Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all

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Target 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services.

Indicator 7.1.1: Percentage of population with access to electricity

From World Bank in partnership with UN Energy and SE4ALL Global Tracking Framework Consortium:

Definition and method of computation	The percentage of the population that has access to electricity, based on national household surveys. Given the low frequency and the regional distribution of some surveys, a number of countries have gaps in available data. To develop the historical evolution and starting point of electrification rates, a simple modeling approach was adopted to fill in the missing data points - around 1990, 2000, 2010 and 2012. This modeling approach allowed the estimation of electrification rates for 212 countries over these time periods. The SE4ALL Global Tracking Framework Report (2013) referenced below provides more details on the suggested methodology for tracking access to energy (Chapter 2, Section 1, page 82-87).
Rationale and interpretation	Access to electricity addresses major critical issues in all the dimensions of sustainable development. The target has a wide range of social and economic impacts, including facilitating development of household-based income generating activities and lightening the burden of household tasks.
Sources and data collection	Data for access to electricity are collected entirely from household surveys (and occasionally censuses), tapping into a wide number of different household survey types including: Demographic and Health Surveys (DHS) and Living Standards Measurement Surveys (LSMS), Multi-Indicator Cluster Surveys (MICS), the World Health Survey (WHS), other nationally developed and implemented surveys, including those by various government agencies (for example, ministries of energy and utilities). The World Bank is the agency that has taken responsibility for compiling a metadatabase of statistics on electricity access harvested from the full global body of household surveys. The World Bank Electrification Database covers more than 180 countries for the period 1990-2012 and is updated regularly. For more information on compiling access to energy data see Global Tracking Framework report (2013) (Chapter 2, Annex 2, page 127-129).
Disaggregation/ additional dimension	Disaggregation of access to electricity by rural or urban place of residence is possible for all countries.
Comments and limitations	While the existing global household survey evidence base provides a good starting point for tracking household energy access, it also presents a number of limitations that will need to be addressed over time. In many parts of the world, the presence of an electricity connection in the household does not necessarily guarantee that the energy supplied is adequate in quality and reliability or affordable in cost and it would be desirable to have fuller information about these critical attributes of the service, which have been highlighted in SDG7.

	Substantial progress has already been made toward developing and piloting a new methodology known as the Multi-Tier Framework for Measuring Energy Access (World Bank) which is able to capture these broader dimensions of service quality and would make it possible to go beyond a simple yes/no measure of energy access to a more refined approach that recognizes different levels of energy access, and also takes into account the affordability and reliability of energy access explicitly referenced in the language of SDG7. The methodology for the Multi-Tier Framework for Measuring Energy Access has already been published based on a broad consultative exercise and represents a consensus view across numerous international agencies working in the field. A first Global Energy Access Survey using this methodology has already been launched and is underway expecting to yield results by early 2017. Discussions are also progressing with the World Bank's Household Survey Technical Working Group regarding the mainstreaming of this methodology into the standardized household questionnaire design that will be applied every three years in all low income countries between 2015 and 2030 as part of the broader SDG monitoring exercise. The adoption of this methodology will allow – over time – the more refined measurement of energy access, making it possible to report more disaggregated information regarding the type of electricity supply (grid or off-grid), the capacity of electricity supply provided (in Watts), the duration of service (daily hours and evening hours), the reliability of service (in terms of number and length of unplanned service interruptions), the quality of service (in terms of voltage fluctuations), as well as affordability and legality of service. Another advantage of this approach is that they can be applied not only to measuring energy access at the household level, but also its availability to support enterprises and deliver critical community services, such as health and education. Methodological challenges associated with the measurement of energy access are more fully described the Global Tracking Framework (2013) (Chapter 2, Section 1, page 75-82), and in the ESMAP (2015) Report "Beyond Connections: Energy Access Redefined" both of which are referenced below.
Gender equality issues	Energy is a service provided at the household, rather than individual level. Nonetheless, it is used differentially by men and women and has different impacts on their well-being. What will be possible, in principle, is to report energy access disaggregated by the gender of the head of household, as long as access to underlying survey micro data can be obtained.
Data for global and regional monitoring	• Electricity access rate: Global coverage is available through the World Bank Global Electrification Database 2015 and the database SE4ALL Global Tracking Framework (World Bank) referenced below.
Supplementary information	Since 2012, under the auspices of Sustainable Energy for All, the World Bank and the International Energy Agency worked on the development of the SE4ALL Global Tracking Framework in close collaboration with a consortium of 24 international agencies (Food and Agricultural Organization (FAO), Global Alliance for Clean Cookstoves (GACC), Global Water Partnership (GWP), 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 Network for the 21st Century (REN21), Stockholm International Water Institute (SIWI), UN Energy, United Nations Development Program (UNDP), United Nations Foundation (UNF), United Nations Department of Economic and Social Affairs (UNDESA), United Nations Industrial Development Organization (UNIDO), United Nations Statistics Division (UNSD), World Energy Council (WEC) and the World Health Organization (WHO)). The consortium has also had discussions with UN Habitat, UNESCO and the five UN Regional Commissions (ECLAC, ESCAP, ESCWA, UNECA, UNECE) regarding their incorporation into the consortium going forward. The Global Tracking Framework developed a series of indicators to measure the three SE4ALL objectives that align closely with those proposed to measure the SDG7 targets. Data was collected on these indicators for the period 1990-2012 for more than 180 countries worldwide and is publicly available at the data platform cited below. The SE4ALL Global Tracking Framework has already been published in two editions: the 2013 Report covering the baseline period 1990-2010, and the 2015 report updating progress from 2010-2012. In future, more refined data on the source of electricity obtainable through the Multi-Tier Framework for Measurement of Energy Access will make it possible also to understand the extent to which service is being provided by off-grid renewable energy, which will be a useful input into measurement of indicator 7.2 on renewable energy, as has been noted by IRENA.
References	• Global Tracking Framework Report (2013) http://trackingenergy4all.worldbank.org • Global Tracking Framework Report (2015) http://trackingenergy4all.worldbank.org/ • Global Tracking Framework database (2015) http://data.worldbank.org/data-catalog/sustainable-energy-for-all • Multi-Tier Framework for Measuring Energy Access, https://www.esmap.org/node/55526

