

METHODOLOGY DOCUMENTATION

CORSIA Supply Projection Model

Eligibility-adjusted forecast of CORSIA-usable credit supply by compliance phase

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Overview

This model estimates how many carbon credits are likely to be available and usable for CORSIA compliance in a given phase, combining credits that have already been issued with credits expected to be issued in future years. Raw issuance forecasts are built project by project, then progressively discounted to reflect three real-world constraints: registries historically issue fewer credits than projects estimate, only a portion of a project's credits carry CORSIA tagging, and a credit can only be used for CORSIA once its host government applies a corresponding adjustment. The output is a single supply figure for a selected CORSIA phase, split between credits already in circulation and credits still to be issued. The same supply logic forms the supply side of the AlliedOffsets CORSIA Market Clearing Price Model.

Data Inputs

Field / Parameter	Description	Source / Notes
Project status	Whether a project is active, pending, or pending renewal. Determines which of the two forecasting methods is applied.	AlliedOffsets project data
Estimated annual emission reduction	The registry-stated volume of emission reductions a project expects to generate each year. Used as the forecast basis for projects that have not yet issued credits.	Registry project documentation
Crediting period start and end dates	The window over which a project is entitled to generate credits. Bounds the forecast horizon for each project.	Registry project documentation
Historical issuance volumes by vintage	Credits actually issued by each project for each vintage year. Used both as realised supply and as the forecast basis for projects already issuing.	Registry issuance records
Retirement and cancellation volumes	Credits withdrawn from circulation. Used to derive remaining unretired supply as a separate reference measure.	Registry transaction records
Date of issue	When credits were issued relative to their vintage year. Used to derive the typical lag between a vintage being generated and credits reaching the market.	Registry issuance records
Developer-reported issuance forecasts	Forward issuance volumes self-reported by project developers in project design documentation. Take precedence over modelled forecasts where available.	Project design documents

Field / Parameter	Description	Source / Notes
Registry	The standard under which a project is registered. Drives CORSIA eligibility rules, the historical achievement ratio, and the assumed issuance lag.	AlliedOffsets project data
Project country	The host country of the project. Links each project to its host-government policy indicators.	AlliedOffsets project data
Sector, sub-sector and methodology	Used to test each project against the registry-specific and activity-specific eligibility criteria published by ICAO.	AlliedOffsets project and methodology data
CCP approval status	Whether a project or methodology carries Core Carbon Principles approval. Used as a proxy for second-phase eligibility where full ICAO criteria are not yet published.	ICVCM
CORSIA phase tags on issued credits	The CORSIA phase labelling attached to credits that have already been issued.	Registry credit records
Article 6 authorisation flags	Whether issued credits are authorised for CORSIA, for other compliance purposes, or for other purposes generally.	Registry credit records
Corresponding adjustment status	Whether a host country has applied a corresponding adjustment to a project's credits.	Registry credit records
Letter of Authorisation status	Whether a project holds a host-country letter of authorisation under Article 6.	AlliedOffsets Article 6 tracking
NDC conditionality	Whether a project's emission reductions fall inside the conditional or unconditional portion of its host country's climate pledge.	AlliedOffsets NDC analysis
NDC crediting band	The estimated volume of reductions a country could authorise for export without compromising its own climate pledge. Serves as the country export ceiling.	AlliedOffsets Article 6 carbon budget analysis
Policy favourability score	A composite measure of how supportive a country's overall carbon market policy environment is.	AlliedOffsets country policy scoring
Political risk score	A country-level stability measure, where a higher score indicates lower risk.	AlliedOffsets country policy data
Article 6 progress score	A measure of how far a country has advanced in operationalising Article 6, scored on a fixed fifteen-point scale.	AlliedOffsets Article 6 progress monitor
Article 6.2 pilot project authorised reductions	Volumes already authorised under bilateral Article 6.2 pilot arrangements, counted against a country's export ceiling.	AlliedOffsets Article 6.2 pilot project tracking
Compliance phase selection	The CORSIA phase the user wishes to size supply for. Supplied at the point the model is run.	User-supplied parameter

Logical Flow

1 Separate projects by development stage

Projects are split into those already issuing credits and those not yet issuing. The two groups are forecast differently: projects with an issuance history are assumed to continue at their own observed rate, while projects without one can only be forecast from the volumes stated in their registry documentation.

