2.28	5.24	6.58	8.47	0.00	2.18	0.57	0.90	4.13	0.12	0.00	0.56	21.31	10.14	3.75	415.53
Isle of Man <sup>a</sup>		4.05	6.43	3.81	0.00	0.00	0.46	0.00	0.00	0.00	0.00	3.35	0.01	0.08	0.00	2.28
Israel <sup>b</sup>	5.80	8.50	8.66	9.34	0.00	0.07	0.01	0.00	0.00	9.23	0.00	0.04	2.80	46.43	0.00	526.91
Italy <sup>b,d</sup>	3.78	12.79	14.39	17.09	0.00	6.25	4.66	1.34	1.21	1.94	0.59	1.11	439.81	298.28	44.60	4,579.68
Jamaica <sup>b</sup>	7.63	13.72	17.04	15.99	8.65	5.09	0.42	1.46	0.36	0.00	0.00	0.00	1.06	11.43	1.26	86.00
Japan <sup>b</sup>	4.55	4.59	4.54	5.53	0.00	1.78	2.49	0.00	0.15	0.89	0.15	0.07	480.58	120.25	0.00	10,870.92
Jordan <sup>b</sup>	2.77	2.97	2.93	3.13	0.06	0.03	0.08	0.00	0.00	2.95	0.00	0.01	0.20	6.57	0.00	216.08
Kazakhstan <sup>b</sup>	1.41	1.38	1.33	1.36	0.06	0.00	1.30	0.00	0.00	0.00	0.00	0.00	19.54	0.92	0.00	1,501.79
Kenya <sup>b</sup>	77.50	76.27	78.50	75.52	71.83	0.07	1.62	0.00	0.02	0.00	1.98	0.00	22.56	439.36	0.00	611.66
Kiribati <sup>a</sup>	5.77	2.71	2.84	2.95	2.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.71
Korea (Dem. People's Rep. of) <sup>b</sup>	7.19	10.63	14.33	17.02	1.19	7.52	8.31	0.00	0.00	0.00	0.00	0.00	34.97	36.66	0.00	420.91
Korea (Rep. of) <sup>b</sup>	1.63	1.31	1.61	2.84	0.00	1.63	0.17	0.33	0.07	0.18	0.09	0.36	27.46	104.44	15.64	5,198.65
Kosovo <sup>b</sup>		20.92	20.86	21.46	18.82	1.70	0.91	0.00	0.00	0.03	0.00	0.00	0.47	10.54	0.00	51.29
Kuwait <sup>b</sup>	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	593.37
Kyrgyzstan <sup>b</sup>	7.93	25.59	22.45	28.25	0.08	0.01	28.16	0.00	0.00	0.00	0.00	0.00	36.09	0.12	0.00	128.18
Lao PDR <sup>a</sup>	94.93	88.01	88.28	90.34	72.85	0.00	16.65	0.00	0.00	0.84	0.00	0.00	12.64	52.64	0.00	72.25
Latvia <sup>b</sup>	17.57	33.06	40.37	40.24	15.03	16.71	5.81	0.64	0.41	0.00	0.00	1.64	12.93	49.73	1.01	158.24
Lebanon <sup>b</sup>	11.34	5.20	4.91	3.20	2.08	0.30	0.32	0.00	0.00	0.51	0.00	0.00	0.63	5.71	0.00	197.74
Lesotho <sup>a</sup>	52.03	53.45	52.32	51.82	47.37	0.00	4.44	0.00	0.00	0.00	0.00	0.00	2.47	26.30	0.00	55.52
Liberia <sup>a</sup>	88.24	89.29	85.85	89.82	10.80	79.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.61	0.00	74.16
Libya <sup>b</sup>	3.13	1.57	1.91	1.75	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.33	0.00	361.01
Liechtenstein <sup>a</sup>		58.69	61.92	62.18	5.97	0.00	28.29	0.00	0.00	21.11	0.00	6.81	1.34	0.39	0.00	2.78
Lithuania <sup>b</sup>	3.10	21.69	24.28	28.07	10.76	10.13	1.81	1.34	2.90	0.33	0.02	0.78	13.55	39.31	2.65	197.73
Luxembourg <sup>b</sup>	1.72	3.66	4.17	6.97	0.00	1.81	0.84	1.98	0.62	0.83	0.00	0.89	4.69	2.83	2.99	150.99
Macao (SAR, China) <sup>a</sup>	0.66	6.83	11.70	10.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.73	0.00	2.88	0.00	26.84
Macedonia (The former Yugoslav Rep. of) <sup>b</sup>	2.41	22.59	16.88	18.30	8.74	1.07	7.54	0.00	0.44	0.09	0.43	0.00	5.83	7.39	0.00	72.19
Madagascar <sup>a</sup>	85.91	81.93	76.70	73.56	32.19	39.36	2.01	0.00	0.00	0.00	0.00	0.00	2.43	86.28	0.00	120.58
Malawi <sup>a</sup>	84.03	79.73	81.16	80.58	34.37	37.11	9.10	0.00	0.00	0.00	0.00	0.00	5.85	45.99	0.00	64.34
Malaysia <sup>b</sup>	11.98	3.82	4.41	4.77	1.83	0.11	2.20	0.59	0.00	0.04	0.00	0.01	46.36	35.98	11.67	1,970.94
Maldives <sup>a</sup>	4.46	1.16	1.04	0.91	0.87	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.14	0.00	16.03
Mali <sup>a</sup>	88.15	84.86	85.14	83.56	77.98	2.11	3.47	0.00	0.00	0.00	0.00	0.00	2.07	47.72	0.00	59.59
Malta <sup>b</sup>	0.00	1.39	2.60	3.95	0.25	0.00	0.00	1.22	0.00	2.20	0.00	0.				

