LIFE-ALFIO Socio-economic Impact Assessment Report

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ABBREVIATIONS

- **AS** — Attribution Share
- **BAU** — Business As Usual
- **BOM** — Bill of Materials
- **BPR** — Biocidal Products Regulation (EU No 528/2012)
- **CAPEX** — Capital Expenditure
- **CB** — Competent Body (EU Ecolabel authority)
- **CLP** — Classification, Labelling and Packaging (Regulation (EC) No 1272/2008)
- **CMO** — Contract Manufacturing Organisation
- **CO_2eq** — Carbon Dioxide Equivalent
- **COI** — Cost of Illness
- **DAU/MAU** — Daily/Monthly Active Users (platform analytics)
- **DPA** — Data Processing Agreement
- **DPIA** — Data Protection Impact Assessment
- **EC** — European Commission
- **EN** — European Standard (e.g., EN 15458)
- **EQ** — Evaluation Question
- **EU** — European Union
- **EU Ecolabel** — EU environmental label for products/services meeting defined criteria
- **FG** — Finished Goods
- **FTE** — Full-Time Equivalent (jobs)
- **GHG** — Greenhouse Gas
- **GPP** — Green Public Procurement
- **HH** — Household
- **IO (tables)** — Input–Output (economic multipliers)
- **IRR** — Internal Rate of Return
- **ISO** — International Organization for Standardization
- **JV** — Joint Venture
- **KPI** — Key Performance Indicator
- **LCA** — Life Cycle Assessment
- **LIFE** — EU LIFE Programme (environment & climate action)
- **NEV** — Net Economic Value (NPV of producer gains)
- **NPV** — Net Present Value
- **OEE** — Overall Equipment Effectiveness
- **OPEX** — Operating Expenditure
- **OTIF** — On-Time In-Full (delivery reliability)
- **QA** — Quality Assurance
- **QC** — Quality Control
- **REACH** — Registration, Evaluation, Authorisation & Restriction of Chemicals (Regulation (EC) No 1907/2006)

- **RFP** — Request for Proposals (tenders)
- **RBAC** — Role-Based Access Control
- **SDS** — Safety Data Sheet
- **SEIA** — Socio-economic Impact Assessment
- **SKUs** — Stock-Keeping Units (product variants)
- **SME** — Small and Medium-sized Enterprise
- **SOP** — Standard Operating Procedure
- **SVOC** — Semi-Volatile Organic Compounds
- **TDS** — Technical Data Sheet
- **TiO_2** — Titanium Dioxide
- **ToC** — Theory of Change
- **VOC** — Volatile Organic Compounds
- **#WaterWiseEU** — EU initiative for water resilience (hashtag used in communications)
- **WTP** — Willingness To Pay
- **ASP** — Average Selling Price
- **CoA** — Certificate of Analysis
- **D1/D2/B2/B3** — Project action/deliverable codes (Communication/Dissemination; Pilot Batches; Organoclay Production)
- **PMO** — Project Management Office

Contents

1. Executive Summary

This revised **Socio-economic Impact Assessment (SEIA)** focuses on the **exact socio-economic effects evidenced during the project period**, while clearly separating them from **future market uptake**, which remains dependent on **After-LIFE implementation**. While the previous version described the methodology and scenario logic in detail, this revised version states more clearly **what was actually achieved during the grant period**, **what can be measured with sufficient certainty**, and **what remains prospective**.

The **verified project-period outputs** are as follows: **(i) 10.4 t of organoclay produced** on the LIFE prototype under **Action B.3**; **(ii) 16 validated paint formulations produced at 1,000 L each**, i.e. **16,000 L in total**, under **Action B.2**; and **(iii) an operational PaintsForLife.eu platform** used for dissemination and replication support, with approximately **40,000 active users** and **275,000 interactions** reported for **2020–2025**. These outputs constitute the **main evidence base** for the present assessment.

The **economic impact during the grant period** is best characterised as **enabling and preparatory**, rather than as fully realised commercial uptake. The project created **usable technical assets**, **documentation assets**, a **pilot production base**, and a **functioning dissemination and replication platform**. It also maintained **5–7 staff directly linked to LIFE activities**, corresponding to an average of **3.6 FTE new green jobs** during implementation, while additional temporary research-related positions were created at **RTU** and **UL**. The project also generated local and regional activity through **prototype hosting**, **utilities**, **research and testing services**, and **industrial demo-batch cooperation**.

At the same time, the evidence available does **not** support an **exact monetised calculation of realised commercial producer gains during the grant period**. **Ecolabel issuance was delayed**, adopter-side market uptake remained limited, and the reporting available for this SEIA does not include sufficiently complete **audited market-volume data**, **executed paid licence income**, or **adopter-side financial records** to calculate an exact realised commercial return. To avoid overstatement, this revised assessment therefore reports the **producer-side commercial NPV for the verified project period conservatively as EUR 0**. This does **not** mean that the project created no value; rather, it means that the value created during the grant period took the form of **validated assets, technical readiness and market-enabling capacity**, rather than **audited realised commercial cash flow**.

The **impact on the local economy** is therefore evidenced primarily through **direct project employment**, **temporary research and testing work** at partner institutions, and **business opportunities** created for local service providers, suppliers and industrial partners involved in **installation**, **testing**, **hosting** and **communication activities**. **Growth potential and future business opportunities** are considered real, but they remain **prospective** until After-LIFE uptake is evidenced by **executed licences**, **sales volumes**, or **procurement wins**.

The **impact on population and public health** is **positive in direction**, but cannot yet be stated as an **exact household-level grant-period figure**. The project validated **zero-film-preservative, low-VOC decorative paint formulations** and published open technical and communication materials that support **safer purchasing and specification choices**. However, because **verified placed-on-market volumes remained limited during the project** and broader commercial rollout has shifted to the **After-**

LIFE period, this revision does **not** convert these enabling outputs into exact grant-period **household exposure** or **monetised health impact** figures.

The **environmental impact during the grant period** is likewise best understood as a **demonstrated and documented reduction potential**, rather than a large realised market-scale reduction. The project proved that **16,000 L of pilot formulations** can be produced **without film-preservative biocides** and with **low VOC levels**, and the associated **LCA** confirms that the formulations are **at least comparable to conventional references**, while reducing **toxicity-related concerns**. However, where **auditable commercial market volumes are not yet available**, this revised assessment does **not overstate** exact project-period figures for **avoided hazardous actives**, **avoided VOCs**, or **market-scale CO_2eq reductions**.

The **main future risks** affecting socio-economic outcomes are already known and evidenced in the project record. These include **supply-chain and energy shocks**, **delayed certification**, **institutional reorganisation of the competent body**, and **ALINA's constrained financial situation**. These factors explain why a substantial part of the project's expected socio-economic return has shifted from the **grant period** to the **After-LIFE period**.

In conclusion, the **exact socio-economic result of LIFE-ALFIO during the grant period** is **not** a high volume of already monetised market sales, but the **successful creation of verified technical, organisational and dissemination assets** that make later uptake possible. This report therefore presents a **conservative and auditable assessment**: **exact realised project-period effects are stated directly**, while **future benefits are kept separate and described as potential, not counted as achieved**.

2. Objectives, Scope & Evaluation Questions

2.1 Objectives

- **Primary objective:** quantify and explain the **socio-economic value** created by LIFE-ALFIO through:
  (i) the **non-biocidal organoclay additive** (prototype production and supply readiness),
  (ii) **16 eco-aligned paint formulations** validated at **1,000 L** each, and
  (iii) the **PaintsForLife.eu** platform that enables replication, procurement uptake and SME participation.

- **Secondary objectives:**

  - Measure **economic effects** on producers (costs, productivity, time-to-market) and on the supply chain (materials, QA, distribution) including skills/jobs.

  - Estimate **social/health benefits** from reduced exposure to film-preservative biocides and better consumer information.

- Quantify **environmental externalities avoided** (hazardous actives, VOC proxies, CO_2/LCA where available) with links to water-protection outcomes.
- Assess **replicability/transferability** (barriers, enablers, transaction costs) and define **After-LIFE KPIs** to 2030.

2.2 Scope

- **Intervention package:** B3 prototype (10.4 t output), B2 pilot batches (**16,000 L** total), B1 ecolabel documentation track, D1/D2 dissemination and the digital platform.
- **Geography:** EU focus with initial emphasis on **Baltics/Nordics** (early adopters), followed by **DACH/Benelux** per the replication plan.
- **Actors:** paint producers (SME/large), raw-material suppliers, public procurers, consumers, auditors/competent bodies.
- **Time horizon:** project period + **five-year After-LIFE (to 2030)** with **Downside/Base/Upside** adoption scenarios.
- **System boundary:** impacts attributable to (a) use of organoclay in reformulated paints, (b) adoption of the 16 formulations, and (c) information/transaction effects of the platform. Upstream mining/transport and long-tail end-user behaviour beyond provided guidance are treated qualitatively unless LCA data enable quantification.
- **Counterfactual ("business as usual"):** continued reliance on **film biocides**, slower/fragmented reformulation and documentation, lower eco-label penetration.

2.3 Evaluation Questions (EQs)

Economic

- **EQ1.** By how much do LIFE-ALFIO outputs **reduce producer costs** (reformulation, documentation, certification) and **accelerate time-to-market**?
- **EQ2.** What **revenues and jobs** are supported (direct/indirect), and how does impact differ for **SMEs vs. large firms**?
- **EQ3.** What is the **net economic value** (producer surplus/cost-benefit) under Base and sensitivity scenarios?

Social & Health

- **EQ4.** To what extent does replacing biocides with organoclay **lower potential exposure** for workers and households (proxy indicators; literature factors)?
- **EQ5.** How do **consumer information** and **public procurement** tools (platform, ecolabel materials) change purchasing behaviour and perceived risk?

Environmental / Externalities

- **EQ6.** What quantities of **hazardous actives** and **VOC proxies** are **avoided** as adoption scales; what are the **CO_2/LCA deltas** where data exist?
- **EQ7.** How do avoided releases contribute to **water-protection** goals (#WaterWiseEU), and what is a credible monetary range for those externalities?

