Project Overview Document (POD)

Landor – Low-Carbon Nitrogen Fertilizer Substitution Through Mass Balance

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Glossary

Term	Definition
Carbon Intensity Reduction	The verified emission reduction attributable to one functional unit of product (kg CO_2e per tonne of fertilizer). It translates the pool-level reduction into product- and crop-level claims. "ERF" (Emission Reduction Factor) is used in this document and the allocation workbook as the internal name for the same factor.
Land Management Unit (LMU)	The spatial unit at which emission reductions are monitored and attributed. In this project, an LMU corresponds to one farm. Individual fields within the same farm and crop are aggregated into the farm-level LMU; sub-field boundaries are not required.
Sourcing region	The geographic area within which all participating LMUs are located. For this project the sourcing region is Switzerland. It serves as the contextual frame for regional benchmarks and baseline data.
Product Carbon Footprint (PCF)	The cradle-to-factory gate GHG emissions associated with one unit of product. PM.0002 Table 7 defines the acceptable evidence tiers for PCF data, ranging from third-party-verified LCAs to supplier declarations with conservative defaults.
Mass balance	The specific chain-of-custody model applied in this project. Physical low-emission and conventional fertilizer products may be blended within Landor's inventory; what is controlled is the total CO_2e content across all products. The quantity of emission reductions that can be allocated downstream is capped by the verified product-level CO_2e reduction ceiling, and nitrogen content serves as the allocation key for distributing reductions to individual crops. See Sections 2.5 to 2.7 for the full mechanics.
Inset Unit	The official unit is the Inset Unit (1 tCO_2e); when issued and recorded on the Proba registry one Inset Unit represents 1 tCO_2e. Inset Units can be bundled and transferred to offtakers.

1. Project description

1.1 Summary of the project

Landor, a Swiss fertilizer business and subsidiary of Fenaco, is lowering the fertilizer-related (cradle-to-gate) GHG emissions of the crops grown by the farmers it supplies. By partially substituting conventional fertilizer with lower-carbon alternatives, Landor reduces the total carbon intensity of its nitrogen fertilizer pool; the resulting reduction is allocated to participating farmers' crops and passed to the downstream food companies that source those crops and claim the emission reductions.. The project will generate certified emission reduction from the incorporation of these lower-carbon fertilizers into Landor's inventory and sales, creating an insetting program within Landor's agricultural supply chain.

The project works under a mass-balance chain-of-custody model (detailed in Section 2.5), physical segregation is not required; Landor tracks quantities and PCFs across its inventory to establish a verified emission reduction ceiling. The volume of low-carbon fertilizers procured, and their verified PCF relative to conventional equivalents, determines the maximum quantity of emission reductions Landor can issue, both in aggregate and per tonne of fertilizer actually used by each farmer — with the per-tonne rate reflecting verified PCF differences, so reductions are always proportional to real application volumes and cannot exceed what was genuinely sourced.

Farmers buy fertilizer from Landor and apply it to specific crops and fields. The pool-level emission reductions are then allocated down to individual farmers based on their actual fertilizer purchases and field applications, creating the farm-level traceability needed for downstream Scope 3 claims. Farmer-level volume-matching rules ensure that total allocated reductions never exceed verified pool-level reductions (described in Section 2.4, 2.6 & 2.7).

Certificates are then issued by Landor and transferred to food company buyers to support their Scope 3 reporting supported by transparent documentation and verification.

1.2 Project objective(s)

The objectives of the project are the following:

- **Lower GHG emission in Landor's Nitrogen-based fertilizer inventory**: (Partly) replace conventional fertilizer products with verified lower-carbon footprint alternatives to cut cradle-to-gate GHG emissions embedded in Landor's inventory.
- **Allocate and certify emission reductions to specific crops**: Using Proba methodology PM.0002, quantify and verify the pool-level emission reductions, then allocate these certified reductions to specific crops based on actual fertilizer use.
- **Enable Scope 3 Claims**: Provide downstream partners (Food companies) with traceable, mass-balance–based emission reduction units that they apply to the fertilizer-related share of the crops they source, lowering the carbon footprint of those crops in their Scope 3 (Category 1) inventories. The unit is a discrete, verified fertilizer-related emission reduction allocated to specific crops and not a recalculated full crop carbon-intensity figure..
- **Demonstrate Financial and Technical Feasibility**: Show that Inset Units revenues or buyer co-investment can compensate the green premium of low-carbon fertilizers, establishing additionality and scalability for wider adoption.

1.3 Project timelines

Project start date: The project is expected to begin with the first purchased batch of low-carbon fertilizer for the cropping season 2027. This marks the start of data collection and intervention implementation under this POD.

- The POD is submitted within two years of this date, in compliance with *Proba Standard Section 3.5*.

Crediting period: The **crediting period is** 5 years (within the 7-year maximum permitted by PM.0002 §1.5). Emission reductions are quantified and verified annually

(one Yield Period per cropping season) and Inset Units are issued on a per-year basis. The crediting period can be renewed for another 5 years.

- Each annual verification cycle corresponds to one Yield Period as defined by the Proba Standard.
- The crediting period may be renewed subject to full re-validation, including reassessment of additionality, baseline conditions, and compliance with the latest version of *PM.0002*.

Eligibility windows: This project applies two timing safeguards to ensure that emission reductions are linked to real fertilizer use and to identifiable crop outputs.

1. **Fertilizer application eligibility window:** Eligibility for certificate issuance is limited to low-carbon footprint fertilizers that are distributed within **12 months of purchase**, measured from the purchase date of the low-carbon footprint fertilizer by Landor. Fertilizer volumes applied after this window are not eligible for certification.
2. **Crop attribution eligibility window:** Allocation of CO_2e reductions to a specific crop/farmer is part of the verification process. Attribution must be tied to the relevant harvest period and evidenced through Landor's ERP sales records and farm-level invoices (Sections 2.6 & 6.1)

Rules governing sales/claims timelines for issued certificates are defined in the crediting and issuance sections of this POD.

Project End & Renewal:

- The project may be renewed for further crediting periods, each subject to the full re-validation described under the Crediting period above (PM.0002 §1.5).
- A final verification and report will be completed at closure, confirming all issued Inset Units and outcomes.

1.4 Project stakeholders and roles

The Landor Project is a collaborative effort between fertilizer producers, distributor and downstream buyers to decarbonize fertilizer sourcing through a verified mass-balance

approach. The table below outlines all stakeholders and their roles in project implementation and Inset Unit generation.

Role	Organization	Responsibilities
Project Developer	Landor (Fenaco Cooperative)	Acts as the Project Developer. Procures and integrates low carbon nitrogen based fertilizers, monitors the substitution mass, and manages implementation. Coordinates with Proba and the verifier. Key contact: *Damian Santschi.*
Certification & Methodology Developer	Proba	Leads feasibility assessment and methodology alignment (PM.0002). Oversees validation, registration, and issuance of certificates under the Proba Standard. Facilitates MRV setup and ensures methodological compliance.
Downstream Buyer / Insetting Partner	Include: **- [Redacted for public consultation]**	Sponsors in the low-carbon fertilizer program. Claims verified Scope 3 emission reductions within its agricultural supply chain, based on the proportion of low carbon fertilisers sourced.
Low carbon nitrogen based fertilizers Supplier(s)	See Appendix A	Provides verified product carbon footprints and supporting documentation to Landor. Ensures compliance with GHG footprint criteria for low-carbon feedstock.
Validation & Verification Body (VVB)	Ceres Cert	Conducts independent validation of the POD and verification of GHG reductions per Proba Standard. Confirms data integrity and traceability within the mass-balance framework.
Parent Organization / Oversight	Fenaco Cooperative	Provides governance and oversight for Landor. Ensures strategic alignment with fenaco's sustainability goals and internal approval for insetting and carbon project activities.
Farmers (Indirect Participants)	Landor's farmer customers	Use fertilizers as per standard practice. No agronomic change is required; however, their use of low-carbon fertilizer is essential for the value chain emission reductions attributed to this project.

1.5 Project specific details

Emission reductions are accounted for at the fertilizer product level, using product carbon footprints (PCFs) expressed in $kgCO_2e$ per kg of product. This ensures all cradle-to-gate emissions are treated consistently across products with different chemical compositions. Where needed for allocation across crop types, nitrogen mass (t or Kg of N) is used as a secondary distribution key (Section 4.4). The mechanics of the mass-balance model, chain of custody, and allocation logic are described in Section 2.5 to Section 2.7. Certificates are issued to Landor and transferred to downstream food companies; farmers do not hold certificates or make claims.