	Share in total final energy consumption (%)												Final use of renewable energy (petajoules)			Total final energy consumption (petajoules)	
	Solid biofuels												Elec- tricity	Heat	Trans- port		
	Renewable energy				Tradi- tional use	Modern use	Hydro	Liquid biofuels	Wind	Solar	Geo- thermal	Other (biogas, renewable waste, marine)					
	1990	2010	2012	2014	2014	2014	2014	2014	2014	2014	2014	2014					2014
Mauritania <sup>a</sup>	47.00	34.00	31.84	32.58	32.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.10	0.00	40.22
Mauritius <sup>b</sup>	47.07	13.66	11.61	10.64	0.71	8.50	0.93	0.00	0.03	0.26	0.00	0.22	1.98	1.47	0.00	32.49	
Mayotte <sup>a</sup>	33.41	9.96	12.24	11.73	9.58	0.00	0.00	0.00	0.00	2.14	0.00	0.00	0.05	0.28	0.00	2.83	
Mexico <sup>b</sup>	14.41	9.36	8.96	9.80	0.00	6.30	2.50	0.00	0.41	0.19	0.39	0.01	159.32	299.83	0.00	4,685.77	
Micronesia (Federated States of) <sup>a</sup>		1.84	1.59	1.32	0.34	0.64	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.02	0.00	1.66	
Moldova (Rep. of) <sup>b</sup>	1.14	8.44	10.47	13.05	11.13	0.81	1.01	0.00	0.00	0.00	0.00	0.08	1.02	11.56	0.00	96.37	
Monaco																	
Mongolia <sup>b</sup>	1.89	4.35	3.54	3.97	2.50	1.06	0.00	0.00	0.42	0.00	0.00	0.00	0.58	5.00	0.00	140.67	
Montenegro <sup>b</sup>		54.52	46.20	45.98	24.06	2.18	19.74	0.00	0.00	0.00	0.00	0.00	5.19	6.89	0.00	26.27	
Montserrat <sup>a</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	
Morocco <sup>b</sup>	19.48	14.50	11.47	11.78	4.10	5.51	1.00	0.00	1.17	0.00	0.00	0.00	12.85	56.83	0.00	591.64	
Mozambique <sup>b</sup>	93.10	91.30	90.82	88.85	70.43	8.81	9.62	0.00	0.00	0.00	0.00	0.00	40.88	336.84	0.00	425.12	
Myanmar <sup>b</sup>	90.91	85.02	78.95	68.52	63.21	2.09	3.22	0.00	0.00	0.00	0.00	0.00	22.51	456.94	0.00	699.71	
Namibia <sup>b</sup>		26.37	28.56	27.62	6.21	1.72	19.58	0.00	0.00	0.11	0.00	0.00	13.37	5.49	0.00	68.31	
Nauru <sup>a</sup>	0.00	0.08	0.09	0.04	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.42	
Nepal <sup>b</sup>	95.12	87.29	84.70	84.38	78.19	0.87	2.90	0.00	0.00	0.00	0.00	2.41	14.01	393.15	0.00	482.55	
Netherlands <sup>b</sup>	1.32	3.88	4.97	5.67	0.00	1.93	0.02	0.88	1.15	0.22	0.08	1.38	41.43	44.94	14.62	1,781.64	
New Caledonia <sup>a</sup>	10.16	4.45	6.02	3.98	0.01	0.00	2.99	0.00	0.59	0.39	0.00	0.00	1.18	0.12	0.00	32.52	
New Zealand <sup>b</sup>	30.02	31.24	30.77	30.86	0.00	7.99	14.66	0.03	1.33	0.08	6.57	0.20	110.06	53.42	0.18	530.28	
Nicaragua <sup>b</sup>	68.77	52.64	52.08	51.84	39.04	7.51	1.10	0.00	2.35	0.00	1.84	0.00	6.45	43.77	0.00	96.87	
Niger <sup>b</sup>		80.70	72.73	78.13	78.11	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	86.39	0.00	110.60	
Nigeria <sup>b</sup>	87.78	86.78	86.45	87.27	81.11	5.84	0.32	0.00	0.00	0.00	0.00	0.00	15.48	4,192.00	0.00	4,820.96	
Niue <sup>a</sup>	0.57	26.70	24.20	23.14	0.58	0.00	0.00	0.00	0.00	22.56	0.00	0.00	0.00	0.02	0.00	0.07	
Northern Mariana Islands <sup>a</sup>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	
Norway <sup>b,c</sup>	59.17	56.33	58.45	57.09	0.00	4.34	50.44	0.73	0.82	0.00	0.00	0.76	381.32	37.30	5.43	742.78	
Oman <sup>b</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	684.87	
Pakistan <sup>b</sup>	57.50	46.30	46.17	47.21	39.17	4.89	3.10	0.00	0.04	0.00	0.00	0.00	93.94	1,318.03	0.00	2,991.12	
Palau <sup>a</sup>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.92	
Palestine (State of) <sup>a</sup>	22.08	14.06	12.24	10.53	5.98	0.42	0.00	0.00	0.00	4.12	0.00	0.00	0.00	6.77	0.00	64.29	
Panama <sup>b</sup>	43.59	19.94	20.62	19.77	5.00	2.73	10.78	1.00	0.25	0.00	0.00	0.00	15.72	10.85	1.42	141.57	
Papua New Guinea <sup>a</sup>	70.48	55.25	55.47	50.03	41.25	4.76	2.82	0.00	0.00	0.00	1.20	0.00	6.37	54.74	0.00	122.14	
Paraguay <sup>b</sup>	78.51	64.25	62.68	63.12	19.16	23.55	18.15	2.26	0.00	0.00	0.00	0.00	35.26	83.01	4.34	194.26	
Peru <sup>b</sup>	39.43	30.73	28.25	25.64	12.42	0.78	10.04	2.19	0.09	0.08	0.00	0.04	74.61	90.16	13.26	694.45	
Philippines <sup>b</sup>	50.95	28.81	30.22	28.72	14.53	7.51	2.42	1.47	0.04	0.00	2.73	0.01	58.38	247.14	14.31	1,113.59	
Poland <sup>b</sup>	2.50	9.51	10.94	11.55	0.00	8.90	0.25	1.18	0.87	0.03	0.03	0.28	56.73	203.56	29.54	2,509.90	
Portugal <sup>b</sup>	26.95	27.83	25.52	30.50	0.00	13.34	7.89	1.86	6.14	0.84	0.11	0.32	98.84	78.68	10.92	617.88	
Puerto Rico <sup>a</sup>	1.75	0.57	0.56	1.63	0.00	0.00	0.38	0.00	1.03	0.22	0.00	0.00	1.16	0.00	0.00	70.93	
Qatar <sup>b</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	559.67	
Reunion <sup>a</sup>	37.52	16.45	16.91	16.79	1.47	7.20	3.60	0.00	0.13	4.10	0.00	0.29	1.45	5.06	0.00	38.73	
Romania <sup>b</sup>	3.36	24.10	21.55	24.34	14.67	1.79	4.89	0.78	1.61	0.42	0.11	0.06	62.78	146.82	6.98	889.77	
Russian Federation <sup>b</sup>	3.75	3.34	3.35	3.46	0.26	0.42	2.77	0.00	0.00	0.00	0.01	0.00	440.16	107.28	0.00	15,840.68	
Rwanda <sup>a</sup>	84.27	90.66	89.03	88.45	80.26	7.40	0.79	0.00	0.00	0.00	0.00	0.00	0.62	67.94	0.00	77.51	
Saint Barthelemy																	
Saint Helena <sup>a</sup>	15.07	10.50	8.72	10.61	6.49	0.00	0.00	0.00	3.85	0.27	0.00	0.00	0.00	0.01	0.00	0.08	
Saint Kitts and Nevis <sup>a</sup>	40.03	0.99	1.33	1.49	0.01	0.00	0.00	0.00	1.32	0.16	0.00	0.00	0.03	0.00	0.00	1.79	
Saint Lucia <sup>a</sup>	5.47	2.20	2.18	2.15	2.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	3.79	
Saint Martin (French part)																	
Saint Pierre and Miquelon <sup>a</sup>	0.00	0.53	0.44	0.39	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.73	
Saint Vincent and the Grenadines <sup>a</sup>	15.44	5.43	5.78	7.50	2.36	0.00	5.14	0.00	0.00	0.00	0.00	0.00	0.13	0.06	0.00	2.43	
Samoa <sup>a</sup>	46.20	46.75	40.02	42.06	37.39	1.92	2.75	0.00	0.00	0.00	0.00	0.00	0.10	1.49	0.00	3.79	
San Marino																	
Sao Tome and Principe <sup>a</sup>	71.48	43.76	41.45	41.60	40.59	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.02	0.77	0.00	1.90	
Saudi Arabia <sup>b</sup>	0.04	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	4,748.62	
Senegal <sup>b</sup>	55.55	50.26	50.37	43.30	40.56	1.81	0.92	0.00	0.00	0.01	0.00	0.00	1.21	46.15	0.00	109.37	
Serbia <sup>b</sup>	15.49	20.60	19.61	23.43	11.22	2.34	9.74	0.00	0.00	0.01	0.07	0.05	31.07	43.45	0.00	318.04	
Seychelles <sup>a</sup>	4.25	0.63	0.63	1.03	0.56	0.00	0.00	0.00	0.43	0.04	0.00	0.00	0.02	0.03	0.00	5.13	
Sierra Leone <sup>a</sup>	93.92	84.18	78.43	73.05	50.71	21.99	0.35	0.00	0.00	0.00	0.00	0.00	0.20	42.00	0.00	57.77	
Singapore <sup>b</sup>	0.19	0.48	0.50	0.62	0.00	0.12	0.00	0.00	0.00	0.03	0.00	0.48	2.78	0.00	0.00	446.88	
Sint Maarten (Dutch part) <sup>a</sup>			0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.06	
Slovak Republic <sup>b</sup>	2.23	10.28	10.47	12.14	0.00	5.85	3.62	1.51	0.01	0.58	0.04	0.54	19.96	19.64	5.60	372.32	
Slovenia <sup>b</sup>	12.35	19.61	19.84	22.68	0.00	11.79	8.29	0.96	0.01	0.59	0.67	0.37	17.28	24.44	1.83	192.04	
Solomon Islands <sup>a</sup>	59.01	64.61	63.53	62.96	62.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.20	0.00	5.08	
Somalia <sup>a</sup>	91.88	93.57	93.75	93.86	67.58	26.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.62	0.00	97.62	
South Africa <sup>b</sup>	16.63	17.09	16.64	16.59	13.32	2.82	0.09	0.00	0.10	0.25	0.00	0.00	9.92	479.69	0.00	2,951.72	
South Sudan <sup>b</sup>			30.20	29.83	27.38	2.42	0.00	0.00	0.00	0.03	0.00	0.00	0.01	6.78	0.00	22.75	
Spain <sup>b</sup>	10.54	14.40	15.77	17.35	0.00	5.41	3.73	1.30	4.95	1.65	0.03	0.29	327.65	173.80	40.04	3,120.65	