Indicator 7.1.2: Proportion of population with primary reliance on clean fuels and technology

From World Health Organization in partnership with UN Energy and SE4ALL Global Tracking Framework Consortium:

Definition and method of computation	The percentage of population with primary reliance on clean fuels and technology at the household level. **From non-solid fuels to clean fuels** Current global data collection focuses on the primary fuel used for cooking, categorized as solid or non-solid fuels, where solid fuels are considered polluting and non-modern, while non-solid fuels are considered clean. This single measure captures a good part of the lack of access to clean cooking fuels, but fails to collect data on type of device or technology is used for cooking, and also fails to

capture other polluting forms of energy use in the home such as those used for lighting and heating.

New evidence-based normative guidance from the WHO (i.e. *WHO Guidelines for indoor air quality guidelines: household fuel combustion),* highlights the importance of addressing both fuel and the technology for adequately protecting public health. These guidelines provide technical recommendations in the form of emissions targets for as to what fuels and technology (stove, lamp, and so on) combinations in the home are clean. These guidelines also recommend against the use of unprocessed coal and discourage the use kerosene (a non-solid but highly polluting fuel) in the home. They also recommend that all major household energy end uses (e.g. cooking, space heating, lighting) use efficient fuels and technology combinations to ensure health benefits.

For this reason, the technical recommendations in the WHO guidelines, access to modern cooking solution in the home will be defined as "access to clean fuels and technologies" rather than "access to non-solid fuels." This shift will help ensure that health and other "nexus" benefits are better counted, and thus realized.

Definition

Percent of population with primary reliance on clean* fuels and technologies at the household level.

The indicator is calculated as the number of people using clean fuels and technologies for cooking, heating and lighting divided by total population reporting that any cooking, heating or lighting, expressed as percentage.

*"Clean" is defined by the emission rate targets and specific fuel recommendations (i.e. against unprocessed coal and kerosene) included in the normative guidance *WHO guidelines for indoor air quality: household fuel combustion*.

Method of computation
The indicator is modelled with household survey data compiled by WHO. The information on cooking fuel use and cooking practices comes from about 800 nationally representative survey and censuses. Survey sources include Demographic and Health Surveys (DHS) and Living Standards Measurement Surveys (LSMS), Multi-Indicator Cluster Surveys (MICS), the World Health Survey (WHS), and other nationally developed and implemented surveys.