1.6 About Landor

Registered Name	fenaco Genossenschaft (trading as LANDOR)
Address	Auhafenstrasse 50, 4132 Muttenz
Country of Registration	Switzerland
Parent Organization	fenaco Genossenschaft
Main Contact Person	Damian Santschi (Project Manager)
Phone	+41 58 433 66 66
Email	damian.santschi@landor.ch

2. Project Boundaries

2.1 Geographical boundaries

This project is implemented at Landor's fertilizer facility in Switzerland (Section 1.6). This facility serves as the operational sites where the substitution of conventional nitrogen-based fertilizer products with verified lower-carbon alternatives occurs through procurement and mass-balance accounting.

The intervention does not take place at farm level. The reason is physical: once the verified low-carbon ammonia is blended with conventional products in Landor's inventory, its physical identity can no longer be traced, so a distinct low-carbon fertilizer cannot be segregated, delivered to, or applied by an individual farm. The carbon intensity of the nitrogen is therefore changed upstream, at the pool level, and the resulting reduction is allocated to specific farms and crops afterwards by mass balance. Farm level is where reductions are attributed, not where the intervention occurs.. However, under *PM.0002 Section 2.3*, this project is classified as an LMU-level project for the purposes of spatial boundary definition, monitoring, and allocation. This classification reflects the granularity at which emission reductions are monitored and attributed, not the physical location of the intervention itself. Because Landor maintains farm-level sales records and application data for all participating farms and crops, the project meets PM.0002's LMU-level data requirements: crop-specific fertilizer quantities and nitrogen application totals per farm are documented and verifiable. LMU-level farm data is used to monitor, allocate, and attribute emission reductions to specific crops, as required by *PM.0002*'s LMU spatial boundary classification.

In practice, the project operates at two linked levels:

- pool-level CO_2e accounting at Landor's inventory (where the emission reduction ceiling is calculated) and,
- LMU-level attribution for downstream allocation to crops and buyers.

Switzerland constitutes the project's sourcing region as defined in *PM.0002*: A geographically distinct area with common environmental, climatic, and land use conditions, within which all participating LMUs are located.

Documentation and Identification:

- All participating Landor facilities will be documented with name, location, and operational function (e.g., blending, storage, distribution) (Section 1.6) .
- This facility falls fully under Landor's legal and operational control as part of the Fenaco cooperative, ensuring clear authority over all processes included in the project boundary.
- A value-chain confirmation document the linkage from fertilizer to food company to support Scope 3 insetting claims. The linkage is more fully explained in Section 2.6
- Farm-level sales records and application data for all participating farms and crops — the LMU dataset used for monitoring and allocation (see Sections 2.6 and 6.1).

If low-carbon fertilizer procurement expands in the future, the project boundary may include additional Landor facilities, provided they remain under Fenaco/Landor operational control and are validated before inclusion.

2.2 Operational Boundaries

Fertilizer Products and Activity Scope

The project includes all relevant nitrogen-based fertilizers in Landor's commercial portfolio. The intervention consists exclusively of substituting conventional nitrogen-based fertilizer products with verified lower-carbon alternatives, supplied by one or more certified producers. Landor procures a defined quantity of verified lower-carbon fertilizer products, and these quantities directly replace equivalent conventional fertilizer products within Landor's inventory, under a verified mass-balance chain-of-custody model.

The manufacturing processes and chemical composition of the fertilizer products are identical between baseline and project conditions; only the carbon intensity of the upstream nitrogen pathway differs. Nutrient content and agronomic performance remain unchanged. Green and grey fertilisers may coexist within Landor's inventory, but all accounting occurs at the total nitrogen-based fertilizer pool level.

The fertilizer a farmer physically receives is a conventional-equivalent blend; it is not labelled or sold as 'low-carbon', and the farmer cannot independently claim a low-carbon attribute. The verified reduction is recognised once at pool level and allocated through retired certificates, preventing double counting or double claiming.

System boundary

The project operates under a cradle-to-gate system boundary at the fertilizer product level. The boundary includes all upstream and manufacturing emissions embedded in the fertilizer products procured and sold by Landor, as reflected in verified product carbon footprints (PCFs). Under the baseline scenario, Landor procures conventional nitrogen-based fertilizer products with standard cradle-to-gate emission intensities. Under the project scenario, Landor procures fertilizer products with verified PCFs, produced using lower-carbon nitrogen pathways. The intervention therefore consists of substituting higher-carbon fertilizer products with lower-carbon fertilizer products that are agronomically equivalent. The system boundary includes:

- upstream feedstock extraction and energy inputs,
- fertilizer precursor production and nitrogen conversion processes.
- fertilizer manufacturing and finishing steps (e.g., granulation, blending, drying),
- cradle-to-gate emissions up to the point of delivery to Landor.

All downstream stages remain outside the project boundary because they are unaffected by the intervention. These excluded stages include:

- transportation beyond Landor’s gate,
- on-farm fertilizer application,
- soil emissions and field-level nitrous oxide emissions,
- crop growth, harvesting, processing, and consumption.

The project impact arises exclusively from the difference in cradle-to-gate embedded emissions (PCFs) between conventional and lower-carbon fertilizer products. No changes resulting from the intervention occur in nutrient composition, fertilizer formulation, farmer practices, or agronomic performance.

Included Activities:

The following activities are included within the operational boundary of the project:

1. Procurement and verification of lower-carbon fertilizer products

- Collection and verification of supplier product carbon footprints (PCFs), expressed in tCO_2e per ton of product (or Kg CO_2e per Kg).
- Documentation of low carbon fertilizer supplier emission factors and third-party certification supporting PCF claims.
- Confirmation that lower-carbon products are functionally equivalent to conventional alternatives.

2. Inventory-level mass-balance accounting

- Tracking of fertilizer product volumes received, stored, and sold.
- Maintenance of a pool-level accounting system that records:
    - quantities of conventional and lower-carbon fertilizer products,
    - associated PCFs,
    - resulting total embedded emissions (tCO_2e) within the inventory for each accounting period.
- Calculation of the total verified emission reduction generated at the inventory level (tCO_2e ceiling for certificate issuance).

3. ERP-based traceability and documentation

Landor's Enterprise Resource Planning (ERP) system records each fertilizer purchase and sale with a unique transaction identifier, providing transaction-level traceability of products, quantities and PCFs from supplier procurement through inventory to farm-level sales. This accounting traceability is what underpins the mass-balance chain of custody (Section 2.5): the low-carbon molecules themselves are not physically segregated or tracked to individual farmers.

The specific parameters tracked and their evidence requirements are defined in the pool-level MRV table (Section 6.1.1, P-series parameters). All records are retained for ten years.

4. Mass-balance reconciliation and allocation

- Periodic reconciliation of total fertilizer volumes and associated embedded emissions within the inventory pool.

- Confirmation that total allocated emission reductions (tCO_2e) do not exceed the verified reductions generated at the inventory level.
- Documentation sufficient to support independent validation and verification under the Proba Standard.

5. Eligible Crops

The project affects agricultural commodities where Landor fertilizer is applied and that enters the downstream buyer's sourcing. These include:

- potatoes
- wheat
- sugar beets
- other regionally relevant crops relying on Landor fertilizers

To ensure that Scope 3 insetting claims are made exclusively for value-chain connected emission reductions, the emission reductions are attributed only to farmers and crops that meet both requirements:

- They purchased fertilizer from Landor during the allocation period, and
- Their crop enters the downstream buyer's supply chain.

2.3 Value chain scope

The project operates across the fertilizer and agricultural value chain, linking upstream decarbonization of nitrogen production with downstream Scope 3 insetting claims by a food company. Although the physical emission reduction originates in the manufacturing of the fertilizer product, the reduced carbon intensity flows downstream through fertilizer products and ultimately into the agricultural commodities purchased by the buyer.

The intervention covers the chain from low carbon nitrogen production, through Landor's fertilizer distribution, down to the farm-gate boundary of the buyer's supply chain:

Tier	Stage	Actors / Examples	Role in the Project

Tier 1 - Input Production	Nitrogen based fertilizer manufacturing	See Appendix A	Manufacture fertilizer products using low-carbon nitrogen pathways instead of conventional fossil-based processes. This is where the cradle-to-gate emission reduction embedded in the fertilizer product originates.
Tier 2 - Fertilizer Distribution	Fertilizer incorporation & sales	Landor (Fenaco)	Integrates low-carbon fertilizer products into its inventory, performs mass-balance allocation, tracks emission reductions, and sells fertilizer to farmers..
Tier 3 - Farming	Crop production (Section 2.2 Eligible crops)	Swiss farmers supplied by Landor	Apply fertilizer under normal agronomic practices. No behavioral or agronomic changes occur as a result of this project. Emission differences arise solely from fertilizer carbon intensity.
Tier 4 - Food Company / Retail	Agricultural sourcing	Downstream buyer	Claims Scope 3 reductions for purchased crops grown using fertilizers with mass-balanced lower-carbon PCFs sourced from Landor.