	Share in total final energy consumption (%)												Final use of renewable energy (petajoules)			Total final energy consumption (petajoules)
	Solid biofuels											Other (biogas, renewable waste, marine)				
	Renewable energy				Traditional use	Modern use	Hydro	Liquid biofuels	Wind	Solar	Geo-thermal		Elec-tricity	Heat	Trans-Port	
	1990	2010	2012	2014	2014	2014	2014	2014	2014	2014	2014					
Sri Lanka <sup>b</sup>	78.09	61.84	60.69	57.59	33.20	20.33	3.82	0.00	0.23	0.02	0.00	0.00	15.52	202.73	0.00	379.02
Sudan <sup>b</sup>	73.27	61.44	59.82	62.42	36.96	19.02	6.44	0.00	0.00	0.00	0.00	0.00	27.39	238.27	0.00	425.63
Suriname <sup>b</sup>		24.54	23.05	25.38	6.16	1.79	17.44	0.00	0.00	0.00	0.00	0.00	4.39	2.00	0.00	25.16
Swaziland <sup>a</sup>	85.25	62.68	63.03	63.55	21.06	37.34	5.15	0.00	0.00	0.00	0.00	0.00	1.95	22.14	0.00	37.91
Sweden <sup>b</sup>	34.06	45.98	49.90	49.54	0.00	26.79	14.59	2.86	2.57	0.05	0.00	2.69	245.67	337.79	37.03	1,252.56
Switzerland <sup>b,f</sup>	17.11	21.49	22.99	23.45	0.00	4.59	14.77	0.10	0.04	0.62	1.66	1.68	120.02	57.49	0.76	760.15
Syrian Arab Republic <sup>b</sup>	2.36	1.41	2.56	2.99	0.00	0.10	2.90	0.00	0.00	0.00	0.00	0.00	7.83	0.26	0.00	270.36
Tajikistan <sup>b</sup>	29.64	61.84	56.07	40.71	0.00	0.00	40.71	0.00	0.00	0.00	0.00	0.00	42.91	0.00	0.00	105.40
Tanzania (United Rep. of) <sup>b</sup>	94.78	90.32	86.35	86.67	66.92	18.91	0.83	0.00	0.00	0.01	0.00	0.00	7.58	769.46	0.00	896.51
Thailand <sup>b</sup>	33.64	22.65	23.29	23.59	9.19	10.68	0.64	2.01	0.04	0.16	0.00	0.88	55.20	602.84	61.20	3,049.44
Timor-Leste <sup>a</sup>		33.89	25.08	19.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	5.31
Togo <sup>b</sup>	78.70	65.83	72.74	72.83	59.86	9.00	3.97	0.00	0.00	0.00	0.00	0.00	3.65	60.59	0.00	88.20
Tonga <sup>a</sup>	1.49	1.01	1.13	1.63	1.03	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.01	0.01	0.00	1.30
Trinidad and Tobago <sup>b</sup>	1.19	0.33	0.32	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	176.02
Tunisia <sup>b</sup>	14.48	12.69	13.08	12.92	11.58	0.22	0.05	0.00	0.47	0.61	0.00	0.00	1.69	38.40	0.00	310.21
Turkey <sup>b</sup>	24.57	14.35	12.84	11.58	0.00	3.91	3.55	0.18	0.74	1.00	2.06	0.13	154.51	228.71	6.07	3,362.25
Turkmenistan <sup>b</sup>	0.28	0.07	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	746.40
Turks and Caicos Islands <sup>a</sup>	1.79	0.52	0.51	0.58	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.11
Tuvalu <sup>a</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Uganda <sup>a</sup>	96.04	91.98	91.36	89.22	87.53	0.00	1.68	0.00	0.00	0.00	0.00	0.00	6.84	356.05	0.00	406.76
Ukraine <sup>b</sup>	0.65	2.88	2.86	3.50	1.85	0.53	0.89	0.07	0.12	0.04	0.00	0.00	25.82	57.34	1.72	2,426.68
United Arab Emirates <sup>b</sup>	0.00	0.12	0.12	0.17	0.00	0.12	0.00	0.00	0.00	0.05	0.00	0.00	0.94	2.37	0.00	1,971.75
United Kingdom of Great Britain and Northern Ireland <sup>b</sup>	0.65	3.69	4.82	7.29	0.00	2.68	0.39	0.97	2.14	0.32	0.00	0.79	212.48	94.76	47.12	4,857.84
United States of America <sup>b</sup>	4.18	7.51	8.48	8.91	0.00	3.46	1.39	2.50	0.98	0.29	0.12	0.18	1,766.71	2,084.79	1,440.88	59,375.95
United States Virgin Islands <sup>a</sup>	0.00	0.00	0.08	0.77	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.02	0.00	0.00	2.31
Uruguay <sup>b</sup>	44.81	52.82	46.92	55.43	7.10	30.19	15.68	1.27	1.19	0.00	0.00	0.00	33.17	60.60	1.88	172.55
Uzbekistan <sup>b</sup>	1.33	2.64	2.38	2.90	0.00	0.01	2.88	0.00	0.00	0.00	0.00	0.00	35.26	0.17	0.00	1,223.02
Vanuatu <sup>a</sup>	24.16	38.38	40.30	32.43	30.24	0.00	0.86	0.93	0.37	0.02	0.00	0.00	0.03	0.84	0.00	2.68
Venezuela (Bolivarian Rep. of) <sup>b</sup>	11.98	11.44	12.24	12.30	0.51	1.19	10.60	0.00	0.00	0.00	0.00	0.00	191.05	30.60	0.00	1,802.40
Viet Nam <sup>b</sup>	76.08	34.80	38.11	36.20	22.20	5.12	8.86	0.00	0.01	0.00	0.00	0.00	196.29	603.41	0.00	2,209.11
Wallis and Futuna Islands <sup>a</sup>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
Yemen <sup>b</sup>	2.15	0.96	1.33	1.06	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.37	0.00	222.94
Zambia <sup>b</sup>	82.98	92.10	88.63	88.09	56.91	19.95	11.23	0.00	0.00	0.00	0.00	0.00	37.50	256.65	0.00	333.93
