

## Technologies Glossary

Term	Definition
<b>Energy efficient Technologies</b>	
<b>Community-based Distributed Energy Storage (DES)</b>	
Application programming interface (API)	A set of rules and specifications that define how two pieces of software can communicate with each other. This allows developers to build applications that can access and integrate with a wide range of external services and data sources.
Blockchain	A decentralized and distributed digital ledger that records transactions across multiple computers in a secure, transparent, and tamper-resistant manner.
Business process	A collection of activities or tasks performed in a specific sequence to produce a service or product for customers (serves a particular business goal)
Business process management (BPM)	A cross disciplinary approach to designing, analyzing, automating, executing, and monitoring business processes to improve efficiency, effectiveness, and agility. It combines knowledge from the fields of information technology and business management and enables organizations to identify, model, optimize, and continuously improve their business processes.
Business process management software (BPMS)	Software that helps businesses model, automate, analyze, and optimize their business processes. It provides a platform for designing, managing, and executing business workflows, ensuring that processes are standardized, efficient, and compliant with regulations.
Business process modelling notation (BPMN)	A standard language for graphically representing business processes making it easier to understand, analyze, and improve them. BPMN is widely used by business analysts and IT professionals to model, document, and manage business processes.
Clustering	A technique used in Data Science that aims to identify groups of similar data points in a dataset based on their similarity. Clustering is a powerful tool that can be used to gain insights from data.
Collaborative filtering	A technique used in recommender systems to make predictions about the interests of a user or group of users. It works by analyzing the collective preferences of users to recommend items that they might like.

Community detection	A technique in Data Science that aims to uncover groups of interconnected entities, called communities, within a network or graph. Community detection algorithms are employed to identify hidden structures and patterns within complex networks, providing valuable insights into the relationships and dynamics of the entities involved.
Crowdsourcing	The process of leveraging the collective intelligence and contributions of a large group of people, typically through online platforms, to gather or analyze data for various purposes. By aggregating and analysing the input of a large number of people, crowdsourcing can help to identify patterns, trends, and insights that might not be obvious to any single individual.
Dashboard	A visual representation of the results of data analysis, using a variety of charts, graphs, and other visual elements, that provide to users a concise and easy to understand overview of the contained information.
Data analytics	The process of collecting, cleaning, transforming, and analyzing data to extract meaningful insights and make informed decisions.
Data schema (or schema)	The organizational structure of a dataset that defines the relationships between the different elements of the data, as well as the constraints that must be enforced on the data.
Data Science	Data science is an interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from data in various forms. It encompasses a wide range of techniques and tools, including data mining, statistics, artificial intelligence, and machine learning.
Database	An organized collection of data, typically stored electronically in a computer system. The data is structured in a way that allows it to be easily accessed, managed, and analyzed.
Data-driven solution	An approach that emphasizes the collection, analysis, and interpretation of data to solve problems and drive improvement.
Distributed Technologies	Ledger A broad term referring to technologies that use a distributed network of computers to maintain a synchronized and shared ledger. Blockchain is a type of DLT.
Forecasting	A process for constructing mathematical models to describe the future behavior based on historical data. These models are then used to predict future events or trends, making it a valuable tool for businesses and other organizations that need to make decisions based on future expectations.
Graph	A data structure that consists of nodes (also called vertices) connected by edges. Nodes can represent entities such as people, places, or objects, while edges represent relationships between those entities. Graphs are a powerful tool for visualizing and analyzing data, and they can be used to identify patterns, trends, and anomalies in data.
Immutability	The property of being unchangeable or tamper-resistant. In the context of blockchain, immutability ensures that once a block is added to the chain, it cannot be altered or deleted, providing a high level of security and trust.

