

RBE Tracker Glossary

Term	Explanation ¹
(Total) Final energy consumption (TFEC)	Energy that is supplied to the consumer for all final energy services, such as transport, cooling and lighting, building or industrial heating, or mechanical work. This differs from Total Final Consumption (TFC), which includes all energy use in end-use sectors (TFEC) as well as energy used for non-energy applications, such as feedstocks for petrochemical manufacturing.
Absorption chillers	Chillers that use heat energy from any source (solar, biomass, waste heat, etc.) to drive air conditioning or refrigeration systems. The heat source replaces the electric power consumption of a mechanical compressor. Absorption chillers differ from conventional (vapour compression) cooling systems in two ways: 1) the absorption process is thermochemical in nature rather than mechanical, and 2) the substance that is circulated as a refrigerant is water rather than chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs), also called Freon. The chillers generally are supplied with district heat, waste heat or heat from co-generation, and they can operate with heat from geothermal, solar or biomass resources.
Acceleration areas	Specific geographic zones designated by governments where the permitting and approval processes for renewable energy projects are simplified and sped up to encourage rapid development.
Adsorption chillers	Chillers that use heat energy from any source to drive air conditioning or refrigeration systems. They differ from absorption chillers in that the adsorption process is based on the interaction between gases and solids. A solid material in the chiller's adsorption chamber releases refrigerant vapour when heated; subsequently, the vapour is cooled and liquefied, providing a cooling effect at the evaporator by absorbing external heat and turning back into a vapour, which is then re-adsorbed into the solid.
Agrivoltaic	Simultaneous use of agricultural land for both growing crops and a photovoltaic (PV) solar energy system. With the agrivoltaics solar energy system, certain types of agricultural products can be grown while generating electricity on agricultural lands and under the construction where solar panels are placed.

¹ Please note that interpretations of what constitutes "clean" or "green" can vary widely depending on the organisation, regulatory framework, and regional context. To ensure data accuracy and global comparability, REN21 relies on established, scientific definitions of renewable energy, which may exclude certain technologies that other entities classify as "clean" or "green".

Auction	See Tendering.
Bagasse	The fibrous matter that remains after extraction of sugar from sugar cane.
Baseload	The minimum, continuous amount of energy (power or heat) required by a system over a given period, which must be met by sources capable of running consistently without interruption (e.g., geothermal systems).
Battery Energy Storage Systems (BESS)	Large-scale, stationary battery installations used to store excess electricity—often from renewable sources—and release it back into the power grid when demand is high or generation drops.
Behind-the-meter system	Any power generation capacity, storage or demand management on the customer side of the interface with the distribution grid (i.e., the meter). (Also see Front-of-meter system.)
Biodiesel	A fuel produced from oilseed crops such as soy, rapeseed (canola) and palm oil, and from other oil sources such as waste cooking oil and animal fats. Biodiesel is used in diesel engines installed in cars, trucks, buses and other vehicles, as well as in stationary heat and power applications. Most biodiesel is made by chemically treating vegetable oils and fats (such as palm, soy and canola oils, and some animal fats) to produce fatty acid methyl esters (FAME). (Also see Hydrotreated vegetable oil (HVO) and hydrotreated esters and fatty acids (HEFA).)
Bioeconomy (or bio-based economy)	Economic activity related to the invention, development, production and use of biomass resources for the production of food, fuel, energy, chemicals and materials.
Bioenergy	Energy derived from any form of biomass (solid, liquid or gaseous) for heat, power and transport. (Also see Biofuel.)
Biofuel	A liquid or gaseous fuel derived from biomass, primarily ethanol, biodiesel and biogas. Biofuels can be combusted in vehicle engines as transport fuels and in stationary engines for heat and electricity generation. They also can be used for domestic heating and cooking (for example, as ethanol gels). Conventional biofuels are principally ethanol produced by fermentation of sugar or starch crops (such as wheat and corn), and FAME biodiesel produced from oil crops such as palm oil and canola and from waste oils and fats. Advanced biofuels are made from feedstocks derived from the lignocellulosic fractions of biomass sources or from algae. They are made using biochemical and thermochemical conversion processes, some of which are still under development.

Biogas	Biogas is a gaseous mixture consisting mainly of methane and carbon dioxide produced by the anaerobic digestion of organic matter (broken down by microorganisms in the absence of oxygen). Organic material and/or waste is converted into biogas in a digester. Suitable feedstocks include agricultural residues, animal wastes, food industry wastes, sewage sludge, purpose-grown green crops and the organic components of municipal solid wastes. Raw biogas can be combusted to produce heat and/or power. It also can be refined to produce biomethane.
Biomass	Any material of biological origin, excluding fossil fuels or peat, that contains a chemical store of energy (originally received from the sun) and that is available for conversion to a wide range of convenient energy carriers.
Biomass energy, modern	Energy derived from combustion of solid, liquid and gaseous biomass fuels in high-efficiency conversion systems, which range from small domestic appliances to large-scale industrial conversion plants. Modern applications include heat and electricity generation, combined heat and power (CHP) and transport.
Biomass gasification	In a biomass gasification process, biomass is heated with a constrained amount of air or oxygen, leading to the partial combustion of the fuels and production of a mix of combustion gases that, depending on the conditions, can include carbon monoxide and dioxide, methane, hydrogen and more complex materials such as tars. The resulting gas can either be used for power generation (e.g., in an engine or turbine) or else further purified and treated to form a “synthesis gas”. This can then be used to produce fuels including methane, alcohols, and higher hydrocarbon fuels, including bio-gasoline or jet fuel. While gasification for power or heat production is relatively common, there are few examples of operating plants producing gas of high enough quality for subsequent synthesis to more complex fuels.
Biomass pellets	Solid biomass fuel produced by compressing pulverised dry biomass, such as waste wood and agricultural residues. Pellets typically are cylindrical in shape with a diameter of around 10 millimetres and a length of 30-50 millimetres. Pellets are easy to handle, store and transport and are used as fuel for heating and cooking applications, as well as for electricity generation and CHP. (Also see Torrefied wood.)
Biomass, traditional (use of)	Solid biomass (including fuel wood, charcoal, agricultural and forest residues, and animal dung), that is used in rural areas of developing countries with traditional technologies such as open fires and ovens for cooking and residential heating. Often the traditional use of biomass leads to high pollution levels, forest degradation and deforestation.
Biomethane	Biogas can be turned into biomethane by removing impurities including carbon dioxide, siloxanes and hydrogen sulphides, followed by compression. Biomethane can be injected directly into natural gas networks and used as a substitute for

natural gas in internal combustion engines without risk of corrosion. Biomethane is often known as renewable natural gas (RNG), especially in North America.