Estimates of primary cooking energy for the total, urban and rural population for a given year are obtained separately using a multilevel model. The model only accounts for regions, countries and time as a spline function, and estimates are restricted to values ranging from zero to one. More details on the model are published elsewhere (Bonjour et al, 2013).

Estimates for countries with no available surveys were obtained as follows:

- When survey data is available for a country, the regional population-weighted mean is used to derive aggregate estimates at a regional or global level, however no country point estimate is given for that country is reported
- Countries classified as high-income with a Gross National Income (GNI) of more than US$ 12,746.- per capita are assumed to have made a

	complete transition to using clean fuels and technologies as the primary domestic energy source for cooking and the primary reliance on polluting (unclean) fuels and technologies use is reported to be less than 5% and assumed as zero for regional and global estimates. For estimating the fraction of the population relying on clean fuels and technologies for heating and lighting, the same methodology using survey data to derive country estimates for a particular year will be used using the same above mentioned assumptions.
Rationale and interpretation	**Primary reliance on clean fuels and technologies** Cooking, lighting and heating represent a large share of household energy use across the low- and middle-income countries. For cooking and heating, households typically rely on solid fuels (such as wood, charcoal, biomass) or kerosene paired with inefficient technologies (e.g. open fires, stoves, space heaters or lamps). It is well known that reliance on such inefficient energy for cooking, heating and lighting is associated with high levels of household (indoor) air pollution. The use of inefficient fuels for cooking alone is estimated to cause over 4 million deaths annually, mainly among women and children. This is more than TB, HIV and malaria combined. These adverse health impacts can be avoided by adopting clean fuels and technologies for all main household energy end-or in some circumstances by adopting advanced combustion cook stoves (i.e. those which achieve the emission rates targets provided by the WHO guidelines) and adopting strict protocols for their safe use. Given the importance of clean and safe household energy use as a human development issue, universal access to energy among the technical practitioner community is currently taken to mean access to both electricity and clean fuels and technologies for cooking, heating and lighting. For this reason, clean cooking forms part of the universal access objective under the UN Secretary General's Sustainable Energy for All initiative.
Sources and data collection	**Access to clean fuels and technologies** Primary household fuels and technologies, particularly for cooking, is routinely collected at the national levels in most countries using censuses and surveys. Household surveys used include: United States Agency for International Development (USAID)-supported Demographic and Health Surveys (DHS); United Nations Children's Fund (UNICEF)-supported Multiple Indicator Cluster Surveys (MICS); WHO-supported World Health Surveys (WHS); and other reliable and nationally representative country surveys. The World Health Organization is the agency that has taken responsibility for compiling a database of statistics on access to clean and polluting fuels and technologies harvested from the full global body of household surveys for cooking, heating and lighting. Currently, the WHO Database covers cooking energy for 157 countries and one territory for the period 1970-2015 and is updated regularly and publicly available. For lighting, the WHO database includes data for 76 countries for the period 1963-2014. For heating, the WHO database includes data for 16 countries for the period 1986 – 2012. Presently WHO is working with national surveying agencies, country statistical offices and other stakeholders (e.g. researchers) to enhance multipurpose household survey instruments to gather data on the fuels and technologies used for heating and lighting.
Disaggregation / additional dimension	Disaggregated estimates for different end-uses (i.e. cooking, heating* and lighting*). (*With expected improvements in household surveys, this will be possible for heating and lighting for all countries.)