Replicability & Governance

- **EQ8.** Which **barriers** (supply-chain/energy shocks, certification process frictions) most affected outcomes, and which **mitigations** work best for replication?
- **EQ9.** What **policy/market enablers** (ecolabel procedures, shared dossiers, digital platforms) yield the highest impact per euro?

2.4 Attribution & Measurement

- **Attribution method:** contribution analysis linking verified outputs (10.4 t organoclay; 16 × 1,000 L pilots; platform analytics) to outcomes, triangulated with monitor records and stakeholder inputs.
- **Valuation:**
    - Economic: bill-of-materials/process deltas, avoided certification/admin costs, productivity/time savings.
    - Social/health: cost-of-illness / WTP ranges applied to exposure proxies.
    - Environmental: unit values for avoided hazardous actives/VOC; LCA factors when available.
- **Uncertainty:** sensitivity to **adoption (±15%)**, **price (±10%)** and **energy (+15%)**; report **ranges** and document assumptions.

2.5 Audiences & Use

- **Policy makers & competent bodies:** inform ecolabel/procurement guidance and platform-based replication.
- **Industry (esp. SMEs):** demonstrate business case, cost/time savings, documentation re-use and risk reduction.
- **Investors & programmes:** align After-LIFE financing with measurable socio-economic benefits.
- **Public/consumers:** provide transparent evidence of health and environmental gains from biocide-free paints.

2.6 Data & QA

- **Primary sources:** project evidence (B2/B3 outputs, platform stats), monitoring records, financial/operational data, interview notes.

- **QA:** traceability tables (input → indicator), version control, reproducible calculation sheets (annex).

3. Intervention Logic / Theory of Change

This section explains **how** LIFE-ALFIO turns resources and activities into measurable **outputs**, **outcomes** and long-term **impacts**, and **why** those changes are plausible and attributable. It also sets out the **assumptions**, **external factors**, **indicators**, **evidence sources**, and **risks/mitigations** used in the Socio-economic Impact Assessment (SEIA).

3.1 Problem statement and change pathway (narrative)

Baseline problem. Water-borne decorative paints still rely on **film-preservative biocides** to ensure in-can stability. These substances face tightening **EU regulatory pressure** and **eco-label expectations**, while many SMEs lack the capacity to reformulate quickly, document compliance, and scale production without excessive cost and risk.

LIFE-ALFIO change pathway. The project tackles the problem via a **non-biocidal materials route** (organoclay additive) combined with **validated eco-aligned formulations** and a **digital platform** that diffuses knowledge and reduces transaction costs. Demonstrating **manufacturability** (10.4 t organoclay; 16×1,000 L pilot batches) and providing **dossier-quality documentation** enables producers—especially SMEs—to adopt safer formulations faster, at lower cost, with clearer evidence for auditors and public buyers.

3.2 Logic model (from inputs to impacts)

Inputs

- LIFE funding and co-financing; beneficiary and partner expertise (R&D, QA, regulatory).
- Pilot equipment and facilities; testing services; advisory/competent-body interactions.
- Digital assets (platform, content, templates), communication channels, stakeholder networks.

Activities

1. **Technology & scale-up (B3):** produce **organoclay** on a pilot line; establish SOPs/QC.
2. **Formulation validation (B2):** manufacture **16 pilot batches (1,000 L each)**; run lab/field tests; compile TDS/SDS/QC.
3. **Certification track (B1):** assemble eco-label dossiers, harmonise labels/criteria cross-walks, respond to review rounds.
4. **Dissemination & capacity building (D1/D2):** publish platform content, guidance, videos; present to stakeholders; support procurement uptake.

5. **Replication & transferability (B5):** design licensing/admin workflows; define pricing options; produce policy suggestions for GPP.

Outputs (direct, verifiable)

- **10.4 t** organoclay produced under pilot SOP/QC.
- **16,000 L** eco-aligned formulations at 1,000 L scale (16 SKUs) with documentation packs.
- A functioning **PaintsForLife.eu** platform hosting open guidance and licensing options.
- Ecolabel dossiers submitted and iterated (process evidence); dissemination materials and policy suggestions delivered.

Outcomes (near- to medium-term)

- **Manufacturability & evidence** de-risk adoption (especially for SMEs).
- **Reduced transaction costs** for certification/procurement via shared dossiers and platform artefacts.
- **Earlier "go/no-go" decisions** in companies (shorter time-to-market); first replication cases/licences.
- **Consumer/procurement clarity**—responsible paint choice content and eco-label cross-walks improve trust and market pull.

Impacts (long-term)

- **Economic:** increased green revenue; productivity gains; skilled jobs in production/QA/regulatory and digital services.
- **Social/health:** reduced potential exposure to film-preservative biocides for workers and households; better indoor air quality proxies.
- **Environmental:** avoided hazardous actives and VOC proxies; improved water-protection alignment; favourable LCA deltas as industrial use scales.

3.3 Assumptions underpinning the ToC

- **A1 – Technical validity:** Organoclay performs as a **drop-in** non-biocidal stabiliser across target binder systems at validated dosages; 1,000 L proof is representative of routine production.
- **A2 – Documentation sufficiency:** The combination of TDS/SDS/QC, eco-label cross-walks and platform artefacts is sufficient for auditors and public buyers to process tenders/certifications efficiently.
- **A3 – Market receptivity:** Public procurement and consumer trends continue to favour **eco-label/low-toxicity** paints; SMEs respond to reduced documentation burden.

- **A4 – Replication economics:** Licensing/administration costs remain modest relative to benefits (time and risk reduction), enabling uptake without large CAPEX.
- **A5 – Policy stability:** EU BPR/REACH/VOC trajectories and eco-label criteria remain broadly consistent; changes are manageable through dossier updates.

3.4 External factors (positive/negative)

- **Exogenous shocks:** supply-chain disruptions, energy price spikes, or geopolitical events can delay scaling and dossier updates (observed during 2021–2024).
- **Institutional change:** reorganisation of the competent body can pause eco-label issuance (observed in 2025).
- **Procurement practice:** degree of eco-label inclusion in tenders; national GPP guidance.
- **Competing technologies:** "green" biocides and proprietary alternatives may influence price/performance perceptions.

3.5 Contribution and attribution strategy

- **Contribution analysis** links **verified outputs** (10.4 t; 16×1,000 L; platform engagement) to **intermediate outcomes** (documentation reuse, shortened cycles) and **impacts** (economic/social/environmental).
- **Triangulation** uses monitoring records, stakeholder interviews, platform analytics, and (when available) procurement/eco-label wins.
- **Counterfactual** assumes continued use of film biocides, slower/fragmented reformulation, and higher per-SKU dossier cost—creating a basis for **net effect** estimation.
- **Time separation** distinguishes **project-period** effects from **After-LIFE** ramp-up (to 2030).

3.6 Indicators and measurement (with examples)

Economic

- **E1 – Producer cost delta (€/L)**: (baseline BOM+process+admin) – (ALINA route, incl. licensing/admin).
- **E2 – Time-to-market (months)**: lab concept → first commercial sale; reduction attributable to pilot proof and dossier reuse.
- **E3 – Jobs supported (FTE)**: direct (production/QA/platform) + indirect (suppliers/distributors).

Social/Health

- **S1 – Households reached (proxy):** liters of reformulated paint × coverage × residential share.
- **S2 – Exposure reduction index:** proxy based on removal of film-preservative actives in interior paints.

- **S3 – Health co-benefits (€):** cost-of-illness/WTP ranges applied to S2.

Environmental

- **EN1 – Avoided hazardous actives (kg):** baseline dose per liter − mineral route × liters adopted.
- **EN2 – VOC proxy reduction (kg):** recipe delta × liters adopted.
- **EN3 – CO_2eq delta (t):** LCA factor × liters (where data available).
- **EN4 – Water-risk index:** qualitative score linked to avoided toxic releases.

Uptake & Replication

- **U1 – Licences/year** and **U2 – Liters of reformulated paint**.
- **U3 – Ecolabel wins** (count) and **U4 – Procurement references** citing eco-label or platform evidence.
- **U5 – Platform engagement** (qualified downloads/requests).

3.7 Evidence sources and QA

- **Primary evidence:** production logs (10.4 t), pilot batch records (16×1,000 L), QC/CoA summaries, platform analytics, dissemination artefacts, policy suggestions/GPP notes, eco-label correspondence.
- **Secondary evidence:** literature for health and environmental valuation (unit values), procurement studies, SME cost benchmarks.
- **QA methods:** traceability matrix (input → calculation → indicator), version control, reproducible calculation sheets, and sensitivity analysis recorded alongside assumptions.

3.8 Risks to the change pathway and mitigations

Risk	How it affects the ToC	Mitigation (project & After-LIFE)
Supply-chain & energy shocks	Delay scale-up → late parameters → dossier churn	Dual sourcing; staged batches; document version control; buffer timelines
Institutional reorganisation	Pause eco-label issuance	Maintain full dossier; prepare re-filing under successor authority; phase initial 4 products
Competing narratives ("green" biocides)	Market confusion; slower adoption	Publish head-to-head evidence; platform transparency; case studies
SME capacity limits	Under-utilisation of outputs	Provide templates, cross-walks, licensing support; onboarding webinars

Funding gaps for scale-up	Slower market penetration	Blended finance; tranche-based milestones; JV/CMO routes

3.9 Visual summary (textual)

Inputs → Activities → Outputs → Outcomes → Impacts

- **Inputs:** funding, expertise, pilot assets, digital platform
  → **Activities:** B3 organoclay production; B2 16×1,000 L; B1 dossier; D1/D2 dissemination; B5 replication
  → **Outputs:** 10.4 t organoclay; 16,000 L validated formulations; open documentation & platform
  → **Outcomes:** reduced cost/time-to-market; auditor-ready packages; initial licences/adopters; procurement clarity
  → **Impacts:** economic (revenue/jobs), social/health (lower exposure), environmental (avoided hazardous actives/VOC; water-risk reduction)

3.10 Implications for the SEIA

- The ToC justifies **which indicators** we measure (cost/time deltas, avoided actives, health proxies, uptake) and **how** we attribute change to LIFE-ALFIO.
- It also clarifies **what we do not over-claim** (e.g., consumer behaviour beyond provided guidance; full LCA outside available data).
- The approach ensures the SEIA remains **policy-relevant** (eco-label/GPP), **industry-useful** (SME documentation reuse), and **auditable** (clear evidence trail).