Blended finance	The strategic use of public or philanthropic funds to reduce the financial risk of a project (such as a rural renewable energy installation), thereby making it attractive enough to mobilise private investment.
Blending mandates	Legal requirements set by governments that dictate a specific percentage of renewable fuels (like ethanol or biodiesel) must be mixed with conventional fossil fuels for transport.
Blockchain	A decentralised ledger in which digital transactions (such as the generation and sale of a unit of solar electricity) are anonymously recorded and verified. Each transaction is securely collected and linked, via cryptography, into a time-stamped “block”. This block is then stored on distributed computers as a “chain”. Blockchain may be used in energy markets, including for micro-trading among solar PV prosumers.
Building energy codes and standards	Rules specifying the minimum energy standards for buildings. These can include standards for renewable energy and energy efficiency that are applicable to new and/or renovated and refurbished buildings.
Capacity	The rated power of a heat or electricity generating plant, which refers to the potential instantaneous heat or electricity output, or the aggregate potential output of a collection of such units (such as a wind farm or set of solar panels). Installed capacity describes equipment that has been constructed, although it may or may not be operational (e.g., delivering electricity to the grid, providing useful heat or producing biofuels).
Capacity factor	The ratio of the actual output of a unit of electricity or heat generation over a period of time (typically one year) to the theoretical output that would be produced if the unit were operating without interruption at its rated capacity during the same period of time.
Capital subsidy	A subsidy that covers a share of the upfront capital cost of an asset (such as a solar water heater). These include, for example, consumer grants, rebates or one-time payments by a utility, government agency or government-owned bank.
Carbon intensity	Measure of carbon emitted by weight per megajoule of energy produced, or rate of produced greenhouse gas emissions to gross domestic product (GDP).
Carbon neutrality	The achievement of a state in which every tonne of carbon dioxide emitted to the atmosphere is compensated by an equivalent tonne removed (e.g., sequestered). Emissions can be compensated for by carbon offsets.

Cascading principle	A resource management approach where materials (like biomass or wood) are used sequentially for their highest-value purpose first (such as manufacturing products), and are only burned for energy recovery as a final, end-of-life step.
Climate change adaptation	Actions and strategies taken to adjust to the current and future impacts of climate change, such as using decentralised solar energy to strengthen a community's resilience against power grid failures during extreme weather.
Climate change mitigation	Efforts and actions aimed at reducing or preventing the emission of greenhouse gases to slow down global warming, primarily achieved by transitioning away from fossil fuels to renewable energy.
Collective self-consumption	A model where a group of consumers (such as residents in an apartment building or a neighbourhood) jointly generate, share, and consume their own renewable energy, often through shared rooftop solar panels.
Combined heat and power (CHP) (also called co-generation)	CHP facilities produce both heat and power from the combustion of fossil and/or biomass fuels, as well as from geothermal and solar thermal resources. The term also is applied to plants that recover “waste heat” from thermal power generation processes.
Community choice aggregation (CCA)	Under a CCA, municipalities themselves (independently or in partnership with an agency running the CCA) aggregate their residents’ and businesses’ electricity demand and set out to procure electricity for all participating customers city-wide through direct contracts with energy producers or through third-party energy providers. By enabling local communities to procure their own electricity, CCAs can be an attractive option for cities that want more local control over their electricity mix, for instance to increase the share of renewable electricity.
Community energy	An approach to renewable energy development that involves a community initiating, developing, operating, owning, investing and/or benefiting from a project. Communities vary in size and shape (e.g., schools, neighbourhoods, partnering city governments, etc.); similarly, projects vary in technology, size, structure, governance, funding and motivation.
Concentrating photovoltaics (CPV)	Technology that uses mirrors or lenses to focus and concentrate sunlight onto a relatively small area of photovoltaic cells that generate electricity (see Solar photovoltaics). Low-, medium- and high-concentration CPV systems (depending on the design of reflectors or lenses used) operate most efficiently in concentrated, direct sunlight.
Concentrating solar collector technologies	Technologies that use mirrors to focus sunlight on a receiver (see Concentrating solar thermal power). These are usually smaller-sized modules that are used for the production of heat and steam below 400 degrees Celsius (°C) for industrial applications, laundries and commercial cooking.

**Concentrating solar thermal power (CSP)
(also called solar thermal electricity, STE)**

Technology that uses mirrors to focus sunlight into an intense solar beam that heats a working fluid in a solar receiver, which then drives a turbine or heat engine/generator to produce electricity. The mirrors can be arranged in a variety of ways, but they all deliver the solar beam to the receiver. There are four types of commercial CSP systems: parabolic troughs, linear Fresnel, power towers and dish/engines. The first two technologies are line-focus systems, capable of concentrating the sun's energy to produce temperatures of 400 °C, while the latter two are point-focus systems that can produce temperatures of 800 °C or higher.

Concessional finance

Financial support, such as loans, offered on terms significantly more generous than standard market rates—crucial for making renewable energy projects economically viable in developing or higher-risk markets.