	Disaggregation of access to clean fuel and technologies for cooking by rural or urban place of residence is possible for all countries. Gender disaggregation by main user (i.e. cook) of cooking energy will be available with expected improvements in household surveys Gender disaggregation of head of household for cooking, lighting and heating is available
Comments and limitations	**Access to non-solid fuels** The indicator uses the type of primary fuels and technologies used for cooking, heating, and lighting as a practical surrogate for estimating human exposure to household (indoor) air pollution and its related disease burden, as it is not currently possible to obtain nationally representative samples of indoor concentrations of criteria pollutants, such as fine particulate matter and carbon monoxide. However epidemiological studies provide a science-based evidence for establishing those estimates using these surrogates. The indicator is based on the main type of fuel and technology used for cooking as cooking occupies the largest share of overall household energy needs. However, many households use more than one type of fuel and stove for cooking and, depending on climatic and geographical conditions, heating with polluting fuels can also be a contributor to household (indoor) air pollution levels. In addition, lighting with kerosene, a very polluting and hazardous fuel is also often used, and in some countries is the main fuel used for cooking. While the existing global household survey evidence base provides a good starting point for tracking household energy access for cooking fuel, it also presents a number of limitations that will need to be addressed over time. Currently there is a limited amount of available data capturing the type of fuel and devices used in the home for heating and lighting. Accordingly WHO in cooperation with World Bank, and the Global Alliance for Clean Cookstoves, is leading a survey enhancement process with representatives from country statistical offices and national household surveying agencies (e.g. DHS, MICS, LSMS) to better gather efficiently and harmoniously information on the fuels and technologies for cooking, heating and lighting. This process is currently in the piloting phase with expected rollout of the final household surveys questions (~6 questions in total) expected in the coming year. These few questions will replace and slightly expand the current set of questions commonly used on national multipurpose surveys to assess household energy. Substantial progress has already been made toward developing and piloting a new methodology known as the Multi-Tier Framework for Measuring Energy Access (World Bank) which is able to capture the affordability and reliability of energy access explicitly referenced in the language of SDG7 and harnesses the normative guidance in the WHO guidelines to benchmark tiers of energy access. The methodology for the Multi-Tier Framework for Measuring Energy Access has already been published based on a broad consultative exercise and represents a consensus view across numerous international agencies working in the field. A first Global Energy Access Survey using this methodology has already been launched and is underway expecting to yield results by early 2017.
Gender equality	Energy is a service provided at the household, rather than individual level.

issues	Nonetheless, it is used differentially by men and women and has different impacts on their health and well-being. What will be possible, in principle, is to report energy access disaggregated by the main user of cooking energy. In addition, WHO's Household energy database includes country data from thirty countries on the time spent by children collecting fuelwood and water disaggregated by sex. With the improvements in data collection via the aforementioned survey harmonization process, data will be available reporting time spent exclusively on fuel collection rather than in combination with water collection.
Data for global and regional monitoring	Coverage of 157 countries is available through the WHO Global Household Energy Database. The Sustainable Energy for All Global Tracking Framework reports clean cooking fuel and technology access rates based on WHO data every two years.
Supplementary information	Since 2012, under the auspices of Sustainable Energy for All, the World Bank and the International Energy Agency worked on the development of the SE4ALL Global Tracking Framework in close collaboration with a consortium of 24 international agencies (Food and Agricultural Organization (FAO), Global Alliance for Clean Cookstoves (GACC), Global Water Partnership (GWP), 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 Network for the 21st Century (REN21), Stockholm International Water Institute (SIWI), UN Energy, United Nations Development Program (UNDP), United Nations Foundation (UNF), United Nations Department of Economic and Social Affairs (UNDESA), United Nations Industrial Development Organization (UNIDO), World Energy Council (WEC) and the World Health Organization (WHO)). The consortium has also had discussions with UN Habitat, UNESCO and the five UN Regional Commissions (ECLAC, ESCAP, ESCWA, UNECA, UNECE) regarding their incorporation into the consortium going forward. The Global Tracking Framework developed a series of indicators to measure the three SE4ALL objectives that align closely with those proposed to measure the SDG7 targets. Data was collected on these indicators for the period 1990-2012 for more than 180 countries worldwide and is publicly available at the data platform cited below. The SE4ALL Global Tracking Framework has already been published in two editions: the 2013 Report covering the baseline period 1990-2010, and the 2015 report updating progress from 2010-2012. The GTF is a more extensive survey assessment of energy access in the home, permitting a more in-depth analysis of the factors contributing to clean household energy access and are an important complement to the national, regional and global estimates provided by WHO. In future, the more refined data on clean cooking obtained through the Multi-Tier Framework for Measurement of Energy Access, will serve as an important complement to the current enhancement and harmonization of the national surveys (e.g. DHS, MICS, LSMS) and census which will further facilitate the monitoring of both the fuel and technology used for cooking and lighting.
References	• Global Tracking Framework report (2013)