Scope Description:

- The project boundary includes Tiers 1–4, ranging from fertiliser production to the farm-gate of the buyer's supply chain.
- Only the upstream nitrogen pathway used to manufacture the fertilizer products changes between baseline and project scenarios.
    - All downstream chemical and agricultural processes remain unchanged.
- The project creates a direct Scope 3 linkage: lower upstream emissions embedded in fertilizer → lower embedded emissions in crops → lower Scope 3 category 1 "Purchased Goods & Services" emissions for the buyer.
- No downstream stages beyond the farm gate (transport, processing, retail, consumer) are included in the certificates issuance boundary.

2.4 Crediting framework

Insetting Framework & Distinction from Offsetting

This project qualifies as an insetting activity under the Proba Standard by replacing conventional fertilizer products with verified lower-carbon fertilizer products. Unlike offsets, these reductions remain within the supply chain and are not transferable to unrelated third parties. The structure of this insetting model is as follows:

- **Scope of claim:** The verified reductions are used for corporate Scope 3 accounting by the buyer (food company) within the shared value chain.
- **Crediting mechanism:** Verified emission reductions are converted into Proba's Inset Units, each representing 1 t CO_2e reduced and traceable to a specific crop and LMU through the allocation register. These units are issued, tracked, and retired in the Proba registry, ensuring one unique certificate per tonne of CO_2e.
- **Substitution logic:** Each tonne of conventional fertilizer product substituted by a verified lower-carbon fertilizer product generates an emission reduction equal to the difference in their cradle-to-gate product carbon footprints (PCFs), expressed in tCO_2e. The claim is therefore tied directly to the avoided embedded emissions resulting from this product-level substitution.
- **Boundary of benefit:** The resulting impact remains entirely within the fertilizer-to-food-company chain, supporting the downstream partner's climate targets without entering external carbon markets.
- **Flexibility clause:** Inset Units are issued only for volumes covered by signed downstream insetting agreements. The remainder of the verified pool stays un-issued until an agreement is in place, and it is this un-issued remainder that retains flexibility: it may be (a) reassigned to another buyer within the same value chain for Scope 3 insetting use, or (b) carried forward for insetting use in a subsequent crediting period. By exception, un-issued units may also be sold outside the supply chain as offsetting units (single claim, Proba Standard Section 5.5). Once Inset Units have been issued against a signed agreement they remain insetting units and are not converted to offsets.

This model guarantees that the project's climate benefit is realized and accounted for within the value chain, maintaining traceability, avoiding market leakage, and aligning with Proba's insetting integrity principles.

Certificate issuance and claiming:

Certificate issuance occurs after verifying all chain-of-custody and traceability conditions described in Sections 2.5 to Section 2.7. The following principles govern certificate issuance and claiming:

A. **Issuance to Landor:** Proba issues Inset Units based on verified emission reductions that fall within the product-level CO_2e reduction ceiling and are justified through farm-level allocation records.
B. **Transfer to buyers:** Landor transfers Inset Units to downstream companies whose products source from participating farms. Buyers may claim verified Scope 3 reductions linked to fertilizer use within their supply chain.
C. **Role of farmers:** Farmers do not generate or claim Inset units. They provide the traceable pathway connecting Landor's upstream decarbonization with the buyer's supply chain.
    a. Although farmers neither generate nor claim Inset Units, through Landor's ERP sales and application record, they provide the underlying data (fertilizer product and quantity purchased, crop and field of application, and timing; see Section 2.6) that enables allocation and verification.
    b. This data is drawn from each farm's standardised plot records — the fiche de parcelle (Parzellenblatt) which document, per parcel and crop, the fertilizer products applied and their quantities, nitrogen content (N total / N available) and application dates, alongside crop, variety, area and yield. These records are typically maintained in Barto, the leading Swiss digital farm-management platform (a Fenaco subsidiary), or an equivalent system providing the same information.
D. **Uniqueness:** Certificates/Inset Units are issued once, retired after transfer, and cannot be reused across buyers or claimed by Landor in its own footprint.

The detailed issuance workflow, causality verification, and proof-of-sourcing requirements are described in Section 7.

Double Counting:

The project includes safeguards to prevent double counting, double claiming, or double issuance:

- This project is not registered under any other carbon registry, and Landor commits not to submit it elsewhere for crediting during its operational period.
- Each certificate is issued once, retired upon claiming, and cannot be reused or claimed by Landor in its own GHG inventory, see “Certificate issuance and claiming” above (uniqueness principle) and Section 7.2 (retirement mechanism).
- Mass balance avoids double counting because the verified upstream reduction is quantified once at pool level (capped by the product-level CO_2e ceiling) and recognised nowhere else. The blended physical product carries no separate low-carbon claim, so its recipient cannot also report the reduction; each Inset Unit is issued once, allocated to a single crop/LMU, and retired on claim (PM.0002 mass-balance CoC).
- The low-carbon attribute of the procured fertilizer is claimed only once, by this project. Landor obtains a written attestation from each low-carbon input supplier that the same emission reduction or its low-carbon attribute (e.g. via an EPD, a book-and-claim certificate, or the supplier's own carbon claim) has not been and will not be sold, transferred, or reported under any other scheme or to any other party.

National Inventory Alignment:

The project’s emission reductions occur within Switzerland and are associated with private-sector industrial activities. While these reductions may contribute indirectly to lower national industrial emissions, they are not claimed under any national mitigation. The reductions are used solely for corporate Scope 3 accounting within the participating value chain and remain distinct from national GHG targets or NDC commitments.

AgroImpact is a Swiss programme launched in 2023 that helps farms measure and reduce their carbon footprint. It gives participating farms a full carbon assessment using an IPCC- and SBTi-based methodology and channels climate premiums to those that cut emissions. It operates at the on-farm level for national and industry decarbonisation diagnostics — distinct from, and not overlapping with, the upstream

fertilizer-substitution reduction credited under this project. If AgroImpact or another Swiss mechanism later accepts a specific N based fertiliser emission factor for use in national farm or inventory diagnostics, this acceptance applies only to the emission factor itself. The Proba crediting and registry rules remain the governing system for issuance, attribution and retirement of Inset Units under this project. Landor will not claim the same verified reductions in its own corporate footprint, and certificates issued under this project will not be treated as national mitigation or counted in national inventories. Because the reduction credited here is created upstream in Landor's fertilizer pool and not by an on-farm practice change, the farmer receives an unlabelled conventional-equivalent blend; it cannot also be claimed as a farm-level reduction under AgroImpact.

2.5 Chain-of-Custody (CoC) Model

The project applies a mass-balance chain-of-custody model as defined in *PM.0002*. The low-carbon attribute originates from a specific physical input — verified low-carbon Nitrogen — which is segregated and evidenced by supplier documentation up to the point it is delivered to Landor. Once this input enters Landor's inventory it is blended with conventional fertilizer products, after which the individual molecules can no longer be physically distinguished or traced to a particular farmer or crop. Because physical traceability is lost at this blending step, the project does not attempt to follow the physical product; instead, the verified CO_2e reduction is carried forward on a nitrogen-mass basis and tracked through Landor's inventory accounting. Segregation within Landor's blended pool is therefore neither possible nor required as the quantity of emission reductions that can be claimed downstream is governed by the verified quantities and PCFs of the low-carbon products actually procured. This establishes a traceable link between the upstream substitution of conventional fertilizer products with lower-carbon alternatives and the physical crop volumes (e.g. potatoes, sugar beets) ultimately delivered to buyers.

The pool ceiling defines the maximum quantity of emission reductions that can be allocated downstream in a given accounting period. Reductions are distributed to individual crops and LMUs through a nitrogen-based allocation mechanism described in Section 2.7, and total allocations may never exceed the pool ceiling. The traceability

requirements that link the ledger to specific farms, crops, and buyers are described in Section 2.6.

The Proba platform is the system of record. All official quantification, issuance, and retirement of Inset Units take place on the platform. The workbook is maintained so that its results reconcile with the platform's.

2.6 Traceability Requirements

To guarantee credible insetting, three traceability links must be demonstrated for every certified reduction.

A. Fertilizer traceability (Landor → Farmer → Crop/LMU)

Landor documents fertilizer sales to each participating farmer and records the fertilizer products and quantities (kg product) purchased and applied to each eligible crop/LMU. To support the nitrogen-based allocation described in Section 2.7, the following data is recorded per crop/LMU:

- fertilizer product(s) applied (SKU/grade) and quantity,
- nitrogen content (%N) for each fertilizer product (from product spec),
- derived nitrogen mass applied (tN) = quantity × %N,
- crop and LMU identifiers and application timing.

B. Crop-to-Buyer traceability (Farmer → Buyer)

The farm outputs (e.g., potatoes, wheat) must be shown to enter the supply chain of the certificate-claiming food company. Acceptable documentation includes: contracts, delivery notes, procurement records, or buyer sourcing confirmations. Only crops demonstrably entering the buyer's supply chain are eligible. Landor supplies the evidence linking the verified reduction to a specific crop, location and crop season, together with the chain-of-custody record. Whether and how that reduction is then claimed — within Scope 3, as a BVCM contribution, or otherwise — is the buyer's decision, assured by the buyer's own auditor. The project's role is to provide credible, traceable crop-linked reduction data, not to make or validate the buyer's downstream accounting claim.

