Project Overview Document

Bencros: Repurposing Rubber Materials for Marine Fender and Rubber Compound Production

Project ID: PROBA.2025.0003 | Version 1.0 | July 2026

Author: Joost Komijn, Bencros

Table of Contents

List of Definitions

For a full overview please refer to the Proba Standard. Definitions introduced or clarified for this project are listed below.

Term	Definition
Additionality	The principle that a carbon reduction project must deliver GHG emission reductions that would not have occurred in the absence of the project, beyond a business-as-usual scenario or existing regulatory requirements.
Baseline (scenario)	The hypothetical reference case, and related GHG emission sources, that best represents the conditions most likely to occur in the absence of the proposed GHG project.
Beyond Value Chain Mitigation (BVCM)	Mitigation action, or the resulting emission reductions, that occurs outside a company's own value chain. Under GHG Protocol and SBTi guidance, such reductions are reported separately and are not netted into the company's inventory or product carbon footprint.
Buffer Pool	A reserve of carbon credits established to cover potential losses in GHG projects, sized in line with the reversal risk associated with the project.
Chain of Custody (CoC)	The documented model by which the physical flow of material and the associated emission reduction claim are tracked from origin to the final claiming entity. Models include mass balance, book-and-claim, and direct physical traceability.
Conservativeness	The use of conservative assumptions, values, and procedures to ensure that GHG emission reductions are not over-estimated.
Crediting Period	The defined period during which a GHG project is eligible to generate and issue carbon credits for the emissions it reduces. It may be renewed subject to re-validation.
Insetting	The practice of implementing sustainability interventions within a company's own value chain to reduce GHG emissions, as distinct from offsetting, which supports reductions outside the value chain.
Leakage	The unintended increase in GHG emissions outside the project boundary that results directly from the project's activities.
Permanence	The assurance that the reductions achieved by a GHG project will remain effective and will not be reversed over time.
Uncertainty	The degree of doubt associated with the estimation of GHG emissions, removals, or reductions, arising from variability in measurements, calculations, and assumptions.
Waste Recovery	The use of wastes as an input material to create valuable products as new outputs, with the aim of reducing the amount of waste generated.

List of Abbreviations

Abbreviation	Definition
BVCM	Beyond Value Chain Mitigation
CB	Carbon Black
CoC	Chain of Custody
CP	Crediting Period
EF	Emission Factor
EOL	End of Life
GHG	Greenhouse Gas
GLEC	Global Logistics Emissions Council
LCA	Life Cycle Assessment
MRV	Monitoring, Reporting, and Verification
NR	Natural Rubber
PCF	Product Carbon Footprint
POD	Project Overview Document
SDG	Sustainable Development Goal
SR	Synthetic Rubber (also: Substitution Ratio, in context)
UC	Unvulcanized (rubber) Compound
VVB	Validation and Verification Body
WTW	Well-to-Wheel

1. Project Description

1.1 Summary of the Project

The Bencros project addresses the greenhouse gas (GHG) emissions associated with the production and disposal of rubber. Marine fender manufacturers, and the wider technical rubber sector, traditionally rely on virgin rubber compound as the preferred input material. At the same time, large volumes of industrial rubber compound waste are incinerated or otherwise disposed of, producing avoidable emissions.

Bencros recovers tyre rubber compound waste, technical compound waste, and vulcanized rubber, and reprocesses them into specification-grade secondary compound. That compound is used to make two products: marine fenders, which are the only product credited in the retroactive and first regular crediting years, and, from 2026 onward, unvulcanized rubber compound sold directly to third-party buyers. Each Bencros product displaces the equivalent virgin product on a one-to-one basis: a tonne of Bencros marine fender replaces a tonne of virgin marine fender, and a tonne of Bencros unvulcanized compound replaces a tonne of virgin unvulcanized compound.

The intervention delivers two independent reduction mechanisms.

- First, avoided virgin production: because the Bencros product substitutes the full virgin equivalent, the cradle-to-gate material emissions of the displaced virgin product are avoided.
- Second, avoided incineration: rubber waste that would otherwise have been incinerated in its source region is diverted into the recovery process, avoiding the associated fossil CO2 emissions.

The project applies the PM.0006 methodology developed under the Proba Standard, which quantifies emission reductions from waste recovery used to displace virgin materials or energy inputs. Crediting follows the insetting pathway of PM.0006 exclusively: the verified reductions are claimed within the value chain by the purchasers of Bencros products, as described in Sections 2.4, 2.5, and 7.

Actual processed volumes and verified emission reductions for any period are reported in the periodic monitoring reports verified by the Validation and Verification Body (VVB). This document sets out the method, boundaries, emission factors, parameters, and ex-ante expectations only.

Parameter	Value
Methodology developer	Proba World BV
Methodology ID	PM.0006 v1.0
Methodology title	Use of Waste Recovery to Transition to a Circular Economy
Website	https://proba.earth/waste_recovery_methodology
Approved by Proba?	Yes, developed by Proba

1.2 Project Objectives

The project pursues the following objectives:

- **Generate verified GHG reductions**: deliver credible, traceable, and verified Scope 3 emission reductions for the value chain partners that purchase Bencros marine fenders and unvulcanized rubber compound, in alignment with the Proba Standard, the GHG Protocol, and SBTi guidance.
- **Repurpose rubber waste**: divert EU tyre-compound and other rubber waste streams from incineration and landfill into new products, thereby avoiding end-of-life emissions and lowering demand for virgin rubber.
- **Advance circular rubber models**: develop a scalable circular-rubber solution that balances costs and benefits across the value chain, enabling wider adoption across the rubber and marine-fender industries.
- **Enable collaborative financing**: involve fender manufacturers and rubber-compound buyers in co-financing mechanisms that support waste diversion, processing, and market uptake of recycled compounds.
- **Improve product carbon footprint**: reduce the embodied carbon of both credited products by replacing virgin rubber compound with recovered compound.