Zimbabwe <sup>b</sup>	63.98	82.88	78.02	81.13	71.32	5.44	4.07	0.29	0.00	0.00	0.00	0.00	16.50	302.65	1.15	394.79
<b>World<sup>a,b</sup></b>	<b>16.66</b>	<b>17.51</b>	<b>17.91</b>	<b>18.33</b>	<b>8.44</b>	<b>4.21</b>	<b>3.24</b>	<b>0.89</b>	<b>0.60</b>	<b>0.50</b>	<b>0.16</b>	<b>0.28</b>	<b>15,962.75</b>	<b>46,908.37</b>	<b>3,093.59</b>	<b>359,946.24</b>
<b>Africa<sup>a,b</sup></b>	<b>60.25</b>	<b>57.48</b>	<b>56.54</b>	<b>56.97</b>	<b>48.87</b>	<b>6.24</b>	<b>1.67</b>	<b>0.01</b>	<b>0.08</b>	<b>0.05</b>	<b>0.06</b>	<b>0.00</b>	<b>386.25</b>	<b>12,027.03</b>	<b>1.37</b>	<b>21,789.66</b>
Africa (excluding North Africa) <sup>a,b</sup>	70.89	71.88	70.69	70.47	61.45	7.16	1.70	0.01	0.03	0.05	0.07	0.00	310.01	11,588.05	1.37	16,886.26
North Africa <sup>a,b</sup>	15.72	11.46	10.06	10.51	5.55	3.08	1.57	0.00	0.25	0.05	0.00	0.00	80.24	434.99	0.00	4,903.40
Arab region <sup>a,b</sup>	6.54	4.23	3.59	3.60	1.81	1.02	0.60	0.00	0.08	0.09	0.00	0.00	103.51	453.54	0.00	15,483.15
Arab Least Developed Countries (LDCs) <sup>a,b</sup>	56.61	41.95	42.15	40.82	24.74	12.10	3.98	0.00	0.00	0.00	0.00	0.00	24.22	256.92	0.00	688.78
Arab North Africa <sup>a,b</sup>	7.21	5.48	4.81	4.54	2.59	1.29	0.26	0.00	0.33	0.07	0.00	0.00	10.65	106.35	0.00	2,574.78
Gulf Cooperation Council Countries (GCC) <sup>a,b</sup>	0.03	0.03	0.03	0.04	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.93	2.67	0.00	8,742.87
Mashreq <sup>a,b</sup>	5.36	4.20	4.12	4.47	1.24	1.12	1.68	0.00	0.12	0.31	0.00	0.00	63.69	91.62	0.00	3,476.71
<b>Asia Pacific<sup>a,b</sup></b>	<b>22.96</b>	<b>18.26</b>	<b>18.06</b>	<b>18.26</b>	<b>11.42</b>	<b>2.12</b>	<b>3.05</b>	<b>0.15</b>	<b>0.38</b>	<b>0.66</b>	<b>0.23</b>	<b>0.24</b>	<b>6,551.95</b>	<b>24,340.73</b>	<b>253.69</b>	<b>170,583.06</b>
East and North-East Asia <sup>a,b</sup>	23.27	14.52	14.31	14.88	8.36	0.49	3.70	0.10	0.52	1.10	0.23	0.38	4,436.75	9,396.90	90.51	93,579.85
North and Central Asia <sup>a,b</sup>	3.59	3.51	3.39	3.54	0.33	0.34	2.86	0.00	0.00	0.00	0.01	0.00	561.85	146.49	0.01	19,982.32
South and South-West Asia <sup>a,b</sup>	48.81	31.53	30.69	29.52	21.43	5.48	1.77	0.06	0.35	0.19	0.19	0.06	866.28	9,935.65	20.39	36,661.29
South-East Asia <sup>a,b</sup>	51.50	31.48	32.40	31.33	22.37	5.23	2.29	0.83	0.01	0.04	0.38	0.18	488.92	4,526.81	132.84	16,432.04
The Pacific <sup>a,b</sup>	13.37	13.15	12.91	13.82	1.43	5.75	3.56	0.25	0.97	0.73	0.92	0.21	227.07	305.95	9.94	3,927.56
<b>Europe, North America, and Central Asia<sup>a,b</sup></b>	<b>5.88</b>	<b>9.97</b>	<b>10.83</b>	<b>11.50</b>	<b>0.36</b>	<b>4.21</b>	<b>3.15</b>	<b>1.60</b>	<b>1.06</b>	<b>0.48</b>	<b>0.18</b>	<b>0.45</b>	<b>7,141.14</b>	<b>6,590.62</b>	<b>2,127.42</b>	<b>137,935.89</b>
Eastern Europe, Caucasus, and Central Asia <sup>a,b</sup>	3.89	4.84	4.70	4.76	0.51	0.89	2.64	0.03	0.10	0.31	0.26	0.02	749.82	533.85	7.90	27,106.84
North America <sup>a,b</sup>	6.16	9.07	10.13	10.44	0.00	3.83	2.77	2.34	0.96	0.26	0.10	0.17	3,007.21	2,451.66	1,519.25	66,842.94
South-East Europe <sup>a,b</sup>	6.86	23.29	21.65	26.05	14.37	1.83	7.67	0.63	0.93	0.38	0.15	0.08	181.14	375.95	13.78	2,191.75
Western and Central Europe <sup>a,b</sup>	7.30	13.59	15.21	16.79	0.11	7.11	3.87	1.47	1.85	0.93	0.25	1.21	3,258.92	3,173.23	586.50	41,794.37
Latin America and Caribbean <sup>a,b</sup>	32.62	28.51	27.52	27.15	4.27	10.75	8.50	3.02	0.31	0.16	0.13	0.01	2,430.33	3,363.57	712.24	23,961.41
Caribbean <sup>a,b</sup>	36.54	20.78	22.54	22.32	13.03	7.27	0.58	1.15	0.22	0.08	0.00	0.00	11.28	206.07	1.81	981.88
Latin America <sup>a,b</sup>	32.33	28.85	27.74	27.36	3.89	10.90	8.84	3.10	0.32	0.16	0.13	0.01	2,417.08	3,159.48	710.43	22,979.53
Low income <sup>a,b</sup>	67.38	79.69	79.71	80.68	69.01	8.68	2.80	0.02	0.01	0.00	0.00	0.16	214.60	5,822.88	1.37	7,484.91
Lower middle income <sup>a,b</sup>	44.58	40.69	40.62	40.13	31.53	5.75	2.23	0.15	0.23	0.08	0.16	0.01	1,464.32	19,575.80	76.02	52,619.05
Upper middle income <sup>a,b</sup>	26.50	18.01	17.24	17.33	7.99	2.55	4.25	0.69	0.48	0.84	0.24	0.30	6,233.64	13,947.12	821.50	121,180.90
High income <sup>a,b</sup>	6.06	9.05	9.84	10.44	0.10	3.99	2.98	1.41	0.93	0.47	0.14	0.41	8,006.91	6,567.09	2,189.76	160,531.58