C. Pool and PCF traceability (Supplier → Landor → Pool ledger)

Landor retains supplier documentation confirming, for each low-carbon fertilizer product procured:

- the product carbon footprint (PCF) and year
- the quantities procured and sold during the crediting period,
- the conventional reference product used for comparison (standard "grey" PCF) and its data source.
- An attestation that the low-carbon attribute (and the associated emission reduction) has not been sold, transferred, or reported under any other scheme or to any other party according to §2.4 (Double Counting).

These records define (i) the pool CO_2e reduction ceiling, calculated from verified product-level PCF differences, and (ii) the nitrogen mass contained in the substituted fertilizer products (tN), which serves as the allocation denominator for distributing reductions to crops.

2.7 Allocation Logic and Mass-Balance Rules

This project applies a two-layer integrity model

2.7.1 Input-level CO_2e accounting (security / reconciliation layer)

A. Accounting is performed at **fertilizer** input level using product carbon footprints (PCFs, $kgCO_2e/kg$ product).
B. The total verified CO_2e reduction ceiling is calculated as the sum of $(PCF_{Grey} - PCF_{Green}) \times quantity\ substituted$ for each substituted fertilizer product.
C. This ceiling is the maximum quantity of reductions that can be issued and allocated downstream in the period.

2.7.2 Nitrogen-based allocation (claim layer)

Verified product-level CO_2e reductions are allocated to individual crops using nitrogen mass as a common allocation key, reflecting nitrogen's role as the functional nutrient

common to all fertilizer products in scope. The formal derivation of the ERF and its application to crop/LMU allocations are presented in Section 4.4, Steps 2–3.

2.7.3 Integrity rules (apply in all cases):

1. **Pool ceiling:** Total allocated reductions (tCO_2e) across all crops/farms must never exceed the verified product-level CO_2e reduction ceiling for the period.
2. **Farm/crop volume matching:** A farm may only receive allocations for fertilizer volumes it actually purchased from Landor and applied to an eligible crop/LMU.
3. **Scaling rule:** see Section 4.4 Step 4.
4. **Temporal matching & roll-forward:** Eligibility windows in Section 1.3 apply. Unused reduction potential may be carried forward to the next period (if accepted by the downstream buyer), reassigned to another buyer within the same value chain, or, where no insetting partner claims the units, sold outside the supply chain as offsetting units under the conditions described in the Flexibility clause in Section 2.4.
5. **Virtual allocation:** Physical segregation is not required; allocations are virtual book entries backed by the pool ledger and farm/crop evidence.

3. Project Additionality

The project meets Proba's additionality requirements across all three dimensions:

Regulatory Additionality: No Swiss or EU regulation requires the use of low-carbon fertilizer production. The switch from grey to low carbon fertiliser is voluntary and exceeds any legal or policy obligations.

- **Financial Additionality**: low-carbon fertilizer products entail higher procurement costs than conventional equivalents without providing financial returns or agronomic advantages. Adoption would not occur without the enabling role of carbon finance.
- Carbon-pricing schemes such as the EU ETS, CBAM and the Swiss CO_2 levy raise the cost of fossil-based production but neither mandate low-carbon fertilizer nor close the green premium; their effect is far from sufficient to make adoption business-as-usual, so carbon finance remains necessary.
- Voluntary schemes such as AgroImpact reward measured on-farm emission reductions but do not fund or mandate Landor's upstream procurement of low-carbon fertilizer, nor close the green premium at the point of purchase. As the credited reduction is created upstream and is distinct from any on-farm AgroImpact claim (Section 2.4: National Inventory Alignment), no existing scheme (regulatory or voluntary) provides the revenue or obligation that would make adoption business-as-usual.

Prevalence: The use of low-carbon fertilizer products is not business as usual. The large majority of nitrogen-based fertilizers on the market are still produced using fossil-based pathways. For further detail, refer to the completed Proba_Additionality_Assessment_Landor.docx for Landor, submitted as an appendix to this Project Overview Document and available on the Proba Registry.

4. Quantification approach

4.1 Interventions in scope

The project implements a single intervention:

- ➔ the substitution of conventional ("grey") with verified lower-carbon ("green") nitrogen-based fertilizer products within Landor's inventory under a mass-balance chain-of-custody model.
- ➔ This corresponds to intervention **type (α)** *"Fertilizer production emissions reduction"* as defined in *PM.0002 Section 2.1*.

The intervention does not alter the fertilizer products' agronomic characteristics (see Section 2.2). It is defined by Landor's procurement of specific low-carbon fertilizer products with verified cradle-to-gate product carbon footprints (PCFs). For each low-carbon fertilizer product procured, a functionally equivalent conventional reference product ("grey") with a documented PCF is defined for comparison.

The quantified mitigation outcome is calculated as the difference between the conventional and low-carbon product PCFs, multiplied by the substituted quantities, aggregated across all substituted products during the accounting period. This defines the verified product-level CO_2e reduction ceiling for the period.

4.2 Methodology used

The project follows Proba Methodology PM.0002 – *"Adoption of Low-Emission Fertilizer Technologies to Transition to Low-Carbon Agriculture."* and follows the criteria of ISO 14064-2:2019, as required by the Proba Standard Section 3.4.

PM.0002 directly covers the replacement of high-emission fertilizers with low-emission alternatives. It provides the framework for:

- Defining baseline fertilizer nitrogen/carbon intensity,
- Quantifying Emission reduction from upstream fertiliser substitution,

- Applying mass-balance tracking for low-carbon vs conventional fertilizer products.
- Allocating reductions to farms in proportion to fertilizer application,
- Monitoring fertilizer volumes, carbon intensity, and allocations, and
- Verifying that claimed reductions are consistent with traceable fertilizer use.

4.2.1 GHG Sources, Sinks and Reservoirs

Following ISO 14064-2 and PM.0002 Section 4.2 (Table 6), the relevant GHG sources are the six activity steps:

GHG source	Baseline	Project	Differs?	Treatment
(1) Fertilizer production (cradle-to-gate)	Included	Included	Yes	Sole source of the reduction; quantified as the difference in product PCFs × substituted quantity.
(2) Transportation to Landor	Included	Included	Negligible	Carried within the cradle-to-gate PCF; not materially different between scenarios (see Section 4.3).
(3) Field spreading	Included	Included	No	Same product, quantity and agronomy in both scenarios.
(4a) Direct soil N_2O	Included	Included	No	Unchanged.
(4b) Indirect N_2O (NH_3 volatilisation)	Included	Included	No	Unchanged.
(4c) Indirect N_2O (leaching/runoff)	Included	Included	No	Unchanged.

Because the intervention changes only the carbon intensity of the nitrogen produced upstream and not the type or quantity of fertilizer applied, only source (1) differs between the baseline and project scenarios, and it is the sole source carried into the quantification (Section 4.3). Transport (2) is captured within the cradle-to-gate PCF and is negligible; the field-related sources (3)–(4c) are identical in both scenarios. The project involves no carbon sequestration, land-use change or soil-carbon storage, so

there are no GHG sinks or reservoirs and no removals are claimed; permanence and reversal risks therefore do not apply (see Section 5.2.2).

4.2.2 PCF Selection Approach

This project applies a differentiated cradle-to-gate PCF selection approach depending on the role of the fertilizer product in the accounting model:

Substituted fertilizer products (primary PCFs): For fertilizer products that are directly substituted under the project (i.e., conventional "grey" products replaced by verified low-carbon alternatives), Landor applies supplier-specific and documented product carbon footprints wherever available. PCF evidence is selected following the descending-priority hierarchy in PM.0002 detailed below. These PCFs are used to calculate the product-level CO_2e reduction ceiling and therefore require a high level of accuracy and transparency.

Non-substituted fertilizer products (reference PCFs): For fertilizer products that are not directly substituted but remain part of Landor's overall fertilizer inventory pool, Proba applies conservative and representative PCFs or derived PCFs for blended products. These reference PCFs are used to maintain mass-balance integrity and prevent unintended shifts toward higher-carbon products within the pool. They do not directly determine the emission reduction ceiling but function as a safeguard mechanism.

Where a verified producer-specific PCF is unavailable for a substituted product, the PCF is sourced in the descending priority set out in PM.0002 Table 7:

1. verified producer EPD/PCF/sustainability report;
2. a widely accepted industry tool or database (ecoinvent, Agri-footprint, the Fertilizer Carbon Footprint Calculator);
3. a Tier 1–2 industry reference such as the IFS Carbon footprint of fertilizer production: regional reference values;
4. relevant scientific literature;
5. non-validated supplier data — admissible only if cross-verified against a higher-tier value, based on ISO 14067 / ISO 14040-44 / GHG Protocol Product methodology, and disclosed as unverified.

