Glossary of Terms
in Sustainable Energy Regulation

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Active Networks: Distribution networks traditionally are passively managed. Active management enables generators and customers to connect more easily; allow greater interaction between utilities and customers and provide incentives to consumers and generators to act more efficiently both in the short and long-term. Active management stems from greater interconnectivity of networks and the use of local control areas (or 'cells'). Such networks offer the opportunity for an increased range of services to consumers, as well as offering greater operational security. They tend to become increasingly necessary as the level of distributed generation on a system increases.

Abuse of Dominance: The action of a company to take advantage of a position of market strength so that it cannot be effectively challenged though competition. This relates to monopolisation and acts to reduce welfare within the market, driving up costs to the consumer.

Ancillary Services: A range of services necessary to the efficient running of the electricity system which are outside the basic needs of energy, generating capacity, and power delivery. Some of these (such as regulation and reactive power) are required during normal operations to maintain the necessary balance between generation and load in real time and maintain voltages within the required ranges. Other ancillary services (such as contingency reserves) provide insurance to prevent minor problems from becoming major catastrophes. Finally, some services (such as system blackstart) are required to restore the bulk-power system to normal operations should a major outage occur.

Average Electricity Tariff: The average price paid by consumers over the course of one year. It is significant in that it will often be the base for the setting of tariffs paid under Tariff Mechanisms.

Balancing: That is, balancing of supply and load (or demand) for electricity.

Benchmarking: The continuous process of measuring companies in similar service areas against strong competitors or recognized industry leaders – for example, where there are several electricity distribution companies their operating efficiency can be compared. Benchmarking is used by regulators to improve performance and can be applied to all facets of operation. It requires a measurement mechanism so that the performance "gap" can be identified.

Black certificates: sometimes used to refer to greenhouse gas reductions

CHP: See Combined Heat and Power, Co-generation.

Co-generation: A method of using the heat that is produced as a by-product of electrical generation and that would otherwise be wasted. The heat can be used for space heating of buildings (usually in district or community heating schemes) or for industrial purposes. Utilising the heat in this way means that 70-85% of the energy converted from fuel can be put to use, rather than the 30-50% that is typical for electrical generation alone. Co-generation schemes can be relatively small scale, for use at the level of a factory or hospital, or can be major power stations. The term CHP is employed in the UK and some other parts of Europe, while the term co-generation is employed elsewhere in Europe, the US and other countries.

Combined Heat and Power (CHP): See Co-generation

Connection Charging: The charges associated with connecting a generator to the distribution or transmission network. These charges can be deep, wherein the generator must pay all costs of connection and reinforcement of the network to enable their connection, or they may be shallow, wherein the generator pays the costs only within the immediate area (or not at all). Considerable variance may occur between these two extremes.

Consumer Price Index (CPI): See RPI-X.

Contestable Markets: A contestable market is one where the barriers to entry are low. Thus a perfectly contestable market would have no barriers. Barriers can include anything which acts to protect the industry incumbent from new entrants and can stem from institutional or regulatory arrangements relating to pricing, licensing, marketing or a number of other sources.

Corporatisation: The act of transferring a state-owned utility or body into a limited liability corporate agent. The state tends to maintain ownership of the agent. The process is often the precursor to privatisation.

Declared Net Capacity (dnc): A modifying factor applied to the plate (theoretical) capacity of an intermittent renewable energy generator to establish the realistic output. In broad terms, the dnc is the equivalent capacity of baseload plant that would produce the same average annual energy output as the renewable energy plant. The dnc will, in practice, vary from generator to generator; however a general multiplying factor is sometimes applied to give a general figure for the turbine performance. It is most commonly applied to wind power.

Decoupling: Regulatory tool designed to break the link between a utility's earnings and the energy consumption of its customers. Decoupling attempts to guarantee revenue level to utility companies and make them indifferent to change in sales volumes. This is done by fixing a target revenue and adjust the price if actual revenues collected is greater or lesser than the target revenue.

Deep Charging: See Connection Charging

Demand Side Management: The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand. It refers only to energy and load-shape modifying activities that are undertaken in response to utility-administered programs. It does not refer to energy and load-shape changes arising from the normal operation of the marketplace or from government-mandated energy efficiency standards. Demand-Side Management (DSM) covers the complete range of load-shape objectives, including strategic conservation and load management, as well as strategic load growth.