4. Methodological Framework

This section defines **how** socio-economic impacts are measured and attributed to LIFE-ALFIO, the **counterfactual** against which change is assessed, the **valuation** techniques applied to economic, social/health and environmental effects, the **data** and **quality assurance** procedures, and the **uncertainty/sensitivity** treatment used to derive robust ranges (Downside/Base/Upside) for 2025–2030.

4.1 Evaluation design

- **Design type:** *Contribution analysis* with quantified attribution where feasible. We triangulate verified **outputs** (B2/B3), **process evidence** (B1 ecolabel track, D1/D2 dissemination), **platform analytics**, and **stakeholder inputs** to link activities → outputs → outcomes → impacts (see ToC).
- **Unit of analysis:** (i) a *liter of reformulated paint* using organoclay or a validated formulation; (ii) an *adopting producer* (SME/large); (iii) *societal end-points* (exposure proxies, avoided hazardous actives/VOC).
- **Time horizon:** project period + **5 years After-LIFE** (to 2030).

- **Decision lenses:** economic efficiency (€/unit), social/health outcomes, environmental externalities, replicability/transaction costs.

4.2 Counterfactual ("business as usual", BAU)

- **BAU definition:** continued reliance on **film-preservative biocides** for water-borne paints; fragmented, per-SKU certification/documentation with higher effort and fees; slower market uptake of eco-label formulations.
- **BAU data sources:** literature on preservative dosing and approval cycles, SME interviews on certification costs, historical ecolabel penetration in decorative paints, monitor records on scaling constraints.
- **Contrast with project case:** organoclay *drop-in* route + validated **16×1,000 L** formulations + shared documentation on *PaintsForLife.eu* (reduced reformulation iterations, dossier reuse, faster procurement qualification).

4.3 Attribution logic

We attribute impact to LIFE-ALFIO when **all** conditions hold:

1. The indicator is **causally linked** to project outputs (e.g., liters of paint using organoclay or a validated LIFE recipe).
2. The **timing** is consistent (post-B2/B3 outputs; post-publication on the platform).
3. A reasonable **share of change** cannot be explained by non-project factors (e.g., general market trend).
    - **Attribution share (AS)** by adopter *i* is estimated from:

$$AS_i = \min\left(1, \frac{W_{\text{LIFE evidence}} + W_{\text{LIFE assets}}}{W_{\text{total drivers}}}\right)$$

with evidence weights (0–1) for LIFE documentation, pilot proof, direct support, versus other drivers (supplier initiatives, regulation). In Base case we use **AS = 0.6** for SME adoptions and **AS = 0.4** for large firms (sensitivity ±0.15).

4.4 Indicators and formulas (summary)

Code	Indicator	Formula	Notes
E1	Producer cost delta (€/L)	(\Delta C = (C_\text{BOM}+C_\text{proc}+C_\text{admin})*text{BAU}* - *(C*\text{BOM}+C_\text{proc}+C_\text{admin})_\text{LIFE})	Includes avoided re-approvals and dossier reuse.
E2	Time-to-market reduction (months)	(\Delta T = T_\text{BAU} - T_\text{LIFE})	Based on pilot-proof and documentation packages.
E3	Net economic value (€)	(\text{NEV} = \sum_t \frac{(\Delta C \cdot L_t + \text{margin uplift}_t) \cdot AS - \text{licence/fees}_t}{(1+r)^t})	Discount rate (r = 3!-!4%); liters (L_t).
E4	Jobs supported (FTE)	IO multipliers × incremental revenue/OPEX	Separate direct (production/QA/platform) and indirect.

Social/Health (proxy-based)

Code	Indicator	Formula	Notes
S1	Households reached	(HH = \frac{L \cdot \text{coverage (m^2/L)}}{\text{m^2 per dwelling}} \cdot \text{residential share})	Conservative residential share 60–70 %.
S2	Exposure reduction index	qualitative scale 0–1	1 = full replacement of film biocide; 0 = none.
S3	Health co-benefit (€/year)	(\text{HCB} = HH \cdot S2 \cdot V_\text{health})	(V_\text{health}) from COI/WTP meta-ranges (Annex A).

Environmental

Code	Indicator	Formula	Notes
EN1	Avoided hazardous actives (kg)	(\text{AA} = L \cdot (d_\text{BAU} - d_\text{LIFE}))	(d) = preservative dose (kg/L); LIFE dose ~0.
EN2	VOC proxy reduction (kg)	recipe delta × liters	Based on formulation sheets.
EN3	CO_2eq delta (t)	(\Delta \text{CO_2} = L \cdot f_\text{CO_2})	(f_\text{CO_2}) from LCA factors where available.
EN4	Water-risk reduction (index)	narrative scorecard	Links to #WaterWiseEU outcomes.

(Detailed calculation sheets and unit values are included in Annex B/A.)

4.5 Valuation methods

- **Economic valuation:** direct costing (BOM, process time, QA/admin), avoided certification fees (single-window vs per-SKU), productivity effects (fewer reformulation cycles), and margin uplift for ecolabel-eligible lines. Present as €/L and €/adopter per year; discount over 2025–2030.
- **Health valuation:** apply **cost-of-illness (COI)** and **willingness-to-pay (WTP)** ranges to S1×S2. We report **bands** (Low/Base/High) for conservative communication.
- **Environmental valuation:** use standard **unit values** for avoided hazardous releases/VOC and, where LCA data exist, **CO_2eq**. For indicators lacking robust monetisation, we present **physical units** plus qualitative water-risk scoring.

4.6 Data sources & integration

- **Primary project data:** B3 logs (10.4 t output), B2 batch records (16×1,000 L), platform analytics (visits, downloads, enquiries), dissemination records (D1/D2), ecolabel dossiers and correspondence (B1 process).
- **Stakeholder inputs:** structured interviews with adopters, suppliers, auditors/procurers (short templates in Annex D).
- **Secondary sources:** public ecolabel criteria, VOC/bicide literature, EU externality handbooks, SME cost benchmarks.
- **Data joins:**
    1. Map **liters** produced/adopted → economic and environmental formulas.
    2. Map **adopters** (SME/large) → attribution shares and cost structures.
    3. Map **platform events** (qualified downloads/licence requests) → near-term adoption proxies.

4.7 Scenario building & sensitivity

- **Adoption scenarios (liters & licensees):**
    - *Downside*: slower uptake, procurement lag, AS reduced by 0.15.
    - *Base*: declared plan; AS 0.6 (SME) / 0.4 (large).
    - *Upside*: faster licensing and early procurement wins; AS +0.15.
- **Key sensitivities:**
    - Volume **±15 %**; price **±10 %**; energy **+15 %** (affects process cost and margin).
    - Health unit values: use **low–high** literature bounds.
    - CO_2/VOC factors: conservative vs central LCA values.

4.8 Quality assurance (QA) & transparency

- **Traceability matrix:** each indicator has a *source* → *transformation* → *output* trail; all transformations stored in calculation sheets (Annex B).
- **Version control:** inputs (labels, SDS/TDS, recipes) carry timestamps; changes logged when dossiers are updated.
- **Reproducibility:** provide clear formulas, parameter tables and scenario toggles to re-run calculations.
- **Peer check:** internal review by technical and business leads; external sense-check with one industry and one policy expert (short notes in Annex C).

4.9 Ethics & handling of uncertainty

- **Ethical standard:** no personal data beyond professional contacts; any image data used in case studies is aggregated and anonymised.
- **Uncertainty policy:** we **avoid point estimates** where evidence is incomplete and instead publish ranges with explicit assumptions; we **do not** monetise indicators lacking credible unit values.

4.10 Reporting conventions

- Monetary values in **EUR (real, 2025)**; discount rate **3–4 %** documented per table.
- Physical units: liters, kg, t, m^2, FTE.
- Ranges reported as **Low | Base | High**; where adoption is the driver, we display *scenario bridges* illustrating contribution of price, volume, and energy to the outcome.

4.11 Implementation checklist (for the computation workbook)

1. Enter **liters/adopters** per scenario by year (2025–2030).

2. Set **AS** (attribution shares) per adopter class.
3. Input **cost parameters** (BOM/process/admin BAU vs LIFE).
4. Choose **unit values** for health/environment (Annex A).
5. Run **E/S/EN** indicator sheets; export **Low/Base/High** tables.
6. Generate **waterfall/bridge charts** for the narrative sections.
7. Record **assumptions and sources** in the log tab.

5. Baseline & Data Sources

This section defines the **starting point** for socio-economic measurement and lists the **authoritative data sources** used in the assessment. It anchors indicators in **verified project evidence** (deliverables/timetable), **monitoring/KPI methods**, and **supporting annexes** to ensure traceability.

5.1 Project & operational baseline (what exists before impact is counted)

Deliverables & timetable (approved plan).

- Form **C2** establishes the relevant outputs and due dates, including **B2 – 16,000 L pilotparty of formulations**, **B3 – 10.4 tons of organoclay produced**, **LCA report**, and this **Socio-economic impact assessment report** (due **30/09/2024**).
- Form **C3** sets the phasing of Actions A–E through 2018–2024 (preparatory → implementation → monitoring → communication/management).

Verified production baseline (evidence for outputs).

- **B3**: Organoclay production **target 10.4 t** (Action B3) as the project's scale-up proof.
- **B2**: Pilot batches **16 × 1,000 L = 16,000 L** (Action B2) to validate manufacturability and generate test/demo material.

Use in SEIA: these outputs are the **minimum conditions** for credible adoption scenarios; liters/tons are the physical anchors for E/S/EN indicators.

5.2 Monitoring framework & KPI definitions (how the project measures itself)

Monitoring Methodology (C2 annex).

The dedicated methodology specifies: KPI names, units, roles, data cadence (annual/quarterly), and sources for **organoclay volumes, liters of paint produced with organoclay, jobs, platform metrics, and revenues**. These definitions are adopted here to maintain continuity between project reporting and SEIA indicators.

KPI snapshot (system export).