2

Fill gaps in project-level inputs

Where a project has no stated annual emission reduction estimate, the average annual issuance for its registry is substituted. Where a crediting period is missing, it is inferred: durable removals projects are assigned a five-year crediting period in line with their registry's published documentation, and forestry projects working under REDD methodologies are assigned the average crediting period length observed across comparable projects. Projects that still have no usable emission reduction estimate after these steps are excluded.

3

Forecast issuance for projects not yet issuing

Each project's stated annual emission reduction is repeated for every year of its crediting period, producing a flat annual forecast across the full entitlement window.

4

Forecast issuance for projects already issuing

Each project's average historical annual issuance is calculated and repeated for every year from its most recent vintage through to the end of its crediting period. This anchors the forecast to demonstrated performance rather than stated intent.

5

Apply CORSIA phase eligibility rules

Every forecast project-year is tested against the eligibility criteria ICAO has published for each approved registry. The tests cover project start dates, vintage year windows, sector and methodology restrictions, project scale, and sustainable development or co-benefit certification. Activity-specific exclusions are applied, including large-scale grid-connected electricity generation above fifteen megawatts and higher-volume forestry projects in a defined list of countries with elevated deforestation-baseline risk. Each project-year is labelled with the phase it qualifies for, or left untagged if it qualifies for none.

6

Determine second-phase eligibility

Because ICAO has not published complete criteria for the second compliance phase, second-phase eligibility is inferred from the first-phase population. Registries whose criteria are unchanged carry their projects forward directly; for the remaining registries, only projects using a defined set of newer consolidated methodologies or carrying Core Carbon Principles approval are treated as second-phase eligible.

7

Substitute developer-reported forecasts

Where a project developer has published its own forward issuance estimates, those figures replace the modelled forecast for the matching vintage years. Where a developer has published estimates for some vintages but not others, the unlisted vintages are treated as zero rather than being modelled, on the basis that the developer's own schedule is the more reliable guide to which years it expects to generate credits in.

8

Adjust forecasts for historical registry performance

Forecast volumes are scaled by a registry-level achievement ratio that compares what projects under that registry actually issued against what they estimated they would issue. This corrects for the consistent tendency of stated estimates to exceed realised issuance.

9

Assign the year credits reach the market

Because credits are issued some years after the vintage they represent, each forecast vintage is shifted forward by the average issuance lag observed for its registry. Where that shifted year has already passed, the registry's longest observed lag is applied instead, reflecting that a delayed issuance is now more likely to follow a slower pattern. Forecast volumes whose expected market year still falls in the past are removed entirely.

10

Measure the CORSIA-tagged share of each project vintage

For credits already issued, the proportion of each project's vintage that carries CORSIA tagging is calculated, alongside the proportion authorised under Article 6 and the proportion already carrying a corresponding adjustment. These proportions are used to scale supply down to the genuinely CORSIA-relevant portion rather than assuming a project's entire output is usable.

11

Score each host country's likelihood of authorising exports

A country-level score is built to represent how likely a host government is to authorise credits and apply a corresponding adjustment. It combines whether the country has already authorised any credits, how far it has progressed on Article 6 implementation, how much headroom it has left against its own climate pledge, its political stability, and its broader policy environment.

12

Filter to the relevant supply pool

The supply pool is narrowed to the selected compliance phase and to credits that could plausibly be exported. Projects under conditional approval and those tagged only to the pilot phase are excluded, as are all projects hosted in the United States. Only projects whose reductions fall within the conditional portion of their host country's pledge are retained, unless they already hold confirmed CORSIA eligibility. The forecast horizon is capped at 2027, extending to 2035 for second-phase supply.

13

Apply corresponding-adjustment likelihood and aggregate

Credits that already hold confirmed CORSIA eligibility and have been issued are counted at their CORSIA-tagged volume without further adjustment, because the authorisation step is already complete. Credits that meet the technical criteria but have not yet been authorised, and all forecast future issuance, are scaled by the host country's export score to reflect the probability that the corresponding adjustment will be granted. The results are summed into a single supply figure split between issued and projected volumes.