De-regulation: The process of removing or reducing regulation. It is often employed in connection with the liberalisation process for privatised industries. The term is sometimes used erroneously to describe the movement of publicly owned companies and industries in to the private sector. This can generally be more accurately referred to using the terms; privatisation, liberalisation and re-regulation.

Distributed Generation: Essentially any generator which connects directly to the distribution (low voltage) electricity grid rather than the transmission (high voltage) grid.

Distribution: The transport of low voltage electricity. This connects the transmission network with the majority of electricity consumers. The process is overseen by a distribution network operator. Management of distribution is a natural monopoly due to the economies of scale inherent to it.

Distribution Network Operator (DNO): The owner of the physical network providing electricity at low voltages. Generally connects the transmission grid to the majority of consumers, though some larger consumers may connect directly to the transmission grid. The DNO may have some involvement in balancing the supply of electricity.

Distribution Use-of-System Charging (DUoS): Charging for use of the distribution network and paid to distribution companies by customers, via supply companies.

District energy or heating: Heating provided from a central boiler or a number of heat stations or boilers to serve a network of pipes that supply heat to a number of buildings. Such schemes may be fuelled by a range of sources, both fossil and renewable and some schemes are multi-fuelled, (e.g. with gas and biomass heat stations). The buildings served may be a mix of housing, public and commercial buildings. The heat stations may also generate electricity - co-generation (CHP) and may supply cooling services as well.

Dominance: Circumstances wherein one actor gains a position of strength within a market sector such that effective competition is no longer possible, with likely adverse effects on consumer welfare. See also Abuse of Dominance.

Economies of Density: Generally, economies wherein unit costs are lower in relation to population density. The higher the population density, the lower the likely costs of infrastructure required to provide a service. One example would be the costs associated with providing electricity networks to urban versus rural areas.

Economies of Scale: In many cases, the bigger a company gets, the cheaper it is able to produce or distribute each additional unit. Generally, this is because some costs of production do not increase with each unit. These fixed costs are effectively averaged out over the cost of each unit, so that each unit produced reduces the average.

Economies of Scope: A situation in which one company can produce or distribute two or more different goods more cheaply than if the goods were made by different companies.

Embedded Generation: Another term for distributed generation, distributed generation is the preferred term.

Energy Conservation: Using less energy (kWh) irrespective of whether the benefits increase, decrease or stay the same. Energy conservation is thus the goal if environmental targets are to be met.

Energy Efficiency: This can be defined in slightly different ways, and includes using less energy (kWh) to achieve the same benefits (e.g. internal temperature, industrial output etc), or using the same or a lesser amount of energy (kWh) but achieving more benefits (e.g. a warmer home, higher output). The focus tends to be on improving the welfare of the end-user.

Energy Services: The provision of energy supply and measures concerned with end-use in a single package.

Energy services company (ESCO): Companies concerned with maximising efficient and cost-effective supply and end-use of energy for their customers. This can encompass a mixture of the following as appropriate; competitive purchasing of various fuels; CHP; end-use efficiency measures; consumption monitoring and management and others. ESCOs should be distinguished from energy supply companies; the main role of which is supplying units of gas, electricity or heat. ESCOs can also be distinguished from energy management companies whose main role is supplying energy efficiency services.

Entry and Exit Charging: Both examples of Use-of-System Charging. Entry charges are the charges relevant to connection an electricity network. They can be capacity based but this does not have to be the case. Entry charges contribute to the income of the network owner, though they do not have to specifically relate to the costs of reinforcing the network to allow entry at that point. Exit charges should effectively cover any shortfall in meeting network infrastructure costs not met within connection costs (deep or shallow) or by other use of system charges such as entry charges.

Feed-in Tariff: a 'pricing law' where the rates paid to producers of electricity from renewable sources are set in a law, and calculated to provide sufficient profitability for the investment.

Generation: The production of electricity from other energy sources. This can include coal, oil, gas, nuclear fission, wind, waste combustion and many others. Generation can be entirely run as a monopoly or be subject to competition.