A project **KPI data snapshot (11/03/2024)** is included to evidence platform/uptake series and to seed the baseline time-series for scenario construction (2025–2030). *(File referenced in annex list of the Final Report.)*

Use in SEIA: KPI names/units are reused verbatim; where time series are incomplete, we treat 2024 as the **latest observed** baseline and project forward under Downside/Base/Upside scenarios.

5.3 Replication & market pathway (assumptions carried from the proposal)

B5 – Replicability & Transferability Plan.

B5 provides the adoption logic (online platform + licensing), partner roles, communication timing, and monetisation/administration concepts that underpin the **Base case** diffusion pattern used in SEIA.

C2M Commercialisation checklist.

The proposal-consistent self-assessment defines the **time-to-market of 3–5 years**, finance need **€0.5–2.0 m**, SME ownership of the innovation, and early-adopter focus—assumptions reused to bound adoption/finance sensitives.

Use in SEIA: B5 and C2M frame **where** and **how fast** impacts can plausibly materialise (Baltics/Nordics → DACH/Benelux), ensuring alignment with the approved concept.

5.4 Communication & replication infrastructure (evidence of reach)

Platform administration manual (B5.2).

Documentation of **PaintsForLife.eu** workflows—content taxonomy, formulation SKUs, customer licensing options (incl. “EU Ecolabel Rights” package), and order/customer administration—shows the **operational rails** for replication and transaction support.

Publications in industry magazines (D2.2).

Peer/industry-audience articles present **field and EN-15458 lab results** (e.g., dose finding, durability/biological growth effects) that substantiate technical claims for adopters and inform valuation inputs (performance equivalence).

Use in SEIA: Platform capacity and published evidence strengthen attribution to project outputs when mapping platform events/licensing to liters adopted.

5.5 Policy & procurement enablers (context for external uptake)

Initiative to policy makers (B5.4).

The policy suggestion document (with **ministry acknowledgment on pp. 30–31**) outlines GPP/eco-label levers for paints/varnishes—used to justify procurement pull and reduced transaction costs for public buyers in the SEIA.

5.6 Ecolabel status (process baseline & deviation context)

The deliverable list (C2) foresees **"16 formulation Ecolabel certificates."** Process evidence (application bundle, review sheets, correspondence) and the subsequent **competent-body reorganisation** are documented in the Final Report deviations; SEIA treats ecolabel **as a driver of uptake** (procurement confidence) rather than a measured output within the project window—effects are modelled into **After-LIFE** scenarios. *(Process documents referenced in the Final Report; see B1/B5 ecolabel status note.)*

5.7 Data limitations & treatment

This revised SEIA distinguishes strictly between (i) verified project-period effects and (ii) future benefits that may arise only after commercial uptake. Platform reach, stakeholder interest, and After-LIFE scenarios are treated as enabling evidence and not as realised sales, realised household benefits, or realised environmental savings unless supported by auditable market-volume data.

Where commercial uptake data are incomplete or not auditable, this report uses conservative treatment. In particular, it does not convert platform traffic, stakeholder discussions, or scenario assumptions into achieved producer income, achieved household exposure reduction, or achieved avoided-emission totals for the grant period.

For this reason, producer-side commercial NPV is reported conservatively for the verified project period only. Future benefits remain described as potential After-LIFE outcomes unless and until supported by executed licences, verified sales volumes, or auditable adopter records.

5.8 Source map (provenance table)

Evidence class	Primary source	How used in SEIA
Deliverables & deadlines	**Form C2**	Defines outputs and due dates (B2/B3, LCA, SEIA).
Timetable	**Form C3**	Aligns output timing with outcomes/impacts.
Monitoring method	**Annex C.2.1**	KPI names/units/cadence; QA roles.
KPI snapshot	**KPI export (11/03/2024)**	Baseline series for platform/uptake indicators.
Replication plan	**B5 R&T Plan**	Adoption logic, geography, comms; scenario scaffolding.
Commercialisation context	**C2M checklist**	Time-to-market, finance need; sensitivity bounds.
Platform ops	**B5.2 Admin manual**	Evidence of licensing/transaction capacity.
Technical validation	**D2.2 Publications**	Performance evidence for adoption/valuation.
Policy lever	**B5.4 Policy suggestion**	Procurement/GPP context; uptake enabler.

6. Indicator Set (with calculation notes)

This section defines the **indicators, formulas, units, inputs, data sources, and QA rules** used in the SEIA. Indicators mirror the project's **Monitoring Methodology** (names/units/cadence) to ensure consistency with LIFE reporting and After-LIFE tracking. Where relevant we reference the approved **deliverables list (C2)**, timetable (C3), the **R&T plan B5**, and the **C2M** commercialisation self-assessment.

6.1 Economic indicators

Code	Indicator	Unit	Formula (Base)	Key inputs	Data source(s)	Notes & QA
E1	**Producer cost delta** (reformulation, documen	€/L	(\Delta C = (C_\text{BOM}+C_\text{proc}+C_\text{admin})*text{BAU}* - *(C*\text{BOM}+C_\text{proc}+C_\text{admin})_\text{LIFE})	BOM deltas; process time;	Company cost sheets; **Monitoring Method**	Use **single-window dossier** vs. per-SKU BAU; document assumptions

	tation, certification)			admin/cert fees	**ology** KPI definitions	per adopter class; annual cadence.
E2	**Time-to-market reduction**	months	$\Delta T = T_{BAU} - T_{LIFE}$	Pilot proof (1,000 L), reuse of documentation	B2/B1 evidence; B5 process	Record start/stop definitions (lab concept → first sale); keep a change log.
E3	**Net economic value (NEV)**	€ (NPV)	$\text{NEV} = \sum_t \frac{(\Delta C \cdot L_t + \text{margin uplift}_t)\cdot AS - \text{licence/fees}_t}{(1+r)^t}$	(L_t) liters adopted; attribution share **AS**; discount **r**	KPI liters; contracts; B5 licensing model	Default **AS**: SME 0.6 / Large 0.4 (sens. ±0.15); **r=3–4%**; show Low
E4	**Jobs supported** (direct + indirect)	FTE	IO multiplier × (incremental revenue or OPEX)	€/L margin; adoption volumes	Company HR/finance; IO tables	Separate production/QA/platform FTE; document multiplier choice; annual QA review.

Calculation notes.

- E1/E2 feed **E3**; align periodisation with **C3** timetable and After-LIFE horizon.
- Where enterprise data are missing, use conservative sector benchmarks with sources logged in Annex A.

6.2 Social & Health indicators (proxy-based)

Code	Indicator	Unit	Formula (Base)	Inputs	Data source(s)	Notes & QA
S1	**Households reached** (proxy)	# HH	(HH = \frac{L \cdot \text{coverage (m^2/L)}}{\text{m^2 per dwelling}} \cdot s_\text{res})	Coverage m^2/L; dwelling size; residential share (s_res)	Product TDS; EU housing stats	Use interior share 60–70%; justify coverage from TDS; record country mix where material.
S2	**Exposure-reduction index**	0–1	Qualitative scoring rubric (biocide → non-biocide)	Adoption type (full/partial)	Formulation dossier; substitution evidence	1.0 = full replacement of film biocide for interior use; 0.5 = partial; record method in Annex B.
S3	**Health co-benefit**	€/y	(\text{HCB} = HH \cdot S2 \cdot V_\text{health})	Unit value (V_health) (COI/WTP ranges)	EU handbooks/literature	Report Low

Calculation notes.

- Keep S1 conservative (avoid double counting rooms/repaints).
- Publish **assumption table** (coverage, dwelling m^2, V_{health}) with sources.

6.3 Environmental indicators

Code	Indicator	Unit	Formula (Base)	Inputs	Data source(s)	Notes & QA
EN1	**Avoided hazardous actives**	kg	(\text{AA} = L \cdot (d_\text{BAU} - d_\text{LIFE}))	BAU biocide dose (d_BAU), LIFE dose ~0	Industry refs; formulation sheets	Document baseline dose ranges by product type; publish sensitivity.
EN2	**VOC proxy reduction**	kg	Recipe delta × liters	VOC content change vs. baseline	TDS/SDS; ecolabel criteria	Use ecolabel thresholds and actual recipe values; keep per-liter factors transparent.
EN3	**CO_2eq delta**	t	(\Delta \text{CO_2} = L \cdot f_\text{CO_2})	LCA factor ($f_\text{$CO_2$}$)	LCA deliverable; literature	Report only where LCA factors are available (per C2 LCA deliverable).
EN4	**Water-risk reduction**	index	Scored rubric (toxicity, mobility, load)	Hazard class; release potential	Ecolabel dossier; hazard tables	Provide rubric in Annex B; link to #WaterWiseEU narrative used in D2.

6.4 Uptake & Replication indicators

Code	Indicator	Unit	Formula / rule	Inputs	Data source(s)	Notes & QA
U1	**Licences per year**	#	Count of executed licences	Signed licences	Platform admin logs; B5 manual	Cross-check platform admin export with finance.
U2	**Liters of reformulated paint**	L	Σ liters reported by adopters (by SKU)	Sales/production records	KPI method; Monitoring Methodology	Treat as **primary driver** for E/S/EN; annual cadence.

U3	**Ecolabel wins**	#	Certificates or tender wins citing ecolabel	Certificates; tender docs	Ecolabel dossier; buyer notices	Given reorganisation, treat as After-LIFE KPI; document pipeline where appropriate.
U4	**Procurement references**	#	Public tenders referencing platform/dossier	Tender DB; buyer records	Platform/B5	Keep evidence (RFP copy/screens).
U5	**Platform engagement**	# events	Qualified downloads/requests	Analytics export	Admin manual + KPI snapshot	Use as **leading indicator** only, not sales.

6.5 Calculation scaffolding (how numbers are built)

1. **Adoption volumes**: compile **U2 liters** by year (2025–2030) under Downside/Base/Upside.
2. **Attribution share (AS)**: default **0.6** (SME) / **0.4** (large); adjust ±0.15 in sensitivity.
3. **Economic**: compute **E1** and **E2** per adopter class → aggregate into **E3 (NEV)** with **r = 3–4%**.
4. **Social/Health**: S1 from liters and coverage; multiply by **S2** and V_{health} to get **S3** (Low|Base|High).
5. **Environmental**: apply per-liter factors to liters for **EN1/EN2**; if LCA factors exist, compute **EN3**; score **EN4** qualitatively.
6. **Reporting**: present **annual** and **cumulative** tables with Low|Base|High; add **scenario bridges** to show drivers.

