

## ENERGY FLEXIBILITY GLOSSARY

Term	Definition
<b>Energy flexibility and demand response strategies</b>	
Energy Flexibility	The energy flexibility is the ability of an energy system to adapt itself to any changes of energy variation (demand or supply) maintaining the same level of service produced.
Demand response strategies	Demand response refers to balancing demand on the electricity grids by encouraging customers to shift electricity demand to times when more electricity is available or other demand is lower, usually through prices or financial incentives.
<b>Flexibility resources, services and products</b>	
Flexibility resource	Physical resource (DER) or unit process, which may be operated flexible way outside its normal operation mode.
Flexibility service	Flexibility service is an abstract description how to utilize flexibility resource for one specific purpose.
Flexibility product	Flexibility product is the traded or contracted agreement to realize defined delivery of a specified flexibility service.
Energy cost minimization	Energy cost minimization is end-customer's internal service to operate flexibility resources for operational cost minimization. In multi-energy system this might be a choice between energy sources. Second possibility is load shifting to avoid high-price hours and increase self-consumption of on-site generating unit or remote generating units of power purchase agreement.
Self-consumption	Self-consumption is a functionality where a prosumer utilize flexibility to increase the utilization rate of on-site generating unit (e.g. a solar power plant) by modifying electricity demand or energy storage to avoid or minimize the excess electricity to flow to public electricity grid. The aim of self-consumption is to minimize the electricity supply from a grid and to maximize the utilization of on-site electricity generation.
Prosumer	Prosumer is a combination of roles of electricity consumer and producer. It may have also a role of flexibility service provider.
Load shifting	Load shifting is a demand response functionality to shift energy consumption from one moment to another moment. The shifted demand may be consumed beforehand and stored to a buffer storage. For example, electric pre-heating/-cooling will store thermal energy into a building by increasing/decreasing room temperature above/below a specified nominal setting point within a given constraints. Alternatively, the load shifting

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	<p>may post-pone the energy demand, when a buffer storage is utilized to continue the primary process (e.g. heating/cooling a building), and later the energy consumption is increased to fill-in the buffer storage.</p>
Power purchase agreement	<p>Power purchase agreement (PPA) is a bilateral long-term electricity supply contract between electricity producer and consumer. Typical example of PPA is to contract between a wind or a solar farm owner and an industrial consumer to supply electricity and guarantees of origin certificates next 10-20 years with a defined price and specified amount of energy annually or per centage of the output of the farm.</p>
Power peak cutting	<p>Power peak cutting is a demand response functionality where energy demand is reduced to decrease the peak power of the end-customer. The reduced power will not be shifted to another moment but completely avoided.</p>
Frequency control	<p>Frequency control is a service to maintain continuous power balance in the electricity system. On technical level this is divided to several steps within time domain. The fastest step is the inertia response, followed by a primary control response, secondary and tertiary responses. In European electricity market context, all these services are market-based services which transmission system operator buys via a marketplace from flexibility service providers. A generic name for this kind of technical services like frequency control services is an ancillary service.</p>
Transmission system operator	<p>Transmission system operator (TSO) is the owner and the operator of electricity grid on the highest voltage levels. TSO is responsible of power system security, i.e. guaranteeing for example the continuous power balance. TSO has also obligation to enable and support the efficient operation of electricity markets.</p>
Flexibility service provider	<p>A party that offers flexibility services based on acquired (aggregated) resources. [1]</p>
Day-ahead market	<p>The day-ahead market is a marketplace where the trading of electricity (buying and selling) happens one day prior the day of delivery. In Europe the day-ahead market is organized as a closed auction or through bilateral contracts between two parties.</p>
Non-firm connection contract	<p>Connection agreements that DSOs need to offer to system users across the EU have generally concerned agreements with firm capacity rights. This implies that system users should be able to always access their contracted capacity for the full 100%. Alternative connection agreements can generally be thought of</p>

