

CarbonSim Glossary

(October 20, 2017)

| Term | Meaning |
|---|---|
| Abatement [left frame] | Reduction in emissions through the use of low-carbon technologies, fuel switching, and/or practices e.g. use of carbon capture and sequestration, energy efficiency upgrades, fuel switching from coal to renewable energy. Information regarding a Player 's Abatements can be accessed from the Left Frame . |
| Abatement Screen [left frame] | A screen that provides the Player with information about and the ability to implement Abatements. Information regarding a Player 's Abatements can be accessed from the Left Frame . |
| Abatement Undertaken | Abatement opportunities that have been implemented. |
| Administrator | In the simulation, the Administrator is a proxy for the government entity that is charged with establishing the rules for and operating the ETS. |
| Allocation | The quantity of Allowances that are allocated by the Administrator to each Player . Allocation are provided to players prior to the commencement of the exercise for all years of the exercise. The method of allocation cannot be adjusted. |
| Allowance | A government-issued instrument that provides Companies with the ability to emit one tonne of CO2e per the terms of the ETS. As a condition of compliance at the end of each Year Companies must surrender Allowances equivalent to emissions released by their Units . If allowed by the Administrator, unused Allowances may be sold or Banked . |
| Allowance Auction [left frame] | The auction used in this simulation is a single-round, sealed-bid (<i>bid information is not shared with other players</i>), uniform price (<i>all winning bids pay the same price</i>) Auction. Allowances offered for Auction are included in (not in addition to) the Cap . There may be multiple Auctions each Year and multiple Vintages offered for sale in each Auction. The Allowance Auction can be accessed from the Left Frame . |
| Allowance Auction Time | The time remaining during which trades can occur through the Allowance Auction . |
| Annual Emission Reductions [left frame] | Emission reductions that are delivered as the result of fully implemented Abatements. This information can be found on the Available Emission Reduction Opportunities table which can be accessed via Abatement on the Left Frame . |
| Annual Net Revenue/Cost [left frame] | The annual cost (profit) that is incurred (produced) through the use of an Abatement . This information can be found on the Available Emission Reduction Opportunities table which can be accessed via Abatement on the Left Frame . |
| Artificial Intelligence (AI) | Artificial Intelligence is a means by which non-human players – aka, AI Players -- can make decisions and perform tasks that normally require human intelligence. |

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| Artificial Intelligence (AI) Player [left frame] | In the context of CarbonSim , an Artificial Intelligence (AI) Player is a non- Human Player that uses AI to decide when and how to install Abatements and participate in the Allowance Auction and Exchange market in order to resolve its long/short position and comply in the most cost-effective fashion. Typically, in any given CarbonSim, AI Players make up the majority of the Players. They are included in order to make the simulation more realistic. |
| Auction Bid [left frame] | A means by which a Player submits a Bid into the Allowance Auction . To submit a Bid the Player must specific the Bid Volume, Vintage, and Unit Bid Price. This information can be found on the Auctions Screen which can be accessed via Abatement on the Left Frame . |
| Auction Price Ceiling and Floor | Administrator defined prices at which auctioned (but not Secondary Market) Allowances cannot be sold above (Ceiling Price) or below (Floor Price). The existence of both is often called a " Price Collar ". |
| Auction Screen [left frame] | Allows Player to see My Auction History and the ETS-wide Allowance Auction results. Players can also submit Auction Bids into the Auction. This information can be found on the Auctions Screen which can be accessed via Abatement on the Left Frame . |
| Available Capital [dashboard] | A dynamic number, Available Capital represents the monies available to a Player . Such capital is derived from the operation of a Unit and can be used to implement Abatements and/or participate in the Primary and Secondary Markets. |
| Available Emission Reduction Opportunities [left frame] | Abatement opportunities available to a Player in order to reduce emissions onsite, typically via the use of efficiency upgrades, fuel changes, control options, and unit/facility shutdowns. Of utmost importance to a Player's decision to implement an Abatement are the following factors: (a) Implementation Time (shorter is better); (b) Cost (expressed in currency/tCO2e) (lower the better). |
| Bank or Banking | The means by which Players can save unused Allowances . If allowed by the Administrator , Banked Allowances can be used for subsequent year compliance, sold, or purchased. |
| Banked Allowances | Unused Allowances that are allocated to or acquired by a Player which at the end of a Year are carried over for later use or sale in a subsequent Year . |
| Banking Limit | An Administrator defined rule that defines the quantity of Allowances that may be carried over from one Year to the next for later use or sale. |
| Best Bid [top bar] | At any given moment, the Order that features the highest (most aggressive) Bid price. The Best Bid is expressed in the player's selected currency (e.g., \$, ¥, €, ₩, etc.) per Allowance or tonne of Offsets . |
| Best Offer [top bar] | At any given moment, the Order that features the lowest (most aggressive) Offer price. The Best Offer is expressed in \$ (or the player's selected currency) per Allowance or tonne of Offsets . |
| Bid (or Bid to Buy) | A means by which a Player expresses a willingness to purchase Allowances or Offsets . A Bid includes conditions regarding quantity, price, and terms, all of which must be satisfied in order to Fill the Order . |