Conversion efficiency

The ratio between the useful energy output from an energy conversion device and the energy input into it. For example, the conversion efficiency of a PV module is the ratio between the electricity generated and the total solar energy received by the PV module. If 100 kWh of solar radiation is received and 10 kWh of electricity is generated, the conversion efficiency is 10%.

Conversion losses

The energy that is "lost" (typically as waste heat) when energy is transformed from one form to another, such as converting fuel into electricity, or converting electricity back into heat.

Cost of capital

The expense associated with securing financing or loans for a project. For renewable energy, this cost is often higher in developing economies due to perceived financial risks, currency volatility, and limited access to affordable finance.

Crowdfunding

The practice of funding a project or venture by raising money – often relatively small individual amounts – from a relatively large number of people ("crowd"), generally using the Internet and social media. The money raised through crowdfunding does not necessarily buy the lender a share in the venture, and there is no guarantee that money will be repaid if the venture is successful. However, some types of crowdfunding reward backers with an equity stake, structured payments and/or other products.

Curtailement

A reduction in the output of a generator, typically on an involuntary basis, from what it could produce otherwise given the resources available. Curtailement of electricity generation has long been a normal occurrence in the electric power industry and can occur for a variety of reasons, including a lack of transmission access or transmission congestion.

Decarbonisation

The reduction or elimination of carbon dioxide emissions from energy systems, industries, and economies, typically achieved by switching from fossil fuels to zero-carbon energy sources.

Degression	A mechanism built into policy design establishing automatic rate revisions, which can occur after specific thresholds are crossed (e.g., after a certain amount of capacity is contracted, or a certain amount of time passes).
Demand response	Use of market signals such as time-of-use pricing, incentive payments or penalties to influence end-user electricity consumption behaviours. Usually used to balance electrical supply and demand within a power system.
Demand-side management	The application of economic incentives and technology in the pursuit of cost-effective energy efficiency measures and load-shifting on the customer side, to achieve least-cost overall energy system optimisation.
Digitalisation	The application of digital technologies across the economy, including energy.
Digitisation	The conversion of something (e.g., data or an image) from analogue to digital.
Direct employment (Renewables)	Jobs created specifically within core renewable energy activities, such as the direct manufacturing, construction, installation, and daily operation of renewable energy facilities.
Direct renewable heat	The use of renewable energy sources, such as geothermal or solar thermal, to provide heat directly to buildings, district networks, or industrial processes without first converting the energy into electricity.
Distributed generation	Generation of electricity from dispersed, generally small-scale systems that are close to the point of consumption.
Distributed renewable energy	Energy systems are considered to be distributed if 1) the systems are connected to the distribution network rather than the transmission network, which implies that they are relatively small and dispersed (such as small-scale solar PV on rooftops) rather than relatively large and centralised; or 2) generation and distribution occur independently from a centralised network.
Distribution grid	The portion of the electrical network that takes power off the high-voltage transmission network via sub-stations (at varying stepped-down voltages) and distributes electricity to customers.
District heating (networks)	A system for distributing heat generated in a centralised location through a network of underground insulated pipes to warm multiple residential, commercial, or industrial buildings simultaneously.
Divestment	Removal or selling of an investment from stranded assets, funds, bonds or stocks. Divestment is an opposite action of investment.

Drop-in biofuel	A liquid biofuel that is functionally equivalent to a liquid fossil fuel and is fully compatible with existing fossil fuel infrastructure.
Electric vehicle (EV)	Includes any road-, rail-, sea- and air-based transport vehicle that uses electric drive and can take an electric charge from an external source, or from hydrogen in the case of a fuel cell electric vehicle (FCEV). Electric road vehicles encompass battery electric vehicles (BEVs), plug-in hybrids (PHEVs) and FCEVs, all of which can include passenger vehicles (i.e., electric cars), commercial vehicles including buses and trucks, and two- and three-wheeled vehicles.
Electrification	The process of replacing technologies that rely on direct fossil fuel combustion with those that use electricity, such as switching from gas-powered cars to electric vehicles or from gas boilers to heat pumps.
Electrified transport	The broader ecosystem of electric mobility, encompassing not just passenger electric cars, but also electric two- and three-wheelers, buses, heavy trucks, fuel cell vehicles, and the associated public and private charging infrastructure.
Enabling technologies	Technologies and infrastructure that facilitate the deployment, integration, storage, distribution, and efficient use of renewables across energy systems. This includes grids, energy storage, digital/flexibility solutions, electric vehicles, heat pumps, and charging infrastructure.
End-use sectors	The final areas or categories of the economy where energy is ultimately consumed to provide a service, primarily encompassing transport, buildings, industry, and agriculture.
Energy	The ability to do work, which comes in a number of forms including thermal, radiant, kinetic, chemical, potential and electrical. Primary energy is the energy embodied in (energy potential of) natural resources, such as coal, natural gas and renewable sources. Final energy is the energy delivered for end-use (such as electricity at an electrical outlet). Conversion losses occur whenever primary energy needs to be transformed for final energy use, such as combustion of fossil fuels for electricity generation.
Energy audit	Analysis of energy flows in a building, process or system, conducted with the goal of reducing energy inputs into the system without negatively affecting outputs.
Energy carrier	A substance or system that moves energy in a usable form from one place to another, such as electricity, hydrogen, or refined petroleum products.