Every PCF must be cradle-to-gate, dated, and documented with its source, method and validation body; baseline and project PCFs are kept on the same source type and standard, and where they differ the difference is disclosed and a conservative value used. Where supplier-specific PCFs are unavailable for substituted products, conservative default PCFs may be applied, in which case the resulting emission reduction ceiling is calculated using the more conservative value. The complete fertilizer pool list, substituted product pairs, nitrogen contents, and selected PCFs are provided in Appendix A.

4.3 Quantification approach

The quantification covers cradle-to-gate CO_2e emissions embedded in fertilizer products procured and sold by Landor, based on product carbon footprints (PCFs). No downstream or agronomic processes are modified. Emissions from fertilizer application (N_2O), on-farm fuel use, and crop processing remain unchanged and are excluded from the project boundary. In accordance with *PM.0002*, the baseline PCFs used for conventional reference products will be reviewed and updated at each verification cycle to reflect changes in market conditions, technology, or data availability. This constitutes the dynamic baseline required by PM.0002 §1.4: it is reassessed at each verification and at crediting-period renewal, alongside the additionality re-check (Section 3), to reflect developments such as the EU ETS and CBAM.

Baseline type selection: This project applies a counterfactual baseline approach as defined in *PM.0002 Table 4.* The baseline fertilizer type for each substituted product is the corresponding conventional (“grey”) version of the same product, with its standard cradle-to-gate PCF.

Quantification is performed in two linked steps: pool-level ceiling from PCF differences, and nitrogen-based ERF allocation to crops, as detailed in Section 4.4.

Under *PM.0002 Section 4.2 (Table 6)*, the methodology defines six activity steps that may contribute to baseline and project emissions: (1) fertilizer cradle-to-gate, (2) transportation, (3) field spreading, (4a) direct N_2O, (4b) indirect NH_3 volatilisation, and (4c) indirect leaching/runoff.

Because this project's intervention is limited to type (a) fertilizer production emissions reduction, only activity (1) differs between baseline and project scenarios. Transport to Landor (2) plays a negligible part: the cradle-to-gate footprint of nitrogen fertilizer is dominated by ammonia synthesis and nitric-acid N_2O, so inbound transport is only a minor share of the total and any difference in sourcing distance between the low-carbon and conventional products is immaterial per tonne of nitrogen. Field spreading (3) and the field emissions (4a direct N_2O, 4b NH_3 volatilisation, 4c leaching/runoff) are identical in both scenarios, as they depend only on the type and quantity of nitrogen applied, and the farmer receives the same product in the same amount.

The net emission reduction consequently reduces to the product-level PCF difference multiplied by the substituted quantity, subject to the leakage and uncertainty adjustments defined in *PM.0002 Section 5 (Equation 10)*, both of which are zero for this project (see Section 5.2). The step-by-step calculation method that implements this logic is presented in Section 4.4 below.

Prior to the close of each crop season, Landor may produce a preliminary accounting using projected hectares, estimated nitrogen application rates, and pre-production PCF estimations from suppliers. This preliminary figure is used for internal forecasting and buyer engagement only. Final accounting is performed after harvest, using actual fertilizer tonnages from Landor's ERP, confirmed farmer application records, and production-confirmed PCFs. Only the final accounting is submitted to the VVB and used for certificate issuance. Any difference between preliminary and final figures is reconciled in the monitoring report.

4.4 Calculation methods

Mass-balance accounting steps:

The following four-step process is implemented in the operational accounting sheet "Appendix A", with a worked example shown in Section 5.1.

Step 1 — Product level CO2e reduction ceiling

The verified CO_2e reduction ceiling for the period is calculated as:

$$Ceiling(tCO2e) = \Sigma_p (PCF_{grey,p} - PCF_{green,p}) \times Q_{sub,p}$$

This ceiling represents the maximum total emission reduction that may be allocated during the accounting period.

Step 2 — Compute the pool-based Emission-Reduction Factor (ERF)

Equation:

$$ERF = \frac{\Sigma_{p \in P_{sub}} (PCF_{grey,p} - PCF_{green,p}) \times Q_{sub,p}}{\Sigma_{p \in P_{sub}} (Q_{Sub,p} \times N_p)}$$

Where:

- ERF = **Emission-Reduction Factor** per tonne of nitrogen (tCO_2e per tN)
- p = product, in this case the fertiliser
- P_{sub} = set of **substituted** fertilizer products (those for which a grey vs green comparison is defined)
- $PCF_{grey,p}$ = conventional product carbon footprint for product p (tCO_2e per t product)
- $PCF_{green,p}$ = low-carbon product carbon footprint for product p (tCO_2e per t product)
- $Q_{Sub,p}$ = quantity of substituted low-carbon product p in the period (t product)
- N_p = nitrogen content of product p (tN per t product; e.g., 0.46 for urea 46%)

Plain-language explanation:

1. This equation first calculates the total CO_2e reduction generated by substituting conventional fertilizers with lower-carbon alternatives.

2. It does this by taking the difference between the conventional and low-carbon product carbon footprints (PCFs) for each substituted product and multiplying that difference by the quantity substituted.
3. All substituted products are then summed to determine the total verified CO_2e reduction for the period (the pool ceiling).
4. It then calculates the total nitrogen mass contained in those substituted fertilizer quantities. This nitrogen mass serves as the allocation denominator, providing a consistent basis for distributing the product-level CO_2e reductions across crops with different fertilizer mixes
5. Finally, it divides the total CO_2e reduction by the total substituted nitrogen mass. The result is a single Emission-Reduction Factor (ERF), expressed as tonnes of CO_2e reduced per tonne of nitrogen (tCO_2e/tN).

Step 3 — Allocate reductions to an eligible crop/LMU (distribution)

Equation:

$$ER_c = \left(\sum_{j \in Jc} Q_{c,j} \times N_j\right) \times ERF$$

Where:

- ER_c = **emission reduction allocated** to crop/LMU c (tCO_2e)
- J_c = set of fertilizer products applied on crop/LMU c (from invoices / application records)
- $Q_{c,j}$ = quantity of fertilizer product j applied on crop/LMU c (t product)
- N_j = nitrogen content of product j (tN per t product)
- ERF = factor calculated in Step 2 (tCO_2e per tN)

Plain-language explanation:

1. This equation calculates the CO_2e reduction allocated to a specific crop or Land Management Unit (LMU).

2. It first determines the total nitrogen mass applied to that crop by multiplying each fertilizer quantity used by its nitrogen content and summing the results.
3. It then multiplies the total nitrogen applied by the Emission-Reduction Factor (ERF) calculated in Step 2.
4. The result is the amount of CO_2e reduction allocated to that crop or LMU.

Step 4 — Ceiling safeguard

The ERF derived from substituted nitrogen represents the maximum reduction intensity per tonne of nitrogen that can be allocated. If total nitrogen applied across eligible crops exceeds the substituted nitrogen represented in the pool, allocations must be proportionally reduced so that total allocated reductions remain equal to the verified ceiling.

So:

- If Total allocations ≤ Ceiling
- If $\sum N_{applied} > \ substituted\ N$, proportional reduction is possible

ERF may be diluted but never increased using the following equations:

Effective ERF (after safeguard):

$$ERF_{effective} = \ min\ (ERF, \frac{Ceiling}{N_{applied,\ total}})$$

Where:

- $ERF_{effective}$: The emission-reduction factor actually used for allocation after applying the ceiling safeguard (tCO_2e per tN). It may be equal to ERF or lower, but never higher.
- ERF**:** The maximum emission-reduction factor derived from substituted fertilizer products (tCO_2e per tN).
  This comes from Step 2 (Ceiling ÷ Substituted N).
- $Ceiling$**:** The verified total CO_2e reduction available in the period (tCO_2e), calculated from substituted product PCF differences × quantities.

- $N_{applied,\,total}$: The total nitrogen applied across all eligible crops/LMUs during the period (tN), based on recorded fertilizer quantities and their nitrogen contents.
- $min(\ldots)$: means choose the smaller of the two values inside the brackets.

Final allocation per crop:

$$ER_{c,final} = N_{applied,c} \times ERF_{effective}$$

Where:

- $ER_{c,final}$: The final CO_2e reduction allocated to crop or LMU c (tCO_2e).
- $N_{applied,c}$: The nitrogen applied to crop or LMU c (tN), calculated from fertilizer quantities × nitrogen content.
- $ERF_{effective}$: The safeguarded emission-reduction factor from **Effective ERF** Equation (tCO_2e per tN).

