

METHODOLOGY DOCUMENTATION

CORSIA Market Clearing Price Model

SQL-based supply/demand equilibrium model incorporating A6 Export Score adjustments

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Overview

The CORSIA Market Clearing Price Model estimates the price at which CORSIA offsetting demand would be met by available supply in a given compliance phase. It operates in two integrated stages: first, it calculates a country-level A6 Export Score reflecting the likelihood that a country will successfully export carbon credits under Article 6; second, it uses that score to risk-adjust supply volumes before identifying the minimum market price at which total price-sensitive demand falls within total adjusted supply. A fallback price of \$400 per tonne is applied when no equilibrium is found within the modelled price range.

Data Inputs

Field / Parameter	Description	Source / Notes
NDC Export Ceiling	The maximum volume of credits a country is permitted to export under its Nationally Determined Contribution. Used to set the upper bound of available export capacity and to derive NDC Headroom.	AlliedOffsets NDC budget data
Authorized Credit Volume (Registry)	Total volume of issued credits carrying an Article 6 authorization flag — covering authorization for compliance purposes, other authorized purposes, or CORSIA specifically. Represents the portion of a country's export ceiling already committed.	AlliedOffsets registry and compliance detail records
Article 6.2 Pilot Project Authorizations	Authorized credit volumes from Article 6.2 pilot projects, tracked separately from main registry records. Combined with registry-authorized volumes to give total authorized credits per country.	AlliedOffsets Article 6.2 pilot project data
Political Risk Score	Country-level political risk index. A higher score indicates lower political risk, reflecting more stable and favorable conditions for Article 6 credit export.	AlliedOffsets country policy details
A6 Progress Score	Composite score measuring how far a country has progressed in establishing Article 6 bilateral agreements and authorization infrastructure. Scored on a scale with a maximum value of 15.	AlliedOffsets A6 Progress Monitor
Policy Favorability Score	Monthly index reflecting how favorable a country's domestic policy environment is for carbon credit exports. Retrieved for the most recent completed month.	AlliedOffsets country policy scores (monthly)
Issued Credit Volume	Historical issued credit volumes per project, including CORSIA eligibility classification and the share of credits tagged as eligible for CORSIA offsetting.	AlliedOffsets supply projections and project registry data

Field / Parameter	Description	Source / Notes
Projected Issuance	Forward-looking issuance estimates per project, used to model future supply contributions. Applied alongside historical issued volumes to form the total supply base.	AlliedOffsets supply projections data
CORSIA Demand at Price	Price-sensitive demand curve representing the volume of CORSIA offsetting obligations that airlines would meet at each modelled price point, disaggregated by administering state and compliance phase.	AlliedOffsets CORSIA demand model
Phase (user parameter)	Specifies the CORSIA compliance phase to model — for example, Pilot Phase, First Phase, or Second Phase. Filters both supply and demand to the relevant phase.	User-supplied at query execution
Administering State Exclusion (user parameter)	Allows one or more administering states to be excluded from the demand calculation. Useful for scenario analysis or when specific states are out of scope.	User-supplied at query execution

Logical Flow

1

Retrieve country policy and budget data

For each country, the most recent monthly policy favorability score is retrieved, along with the NDC export ceiling — the maximum volume of credits the country is permitted to export under its Nationally Determined Contribution. Only countries with a non-negative export ceiling are included in the model.

2

Aggregate authorized credit volumes

Two sources of Article 6 authorized credits are combined per country: credits issued through the main registry that carry an Article 6 authorization flag (covering compliance, CORSIA, or other authorized purposes); and credits from separately tracked Article 6.2 pilot project records. Together these represent the volume of a country's export ceiling that is already committed to authorized transactions.

3

Derive NDC Headroom

For each country, NDC Headroom is calculated by subtracting total authorized credits from the export ceiling. A positive value indicates remaining capacity within the NDC to authorize further credit exports. This headroom is a key input into the A6 Export Score.

4

Normalize scoring components

Each of the five A6 Export Score components is normalized to a 0–1 scale to enable weighted combination. NDC Headroom, Political Risk, and Policy Favorability are each ranked by their relative position across all countries (percent rank). A6 Progress is converted to a ratio by dividing by 15, the maximum achievable score. Authorization Status is treated as a binary flag: 1 if any authorized credits exist, 0 if none.

