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# Platts Energy Transition Glossary

The following glossary explains some of the terms used across energy transition topics, as employed by S&P Global Platts in its pricing, news and analysis. Many of these terms are novel and may change over time.

Note that this glossary is ordered by topic rather than alphabetically.

**Greenhouse Gas (GHG):** A gas that absorbs heat in the atmosphere, creating a 'greenhouse' effect. GHGs can be naturally-occurring or man-made, but human activity has dramatically increased the volume of GHGs in the atmosphere, largely through the production and combustion of fossil fuels including coal, oil and gas.

- **Carbon Dioxide:** CO<sub>2</sub>. The most prevalent and well-known of the GHGs, produced through the combustion of fossil fuels and other human activities such as deforestation and biomass burning. The concentration of CO<sub>2</sub> in the atmosphere has increased by more than 50% since the beginning of industrialization.
- **CO<sub>2</sub>e:** Carbon Dioxide Equivalent. A measure that normalizes the quantity of different greenhouse gases based on potency, with the potency of CO<sub>2</sub> used as a baseline. For example, methane has 25 times more warming potential in the atmosphere compared to carbon dioxide over 100 years. So 1 metric ton of methane is 25 metric tons CO<sub>2</sub>e. Also referred to as the Global Warming Potential (GWP).
- **Methane:** See separate entry below.
- **Nitrous Oxide:** N<sub>2</sub>O. Produced as a by-product of human activities such as deforestation and agriculture, the concentration of Nitrous Oxide in the atmosphere has increased dramatically. Can be used in industrial processes and was an early anaesthetic ("laughing gas"). Is 265-298 times more potent than CO<sub>2</sub> over 100 years and remains in the atmosphere for more than 100 years on average.
- **Industrial Gases:** Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur hexafluoride (SF<sub>6</sub>), Nitrogen Trifluoride (NF<sub>3</sub>). By-products of industrial activities and not naturally occurring, these gases have a GWP of thousands or even tens of thousands times that of CO<sub>2</sub>.

**Emissions:** The production and discharge of gases into the atmosphere that have an environmental impact. These may include greenhouse gases, but can also include other pollutants such as NO<sub>x</sub>, SO<sub>x</sub>, CFCs etc. "Emissions markets" is a generalised term, and typically more specific references are preferred.

- **Direct/Indirect Emissions:** Direct emissions are from sources that are owned or controlled by the reporting entity, while indirect emissions are emissions that are a consequence of the activities of a reporting entity, but occur at sources owned or controlled by another entity. Critical in carbon accounting.

- **Embedded Emissions:** The sum of the emissions required to create something from the beginning of its lifecycle (raw material extraction) through to market (including transportation of final product to shelf).
- **Scope 1/2/3:** Scope 1 Emissions cover all direct emissions generated by an entity or by components directly under their control. Scope 2 Emissions covers all indirect emissions from energy used by an organization. Scope 3 Emissions covers all indirect emissions from activities of the organization which occur from sources that they do not own or control.

**Carbon:** In this context, used as shorthand to refer to all greenhouse gas emissions (see CO<sub>2</sub>e), but sometimes specifically to Carbon Dioxide. Note that in some sectors it refers to the element itself (ie carbon black, carbon nanofibers etc).

- **Carbon Accounting:** The process used to measure the volume of greenhouse gases emitted by a particular entity or process over a particular period of time. Used by many countries, corporations and individuals to calculate a "carbon footprint", or the amount of carbon dioxide equivalents emitted into the atmosphere as a result of the activities of a particular individual, organization or community.
- **Carbon Intensity:** The total GHG impact of a specific activity or industrial production process. For example, the metric tons of carbon dioxide equivalent gases emitted through the production of one ton of aluminum.
- **Double Counting:** When two or more organizations claim ownership of either a specific GHG emission OR GHG saving (including in the form of a carbon credit used to offset emissions). When the same ton of CO<sub>2</sub> is allocated to multiple parties in a supply chain, for example, the volume of "counted" emissions will exceed the volume of "actual" emissions. However, if the same GHG saving is used to generate, for example, a carbon credit and a separate claim to GHG reductions, then the volume of actual emissions will exceed the volume of counted emissions.
- **Independent Verifier:** A third-party organization who reviews and verifies that an organization's carbon accounting practices are accurate and reflect the real-world volume of emissions emitted through specific activity.