6.6 Sources & traceability rules

- **Governance anchors**: use C2/C3 to time-stamp outputs (B2/B3) and SEIA due date; keep adoption curves consistent with B5/C2M.
- **KPI integrity**: adopt names/units/cadence per **Monitoring Methodology**; store raw exports and transformations (Annex B).
- **Platform/transaction evidence**: rely on **B5.2 admin manual** and platform exports for U1/U5.
- **Technical performance evidence**: **D2.2 publications** inform dose/effect equivalence and compatibility assumptions (notes for EN and E factors).

6.7 Sensitivity & uncertainty handling

- **Adoption:** ±15 % liters; **AS** ±0.15.
- **Price/costs:** ±10 % on BOM/process/admin; **energy** +15 % (affects E1 and margin used in E3).
- **Health/environment unit values:** publish Low|Base|High using EU handbook ranges; for unknowns, keep physical units only.
- **Presentation:** all monetised results shown as **ranges**; provide tornado charts and scenario bridges in Section 7.

6.8 Data quality (QA checklist)

- Each indicator row has a **source → transform → output** trail (table ID, sheet name).
- **Version control**: timestamp inputs (TDS/SDS, recipes, labels) and maintain a change log.
- **Reproducibility**: equations live in workbook formulas; parameters centralised in a **"Params"** sheet.
- **Peer check**: technical (formulations/QC) + business (costs/licensing) reviews before release.

-

7. Results

This section reports **what is already verified** in the project evidence base (outputs), and the **modelled socio-economic outcomes** for the project period and **After-LIFE (to 2030)** under the Downside/Base/Upside framework defined in Section 4. Results are presented as **ranges** where valuation depends on adoption and unit-value assumptions. Indicator definitions and formulas follow Section 6 and the project **Monitoring Methodology** to preserve continuity with LIFE reporting.

7.1 Verified project outputs (evidence anchors)

These are the **physical anchors** from which economic, social/health and environmental outcomes are derived:

- **B3 – Organoclay production: 10.4 t** produced on the LIFE prototype (manufacturability, SOP/QC established).
- **B2 – Pilot/exhibit batches: 16,000 L** total (**1,000 L × 16 formulations**) produced to validate scale and provide materials for tests/demonstrations.
- **Digital dissemination rail:** operational **PaintsForLife.eu** platform (administration manual, licensing options, order/customer administration) enabling replication and dossier reuse.
- **Technical credibility:** peer/industry publications reporting field and EN-15458 lab outcomes relevant to performance equivalence (dose, durability, biological growth).

These outputs correspond to the approved deliverables (Form **C2**) and timetable (**C3**). They are treated as **minimum conditions** for the adoption scenarios.

7.2 Economic results (Base case ranges)

This revised section replaces generic **"base-case ranges"** with a more conservative statement of the **economic effects that can be evidenced during the grant period**. The project delivered **10.4 t of organoclay**, **16,000 L of validated formulations**, and a **functioning dissemination and replication platform**. These outputs reduced technical uncertainty and created **usable technical and documentation assets** for future adopters; however, they do **not in themselves constitute realised adopter revenue**.

The **exact economic effects evidenced during project implementation** are the following: **5–7 staff** were maintained directly on LIFE activities, corresponding to an average of **3.6 FTE new green jobs** during the implementation period; **additional temporary positions** were created at partner institutions for formulation, testing and monitoring; and **local economic activity** was supported through **prototype hosting**, **utilities**, **testing**, **communication** and **demo-batch cooperation**. These are the **auditable local-economy effects** that can be directly linked to project implementation.

By contrast, the evidence used for this SEIA does **not** contain sufficiently complete **adopter-side commercial records** to calculate an exact realised **per-litre producer saving**, exact realised **adopter**

revenue increase, or exact realised **commercial NPV** attributable to market uptake during the grant period. **Ecolabel issuance was delayed** and **commercial rollout remained limited**. To avoid overstatement, the **producer-side commercial NPV for the verified grant period is therefore reported conservatively as EUR 0**.

Accordingly, the **cost-benefit conclusion for the grant period** is that LIFE funding produced **verified technical and organisational assets**, **direct project employment**, and **future business opportunities**, but **not yet an auditable commercial return large enough to be monetised precisely as an achieved market-uptake NPV** during the grant window.

7.3 Social & health results (proxy-based)

The **social and health direction of impact** is **positive** and is linked to the project's core technical result: the validation of **water-borne paint formulations without film-preservative biocides and with low VOC levels**. This reduces the need for **hazardous preservative actives** in interior paint systems and improves the **quality and transparency of information** available to professionals, households and public buyers.

However, this revision does **not** convert these enabling effects into an **exact grant-period number of households reached through placed-on-market products** or into an **exact monetised health benefit**. The available project evidence does not provide sufficiently complete **auditable commercial sales volumes** or **final consumer deployment data** for the grant period. Exact **population-level effects** therefore remain to be monitored in the **After-LIFE period**, once verified market-uptake data become available.

The **measurable social effect during the project period** is therefore best stated as **capacity creation and risk reduction**: **safer formulations were technically validated**, **public-facing information and professional documentation were published**, and the basis was created for **later population benefits once commercial use scales**.

7.4 Environmental results

he **exact environmental achievement during the grant period** is the verified demonstration that **16 validated paint formulations**, produced at **16,000 L pilot scale in total**, can be formulated **without film-preservative biocides** and with **low VOC levels**. In parallel, **10.4 t of organoclay** were produced on the LIFE prototype and used for **pilots**, **technical validation** and **industrial testing**.

The associated **LCA** confirms that, for the **representative formulations assessed**, organoclay-based paints perform **at least comparably to conventional references** while lowering **toxicity-related concerns** linked to **film-preservative biocides**. This is an important environmental result because it validates the project hypothesis that a **non-biocidal route is technically feasible** and environmentally preferable in the relevant impact categories.

At the same time, this revision deliberately avoids **overstating market-scale environmental benefits** for the grant period. Exact figures for **avoided hazardous actives**, **avoided VOCs**, and **CO_2eq reductions** attributable to commercial paints placed on the market are **not claimed here unless supported by auditable commercial volume data**. The **project-period environmental conclusion** is

therefore one of **validated substitution potential** and **demonstrated safer formulation design**, rather than **high realised market-scale savings**.

7.5 Scenario results (Downside | Base | Upside)

Future scenarios remain useful for **management and After-LIFE planning**, but in this revised report they are **explicitly separated from achieved project-period impacts**. The **Downside, Base and Upside** adoption paths describe possible **2025–2030 outcomes** under different conditions of **certification**, **financing**, **supply** and **market uptake**; they are **not counted as achieved grant-period socio-economic results**.

This separation is important for **auditability**. The **achieved results of the grant period** are reported above on the basis of **verified evidence**. **Future volumes**, **future adopter savings**, **future health benefits**, and **future environmental reductions** remain **prospective** and should be confirmed only through subsequent **executed licences**, **verified litres adopted**, **procurement references**, and **audited financial data**.

7.6 Distributional effects

The project's **realised grant-period benefits** were distributed mainly through **direct project execution** and **capability building**. **SIA ALINA** carried the main technical and organisational burden of **prototype development**, **dossier preparation** and **platform implementation**. **UL** and **RTU** contributed **research**, **testing** and **temporary staffing effects**. **Industrial and service partners** benefited through **hosting**, **utilities**, **testing**, **demo-batch work** and **cooperation activities**.

Potential **future gains** are expected to be more broadly distributed across **SMEs**, **binder suppliers**, **service providers** and **public buyers** once commercial uptake materialises; however, these **prospective distributional effects are not counted here as achieved impacts**.

7.7 Sensitivity summary

The main sensitivity in this assessment is **not the formula itself**, but the **maturity of market-uptake evidence**. If **auditable adopter volumes**, **licence income** and **buyer records** become available, the exact monetary estimates can be updated. At the date of this report, the most material uncertainties remain **certification timing**, **commercial rollout**, **energy and supply conditions**, and **ALINA's financing constraints**.

For that reason, this revision applies a **conservative reporting rule**: where a result cannot be supported by **verified project-period data**, it is either kept **qualitative** or set aside for **After-LIFE monitoring**, rather than monetised as an **achieved project-period benefit**.

7.8 Confidence & limitations

Confidence is high for the project's direct outputs and implementation evidence: 10.4 t of organoclay produced, 16,000 L of pilot formulations produced, platform operation, dissemination evidence, and direct staffing effects. Confidence is lower for exact commercial uptake, exact adopter-side savings, and exact household-level deployment, because these depend on external market behaviour and on data that were not fully auditable within the grant period.

This report therefore applies a stricter evidentiary threshold than the previous version. Verified outputs and direct effects are stated as exact results. Future benefits and market-scale monetised outcomes are described only as potential or planning scenarios, unless supported by auditable uptake records. This conservative approach is intended to ensure that the SEIA remains coherent, transparent and proportionate to the available evidence.

7.9 How to read the tables/figures (implementation note)

- **Annual & cumulative** results are provided in the workbook with **Low | Base | High** columns per indicator.
- **Traceability:** each figure references a calculation sheet (Annex B) and inputs table (coverage, doses, unit values).
- **Replicability:** the same structure can be reused by new adopters or in other Member States by changing **liters/adopters** and local unit values.

8. Case Studies

No adopter-specific quantified commercial case study is included in this revised SEIA as counted impact evidence. To avoid overstating results, the assessment relies only on verified project-period evidence and documented implementation facts.

The strongest observed evidence relevant to later socio-economic impact is the combination of (i) pilot-scale proof at 1,000 L per formulation, (ii) 10.4 t organoclay production on the prototype, (iii) platform-based dissemination and documentation, and (iv) continued stakeholder and industry interest. These elements demonstrate readiness for replication but are not converted here into exact company-level revenue or household-effect claims.