	http://trackingenergy4all.worldbank.org/ • Global Tracking Framework Report (2015) http://trackingenergy4all.worldbank.org/ • Global Tracking Framework database (2015) http://data.worldbank.org/data-catalog/sustainable-energy-for-all • Multi-Tier Framework for Measuring Energy Access, https://www.esmap.org/node/55526 • WHO Guidelines for indoor air quality: Household Fuel Combustion, WHO (2014) http://www.who.int/indoorair/guidelines/hhfc/en/ • Bonjour S, Adair-Rohani H, Wolf J, Bruce NG, Mehta S, Prüss-Ustün A, Lahiff M, Rehfuess EA, Mishra V, Smith KR. Solid Fuel Use for Household Cooking: Country and Regional Estimates for 1980-2010. Environ Health Perspect (2013): .doi:10.1289/ehp.1205987.) • Population using solid fuels meta-data, WHO http://apps.who.int/gho/indicatorregistry/App_Main/view_indicator.aspx?iid=318

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.

Indicator 7.2.1: Renewable energy share in the total final energy consumption

From International Energy Agency in partnership with IRENA, United Nations Statistics Division (UNSD), UN Energy and SE4ALL Global Tracking Framework Consortium:

Definition and method of computation	The renewable energy share in total final consumption is the percentage of final consumption of energy that is derived from renewable resources. It is calculated by dividing consumption of energy from all renewable sources by total final energy consumption. Renewable energy consumption includes consumption of energy derived from: hydro, solid biofuels, wind, solar, liquid biofuels, biogas, geothermal, marine and waste. Total final energy consumption is calculated from national balances and statistics as total final consumption minus non-energy use. Renewable energy consumption is derived from three tables of the IEA world energy statistics and balances: total final consumption, electricity output and heat output. All volumes reported in the total final consumption table are taken as reported. Since volumes for electricity and heat in the final consumption table are not broken down by technology, electricity and heat output tables are used instead to break down final consumption of electricity and heat by technology. The allocation by technology is done by deriving the share of technology in electricity and heat output tables and multiplying that share by final energy consumption of electricity and heat, respectively. For instance, if total final consumption table reports 150 TJ for biogas energy, while total final consumption of electricity is 400 TJ and heat 100 TJ, and the share of biogas in total electricity output is 10 percent and 5 percent in heat, the total reported number for biogas consumption will be 195 TJ (150 TJ+400TJ*10%+100TJ*5%). The Global Tracking Framework Report (2013) provides more details on the suggested methodology for defining and measuring renewable energy (Chapter 4, Section 1, page 201-202).
Rationale and interpretation	The target "By 2030, increase substantially the share of renewable energy in the global energy mix" impacts all three dimensions of sustainable development. Renewable energy technologies represent a major element in strategies for greening economies everywhere in the world and for tackling the critical global problem of climate change. A number of definitions of renewable energy exist; what they have in common is highlighting as renewable all forms of energy that their consumption does not deplete their availability in the future. These include solar, wind, ocean, hydropower, geothermal resources, and bioenergy (in the case of bioenergy, which can be depleted, sources of bioenergy can be replaced within a short to medium-term frame). Importantly, this indicator focuses on the amount of renewable energy actually consumed rather than the capacity for renewable energy production, which cannot always be fully utilized. By focusing on consumption by the end user, it avoids the distortions caused by the fact that conventional energy sources are subject to significant energy losses along the production chain.
Sources and data collection	Data on renewable energy consumption are available through national Energy Balances produced by the International Energy Agency and the United Nations