Energy conservation	Any change in behaviour of an energy-consuming entity for the specific purpose of affecting an energy demand reduction. Energy conservation is distinct from energy efficiency in that it is predicated on the assumption that an otherwise preferred behaviour of greater energy intensity is abandoned. (See Energy efficiency and Energy intensity.)
Energy efficiency	The measure that accounts for delivering more services for the same energy input, or the same amount of services for less energy input. Conceptually, this is the reduction of losses from the conversion of primary source fuels through final energy use, as well as other active or passive measures to reduce energy demand without diminishing the quality of energy services delivered. Energy efficiency is technology-specific and distinct from energy conservation, which pertains to behavioural change. Both energy efficiency and energy conservation can contribute to energy demand reduction.
Energy intensity	Primary energy consumption per unit of economic output. Energy intensity is a broader concept than energy efficiency in that it is also determined by non-efficiency variables, such as the composition of economic activity. Energy intensity typically is used as a proxy for energy efficiency in macro-level analyses due to the lack of an internationally agreed-upon high-level indicator for measuring energy efficiency.
Energy service company (ESCO)	A company that provides a range of energy solutions including selling the energy services from a (renewable) energy system on a long-term basis while retaining ownership of the system, collecting regular payments from customers and providing necessary maintenance service. An ESCO can be an electric utility, co-operative, non-governmental organisation or private company, and typically installs energy systems on or near customer sites. An ESCO also can advise on improving the energy efficiency of systems (such as a building or an industry) as well as on methods for energy conservation and energy management.
Energy subsidy	A government measure that artificially reduces the price that consumers pay for energy or that reduces energy production cost.
Energy sufficiency	Entails a change or shift in actions and behaviours (at the individual and collective levels) in the way energy is used. Results in access to energy for everyone while limiting the impacts of energy use on the environment. For example, avoiding the use of cars and spending less time on electrical devices.
Environmental Impact Assessments (EIAs)	Formal, structured evaluations conducted before a project is approved to identify, predict, and mitigate any potential negative environmental effects of building a new renewable energy or infrastructure project.

ESG (Environmental, Social and Governance)	Also known as “sustainable investing”. Corresponds to a collection of standards in measuring sustainability and represents the key factors of a firm’s or an industry’s investment. Environmental criteria relate to the quality and functioning of the natural environment and natural systems, and also may include pollution, energy use, climate change, greenhouse gas emissions, changes in land use and waste management. Social criteria refer to well-being, human rights, human capital, labour standards in the supply chain, child, slave and bonded labour, workplace health and safety, freedom of association and expression, diversity, relations with local communities, activities in conflict zones, health and access to medicine and consumer protection. Governance criteria relate to the governance of companies and other investee entities, such as disclosure of information, business ethics, bribery and corruption, internal controls and risk management, relationship between a company’s management, shareholders and stakeholders.
Ethanol (fuel)	A liquid fuel made from biomass (typically corn, sugar cane or small cereals/grains) that can replace petrol in modest percentages for use in ordinary spark-ignition engines (stationary or in vehicles), or that can be used at higher blend levels (usually up to 85% ethanol, or 100% in Brazil) in slightly modified engines, such as those provided in “flex-fuel” vehicles. Ethanol also is used in the chemical and beverage industries.
Extended Producer Responsibility (EPR)	A policy approach that makes manufacturers legally and financially responsible for the entire life cycle of their products, specifically mandating that they organise and fund the collection and recycling of their products at the end of their useful life.
Fatty acid methyl esters (FAME)	See Biodiesel.
Feed-in policy (feed-in tariff or feed-in premium)	A policy that typically guarantees renewable generators specified payments per unit (e.g., USD per kWh) over a fixed period. Feed-in tariff (FIT) policies also may establish regulations by which generators can interconnect and sell power to the grid. Numerous options exist for defining the level of incentive, such as whether the payment is structured as a guaranteed minimum price (e.g., a FIT), or whether the payment floats on top of the wholesale electricity price (e.g., a feed-in premium).
Final energy	The part of primary energy, after deduction of losses from conversion, transmission and distribution, that reaches the consumer and is available to provide heating, hot water, lighting and other services. Final energy forms include, among others, electricity, district heating, mechanical energy, liquid hydrocarbons such as kerosene or fuel oil, and various gaseous fuels such as natural gas, biogas and hydrogen.
Financial	See Fiscal.

Fiscal/financial	Policies governing public fund allocation, including incentives (e.g., subsidies for renewables) or disincentives (e.g., carbon taxes).
Flywheel energy storage	Energy storage that works by applying available energy to accelerate a high-mass rotor (flywheel) to a very high speed and thereby storing energy in the system as rotational energy.
Fossil fuel subsidies	Government policies—such as tax exemptions, regulated low prices, or direct cash transfers—that artificially lower the cost of producing or using coal, oil, and gas, which can distort markets and delay the transition to renewables.
Front-of-meter system	Any power generation or storage device on the distribution or transmission side of the network. (Also see Behind-the-meter system.)
Generation	The process of converting energy into electricity and/or useful heat from a primary energy source such as wind, solar radiation, natural gas, biomass, etc.
Geothermal energy	Heat energy emitted from within the earth's crust, usually in the form of hot water and steam. It can be used to generate electricity in a thermal power plant or to provide heat directly at various temperatures.
Green bond	A bond issued by a bank or company, the proceeds of which will go entirely into renewable energy and other environmentally friendly projects. The issuer will normally label it as a green bond. There is no internationally recognised standard for what constitutes a green bond.
Green building	A building that (in its construction or operation) reduces or eliminates negative impacts and can create positive impacts on the climate and natural environment. Countries and regions have a variety of characteristics that may change their strategies for green buildings, such as building stock, climate, cultural traditions, or wide-ranging environmental, economic and social priorities – all of which shape their approach to green building.
Green energy purchasing	Voluntary purchase of renewable energy – usually electricity, but also heat and transport fuels – by residential, commercial, government or industrial consumers, either directly from an energy trader or utility company, from a third-party renewable energy generator or indirectly via trading of renewable energy certificates (such as renewable energy credits, green tags and guarantees of origin). It can create additional demand for renewable capacity and/or generation, often going beyond that resulting from government support policies or obligations.