Influencer detection	A technique that identifies and classifies users in a network that have the potential to significantly impact other users or communities.
Ledger	A record-keeping system that tracks and stores information about transactions. In the context of blockchain, it is a digital ledger.
Machine Learning	A branch of artificial intelligence (AI) that allows computers to learn from data without being explicitly programmed. This means that machines can identify patterns and trends in data, and use those patterns to make predictions or decisions.
Metadata	Provides information about the data's structure, content, and origin. Metadata can be used to organize, manage, and search for data. It can also be used to understand the meaning of the data and to make informed decisions about how to use the data.
Network analysis	The study of the relationship between objects or entities represented as nodes in a network or graph. It is used to analyze and visualize complex networks, identify important nodes and communities, and predict the behavior of the network.
Permissioned Blockchain	A blockchain in which access to participate in the network and validate transactions is restricted to a specific group of participants. Typically, participants are known and trusted entities.
Permissionless Blockchain	A blockchain where anyone can join the network, participate in the consensus process, and validate transactions without requiring explicit permission. Bitcoin is an example of a permissionless blockchain.
Recommendation system	A type of information filtering system that utilises artificial intelligence (AI) to provide suggestions to users that they might like or find interesting.
Renewable energy sources (RES)	Sources of energy (such as solar, wind, geothermal, hydroelectric, and biomass) that are replenished naturally over time and are not consumed or depleted when used.
RESTful or REST API	A type of API that adheres to the principles and constraints of REST (Representational State Transfer), an architectural style for designing and developing web services. RESTful APIs are widely used for building modern web applications
Semi-structured data	A form of data that does not conform to a predefined schema but contains some organizational properties, such as tags or markup.
Smart Contract	Self-executing contracts with the terms of the agreement directly written into code. Smart contracts automatically execute and enforce the terms when predefined conditions are met.
Structured data	Highly organized and neatly arranged data that follows a predefined format. It is easily searchable, analyzable, and integrable with other data sources.
Time series data	A collection of data points indexed in time order, typically a sequence of measurements taken at regular intervals, such as every minute, hour, day, etc.

Topic extraction / Topic modelling / Topic detection	A technique in Data Science that aims to identify the main themes or topics within a collection of text documents.
Transaction	An action or set of actions that modifies the state of the blockchain. Transactions can include the transfer of assets, data, or the execution of smart contracts.
Trend analysis	The process of identifying, analyzing, and understanding patterns or trends in data over time.
Unstructured data	A form of data that does not have a predefined format or organizational structure. Unstructured data is typically more difficult to analyze than structured data.
Variable renewable energy (VRE)	Renewable energy sources that are not dispatchable due to their fluctuating nature, such as wind power and solar power, as opposed to controllable renewable energy sources, such as dammed hydroelectricity or biomass, or relatively constant sources, such as geothermal power.
Web scraping	The process of gathering public data from websites in an automated way.
<b>Hydrogen</b>	
AEM	<b>Anion Exchange Membrane electrolyzers</b>
ALK or AWE	<b>Alkaline Water electrolyzers</b>
Boudouard reaction	Is a disproportionation reaction between carbon dioxide and carbon monoxide and carbon (in the form of graphite).
CAPEX	<b>CAPital Expenditures</b> are a company's major, long-term expenses including physical assets, such as manufacturing plants, equipment and machinery, building improvements, computers, vehicles and trucks.
Haber Bosch Reaction	It is a chemical reaction that takes place between $N_2$ and $H_2$ at elevated pressures (100-1000 bar) and temperatures (500-600 °C) in the presence of an iron metal catalyst. The reaction product is mainly $NH_3$ .
LCOH	<b>Levelized Cost Of Hydrogen</b> takes into consideration both capital and operating expenditures (CAPEX and OPEX) of a certain green hydrogen project and is expressed in €/kg or \$/kg.
LOHC	<b>Liquid Organic Hydrogen Carriers:</b> They are chemical compounds that can take and release hydrogen through chemical reactions.
OPEX	<b>OPerating EXpenses</b> are a company's day-to-day expenses such as ordinary and customary costs for the industry in which the company operates including repairs, salaries, supplies and rent.
PEM	<b>Polymer electrolyte membrane electrolyzers</b>
P2X	<b>Power to X:</b> This term refers to the conversion of electricity into an energy carrier which could be mainly heat/cold or a chemical compound.