5

Compute A6 Export Score

A weighted composite score is calculated for each country by combining the five normalized components: Authorization Status (30%), A6 Progress (25%), NDC Headroom (20%), Political Risk (15%), and Policy Favorability (10%). Where a country's Policy Favorability data is unavailable, the remaining four components are rescaled proportionally to fill 100% of the weight. The final score falls between 0 and 1, with higher values indicating greater export readiness.

6

Assemble risk-adjusted supply

Project-level supply is assembled from two sources: historical issued credits and forward-looking projected issuance. For projects whose credits are already confirmed CORSIA-eligible, the full eligible share of issued credits is included. For projects not yet confirmed eligible, issued credits are discounted by the country's A6 Export Score, reflecting the probability that those credits will ultimately receive authorization. All projected issuance is adjusted by the A6 Export Score regardless of eligibility status. Projects are filtered to the specified CORSIA phase, conditional NDC alignment status, non-US origin, and the relevant compliance year range.

7

Aggregate total adjusted supply

All adjusted supply volumes — issued and projected, across all eligible projects — are summed to a single total supply figure for the modelled phase and year range. This aggregated figure is used as the supply input to the clearing price calculation.

8

Filter and aggregate CORSIA demand by price

CORSIA demand is drawn from a pre-modelled price-sensitive demand curve. Records are filtered to the specified compliance phase and offsetting deadline, with any specified administering states excluded. Demand volumes are then summed by price point, producing a total price-sensitive demand figure at each modelled price level.

9

Identify market clearing price

The model identifies the lowest price point at which cumulative price-sensitive demand does not exceed total adjusted supply. This is the CORSIA Market Clearing Price — the price at which the market clears given the modelled supply and demand conditions. If no such price exists within the modelled range (demand exceeds supply at every price point), a fallback price of \$400 per tonne is returned.

Key Calculations

Authorized Credits (Country Total)

The total authorized credit volume per country is derived by summing two sources: credits carrying an Article 6 authorization flag from the main registry, and credits from Article 6.2 pilot project records. Both figures are treated as zero where no data exists, ensuring countries with no authorized activity return a total of zero rather than a null.

NDC Headroom

NDC Headroom equals a country's export ceiling minus its total authorized credits. It represents the remaining capacity within the NDC for additional Article 6 credit exports. Where authorized volumes exceed the recorded ceiling, the result will be negative, which would indicate over-authorization relative to the NDC budget.

Percent Rank Normalization

Applied to NDC Headroom, Political Risk Score, and Policy Favorability Score. Each country is ranked by its value for that component relative to all other countries, producing a score between 0 and 1. The country with the lowest value receives a score near 0; the highest receives a score near 1. For Political Risk, this ranking correctly reflects the score's directionality: higher political risk scores indicate lower risk, so countries with higher scores receive higher normalized values.

A6 Progress Normalization

The A6 Progress Score is divided by a fixed value of 15, representing the maximum achievable progress score. This produces a normalized ratio between 0 and 1. Where a country's A6 Progress Score is null, it is treated as zero.

Authorization Status Flag

A binary indicator: countries with any authorized credits — whether from registry records or pilot projects — receive a flag of 1. Countries with no authorized credits receive 0. Volume magnitude is not considered; the flag reflects only the presence or absence of authorization activity.

A6 Export Score (Weighted Composite)

The five normalized components are combined using fixed weights: Authorization Status 30%, A6 Progress 25%, NDC Headroom 20%, Political Risk 15%, and Policy Favorability 10%. Where Policy Favorability data is unavailable for a country, the four remaining components are rescaled so that their weights sum to 100%. This rescaling is achieved by dividing the four-component subtotal by 0.90, which is the combined weight of those four components. The final A6 Export Score ranges from 0 to 1.