Guideline	Non-binding recommendations or best practices to support compliance with regulations or effective project implementation, like solar panel installation guides.
Heat pump	A device that transfers heat from a heat source to a heat sink using a refrigeration cycle that is driven by external electric or thermal energy. It can use the ground (geothermal/ground-source), the surrounding air (aerothermal/air-source) or a body of water (hydrothermal/water-source) as a heat source in heating mode, and as a heat sink in cooling mode. A heat pump's final energy output can be several multiples of the energy input, depending on its inherent efficiency and operating condition. The output of a heat pump is at least partially renewable on a final energy basis. However, the renewable component can be much lower on a primary energy basis, depending on the composition and derivation of the input energy; in the case of electricity, this includes the efficiency of the power generation process. The output of a heat pump can be fully renewable energy if the input energy is also fully renewable.
Hydropower	Electricity derived from the potential energy of water captured when moving from higher to lower elevations. Categories of hydropower projects include run-of-river, reservoir-based capacity and low-head in-stream technology (the least developed). Hydropower covers a continuum in project scale from large (usually defined as more than 10 MW of installed capacity, but the definition varies by country) to small, mini, micro and pico.
Hydrotreated vegetable oil (HVO) and hydrotreated esters and fatty acids (HEFA)	Biofuels produced by using hydrogen to remove oxygen from waste cooking oils, fats and vegetable oils. The result is a hydrocarbon that can be refined to produce fuels with specifications that are closer to those of diesel and jet fuel than is biodiesel produced from triglycerides such as fatty acid methyl esters (FAME).
Indirect employment (Renewables)	Jobs created in the upstream supply chains that support the renewable energy sector, such as producing the raw steel, plastics, and services necessary to build and maintain renewable energy facilities.
Induced economic impacts	The wider ripple effects of renewable energy development on the broader economy, such as increased local spending by newly employed workers, savings from lower energy costs, and improved trade balances from reducing fossil fuel imports.
Integrated energy planning	A comprehensive planning approach that considers both energy supply and demand across all sectors (like transport, buildings, and industry), incorporating efficiency, grid modernisation, and broader economic goals.
Inverter (and micro-inverter), solar	Inverters convert the direct current (DC) generated by solar PV modules into alternating current (AC), which can be fed into the electric grid or used by a local, off-grid network. Conventional string and central solar inverters are connected to multiple modules to create an array that effectively is a single large panel. By contrast, micro-inverters convert generation from individual solar PV modules; the output of several micro-inverters is combined and often fed into the electric grid.

A primary advantage of micro-inverters is that they isolate and tune the output of individual panels, reducing the effects that shading or failure of any one (or more) module(s) has on the output of an entire array. They eliminate some design issues inherent to larger systems, and allow for new modules to be added as needed.

Investment

Purchase of an item of value with an expectation of favourable future returns. In this report, new investment in renewable energy refers to investment in: technology research and development, commercialisation, construction of manufacturing facilities and project development (including the construction of wind farms and the purchase and installation of solar PV systems). Total investment refers to new investment plus merger and acquisition (M&A) activity (the refinancing and sale of companies and projects).

Investment tax credit

A fiscal incentive that allows investments in renewable energy to be fully or partially credited against the tax obligations or income of a project developer, industry, building owner, etc.

Joule

A joule (J) is a unit of work or energy equal to the work done by a force equal to one newton acting over a distance of one metre. One joule is equal to one watt-second (the power of one watt exerted over the period of one second). The potential chemical energy stored in one barrel of oil and released when combusted is approximately 6 gigajoules (GJ); a tonne of oven-dry wood contains around 20 GJ of energy.

Levelised cost of energy/electricity (LCOE)

The cost per unit of energy from an energy generating asset that is based on the present value of its total construction and lifetime operating costs, divided by total energy output expected from that asset over its lifetime.

Long-term strategic plan

A strategy to achieve energy savings over a specified period of time (i.e., several years), including specific goals and actions to improve energy efficiency, typically spanning all major sectors.

Mandate

See Regulation.

Market concession model

A model in which a private company or non-governmental organisation is selected through a competitive process and given the exclusive obligation to provide energy services to customers in its service territory, upon customer request. The concession approach allows concessionaires to select the most appropriate and cost-effective technology for a given situation.

Merit order

A way of ranking available sources of energy (particularly electricity generation) in ascending order based on short-run marginal costs of production, such that those with the lowest marginal costs are the first ones brought online to meet demand, and those with the highest are brought on last. The merit-order effect is a shift of market prices along the merit-

order or supply curve due to market entry of power stations with lower variable costs (marginal costs). This displaces power stations with the highest production costs from the market (assuming demand is unchanged) and admits lower-priced electricity into the market.

Micromobility

Micromobility includes modes such as electric sidewalk / “kick” scooters and dockless bicycles (both electric and traditional), as well as electric moped-style scooters and ride-hailing and car-sharing services. Many new mobility service companies have committed to sustainability measures, including the use of renewable electricity for charging vehicles as well as for operations.

Mini-grid / Micro-grid

For distributed renewable energy systems for energy access, a mini-grid/micro-grid typically refers to an independent grid network operating on a scale of less than 10 MW (with most at very small scale) that distributes electricity to a limited number of customers. Mini-/micro-grids also can refer to much larger networks (e.g., for corporate or university campuses) that can operate independently of, or in conjunction with, the main power grid. However, there is no universal definition differentiating mini- and micro-grids.

Modern renewables

Highly efficient and sustainable renewable energy technologies, including renewable electricity (solar, wind, hydro), modern bioenergy, and renewable heat technologies.

Molten salt

An energy storage medium used predominantly to retain the thermal energy collected by a solar tower or solar trough of a concentrating solar power plant, so that this energy can be used at a later time to generate electricity.

Monitoring

Energy use is monitored to establish a basis for energy management and to provide information on deviations from established patterns.

Multi-Tier Framework

A comprehensive measurement tool used to assess a population's energy access not just by a simple "yes/no" connection, but by grading the quality of the energy service across factors like reliability, affordability, safety, and daily availability.

Municipal operations

Services or infrastructure that are owned and/or operated by municipal governments. This may include municipal buildings and transport fleets (such as buses, police vehicles and refuse collection trucks).