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| Briefcase [top bar] | Clicking on the briefcase reveals to the Player the amount of Capital and Compliance Instruments . |
| Cancel an Order | A process whereby a Player voids (or cancels) a yet-to-be Filled Order . |
| Candlestick Graph | Found on the Dashboard and Exchange Market , a chart that visually describes price and volume movements of Compliance Instruments . Price movements that are yellow (or green) indicate that the market has risen from the prior trade. Those that are red indicate that the price has fallen from the prior trade. |
| Cap or Emissions Cap or Allowance Cap | The maximum quantity of Allowances that are allowed to be used. An ETS features a system-wide Cap (the sum of all Allowances in the ETS), annual Caps (the sum of Allowances that can be emitted in any given year), and Company or Unit -specific Caps (the sum total of Allowances held by each Company or Unit). |
| Capital or Existing Capital | The money available to each Company . Capital can be used to invest in Abatement options, secure Compliance Instruments , and operate. The Existing Capital may be adjusted (increased/decreased) by virtue of profits (or losses) made by the Company through the operation of its Units and/or participation in the carbon market(s). |
| CarbonSim | EDF's CarbonSim is a training tool that was designed with two beneficiaries in mind – policymakers responsible for the design, administration, and management of ETSS and industrial enterprises that are subject to ETSSs. |
| Ceiling Price | An Administrator set price beyond which Compliance Instruments cannot transact. Orders with prices higher than the Ceiling Price cannot be placed. Ceiling Prices (like Floor Prices) can be set for the Primary Market but not the Secondary Market . |
| Carbon Intensity [abatement] | A measure of the average CO2e emission rate of a Company relative to the intensity of emissions as compared against revenues. |
| Clear | When an Order – Bid or Offer – is Filled . |
| Close Price Graph [dashboard] | Found on the Dashboard and Exchange Market , a chart that visually describes price movements of Compliance Instruments . |
| Company | A Company is part of an Industry or Sector and is comprised of one or more Units . Each Human Player takes the role of controlling a Unit within a Company . It is possible for a Company to span multiple ETSS if it owns units in multiple ETSSs. A Company may consist of one or more regulated Units . |
| Company Management [left frame] | Simulation screen (available from the left frame) that provides a summary of a Player 's position. It also facilitates the transfer of Capital and Compliance Instruments between Units . |
| Company Resource Management Options | Transfer capital and Compliance Instruments between Units . |
| Compliance Instruments | Allowances and Offsets that are surrendered at the end of each Year in amounts equal to reported Emissions from a Company . Compliance Instruments can also be transacted on the Primary and Secondary Markets. |