	Statistics Division (UNSD) for more than 180 countries. The energy balances make it possible to trace all the different sources and uses of energy at the national level. Some technical assistance may be needed to improve these statistics, particularly in the case of renewable energy sources. Specialized industry surveys (e.g. on bioenergy use) or household surveys (in combination with the measurement of other indicators) would be feasible approaches to filling in data gaps (e.g. for use of firewood, off-grid solar energy).
Disaggregation/additional dimension	Disaggregation of the data on consumption of renewable energy, e.g. by resource and end-use sector, could provide insights into other dimensions of the goal, such as affordability and reliability. For solar energy, it may also be of interest to disaggregate between grid and off-grid capacity.
Comments and limitations	**Comments with regard to specific renewable energy resources:** • Solar energy consumption includes solar PV and solar thermal • Liquid biofuel energy consumption includes biogasoline, biodiesels and other liquid biofuels • Solid biofuel consumption includes fuelwood, animal waste, vegetable waste, black liquor, bagasse and charcoal • Waste energy covers energy from renewable municipal waste **Limitations** • A limitation with existing renewable energy statistics is that they are not able to distinguish whether renewable energy is being sustainably produced. For example, a substantial share of today's renewable energy consumption comes from the use of wood and charcoal by households in the developing world, which sometimes may be associated with unsustainable forestry practices. There are efforts underway to improve the ability to measure the sustainability of bio-energy, although this remains a significant challenge. • Off-grid renewables data is limited and not sufficiently captured in the energy statistics • The method of allocation of renewable energy consumption from electricity and heat output assumes that the share of transmission and distribution losses are the same between all technologies. However, this is not always true because renewables are usually located in more remote areas from consumption centers and may incur larger losses. • Likewise, imports and exports of electricity and heat are assumed to follow the share of renewability of electricity and heat generation, respectively. This is a simplification that in many cases will not affect the indicator too much, but that might do so in some cases, for example, when a country only generates electricity from fossil fuels but imports a great share of the electricity it uses from a neighboring country's hydroelectric power plant. • Methodological challenges associated with defining and measuring renewable energy are more fully described the Global Tracking Framework (2013) Chapter 4, Section 1, page 194-200.
Gender equality	Not applicable
Data for global and regional monitoring	Between the various existing data sources, primarily the IEA Energy Balances and the UN Energy Statistics Database, annual total and renewable energy consumption for every country and area can be collected. The Sustainable Energy for All Global Tracking Framework is reporting this indicator at a global level between 2010 and 2030.

Supplementary information	Since 2012, under the auspices of Sustainable Energy for All, the World Bank and the International Energy Agency worked on the development of the SE4ALL Global Tracking Framework in close collaboration with a consortium of 24 international agencies (Food and Agricultural Organization (FAO), Global Alliance for Clean Cookstoves (GACC), Global Water Partnership (GWP), 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 Network for the 21st Century (REN21), Stockholm International Water Institute (SIWI), UN Energy, United Nations Development Program (UNDP), United Nations Foundation (UNF), United Nations Department of Economic and Social Affairs (UNDESA), United Nations Industrial Development Organization (UNIDO), United Nations Statistics Division (UNSD), World Energy Council (WEC) and the World Health Organization (WHO)). The consortium has also had discussions with UN Habitat, UNESCO and the five UN Regional Commissions (ECLAC, ESCAP, ESCWA, UNECA, UNECE) regarding their incorporation into the consortium going forward. The Global Tracking Framework developed a series of indicators to measure the three SE4ALL objectives that align closely with those proposed to measure the SDG7 targets. Data was collected on these indicators for the period 1990-2012 for more than 180 countries worldwide and is publicly available at the data platform cited below. The SE4ALL Global Tracking Framework has already been published in two editions: the 2013 Report covering the baseline period 1990-2010, and the 2015 report updating progress from 2010-2012. In future, more refined data on the source of electricity obtainable through the Multi-Tier Framework for Measurement of Energy Access will make it possible also to understand the extent to which service is being provided by off-grid renewable energy, which will be a useful input into measurement of indicator 7.2 on renewable energy, as noted by IRENA.
References	• Global Tracking Framework report (2013) http://trackingenergy4all.worldbank.org/ • Global Tracking Framework Report (2015) http://trackingenergy4all.worldbank.org/ • Global Tracking Framework database (2015) http://data.worldbank.org/data-catalog/sustainable-energy-for-all • UN Energy Statistics Database http://unstats.un.org/unsd/energy/edbase.htm • IEA Energy Balances and Statistics http://www.iea.org/statistics/topics/energybalances/ • IRENA Renewable Energy Database http://resourceirena.irena.org/gateway/dashboard

Target 7.3 By 2030, double the global rate of improvement in energy efficiency.