- **Compliance Market:** Mandatory schemes to reduce GHG emissions through a 'cap and trade' scheme in which the total emissions for a given sector and geography are limited by statute. Entities responsible for emissions must produce allowances for all reported emissions within specified periods, and these allowances can be traded in advance of final use. Some schemes, at different times, have allowed the use of carbon credits in addition to allowances. The ICAO's CORSIA scheme will be a hybrid compliance-voluntary scheme once it reaches full maturity (see below).
  - **Voluntary Market:** Voluntary schemes to reduce GHG emissions through the purchase of carbon credits. The voluntary market is largely comprised of companies making pledges voluntarily – or through share-holder pressure – to achieve specific objectives around GHG emissions (ie Net-Zero by 2040). Carbon Allowance: A certificate used in compliance-based carbon markets that permits an entity to emit one ton of carbon dioxide or an equivalent greenhouse gas. By definition, the number of allowances in a market is finite, and carbon reduction is achieved by gradually reducing the number of allowances available in the market at any time. Allowances can typically be traded between organizations, so that organizations that use less CO<sub>2</sub> than permitted can sell the right to emit CO<sub>2</sub> to organizations that use more than they are allotted. The most advanced allowance market in the world is the EU Energy Trading Scheme (EU-ETS), with the California Cap-and-trade system the second largest. The Chinese Emissions Trading Scheme, launched in July 2021, is expected to overtake the EU-ETS as the largest compliance scheme globally.
  - **Free Allocations:** An approach in cap and trade schemes (including the EU ETS) which applies to sectors outside of specified areas. A proportion of allowances (as of 2020, more than 40% in the EU-ETS) are essentially set aside for specific sectors and not subjected to the market price of auction. This is intended to combat carbon leakage but is controversial, with critics arguing that it discourages certain high-polluting sectors from making investments to cut back on GHG emissions.
  - **EUA/UKA:** EU Carbon Allowance/UK Carbon Allowance.
  - **CCA:** California Carbon Allowance.
  - **Carbon Credit:** A certificate that is issued by a specific authority certifying that one ton of carbon has been either reduced, avoided or removed by a specific project, such as the building of a renewable energy plant in lieu of a fossil fuel-based one or the rewilding of a forest. Carbon credits can then be traded, and ultimately retired by an entity to offset its overall carbon footprint. Carbon credits can only be generated once per ton of CO<sub>2</sub>e, and then once retired cannot be used again.
  - **Additionality:** The principle that carbon credits can only be generated by projects that would not otherwise be economically feasible in the absence of the additional capital generated through the issuance of voluntary carbon credits.
  - **CER:** Certified Emission Reduction, or one way of labelling the credits generated by specific projects. Used by CDM, Gold Standard.
  - **VER:** Verified Emission Reduction, or another way of labelling the credits generated by specific projects. Used by VCS.
  - **ERU:** Emissions Reduction Units, another way of labelling the credits generated by specific projects. Used by JI.
  - **Carbon Offset:** The amount of GHG emissions "neutralised" through the purchase and retirement of carbon credits.
  - **Carbon Standard:** Private organizations (typically non-profits) that track carbon credit projects and verify that they meet specific reporting and methodology standards, essentially ensuring that the projects do what they say they do. Some registries are more well-respected than others. Examples include: Verified Carbon Standard (VCS), Gold Standard (GS), American Carbon Registry (ACR), Climate Action Reserve (CAR), and Architecture for REDD+ Transactions (ART).
  - **Carbon Registry:** The immutable ledger of issuances and retirements of credits maintained by an individual Standard. Typically, an individual registry will only include credits generated by projects it certifies, however there is a growing demand for a more joined-up approach to registry tracking. A meta-registry is a registry of registries, which brings together the records of a set of other registries in a single ledger.
  - **Carbon Tax:** An indirect tax – rather than direct tax – on the use of fossil fuels in industrial production or transportation, which is intended to encourage a reduction in the emission of GHGs.
  - **Carbon Leakage:** The process by which tougher environmental restrictions within a certain country or geographical region encourages the relocation of carbon intensive processes to areas where environmental restrictions are looser. Carbon Leakage means that the net impact of a particular climate policy or action could be neutral, or lead to an increase, with regards to emissions.
  - **CBAM:** The Carbon Border Adjustment Mechanism. The European Union's proposed legislation to address carbon leakage by requiring imported goods to be subjected to the same carbon costs as EU-based businesses. The proposed legislation is expected to move ahead with a roll-out date of 2023 and is expected to include most manufacturing and transportation industries. How the additional cost will be calculated is still a matter for some debate, but it is thought that it will likely link to the cost of carbon in the EU-ETS.
  - **Nature-Based Solution:** Any carbon credit project that uses a nature-based solution to reduce, avoid or remove GHG emissions. This includes farming, forestry & land-use projects.
  - **Platts CNC:** Platts' voluntary carbon credit assessment reflecting the most competitive nature-based carbon credits. Can include credits from projects that either reduce/avoid or remove emissions, but is typically derived by avoided deforestation projects, which tend to be the most competitive nature-based carbon credits in the market.
- Carbon Capture:** Any technology or natural solution that pulls carbon dioxide from the atmosphere or a dedicated source and stores it.