Green certificates: see Renewable Energy Certificates.

Horizontal Integration: The expansion of a company to take in other companies at the same step in the value chain. For example, an electricity generation company which purchased another generating company would be increasing its horizontal integration. Horizontal integration can be contrasted with vertical integration. Increasing horizontal integration allows greater opportunity for capture of economies of scale and of scope.

Integrated Resource Planning (IRP): IRP develops the concepts of least cost planning to more readily take into account environmental resources, which are not always considered in LCP. IRP tends to focus more heavily on total kWh supplied rather than peak kW demand.

Least Cost Planning (LCP): Calculation of the comparative costs and benefits of investment in developing capital assets; be it in generation, supply or transmission against the investment in measures to reduce demand. Consideration can include non-market costs and benefits. The aim is to identify the cheapest form of investment. The process tends to stem from an assessment of the peak kW demand rather than the total kWh supplied, though this can be used.

Liberalisation: Technically, the removal of restrictions on the movement of capital. It has come to refer to a policy of promoting liberal economics by limiting the role of government in the operation of the market economy. Liberalisation can include privatisation and deregulation/re-regulation. Typically it refers to the establishment of an industry structure to allow competition, for example, as is possible with electricity generation. The process includes the shifting of publicly-owned companies into the private sector, such that provision of services is subject to greater competition or, in the case of natural monopolies to greater oversight with regard to economic efficiency.

Marginal Cost: The cost of producing a single extra unit of a commodity.

Market Failure: The failure of the market to allocate resources efficiently. There are four main causes; abuse of market power; failure to account for externalities; the provision of public goods; and asymmetry of information, that is, where one actor knows more about market values than other actors in the sector.

Market Power: The ability of a company or group of companies to exert control over a market such that the quantity of goods available in the market or the price of goods is impacted. Monopolies, oligopolies and monopsonies are all typified by companies who can exert market power.

Micro-generation: Micro-generation systems typically range in size from a few kilowatts (kW) to 500 kW. They are small generators installed close to the point of use, either in smaller businesses or for household use.

Monopoly: The situation wherein one company has the market power to control the price or availability of a good or service. If this is unregulated, the company is likely to produce fewer goods or to sell goods more expensively than would be the case in a competitive environment. In practice, a monopoly may refer to an industry where one company has power to control the sector regardless of other companies or it may refer to a sector where only one company exists. It should be noted that outside natural monopolies, few monopolies are absolute and that even dominant companies may be subject to pressures on their price setting or limiting of supply. The effects of monopoly, including natural monopoly, on welfare can be limited by appropriate regulation.

Monopsony: A market where a single consumer of a service or good has sufficient market power to dictate the price of that good or service. One example of such a situation can occur in the electricity sector if the sector has only one main buyer of electricity.

Natural Monopoly: A monopoly where the market can be served most cheaply by a single firm, rather than by a number of competitors. The most notable examples with regard to electricity are transmission and distribution networks, where it would be grossly inefficient in terms of capital investment to have competing networks serve the same customers.

Oligopoly: Oligopoly occurs when a number of firms dominate the market for a service or good and effectively act to maintain prices at a higher level than would be likely to occur through competition, effectively mimicking a monopoly. Oligopolies may form as a result of outright collusion, as with the formation of a cartel or may be more informal, as with the adoption of non-price competition, wherein companies in the oligopoly compete on factors other than price in order to avoid margin reducing price wars.

Passive Networks: The 'traditional' electricity supply paradigm, wherein generators are hooked to the transmission network and then supply electricity to order, down to the level of distribution.

Perfect Competition: A (theoretical) market where competition is total. Competitors exhibit no market power and their profit level is only that required to keep them in business.

Performance Based Regulation (PBR): Regulatory approaches rely on the application of financial incentives and disincentives related to specific outputs to induce desired behaviours on the part of regulated companies. PBR links company outputs to revenue and can be applied to achieve benefits such as increased innovation, increased standards for quality of supply, reduced losses and a range of other things which are perhaps otherwise not addressed by regulatory approaches such as rate-of-return.

Price Capping: The application of a limit on the prices that a utility may charge in a given regulatory period. A regulator sets the amount with the aim of taking into account the increases in productivity expected of the sector in comparison with the ongoing inflation in the economy as whole. Price capping will often be used in conjunction with benchmarking in order to allow the regulator to more easily assess the levels of productivity that a company should be achieving.