a. Data are from the United Nations.  
 b. Data are from the International Energy Agency.  
 c. Includes Monaco.

d. Includes San Marino.  
 e. Includes Svalbard and Jan Mayen Islands.  
 f. Includes oil data for Liechtenstein.



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### Global Chapters

The chapters on access to energy (chapter 2 and 3) were prepared by a working group comprising the World Bank/Energy Sector Management Assistance Program (ESMAP) and International Energy Agency (IEA), Practical Action, Global Alliance for Clean Cookstoves, and World Health Organization (WHO). The main contributing authors were Elisa Portale, Juliette Besnard, and Julia Heckmann (World Bank/ESMAP); Ramesh Ramankutty and Sarah Hillware (World Bank/ESMAP); Dan Dorner and Hannah Daly (IEA); Carlos Dora, Heather Adair-Rohani, Sophie Gumy, Jessica Lewis (WHO); Lucy Stevens and Mattia Vianello (Practical Action); Sumi Mehta, Jessie Durrett, Cecilia Flatley (Global Alliance for Clean Cookstoves), Rodrigo Leme and Adrian Whiteman (International Renewable Energy Agency, IRENA), and Glada Lahn (Chatham House, The Royal Institute of International Affairs).

The chapter on access to electricity (chapter 2) benefited from new data model approach based on the WHO estimation model and efforts conducted by Sophie Gumy (WHO). The chapter on access to clean fuel (chapter 3) is based on official data from the WHO Household Energy Database.

The energy efficiency chapter (chapter 4) was prepared by a working group comprising the World Bank/ESMAP, IEA, Copenhagen Centre on Energy Efficiency, World Energy Council, and International Partnership for Energy Efficiency Cooperation (IPEEC). The main contributing authors were Ivan Jaques and Esra Bozkir (World Bank/ESMAP); Tyler Bryant, Jae Sik Lee, Samuel Thomas, Pierpaolo Cazzola, Renske Schuitmaker, Gianluca Tonolo, Urszula Ziebinska, Roberta Quadrelli, Melanie Slade, and David Morgado (IEA); Timothy Farrell (Copenhagen Centre on Energy Efficiency); Stuart Neil (World Energy Council); and Benoit Lebot and Jurei Yada (IPEEC). Support in data preparation and analysis was provided by Olivier Lavagne d'Ortigue (World Bank/ESMAP).