- **CCUS:** Carbon Capture Utilization and Storage. Used in conjunction with industrial production to decrease the emissions generated from a particular activity. The captured emissions can either be stored or utilized for an alternative purpose eg Mineralisation, whereby captured carbon is turned into a solid for further uses, such as construction, and stores emissions indefinitely.
- **Nature-Based Carbon Capture:** Any naturally occurring carbon sink including, but not limited to, standing forests, wetlands, peat bogs, rewilding initiatives
- **Direct Air Capture:** Any process that directly captures carbon dioxide or other GHG emissions from the atmosphere.
- **Point Capture:** Any process that captures carbon dioxide or other GHG emissions from existing industrial processes
- **Soil Sequestration:** The process of using the soil cycle to capture carbon, which is essential for farming and soil health. This is managed through limited tillage in farming and also cuts down on soil erosion.
- **Biochar:** Charcoal produced from plant matter and stored in soil as a means of removing carbon dioxide from the atmosphere.

**Carbon-Accounted Commodity:** A commodity that has been verified as having a particular carbon intensity, including the GHG impact across specified boundaries of production, combustion and other processes. These may include exploration, drilling & development, production & extraction, surface processing, transportation, refining and combustion (with a range of possible boundaries within each of these processes).

- **Full Life-Cycle:** Accounting not just for the GHG impact of the production and transportation of a commodity over the full life of the project, but also including the GHG emissions impact from the exploration and full development of the producing area, the impact from subsequent processing (eg refining, liquefaction), and the impact of combustion, where relevant. Full life-cycle carbon accounting can be difficult to achieve at high certainty because many different entities control the commodity along the supply chain, meaning that some processes are likely to be estimated rather than measured. Note that some claims are made for full life-cycle that do not include all associated processes (eg not including exploration).
- **Marginal:** Accounting for the GHG impact of producing a marginal amount of a commodity, and hence excluding exploration and (where relevant) drilling & development. Marginal accounting is easier to achieve than full life cycle since many production areas continue to produce for decades, and data on older operations can be hard to establish. It also represents the impact of any decisions to produce and commercialize 'today', and so the incentives related to this impact are directly representative of those same decisions. In contrast, full life cycle analyses penalize some production for 'sunk carbon costs' – eg a high CO<sub>2</sub>e development field may have fewer current production emissions than a lower development-intensity, newer field.

**Low Carbon Commodities:** Commodities that have been established through carbon accounting as having a lower carbon intensity than a specified baseline. This may be achieved through verified changes to reduce the climate impact across the production pathway. Such changes can include electrification, a transition to lower-carbon production processes (ie the use of hydrogen instead of natural gas), the introduction of carbon capture, maintenance of leaks along the transportation system, the use of more advanced meters to reduce flaring (where relevant), or some combination of the above measures and more. Some commodities inherently have lower carbon intensity than peers due to, for example, field geology and associated infrastructure. Hence, the baseline for comparison is the key determinant of 'low carbon'. Baselines can be established for a given specification of commodity (light, sweet crude), a given grade (WTI Midland) or by operations footprint (low carbon metals production).

**Carbon Neutral Commodities:** A carbon accounted commodity that has associated emissions offset through the retirement of carbon credits. Offsets and accounting can cover different boundaries (as above). The quality of credits employed is of particular concern, as is the independent verification of associated emissions.

**Methane:** CH<sub>4</sub>. Both a fuel in its own right and a greenhouse gas produced as a by-product of fossil fuel production and certain farming practices (particularly the growth of livestock farming). Methane is shorter lived in the atmosphere than CO<sub>2</sub> (about 10 years) but is between 28 and 36 times more potent over 100 years.