Sabatier Reaction	It is a chemical reaction that takes place between H <sub>2</sub> and CO <sub>2</sub> at pressures (5-24 bar) and temperatures (250-300 °C) in the presence of a nickel catalyst. The reaction products are mainly CH <sub>4</sub> and H <sub>2</sub> O.
SOEC	<b>Anionic Solid Oxide Electrolyzers</b>
WGS	<b>Water Gas Shift</b> reaction is the reaction of carbon monoxide and water vapor to form carbon dioxide and hydrogen.
% wt	This acronym stands for weight per cent
<b>Renewable Energy Assisted Carbon capture, utilization and/or storage (CCUS)</b>	
Coefficient of Performance (COP)	Measure of efficiency for a heat pump. It is a ratio of useful thermal energy (heating and/or cooling) provided to work (energy) required.
Concentrating Photovoltaic Thermal (CPVT) System	It is the technical term for Hybrid Solar Panel Matrix Loop system. Refer to the definition for Hybrid Solar Panel Matrix Loop below.
Concentration Ratio	It refers to the factor by which incoming solar radiation is magnified or focused onto specific components. It quantifies the degree of concentration achieved by the concentrator in optimizing energy absorption.
Concentrators	Concentrators are devices designed to magnify or focus incoming solar radiation onto specific components. They enhance the efficiency of both the photovoltaic (PV) cells and thermal collectors integrated into the system.
Heat Pump	A heat pump is a device that uses work to transfer heat from a cool space to a warm space by transferring thermal energy using a refrigeration cycle, cooling the cool space and warming the warm space.
Hybrid Solar Panel Matrix Loop	It is an innovative hybrid system designed to generate both electricity and heat simultaneously within a single module. It incorporates three components: a concentrator to focus incoming solar radiation, a high-efficiency photovoltaic cell for electricity production, and a thermal collector to harness the surplus solar energy.
Maximum Power Point (MPP) Tracking	It is a technique employed to optimize the energy harvesting efficiency of PV panels. The MPP is the operating point at which the PV module generates the maximum electrical power output under specific environmental conditions.
PV Cells	Photovoltaic (PV) cells, also known as solar cells, are semiconductor devices that convert sunlight directly into electricity. They are a key component in solar power systems, providing a clean and renewable source of energy.
Refrigerant	Working fluid used in the refrigeration cycle/ heat pumps.
Thermal Collectors	These are devices designed to capture solar energy in the form of heat. They maximize the absorption of solar radiation and efficiently transfer the captured heat to a fluid or material within the system.

Carbon Capture, Usage and Storage (CCUS)	Refers to the storage of the captured CO <sub>2</sub> and or effective use of in a manner that prevents its further release to the atmosphere.
Specific reboiler duty (SRD)	In CCUS technology, this refers to the total energy per quantity of CO <sub>2</sub> desorbed [MJ/kg <sub>CO2</sub> ] during solvent regeneration in the reboiler connected at the bottom of a regeneration column.
Flue gas	A mixture of components in exhaust gases (containing substantial CO <sub>2</sub> concentrations) produced by the burning of fuel or other materials in power stations and or industrial plants usually emitted to the atmosphere via ducts.
Post combustion CO <sub>2</sub> Capture	Refers to CO <sub>2</sub> removal from the flue gases downstream the combustion process before their emission to the atmosphere.
<b>Biomass based fuels and feedstocks</b>	
Biorefinery	It is a biofuel refinery, mainly liquid, through which the liquid fuel is upgraded with the presence of a catalyst and through separation processes, included in the mechanism of the biorefinery, high value chemicals are recovered from the liquid fuel.
Catalytic cracking	It is a process that takes place in the refining of oil. With the use of a catalyst the heaviest fractions of oil are broken into lighter and high value products are produced.
Condensation	Change of the physical form of matter. It is the phase in which a gas is liquefied. In the case of pyrolysis through condensation, a liquid product rich in light organics is obtained.
High Heating Value	The amount of heat released from the combustion of volume of fuel.
PLC-Controller	Software that controls and detects the operation of input systems on a device/machine.
Purification	Proces of removing substances (mainly harmful), in this case from the liquid fuel.
Pyro-gasification	Pyro-gasification is a thermochemical process through which biomass is converted into gaseous products. Biomass conversion is carried out in anoxic conditions and under high temperatures ranging from 800-1200 °C. The product which is produced through pyro-gasification is called syngas and consists of CO, H <sub>2</sub> , CH <sub>4</sub> and CO <sub>2</sub> .
Pyrolysis	Pyrolysis is a thermal process that converts biomass into solid, liquid and gaseous fuels and products. The conversion of biomass is carried out through its degradation under high temperature conditions and in the absence of oxygen.
Shredder Heavy Fraction product	It is a polymer fraction which is derived from shredding residues and consists mainly of aluminum, copper, rubber and plastics.
Syngas	Syngas is the gaseous product produced by the gasification process. It is rich in H <sub>2</sub> , CO, CO <sub>2</sub> , CH <sub>4</sub> and can be used as a gaseous fuel.

Wet impregnation techniques	Process of manufacturing heterogeneous catalysts. The metal is dissolved in an aqueous solution and then the catalyst support is impregnated with this solution in order to place the metal within the pores of the catalyst support.
<b>Asset digitalization</b>	