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The prospects chapter (chapter 6) was prepared by a working group comprising the World Bank/ESMAP, IEA, IRENA, World Energy Council, International Institute for Applied Systems Analysis, United Nations Development Programme, REN21, and Sustainable Energy for All (SEforALL). The main contributing authors were Zuzana Dobrotkova (World Bank/ESMAP); Dan Dorner and Hannah Daly (IEA); Dolf Gielen and Deger Saygin (IRENA); Sandra Winkler and Stuart Neil (World Energy Council); Keywan Riahi, Shonali Pachauri and Narasimha Rao (International Institute for Applied Systems Analysis); Marcel Alers (United Nations Development Programme); Christine Lins, Rana Adib and Hannah E. Murdoch (REN21); and Fiona Messent (SEforALL). The chapter draws on results of a number of global modeling exercises including the World Energy Outlook (IEA), the REmap roadmap (IRENA), and The Grand Transition (World Energy Council).

### Regional Chapters

The second part on regional stories (chapter 7 to 12) was prepared by a working group comprising the World Bank and five United Nations Regional Commissions. The main contributing authors were Alejandro Moreno and Nicolina Angelou (World Bank/ESMAP); Peter Zhou (lead author), Soteri Gatera, Mongameli Mhlanga, and Linus Mofor (contributing authors), under the leadership of Stephen Karingi and Fatima Denton (United Nations Economic Commission for Africa); Laura El-Katiri and Radia Sedaoui, with support from Roula Majdalani and Wafa About Hosn (United Nations Economic and Social Commission for Western Asia, ESCWA); Kimberly Roseberry, and Remife de Guzman, with support from Hongpeng Liu, and Sergey Tulinov, (United Nations Economic and Social Commission for Asia Pacific, ESCAP) Yougping Zhai and David Elzinga (Asian Development Bank); Robert Tromp and Lisa Tinschert, with additional contributions from UNECE Sustainable Energy Division staff; and Beno Ruchansky, Andres Schuschny, and Manlio F. Coviello (United

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In preparation for the regional chapters, technical workshops or virtual consultations were organized for country consultation in each region.

For the **Africa region**, a Specialized Technical Committee session on Energy was organized by the United Nations Economic Commission for Africa in Lome, Togo on 13-17 March 2017, with the following participants from 14 countries and multiple organizations: Clément Bill Akouedenoudie, Energy Engineer, Ministry of Energy and Water, Benin; Marguerite Hayabele Guillame, Head of Monitoring, Ministry of Water and Energy, Cameroon; Babe Danki Emmanuel, Consultant Engineer, Ministry of Planning, Cameroon; Louis Kahindo Boyabonzene, Technical Advisor Electricity, Ministry of Energy and Hydraulic Resources, Congo (Dem. Rep. of); Christian Vunda Ngulumingi, Technical Advisor New and Renewable Energies, Ministry of Energy and Hydraulic Resources, Congo (Dem. Rep. of); Mohammed Omran, First Under-Secretary for Research, Planning & Authorities follow up, Ministry of Electricity and Energy, Egypt; Ahmed Magdy, Second Secretary, Embassy of Egypt in Addis Ababa, Egypt; Ahmed Zaghoul, Third Secretary, Embassy of Egypt in Lome, Egypt; Belyou Tekola, Senior Expert on Development Cooperation and Foreign Relation, Ministry of Water, Irrigation and Energy, Ethiopia; Wondimu Tekle, State Minister, Ministry of Water, Irrigation and Electricity, Ethiopia; Francisco-J. Onana Mangué, Focal Point - Expert, Ministry of Industry and Energy, Equatorial Guinea; Leovigildo Mahon Gerona, Technical Expert on Energy Generation, Ministry of Industry and Energy, Equatorial Guinea; Kwabena A. Otu-Danquah, Ag. Director, Renewable Energy and Energy Efficiency Promotion, Energy Commission, Ghana; Wisdom Ahiataku-Togobo, Director, Ministry of Energy, Ghana; Mehamed Douno, Deputy Director General, Strategy and Development, Ministry of Energy and Hydraulics, Guinea; Paul Mbuti, Principal Renewable Energy Officer, Ministry of Energy and Petroleum, Kenya; Timothy Gakuu, Chief Economist, Ministry of Energy and Petroleum, Kenya; Barrack Ouma, Chief Geophysicist, Ministry of Energy and Petroleum, Kenya; Julius Mwathani, Senior Principal Superintending Engineer, Directorate of Electrical Power Development, Ministry of Energy and Petroleum, Kenya; Mamadou



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For the **Arab region**, a technical workshop was organized by ESCWA in Beirut, Lebanon on 24–25 January 2017, with the following participants from 9 ESCWA Member States, and experts from multiple organizations: Hussain Jaffar Abdulla Makki Ali, Director of studies and International Relations Department, National Oil and Gas Authority, Bahrain; Ahmed Mohamed Mohina, Undersecretary for Authorities' Follow up, Ministry of Electricity, Egypt; Amal Ahmed Hassan Elshaieb, General Manager for Industrial Statistics, Central

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For the **Asia-Pacific region**, a technical workshop was organized by ESCAP in Bangkok, Thailand on 16 January 2017, with the following participants from 26 countries: Hayk Harutyunyan, Deputy Minister, Ministry of Energy Infrastructures and Natural Resources, Armenia; Vugar Jabbarov, Adviser, Ministry of Energy, Azerbaijan; Lutfar Rahman, General Manager, Bangladesh Oil, Gas and Mineral Corporation (Pertobangla), Bangladesh; Satchi Dukpa, Chief Engineer of Planning and Coordination Division, Department of Renewable Energy, Ministry of Economic Affairs, Bhutan;