1.3 Project Timelines

The crediting period runs from 1 January 2024 to 31 December 2028 (5 years), renewable in accordance with PM.0006 §1.5. The start date is anchored to the date on which Bencros first submitted its expression of interest in the feasibility study (February 2024), which constitutes documented evidence of the intent to utilise carbon finance and satisfies the PM.0006 §1.5 retroactive crediting requirement.

Retroactive crediting is applied from 1 January 2024, within the maximum one-year retroactive window from the earliest feasibility-study submission. Renewal of the crediting period requires full re-validation, including reassessment of additionality, baseline, and compliance with the then-current version of PM.0006.

Milestone	Start Date	End Date	Notes
POD validation	July 2026	August 2026	Pending on actual validation report
Retroactive crediting period	01 January 2024	31 December 2024	Anchored to feasibility study submission (February 2024)
Regular crediting period	01 January 2025	31 December 2028	5-year crediting period per PM.0006 §1.5
Annual verification	July 2026	31 December 2028	Frequency: yearly. The first verification covers the combined retroactive (2024) and 2025 periods; annual verification thereafter.

1.4 Project Stakeholders and Roles

Role	Organisation	Responsibilities
Project Developer	Bencros s.r.o., Nabr. L. Štúra 1173/25, 956 18 Bošany, Slovakia. ID: 45375283. VAT ID (IČ DPH): SK2022961413. E-mail: sales@bencros.com	Coordinates the overall project, implements interventions, oversees monitoring and reporting.
Value Chain Partners (buyers)	To be confirmed	Purchasers of Bencros marine fenders and, from 2026, unvulcanized rubber compound. Claim the verified Scope 3 emission reductions within their own value chain (insetting).
Validation & Verification Body (VVB)	Bureau Veritas	Conducts independent validation of the POD and verification of repurposing activities and related GHG reductions.
Regulatory & Local Authorities	Slovak Environmental Agency	Oversee waste-management compliance and enforce EU waste directives locally; issue permits; monitor environmental safeguards.

Bencros is Europe's largest manufacturer of rubber fenders, supplying ports, harbours, tug builders, and shipyards across more than three continents. Operating from its production facility in Slovakia, the company produces a broad range of fender types for marine, offshore, industrial, infrastructure, and agricultural applications, and exports regularly to North and South America, the Middle East, Africa, and Australasia. The company employs over 100 people across 6,000 m2 of production space and across 21,000 m2 total space. Circularity is embedded in its manufacturing model: the company actively collects tyre and technical compound waste streams and end-of-life rubber, including used fenders recovered from customers, and reprocesses it as feedstock for new production. The rubber waste recovery project described in this POD formalises and extends this integrated approach, diverting tyre compound waste, technical compound waste, and vulcanized rubber from incineration and converting it into specification-grade secondary compounds.

1.5 Applicability of the Methodology

The methodology PM.0006 (Use of Waste Recovery to Transition to a Circular Economy, Proba World BV) is applicable to this project. The key applicability criteria and how this project satisfies them are set out below:

- The project applies under the waste recovery scope, supporting the transition to a circular economy.
- Waste recovery here means converting discarded rubber compounds into marine fenders and into unvulcanized rubber compound, displacing virgin rubber and preventing end-of-life emissions.
- The waste is collected and diverted from incineration, the baseline disposal route for the relevant streams, thereby avoiding GHG emissions.

- Emission factors are specific to the project's processes, avoided virgin material use, and waste streams.
- The project applies the insetting pathway of PM.0006. The verified reductions are claimed within the value chain by users of Bencros products (see Sections 2.4 and 2.5).
- Both mechanical and chemical processes are eligible; this project applies mechanical recycling at the Slovak facility.
- Emission reductions are assessed using two functional units: one tonne of marine fenders produced, and one tonne of unvulcanized rubber compound produced, each compared against its virgin counterpart, ensuring a fair comparison between baseline and project scenarios.
- All recovered waste is quantified at the facility's exit gate using mass-balance methods applied where intermediate products are generated.
- Non-recoverable residues are managed responsibly and in compliance with applicable regulations.
- The project is not combined with other programs or methodologies, and adheres to the Proba Standard.

Screening assessment per stream (PM.0006 §1.2):

Stream	GHG Impact Potential	Contamination Level	Recovery Potential
Stream 1: Tyre rubber compound (TIA to TIE)	High: fossil-based rubber incineration releases CO2	Low: post-production off-spec compound; controlled provenance	High: mechanical reprocessing yields high-quality feedstock
Stream 2: Technical compound waste (TEA to TEC)	High: 24% of TEB/TEC destined for incineration	Low: post-production waste, traceable to manufacturing sites	High: functionally equivalent to virgin compound after processing
Stream 3: Vulcanized rubber (VG, VR)	Medium to High: approximately 46.5% incineration share for end-of-life tyre fractions	Low to Medium: sorted vulcanized fractions; no hazardous content	Medium: requires additional processing; recoverable into granulate (VG) and fine powder (VR)

Minimum 5% reduction requirement. The requirement is satisfied for both products by a wide margin, tested per functional unit on the production component (the fixed component of the reduction factor, being the displaced baseline PCF less the project transport emission):

- Marine fender: (2.6241 minus 0.2022) / 2.2234 = 92.3% of the baseline production emission.
- Unvulcanized rubber compound: (2.6241 minus 0.2022) / 3.3980 = 92.3% of the baseline production emission.

Both comfortably satisfy the minimum reduction requirement per PM.0006 §1.3.1.