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| Compliance Obligation | When a Player surrenders a volume of Abatement derived reductions and/or Compliance Instruments in sufficient quantities to equal its reported emissions (and meets all other terms imposed upon it by the ETS) it has satisfied its Compliance Obligation. |
| Current Capital [top bar] | Monies available to the Player to either install Abatements or transact in the Primary or Secondary Market . |
| Current Orders | Orders that have yet to Clear . |
| Dashboard [left frame] | A screen that provides critical information on My Finance , My Compliance , My Long/Short Position , My Abatement Implementation Status , My Auction History , My Trade History , the Exchange Market Graph , and the Market Price . |
| Emissions or Unit Emissions | Emissions, measured in metric tonnes, that are released by a Company or Unit over a particular period of time (typically, one year). |
| Emissions Reduction Target or Target Emissions | The quantity of Emissions allowed to be emitted by a Player in an ETS system within a given Year (i.e. the annual Company - or Unit -specific Cap). Penalties are imposed on Companies that fail to surrender sufficient Compliance Instruments in a quantity equal to actual Emissions. |
| Emissions Trading System or ETS | Emissions Trading System. ETSS are government created programs instituted for the purpose of constraining carbon emissions in a geographical area. ETS rules are defined by the Administrator . |
| Exchange Market [left frame] | A method of trading Compliance Instruments through which Players (Human and A-I) can Post Bids , Post Offers , and Trade Compliance Instruments privately through an Exchange. Unlike the OTC Market , Orders are Matched against all others that are then active on the Exchange. Exchange Markets run continuously and per Administrator defined rules. The Exchange Market can be accessed from the Left Frame . |
| Exchange Market Graph [dashboard] | A visual display that provides information on Compliance Instrument Trades that are cleared in the Exchange Market . |
| Exchange Market Orders | Orders that relate to the Exchange Market . |
| Execution | The process by which Orders are Filled , Compliance Instruments and monies are delivered. |
| Fill-or-Kill Orders | An Order to buy or sell a specified number of Compliance Instruments that is routed to the Secondary Market for immediate Execution . If the order cannot be immediately Filled, it is Cancelled (killed) automatically. |
| Fill the Order | A process whereby an Order is completed. A Bid (Offer) is filled when it is matched with an Offer (Bid) with like price, quantity, and terms. |
| Floor Price | An Administrator set price below which Compliance Instruments cannot transact. Orders with prices lower than the Floor Price cannot be placed. Floor Prices (like Ceiling Prices) can be set for the Primary Market (Auctions) but not the Secondary Market . |
| Forecast Compliance Obligation | The capped quantity of CO2e that is emitted by a Company that is subject to the ETS . The Unit is required to have sufficient Compliance Instruments and/or abatement derived reductions to meet their Forecast Compliance Obligation at the end of each Year . |

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| Forecast Long/Short Position [dashboard] | The expected end of Year position relative to available (and useable) Compliance Instruments and a Player's Compliance Obligation . At any given time a Player may have a Forecast Long (Short) Position if the Player is expected to have more (less) than sufficient Compliance Instruments on hand relative to the Player's expected Compliance Obligation. |
| Forecast Return on Investment (ROI) [abatement] | In the context of CarbonSim , measures the financial gain or loss generated through the implementation of an Abatement investment relative to the amount of money invested. ROI is usually expressed as a percentage and is typically used for personal financial decisions, to compare a company's profitability or to compare the efficiency of different investments. |
| Free Allowances | An Administrator -defined quantity of Allowances that are provided to Players . |
| Free Allowance Allocation % This Year | The percent of total Allowances that are Allocated (distributed) for free to Companies at the start of the Year . |
| Historical Average Carbon Price Chart [left frame] | A display that provides graphical and numerical information regarding Compliance Instrument market information and transactions (e.g., volumes traded, prices transacted, number of trades) that have cleared through the Exchange (trades cleared through the Auction are not included). The chart can be accessed on the Exchange Market via the Left Frame . |
| Human Player | In the context of CarbonSim , a Human Player is an individual that is granted access to CarbonSim by the Administrator. The individual develops and implements a strategy that in order to decide when and how to install Abatements and participate in the Allowance Auction and Exchange market in order to resolve its Long (Short) Position and comply in the most cost-effective fashion. |
| Implementation Time [left frame] | The period in years before an Abatement becomes effective from the time it is first implemented. This information can be found on the Available Emission Reduction Opportunities table which can be accessed via Abatement on the Left Frame . |
| Industry or Sector | Each simulation scenario includes one or more industries or sectors. Any given scenario could include up to 39 sectors. |
| Last Trade | The price of the most recent trade, typically in the Exchange Market , expressed in \$ (or other currency)/ tCO2e for the particular Compliance Instrument . |
| Left Frame | Left side of Player 's screen which provides access to the Dashboard , Company Management , Unit , Abatement , Allowance Auction , Exchange Market , OTC Market , System Info , and Surrender and Banking . |
| Limit Order <ul style="list-style-type: none"> • Buy Limit Order • Sell Limit Order [exchange market] | A Buy Limit Order is an order to purchase Compliance Instruments in the Exchange Market at or <i>below</i> a specified price. A Sell Limit Order is an order to purchase Compliance Instruments at or <i>above</i> a specified price. While a Limit Order guarantees the price at which the Order can be filled it does not guarantee that it will be filled. Players use Limit Orders when they want an Order to be Filled at a price that is better than the Market Price (higher for Offers [Sell Orders], lower for Bids [Buy Orders]). |