Price Regulation: Regulation wherein utilities are incentivised to maximise their efficiency in order to maximise their profits. Prices are regulated but profits are not. The usual form is to allow prices to rise by an amount related to inflation minus an efficiency factor – if this factor is large enough prices will actually have to fall. The main criticism is that it can allow companies to make unreasonably high profits if the efficiency factor is set too low. It originated in the UK as RPI-X. It is usually differentiated from rate of return regulation.

Privatisation: The process of moving a body or institution from ownership in the public sector to ownership in the private sector. This can be carried out using different processes, for example, the sale of shares to the general public or the sale of the whole company to a specific bidder.

Production Tax Credit: Generally provides a per kilowatt-hour tax credit for electricity generated by qualifying energy resources. The mechanism tends to be used exclusively in the US to stimulate renewable energy exploitation. Usually available for a fixed period, tax credits provide a fixed credit per kWh adjusted annually for inflation. The use of credits can penalise smaller generators if they do not pay sufficient tax to use the credits against other investment.

Public Benefits Fund: A surcharge on a consumer's bill from an electric distribution company to pay for the costs of certain public benefits such as energy efficiency or low-income assistance.

Quota Mechanism: More generally known as a Renewable Portfolio Standard or as an obligation mechanism.

Rate of Return Regulation: A form of regulation wherein the regulator determines the rate of return that a utility needs to and can be allowed to earn on investment and this sets the basis of the prices that can be charged. Effectively this means that profit levels are regulated. This is the system mainly used in the US. The main criticism is that it does not encourage efficiency as much as the RPI-X form of price regulation. In practice this can lead to inefficiency, lack of innovation and 'gold plating' - that is, overspending to keep profits down.

Regulatory Failure: This occurs where the costs of introducing regulation outweigh the benefits.

Regulatory Risk: A risk to businesses that changes in regulation will have a negative impact on their operation. Where governments and regulators raise regulatory risk, they are likely to come under pressure to allot some form of compensation to companies who suffer as a result of regulation in order to ensure that future investment is not discouraged.

Renewable Energy: The use of energy from a source that does not result in the depletion of the earth's resources whether this is from a central or local source.

Renewable Energy Certificates (RECs): A certificate that represents a unit of renewable electricity generated that can be used to verify the fulfilment of an obligation to source a certain percentage of renewable generation as required in Renewable Portfolio standard schemes. Trading may be allowed so that companies that under-achieve their obligation can buy certificates from those who have over-achieved.

Renewable Portfolio Standard (RPS): A market based mechanism devised by Nancy Rader and Richard Norgaard for the American Wind Energy Association in 1996. It obliges supply companies or consumers to purchase a specific amount of electricity from renewable energy sources. The key goal of such a mechanism is to minimise the costs of increasing renewable energy capacity through the stimulation of competition to fulfil obligations. The RPS mechanism is also known as a quota or obligation mechanism. Examples of the RPS include the Renewables Obligation in the UK or the Mandatory Renewable Energy Target in Australia). The market may be operated through the creation and trading of certificates (Renewable Energy Certificates).

Regulatory Asset Base (RAB) (Also Regulatory Asset Value - RAV): The capital value of the assets used by regulators in setting prices or price limits for utility companies. A basic formula in utility rate-setting is: Required Revenue = Operating Costs + Depreciation + Return on Capital. That is to say, utility charges should be designed to recover no more than reasonable operating costs (including taxes), plus capital charges that provide investors with a competitive return equal to what they would have earned on other investments of equivalent risk. Capital charges include both a return *of* investment (also known as depreciation) and a return *on* investment (known as profit). Both depreciation and return on capital require an approach to *asset valuation*, i.e., the determination of the Regulatory Asset Base.

Reserves: Several types of controllable reserve enable a system operator to achieve an ongoing balance of generation against load. Continuous fluctuations are balanced using regulating reserves. Frequency deviations are balanced using frequency-responsive reserves. Daily cycling of load is met by load following and by generator dispatch. Sudden failures in generation and transmission can be compensated in a number of ways; spinning reserve, non-synchronized reserve and operating reserve. Where possible Contingency Reserves are also generally maintained, these provide reserves which can be called upon should the case of the worst credible event for the network arise.