1.6 Eligibility

The eligibility requirements of PM.0006 §1.3 are satisfied for both products and all three streams:

- **Eligible waste types**: all streams consist of post-production waste, i.e. by-products generated during manufacturing at rubber compound facilities.
- **Not hazardous**: the rubber compound and vulcanized rubber streams are not classified as hazardous under the Basel Convention or the EU Waste Framework Directive (2008/98/EC).
- **Not EPR-mandated**: no Extended Producer Responsibility scheme mandates the recovery of these specific rubber streams in the relevant jurisdictions.
- **Not mixed MSW**: all streams are source-segregated industrial waste, not mixed municipal solid waste.
- **Minimum GHG reduction**: both products achieve well above 5% net reduction per functional unit (see §1.5).
- **Functional equivalence**: recovered compound meets the same technical specification as virgin compound; marine fenders made from it meet the same specification as virgin-rubber fenders; the substitution ratio SR = 1. Bencros can provide technical specifications, QA test results, and reference service life data to the VVB upon request.

The details of this page have been redacted

The details of this page have been redacted

Mitigation route	Streams / products concerned	How the emission reduction is generated
Full-product substitution	All streams; both products	Bencros marine fenders replace virgin marine fenders, and Bencros unvulcanized compound replaces virgin unvulcanized compound, on a one-to-one basis. The full cradle-to-gate material emissions of the displaced virgin product are avoided.
Waste-disposal diversion (avoided incineration)	Stream 1 (grade TIE only), Stream 2 (TEB, TEC), Stream 3 (VG, VR)	Off-spec or end-of-life rubber that would otherwise be incinerated is rerouted to Bencros, avoiding CO2 emissions from combustion of fossil-based carbon content.

The process diagram of the facility is as follows:

The details of this page have been redacted

Bencros confirms that the environmental benefits of the waste streams and of the products sold before certification have not already been accounted for by existing customers, for example through a lower marine fender PCF communicated to those customers. Certificates and low-carbon product attributes are never claimed simultaneously for the same volumes. Bencros restates this as an explicit declaration embedded in each monitoring report.

2.4 Project Additionality

Additionality is assessed for the insetting pathway per PM.0006 §1.4. For the insetting scenario, the POD must transparently document prevalence additionality and provide an explanation that carbon finance positively affects the use of the waste recovery method. Regulatory additionality is retained below as supporting context, together with the standing obligation to disclose any regulatory changes affecting additionality at every verification.

Market research basis.
To substantiate the additionality assessment, Bencros commissioned independent market research from Kosmo Research (June 2026). The study comprised two surveys covering the segments relevant to the intervention: manufacturers and distributors of marine port-protection systems across Northern Europe, and technical rubber manufacturers. Senior practitioners in each segment were contacted directly, with structured follow-up, and responses are reported in aggregated, anonymised form. The research quantifies scrap disposal routes, benchmarks sustainability commitments, and maps the barriers to and adoption of recovered rubber in maritime and technical-rubber applications. The target population is structurally narrow, dominated by a small number of large, globally active manufacturers, so the sampled contacts represent a material share of sector capacity; the figures are informed practitioner estimates rather than audited data. Detailed findings are set out in the report; the relevant outcomes are drawn on in Sections 2.4.2 and 2.4.3.

2.4.1 Regulatory Additionality

The project activity is not required by law or regulation. While the EU Circular Economy Action Plan (CEAP) promotes increased material circularity with a target to double the circular material use rate to 23% by 2030 (from 11.5% in 2020), as of 2022 zero measurable progress had been achieved and no legal mandates require the use of recycled rubber in marine fenders or in industrial rubber products more broadly. No EU or national regulation mandates the recovery of these specific rubber waste streams or their use in fender or compound production. The project intervention is therefore ahead of the regulatory landscape and meets regulatory additionality. In accordance with PM.0006 §1.4, Bencros will confirm at every verification whether any regulatory change has occurred that may affect the project's additionality.

2.4.2 Prevalence Additionality

The use of recycled rubber in marine fenders is not industry standard. Sector evidence confirms a strong preference for virgin rubber on quality grounds: Trelleborg's published technical guidance states that the TGA (Thermo Gravimetrische Analyse) test determines whether fenders have been produced using a technically superior rubber formulation, one that includes little or no recycled rubber. Adoption

The details of this page have been redacted

- **(i) Value chain scope. Tier by tier**: waste generators (rubber and tyre plants in France, Poland, and the UK); transport to Slovakia; Bencros recovery and manufacturing in Slovakia; product buyers (fender purchasers, and unvulcanized compound purchasers from 2026); and end users.
- **(ii) CoC model. Direct physical traceability**. This model is justified because Bencros sells the physical product directly to the claiming buyer. Emission reduction certificates are attached to delivered product volumes and retired on the Proba blockchain registry against the specific buyer.
- **(iii) Traceability mechanism**. ERP item-code-level movement registers track material from waste receipt through to consumption, supplemented by internal mass balance at Bencros (material in versus product out), together with the Proba registry, which records a unique ID and full transfer history for each certificate. Proba requires a declaration of causality during transfer of the certificate and a proof of sourcing during claiming of certificate.
- **(iv) No double allocation**. A tonne of product carries at most one certificate-backed claim.

2.6 Planned Scope Extension: Stream 4, End-of-Life Marine Fenders (Ex-Ante Provision)

Bencros foresees accepting rubber from decommissioned (end-of-life) marine fenders as an additional feedstock. This stream, designated Stream 4 with workbook grade MFE, is not active in the current monitoring periods and carries no volumes in this POD. This section is an ex-ante provision only: it defines the framework under which the stream will be included, while the stream-specific parameters are established at the time of inclusion and remain fixed for the remainder of the crediting period, in accordance with the PM.0006 temporal boundary rules and the extension-of-scope provisions of the Proba Standard (section 4.3). Activation is notified to the VVB and assessed at the first verification covering the stream.