Dimension	Indicator	Result (range)	How measured
Economic	E1 – Producer cost delta	**–€0.02 to –€0.05/L** (admin/cert/documentation savings)	Dossier reuse vs per-SKU BAU
	E2 – Time-to-market	**–3 to –5 months**	From lab concept to first tendered sale
	E3 – NEV (SME)	**Positive** (Base case)	Savings + early revenue (discounted)
Social/Health	S1 – Households reached	**~2,000–3,000 HH**	Liters × coverage ÷ m^2/dwelling × residential share

	S2 – Exposure reduction	**1.0** (full interior replacement)	Biocide→organoclay switch
Environmental	EN1 – Avoided hazardous actives	**Tied to liters** (kg)	Dose_BAU − dose_LIFE≈0
	EN2 – VOC proxy	**Neutral to positive**	Recipe delta × liters
Dimension	Indicator	Result (range)	How measured
Economic	E1 – Producer cost delta	**~neutral on BOM/process; −admin**	Binder co-dev + dossier reuse
	E2 – Time-to-market	**−2 to −4 months**	Pilot proof + pre-filled criteria maps
	E3 – NEV (SME + partner)	**Positive** (Base; sensitive to volume)	Discounted savings + margin
Social/Health	S1 – Households reached	**Indirect (B2B/OEM channel)**	Proxy via retail roll-out liters
	S2 – Exposure reduction	**0.5–1.0**	Full or partial product range switch
Environmental	EN1 – Avoided hazardous actives	**Proportional to OEM liters**	Baseline dose assumptions by SKU
	EN2 – VOC proxy	**Neutral to positive**	Recipe delta × liters
	EN4 – Water-risk index	**Improved**	Qualitative score (rubric)

9. Barriers, Risks & Mitigations

This section distils the **main obstacles** that affected (or may affect) the socio-economic outcomes, and the **control measures** that keep residual risk within appetite during **After-LIFE (to 2030)**. It aligns with the Theory of Change (Section 3), Methods (Section 4), and the adoption scenarios (Section 7).

9.1 Barrier map (what mattered most)

- **B1. Supply-chain shocks & energy price spikes (2021–2024).** Shortages/lead-time volatility for binders, pigments and packaging; elevated energy costs affected pilot scheduling and unit margins; **delayed arrival of scaled-paint parameters** needed for ecolabel dossiers.

- **B2. Certification process friction (portfolio complexity).** Large, multi-SKU dossier; iterative clarifications; need for **external expert** increased cost and time.

- **B3. Institutional reorganisation (Competent Body, 2025).** Liquidation/merger disrupted continuity of case officers; evaluation **paused** prior to certificate issuance.
- **B4. SME capability & bandwidth.** Limited regulatory/documentation capacity and cashflow to run multiple SKUs through certification while operating production.
- **B5. Market messaging noise / competing "green biocide" claims.** Confusion for buyers; risk of slower procurement conversion without clear, comparable evidence.

9.2 Risk register (project → After-LIFE)

#	Risk (short name)	Description (why it matters)	Inherent (Impact/Prob.)	Key mitigations (control design)	Residual	Owner	Early-warning indicators
1	Supply-chain & energy	Delays in scale-up; margin squeeze	High/Med	Dual sourcing & framework POs; batch phasing; energy-indexed contracts; process efficiency (SOP/QA)	Med/Med	COO	Supplier OTIF; lead-time ↑; energy index ↑
2	Ecolabel process drag	Multi-SKU dossier cycles; expert cost	Med/High	**Single-window** dossier; priority queue (4 SKUs first); shared artefacts (labels, cross-walks)	Med/Med	QA/Reg	No. of open issues; expert queue time; fee notices
3	Institutional change	Competent-body reorg pauses case	High/Low	Maintain complete dossier; **carry-over pack** for successor authority;	Med/Low	CEO/QA	Org. notices; staff turnover; response lag

				contact matrix & MoU			
4	SME bandwidth & cash	Adoption stalls for lack of capacity	Med/Med	Platform bundles; templated QA packs; phased licensing; milestone billing	Med/Low	BD Lead	Missed onboarding steps; invoice cycle ↑
5	Market confusion	"Green biocide" narratives slow uptake	Med/Med	Head-to-head data; case studies; neutral comparison sheets; procurement language templates	Med/Low	Comms/BD	RFP language; buyer questions; win-rate ↓
6	Quality drift at ramp-up	Batch variance undermines trust	Med/Low	SPC on critical steps; CoA per lot; second CMO/JV; ISO-aligned QA & change control	Low/Low	QA/COO	CoA fails; complaint rate; OEE ↓
7	Data integrity & GDPR	Loss of trust; platform risk	Med/Low	RBAC/MFA; backups; DPIA; SLA>99.5%; incident runbook	Low/Low	Platform PM	Error rates; DAU ↓; audit flags
8	Funding timing	CAPEX/WC gap delays scale	Med/Med	Blended finance; tranche-based	Med/Low	CFO	Runway <9 m; tranche slippage

				milestones; bridge options			

Rating scale: Low/Med/High. Residual assumes mitigations implemented.

9.3 What we learned (and kept)

1. **Single-window documentation beats fragmented filing.** Consolidating SKUs into a portfolio dossier reduces fee duplication and inconsistency risk, even if it requires heavier internal coordination.

2. **1,000 L proof is the fastest trust builder.** Plant-ready batches and QC shorten internal approvals and public-buyer scrutiny; use them as the centrepiece of tender packs.

3. **Binder-partner route accelerates SME adoption.** Co-developing within binder systems spreads validation cost and produces evidence buyers recognise.

4. **Keep an auditable "carry-over pack".** When institutions reorganise, a compact dossier (issue log, replies, versioned artefacts) enables continuity with new officers.

9.4 Mitigation playbooks (ready to run)

P1 – Supply-chain & energy playbook

- **Before:** secure dual suppliers; include **energy indexation** and minimum-volume clauses; maintain **6-week raw** and **3-week FG** buffers.
- **During:** adjust batch sizes; prioritise SKUs affecting ecolabel dossiers; trigger process-efficiency projects when energy ↑15%.
- **After:** review OEE/variance monthly; renegotiate indexation annually.

P2 – Certification continuity playbook

- **Before:** freeze artefacts (labels, cross-walks); assign **issue owners**; define **4-SKU priority** for quick wins.
- **During:** respond in **≤20 working days** to checklists; track **open items** and **expert status**; document "rationale for equivalence".
- **If reorg:** send **carry-over pack** + request for recognition of prior reviews; seek written timeline from successor authority.

P3 – SME onboarding playbook

- **Bundle:** recipe + TDS/SDS + QC template + procurement language; 90-day pilot SLA; **milestone billing** to reduce cash strain.

- **Training:** 2h remote session; binder alignment; change-control checklist.

P4 – Evidence & messaging playbook

- **Collateral:** neutral comparison sheets (biocide vs mineral route); **case studies**; EN-standard references; platform link.
- **Procurement:** ready-to-paste ecolabel/criteria cross-walks; “no-greenwashing” language.

9.5 Link to scenarios & KPIs

- **Downside → Base → Upside** transitions in Section 7 use **P1–P4** levers as the main switches (volume ±15 %, price ±10 %, energy +15 %).
- **KPIs to monitor risk trajectory:**
    - Commercial: **licenses/quarter**, win-rate, liters/quarter, **ASP variance**.
    - Operations: **batch variance ≤5%**, CoA pass-rate, **OTIF ≥95%**, energy/t.
    - Certification: open issues, days-to-response, expert queue time.
    - Platform: DAU/MAU, qualified requests (leading indicator).

9.6 Residual risk statement

With the controls above, **no High/High** items remain. The top residuals are **Supply-chain & energy (Med/Med)** and **Certification process drag (Med/Med)**—actively managed via dual-sourcing/indexation and the **single-window/priority-SKU** approach. Institutional reorganisation risk is **Med/Low** after adopting the **carry-over pack** routine. The remaining risks are **Low/Low** or **Med/Low** and compatible with the base-case socio-economic trajectory reported in Section 7.

10. After-LIFE Outlook (2025–2030)

This section sets a **clear, investable plan** for scaling LIFE-ALFIO results beyond the project, with phased market entry, financing, governance, and a monitoring cadence that keeps socio-economic benefits on track.

10.1 Objectives (2025–2030)

- **Impact:** accelerate replacement of film-preservative biocides in water-borne paints; deliver measurable economic, health and environmental gains.
- **Scale:** reach **120 t/year** organoclay supply capacity and **≥60 active licences** by 2030.
- **Quality & compliance:** maintain **batch variance ≤5%**, ISO-aligned QA, and procurement-ready documentation sets.

- **Evidence:** produce a consistent trail of adoption (liters, licences, tender wins) and avoided hazardous actives (kg).

10.2 Adoption scenarios & ramp (Downside | Base | Upside)

- **Geography: Baltics/Nordics (2025–2026)** → **DACH/Benelux (2026–2028)** → **Southern EU (2028–2030)**.
- **Channels:** SME manufacturers and private-label producers first; then Tier-1 via **binder-partner** paths.
- **Drivers:** dossier reuse (single-window), 1,000 L proof, procurement templates; re-engaged **ecolabel** processing once the successor competent body is fully operational.
- **Switches:** volume (±15%), price (±10%), energy (+15%), attribution share (±0.15), and an **early procurement win**.

10.3 Workstreams & milestones

Workstream	2025–2026	2026–2028	2028–2030
Commercial	10–15 licences (SME/PL); first buyer pilots	+30–35 licences; DACH/Benelux entry	≥15 new licences/yr; Southern EU distributors
Supply/QA	Pre-commercial line; dual-sourcing; CoA per lot	60 t/y run-rate; SPC on critical steps	120 t/y capacity; ISO audit / recert
Certification	Re-file ecolabel (4 priority products); carry-over pack	Expand to portfolio batches; tender references	Continuous renewals; portfolio maintenance
Platform	e-licensing v2 (analytics, DPA); onboarding guides	1,000+ verified pro-users; transaction logs	Data services (benchmarks, compliance toolkits)
Policy & GPP	Share policy suggestions; buyer briefings	Procurement playbooks; city pilots	Cross-border replication cases

10.4 Financing & resourcing

- **Size & use: €1.3m** blended package (CAPEX for pre-commercial line & QA lab; working capital; platform/security; market access).
- **Sources:** public innovation (grants/repayables) + private equity; milestone tranches tied to **S1/S2/S3** supply milestones and **G2/G3** licensing gates.
- **Operating model:** lean core team (BD/Reg/QA/Platform PM) + **CMO/JV** for production; binder-partner co-creation to scale adoption.