- **Low Methane Gas:** Natural gas that has been established through carbon accounting as having a lower methane intensity than a specified baseline. This may be achieved through improved technology to reduce or halt venting and flaring.
- **Biomethane:** A renewable natural gas (see above) which is produced from biogas derived from organic matter, but with the CO<sub>2</sub> removed. Can be used as an alternative to fossil fuel-derived methane. Maintains the same emissions impact from combustion as fossil fuel-derived methane.
- **Methane Performance Certificates (MPCs):** A certification that gas production from a specific area meets a threshold for methane generation, as defined by Platts using the Environmental Protection Agency's (EPA) Subpart W data, which measures the methane output from all of the gas producers in the US.
- **Methane Intensity:** Methane emissions intensity refers to the "leak rate" of gas production, or the ratio of methane emissions to natural gas produced.
- **Methane Slip:** Any methane leakage that occurs throughout gas production, either through pipeline transport, bunker transfer (in the case of LNG cargoes), or via emissions that fail to burn during the combustion process.
- **Fugitive Methane Emissions:** Similar to Methane Slip, this also includes any additional emissions associated with flaring and venting of excess gas into the atmosphere.

**Crude Oil:** Unrefined petroleum, through production, processing and consumption, accounts for the largest proportion of current GHG emissions globally. Combustion of oil results in the production of carbon dioxide, but production, processing and transportation also results in the release of methane, carbon dioxide, and other GHGs.

**Jet/Aviation:** Aviation remains one of the most difficult to decarbonise sectors, with emissions from aviation responsible for about 12% of all emissions generated by transport. Jet fuel quality is highly controlled for safety purposes and attempts to increase the bio-component or limit the amount of sulfur generated through its combustion have prompted deterioration in its performance in other respects.

- **CORSIA:** The Carbon Offsetting and Reduction Scheme for International Aviation as issued by the International Civil Aviation Organization (ICAO) is a hybrid compliance-voluntary carbon reduction scheme for international aviation. CORSIA is expected to bring about emissions reductions through the use of improved technologies, the development of biofuels, and the use of voluntary carbon credits to prevent emissions from international aviation from exceeding a 2019 baseline.
- **Sustainable Aviation Fuel (SAF):** Fuel produced from sustainable feedstocks that can be used in lieu of, or in conjunction with, traditional jet fuel, leading to a reduction in overall carbon emissions over the course of its full lifecycle. Sustainable feedstocks used in the production of SAF or “bio-jet” include waste cooking oils and non-palm waste oils from other plants, as well as solid wastes like packaging, paper, textiles and foodscrap. SAF can also be produced from other bio-sources of fuel, including waste wood, algae and other fast-growing plants.

**LNG:** Liquefied Natural Gas. Natural gas that has been cooled to minus 160 degrees Celsius in order to facilitate transportation. Once seen as the bridging fuel between oil and “green alternatives”, LNG is increasingly being re-examined as an alternative in some parts of the world, given the energy-intensive processes involved in its production, as well as the emissions associated with its production and transportation. Notably, the calculation of methane slippage is an important part of overall emissions.

**Natural Gas:** A fossil fuel that is produced either as a by-product of crude production or in its own right. While highly efficient gas turbines produce far less emissions than other forms of hydrocarbon energy use, the supply chains for natural gas can constitute a significant share of total emissions due to methane slippage and the high energy requirements of transporting the fuel.

- **Low Carbon Gas:** Natural gas that has been established through carbon accounting as having a lower carbon intensity than a specified baseline. In addition to the broader definitions of low carbon commodities, for natural gas this may include alternative, renewable sources.
- **Producer Certified Gas:** Natural gas certified by a third party, previously referred to as responsibly sourced natural gas (RSG), required to meet, amongst other things, specific carbon and methane intensity thresholds throughout the production process. At the moment, methane intensity is the sole factor in the Platts definition of PCG. The PCG standard will be reviewed

regularly, broadening its definition with the addition of other environmental, social and governance (ESG) components as the market evolves. Elements that are currently required to meet specifications of PCG are:

- Methane intensity of production is less than 0.10% as calculated by an independent third party
  - Production volumes monitored and verified by an independent third party
  - Emissions continuously monitored during production by an independent third party
- **Renewable Natural Gas:** Natural gas that is produced from renewable resources, such as decomposing plant matter, food and human waste, or any other natural resource. Raw biogas typically requires further processing to allow it to be fully interchangeable with conventional natural gas so that it can be ‘dropped in’ to existing gas networks. While it is renewable in terms of its production pathway, it still emits GHGs when combusted, which makes it controversial, particularly when its production displaces existing ecosystems.
  - **Biogas/Biomass:** Biogas is gas that is produced from the breakdown of organic matter in the absence of oxygen. This primarily consists of methane and carbon-dioxide. Biomass is the name for the organic matter used to produce biogas.
  - **Waste Gas:** Gas captured as a by-product of industrial or agricultural processes and then further processed for use alongside conventional fuel.
  - **Landfill Gas:** Gas captured direct from landfills and then further processed for use alongside conventional gas.