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| Long | A Player is Long if, at any given time, it has a quantity of Compliance Instruments that is more than sufficient to meet its Compliance Obligation for the particular Year . |
| Lot Size | A minimum quantity of Compliance Instruments that can be submitted in an Order, traded, and/or Surrendered or Banked for compliance. In CarbonSim the minimum lot size is one tonne. |
| Marginal Abatement Cost Curve or MACC | A MACC shows the Abatements that can be used by a Unit , the volume of emission reductions that can be achieved, and the cost to reduce 1 mte CO2e through the use of each Abatement. Typically, when looking at a MACC, Abatements that are characterized by a lower per unit cost and are on the left side of the curve and those with higher costs are on the right. The MACC does NOT show the total cost of each Abatement (which is a function of capital and operation and maintenance costs of the Abatement). |
| Marginal Cost of Compliance | A dynamic number calculated by dividing by the total monies expended on abatements and Compliance Instruments by the Player's Compliance Obligation . |
| Market or Carbon Market | The Market through which Compliance Instruments are transacted. The Market consists of Allowance Auctions (the Primary Market) and transactions by and between Players through the Exchange Market and the OTC Market (the Secondary Market). |
| Market Order | An order to buy or sell a specific number of Compliance Instruments at the best price (Market Price) available at the time the Order is submitted to the Exchange Market . If a Market Order is submitted into a market where there is matching volume then there is a very high likelihood that the Order will get Filled at the then current Market Price. |
| Market Price | The price of Compliance Instruments on the Secondary Market . The Market Price is dynamic. |
| Match or Matched | When the price and terms of a Bid (Offer) met those of an active Offer (Bid). |
| Messaging [top bar] | Human players can send free text chat messages to players they are engaged in OTC selling with during the sale process. |
| My Abatement Implementation Status [left frame] | Accessible via Abatement on the Left Frame , provides the status of Abatements that have been implemented. Status can be building, operating, or profitable (in profit). |
| My Auction History | My Auction History summarizes a Player's Auction Orders. This information can be found on the Auctions Screen which can be accessed via the Dashboard or Allowance Auction on the Left Frame . |
| My Compliance [dashboard] | My Compliance, accessible through the Dashboard , shows a Player's Marginal Cost of Compliance as compared against the most recent, or Last Trade . |
| My Finance [dashboard] | My Finance, accessible through the Dashboard , shows a Player's Available Capital , Forecast Net Profit, Interest Rate and Payments made, and Net Operating Profit. |

