

PRD - MVP 1

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☰ AI summary	MVP 1 aims to enable clients to conduct double materiality assessments and generate ESRS-compliant sustainability reports, focusing on GHG emissions accounting and essential disclosures for early adopters under EU regulations, with a dedicated module for SMEs.

MVP 1 – Product Requirement Document (Detailed)

Product Name: Carbon Aegis – MVP 1: ESRS Compliance Core

Timeline: 3 months (approx. 12 weeks)

Goal: Enable a client to perform a double materiality assessment, GHG Accounting, and produce an ESRS-compliant sustainability report by the end of this period.

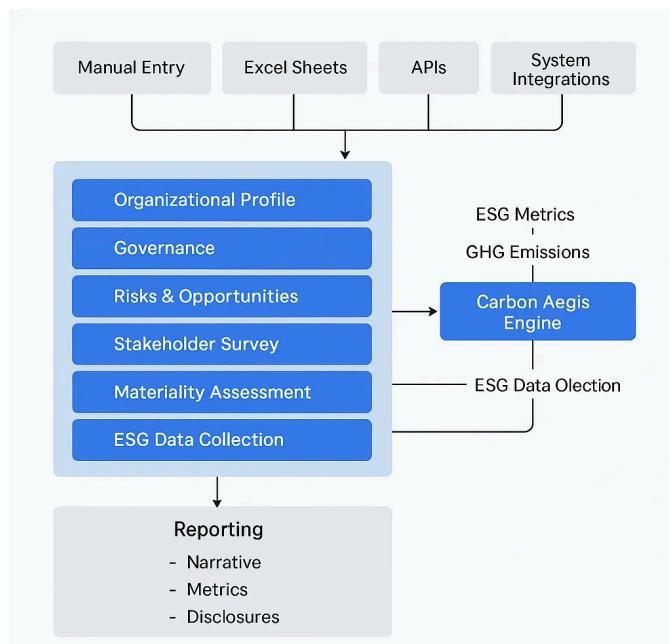
1. Objectives and Scope

MVP 1 is narrowly focused on meeting the **immediate needs of EU CSRD/ESRS reporting** for early adopter companies. The objectives are:

- **Smart GHG Emissions Accounting** in line with the GHG Protocol for Scope 1, 2, and 3, providing auditable, accurate emissions data for the reporting period. This includes **manual entry, Excel uploads, and API-based automated ingestion (MVP 2)**, with intelligent mapping of activity data to emissions factors.
- **Facilitate Double Materiality Assessment (DMA)** so companies can determine which ESRS disclosures are relevant (impact materiality + financial materiality).
- **Cover Essential ESRS Disclosures** – specifically ESRS 2 General Requirements and key topic standards (at minimum Climate (E1), Own Workforce (S1), and Business Conduct (G1)).
- **Generate an ESRS Report** in accordance with **corporate standards, with export in XBRL (iXBRL), PDF and Word formats**, including a **content index** mapping all required disclosures.
- **VSME MODULE:**
Carbon Aegis MVP 1 includes a **dedicated VSME module** to support **SMEs in complying with EFRAG's VSME standards (Basic and Comprehensive levels)**. This will:

- Enable structured, auditable, and export-ready sustainability reports for SMEs.
- Prepare SMEs for supply chain, bank, and ESG-related data requests.
- Align with both **Basic and Comprehensive VSME** requirements published by EFRAG.

Out of Scope (for MVP1): features not directly needed for initial ESRS compliance, such as support for non-ESRS frameworks (GRI, etc.), advanced analytics, automated integrations (manual data upload is acceptable in MVP1), or extensive customisation. These will come in later phases.



Languages: English, German (UI & report export supported)