Indicator 7.3.1: Energy intensity measured in terms of primary energy and GDP

From International Energy Agency in partnership with UN Statistics, UN Energy, and SE4ALL Global Tracking Framework Consortium:

Definition and method of computation	Primary energy intensity is obtained by dividing total primary energy supply over gross domestic product. Total primary energy supply, as defined by the IEA, is made up of production plus net imports minus international marine and aviation bunkers plus-stock changes. For international comparison purposes, GDP is measured in constant terms at purchasing power parity.
Rationale and interpretation	Energy intensity is an indication of how much energy is used to produce one unit of economic output. It is a proxy of the efficiency with which an economy is able to use energy to produce economic output. A lower ratio indicates that less energy is used to produce one unit of output
Sources and data collection	Primary energy supply is typically calculated in the making of national energy balances. Energy balances are available for larger economies from the International Energy Agency and for all countries in the world from UN Statistics, although typically with an additional year of lag.
Disaggregation/additional dimension	Disaggregation of energy intensity, e.g. by sector, could provide further insights into progress towards energy efficiency. At present it is only feasible to calculate such sector disaggregations for the following sectors – industry, residential, transport, agriculture, households – as reported in the SE4ALL Global Tracking Framework. It would be desirable, over time, to develop more refined sectoral level energy intensity indicators that make it possible to look at energy intensity by industry (e.g. cement, steel) or by type of vehicle (e.g. cars, trucks), for example. Doing so will not be possible without statistical collaboration with the relevant energy consuming sectors. Decomposition analysis of energy intensity trends seeks to filter out factors that affect energy demand, such as economy wide scale and structure shifts, form more narrowly defined energy intensity shifts. and applies decomposition analysis to isolate a more refined measure of energy intensity, one that sifts out the temporal shift of relative sector weights. This analysis is also reported in the SE4ALL Global Tracking Framework.
Comments and limitations	Primary energy intensity level is only an imperfect proxy to energy efficiency indicator. It can be affected by a number of factors, such as climate, structure of the economy, nature of economic activities etc. that are not necessarily linked to pure efficiency.
Gender equality issues	Not applicable
Data for global and regional monitoring	IEA and UN energy balances combined provide primary energy supply data for most countries. GDP data is available for all countries in the World Development Indicators database of the World Bank. The Sustainable Energy for All Global

	Tracking Framework is reporting this indicator for 181 countries between 2010 and 2030.
Supplementary information	Since 2012, under the auspices of Sustainable Energy for All, the World Bank and the International Energy Agency worked on the development of the SE4ALL Global Tracking Framework in close collaboration with a consortium of 24 international agencies (Food and Agricultural Organization (FAO), Global Alliance for Clean Cookstoves (GACC), Global Water Partnership (GWP), 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 Network for the 21st Century (REN21), Stockholm International Water Institute (SIWI), UN Energy, United Nations Development Program (UNDP), United Nations Foundation (UNF), United Nations Department of Economic and Social Affairs (UNDESA), United Nations Industrial Development Organization (UNIDO), UN Statistics, World Energy Council (WEC) and the World Health Organization (WHO)). The consortium has also had discussions with UN Habitat, UNESCO and the five UN Regional Commissions (ECLAC, ESCAP, ESCWA, UNECA, UNECE) regarding their incorporation into the consortium going forward. The Global Tracking Framework developed a series of indicators to measure the three SE4ALL objectives that align closely with those proposed to measure the SDG7 targets. Data was collected on these indicators for the period 1990-2012 for more than 180 countries worldwide and is publicly available at the data platform cited below. The SE4ALL Global Tracking Framework has already been published in two editions: the 2013 Report covering the baseline period 1990-2010, and the 2015 report updating progress from 2010-2012.
References	• Global Tracking Framework report (2013) http://trackingenergy4all.worldbank.org/ • Global Tracking Framework Report (2015) http://trackingenergy4all.worldbank.org/ • Global Tracking Framework database (2015) http://data.worldbank.org/data-catalog/sustainable-energy-for-all • UN Energy Statistics Database http://unstats.un.org/unsd/energy/edbase.htm • IEA Energy Balances and Statistics http://www.iea.org/statistics/topics/energybalances/

Target 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.

Indicator 7.a.1: Mobilized amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment

No metadata received on current indicator formulation.

Target 7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries and small island developing States.

Indicator 7.b.1: Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services

No metadata received on current indicator formulation.