Municipal solid waste

Waste materials generated by households and similar waste produced by commercial, industrial or institutional entities. The wastes are a mixture of renewable plant and fossil-based materials, with the proportions varying depending on local circumstances. A default value that assumes that at least 50% of the material is “renewable” is often applied.

National Adaptation Plans (NAPs)	Strategic frameworks developed by countries under the United Nations to identify their medium- and long-term needs for adapting to the effects of climate change and to outline specific strategies to address them.
National Energy and Climate Plans (NECPs)	Comprehensive, long-term strategic frameworks developed by governments (most notably within the EU) to outline their specific targets, policies, and measures for integrating renewable energy, improving efficiency, and reducing emissions.
Nationally Determined Contributions (NDCs)	Official climate action plans submitted by countries under the Paris Agreement, detailing their commitments, targets, and policies to reduce greenhouse gas emissions and adapt to climate impacts.
Net metering / Net billing	A regulated arrangement in which utility customers with on-site electricity generators can receive credits for excess generation, which can be applied to offset consumption in other billing periods. Under net metering, customers typically receive credit at the level of the retail electricity price. Under net billing, customers typically receive credit for excess power at a rate that is lower than the retail electricity price. Different jurisdictions may apply these terms in different ways, however.
Net zero carbon building / Net zero energy building / Nearly zero energy building	Various definitions have emerged of buildings that achieve high levels of energy efficiency and meet remaining energy demand with either on-site or off-site renewable energy. For example, the World Green Building Council's Net Zero Carbon Buildings Commitment considers use of renewable energy as one of five key components that characterise a net zero building. Definitions of net zero carbon, net zero energy and nearly zero energy buildings can vary in scope and geographic relevance.
Net-zero	Net-zero emission refers to achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions emitted from the atmosphere. Equating the amount of gases such as carbon dioxide, methane, nitrous oxide, which are released into the atmosphere due to human-induced activities and cause the greenhouse effect, with the amount of greenhouse gases naturally absorbed by the earth.
Non-motorised transport (NMT)	Walking, cycling, and their variants; also called "active transport" or "human-powered travel".
Ocean power	Refers to technologies used to generate electricity by harnessing from the ocean the energy potential of ocean waves, tidal range (rise and fall), tidal streams, ocean (permanent) currents, temperature gradients (ocean thermal energy conversion) and salinity gradients. The definition of ocean power used in this report does not include offshore wind power or marine biomass energy.

Off-grid systems	Standalone electricity generation and storage systems that operate entirely independently of a central, national power grid, providing crucial power to isolated, rural, or conflict-affected communities.
Off-take agreement	An agreement between a producer of energy and a buyer of energy to purchase/sell portions of the producer's future production. An off-take agreement normally is negotiated prior to the construction of a renewable energy project or installation of renewable energy equipment in order to secure a market for the future output (e.g., electricity, heat). Examples of this type of agreement include power purchase agreements and feed-in tariffs.
Off-taker	The purchaser of the energy from a renewable energy project or installation (e.g., a utility company) following an off-take agreement. (See Off-take agreement.)
Pay-as-you-go (PAYGo)	A business model that gives customers (mainly in areas without access to the electricity grid) the possibility to purchase small-scale energy-producing products, such as solar home systems, by paying in small instalments over time.
Peaker generation plant	Power plants that run predominantly during peak demand periods for electricity. Such plants exhibit the optimum balance – for peaking duty – of relatively high variable cost (fuel and maintenance cost per unit of generation) relative to fixed cost per unit of energy produced (low capital cost per unit of generating capacity).
Pico solar devices / pico solar systems	Small solar systems such as solar lanterns that are designed to provide only a limited amount of electricity service, usually lighting and in some cases mobile phone charging. Such systems are deployed mainly in areas that have no or poor access to electricity. The systems usually have a power output of 1-10 watts and a voltage of up to 12 volts.
Plug-in hybrid electric vehicle	This differs from a simple hybrid vehicle, as the latter uses electric energy produced only by braking or through the vehicle's internal combustion engine. Therefore, only a plug-in hybrid electric vehicle allows for the use of electricity from renewable sources. Although not an avenue for increased penetration of renewable electricity, hybrid vehicles contribute to reduced fuel demand and remain far more numerous than EVs.
Power	The rate at which energy is converted into work, expressed in watts (joules/second).
Power electronics	Solid-state electronic devices and systems that control and convert electric power (e.g., converting direct current from solar panels into alternating current for the grid), which are essential components for modern renewable energy systems and electric vehicles.

Power purchase agreement (PPA)	A contract between two parties, one that generates electricity (the seller) and one that is looking to purchase electricity (the buyer).
Power system flexibility	The ability of an electricity grid to reliably and quickly adapt to rapid changes in both power generation and consumer demand; this is crucial for integrating high shares of weather-dependent renewables like wind and solar.
Power-to-gas (P2G)	The conversion of electricity, either from renewable or conventional sources, to a gaseous fuel (for example, hydrogen or methane).
Primary energy	The theoretically available energy content of a naturally occurring energy source (such as coal, oil, natural gas, uranium ore, geothermal and biomass energy, etc.) before it undergoes conversion to useful final energy delivered to the end-user. Conversion of primary energy into other forms of useful final energy (such as electricity and fuels) entails losses. Some primary energy is consumed at the end-user level as final energy without any prior conversion.
Primary energy consumption	The direct use of energy at the source, or supplying users with unprocessed fuel.
Product and sectoral standards	Rules specifying the minimum standards for certain products (e.g., appliances) or sectors (industry, transport, etc.) for increasing energy efficiency.
Production tax credit	A tax incentive that provides the investor or owner of a qualifying property or facility with a tax credit based on the amount of renewable energy (electricity, heat or biofuel) generated by that facility.
Productive use of energy	Often used in the context of distributed renewables for energy access to refer to activities that use energy to generate income, increase productivity, enhance diversity and create economic value. Productive uses of energy may include local activities such as agriculture, livestock and fishing; light mechanical works such as welding, carpentry and water pumping; small retail and commercial activities such as tailoring, printing, catering and entertainment; and small and medium-scale production such as agro-processing (grinding, milling and husking), refrigeration and cold storage, drying, preserving and smoking.
Prosumer	An individual, household or small business that not only consumes energy but also produces it. Prosumers may play an active role in energy storage and demand-side management.
Public financing	A type of financial support mechanism whereby governments provide assistance, often in the form of grants or loans, to support the development or deployment of renewable energy technologies.