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| My Long or Short Position [dashboard] | My Long or Short Position reflects the Allowance shortfall or surplus as compared to the Player's Compliance Obligation . In any given Year , a Player is Short if its emissions exceed available (and useable) Compliance Instruments . A Player is Long if its available (and useable) Compliance Instruments exceed its emissions. |
| My Trade History [dashboard] | My Trade History, accessible through the Dashboard , shows the disposition of Player's Auction , Exchange , and OTC orders. |
| N.O.P. vs Abatement | Normal Operating Profit versus Normal Operating Profit including revenue (or loss) from Abatement Projects have been implemented. |
| Non-Compliance Penalty | The monetary Penalty that is applied to Players who fail to satisfy their Compliance Obligation . Typically, the Penalty can come in two parts – a financial and an Allowance debit. The size of the penalty correlates with the size of the exceedance. |
| Offer (or Offer to Sell) | A means by which a Player that is Long (has a surplus) expresses a willingness to sell Compliance Instruments . An Offer includes conditions regarding quantity, price, and terms, all of which must be satisfied in order to Fill the Order . |
| Offset Limit | A percentage of a Unit's Compliance Obligation that can be met with Offsets . The balance of the Compliance Obligation must be met with reductions that are derived from Abatements Undertaken and/or Allowances . |
| Offsets | Like an Allowance , an Offset is a Compliance Instruments , issued in mte per year, that can be surrendered by a Company to satisfy its Compliance Obligation (aka, Emission Reduction Target). Unlike Allowances, Offsets generally result from Abatements Undertaken at emission sources that are not included in the Cap . In this simulation Offsets are generally less expensive than Allowances, can be banked at the end of each Year (subject to limitations set by the Administrator), and are subject to restrictions which limit both how many and where Offsets can be used. |
| Offsets-on-Hand | A quantity of Offsets that a Player has and which can be used for their Compliance Obligation. |
| Offsets From This System | Offsets sourced from the system this unit is participating. |
| Offsets From Other Systems | Offsets sourced from another system that this unit is not participating in. |
| Over the Counter - or OTC – Market [left frame] | Over the Counter. A mechanism through which human Players can Post Bids , Post Offers , and trade Allowances and Offsets privately with one another. The OTC Market and Exchange Markets are comprise the Secondary Market. |
| Order | The means by which Players express their interest in transacting Allowances or Offsets. Orders may be placed in the Primary Market (i.e., through the Auction), the Secondary Market (i.e., through the Exchange Market or OTC Market). See also Fill-or-Kill Order, Limit Order, Stop Loss Order). |
| Overall Long or Short Position | This is your long or short position at the end of the year. If I have too many allowances or offsets then my compliance position is considered 'Long'. If I have too few, my position is considered short. |

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| Partial Fill | Most exchanges support partial fills, that is your order will be partially executed and modified. |
| Penalty | A sum of money that is assessed against Players that fail to surrender sufficient Allowances/Offsets and or violate other simulation rules (e.g., those regarding collusion). A Penalty can be issued on a marginal (\$/tCO2e) or on a lump-sum basis. |
| Place (Post) Bid | The process by which a Bid is submitted into either the Auction or the Exchange Market . |
| Place (Post) Offer | The process by which an Offer is submitted into either the Exchange or OTC markets. |
| Place (Post) Order | The process by which a Bid or Offer is submitted into either the Auction or the Exchange Market . |
| Player | A Player is a participant in the Simulation that must manage the activities of one or more Units . Players may be Human or Artificial Intelligence (A-I) . Human Players are people who elect to participate in the Simulation. A-I Players are bots that are programmed to act as if they are rational Players. |
| Position Summary [Company Management Unit Management] | A statement that describes of a Player's overall financial and compliance condition. Position Summaries can be accessed through the Left Frame by clicking on Company Management and Unit Management . |
| Price Collar | In the context of CarbonSim, and Administrator set restrictions designed to ensure that Auction Bids are submitted within a price band that is defined by the Floor Price and the Ceiling Price . |
| Primary Market | The Primary Market consists of the Allowance Auctions which are run by the Administrator. |
| Project Lifetime | The expect duration that a particular Abatement will be in place. After the Project Lifetime, the Abatement will cease as will its draw on Capital and ability to produce emission reductions. This information can be found on the Available Emission Reduction Opportunities table which can be accessed via Abatement on the Left Frame . |
| Resolve Long/Short Position | Selling sufficient Compliance Instruments such that a Player's Position is in balance (i.e., neither Long nor Short) or at a level that is consistent with Player's position given forthcoming compliance obligations, Abatements , growth plans, etc. |
| Secondary Market | The Secondary Market consists of the OTC Market and Exchange Market. |
| Sector | The industry type (such as mining, agriculture, manufacturing) that produces carbon emissions within a particular ETS. Each Unit belongs to a particular Sector. |
| Sector Growth Rate | The year-on-year economic and emissions growth rate for any given Sector within an ETS. |
| Short | A player is short when the player will end the year with more emissions than eligible compliance instruments. |
| Simulation Abatement Average | The average abatement for units in the current trading system. |