Sovatha Sok, Chief of Policy and Planning Office, Department of Cooperation and ASEAN Affairs, Ministry of Mines and Energy, Cambodia; Fengquan An, Deputy Director General of International Department, National Energy Administration, China; Xuantong Zhu, Deputy Division Director, National Energy Administration, China; Zhongming Du, Vice President, Electric Power Planning and Engineering Institute, China; Jianye Rao, Deputy Division Director, Electric Power Planning and Engineering Institute, China; Shuli Wang, Engineer, Electric Power Planning and Engineering Institute, China; Lijuan Chen, Translator, Electric Power Planning & Engineering Institute, China; An Thae Song, First Secretary and Deputy Permanent Representative to ESCAP, Embassy of the Democratic People's Republic of Korea in Bangkok, Korea (Dem. People's Rep. of); Kim Song Jin, First Secretary and Assistant Permanent Representative to ESCAP, Embassy of the Democratic People's Republic of Korea in Bangkok, Korea (Dem. People's Rep. of); Vijay Nath, Assistant Minister, Ministry of Infrastructure and Transport, Fiji; Kolinio Gata Takali, High Commissioner of Fiji to Malaysia and Permanent Representative to ESCAP, High Commission, Fiji; Faranise Cakaubalavu Kinivuwai, Director Policy, Ministry of Infrastructure and Transport, Fiji; Pita Tagicakirewa, Counsellor and Alternate Permanent Representative to ESCAP, High Commission, Fiji; Malvina Frances Singh, Economic Planning Officer, Strategic Planning Office, Ministry of Economy, Fiji; Margalita Arabidze, Head of Energy Efficiency and Alternative Energy Division, Ministry of Energy, Georgia; Bhagwati Prasad Pandey, Special Secretary, Ministry of Power, India; Mohsen Mohammadi, Ambassador Extraordinary and Plenipotentiary and Permanent Representative to ESCAP, Embassy of the Islamic Republic of Iran in Bangkok, Iran (Islamic Rep. of); Houshang Falahatian, Deputy Minister, Ministry of Energy, Iran (Islamic Rep. of); Mostafa Tavanpour, Deputy of the Director General of Energy and Power Planning Department, Ministry of Energy, Iran (Islamic Rep. of); Ali Gholampour, Deputy Permanent Representative to ESCAP, Embassy of the Islamic Republic of Iran in Bangkok, Iran (Islamic Rep. of); Majid Mohammadi Hoassien Abadi, Deputy of International Affairs, Institute for International Studies on Energy, Ministry of Petroleum, Iran (Islamic Rep. of); Vahid Shabani Heidarabadi, Expert, Department for International Affairs, Ministry of Petroleum, Iran (Islamic Rep. of); Akbar Sefat, Expert, Department of International Affairs, Ministry of Energy, Iran (Islamic Rep. of); Hitoshi Kozaki, Head of International

Organization Department and Deputy Permanent Representative to ESCAP, Embassy of Japan in Bangkok, Japan; Toru Adachi, First Secretary and Deputy Permanent Representative to ESCAP, Embassy of Japan in Bangkok, Japan; Satoshi Yoshida, First Secretary and Alternate Permanent Representative to ESCAP, Embassy of Japan in Bangkok, Japan; Bekbergen Kerey, Deputy Director of Department of International Cooperation and Economic Integration Processes, Ministry of Energy, Kazakhstan; Khamso Kouphokham, Deputy Director General, Department of Energy Policy and Planning, Ministry of Energy and Mines, Laos; Ahmed Raouf Mohamed, Assistant Statistical Officer, Energy Department, Ministry of Environment and Energy, Maldives; Gankhuu Purevjav, Minister, Ministry of Energy, Mongolia; Chimeddorj Demchigjav, Director General, Policy and Planning Department, Ministry of Energy, Mongolia; Gantulga Ravjir, Head of Foreign Cooperation Division, Ministry of Energy, Mongolia; Reagan Moses, Director for Climate Change, Environment Division, Department of Commerce, Industry and Environment, Nauru; Pravin Raj Aryal, Joint Secretary, Ministry of Energy, Nepal; Jesus Cristino P. Posadas, Undersecretary, Department of Energy, Philippines; Jesus T. Tamang, Director, Energy Policy and Planning Bureau, Department of Energy, Philippines; Aleksey Ponomarev, Vice President, Industrial Cooperation and Public Programs, Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Russian Fed.; Sione Ula Foliaki, Assistant Chief Executive Officer - Energy Policy Coordination and Management, Ministry of Finance, Samoa; Merrille Goonetilleke, Additional Secretary (Technical), Ministry of Power and Renewable Energy, Sri Lanka; Prasert Sinsukprasert, Deputy Director-General, Energy Policy and Planning Office, Ministry of Energy, Thailand; Dararut Ritboonyakorn, Director of International Energy Cooperation Office, Permanent Secretary of Energy, Ministry of Energy, Thailand; Poonpat Leesombatpiboon, Policy and Plan Analyst, Senior Professional Level, Ministry of Energy, Thailand; Woranon Chansiri, Policy and Plan Analyst, Senior Professional Level, Ministry of Energy, Thailand; Darin Dararuja, Foreign Relation Officer, Permanent Secretary Office, Ministry of Energy, Thailand; Chayapa Srivilas, Foreign Relation Officer, Permanent Secretary Office, Ministry of Energy, Thailand; Inoke Finau Vala, Director of Term - Implementation Unit, Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communication, Tonga; Avafoa Irata, Permanent Secretary/Chief

Executive Officer, Ministry of Public Utilities and Infrastructures, Tuvalu; Ulugbek Agzamov, Head of Division of the Department for UN and International Organizations Affairs, Ministry of Foreign Affairs, Uzbekistan; Nguyen Thanh Hai, Commercial Counsellor, Embassy of the Socialist Republic of Viet Nam in Bangkok, Viet Nam.

For the **Europe, North America, and Central Asia region**, UNECE organized virtual consultations that took place between 12 December 2016 and 22 February 2017, and responses were received from the following participants from 12 countries: Mariela A. Stefanlari, President, Human Environment Culture Foundation, Albania; Olga Dovnar, Deputy Chairperson, International Cooperation Unit, National Statistical Committee, Belarus; Andrei Miniankou, Head of Department, Department for Energy Efficiency, State Committee on Standardization, Belarus; Vladimir Zui, Professor, Belarusian State University, Belarus; Valentina Ilieva, Official, Energy Strategies and Policies for Sustainable Energy Development Directorate, Ministry of Energy, Bulgaria; Zlatko Pavicic, Independent Expert, Croatia; Matija Vajdic, Senior Researcher, Energy Institute Hrvoje Pozar, Croatia; Sigurd Heiberg, Chairperson, Petronavit a.s., Norway; Margalita Arabidze, Head of Energy Efficiency and Renewable Energy Division, Ministry of Energy, Georgia; Anna Sikharulidze, Technical Manager, Sustainable Development Centre Remissia, Georgia; Gogita Todradze, Deputy Executive Director, National Statistics Office, Georgia; Tahmina Mahmud, Independent Expert, Tajikistan; Maksym Chepeliev, Research Economist, Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University, USA (for Ukraine). In addition, the following UNECE country representatives participated in the technical workshop organized by ESCAP in Bangkok, Thailand on 16 January 2017: Hayk Harutyunyan, Deputy Minister, Ministry of Energy Infrastructures and Natural Resources, Armenia; Vugar Jabbarov, Adviser, Ministry of Energy, Azerbaijan; Margalita Arabidze, Head of Energy Efficiency and Alternative Energy Division, Ministry of Energy, Georgia; Bekbergen Kerey, Deputy Director of Department of International Cooperation and Economic Integration Processes, Ministry of Energy, Kazakhstan; Aleksey Ponomarev, Vice President, Industrial Cooperation and Public Programs, Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Russian Fed.; Ulugbek Agzamov, Head of Division of the Department for UN and International Organizations Affairs, Ministry of Foreign Affairs, Uzbekistan.

