



IEA Market Report Series - Renewables 2020

Definitions and notes

Renewable Electricity

The electricity generation and capacity forecasts presented in the dynamic chart and the extended dataset correspond to this report's main and accelerated cases. The accelerated case illustrates how certain market and policy enhancements could increase renewable deployment.

Total renewable capacity/generation

Total renewable capacity and generation equals the sum of bioenergy, hydropower (including pumped storage for capacity), onshore and offshore wind, solar PV, solar CSP, geothermal, and ocean technologies.

Hydropower

Electricity generation excludes pumped storage hydropower.

Bioenergy

Capacity includes capacity from solid, liquid, and gaseous biomass and municipal waste (renewable and non-renewable). It does not include plants that co-fire biomass with fossil fuels; though fossil fuel to biomass conversions are included in this forecast, reported capacity data from IEA statistics (2017 and earlier data points) may not include bioenergy capacity converted from fossil fuels, particularly in mixed plants. Generation from bioenergy includes generation from solid, liquid, and gaseous biomass (including co-fired biomass) and the renewable portion of municipal waste.

Wind

Capacity corresponds to grid-connected capacity.

Solar PV

Capacity for grid-connected solar PV (including distributed PV) is counted at the time that the grid connection is made, and off-grid solar PV systems are included at the time of the installation.

Distributed PV

Small capacity Solar PV classified into three main categories: 1) residential (0 to 10 kW); 2) commercial and industrial (10 kW to 1,000 kW); and 3) off-grid applications (such as solar home systems, small commercial applications, and mini-grids). These groupings take not only size into account, but the purpose of the installation and the availability of data.

Ocean

Capacity and generation includes wave, tide, and ocean technologies.

Sources

Renewable electricity generation data for 2019 in OECD countries is Renewables Information 2020, www.iea.org/statistics/

Renewable capacity data is based on a variety sources that are technology dependent.

For hydropower, bioenergy, and geothermal, 2019 capacity is based largely upon S&P Market Intelligence (2020). For CSP, the 2019 capacity data is based largely upon NREL (2020) and BNEF (2020).

For solar PV, onshore wind, offshore wind, and ocean capacity, a variety sources are used ranging from the IEA Technology Collaboration Platforms, BNEF (2020), IRENA (2020) and in-country analysis and project pipelines.

Geographical coverage

The following focus countries and regions are covered in the electricity dataset:

| Country | Country Code | Region | Region code |
|-----------|--------------|--|-------------|
| Argentina | ARGENTINA | European Union | EU |
| Australia | AUSTRALI | G20 | G20 |
| Belgium | BELGIUM | Middle East and North Africa | MENA |
| Brazil | BRAZIL | Sub-Saharan Africa | SSAFR |
| Canada | CANADA | Association of Southeast Asian Nations | ASEAN |
| Chile | CHILE | Europe | EUROPE |
| China | CHINA | Latin America | LAM |
| Denmark | DENMARK | North America | NAM |
| Egypt | EGYPT | Africa | AFRICA2 |
| Ethiopia | ETHIOPIA | Asia (exc. China) and Pacific | APAC |
| France | FRANCE | Eurasia | EURASIA2 |
| Germany | GERMANY | China region | CHINAREG |

| India | INDIA | World | WORLD |
|-----------------------------|------------|-------|-------|
| Indonesia | INDONESIA | | |
| Islamic Republic of Iran | IRAN | | |
| Israel | ISRAEL | | |
| Italy | ITALY | | |
| Japan | JAPAN | | |
| Jordan | JORDAN | | |
| Kenya | KENYA | | |
| Korea | KOREA | | |
| Mexico | MEXICO | | |
| Morocco | MOROCCO | | |
| Netherlands | NETHLAND | | |
| Nigeria | NIGERIA | | |
| Pakistan | PAKISTAN | | |
| Philippines | PHILIPPINE | | |
| Poland | POLAND | | |
| Russian Federation | RUSSIA | | |
| Saudi Arabia | SAUDIARABI | | |
| South Africa | SOUTHAFRIC | | |
| Spain | SPAIN | | |
| Sweden | SWEDEN | | |
| Chinese Taipei | TAIPEI | | |
| United Republic of Tanzania | TANZANIA | | |
| Thailand | THAILAND | | |

| | | | |
|----------------------|---------|--|--|
| Turkey | TURKEY | | |
| United Arab Emirates | UAE | | |
| United Kingdom | UK | | |
| Ukraine | UKRAINE | | |
| United States | USA | | |
| Viet Nam | VIETNAM | | |

The regions are made of the following countries:

- North America: United States, Mexico and Canada.
- Latin America: Argentina, Plurinational State Of Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Curacao/Netherlands Antilles, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua Other Non-OECD Americas, Panama, Paraguay, Peru, Trinidad And Tobago, Uruguay and Venezuela.
- Europe: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.
- Africa: Benin, Botswana, Cameroon, Angola, Congo, Democratic Republic Of The Congo, Eritrea, Ethiopia, Gabon, Ghana, Cote D'ivoire, Kenya, Mauritius, Mozambique, Namibia, United Republic Of Tanzania, Niger, Nigeria, Senegal, South Africa, South Sudan, Sudan, Togo, Zambia, Zimbabwe, Other Africa, Algeria, Egypt, Morocco, Tunisia and Libya.
- Association of Southeast Asian Nations (ASEAN): Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.
- Sub-Saharan Africa: Benin, Botswana, Cameroon, Angola, Congo, Democratic Republic Of The Congo, Eritrea, Ethiopia, Gabon, Ghana, Cote D'ivoire, Kenya, Mauritius, Mozambique, Namibia, United Republic Of Tanzania, Niger, Nigeria, Senegal, South Africa, South Sudan, Sudan, Togo, Zambia, Zimbabwe and Other Africa.
- Middle East and North Africa: Islamic Republic Of Iran, Iraq, Jordan, Bahrain, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen, Israel, Algeria, Egypt, Morocco, Tunisia and Libya.
- European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain and Sweden.

- G20: Australia, Canada, United States, Saudi Arabia, India, Russian Federation, South Africa, Turkey, Argentina, Brazil, Mexico, France, Germany, Italy, United Kingdom, People's Republic Of China, Indonesia, Japan and Korea.
- Asia (exc. China) and Pacific: Japan, Korea, New Zealand, Australia, Bangladesh, Brunei Darussalam, Cambodia, Chinese Taipei, India, Indonesia, Malaysia, Mongolia, Myanmar, Nepal, Democratic People's Republic Of Korea, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Viet Nam and Other Asia.
- Eurasia: Azerbaijan, Belarus, Bosnia And Herzegovina, Armenia, Georgia, Gibraltar, Kazakhstan, Kosovo, Kyrgyzstan, Republic Of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Albania, North Macedonia, Montenegro and Serbia.
- China Region: People's Republic Of China and Hong Kong.
- World: North America, Latin America, Europe, APAC, SSAFR, MENA and China Region.

Renewable Transport

Ethanol

Production presented in volume; to convert to energy an approximate calorific value of 21 MJ/litre can be used.

Biodiesel and HVO

Production presented in volume; to convert to energy an approximate calorific value of 33 MJ/litre can be used.

Sources

Biofuels: IEA analysis; IEA, 2020; MAPA, 2020; US EIA, 2020.

Geographical coverage

The following focus countries and regions are covered in the transport dataset:

| Country | Country Code | Region | Region code |
|-----------|--------------|----------------|-------------|
| Argentina | ARGENTINA | Africa | AFRICA |
| Australia | AUSTRALI | Latin America | LATINAMERI |
| Austria | AUSTRIA | Non-OECD Total | NONOECDTOT |
| Belgium | BELGIUM | OECD Total | OECD |

| | | | |
|----------------|------------|-------------------------------|------------|
| Brazil | BRAZIL | OECD North America | OECDAM |
| Canada | CANADA | OECD Asia Oceania | OECDAO |
| China | CHINA | OECD Europe | OECDEUR |
| Colombia | COLOMBIA | Asia (exc. China) and Pacific | APAC |
| France | FRANCE | Middle East | MIDDLEEAST |
| Germany | GERMANY | World | WORLD |
| India | INDIA | | |
| Indonesia | INDONESIA | | |
| Italy | ITALY | | |
| Malaysia | MALAYSIA | | |
| Netherlands | NETHLAND | | |
| Philippines | PHILIPPINE | | |
| Poland | POLAND | | |
| Singapore | SINGAPORE | | |
| Spain | SPAIN | | |
| Thailand | THAILAND | | |
| United Kingdom | UK | | |
| United States | USA | | |

The regions are made of the following countries:

- Africa: Algeria, Angola, Benin, Botswana, Cameroon, Congo, Congorep, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Coteivoire, Kenya, Libya, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, South sudan, Sudan, Tanzania, Togo, Tunisia, Zambia, Zimbabwe and Other Africa.
- Middle East: Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudiarabi, Syria, UAE and Yemen.
- OECD North America: Canada, United States and Mexico
- OECD Asia Oceania: Australia, Israel, Japan, Korea and New Zealand.