Key Calculations

Issuance forecast for projects not yet issuing

The project's stated annual emission reduction is applied unchanged to each year of its crediting period. No ramp-up, seasonality or decline curve is modelled, so the resulting profile is flat across the entitlement window.

Issuance forecast for projects already issuing

All historical issuance transactions for the project are averaged to a single annual figure, which is then repeated for each year from the project's most recent vintage to the end of its crediting period. Projects with a single historical issuance therefore carry that issuance forward as their assumed annual rate.

Registry achievement ratio

For each registry, actual issuance is compared against stated annual emission reduction estimates across the 2018 to 2020 period, for projects whose crediting period fully spans that window and whose stated estimate exceeds one hundred credits per year. The resulting average ratio is applied as a multiplier to all forecast volumes for that registry. Where a registry has no usable history, no adjustment is applied and forecasts pass through unchanged.

Issuance lag and expected market year

For each registry, the average number of years between a credit's vintage and its issuance date is calculated, along with the longest such gap observed. A forecast vintage is shifted forward by the average lag to determine when the credits are expected to reach the market. If that year has already passed, the registry's longest observed lag is applied instead. Where a registry has no observable lag history, a two-year average and a ten-year maximum are assumed.

Remaining unretired supply

For credits already issued, retirements and cancellations are subtracted from issuance to give the volume still in circulation. Where withdrawals exceed issuance for a given vintage, the result is set to zero rather than allowed to go negative. This measure is reported alongside the supply figures but is not the basis of the CORSIA supply total, which uses gross issuance.

CORSIA-tagged share of a project vintage

Within each project vintage, the volume of credits carrying CORSIA tagging is divided by the total volume issued for that vintage, producing a proportion between zero and one. Equivalent proportions are calculated for credits authorised under Article 6 and for credits already carrying a corresponding adjustment. Only issued credits in good standing are counted in either the numerator or the denominator.

Article 6 Export Score

A country-level score between zero and one, built from five weighted components. Whether a country has already authorised any credits carries thirty per cent and is treated as a simple yes or no. Article 6 implementation progress carries twenty-five per cent and is expressed as a proportion of a fixed fifteen-point scale. Remaining headroom against the country's climate pledge carries twenty per cent, political stability carries fifteen per cent, and broader policy favourability carries ten per cent; each of these three is converted to a relative ranking against all other countries rather than used at its raw value. Where a country has no policy favourability score, the remaining four components are rescaled proportionally so they still sum to a full score, which is equivalent to dividing the partial score by nine tenths.

NDC headroom

A country's export ceiling less the volume of credits it has already authorised, counting both credits authorised through registries and volumes committed under bilateral Article 6.2 pilot arrangements. Countries whose ceiling calculation returns a negative value are excluded from the headroom component.

Corresponding-adjustment adjustment

The Article 6 Export Score is applied as a multiplier representing the probability that a host government will apply the corresponding adjustment a credit needs in order to be used for CORSIA. Credits that have already been issued and already carry confirmed CORSIA eligibility have cleared this step, so they are counted at full CORSIA-tagged volume. Credits that are issued and meet the technical criteria but remain unauthorised are multiplied by the score, as is all forecast future issuance regardless of the eligibility status currently recorded against the project, since no future credit has yet been authorised.

Final supply aggregation

Adjusted issued volumes and adjusted projected volumes are summed separately across all qualifying project vintages within the selected phase and horizon, then combined into a total. Missing values on either side are treated as zero before summing.