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| Simulation Abatement Total | The overall abatement for all units in the current trading system. |
| Simulation Configuration [top bar] | Accessed through the Top Bar, the Simulation Configuration summarizes key elements of the simulation including the Total Offsets Available, Total Offsets by Trading System, Allowances to be Auctioned this Year, Banking Limit, Systemwide Emission Reduction, My Free Allowances, Penalty Price, Price Collar, Number in Simulation, Emission Variation Range, and Offset Limit. |
| Simulation Dashboard | The first screen that a Player sees that includes all information regarding abatements undertaken, auctions, best bids, best offers, last trades, and other useful information. |
| Sectors % Contribution to Total Emissions | The percent of total emissions that a Sector contributes to the total emissions of and ETS. |
| Send Offer to Sell | The process by which a Player sends an offer to another player via the OTC market. Under the current version of CarbonSim, Bids cannot be sent to other Players. |
| Simulation or Game | An entire end-to-end run through of Carbon Simulation potentially spanning a defined number of years with many Players across multiple Systems. |
| Stop Loss Order [exchange market] | A Stop Loss Order is an order to sell a quantity of Compliance Instruments at a price that is below the current Market Price that is current at the time that the Order is Placed . A Stop Loss Order is designed to limit a Player's loss in the event that Market moves lower than the specified price. With a Stop Loss Order, Execution is NOT guaranteed, especially when the Market moves sharply lower. |
| Surrender and Banking [left frame] | A screen that allows the Player to at the end of the Year , in the case of Compliance Obligations , surrender to the Administrator Compliance Instruments in sufficient quantities to Resolve Player's Long/Short position . In the case of a Long Position , a Player may choose Bank Compliance Instruments in order to carry them forward for use in subsequent Years. If set by the Administrator, the Surrender and Banking can be within the control of the Player or done automatically. |
| System Info [left frame] | A screen that allows for the comparison of the performance of the Player and the enter system. |
| Temporarily Shutdown [abatement screen] | Players can Temporarily Shut Down a Unit in order to reduce a Company's overall Compliance Obligation. Once a temporarily shutdown has been activated, it cannot be undone and will last for one year. |
| Target Emissions | The quantity of Emissions allowed to be emitted by a Human-player in an ETS system. Penalties will be imposed on Players that fail to surrender sufficient compliant Allowances/Offsets in a quantity equal to actual emissions. |
| Target Emissions Reduction | Percent reduction in GHG emissions across the economy that ETS is aiming to achieve. |
| tCO2e | Tonnes of carbon dioxide equivalent. The standard metric for carbon dioxide in climate policy. |
| Tonnes Abated | Tonnes of carbon dioxide equivalent reduced through the implementation of abatement projects. |

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| Top Bar | The portion of the Player 's screen that provides critical information including, Company name, time remaining in the year, Auction number, Current Capital , Forecast Long/Short Position , Overall Marginal Cost of Compliance , Best Offer , Last Trade , Best Bid , Briefcase , Messaging , etc. |
| Trade | When a type and quantity of Compliance Instruments are bought and sold by and between Players. |
| Unit | Units are the operations that release Emissions. A Company may have multiple Units. |
| Unit Information [left frame] | Simulation screen (available from the left frame) that provides a summary of a Unit's Position . |
| Upfront Capital Cost [left frame] | The Capital Cost that is required to implement an Abatement . This information can be found on the Available Emission Reduction Opportunities table which can be accessed via Abatement on the Left Frame . |
| Vintage | Allowances are issued with dates, aka Vintages. The Vintage designates the year during and after which it can be used to meet Compliance Obligations. For example, subject to the rules of the ETS, Year 2 Allowances can be used for compliance in Year 2 or any year thereafter (e.g., Years 3, 4...10). However, Year 2 allowances may not be used to satisfy Year 1 Compliance Obligations. |
| Volume | The quantity of Compliance Instruments . As in Bid , Offer , or Trade Volume. |
| Year | As defined by the Administrator, the Simulation is run over one or more virtual Years. |