

METHODOLOGY DOCUMENTATION

Supply Projections Methodology

Estimating current and future carbon credit supply by project and vintage year

DATE

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TYPE

SQL + Python

Overview

This methodology estimates how many carbon credits are currently available in the market and how many more are expected to become available in future years, broken down by individual project and vintage year. It combines two layers: credits that have already been issued and remain unretired ('existing supply'), and credits expected to be issued for future vintages, based on a blend of statistical forecasting, registry-reported project data, and, where available, project developers' own disclosed forecasts. The output underpins the Supply Projections dashboard and its companion compliance-eligibility view, giving clients a forward-looking view of market supply alongside where that supply is likely to be issued from and when.

Data Inputs

Field / Parameter	Description	Source / Notes
Historical credit transactions	Every recorded issuance, retirement and cancellation for each project and vintage year, including registry, status and issuance date.	AlliedOffsets credit transaction database (credit_all)
Project reference data	Registry, estimated annual emission reduction, crediting period start/end dates, sector, sub-sector, methodology and country for each project.	AlliedOffsets project database (project_all)
Model-based future issuance forecast	A projected issuance volume for each project and future vintage year, generated by the forecasting notebook described below.	short_term_forecast_is suance table
Project developer self-reported forecasts	Forecast issuance volumes disclosed directly by project developers in their Project Design Documents (PDDs), where available.	extras_project_forecast _issuance
Registry historical issuance achievement (2018-2020)	Actual volumes issued during a fixed 2018-2020 baseline window, used to calibrate how much of a registry's estimated potential typically converts into real issuance.	AlliedOffsets credit transaction database, filtered to 2018-2020
CORSIA phase and jurisdictional eligibility flags	Tags indicating whether issued or forecasted credits qualify under CORSIA compliance phases, Article 6 authorization/adjustment, and ~19 national or regional carbon-pricing/tax schemes.	Derived within the forecasting notebook and credit_all compliance fields
Letter of Authorization (LoA) status	Whether a project's host country has issued a Letter of Authorization permitting use of its credits internationally.	loa_risk_projects reference table
NDC alignment status	Whether a project's host country's Nationally Determined Contribution (NDC) is conditional, unconditional, or out of scope.	ndc_aligned_projects reference table

Field / Parameter	Description	Source / Notes
Article 6 CORSIA authorization records	Actual instances of credits authorized by a host country specifically for CORSIA use under Article 6.	credit_all compliance fields

Logical Flow

- Forecast issuance for pending projects**
 For projects that are not yet active (pending registration, pending renewal, etc.), project their estimated annual emission reduction forward across every year of their crediting period. Where a project itself lacks an emission-reduction estimate (common for a handful of registries), substitute that registry's average historical issuance per project-year instead.
- Forecast issuance for active projects**
 For projects that are already active and issuing credits, calculate each project's own average annual transaction volume from its issuance history, then project that constant volume forward from its most recent known vintage year through to the end of its crediting period.
- Combine pending and active forecasts**
 Merge the pending-project and active-project forecasts into a single forward-looking issuance model, refreshed on a recurring schedule to reflect the latest registry and project data.
- Classify CORSIA phase and jurisdictional scheme eligibility**
 Apply an extensive set of registry- and methodology-specific rules to tag each forecasted project-vintage with its likely CORSIA compliance phase (Pilot Phase, First Phase, First Phase with conditional approval, or Second Phase alignment) and its eligibility for national or regional compliance schemes such as California's carbon market, Washington State's cap-and-invest program, and similar jurisdictional mechanisms.
- Build the existing supply baseline**
 From the actual transaction history, calculate net remaining supply for every project and vintage year already on record, by subtracting anything retired or cancelled from what has been issued.
- Override with project developer forecasts where available**
 Wherever a project developer has published their own forecast for a given vintage, use that figure in place of the model-based estimate. For any other future vintage belonging to that same project where the developer has not disclosed a number, treat the forecast as zero rather than reverting to the model.
- Calibrate remaining model-based forecasts by registry track record**
 For forecasts that are not based on a developer's own disclosure, scale the projected volume by a registry-specific adjustment factor reflecting how much of that registry's estimated potential has historically converted into real issued credits.
- Merge issued and projected supply**
 Combine the existing-supply and future-forecast sides into a single record per project and vintage year, tagging each row as either 'issued' or 'projected' and labelling the confidence source of any projection.

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Estimate the year supply becomes available

Determine the expected calendar year in which projected supply will actually reach the market, using either the registry's average historical lag between vintage year and issuance, or, where that would place the estimate in the past, the registry's historical maximum lag instead.

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Remove lapsed projections and attach compliance eligibility

Delete any projected row whose estimated supply year has already passed without being replaced by real issuance data, keeping the table forward-looking. In the companion compliance-eligibility view, attach CORSIA phase status, Article 6 authorization and corresponding-adjustment shares, jurisdictional scheme eligibility, Letter of Authorization status and NDC alignment to every issued and projected row.