For the **Latin America and Caribbean region**, a technical workshop was organized by the United Nations Economic Commission for Latin America and Caribbean in Santiago, Chile on 10 November 2016, with the following participants from 11 countries and several organizations: Andrea Heins, Undersecretary for Energy Efficiency, Ministry of Energy and Mining, Argentina; Mario Mendoza, Director General Energy Planning, Ministry of Hydrocarbons and Energy, Bolivia; Ricardo Gorini, Director, Energy Planning Company, Brazil; Ingacio Santelices, Director Energy Efficiency Division, Ministry of Energy, Chile; Laura Lizano, Sectoral Director of Energy, Ministry of Environment and Energy, Costa Rica; Ernesto Vilalta, Vice Minister of Energy, Ministry of Energy and Mines, Dominican Republic; Adrian Moreno, Undersecretary of Energy Efficiency and Renewables, Ministry of Electricity and Renewable Energy, Ecuador; Luis Reyes, Executive Secretary, National Energy Council, El Salvador; Luis Chang, Minister of Energy, Ministry of Energy and Mines, Guatemala; Odon de Buen, General Manager, National Commission for Efficient Use of Energy, Mexico; Carolina Mena, Director of Energy Efficiency, Ministry of Industry, Energy and Mining, Uruguay; Ghislaine Kieffer, Senior Energy Specialist, IRENA; Roberto Aiello, SEforALL Coordinator for Latin America, IADB; Ivan Jaques, Senior Energy Specialist, World Bank; Francesco Giorgianni, Vice President Chile, World Energy Council.

### Data Sources

The report draws on two metadatabases of global household surveys, an electrification database managed by the World Bank and a database on access to clean fuels and technologies managed by WHO.

The report is based on energy balances data provided by the IEA's Energy Data Center (IEA World energy balances, 2016 and UN Statistics Division). Gross domestic product and value added data are provided by the World Development Indicators of the World Bank. Population data comes the United Nations Population Division.

The report's renewable energy chapter benefited from significant new data processing and automatization efforts conducted by Roberta Quadrelli and Remi Gigoux (IEA's Energy Data Center), Yasmina Abdelilah (IEA's Renewable Energy Division), and Ralf Becker and Leonardo Souza (UN Statistics Division).

The energy efficiency chapter used modelling results for transport intensities from the IEA's Mobility Model, provided by Pierpaolo Cazzola and Renske Schuitmaker (IEA's Transport Unit of the Energy Technology Policy Division in the Directorate of Sustainability, Technology and Outlook).

### Review and Consultation

The public consultation and peer review process was coordinated by Vivien Foster (World Bank) and Martin Hullin (REN21) and benefited from use of the REN21 online consultation platform.

Substantive comments were also provided by Atul Raturi (University of the South Pacific), Baradwaj Kumamuru Venkata (World Bioenergy Association), Mariela Stefanlari, Yamina Saheb (Openexp), Zoe Lagarde (IPEEC), Andrew Scott (Overseas Development Institute), Parthan Binu (Sustainable Energy Associates), David Lecoque (Alliance for Rural Electrification), Dipti Vaghela (Hydro Empowerment Network), Davida Wood (World Resources Institute), Ernesto Elenter (SEG), Emmanuel Ackom (UNEP Technical University of Denmark Partnership), Galyna Trypolska (Institute for Economics and Forecasting, Ukrainian National Academy of Sciences), Gianluca Sambucini and Oleg Dzioubinski (UNECE), Gogita Todradze (National Statistics Office of Georgia), Hannah E. Murdock (REN21), Litvinyuk Igor (International Institute of Energy Policy and Diplomacy of Moscow State Institute of International Relations, Jessie Durret (The Global Alliance for Clean Cookstoves), John Hauge (The Global LPG Partnership, Inc.), Seijin Kim and Elena Virkkala Nekhaev (World Energy Council), Mareike Britten (Hivos), Maria Cristina Silva (Ministry of Energy, Chile), Olola

Vieyra-Mifsud (Advisory Role to the Benin Government), Peter Boait (De Montfort University), Paul Munro (University of South Wales), Reid Detchon (United Nations Foundation), Kimberly Roseberry (ESCAP), Radia Sedaoui (ESCWA), Tara Shine (Tara Shine International Environment and Development Consultancy), Uliana Pysmenna (Institute for Economy and Forecasting), Vanesa Castan Broto (Bartlett Development Planning Unit, University College London), Radoslav Vukas (Ministry of Mining and Energy, Serbia), Yasmina Abdelilah (IEA), and Zitouni Ould-Dada (UNEP).

The World Bank's internal peer review process was led by Riccardo Puliti, with contributions from Marianne Fay, Neil Fantom, Gabriela Elizondo, Dana Rysankova and Ashok Sarkar (World Bank), and Jane Olga Ebinger (SEforALL).

The IEA's internal review process involved Kamel Ben Naceur, Rebecca Gaghen, Hannah Daly, Dan Dorner, Paolo Frankl, Adam Brown, Heymi Bahar, Yasmina Abdelilah, Roberta Quadrelli, Tyler Bryant, Jae Sik Lee, Samuel Thomas, Pierpaolo Cazzola, Renske Schuitmaker, Gianluca Tonolo, Urszula Ziebinska, Melanie Slade, and David Morgado.

### Outreach

The communications process was coordinated by Susan Fleming, Aarthi Sivaraman and Anita Rozowska (World Bank), Jad Mouawad (IEA), and Callum Grieve and Beth Woodthorpe-Evans (SEforALL).

The online platform (<http://GTF.esmap.org>) was developed by Sreejith K.S., Narayanan R., and Ram Prasad of Advanced Software Systems Inc., with input and guidance from Anshul Rana & Aarthi Sivaraman.

The report was edited, designed, and typeset by Bruce Ross-Larson and a team at Communications Development, including Jonathan Aspin, Joe Brinley, Joe Caponio, Mike Crumplar, Shannon Granville, Chris Trott, John Wagley, and Elaine Wilson, with Debra Naylor of Naylor Design. Graphic design of the Executive Summary was by Duina Reyes.











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