Adjusted Supply (Per Project)

For projects with credits already confirmed as CORSIA-eligible: the eligible issued volume is the full issued credit volume multiplied by the CORSIA-eligible share. For projects whose credits are not yet confirmed eligible: the eligible issued volume is further multiplied by the project country's A6 Export Score, discounting it to reflect the likelihood of future authorization. All projected issuance is multiplied by the A6 Export Score regardless of current eligibility status. Issued and projected adjusted volumes are then summed to form each project's total contribution to supply.

CORSIA Market Clearing Price

The clearing price is the minimum price in the demand curve at which cumulative price-sensitive demand is less than or equal to total adjusted supply. The model evaluates each price point in ascending order and selects the first at which the supply constraint is satisfied. If no price point satisfies the condition — meaning demand exceeds supply at all modelled prices — the output defaults to \$400 per tonne via a hard-coded fallback.

Assumptions

- The maximum achievable A6 Progress Score is 15. This divisor is fixed and does not update dynamically if the underlying scoring rubric changes.
- A higher Political Risk Score indicates lower political risk (i.e. more favorable conditions for export). The percent rank normalization is applied in ascending order, meaning countries with higher scores correctly receive higher normalized values.
- Authorization Status is treated as a binary flag. Any authorized volume, regardless of size, produces a score of 1. Volume magnitude is not considered in this component.
- Where Policy Favorability data is unavailable for a country, the remaining four components are rescaled using a fixed factor of 1 divided by 0.90, reflecting the combined weight of those four components.
- United States projects are unconditionally excluded from the supply calculation.
- Only projects with conditional NDC alignment are included in the supply base, unless the credits are already confirmed CORSIA-eligible. Projects with non-conditional alignment are excluded.
- Credits classified under CORSIA Pilot Phase or First Phase (conditional approval) eligibility are excluded from supply across all modelled phases.
- The supply time horizon is capped at 2027 for the First Phase and 2031 for the Second Phase.

- A fallback clearing price of \$400 per tonne is returned when demand exceeds supply at all modelled price points. This value is hard-coded in the model.
- All supply components — issued and projected — are combined into a single aggregate total before comparison with the demand curve. No sequencing or priority is applied between historical issued volumes and forward-looking projections.
- The model is run for a single CORSIA compliance phase at a time. Cross-phase supply or demand interactions are not modelled.
- The Policy Favorability Score used is the value from the most recently completed calendar month, not a trailing average.

Limitations

- The \$400 per tonne fallback is a hard-coded ceiling. In scenarios where the true market clearing price would exceed \$400, the model output is indistinguishable from a genuine \$400 equilibrium — no flag or indicator is produced to signal that the ceiling has been reached.
- The A6 Progress Score divisor of 15 is fixed. If the scoring rubric is revised or new components are added to the progress assessment, the normalization will produce incorrect results unless the divisor is updated accordingly.
- The model does not account for bilateral or over-the-counter transactions conducted outside registry systems. Authorized credit volumes may therefore be understated, leading to an overestimate of NDC Headroom.
- Projected issuance carries inherent uncertainty. The A6 Export Score is applied as a discount to reflect this uncertainty, but it is a probability proxy, not a verified forward commitment.
- The model aggregates supply and demand to phase-level totals. Intra-phase timing mismatches — for example, credits becoming available late in a phase while demand is front-loaded — are not captured.
- Countries with missing Policy Favorability data have their scores rescaled using the four-component formula. If a large proportion of countries are missing this data in a given month, the relative ordering of A6 Export Scores may be distorted.
- The administering state exclusion filter is applied to the demand side only. Supply is not filtered by administering state, which may produce asymmetric scenario outputs in some configurations.
- The model does not support multi-phase or cross-phase clearing price scenarios. Each run produces a single clearing price for one specified phase.

Output

The model returns a single value: the CORSIA Market Clearing Price, expressed in US dollars per tonne of CO₂ equivalent (USD/tCO₂e). This is the lowest price point at which total price-sensitive CORSIA offsetting demand — for the specified compliance phase and administering state set — falls within or equal to total risk-adjusted supply. Where no such equilibrium is found within the modelled price range, the output is \$400 per tonne. The result should be interpreted as the modelled market clearing price under the supply and demand assumptions described in this document, not as a forecast or quoted market price.