Farm-level baseline and project carbon expression:

For each (farm, crop, harvest year, fertilizer product) tuple, the baseline and project emissions are expressed as:

Baseline emissions:

$$BE_{c,j} = Q_{c,j} \times PCF_{grey,j}$$

“Per-product” allocated reduction:

$$ER_{c,j,final} = Q_{c,j} \times N_j \times ERF_{effective}$$

Project emissions:

$$PE_{c,j} = BE_{c,j} - ER_{c,j,final}$$

Where:

- $PCF_{grey,j}$ is the same conventional reference PCF used in Step 1

- $ER_{c,j,final}$ is the nitrogen-weighted share of the crop reduction attributable to fertilizer product *j*, consistent with the "Allocated CO_2e" column in the L2 workbook.
- The baseline is counterfactual: it applies the grey PCF to the quantities the farmer actually used, not to a historical reference year. No additional data collection beyond Step 3 inputs is required.

4.5 Allocation and conservativeness

Conservative assumptions are applied throughout the quantification:

- **Product PCF priority**: Supplier-specific PCFs for low-carbon fertilizers and their conventional reference products are used where available and documented. Where supplier PCFs are not available, conservative default PCFs are applied and justified (Appendix A).
- **System boundary consistency**: Baseline and project PCFs must be cradle-to-gate with consistent boundaries.
- **Pool ceiling safeguard:** See Section 2.7.3 Rule 1 & Section 4.4, Step 4)
- **Farm/crop volume matching**: See Section 2.7.3 Rule 2.
- **Missing/uncertain data:** Where key data are missing (e.g., PCF evidence or product identity), allocation defaults to zero reduction for that volume (i.e., do not issue certificate) or uses conservative defaults as documented.
- **No leakage from activity shift:** The intervention affects only embedded emissions of fertilizer production and does not alter farm practices or land use; leakage is assessed per PM.0002.

5. GHG Impact

5.1 Estimated emission reductions

The pool ceiling, the actual emission reduction from fertilizer substitution, is derived from PCFs and substituted quantities documented in Appendix A calculated using the equations from section 4.4. For early estimation assumptions must be made for the following variables:

- Landors sales
- PCFs
- N rate / ha / farme
- Crop yield

Total ceiling = XXX

- CO2e per ton of Crops 1 = XXX
- CO2e per ton of Crops 2 = XXX
- CO2e per ton of Crops 3 = XXX

5.2 Leakage & Permanence

5.2.1 Leakage

A leakage assessment was conducted in accordance with Proba *Methodology PM.0002*. Because the project consists solely of upstream decarbonization of nitrogen production, with no changes to fertilizer formulation, use, or volumes, all potential leakage pathways were evaluated and found to be **negligible or not applicable**. Additionally, under *PM.0002 Table 1*, the project falls under **Scenario A** (<1,000 ha), for which leakage risk is considered negligible and the deduction is 0%.

LP = 0% (PM.0002 Table 1, Scenario A), and no sourcing-region uncertainty penalty applies (UP = 0%; see Section 2.1). The net verified reduction therefore equals the pool ceiling derived in Section 4.4.

Leakage Type	Description	Assessment

Market Leakage	Landor substitutes conventional grey fertiliser with low carbon fertilizer inventory. Total fertilizer supply, formulation, and distribution remain unchanged.	Negligible
Activity-Shifting	No production is relocated; existing manufacturing pathways are simply decarbonized.	Not applicable
Farmer Use / agronomic leakage	Fertilizer characteristics and nutrient content are identical; no effect on application rates, yields, or farm practice.	Not applicable
Upstream Energy Leakage	Low carbon fertiliser suppliers rely on dedicated renewable electricity or certified low-carbon pathways; no shift to higher-emission energy systems.	Negligible

5.2.2 Permanence

This project generates avoided emissions, not removals. The reduction is embedded in the fertilizer product at the point of manufacture and is locked in once the product is produced and delivered to Landor. Because the lower cradle-to-gate emissions are a permanent characteristic of the manufactured product and are never stored in a reversible carbon pool:

- Discontinuing the practice in future years would merely return emissions to baseline levels; previously verified reductions remain valid.
- Under PM.0002, permanence risk does not apply to this project type, and under Proba Standard version 1.5 no buffer contribution is required for insetting projects without reversal risk. Residual operational risks (data quality, reporting errors), which are unrelated to reversal, are managed through the project's MRV controls rather than a buffer (see Sections 6.3 and 10.2).

Thus, the project's emission reductions are inherently permanent.

6. Monitoring, reporting and verification

6.1 Monitoring framework

To ensure consistent and transparent data collection across all interventions, the following table consolidates the monitoring, reporting, and verification (MRV) requirements for methodologies the PM.0002 applied in the project. It outlines the key parameters, data sources, and reporting frequencies used to support emission reduction quantification and verification.

6.1.1 MRV Tables

Pool-level parameters for product-level CO_2e accounting and issuance ceiling (Landor inventory)

Index	Category name	Subcategory name	Description	Evidence required for baseline	Evidence required for project	Frequency of reporting
P1.1	Fertilizer procurement	Product identification	Name, grade/SKU, and nitrogen content (%N) of each fertilizer product procured by Landor during the accounting period	Product specifications or supplier technical data sheets for standard & low-carbon products.		Updated for every accounting period
P1.2		Quantities procured	Total quantity (tonnes) of each fertilizer product procured, broken down by supplier and product type	Landor ERP procurement records for low-carbon products		
P1.3		Supplier PCFs	Cradle-to-gate product carbon footprint ($kgCO_2e/kg$ product) for each procured fertilizer product	Industry/peer-reviewed default PCFs or supplier-disclosed PCFs for conventional reference products. See Section 4.2.2	Third-party verified or supplier-disclosed PCFs for low-carbon products, with supporting documentation. See Section 4.2.2	
P2.1	Inventory accounting	Quantities sold	Total quantity (tonnes) of each fertilizer product sold to farmers during the accounting period	Landor ERP sales records		
P2.2		Inventory balance	Opening and closing stock of each fertilizer product for the accounting period, to support roll-forward reconciliation	Landor ERP inventory records		
P3.1	Pool-level emission accounting	CO_2e reduction ceiling	Total verified emission reduction (tCO_2e) calculated from substituted product quantities and PCF deltas. See Section 4.4, Step 1	N/A (ceiling is defined by the difference between baseline and project PCFs)	Calculation output from Step 1, supported by P1.2 and P1.3 data: - Total A1 - CO2e Reduction (tCO2e) from: Landor_Virtual_Allocation_L1+2.xlsx	

P3.2		Substituted nitrogen mass	Total nitrogen mass (tN) contained in substituted low-carbon fertilizer products, used as the allocation denominator for ERF derivation. See Section 4.4, Step 2	N/A	Derived from P1.1 (%N) × P1.2 (quantities) for substituted products only: - Total A1 - Substituted N (tN) from:Landor_Virtual_Allocation_L1+2.xlsx	
P3.3		Emission Reduction Factor (ERF)	Pool-derived ERF (tCO_2e/tN), calculated as ceiling ÷ substituted nitrogen mass. See Section 4.4, Step 2	N/A	Calculation output from Step 2, supported by P3.1 and P3.2 - Maximum ERF (tCO2e/tN) from Landor_Virtual_Allocation_L1+2.xlsx	
P4.1	Allocation reconciliation	Asset/Farmer identification	Record of the farmers interventions	Layer 2 (Virtual Allocation) tab Appendix A; exported to the JSON data file	Layer 2 (Virtual Allocation) tab Appendix A; exported to the JSON data file	
P4.2		Total allocated reductions	Sum of all crop/LMU-level allocations (tCO_2e) for the period, confirmed ≤ ceiling (P3.1). See Section 4.4, Step 4	N/A	Reconciliation report cross-referencing farm-level allocation table and pool ceiling: - Total Allocated (tCO2e) from Landor_Virtual_Allocation_L1+2.xlsx	
P4.3		Effective ERF applied	ERF actually used for allocation after ceiling safeguard (tCO_2e/tN), confirmed ≤ maximum ERF (P3.3). See Section 4.4, Step 4	N/A	Calculation output from Step 4: Effective ERF (tCO2e/tN) from Landor_Virtual_Allocation_L1+2.xlsx	

Farm and crop-level parameters for nitrogen-based allocation of emission reductions to LMUs.