- OECD Europe: Austria, Belgium, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, Latvia and Lithuania.
- Asia (exc. China) and Pacific: Japan, Korea, New Zealand, Australia, Bangladesh, Brunei Darussalam, Cambodia, Chinese Taipei, India, Indonesia, Malaysia, Mongolia, Myanmar, Nepal, Democratic People's Republic Of Korea, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Viet Nam and Other Asia.
- World: United States, Mexico, Canada, Argentina, Plurinational State Of Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Curacao/Netherlands Antilles, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua Other Non-OECD Americas, Panama, Paraguay, Peru, Trinidad And Tobago, Uruguay, Venezuela, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, Japan, Korea, New Zealand, Australia, Bangladesh, Brunei Darussalam, Cambodia, Chinese Taipei, India, Indonesia, Malaysia, Mongolia, Myanmar, Nepal, Democratic People's Republic Of Korea, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Viet Nam, Other Asia, Azerbaijan, Belarus, Bosnia And Herzegovina, Armenia, Georgia, Gibraltar, Kazakhstan, Kosovo, Kyrgyzstan, Republic Of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Albania, North Macedonia, Montenegro, Serbia, Benin, Botswana, Cameroon, Angola, Congo, Democratic Republic Of The Congo, Eritrea, Ethiopia, Gabon, Ghana, Cote D'ivoire, Kenya, Mauritius, Mozambique, Namibia, United Republic Of Tanzania, Niger, Nigeria, Senegal, South Africa, South Sudan, Sudan, Togo, Zambia, Zimbabwe, Other Africa, Islamic Republic Of Iran, Iraq, Jordan, Bahrain, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen, Israel, Algeria, Egypt, Morocco, Tunisia, Libya, People's Republic Of China and Hong Kong

Renewable Heat

Total heat consumption (incl. traditional uses of biomass)

Refers to the total amount of renewable and non-renewable energy used for heat by industry, buildings and agriculture sectors. It includes estimates of traditional uses of biomass, but excludes ambient heat harnessed by heat pumps, for which data is not available.

Modern renewable heat consumption (incl. indirect consumption)

Refers to the total amount of renewable energy used for heat, and excludes the traditional uses of biomass. It includes direct consumption of solar thermal, geothermal and bioenergy for heat, as well as indirect consumption of renewable energy through district heating networks and electricity used for heat. Indirect consumption of renewable energy for heat is estimated based on the national shares of renewable sources in electricity generation and in district heating supplies.

Direct renewable heat consumption

Includes direct consumption of bioenergy, solar thermal and geothermal heat

Indirect renewable heat consumption (renewable electricity for heat and renewable district heating and cooling)

includes renewable energy consumed through district heating networks and renewable electricity used for heat. These are estimated based on national shares of renewable sources in district heating supplies and electricity generation.

Sources:

IEA, 2020; World Energy Outlook 2020 & IEA 2020; World Energy Statistics and Balances

Geographical coverage

The following focus countries and regions are covered in the heat dataset:

| Country | Country Code | Region | Region code |
|----------------|---------------------|----------------|--------------------|
| Canada | CANADA | European Union | EU |
| Japan | JAPAN | World | WORLD |
| Russia | RUSSIA | | |
| China | CHINA | | |
| India | INDIA | | |
| Brazil | BRAZIL | | |

The regions are made of the following countries:

- European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain and Sweden.
- World: United States, Mexico, Canada, Argentina, Plurinational State Of Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Curacao/Netherlands Antilles, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua Other Non-OECD Americas, Panama, Paraguay, Peru, Trinidad And Tobago, Uruguay, Venezuela, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, Japan, Korea, New Zealand, Australia, Bangladesh, Brunei



Darussalam, Cambodia, Chinese Taipei, India, Indonesia, Malaysia, Mongolia, Myanmar, Nepal, Democratic People's Republic Of Korea, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Viet Nam, Other Asia, Azerbaijan, Belarus, Bosnia And Herzegovina, Armenia, Georgia, Gibraltar, Kazakhstan, Kosovo, Kyrgyzstan, Republic Of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Albania, North Macedonia, Montenegro, Serbia, Benin, Botswana, Cameroon, Angola, Congo, Democratic Republic Of The Congo, Eritrea, Ethiopia, Gabon, Ghana, Cote D'ivoire, Kenya, Mauritius, Mozambique, Namibia, United Republic Of Tanzania, Niger, Nigeria, Senegal, South Africa, South Sudan, Sudan, Togo, Zambia, Zimbabwe, Other Africa, Islamic Republic Of Iran, Iraq, Jordan, Bahrain, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen, Israel, Algeria, Egypt, Morocco, Tunisia, Libya, People's Republic Of China and Hong Kong