- Stream definition and eligibility. Grade MFE covers post-consumer vulcanized rubber recovered from marine fenders that have reached the end of their useful life. This is an eligible post-consumer waste stream under PM.0006 §1.3. At inclusion, Bencros documents that (i) the stream is not subject to any Extended Producer Responsibility scheme mandating its collection or recovery, (ii) for imported volumes, recovery of this waste is not mandated by regulation in the jurisdiction of origin, and (iii) cross-border shipments follow the applicable procedure under Regulation (EU) 2024/1157 on shipments of waste.
- Mass accounting. Bencros expects to receive the rubber fraction only. Where whole fenders or partial assemblies are received, non-rubber fractions (steel flanges and embedded plates, chains, polyethylene facing pads, and any contamination) are separated, weighed, and documented, and are excluded from crediting; separated metals are routed to conventional

scrap recycling without credit. Only the net rubber mass, reported on a consumption basis consistent with Section 3.1, enters the quantification.

- Quantification at inclusion. The two mitigation routes of Section 2.2 apply unchanged. Full-product substitution: MFE-derived compound displaces virgin input at SR = 1 and is credited through the production component defined in Section 3.2.3, identically to the existing streams. Avoided incineration: the four-step derivation of Section 3.2.3 applies with the following grade-specific parameters, fixed at inclusion:

Parameter	Value at inclusion	Basis
Carbon content	85% default; evidence-based value may substitute	Consistent with Step 2 of Section 3.2.3
Fossil (synthetic) fraction	0.55 conservative floor; batch-level composition evidence may substitute a higher value	Conservative, since the fender recipe carries carbon black and synthetic rubber fractions implying a fossil share above 0.55
EOL incineration share	Established from fender-specific market evidence following the PM.0006 baseline fate hierarchy (historical, then regional, then national five-year data; otherwise best available representative data, conservatively applied). If no adequate evidence is available at inclusion, the share is set to 0% and no end-of-life credit is claimed for MFE	PM.0006 §2.1; consistent with the zero-credit convention applied to grades TIA to TID and TEA

For the avoidance of doubt, the incineration shares of the tyre-derived and technical streams are not transferable to grade MFE, because the baseline fate of end-of-life fenders (landfill, storage, or incineration) must be evidenced for this stream specifically.

- **Transport.** Collection routes for MFE are added to the transport dataset at inclusion, and the average transport distance in Section 3.2.3 is updated on material change per the monitoring framework in Section 6.1. Baseline transportation is not credited, consistent with the conservative treatment of the existing streams.
- **Additionality and leakage.** No regulation mandates the recovery of end-of-life marine fenders, and recovery prevalence for this stream is negligible, which reinforces the prevalence additionality case of Section 2.4.2. The annual regulatory-change statement covers the new stream from inclusion. MFE volumes count toward the annual leakage tier determination under PM.0006 Table 1.
- **Monitoring additions at activation.** The monitoring report additionally contains, for grade MFE: mass received and consumed net of non-rubber fractions, with separation

records; composition evidence where a fossil fraction above the 0.55 floor is applied; the market evidence supporting the EOL incineration share; collection routes and distances; and supplier identity with chain-of-custody records per batch, supporting the allocation options in the Emission Reduction Allocation and Claiming Guidelines (Section C.5a).

- **Buyer claiming.** Where the party supplying the end-of-life fenders is the party whose own waste or sold-product end-of-life is diverted, the avoided-incineration reduction may sit inside that party's inventory (Scope 3 Category 5 or Category 12). The allocation mechanics, including the separate allocation of the MFE end-of-life component to the waste supplier, are set out in the Emission Reduction Allocation and Claiming Guidelines.

3. Quantification Approach

3.1 Interventions in Scope

The project comprises three waste-stream interventions feeding two product routes, all applying methodology PM.0006 v1.0. Shared applicability criteria:

- **Crediting pathway**: the project applies the insetting pathway, enabling verified Scope 3 reductions within the value chain. Direct mitigation is prioritised in line with SBTi draft guidance; indirect mitigation is applied as a transitional measure where direct chain-of-custody traceability is not yet feasible.
- **Functional units**: one tonne of marine fenders produced, and one tonne of unvulcanized rubber compound produced.
- **Substitution ratio**: SR = 1 (one tonne of recovered compound directly displaces one tonne of virgin compound input). Bencros confirms that products made with recovered compound meet the same technical specifications as those produced with virgin rubber. Supporting documentation can be provided to the VVB upon request.
- **Mass balance**: all recovered waste is quantified at the facility's exit gate using official movement registers (ERP system), with volumes reported as consumption (not receipt), a conservative choice.
- **Conservativeness**: applied throughout, as outlined in Section 3.2.3.
- **Program integrity**: the project is not combined with other programs or methodologies and adheres to the Proba Standard.

3.2 Quantification of Emission Reductions

3.2.1 Baseline Scenario

The baseline scenario represents the GHG emissions that would occur in the absence of the project's waste recovery intervention, i.e. what would have happened under business-as-usual conditions. It consists of two independent components.

Virgin product production displaced. In the absence of the project, buyers would purchase the virgin equivalent product: virgin marine fenders, and, from 2026, virgin unvulcanized rubber compound. Because the Bencros product substitutes the full virgin equivalent on a one-to-one basis, the baseline credits the full cradle-to-gate material PCF of the displaced product. Process emissions (compounding and, for fenders, vulcanization) are excluded from both the baseline and the project scenario, because the virgin counterpart would undergo the same compounding and vulcanization; these emissions therefore cancel out and do not affect the reduction. The two baseline PCFs are built bottom-up from the Trelleborg total-mix recipe:

Recipe component	Mass fraction	Component EF (tCO2e/t)
Antioxidant	3.5%	1.500
Vulcanization accelerator	3.5%	1.500
Functional additive	15%	1.610
Carbon black	35%	3.150
Rubber (marine fender: 50/50 NR/SR)	43% (NR 21.5%, SR 21.5%)	NR 0.671; SR 4.795
Marine fender baseline PCF	100%	2.6241
Unvulcanized compound baseline PCF	100% (assumed same as marine fender)	2.6241

The 50/50 Natural Rubber (NR) to Synthetic Rubber (SR) ratio applied to the marine fender is assumed as an industry average. This baseline assumption is supported by JATMA car vs truck-tyre split data (used as a proxy).