RPI-X: Employed as part of Price Capping regulation. RPI is the Retail Price Index and X represents an adjusting factor to account for efficiency gains. It is applied to establish how a utility may raise (or have to lower) its prices in a given regulatory period.

Shallow Charging: See Connection Charging.

Soft Loan: A loan made available (usually by a government) at a preferred rate of interest, or with interest deferred for some time (or both). Such a loan can be made available to encourage investment in particular technologies or industrial sectors.

Spinning Reserve: Generating capacity available from units which is not being used but is connected to and synchronized with the grid to serve additional demand. The spinning reserve must be under automatic governor control to instantly respond to system requirements.

Supplier: A company which buys electricity from a generator, or via a third party, to supply to an electricity consumer. Suppliers are known as retailers in some countries.

Supply: The sale of electricity to final users. Many electricity industries do not separate the supply function from the distribution function and allow the monopoly control of both functions. Other countries or territories separate the functions to allow the use of competition within the supply function whilst separately regulating the natural monopoly of the distribution function.

Sustainable Development: “That which meets all the needs of the present without compromising the ability of future generations to meet their own needs" (U.N. Brundtland Commission)

Sustainable Energy: Effectively, the provision of energy such that it meets the needs of the future without compromising the ability of future generations to meet their own needs. (See Sustainable Development). Sustainable Energy has two key components; renewable energy and energy efficiency.

System Benefits Charge: see Public Benefits Fund.

System Operator: The operator of the transmission grid. Its responsibilities often include proving access to the grid for generators, managing congestion and controlling despatch.

Tariff Mechanism: A mechanism to encourage the growth of renewable energy generating capacity. Notable examples are Denmark and Germany. A tariff mechanism generally provides a particular rate per kWh of electricity generated and guarantees that payments will continue for a fixed or minimum period. The tariff can be fixed beforehand, can be fixed to reduce in specific gradations over time or can be linked to the Average Electricity Tariff. Also known as a price mechanism.

Total Final Consumption (TFC): TFC is the sum of the total consumer end use of energy across all sectors for a specified territory. It is also known as 'delivered energy'. It is usually recorded by end-use sectors such as agriculture, industry, etc.

Total Primary Energy Supply (TPES): The amount of energy made available at source for transformation and end use. It is regulated for international trade such that imports are included and exports are excluded, it makes allowance for any change in the fuel stock of a country and, by convention, does not include fuel used for international transportation. Thus TPES = Indigenous Production + imports - exports - stock change - international transport.

Trade for Aid: The linking of aid payments made from one country to another to trade commitments made by the second country to the first.

Transmission: The transport of high voltage electricity. This is achieved with a transmission network (or grid). Generally the network will connect large generators to lower voltage distribution networks where it will be transported to the majority of electricity consumers. Alternatively, large scale electricity users may connect directly to the transmission network. Management of transmission is a natural monopoly due to the economies of scale inherent to it.

Transmission System Operator (TSO) (also Transmission Network Operator-TNO): The company which owns and maintains the transmission (high voltage) network, and which is responsible for balancing supply and demand in the electricity system.

Transmission Use-of-System Charging (TUoS): Use-of-System Charging associated with the transmission network - i.e. charges from TSOs to generators.

Use-of-System Charging (UoS): The charges which attach to the use of a distribution or transmission network. These include entry and exit charges as well as other operational charges.

Vertical Integration: The ownership by the same company of different functions in a value chain relating to the provision of a particular good or service. The number of functions owned dictates the level of vertical integration. A company in the electricity sector with, for example, ownership of supply and distribution functions, would be vertically integrated. The company's level of vertical integration would increase if it was to develop generating capacity, or to develop some other function in the sector.

White Certificates: A certificate that represents a unit of energy saved that can be used to verify the fulfilment of an obligation to achieve an energy saving target. White certificates are often transferable titles: the party obliged to reach a given target of energy saving may choose between the options either to directly implement the project "producing" the required amount of white certificates, or to purchase the certificates from another agent who has over-achieved his own target.