Pumped storage	Plants that pump water from a lower reservoir to a higher storage basin using surplus electricity, and that reverse the flow to generate electricity when needed. They are not energy sources but means of energy storage and can have overall system efficiencies of around 80-90%.
Regional interconnections	High-voltage power lines and cross-border infrastructure that link the electricity grids of different countries or regions, allowing them to trade electricity, balance supply and demand, and improve grid stability.
Regulation/mandate	Binding rules and laws in official law/policy documents established to control and monitor energy generation, distribution, and consumption, focusing on safety, environmental impact, market fairness, and renewable energy integration.
Regulatory policy	A rule to guide or control the conduct of those to whom it applies. In the renewable energy context, examples include mandates or quotas such as renewable portfolio standards, feed-in tariffs and technology/fuel-specific obligations.
Renewable energy certificate (REC)	A certificate awarded to certify the generation of one unit of renewable energy (typically 1 MWh of electricity but also less commonly of heat). In systems based on RECs, certificates can be accumulated to meet renewable energy obligations and also provide a tool for trading among consumers and/or producers. They also are a means of enabling purchases of voluntary green energy.
Renewable energy communities	Locally rooted, member-controlled organisations (like citizen cooperatives) where individuals, local businesses, and municipalities jointly own and manage renewable energy projects for their collective benefit.
Renewable hydrogen	Hydrogen produced from renewable energy, most commonly through the use of renewable electricity to split water into hydrogen and oxygen in an electrolyser. The vast majority of hydrogen is still produced from fossil fuels, and the majority of policies and programmes focused on hydrogen do not include a focus on renewables-based production.
Renewable natural gas (RNG)	Gas that is produced through the anaerobic digestion of organic matter and processed to remove the carbon dioxide and other gases, leaving methane that meets a high specification and that can be interchangeable with conventional natural gas. See Biomethane.
Renewable portfolio standard (RPS)	An obligation placed by a government on a utility company, group of companies or consumers to provide or use a predetermined minimum targeted renewable share of installed capacity, or of electricity or heat generated or sold. A penalty may or may not exist for non-compliance. These policies also are known as “renewable electricity standards”, “renewable obligations” and “mandated market shares”, depending on the jurisdiction.

Reskilling and Upskilling	The process of training workers—particularly those transitioning out of the declining fossil fuel sector—with the new skills required to manufacture, install, operate, and maintain renewable energy technologies.
Reverse auction	See Tendering.
Roadmap	See Strategy.
Secondary supply	Materials and critical minerals (like copper or lithium) that are obtained by recycling end-of-life products, as opposed to "primary extraction", which refers to mining new raw materials from the earth.
Sector integration (also called sector coupling)	The integration of energy supply and demand across electricity, thermal and transport applications, which may occur via co-production, combined use, conversion and substitution.
Smart energy system	An energy system that aims to optimise the overall efficiency and balance of a range of interconnected energy technologies and processes, both electrical and non-electrical (including heat, gas and fuels). This is achieved through dynamic demand- and supply-side management; enhanced monitoring of electrical, thermal and fuel-based system assets; control and optimisation of consumer equipment, appliances and services; better integration of distributed energy (on both the macro and micro scales); and cost minimisation for both suppliers and consumers.
Smart grid	Electrical grid that uses information and communications technology to co-ordinate the needs and capabilities of the generators, grid operators, end-users and electricity market stakeholders in a system, with the aim of operating all parts as efficiently as possible, minimising costs and environmental impacts and maximising system reliability, resilience and stability.
Smart inverter	An inverter with robust software that is capable of rapid, bidirectional communications, which utilities can control remotely to help with issues such as voltage and frequency fluctuations in order to stabilise the grid during disruptive events.
Solar collector	A device used for converting solar energy to thermal energy (heat), typically used for domestic water heating but also used for space heating, for industrial process heat or to drive thermal cooling machines. Evacuated tube and flat plate collectors that operate with water or a water/glycol mixture as the heat-transfer medium are the most common solar thermal collectors used worldwide. These are referred to as glazed water collectors because irradiation from the sun first hits a glazing (for thermal insulation) before the energy is converted to heat and transported away by the heat transfer medium. Unglazed water collectors, often referred to as swimming pool absorbers, are simple collectors made of plastics

and used for lower-temperature applications. Unglazed and glazed air collectors use air rather than water as the heat-transfer medium to heat indoor spaces or to pre-heat drying air or combustion air for agriculture and industry purposes.