10.5 Governance & risk control (After-LIFE)

- **Cadence:** monthly **Phase Review** (traffic-light on liters, licences, QA, cash); quarterly board with scenario bridge.
- **Key playbooks:**
    - **P1 Supply & energy:** dual suppliers; energy-indexed contracts; 6w raw / 3w FG buffers.
    - **P2 Certification continuity:** single-window dossier; 4-SKU priority queue; ≤20wd response SLA; carry-over pack to successor authority.
    - **P3 SME onboarding:** recipe bundle + QC template + procurement language; 90-day pilot SLA; milestone billing.
    - **P4 Evidence & messaging:** head-to-head sheets, case studies, tender text.

Residual top risks: **Supply/energy (Med/Med)** and **Certification drag (Med/Med)**—actively managed via P1–P2.

10.6 KPIs & dashboards (tracked to 2030)

- **Adoption: Licences/quarter**, **Liters/quarter** (U1/U2).
- **Socio-economic: E1** (€/L savings), **E3** (NEV € NPV), **Jobs FTE**; **S1** households, **S3** health € (range).
- **Environmental: EN1** avoided hazardous actives (kg), **EN2** VOC proxy (kg), **EN3** CO_2eq (t where LCA factors exist).
- **Quality & ops: batch variance ≤5%**, **OTIF ≥95%**, **energy/t** trend.
- **Certification:** open issues, days-to-response, expert queue; ecolabel **wins** and **tender references**.
- **Platform:** qualified requests/downloads (leading indicators), conversion ratio.

Reporting: annual public summary (websites) + internal quarterly pack; parameters and formulas fixed per Section 6 to ensure continuity.

10.7 Procurement & ecolabel strategy

- **Ecolabel:** re-engage with the successor competent body; **phase 4 priority products** first; then portfolio batches as expert capacity stabilises.
- **Public buyers:** provide **ready-to-paste** tender language (criteria cross-walks, consumer info pages) and neutral comparison sheets; pursue **two city procurement pilots** to create visible references.
- **SME benefits:** pooled dossier assets reduce per-SKU costs; platform licensing and buyer packs lower transaction friction.

10.8 Evidence plan & publications

- **Case studies:** publish 3–4 per year (interior/wood; SME/Tier-1; procurement wins).
- **Data transparency:** update platform with anonymised adoption metrics (liters bands; avoided actives proxy).
- **Standards & journals:** continue EN-based testing and field panels; submit concise notes to industry journals to counter "green biocide" confusion.

10.9 Triggers & decision rules

- **Capacity trigger:** sustained demand >80% of current run-rate → initiate incremental capacity (CMO lot expansion) and QA hire.
- **Certification trigger:** >60 days without CB response → escalate via formal letter; shift to phased filing; maintain carry-over documentation.
- **Pricing trigger:** ASP variance >7% or energy index +15% → invoke price escalators; run process-efficiency sprint; re-prioritise high-margin SKUs.
- **Go/No-Go:** if two consecutive quarters miss liters and licence targets by >15% without external shock, pivot to binder-partner channel emphasis.

10.10 2030 snapshot (what success looks like)

- **Adoption: ≥60 active licences**, multi-country footprint; **≥120 t/y** organoclay output; repeat buyers.
- **Socio-economic: positive NEV** across cohorts, sustained SME participation, **measurable household reach** and **monetised health co-benefits** (Base bands).
- **Environmental:** substantial **avoided hazardous actives** and VOC proxies; LCA-based **CO_2eq** reductions reported where factors permit.
- **Governance:** stable QA/compliance stack, replicable documentation routines, and an operational platform that keeps replication costs low for new adopters.

In sum: the After-LIFE plan converts LIFE-ALFIO's proven outputs—**10.4 t organoclay**, **16×1,000 L** pilot recipes, and a working platform—into **scalable market outcomes**, with disciplined risk control, transparent KPIs, and a procurement-friendly evidence trail that compounds socio-economic benefits through 2030.

11. Conclusions & Policy Recommendations

11.1 Policy Recommendations (prioritised)

A. Make certification faster, cheaper, and portfolio-friendly

1. **Enable portfolio submissions and single-window dossiers.** Allow one coherent dossier to cover multiple SKUs/formulations where the evidence set and label logic are shared. This lowers SME transaction costs and speeds up competent-body review.

2. **Introduce a "priority lane" for non-biocidal reformulations.** Create a fast-track for cases that fully replace film-preservative biocides and meet eco-label performance criteria, with predictable timelines.

3. **Establish standing expert pools with transparent SLAs.** Maintain a roster of vetted external experts to avoid ad-hoc backlogs; publish service-level targets (e.g., first review ≤30 working days; clarification cycle ≤20 working days).

4. **Recognise prior reviews in institutional transitions.** When competent bodies reorganise, adopt **carry-over protocols** so applicants can continue from the last agreed checklist, rather than restart.

B. Leverage procurement to pull safer paints

5. **Embed eco-label (or verified equivalent) in public tenders.** Provide standard tender text and acceptance of **equivalent evidence** (cross-walks, test reports, platform dossiers), preventing de-facto discrimination against SMEs without certificates during reorganisation periods.

6. **Pilot "reference buyers" programmes.** Co-fund two to three municipal/provincial buyers per year to run demonstration tenders that explicitly request **non-biocidal interior paints**, publish open results, and share templates.

7. **Adopt portfolio verification in buyer audits.** Permit buyers to verify a set of SKUs via shared dossiers and batch QC evidence, reducing audit cost while maintaining rigor.

C. Support SME adoption and data transparency

8. **Fund shared evidence assets and onboarding.** Small grants/vouchers for **label templates, consumer-info pages, criteria cross-walks, and QC packs** (re-usable across SMEs) offer high return per euro.

9. **Back digital rails for replication.** Treat open platforms that host validated formulations, licensing options, and procurement-ready documents as **public-interest infrastructure**; support interoperability (simple APIs) with national eco-label portals.

10. **Publish neutral comparison sheets.** Provide standard, non-marketing formats that compare **non-biocidal** vs **biocide** routes on performance, documentation, and compliance—reducing "green-biocide" confusion.

D. Finance scale-up with risk-proportionate instruments

11. **Blend public and private finance via milestone tranches.** Tie tranches to verifiable milestones—e.g., **S1/S2/S3 capacity gates** and **G2/G3 licensing gates**—to reduce risk for investors while ensuring public funds translate into liters adopted.

12. **Offer working-capital and certification lines.** Short-cycle facilities (invoice financing/credit insurance) and capped certification loans help SMEs survive long purchaser and certification cycles.

E. Keep monitoring simple, comparable, and auditable

13. **Fix a minimal KPI spine.** Track **licenses/quarter, liters/quarter, avoided hazardous actives (kg), households reached (proxy), and tender/eco-label wins**. Use the same units, formulas and cadence as in the project's Monitoring Methodology.

14. **Standardise dossier versioning and change logs.** Require timestamped labels/SDS/TDS and QC templates; this reduces audit effort and builds trust across borders.

11.2 Implementation Roadmap (who does what)

- **Competent Body / Ministry:** adopt portfolio/fast-track rules, set SLAs, enact carry-over protocols; co-fund expert pools and "reference buyer" pilots.

- **Public Buyers / GPP Units:** insert standard eco-label/equivalent clauses; accept shared dossiers; publish open tender results and templates.

- **Industry Associations / Binder Producers:** co-create recipes and neutral comparison sheets; host regional onboarding days for SMEs.

- **Platform Operator / Consortia:** maintain open catalogue, APIs and licensing workflows; ensure GDPR-safe analytics on adoption (bands, not identifiable data).

- **Finance Agencies / Funds:** provide milestone-based grants/repayables and working-capital lines aligned with adoption KPIs.

11.3 Expected Payoff (why these measures matter)

- **Faster diffusion, lower cost:** Portfolio/fast-track certification and carry-over rules remove structural delays and duplication—especially in transition years.

- **Stronger public-sector pull:** Clear tender language + acceptance of equivalent evidence translates into near-term liters, not just intentions.

- **Reduced risk for SMEs:** Shared documentation, onboarding packs and working-capital tools cut the two biggest barriers—capability and cashflow.

- **Measurable impact:** A stable KPI spine keeps the socio-economic story auditable as adoption scales.

11.4 Conclusions

The **first conclusion** of this revised **SEIA** is that **LIFE-ALFIO produced auditable enabling assets of clear socio-economic relevance.** These include a **pilot organoclay production capability**, **16 validated non-biocidal paint formulations produced at 1,000 L scale**, and a **functioning open platform for documentation and replication support**. These outputs are **exact, verified and directly attributable to the project period**.

The **second conclusion** is that the **main realised socio-economic effects during the grant period** were **direct employment**, **temporary partner work**, **local service and testing activity**, and the **creation of future business opportunities**. The most defensible quantified local-economy effect evidenced in the current project record is the maintenance of **5–7 staff directly linked to LIFE activities**, corresponding to an average of **3.6 FTE new green jobs** during the implementation period, together with **temporary positions at UL and RTU**.

The **third conclusion** is that a **precise commercial cost-benefit result cannot be claimed for the grant period without overstatement**. Because **certification** and broader **market uptake** were delayed, the available evidence does not support an exact monetised **producer-side gain** for the project period. For this reason, the **producer-side commercial NPV for the verified grant period is conservatively reported as EUR 0**.

The **fourth conclusion** is that the **population and environmental effects are positive in direction**, but were only **partly realised during the grant period**. The project demonstrated **safer, non-biocidal, low-VOC formulations** and thereby created the basis for later **health** and **environmental gains**. However, exact **market-scale household effects**, **avoided emissions**, and broader monetised benefits remain dependent on **verified After-LIFE uptake**.

The **fifth conclusion** is that the gap between the **expected** and the **realised grant-period socio-economic benefits** is explained mainly by **external factors** already documented elsewhere in the project record. These include **supply-chain and energy disruption**, **certification delays**, **competent-body reorganisation**, and **ALINA's constrained financial situation**. These factors shifted a significant part of the expected return from the **grant period** into the **After-LIFE period**, rather than invalidating the underlying technical and environmental result.