Key Calculations

Net remaining supply

For each project and vintage year, credits issued minus credits retired or cancelled. If retirements exceed issuance for any reason, the result is floored at zero rather than shown as negative.

Registry adjustment fraction

For each registry, the average (across 2018, 2019 and 2020) of actual credits issued divided by estimated annual emission reduction, calculated only for projects with an estimated annual reduction above 100 tCO₂e and a crediting period that fully spans that three-year window. This produces a single 'delivery ratio' per registry. Where no qualifying history exists for a registry, the ratio defaults to 1 (no adjustment).

Adjusted projected issuance

The raw forecast volume for a project-vintage multiplied by that registry's adjustment fraction, so forecasts are scaled to reflect how reliably that registry's projects have historically delivered on their estimated potential.

Time-to-issue lag

The average number of years between a credit's vintage year and the date it was actually issued, calculated per registry from historical issuance records. Where a registry has no issuance history to draw on, a default lag of 2 years is used.

Maximum time-to-issue lag

The single longest observed gap between vintage year and issuance date for a registry. This is used as a fallback whenever the standard average lag would place a forecast's expected supply year in the past, so that forward-looking projections aren't discarded prematurely. Defaults to 10 years where no history exists.

Estimated supply year

Vintage year plus the registry's time-to-issue lag. If that calculation would place the estimate in a year that has already passed, the registry's maximum observed lag is used instead, pushing the estimate further into the future.

Assumptions

- The registry adjustment fraction is calculated only from projects with an estimated annual emission reduction above 100 tCO₂e and a crediting period fully covering 2018-2020; smaller or shorter-lived projects are not used to calibrate registry delivery rates.

- Where a registry has no qualifying historical achievement data, its adjustment fraction defaults to 1, meaning forecasts for that registry are not scaled up or down.
- Once a project developer has self-reported a forecast for any vintage, every other future vintage for that same project without an explicit disclosed number is treated as zero rather than falling back to the model estimate — on the assumption that a developer publishing a forecast has disclosed their complete known pipeline.
- Negative self-reported forecast values are treated as zero.
- A default time-to-issue lag of 2 years, and a default maximum lag of 10 years, are applied to any registry without enough historical issuance data to calculate its own figures.
- CDM-registered projects are excluded entirely from the forward-looking forecast, reflecting that scheme's wind-down and lack of expected future issuance.
- Isometric ('iso') registry credits are only counted toward existing supply if they have not yet been marked as delivered; Acorn registry credits are counted as existing supply regardless of status.
- CORSIA phase and jurisdictional-scheme eligibility rules include several hard-coded thresholds: a 7,000 tCO₂e/year estimated-reduction threshold above which certain REDD+ (forest and land use) projects outside a defined list of eligible countries are excluded from CORSIA eligibility; a 15 MW capacity threshold above which certain grid-connected renewable energy projects are excluded; exclusion of 'Micro Scale' and 'PER' product-type projects under one registry's rules; and a requirement for Core Carbon Principles (CCP) approval, or specific newer methodologies, for a project to qualify for CORSIA Second Phase alignment.
- From vintage year 2027 onward, VCS-registered REDD+ projects are assumed to have transitioned fully to a newer methodology for Second Phase alignment purposes — a forward-looking assumption not yet confirmed by registry data, and flagged for revisiting as registries update their approved methodology lists.

Limitations

- The registry adjustment fraction is calibrated on a single historical window (2018-2020) and does not automatically adapt to more recent shifts in a registry's issuance behaviour.
- Self-reported developer forecasts are taken at face value; there is no mechanism in this methodology to validate a developer's forecast against the project's technical or financial feasibility.
- A single blended time-to-issue lag is applied per registry; the model does not distinguish between delays caused by verification backlogs versus delays caused by underlying project underperformance.
- Compliance eligibility (CORSIA phase, Article 6, jurisdictional schemes) reflects known criteria at the time of data capture and does not model future eligibility changes — for example, a country authorization that may be granted after a credit's forecasted vintage but before its estimated supply year.
- Two CORSIA-approved registries (BioCarbon Fund ISFL and the Forest Carbon Partnership Facility) were newly recognised for the current compliance period as of the most recent ICAO update, but eligibility logic for them has not yet been implemented pending confirmation of the relevant registry codes and data fields.
- The accuracy of both the forecast volumes and the registry calibration depends on the completeness of underlying project reference data (estimated annual emission reduction and crediting-period dates); missing or incorrect values there will distort results.
- Retirement and cancellation activity is netted against issuance only up to the current data cut-off; the model does not project future retirements.

Output

Two tables are produced. `supply_projections` contains one row per project and vintage year, showing net remaining issued supply, projected/adjusted future supply, the estimated calendar year that supply becomes

available, a flag distinguishing issued from projected rows, and the confidence source behind any projection (project developer reporting, registry-indicated estimate, or registry average). `supply_projections_compliance_eligibility` contains one row per project and vintage year (covering both issued and projected credits) with CORSIA phase eligibility status, Article 6 and corresponding-adjustment share metrics, jurisdiction-specific compliance-scheme eligibility, and NDC alignment status.