Buyers must replace default baselines with buyer-specific values (see Section 7 and the Emission Reduction Allocation and Claiming Guidelines).

End-of-life (EOL) fate of waste diverted. In the absence of the project, the relevant rubber waste streams would have been incinerated. The incineration share by grade is a methodological parameter established from market research and waste management data:

Stream	Grade	Incineration share	Source / notes	EOL credit claimed
2: Technical compound	TEA	0%	No incineration credit claimed (conservative)	No
	TEB	24%	Market research assignment (Bencros); available to VVB on request	Yes
	TEC	24%	As above	Yes
1: Tyre compound	TIA	0%	No incineration credit claimed (conservative)	No
	TIB	0%	No incineration credit claimed (conservative)	No
	TIC	0%	No incineration credit claimed (conservative)	No
	TID	0%	No incineration credit claimed (conservative)	No
	TIE	70%	Market research (Bencros, internal); available to VVB on request	Yes
3: Vulcanized rubber	VG	46.5%	Average of two EOL tyre incineration statistics (48% and 45%)	Yes
	VR	46.5%	As above	Yes

Baseline transportation and baseline virgin-material transportation are not credited. This is a deliberate conservative choice, immaterial given the dominance of the avoided-production and avoided-incineration components and consistent with the PM.0006 §2.2 materiality threshold.

Upon activation of Stream 4 (grade MFE, Section 2.6), a baseline EOL fate for that stream is established from fender-specific evidence following the fallback hierarchy of PM.0006 §2.1 and remains fixed for the remainder of the crediting period.

3.2.2 GHG Sources, Sinks, and Reservoirs

In accordance with the Japan Automobile Tyre Manufacturers Association (JATMA) Tyre LCCO2 Calculation Guidelines, there were insufficient findings on whether rubber products release HFCs, PFCs, SF6, and NF3; these are excluded. Methane (CH4) and nitrous oxide (N2O) emissions from the avoided incineration of rubber are also excluded. This is a conservative choice that understates the baseline, as excluding these gases reduces credited reductions.

The GHG sources for each intervention are set out below at method level. Actual annual emission reduction results are not presented in this POD; they are established for each period in the corresponding monitoring report.

Intervention 1: Stream 1, Tyre Rubber Compound (TIA, TIB, TIC, TID, TIE)

GHG source	GHG type	EF / calculation basis
Virgin product production (avoided)	CO2	Full baseline PCF of the displaced product applied per tonne of product output: marine fender 2.6241 tCO2e/t; unvulcanized compound 2.6241 tCO2e/t
End-of-life disposal, TIE only (avoided)	CO2	Approximately 1.1912 tCO2e per tonne incinerated (see Section 3.2.3)
TIA to TID EOL (avoided)	CO2	Zero credit (conservative)
Transport of waste feedstock to Bencros	CO2	EF = 0.000123 tCO2e/t-km; average 1,643.75 km
Waste recovery (electricity)	CO2	Excluded from quantification per the cancellation rationale in Section 3.2.1; a process-emission estimate is available to buyers on request

Intervention 2: Stream 2, Technical Compound Waste (TEA, TEB, TEC)

GHG source	GHG type	EF / calculation basis
Virgin product production (avoided)	CO2	Full baseline PCF of the displaced product applied per tonne of product output (as above)
End-of-life disposal, TEB/TEC (avoided)	CO2	Approximately 0.7426 tCO2e per tonne incinerated (see Section 3.2.3)
TEA EOL (avoided)	CO2	Zero credit (conservative)
Transport of waste feedstock to Bencros	CO2	EF = 0.000123 tCO2e/t-km; average 1,643.75 km
Waste recovery (electricity)	CO2	Excluded from quantification per the cancellation rationale in Section 3.2.1; a process-emission estimate is available to buyers on request

Intervention 3: Stream 3, Vulcanized Rubber Waste (VG, VR)

GHG source	GHG type	EF / calculation basis
Virgin product production (avoided)	CO2	Full baseline PCF of the displaced product applied per tonne of product output (as above)
End-of-life disposal, VG/VR (avoided)	CO2	Approximately 0.7913 tCO2e per tonne incinerated (see Section 3.2.3)
Transport of waste feedstock to Bencros	CO2	EF = 0.000123 tCO2e/t-km; average 1,643.75 km
Waste recovery (electricity)	CO2	Excluded from quantification per the cancellation rationale in Section 3.2.1; a process-emission estimate is available to buyers on request

3.2.3 Calculation Approach

The following PM.0006 equations are applied. All variables are as defined in the methodology. Detailed calculations for each monitoring period are set out in the corresponding monitoring report.

Emission factor: baseline product production. Each baseline PCF is the sum, over the recipe, of (mass fraction times component EF):

- Marine fender: EF_baseline,MF = (0.035 x 1.500) + (0.035 x 1.500) + (0.15 x 1.610) + (0.35 x 3.150) + (0.215 x 0.671) + (0.215 x 4.795) = 2.623975 tCO2e/t.
- Unvulcanized compound: EF_baseline,UC = EF_baseline,MF = 2.624 tCO2e/t.