The overall conclusion of this revised assessment is therefore **conservative and evidence-based**: **verified project-period effects are stated as achieved results**, while **future benefits are kept separate and described only as potential**, unless and until they are supported by **auditable market evidence**. This approach ensures that the socio-economic assessment remains **coherent**, **transparent** and **proportionate to the evidence currently available**.

11.5 Closing Statement

This revised SEIA takes a deliberately conservative approach. It reports exact project-period effects where the project record is auditable and avoids monetising benefits that cannot yet be supported by verified commercial uptake data. On that basis, the project can be said to have delivered a credible socio-economic foundation for safer paints in Europe: validated technical outputs, direct local economic activity, direct employment effects, open documentation and a clear route to future uptake. The larger commercial, population and environmental returns remain plausible, but they belong to the After-LIFE period and should be confirmed by subsequent monitored evidence rather than treated as already achieved.

Annex A – Valuation methods & unit values

(health/VOC/biocide externalities; discount rate)

A1. Purpose & principles

- Use **conservative ranges** (Low | Base | High) for unit values where uncertainty is material.
- Report physical units **first**; monetise only where defensible references exist.
- Apply a **real discount rate** of **3–4%** to NPV through 2030 (Base = 3.5%).

A2. Economic valuation (producer perspective)

Code	Item	Unit	Source/Method	Low	Base	High	Notes
E1.1	BOM/process delta vs BAU	€/L	Company costing / sector benchmark	−0.03	−0.01	0.00	Sign may vary by binder system
E1.2	Admin/certification savings (single-window vs per-SKU)	€/L	Sum avoided fees/tests ÷ liters	0.01	0.03	0.05	Scales with portfolio size
E2	Time-to-market reduction	months	Project cases / interviews	2	4	6	Converts to value via earlier revenues
E3	Discount rate	% real	SEIA convention	3.0	**3.5**	4.0	Sensitivity runs ±0.5 pp

A3. Health valuation (proxy-based; interiors)

Code	Item	Unit	Method	Low	Base	High	Notes
S1	Households reached	#	(HH = \frac{L \cdot \text{m^2/L}}{\text{m^2/dwelling}} \cdot s_{res})	—	—	—	Coverage & (s_{res}) in Annex B "Params"
S2	Exposure-reduction index	0–1	Full (1.0) or partial (0.5) replacement	0.5	1.0	1.0	Interior paints focus

S3	Health co-benefit/HH	€/HH·y	COI/WTP meta-ranges	5	10	20	Conservative European bounds
S3 total	Health co-benefit	€/y	(HH\cdot S2\cdot €/!HH)	—	—	—	Computed in Annex B

A4. Environmental valuation

Code	Item	Unit	Method	Low	Base	High	Notes
EN1	Avoided hazardous actives	kg	(L \cdot (d_{BAU} - d_{LIFE}))	—	—	—	Dose factors by product type
EN1€	Monetised hazard proxy	€/kg	Externality handbooks	2	5	10	Use as indicative only
EN2	VOC proxy reduction	kg	Recipe delta × L	—	—	—	If VOC delta ≠ 0
EN3	CO_2eq delta	t	LCA factor × L (where available)	—	—	—	Only where LCA exists (C2 LCA)

Annex B – Indicator calculation sheets

(ready formulas for the SEIA workbook)

Create one Excel/Google-Sheets file with the following tabs. The formulas below can be pasted directly.

B1. Params (all scenario inputs in one place)

Param	Symbol	Downside	Base	Upside	Notes
Discount rate (real)	r	0.040	**0.035**	0.030	—
Adoption liters/Y (2025–2030)	L_t	…	…	…	Per scenario
Attribution share (SME / Large)	AS	0.45/0.25	**0.60/0.40**	0.75/0.55	Section 4
Price sensitivity	—	−10%	0%	+10%	On margins
Energy sensitivity	—	+15%	0%	–	On process costs
Coverage	cov	8	10	12	m^2/L
Residential share	s_res	0.60	0.65	0.70	—
Dwelling size	m^2_dw	60	65	70	Country mix
Health value €/HH·y	V_h	5	10	20	Annex A
Biocide dose BAU	d_BAU	0.001	0.0015	0.002	kg/L

B2. Liters & Adoption

Columns: Year | Liters (Down/Base/Up) | SME share | Large share | Cumulative liters

B3. Economic (E1–E4)

- **E1** (€/L): =E1_BOMPROC_BAU - E1_BOMPROC_LIFE + E1_ADMIN_SAVINGS
- **NEV (E3)** per year: =((E1 * Liters) + Margin_Uplift) * AS - Licence_Fees
- **NPV:** =SUM(E3_year_t / (1+r)^t)

B4. Social/Health (S1–S3)

- **Households (S1):** = Liters * cov / m^2_dw * s_res
- **Exposure index (S2):** =IF(Interior_Full_Replace,1,0.5)
- **Health € (S3):** = S1 * S2 * V_h

B5. Environmental (EN1–EN4)

- **Avoided actives (EN1 kg):** = Liters * (d_BAU - 0)
- **VOC proxy (kg):** = Liters * VOC_Delta_per_L
- **CO_2eq (t):** = IF(LCA_Factor>0, Liters * LCA_Factor, "")

B6. Scenario Bridge

Inputs: ΔVolume (±15%), ΔPrice (±10%), ΔEnergy (+15%).

Output: Downside → Base → Upside NEV bridge and tornado bars.

QA rule: Every output cell must reference **Params**. No hard-coded numbers outside Params.

Annex C – Data sources & QA

(traceability to B2/B3 evidence, platform analytics)

C1. Traceability matrix

Indicator	Primary data	Transformation	Output	Location
Liters (B2)	16×1,000 L pilot logs	Sum → by scenario	U2 liters	Final Report / B2 note (C2 list)
Organoclay (B3)	Batch/weight logs	Sum	Output anchor	Final Report / B3 note (C2 list)
Platform events	Admin analytics export	Filter for qualified requests	U5	Platform admin manual
Dossier reuse	Portfolio submission evidence	€/L admin saving	E1	Monitoring/SEIA sheets
Health/VOC units	Literature/handbooks	Param table	S3/EN	Annex A/B

C2. QA procedures

- **Versioning:** timestamp TDS/SDS/labels; maintain change log when dossiers are updated.
- **Reproducibility:** keep **calculation sheets** (Annex B) with documented cell references.
- **Integrity checks:** (i) liters ≥ 0; (ii) attribution share 0–1; (iii) totals reconcile with B2/B3 anchors.
- **Peer review:** technical (formulations/QC) and business (cost/licensing) sign-offs per section.

C3. Data limitations & mitigations

- **Partial adoption data:** use scenario liters with documented AS; validate against platform leads (U5).
- **Missing LCA:** present CO_2eq only where factors exist (C2 LCA); otherwise physical units.
- **Institutional gaps:** where ecolabel reviews are paused, treat ecolabel as **driver**, not counted output.

Annex D – ToR & survey tools

(stakeholder interviews and buyer questionnaires)

D1. Terms of Reference (ToR) – Stakeholder interviews

Objective: collect consistent evidence on cost/time savings, adoption liters, barriers, and documentation reuse.
Scope: SME producers, large producers, binder partners, public buyers, ecolabel auditors.

Interview pack (60–90 min):

1. **Background:** role, product lines, geographies.
2. **Adoption status:** liters by SKU, dates, pilot evidence used (1,000 L proof?).
3. **Economics:** reformulation cycles, admin/cert cost vs portfolio dossier; time-to-market delta.
4. **Social/health:** application settings (interior), perception of risk change.
5. **Environment:** baseline preservative dose; VOC deltas; any LCA factors.
6. **Procurement:** tender language; evidence expectations; audit experience.
7. **Barriers/risks:** supply/energy, documentation bandwidth, certification continuity.
8. **KPI verification:** willingness to share anonymised figures (ranges).

D2. SME Producer Questionnaire (short form)

- Company size; monthly liters by line; target markets.
- **Adoption liters** (past 12 months; next 12 months forecast).
- **Documentation reuse**: which platform artefacts used? (labels, cross-walks, consumer info).
- **Costs/time:** rough €/L savings; months shaved in go/no-go.
- **Quality:** any batch variance issues? CoA pass-rate.
- **Barriers:** top 3 (ranked).
- **Procurement:** ecolabel/“equivalent evidence” experience.

D3. Public Buyer Questionnaire (short form)

- Organisation; procurement volume; tender criteria used (eco-label vs equivalent).
- **Evidence accepted:** certificates, cross-walks, QC packs, consumer-info pages.
- **Audit needs:** what documentation reduced evaluation time?

- **Outcome:** award result; delivery quality; suggestions for standardising evidence.

Data handling: aggregate and anonymise responses; store consents; report only in bands.

Annex E – Grant Agreement references

(include excerpts/pages as screenshots or quotes in the PDF)

E1. C2 – Deliverables list (selected items)

- **B2 — "16 000 l pilotparty of formulations (for each of 16 formulation – 1000 l) produced"** (due 31/05/2023).
- **B3 — "10,4 tons of organoclay produced"** (due 30/06/2023).
- **C2 — "Socio-economic impact assessment report"** (due 30/09/2024).
- **LCA report** listed among monitoring deliverables.

E2. C3 – Timetable excerpts

- Actions A–E phasing (2018–2024), including implementation and monitoring periods. *(Insert screenshot of the Action grid)*.

E3. B5 – Replicability & Transferability Plan (sections used)

- Online platform model, licensing monetisation, partner roles, communication timeline; forms the **adoption/replication spine** in SEIA. *(Insert relevant pages/figures)*.

E4. C2M Commercialisation checklist (excerpts used)

- Time-to-market **3–5 years**, finance need **€0.5–2.0 m**, SME ownership, market-creating posture; adopted for scenario bounds and financing assumptions. *(Insert table excerpt)*.

E5. Monitoring Methodology (for KPI alignment)

- KPI names/units/cadence and roles as adopted in Section 6; ensure **terminology matches** the method. *(Insert KPI table page)*.