2. Users and Use Cases

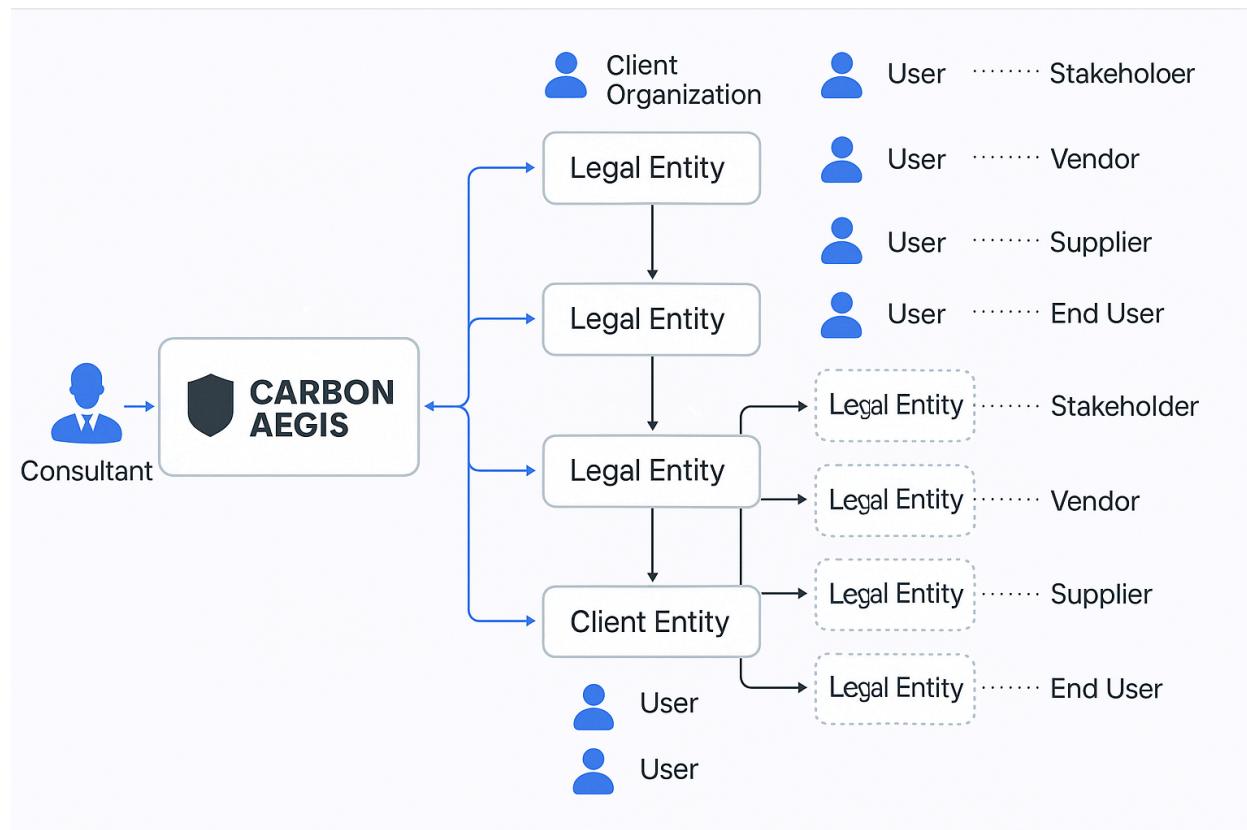
Primary Users: Sustainability managers or ESG reporting leads at companies subject to CSRD, who need to collect ESG data and compile the report. **SME owners, compliance officers, sustainability managers for VSME.** For MVP1,

assume users have basic knowledge of sustainability terms but need guidance on ESRS specifics.

Secondary Users: Banks, investors, corporate buyers etc. Company executives reviewing the report (read-only access), and auditors who will verify the data. In MVP1, secondary users might simply receive output (PDF or Excel of data) rather than interact within the system.

Example Use Cases:

- **UC 1:** Maria, a Sustainability Manager, must prepare her company's first CSRD report. She uses Carbon Aegis to input emissions data, conduct a materiality assessment, and output a report draft. The tool guides her on what to disclose for each ESRS requirement.
- **UC 2:** A medium-sized enterprise applies for green funding and needs a VSME Comprehensive report.
- **UC 3:** A sustainability consultant supports multiple SMEs across sectors.
- **UC 4:** A compliance officer uses VSME reports for CSRD pre-screening.



3. Functional Requirements

3.1 Greenhouse Gas Accounting

- **GHG Data Input:** The system shall allow user to enter activity data for Scope 1, 2, 3 emissions. *Acceptance criteria:* Forms or templates exist for at least: fuel usage (Scope 1), electricity consumption (Scope 2), and the top relevant Scope 3 categories (e.g., Category 1 – purchased goods by spend or quantity).
- **Emission Factor Application:** The system must calculate emissions (CO₂e) by multiplying activity data by appropriate emission factors. It will use a built-in database (e.g., Defra factors for fuel). For MVP1, factors can be static and updated via the annual EPA/Defra datasets.
- **Scope 1 & 2 Reporting:** Provide summary outputs: total Scope 1 emissions (tonnes CO₂e), total Scope 2 (market-based and location-based if available). Users should see calculations transparently (e.g., "Natural Gas – 20,000 kWh - > 4.08 tCO₂e").
- **Scope 3 Categories:** MVP1 should handle at least **3–5 major Scope 3 categories** since these often dominate emissions. Priority: Purchased goods and services, Fuel- and energy-related (not in Scope 1/2), Upstream transport, Business travel, Employee commuting. *Acceptance:* The user can enter data for these categories and get emissions results. Each category calculation follows GHG Protocol guidance (e.g., spend-based method for purchased goods).
- **Emission Results Output:** Emissions results should be stored and available for inclusion in the ESRS report (E1 section). The system will present a summary table of Scope 1, 2, 3 emissions for the year.
- **Audit Trail:** (Basic in MVP1) The system should record the source of each data point (e.g., "uploaded by user on X date"). This can be as simple as a log file or data table accessible to admins. In MVP1, full audit interface isn't required, but data should be stored in a structured way anticipating later audit features.