Emission factor: transport. EF_transport = 0.000123 tCO2e/t-km (GLEC Framework v3.2, Smart Freight Centre, October 2025, Table 8; articulated truck 34 to 40 t GVW, WTW basis, 60% load factor, 17% empty running, diesel fuel). This value is conservative relative to the GLEC default for a fully laden vehicle on the same route. Applied over the average distance of 1,643.75 km, the project transport deduction is 0.2022 tCO2e per tonne of feedstock.

Emission factor: avoided incineration. The avoided-incineration EF is derived in four explicit steps on an empirical energy-recovery basis. All European waste incineration is assumed to occur with energy recovery (Eurostat, 2024), a conservative assumption because energy recovery reduces net CO2e per tonne incinerated.

- Step 1, base EF (energy recovery, literature): EF1 = 2.73 kgCO2e/kg material, the measured factor for plastic incineration with energy recovery at 75% carbon content (three independent sources report 2.73, 2.697, and approximately 2.70 kgCO2e/kg; 2.73 is used).
- Step 2, scale to Bencros carbon content: EF2 = EF1 x (0.85 / 0.75) = 2.73 x (0.85 / 0.75) = 3.094 kgCO2e/kg. Literature reports 87.2% and 84% carbon content; 85% is used as a midpoint.
- Step 3, apply synthetic/fossil fraction by grade: EF3 = EF2 x fossil fraction. For VR, VG, and TIE the synthetic fraction is 0.55 (industry-average NR/SR split for tyre-derived streams): EF3 = 3.094 x 0.55 = 1.702 kgCO2e/kg. For TEB and TEC, entirely synthetic waste streams, the fraction is 1.00: EF3 = 3.094 kgCO2e/kg.

The details of this page have been redacted

The details of this page have been redacted

Parameter	Value	Unit	Source	Notes
				verified net reductions
Buffer pool contribution	0%	%	Proba Standard (Version 1.5)	-

Worked example, per tonne (grade TEB feedstock, marine fender). For one tonne of marine fender produced from grade TEB feedstock: avoided 2.4219, avoided incineration 0.7426,less transport 0.2022, total 3.1645 tCO2e. This is a grade-level illustration; the portfolio-average EOL intensity is lower and is certified per vintage in the monitoring report.

Conservativeness decisions:

- Volumes reported as consumption (not receipt), understating the baseline where material is received but not yet processed.
- Zero EOL credit for grades TEA, TIA, TIB, TIC, TID: five of ten grades receive no incineration credit.
- Carbon content of 85% is a midpoint literature estimate; the upper bound of 87.2% would yield a slightly higher EF.
- Synthetic fraction of 0.55 for VR/VG/TIE is the conservative lower bound of the range.
- CO2 only from avoided incineration: CH4 and N2O are not accounted for.
- Baseline waste and virgin-material transportation are not credited.
- Simple-average transport distance (1,643.75 km) is used instead of the tonne-weighted average of approximately 1,530.6 km, conservatively increasing the project-side deduction.
- The synthetic rubber EF is a representativeness choice per PM.0006 §4.3 (average of three sources) rather than a conservative selection, disclosed transparently in the uncertainty assessment below.

Uncertainty assessment (PM.0006 §4.3)

Emission factors are selected under PM.0006 §4.3 as follows. Single published values are used directly from credible sources for carbon black (PBL 2020), natural rubber (JATMA Table 5), the minor materials (Bridgestone), and transport (GLEC v3.2). For synthetic rubber, an average of three independent sources (RFF 2022; JATMA Table 5; Piccinno et al.) yields 4.795 tCO2e/t; this is a representativeness choice, not a conservative selection. JATMA separately lists a synthetic rubber value of 2.40 tCO2e/t in another context; this discrepancy is handled transparently through the averaging disclosure rather than by silent selection. Ranges with defensible midpoints are used for carbon content (84 to 87.2%, midpoint 0.85) and for the synthetic fraction (lower bound 0.55).

3.2.4 Summary

Expressed as per-tonne yields, the gross reduction factor is approximately 2.58 to 2.59 tCO2e per tonne of marine fender or unvulcanized rubber compound. No absolute results are presented in this POD; actual volumes and verified reductions are established exclusively in the monitoring reports.

4. Leakage and Permanence

4.1 Leakage

4.1.1 Market Leakage (Virgin Production Shift)

Leakage is assessed in accordance with PM.0006 §1.8.1. There is a risk that recovered products do not displace virgin material production but instead lead to its redirection to other markets. PM.0006 Table 1 mandates a tiered market-leakage deduction based on each year's verified net emission reductions:

Scenario	Net emission reductions (tCO2e/yr)	Deduction
A: Small-scale	Below 10,000	0%
B	10,000 to 250,000	5%
C	Above 250,000	10%

The applicable tier is determined at each verification from that year's verified net reductions, and the corresponding deduction is applied automatically in any year the tier changes. Based on ex-ante expectations, the project is expected to classify as small-scale (below 10,000 tCO2e/yr, 0% deduction). No deduction figures are applied in this POD. The deductions applied under this section are irreversible.

4.1.2 Activity Shifting Within the Waste Management Chain

The risk that introducing new recovery activities displaces existing recyclers is assessed as low. The waste streams concerned are predominantly destined for incineration in the source regions, so no established recycling pathway is displaced. Waste-contract and disposal-route documentation can be provided to the VVB upon request. The project is below the 250,000 tCO2e/year threshold at which large-project activity-shifting requirements apply.

4.2 Permanence

The project delivers avoided emissions rather than carbon storage. As stated in PM.0006 §1.8.2, because these reductions result from a one-time prevention of emissions (diversion of waste from incineration or virgin material displacement) rather than sequestration, the risk of reversal is not applicable. Once the waste is recovered in a way that prevents its incineration, the potential for it to emit greenhouse gases is permanently avoided for that waste stream.