Index	Category name	Subcategory name	Description	Evidence required for baseline	Evidence required for project	Frequency of reporting
B1.1	Crop type		Type of crop being cultivated	N/A - counterfactual baseline; see 4.3 and 4.4	JSON file containing (input) data for all LMUs	Reconfirmed or updated for every verification

Index	Category name	Subcategory name	Description	Evidence required for baseline	Evidence required for project	Frequency of reporting
B1.2	Fertilizer	Fertilizer's PCF	Cradle to gate emissions	For the specific requirements see section 4.1 Intervention in scope - PCF should be third part verified or conservative industry/peer-reviewed values should be adopted		
		Type	Fertilisers name, if blend give description which allow PCF allocation ...	N/A - counterfactual baseline; see 4.3 and 4.4	JSON file containing (input) data for all LMUs. Proof of purchase and product label (upon request)	
		Nitrogen rate	N percentage in each fertilizer expressed in percentage	Farmer log, fertilizer product description	Farmer log, fertilizer product description	
		Application rate	Amount applied per farm & Crop used in an emission reduction claim	N/A - counterfactual baseline; see 4.3 and 4.4	JSON file containing (input) data for all LMUs. On request: Landor's ledger of low carbon fertiliser accounting (Section 4.4).	
B1.3	Crop yield	-	Tons harvested per crop	N/A - counterfactual baseline; see 4.3 and 4.4	JSON file containing (input) data for all LMUs Proof of crop yield productivity (e.g., crop insurance reporting records)	

6.2 Reporting and Verification

Monitoring Report

Before verification, Landor will prepare and submit all relevant input data for each Crop (At the Land management unit level):

- Landor will compile all input data at the LMU level which is then structured into a JSON file and imported into the Proba platform
    - For the first crediting year this is a joint effort: Landor delivers the input data and Proba generates the JSON file from it. From the second year onward, Landor will own the process.
- This file will be imported directly into the Proba platform to quantify the impact.
- The input data will also be attached to the monitoring report that will be used for verification and published on the registry.

The monitoring report, together with the underlying data files, is submitted through the Proba platform and made available to the accredited VVB ahead of each Verification Event, in accordance with *Proba Standard Section 2.5*.

A public-facing version of each monitoring report will be published on the Proba Registry (*Proba Standard Section 5.4*). Where commercially sensitive data is involved, a redacted version will be prepared, with a clear statement of what has been withheld.

Site inspection and verification plan:

As the intervention is upstream and document-based, verification centres on records rather than field visits: (i) inspection of Landor's ERP procurement and sales records and the inventory pool ledger; (ii) review of supplier PCF documentation and attestations; and (iii) sample checks of farmer application logs and buyer sourcing records substantiating fertilizer rate and crop yield. The sampling approach and any on-site inspection are agreed with the VVB and documented before each verification event (PM.0002 §6.3).

6.3 Managing data quality

As a project developer, Landor is responsible for the collection, preparation, and quality assurance of all MRV data used in this project. This data forms the basis for the

quantification of GHG emission reductions and the issuance of emission reduction certificates on the Proba platform.

6.3.1 Data exchange and processing

The MRV data, Landor provides, includes all data required under the applicable methodologies:

- LMU identifiers and for each Crop
- Inputs used in both the baseline and project scenarios (standard grey & low carbon fertilizers)
- Crop types and associated yields
- Fertilizer product application rates (kg product per LMU) and derived nitrogen application rates (kg N per LMU).

This data is sourced from a combination of centralized systems within Landor and structured data collection from participating farmers. To ensure consistency and compatibility, all data is compiled using Proba's standardized JSON template prior to submission to the Proba platform. The template contains all MRV data required for the quantification of the estimated and realized impact.

6.3.2 Data quality assurance

Landor applies a structured internal process to safeguard the quality of all submitted MRV data:

- **Four-eyes principle**: The input data Landor provides (ERP procurement/sales records and farm-level application data) are reviewed by a second team member before being processed. In the first crediting year Proba generates the structured JSON file from that input (see Section 6.2), so the control is a review of the source data, not of hand-edited JSON.
- **Traceability**: Each dataset is linked to a specific LMU and crop season, ensuring clear auditability from farm-level data to certificate issuance.

Landor will retain all monitoring records, input data, and supporting documentation for the duration of the crediting period plus five additional years, in accordance with *Proba Standard Section 4.2*.

7. Certificate issuance, claiming and reporting

7.1 Issuance of emission reduction certificates

Emission reduction certificates are issued by Landor through the Proba platform once quantification and verification has been completed.

Each certificate corresponds to a verified emission reduction of one tonne CO_2e, and is uniquely linked to:

- The Land Management Unit / crop to which the verified reduction is allocated for value-chain attribution (traceability link).
- The crop type involved (Section 2.2 - Eligible Crops)
- The intervention(s) applied (referenced via metadata)
- The growing season
- A full audit trail of input and output values used in the quantification

Each certificate carries metadata that includes the following available metrics:

- Total GHG emissions reduced (tCO_2e)
- GHG emissions per tonne of crop produced (emission intensity)
- Cradle-to-gate emissions of applied inputs (grey and low carbon fertiliser)
- Crop yield (tonnes per crop)
- Date of issuance and verification entity

Certificates are registered on the Proba platform registry, and can subsequently be transferred or claimed and retired.

7.2 Attribution of certificates

Attribution is about assigning rights to emission reduction certificates and is the act of designating who enabled the emission reduction based on causality and proof of sourcing. Attribution is only available to buyers who are linked to the crop specific value chains and are positioned upstream to demonstrate sourcing of the relevant crops.

Certificates cannot be claimed by downstream parties who are not in a position to demonstrate causality or sourcing at the commodity level.

7.2.1 Causality

To maintain environmental and accounting integrity of the project, causality must be demonstrated before a buyer can claim certificates as part of their Scope 3 emission reductions. This ensures that buyers only claim reductions they have genuinely enabled and that no free-riding or double claiming occurs.

In this project, causality is established through a declaration made by the project developer at the point of certificate transfer. This declaration confirms that the buyer intended to source from the project area, financially supported the implementation directly and has not claimed the same reductions under any other registry or scheme

The Proba platform performs a causality eligibility check as a supporting mechanism for the buyer's auditor. The full demonstration and verification of causality, however, remains the responsibility of the buyer's auditor when validating claims in Scope 3 reporting. To illustrate the operation of the causality eligibility check, the transfer process from certificate issuance to retirement is summarized below.

1. Project developer can issue verified emission reduction certificates after the VVB has completed the verification;
2. Project developer initiates a certificate transfer to a designated buyer;
3. The causality eligibility check is triggered as part of the transfer process. The project developer is asked to confirm the following three declarations:
    - **Contractual relationship**: a contractual relationship exists between the project developer and the designated buyer covering the sourcing of emission reductions from this project;
    - **Pre-project relationship**: the buyer's involvement or financial support was in place prior to or during project implementation, not acquired after the fact;
    - **No duplicate claims** — the emission reductions being transferred have not been claimed, and will not be claimed, under any other registry or certification scheme.

4. The declarations are recorded on the Proba platform and stored securely for audit and compliance purposes.
5. Buyer receives the certificates

7.2.2 Proof of sourcing

In parallel with causality, proof of sourcing is required before a buyer can claim and retire certificates. As physical traceability of each crop unit is not feasible, the project applies a mass balance approach, ensuring that the total crop volume declared by buyers does not exceed the total crop volume produced within the project in the same season.

1. **Step 1: Buyer initiates retirement of certificates**
2. **Step 2: Source volume declaration** The platform presents the buyer with the crop name and total crop volume linked to the credit bundle. The buyer is required to confirm (by ticking a declaration) that their organisation sourced this volume of crop from the project during the 2025 crop season.
3. **Step 3: Retirement** Once the source volume declaration is completed, the platform proceeds to the retirement screen. The buyer may optionally add a retirement note before finalising.

If both causality and proof of sourcing checks are passed, the buyer's attribution is finalized. The certificates will be retired and may then be included in GHG reporting.

7.3 Reporting of emission reduction certificates

Each buyer who is attributed emission reduction certificates may report them in the context of their Scope 3 GHG emissions, particularly under Category 1: Purchased Goods and Services. The reporting options will be through Absolute Emission Reductions: Buyers may report the total volume of CO_2-equivalent reductions achieved through the project (i.e. the total number of emission reduction certificates attributed to them) as a standalone contribution to supply chain decarbonization.

8. Environmental and Social Safeguards

8.1 Do No Harm Assessment

The Project complies with the "Do No Harm" principle required for GHG mitigation activities under the Proba Standard. This principle ensures that climate action does not cause unintended negative social or environmental consequences. To demonstrate compliance, Landor has completed a review using the *Proba Sustainable Development Benefits and Safeguards* framework. This includes assessing whether the project activities may introduce any environmental or social risks and identifying mitigation measures where relevant. The completed safeguard assessment is included in Appendix B of this document.

8.2 SDG Benefits (Co-Benefits)

The project aims to contribute to the following SDGs.

SDG	Contribution
SDG 2 – Zero Hunger	Maintaining yields while limiting (the carbon footprint of) inputs.
SDG 9 - Industry, Innovation and Infrastructure	Stimulating decarbonization of fertilizer production
SDG 12 – Responsible Consumption and Production	Increasing input use efficiency in Agricultural systems.
SDG 13 – Climate Action	Reducing GHG emissions in crop cultivation.