3.2 Double Materiality Assessment (DMA)

- **Materiality Survey Builder:** The system shall allow creating a list of sustainability topics to assess. For MVP1, we can pre-populate a list aligned

with ESRS (e.g., Climate Change, Pollution, Water, Own Workforce, Community, etc.). The user can rank or score each topic from 1–5 on two dimensions (impact & financial). If stakeholder input is needed, the user can input their feedback manually (external survey integration not required in MVP1, but she could gather input offline and input scores).

- **Guidance and Criteria:** Provide on-screen guidance explaining what constitutes impact vs financial materiality (based on ESRS 1 and ESRS 2 criteria). Possibly include examples ("e.g., Climate Change: high impact (company emits significant GHG) and high financial risk (carbon pricing could cost €X)").
- **Materiality Matrix Output:** After scoring, the system generates a simple matrix or list of topics classified as material or not. *Acceptance:* The output flags which ESRS standards the company must report (e.g., "E1 Climate: Material; S1 Own Workforce: Material; others Not material").
- **Link to Report Content:** The identified material topics should automatically trigger inclusion of those sections in the ESRS report module. For example, if Climate and Own Workforce are material, the E1 and S1 sections in the report wizard become active; others can be hidden or marked N/A with an explanation ("not material as per DMA").
- **Documentation:** The system should document the process and results for auditability – e.g., produce a short text or table summarizing the DMA results that can be included in the report under General Disclosures.

3.3 ESRS Reporting & Disclosure Management

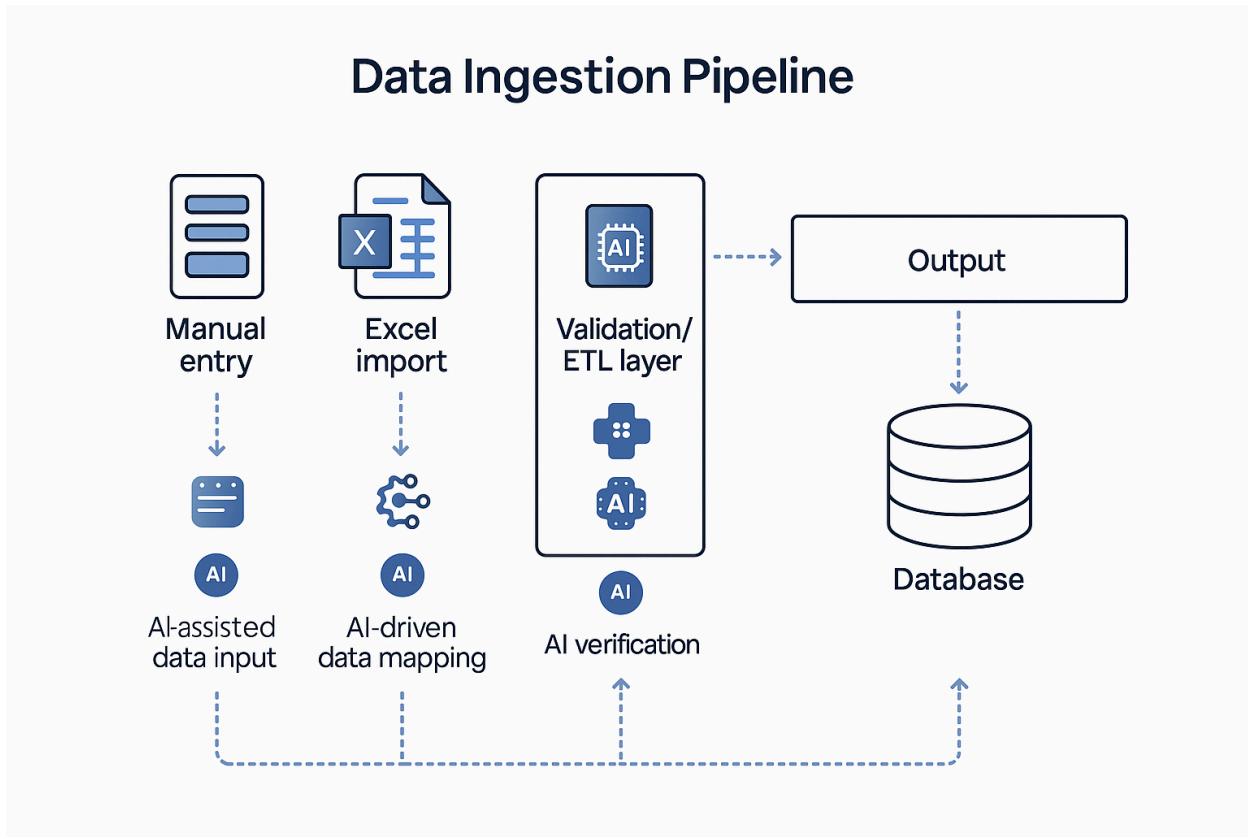
- **General Information Capture:** Provide fields to capture general ESRS 2 information: a description of the business model, a summary of the sustainability strategy, how the materiality assessment was conducted, governance structure for sustainability (which board committee, etc.), and a list of policies and targets. *Acceptance:* The interface presents these as questions or prompts (e.g., "Describe your business model and strategy in relation to sustainability (ESRS 2 GOV-1)"), and the user can input text.
- **Pre-defined Templates:** For each required ESRS disclosure, have a placeholder. For example, ESRS 2 includes disclosures like GOV-1 (roles and