5. Estimated GHG Impact (ex-ante)

Actual processed volumes and verified emission reductions are established exclusively in the annual monitoring and verification cycle and are not presented here. This section sets out the per-tonne reduction factors that the intervention generates, and an indicative projection dependent on realized volumes.

The per-tonne reduction factors, by product and (for the EOL component) by vintage, are:

Factor (tCO2e/t of product)	Marine fender 2024	Marine fender 2025
Project PCF, transport only (EF substitution)	0.2022	0.2022
Production component (fixed)	2.4220	2.4220
EOL component (vintage-specific)	0.1609	0.1690
Gross total	2.5829	2.5910

Indicative projection. Using the illustration of 1,000 t of marine fenders from 2024, the indicative gross reduction is approximately 2,582 tCO2e gross per year. These figures are indicative only and depend on realized volumes; they are not verified reductions.

PM.0006 governance sets an interim maximum issuance cap of 25,000 tCO2e per project per year. The project is expected to remain comfortably within this cap.

6. Monitoring, Reporting, and Verification (MRV)

6.1 MRV Framework

The MRV framework follows PM.0006 §6.1. Monitoring parameters are presented in the standardised format below.

Responsible entity: Bencros (Bencros Rubber Recycling s.r.o., Slovakia). Verification body: Bureau Veritas, annual.

Parameter (description)	Unit	Source	Frequency	QA/QC and comment
Waste volume per grade: mass received and consumed per stream grade	t/year	Official movement registers (ERP)	Annual	Four-eyes review; consumption basis (conservative)
Transport route and distance to Bošany	km	Logistics records, shipping documents	At POD; confirmed annually	Simple average 1,643.75 km; update on material change
Transport EF	tCO2e/t-km	GLEC v3.2 Table 8	Reviewed at CP renewal	0.000123; confirm GLEC version currency
Recovery electricity	kWh/t	Facility meter / utility bills	Annual	Excluded from quantification per the cancellation rationale in Section 3.2.1; process-emission estimate available to buyers on request
Virgin material displaced, by mass balance	t/year	Purchase orders, batch records	Annual	SR = 1; recovered volume x SR = virgin displaced
Product output volume by product type (fender vs unvulcanized compound)	t/year	Production logs	Annual	Basis for allocation
Waste-to-product allocation basis	ratio	Mass balance books	Annual	1:1 assumed pending confirmation (see note)
Certificate-to-buyer linkage records (CoC evidence)	records	Proba registry; delivery records	Per transfer (optional)	See flag in Section 2.5
Baseline EOL fate per stream	% to incineration	Market research document	At POD; min. every 4 years	VVB to assess incineration share evidence

Parameter (description)	Unit	Source	Frequency	QA/QC and comment
Leakage tier	category	Calculation of verified net reduction	Annual	PM.0006 Table 1; reversible after 4 years
Annual regulatory-change statement	statement	Project developer	Annual	PM.0006 §1.4 requirement
Declaration of no prior LCA/PCF disclosure for credited volumes	declaration	Project developer	Annual	Supports double-counting avoidance
Functional equivalence	n/a	Technical specs, QA test results, RSL data	Each verification	VVB to review QA documentation
Buyer notification that default baseline EFs are estimates	notification	Project developer / Proba	On sale	Buyers substitute buyer-specific values

6.2 Monitoring Report

Before each verification, Bencros prepares and submits a monitoring report containing: input data per waste stream in the standardised format (per grade, per year); mass balance documentation confirming volumes diverted, processed, and converted to product; product output volumes by product type; transport records confirming routes and distances; the leakage tier assessment based on verified net reductions; the annual regulatory-change statement; the declaration of no prior LCA/PCF disclosure for credited volumes; and the period results and certified per-tonne factors. The structure of the monitoring report aligns with the Monitoring Report for the combined 2024 and 2025 periods.

Upon activation of Stream 4 (grade MFE), the monitoring report additionally includes the items listed under monitoring additions at activation in Section 2.6.

Site inspection plan (PM.0006 §6.3): a periodic VVB inspection at the Slovak facility is envisaged, covering weighbridge and ERP records sampling, mass balance reconciliation, production logs, and QA records.

6.3 Managing Data Quality

Data quality is managed through: documentation review, with all input data reviewed by at least two persons before submission; traceability, with all rubber volumes recorded at item-code level in the Bencros ERP system, enabling full traceability from receipt to consumption; reconciliation of consumption volumes against receipt records, with outliers flagged for investigation; and document retention of all supporting evidence for a minimum of 10 years, accessible to the auditor and the party buying the certificates.

7. Certificate Issuance, Attribution, and Claiming

Credits are issued post-verification on the Proba blockchain-based registry. Each credit carries a unique ID and full transfer history, preventing double counting. The Project Developer submits a formal declaration confirming the project is not registered under any other carbon registry or national NDC program.

Certificates are attributed within the value chain according to the direct physical traceability CoC model described in Section 2.5: emission reduction certificates are attached to the delivered product volumes and retired on the Proba registry against the specific buyer. Because Bencros sells the physical product directly to the claiming buyer, this supports the credibility of the buyer's Scope 3 claim.

Guidance on how buyers allocate and claim the verified reductions in their own GHG accounting is set out in the standalone document Emission Reduction Allocation and Claiming Guidelines. That document is non-normative: final claiming responsibility rests with the buyer and its auditors.

8. Social and Environmental Safeguards

8.1 Do Not Harm Assessment

The Bencros project complies with the Do No Harm principle required for GHG mitigation activities under the Proba Standard. Bencros has completed a review using the Proba Sustainable Development Benefits and Safeguards framework. The completed safeguard assessment is included in the Appendix.