9. Stakeholder Engagement

9.1 Stakeholder Identification

Stakeholders:

Group	Role / Interest	Affect	Engagement Mode
Landor / fenaco	Project owner/operator; EHS & supply; data to MRV	Direct	Bilateral working sessions; internal approvals
Downstream buyer	Value-chain partner; attribution & claims	Direct	Structured meetings; agreement(s); registry onboarding
Farmers / LANDI co-ops	Receive identical fertilizer; no practice change	Indirect	
VVB: **Ceres Cert**	Independent verification	Indirect	Formal validation/verification
Proba (Standard & Registry)	Standard oversight; issuance/retirement	Indirect	Methodology alignment; platform workflows
Suppliers (low-carbon nitrogen-based fertilizers)	Upstream low-carbon input	Indirect	See Appendix A

9.2 Stakeholder Consultation Methods

Stakeholder consultation was conducted by Landor during project development and onboarding. The methods used included:

- **Engagement with agri-buyers** through structured meetings and bilateral discussions, aligning project goals with buyers' Scope 3 emission reduction targets.

- **Supplier coordination** through meetings and discussions to confirm input specifications and alignment with Proba's requirements for product carbon footprints.
- **Documentation of agreements** including offtake letters to formalize stakeholder roles and secure mutual understanding.
- **Public consultation** by publishing the Project Overview Document (POD) on the Proba website, providing an opportunity for any interested stakeholders to review the project design and submit comments before final validation.

9.3 Summary of feedback

Summarize the stakeholder feedback received before and after the POD was published for public consultation.

– Provide a brief overview of the main points raised by stakeholders (supportive comments, concerns, or suggestions).

– You do not need to include all details here — instead, refer to the stakeholder feedback document published on the Proba registry, which contains the full record of comments received.

– Confirm that the consultation process was carried out in accordance with the Proba Standard.

9.4 Ongoing stakeholder engagement

Cadence & channels

- Yearly project check-ins (Landor–Buyer–Proba) on volumes, issuance/retirement timelines.
- Supplier E&S/PCF updates upon change.
- Registry transparency: issuance/transfer/retirement visible.

Grievance & support

- The grievance process follows the Proba Standard guidelines.
- Any stakeholder may raise a concern related to the project by contacting Landor's project manager at damian.santschi@landor.ch.

    - Concerns may relate to data accuracy, environmental or social impacts, or the conduct of project activities.
- All grievances and their resolution are logged and made available to the VVB during verification.

Assurance

- VVB can review Stakeholder Log, consultation materials, and registry records; corrective actions tracked.

10. Risk assessment

10.1 Identification and mitigation measures

Project-specific risk name/type	Potential negative impact	Mitigation measure(s)
Risk of supplier underperformance	Lower GHG reductions if supply volume or carbon intensity of low carbon fertiliser underdelivers.	Supplier contract includes minimum volume and carbon intensity targets; alternate supplier identified; conservative issuance (ex-post only).
Risk of regulatory or accounting changes	Change in eligibility or claim framing (e.g. new SBTi or GHG Protocol guidance).	Continuous policy monitoring; adaptive claim framework; maintain registry transparency to demonstrate compliance.
Risk of PCF data quality	Supplier provides inaccurate or unverifiable PCF, leading to over-credited emission reductions.	PCFs must be third-party verified or based on conservative industry defaults (Section 4.2.2). Where supplier PCFs cannot be verified, conservative default values are applied. VVB reviews PCF documentation during verification.
Risk of crop-to-buyer linkage failure	Crop produced on eligible farms cannot be demonstrably shown to enter the buyer's supply chain, invalidating the insetting claim.	Buyer must provide procurement records and volume declarations before certificate retirement (Section 7.2.2). Platform reconciliation check confirms crop volumes match. Inset Units remain unretired until linkage is demonstrated.
Manual data entry / transcription error	Incorrect data reported	Four-eyes review plus Proba-generated JSON file (see Section 6.2 and 6.3.2)
Allocation flexibility / mis-allocation of reductions	Discretion in allocating pool-level reductions to crops and LMUs could in principle over-allocate or misattribute reductions.	Total allocation is capped by the pool-level CO_2e ceiling; the allocation register applies automated integrity checks (allocated ≤ maximum; nitrogen allocated ≤ nitrogen actually applied); Inset Units are issued only against signed downstream agreements (Section 2.4); and crop-volume reconciliation (Section 7.2.2) prevents over-claiming.

10.2 Buffer Pool

Under Proba Standard version 1.5, insetting projects that deliver non-reversible emission reductions are not required to contribute to the Proba Buffer Pool. The buffer exists to cover reversal (permanence) risk; this project produces a one-off, upstream fertilizer-production reduction that is locked in at manufacture and cannot be reversed (see Section 5.2.2), so permanence and reversal risks do not apply and no buffer contribution is made. Residual operational risks such as data or reporting errors that could affect the validity of issued Inset Units, are managed through the project's MRV controls rather than a buffer: four-eyes review of input data, Proba-generated quantification, conservative ex-post issuance, and independent VVB verification at each event (see Sections 6.3 and 10.1). Buyers remain responsible for correctly reporting the Inset Units in their own Scope 3 inventories.

Appendices

Appendix A: PCF data, pool-ceiling calculation and farm-level allocation register

Appendix A is the project's operational ledger, provided as the live workbook Landor_Virtual_Allocation_L1+2.xlsx. It reproduces the accounting logic applied by the Proba platform and implements the chain-of-custody ledger of Section 2.5 and the four-step quantification of Section 4.4; it is used both to gather and structure project data and to help Landor allocate reductions to farmers. The Proba platform remains the system of record for official quantification and certificate issuance (Sections 6.2 and 7). All figures recalculate automatically; data is entered only in the coloured input cells. The workbook has five tabs:

- **Tab 0: "Read Me":** orientation, data-flow diagram, and colour key (which cells are manual inputs, which are locked formulas).
- **Tab 1: "A1 Green Procurement" (Table A1):** the substituted pool. Each row pairs a low-carbon (green) product with its conventional (grey) counterpart and their verified PCFs (tCO_2e per tonne of product), the nitrogen content (%N), and the quantity procured. From these it computes the period's total CO_2e reduction ceiling and substituted nitrogen mass (tN). This tab — and only this tab — sets the ceiling.
- **Tab 2: "A2 Grey Procurement" (Table A2):** the non-substituted grey products Landor also sells, with reference PCFs, recorded for mass-balance completeness and leakage control. It does **not** feed the ceiling or the ERF.
- **Tab 3: "Master Reconciliation Engine":** the automated engine. It carries the ceiling and substituted N up from Tab 1, derives the Maximum ERF (ceiling ÷ substituted N), applies the ceiling safeguard to produce the Effective ERF actually used, and reports total allocated and remaining (unallocated) reductions. No manual entry.
- **Tab 4: "Layer 2 Virtual Allocation":** the farm-level allocation register. One row per farm/crop records location, area, yield, the actual nitrogen applied (kg N/ha, with a reference to the supporting farm record) and the green nitrogen allocated to the farm (tN), and returns the CO_2e reduction allocated (N ×

Effective ERF), the counterfactual baseline and project emissions, the per-tonne-of-crop intensity, and built-in integrity checks (allocated nitrogen ≤ actual nitrogen applied; total allocated nitrogen ≤ pool).

PCF sources and assignment rules are documented in-sheet (Tab 2 notes): substituted-product PCFs use supplier or third-party-verified values (e.g. DNV certificates) where available; reference PCFs for non-substituted products follow Brentrup et al. (2018) Table 1, applied conservatively per Section 4.2.2 and 4.5. Current figures are an illustrative worked example pending the first full season of confirmed quantities and supplier PCFs.

Appendix B: Proba Sustainable Development Benefits and Safeguards

The Project Developer is required to assess the GHG project's impact on each environmental and social risk described in the table below.

Criteria	Risk relevant to the project	Response to safeguard requirements (incl POD references)
1. Assessment and management of environmental and social risks	Yes	No new E&S risks introduced. Intervention is limited to upstream fertilizer production — application rates, product chemistry, and farming practices are unchanged. Risks reviewed annually via MRV; see Section 10.
2. Labour rights and working conditions	No	
3. Resource efficiency and pollution prevention	Yes	No change in field-level nutrient application rates, timing, or run-off risk. Green products are functionally equivalent to their conventional counterparts. The improvement is exclusively upstream (production process).
4. Land acquisition and involuntary resettlement	No	
5. Biodiversity conservation and sustainable management of living natural resources	Yes	No change in farming practices, land use, or crop rotation. Participating farms comply with Swiss direct payment cross-compliance requirements, which include existing biodiversity obligations.
6. Indigenous Peoples, Local Communities, and cultural heritage	No	
7. Respect for human rights, stakeholder engagement	Yes	The project operates within Switzerland's regulatory framework. No obligations imposed on farmers. Stakeholder identification, consultation, and grievance process documented in Section 9.
8. Gender equality	No	

9. Robust benefit-sharing	No	
10. Ensuring positive SDG impacts	Yes	Contributes positively to SDGs 2, 9, 12, and 13 (see Section 8.2). No adverse SDG trade-offs identified.