Solar cooker	A cooking device for household and institutional applications that converts sunlight to heat energy that is retained for cooking. There are several types of solar cookers, including box cookers, panel cookers, parabolic cookers, evacuated tube cookers and trough cookers.
Solar home system	A stand-alone system composed of a relatively low-power photovoltaic module, a battery and sometimes a charge controller that can provide modest amounts of electricity for home lighting, communications and appliances, usually in rural or remote regions that are not connected to the electricity grid. The term solar home system kit is also used to define systems that usually are branded and have components that are easy for users to install and use.
Solar photovoltaics (PV)	A technology used for converting light directly into electricity. Solar PV cells are constructed from semiconducting materials that use sunlight to separate electrons from atoms to create an electric current. Modules are formed by interconnecting individual cells. Building-integrated PV (BIPV) generates electricity and replaces conventional materials in parts of a building envelope, such as the roof or facade.
Solar photovoltaic-thermal (PV-T)	A solar PV-thermal hybrid system that includes solar thermal collectors mounted beneath PV modules to convert solar radiation into electrical and thermal energy. The solar thermal collector removes waste heat from the PV module, enabling it to operate more efficiently.
Solar water heater (SWH)	An entire system consisting of a solar collector, storage tank, water pipes and other components. There are two types of solar water heaters: pumped solar water heaters use mechanical pumps to circulate a heat transfer fluid through the collector loop (active systems), whereas thermosyphon solar water heaters make use of buoyancy forces caused by natural convection (passive systems).
Solar-plus-storage	A hybrid technology of solar PV with battery storage. Other types of renewable energy-plus-storage plants also exist.
Standard	Documented criteria ensuring uniformity, safety, and efficiency in the energy sector, such as grid protocols, energy efficiency labels or sustainability standards or emission limits.

Stationary energy storage	Energy storage systems that are permanently installed in one location (such as utility-scale battery parks or pumped hydro facilities), as opposed to mobile batteries used in electric vehicles.
Storage battery	A type of battery that can be given a new charge by passing an electric current through it. A lithium-ion battery uses a liquid lithium-based material for one of its electrodes. A lead-acid battery uses plates made of pure lead or lead oxide for the electrodes and sulphuric acid for the electrolyte, and remains common for off-grid installations. A flow battery uses two chemical components dissolved in liquids contained within the system and most commonly separated by a membrane. Flow batteries can be recharged almost instantly by replacing the electrolyte liquid, while simultaneously recovering the spent material for re-energisation.
Strategy/roadmap	A detailed plan outlining steps, timelines, and milestones to achieve specific energy goals, such as transitioning to renewables or reducing emissions.
Sustainable aviation fuel	According to the International Civil Aviation Organisation, such fuels are produced from three families of bio-feedstock: the family of oils and fats (or triglycerides), the family of sugars and the family of lignocellulosic feedstock.
Sustainable Development Goal 7 (SDG 7)	One of the 17 global goals set by the United Nations, which specifically aims to "ensure access to affordable, reliable, sustainable and modern energy for all" by the year 2030.
Target	A specific, measurable objective or goal set to achieve a desired outcome within a defined timeframe, typically used to guide and evaluate progress in strategic planning or policy implementation. Examples are increasing renewable energy to 50% by 2030, targeted sales of EVs or achieving universal electricity access by a set year.
Tender (also called auction / reverse auction)	A procurement mechanism by which renewable energy supply or capacity is competitively solicited from sellers, who offer bids at the lowest price that they would be willing to accept. Bids may be evaluated on both price and non-price factors.
Thermal energy storage	Technology that allows the transfer and storage of thermal energy. (See Molten salt.)
Torrefied wood	Solid fuel, often in the form of pellets, produced by heating wood to 200-300 °C in restricted air conditions. It has useful characteristics for a solid fuel including relatively high energy density, good grindability into pulverised fuel and water repellence.

Transmission grid	The portion of the electrical supply distribution network that carries bulk electricity from power plants to sub-stations, where voltage is stepped down for further distribution. High-voltage transmission lines can carry electricity between regional grids in order to balance supply and demand.
Upstream supply chains	The early and foundational stages of producing a technology, which in the context of renewables includes raw material extraction (mining), processing, refining, and the manufacturing of basic components before final assembly.
Utility-scale	Large-sized energy generation facilities (such as massive solar or wind farms) designed to feed massive amounts of power directly into the main transmission grid, distinguishing them from smaller, localised (decentralised) systems.
Variable renewable energy (VRE)	A renewable energy source that fluctuates within a relatively short time frame, such as wind and solar energy, which vary within daily, hourly and even sub-hourly time frames. By contrast, resources and technologies that are variable on an annual or seasonal basis due to environmental changes, such as hydropower (due to changes in rainfall) and thermal power plants (due to changes in temperature of ambient air and cooling water), do not fall into this category.
Vehicle fuel standard	A rule specifying the minimum fuel economy of automobiles.
Vehicle-to-grid (V2G)	A system in which electric vehicles – whether battery electric or plug-in hybrid – communicate with the grid in order to sell response services by returning electricity from the vehicles to the electric grid or by altering the rate of charging.
Virtual net metering	Virtual (or group) net metering allows electricity utility consumers to share the output of a renewable power project. By receiving “energy credits” based on project output and their ownership share of the project, consumers are able to offset costs on their electricity utility bill.
Virtual power plant (VPP)	A network of decentralised, independently owned and operated power generating units combined with flexible demand units and possibly also with storage facilities. A central control station monitors operation, forecasts demand and supply, and dispatches the networked units as if they were a single power plant. The aim is to smoothly integrate a high number of renewable energy units into existing energy systems; VPPs also enable the trading or selling of power into wholesale markets.
Virtual power purchase agreement (PPA)	A contract under which the developer sells its electricity in the spot market. The developer and the corporate off-taker then settle the difference between the variable market price and the strike price, and the off-taker receives the electricity certificates that are generated. This is in contrast to more traditional PPAs, under which the developer sells electricity to the off-taker directly.

Voltage and frequency control

The process of maintaining grid voltage and frequency stable within a narrow band through management of system resources.

Waste from Electrical and Electronic Equipment (WEEE)

A regulatory category covering discarded devices that require electricity to function. In the context of the energy transition, this increasingly includes end-of-life solar panels, batteries, and inverters.

Watt

A unit of power that measures the rate of energy conversion or transfer. A kilowatt is equal to 1 thousand watts; a megawatt to 1 million watts; and so on. A megawatt-electrical (MWe) is used to refer to electric power, whereas a megawatt-thermal (MWth) refers to thermal/heat energy produced. Power is the rate at which energy is consumed or generated. A kilowatt-hour is the amount of energy equivalent to steady power of 1 kW operating for one hour.