**Metals:** A GHG-intensive industry both throughout the mining and production process that is particularly susceptible to carbon leakage (see above), making it difficult to decarbonise.

- **Low Carbon Aluminum:** Aluminum that has been established through carbon accounting as having a lower carbon intensity than a specified baseline. This may be achieved through aluminum using renewable energy or hydrogen in the production process, instead of traditional fossil fuels.
- **Low Emissions Steel:** Steel that has been established through carbon accounting as having a lower carbon intensity than a specified baseline. This may be achieved through using renewable energy or hydrogen in the production process, instead of traditional fossil fuels. It can also involve the use of recycled scrap in production.

**Methanol:** CH<sub>3</sub>OH Methyl Alcohol (commonly referred to as MEOH), which is used in a variety of different products, but particularly in the production of industrial resins via formaldehyde and plastics (polymers) via the methanol-to-olefins (MTO) process. It can also be used as a liquid fuel for transportation and produces significantly less emissions than conventional fuels. Methanol may be blended directly into gasoline or via di-methyl ether (DME) and may be used as a bunker fuel for ships.

- **Bio-methanol:** methanol produced from synthetic gas (syngas) from plants and organic waste.

**Hydrogen:** H<sub>2</sub>. The most abundant element on earth, hydrogen is a completely clean-burning fuel that is being explored as one of the cornerstones of the energy transition. Historically its main industrial use has been in refining, where it is a key input in secondary processes. Due to its high volatility and combustibility, it is not naturally occurring in its pure form. As a fuel, it is an energy carrier rather than an energy source, meaning that energy is required to produce pure hydrogen for subsequent energy use.

## Production Paths

- **Steam Methane Reforming:** Most hydrogen today is produced through breaking down hydrocarbons (Steam Methane Reforming), which releases carbon dioxide, a production process industry refers to as 'grey' hydrogen without CCS or 'blue' hydrogen with CCS
- Other production pathways use electricity to split water molecules, producing no direct emissions.
- **Gasification:** Coal and biomass are oxidized with oxygen, steam and heat, producing carbon dioxide, carbon monoxide, water and hydrogen. These gases can be further reformed to produce more hydrogen, typically referred to as 'brown' hydrogen when produced from lignite coal.
- **Electrolysis:** The process by which Hydrogen is generated by using an electric current to breakdown water. Referred to as 'green' hydrogen when powered by renewable electricity and 'purple' hydrogen when powered by nuclear, electrolysis is widely recognised as the lowest carbon way to produce hydrogen. Two technologies are generally in use: Alkaline and Polymer electrolyte membrane (PEM)

- **Pyrolysis:** Referred as 'turquoise' hydrogen, applies high heat in the absence of oxygen to break apart gas molecules, with solid carbon as a by-product.

**Ammonia:** NH<sub>3</sub>. Currently the vast majority of ammonia is used for fertilizer and is a key part of agricultural supply chains. However, it can be used for combustion, and produces no greenhouse gases when burnt. It is viewed as a possible part of hydrogen supply chains since it is easier to transport than liquid hydrogen and can benefit from existing infrastructure.

**Renewable Energy:** Energy derived from a source that isn't depleted when used. This can include hydro, wind, solar and thermal power generation, as well as the use of biofuels, which can be regenerated once used.

- **RECs:** Renewable Energy Certificates or "Green Tags". A US-based trading scheme that acts as proof that 1 MWh of electricity was generated from a renewable resource. RECs can either be compliance-based, ensuring a proportion of the electricity reaching a grid is renewable (ie California) or they can be voluntary, as a means for customers to subsidise the delivery of renewable energy to the electrical grid.
- **Guarantees of Origin (GoOs):** A tradeable instrument that provides evidence of renewable origin for a MWh of electricity. This is the European answer to RECs and is primarily done on a voluntary basis.
- **RINs:** Renewable Identification Numbers. US-compliance market to ensure that a certain volume of renewable fuel is being blended into the gasoline and diesel pools. They can be bought and sold until they are retired to meet an obligated party's renewable volume obligation.

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