8.2 SDG Contributions (Co-Benefits)

SDG	Contribution
SDG 8 (Decent Work & Economic Growth)	Creating green jobs in recycling and processing at the Slovak facility.
SDG 9 (Industry, Innovation, Infrastructure)	Developing scalable circular rubber models applicable across the marine and rubber industries.
SDG 12 (Responsible Consumption and Production)	Circular use of rubber: diverting industrial rubber waste streams from incineration at scale.
SDG 13 (Climate Action)	Verified avoided GHG emissions.

9. Stakeholder Engagement

9.1 Stakeholders

The project involves stakeholders across the rubber recycling and product value chain, including Bencros, the value chain partners that purchase Bencros products, the Slovak Environmental Agency, and Bureau Veritas. Key stakeholder roles are described in Section 1.4.

9.2 Stakeholder Consultation Method

- Public consultation of the POD: the POD will be made publicly available for a comment period prior to validation, as required by the Proba Standard.
- Downstream party discussions: discussions with prospective fender and unvulcanized compound buyers regarding co-financing and chain-of-custody arrangements are ongoing.
- Market research: Bencros's market research on baseline rubber waste disposal routes constitutes indirect stakeholder input from the rubber waste value chain.
- VVB consultation: Bureau Veritas has been engaged as the VVB and consulted on the POD structure and verification approach.

FLAG for VVB Sections 9.3 to 9.5 (feedback summary, impact on project design, ongoing engagement mechanisms) to be completed once the public consultation period has closed. Aim to start on Monday 27 July with a 1 month duration.

9.3 Summary of Feedback

FLAG for VVB To be completed after public consultation period.

9.4 Impact on Project

FLAG for VVB To be completed after public consultation period.

9.5 Ongoing Stakeholder Engagement

- Annual publication of the verified monitoring report on the Proba registry platform.
- Direct engagement with buyers on Scope 3 claim documentation and chain-of-custody requirements.
- Annual reporting to the Slovak Environmental Agency as required by applicable waste management regulations.
- Grievance and support mechanisms available to stakeholders and buyers through Bencros and Proba, with clear escalation paths.

10. Risk Assessment

10.1 Identified Risks and Mitigation Measures

The project is below the 250,000 tCO2e/year threshold at which PM.0006's large-project risk requirements apply. Key identified risks are summarised below.

Risk	Likelihood	Severity	Mitigation
Waste volume shortfall: fewer tonnes processed than projected	Medium	Low	Multi-supplier sourcing across France, Poland, UK; annual verification adjusts credits to actuals.
Incineration-share change alters the baseline EOL fate	Low to Medium	Medium	Baseline fixed for the crediting period; reassessed at renewal; changes disclosed per additionality reporting.
Quality non-conformance: recovered compound fails to meet specifications	Low	High	ISO-certified quality control; QA testing each batch; SR = 1 confirmed by technical documentation.
Data integrity: monitoring data errors or loss	Low	Medium	ERP-level traceability; four-eyes review; document retention of at least 10 years.
Financial additionality erosion: market conditions change	Low to Medium	Medium	Additionality reassessed at crediting period renewal; ongoing monitoring of market conditions.
Double claiming by product buyers: buyers report the same avoided emissions as a low-carbon product attribute in their PCF or Scope 3 disclosures	Low to Medium	Medium	Section 2.3 prohibits simultaneous reporting; certificate transfer requires a no-duplicate-claims declaration; see the Emission Reduction Allocation and Claiming Guidelines.
Waste suppliers separately account for the improved end-of-life of their diverted waste (Scope 3 Category 5), overlapping with certificate claims	Low to Medium	Medium	Supplier communication and CoC declarations that the diverted waste is credited under this project.
Buyer misapplication of certified per-tonne factors in its own inventory	Low to Medium	Medium	Emission Reduction Allocation and Claiming Guidelines and the buyer's auditor oversight.

10.2 Buffer Pool

No buffer pool contribution applies to this project, in accordance with the updated Proba Standard (Version 1.5).

Appendix: Proba Sustainable Development Criteria

Criteria	Risk relevant (Y/N)	Response
1. Assessment and management of environmental and social risks	Yes	The project complies with EU waste directives and REACH requirements, ensuring safe processing of rubber waste. Detailed risk assessment in Section 10.
2. Labour rights and working conditions	No	The project relies on existing industrial facilities and does not involve labour practices with

Criteria	Risk relevant (Y/N)	Response
		significant risks. No direct labour-rights issues identified.
3. Resource efficiency and pollution prevention	Yes	The project diverts rubber waste from landfill/incineration, reduces emissions, and substitutes virgin rubber with recycled compounds.
4. Land acquisition and involuntary resettlement	No	The project operates within existing facilities in Slovakia, with no need for land acquisition or resettlement.
5. Biodiversity conservation and sustainable management	Yes	By avoiding landfill and incineration, the project reduces harmful environmental impacts and lowers virgin rubber demand. No conversion of natural habitats.
6. Indigenous Peoples, local communities, and cultural heritage	No	The project is located in industrial areas in the EU (Slovakia), without direct interaction with Indigenous Peoples or culturally sensitive sites.
7. Respect for human rights and stakeholder engagement	Yes	The POD includes stakeholder consultation requirements (Section 9). Transparent communication with local stakeholders and authorities.
8. Gender equality	No	No gender-related impacts identified.
9. Robust benefit-sharing	Yes	The project contributes circular economy benefits across the value chain. Buyers co-finance interventions, sharing economic and environmental benefits.
10. Ensuring positive SDG impacts	Yes	See SDG table in Section 8.2. Key contributions: SDG 12 (diversion of industrial rubber waste streams at scale), SDG 13 (verified avoided emissions), SDG 9 (scalable circular model), SDG 8 (green jobs).

The details of this page have been redacted

The details of this page have been redacted