	as a deviation of this firm capacity right on different dimensions: they may vary from firm capacity rights that are valid part of the time (i.e. time-specific) to non-firm capacity rights all of the time. [2]
Frequency containment reserve	Frequency containment reserve is a flexibility product utilized for primary frequency control. Only buyers are TSOs according to their needs and sellers are flexibility service providers based on available resources.
<b>Energy management systems (EMS)</b>	
Carbon Reduction Commitment (CRC)	This program addresses efforts to mitigate climate change. It primarily targets large organizations and aims to improve energy efficiency and reduce greenhouse gas emissions. Participants get financial incentives for reducing carbon emissions while penalties are applied in case of non-compliance.
Corporate Social Responsibility (CSR)	Corporate Social Responsibility (CSR) refers to a business practice that involves companies taking responsibility for their impact on society. It goes beyond the traditional focus on profit-making and includes considerations for the social, environmental, and ethical implications of business activities.
Continuous Improvement	Continuous Improvement is a philosophy and methodology focused on enhancing processes, products, or services incrementally over time. It is an ongoing effort to improve efficiency, effectiveness, and quality in all aspects of an organization. The core idea behind continuous improvement is the constant pursuit of better ways of doing things to achieve higher performance and better results.
Data Gateway	A Data Gateway is a technology solution or service that facilitates the secure and efficient transfer of data between different systems or environments. It acts as an intermediary, enabling data to flow seamlessly between on-premises systems, cloud-based platforms, and other data sources
Demand Response (DR)	Demand Response (DR) refers to a strategy used in the energy industry, particularly in electricity markets, to manage and optimize the consumption of electricity in response to supply and demand fluctuations. The primary goal of demand response is to balance the electricity grid by adjusting the consumption of electricity in real-time based on the current conditions of the power system
Distributed Energy Resources (DERs)	Distributed Energy Resources (DERs) refer to a variety of small-scale, decentralized energy technologies and systems that can be deployed at or near the point of use. These resources are often integrated into the electricity grid and can generate or store

	power, contributing to the overall energy supply. DERs play a crucial role in enhancing grid resilience, reducing transmission and distribution losses, and supporting the integration of renewable energy sources
Greenhouse Gases (GHGs)	Greenhouse gases (GHGs) are gases in the Earth's atmosphere that trap heat. They contribute to the greenhouse effect, a natural process that warms the Earth's surface. However, human activities, particularly the burning of fossil fuels and deforestation, have significantly increased the concentrations of these gases, intensifying the greenhouse effect and leading to global warming
Energy performance indicators (EnPI)	EnPIs are quantifiable metrics or parameters used to assess and measure the energy performance of an organization, system, process, or equipment. EnPIs provide valuable data that can help organizations evaluate their energy efficiency, identify areas for improvement, and track progress toward energy-related goals. These indicators are typically expressed in numerical values and are derived from energy consumption and related data.
Energy Management software	Energy Management Software (EMS) refers to computer-based tools and applications designed to monitor, control, and optimize energy consumption within an organization or facility. These software solutions assist businesses and industries in efficiently managing their energy usage, reducing costs, and improving sustainability
HVAC	The "Heating and Ventilation" system, often referred to as HVAC (Heating, Ventilation, and Air Conditioning), is an integrated system designed to control and maintain indoor environmental conditions, ensuring comfort, air quality, and thermal regulation in various spaces
Industry 4.0	Industry 4.0, also known as the Fourth Industrial Revolution, refers to the ongoing transformation of traditional manufacturing and industrial practices with the integration of modern smart technology. This paradigm shift involves the use of advanced technologies to create more intelligent, efficient, and connected industrial systems
PDCA Cycle	The Plan-Do-Check-Act (PDCA) cycle is a fundamental concept in ISO 50001, the international standard for energy management systems. The PDCA cycle is a continuous improvement framework that organizations use to systematically manage their energy performance and achieve energy efficiency goals.
Resource Conservation	Resource conservation refers to the responsible and sustainable management of natural resources to ensure their efficient use, preservation, and protection for current and future generations. This concept encompasses a wide range of resources, including

	water, energy, land, biodiversity, minerals, and other raw materials.
Risk management	Risk management is the process of identifying, prioritizing, and mitigating potential risks or uncertainties that could impact an organization's objectives, operations, projects, or assets. The primary goal of risk management is to systematically identify and analyze risks, develop strategies to handle or mitigate them, and monitor the effectiveness of these strategies to minimize potential negative outcomes. Risk management is a fundamental practice for organizations across various industries and sectors, helping them make informed decisions and improve their ability to achieve their goals while minimizing adverse impacts.
Return on Investment (ROI)	Return on Investment (ROI) is a financial metric used to evaluate the profitability of an investment relative to its cost. It is a measure of the return or gain on an investment expressed as a percentage of the initial investment
Sustainability	Sustainability is a concept that involves meeting the needs of the present without compromising the ability of future generations to meet their own needs. It encompasses a holistic approach to environmental, social, and economic considerations to create a balanced and enduring system
Incineration plant	An incineration plant, also known as an incinerator or waste-to-energy (WTE) facility, is an industrial facility designed to burn waste materials for the purpose of energy recovery. The primary goal is to reduce the volume of waste, minimize environmental impact, and generate energy through the combustion process