Assumptions

- Projects that have not yet issued credits are assumed to generate their stated annual emission reduction in full, in every year of their crediting period, with no ramp-up or decline profile.
- Projects already issuing are assumed to continue issuing at their own historical average annual rate for the remainder of their crediting period.
- Developer-reported forecasts are treated as more reliable than modelled forecasts. Where a developer has published a forward schedule, vintages absent from that schedule are assumed to generate nothing rather than being modelled independently.
- Registry-level historical performance is assumed to be a fair guide to future performance. The achievement ratio is calibrated on the 2018 to 2020 period only and is not updated for more recent issuance behaviour.
- Where a registry has no observable issuance history, credits are assumed to be issued two years after their vintage on average, with a maximum lag of ten years.
- Durable removals projects without a stated crediting period are assumed to hold a five-year crediting period, consistent with their registry's published documentation. Forestry projects under REDD methodologies without a stated crediting period are assigned the average length observed across comparable projects.
- Where a project has no stated annual emission reduction, the average annual issuance for its registry is substituted.
- A higher political risk score denotes lower risk. The score directionality is inherited from the source data and is not independently verified within the model.
- Where a country has no policy favourability score, its Article 6 Export Score is calculated from the remaining four components and rescaled to a full score. This assumes the missing component would not have materially changed the country's relative position.
- Policy favourability is drawn from the most recently completed monthly scoring cycle rather than live data, so the score can lag recent policy developments by up to a month.
- The Article 6 Export Score is applied as a direct multiplier on credit volumes, which assumes the score behaves as a probability that a corresponding adjustment will be granted.
- Projects hosted in the United States are excluded from the supply pool in full.
- Projects tagged to the pilot phase, and projects holding only conditional registry approval, are excluded from the supply pool.
- Only projects whose reductions fall within the conditional portion of their host country's climate pledge are included, unless the project already holds confirmed CORSIA eligibility. This assumes unconditional reductions will not be released for export.
- The forecast horizon is capped at 2027 for all phases, extending to 2035 for second-phase supply. Supply expected to reach the market after those dates is not counted.
- Supply is measured as gross issuance rather than credits still in circulation. Retirements and cancellations are not netted out of the reported figure.
- Second-phase eligibility is inferred rather than confirmed, using a defined set of consolidated methodologies and Core Carbon Principles approval as proxies, because ICAO has not published complete second-phase criteria.

Limitations

- Where a project's host country has no policy record, its Article 6 Export Score cannot be calculated and the project's supply is treated as zero rather than being flagged as unknown. Supply from countries outside the policy dataset therefore disappears silently from the total rather than appearing as a gap.
- The reported figure represents gross issuance and should not be read as available inventory. Credits already retired or cancelled remain within the total, so the figure overstates what a buyer could actually acquire today.
- The model does not attempt to forecast host-government behaviour directly. The export score is a relative ranking of countries against one another, so a uniform global improvement or deterioration in authorisation willingness would not move the scores.
- Because three of the five export score components are relative rankings, a country's score depends on the composition of the country set and can shift when coverage changes even if that country's own position has not.
- Flat annual issuance profiles do not reflect the ramp-up typical of early project operation or the decline seen towards the end of a crediting period, so the timing of supply within the forecast window is approximate.
- The registry achievement ratio is calibrated on a single three-year window and applies uniformly to every project under a registry, regardless of project type, scale or geography.
- Second-phase supply carries materially greater uncertainty than first-phase supply, since eligibility is inferred from proxies rather than tested against published criteria.
- Credits transacted outside registry systems, and any bilateral arrangements not captured in the Article 6.2 pilot dataset, are not reflected in either the supply figures or the headroom calculation.
- Eligibility rules are applied as published at the time of the most recent model update. Subsequent ICAO decisions, including newly approved programmes and methodology changes, are not reflected until the eligibility logic is revised.
- The exclusion of United States projects and the conditional-pledge filter are applied as fixed rules rather than as configurable scenarios, so the model cannot currently size supply under alternative policy assumptions.
- Supply expected to reach the market beyond the modelled horizon is excluded entirely rather than discounted, which creates a hard boundary at the horizon rather than a tapering profile.

Output

The model returns three figures for the selected CORSIA compliance phase: total eligibility-adjusted supply, the portion of that supply from credits already issued, and the portion from credits still forecast to be issued. All figures are expressed in credits, each representing one tonne of carbon dioxide equivalent, and are rounded to whole units. The total should be read as an estimate of credits likely to be usable for CORSIA compliance within the modelled horizon, not as a count of credits currently available for purchase.