responsibilities), SBM-1 (business model), etc. MVP1 can bundle them into logical groups for simplicity. The key is to ensure no major required element is missed. A checklist could be visible indicating completion status of each required disclosure.

- **Climate (E1) Disclosure:** This section should automatically pull the GHG emissions calculated in 3.1. *Acceptance:* After the user calculates emissions, when she navigates to "Climate – E1", it shows Scope 1, 2, 3 totals pre-filled in the report. She can then add narrative for climate risks and targets. Provide fields for at least: current year emissions (tCO₂e), comparison to base year or prior year (if available), climate targets (text or numeric field), and a description of transition plans.
- **Own Workforce (S1) Disclosure:** Provide fields for basic workforce info: number of employees, breakdown by gender (or diversity), any key metrics like turnover or health & safety. If exact metrics aren't known by user, allow them to skip or note "N/A". Since ESRS S1 has many metrics, MVP1 prioritizes critical ones (e.g., workforce diversity and H&S).
- **Business Conduct (G1) Disclosure:** Fields to describe code of ethics, anti-corruption policies, any incidents. Also include a field for tax transparency (which can be high-level since detailed tax disclosure might be in financial report).
- **Non-Material Topics:** The system should automatically generate a statement for each ESRS topic not material: e.g., "Pollution (ESRS E2) has been assessed as not material (see Double Materiality Assessment) and is not included in detail in this report." This ensures compliance by explicitly addressing all ESRS topics.
- **Report Assembly and Download:** Once all inputs are provided, the user should be able to **export the report**. MVP1 can generate a Word/PDF document compiling all sections in a structured format (aligned to ESRS Annex). *Acceptance:* The exported report includes all the filled sections, a cover page or heading, and an **ESRS content index** (mapping each ESRS requirement to where it's reported). The content index can be generated automatically based on which sections were filled. For MVP1, offering a Word or PDF export suffices; XBRL (iXBRL) export is ideal but if not fully ready, it can be planned.

3.4 User Interface & Experience

- **Guidance and Help:** MVP1 will include on-screen guidance for each section. For example, a tooltip or sidebar that provides instructions or examples for what to write (drawn from ESRS guidance documents). This is crucial given many users are new to ESRS. **Acceptance:** Users like Maria can click a help icon next to a question and see an explanation (e.g., "What is meant by 'impact of climate-related risks on your strategy'? ...").
- **Integrated Support:** Chat/email help options visible from within the module.
- **Navigation:** Implement a clear navigation structure – e.g., a sidebar menu or progress bar listing: Materiality Assessment → General Disclosures → E1 Climate → S1 Workforce → G1 Gov → Review → Export. This lets the user jump between sections. Show completion status (checkmarks).
- **Data Save & Validation:** As the user inputs data or text, the system should save periodically (to avoid data loss). Upon attempting to export, validate that key fields are not empty. If something critical is missing (like GHG numbers), prompt the user to fill or confirm omission.
- **Localization:** MVP1 will be in English *and German*. (Future versions might require multi-language support for EU, but not in MVP1 scope unless easily doable for UI labels.)
- **Security & Access:** Basic login authentication (email/password). Role management can be simplistic in MVP1 – assume single user or shared credentials for the sustainability team. Fine-grained roles (viewer, editor) can be future enhancement. Ensure the data is stored securely (compliant with GDPR for any personal data if applicable, though MVP1 likely deals mostly with company-level data).



3.5 VSME Module - Basic & Comprehensive

Basic VSME Module

Feature	Requirement
Survey/Form	11 mandatory disclosures pre-loaded per EFRAG Basic module
Field Types	Numeric, Boolean, Upload, Short Text
Validation	Real-time field checks and warnings for incomplete/missing entries
Export Engine	Export in both PDF and Excel formats
Guidance Layer	Tooltips per question with EFRAG guidance and sample responses
Progress Tracker	Completion status and mandatory field logic
Preview Mode	Read-only version of the report before export

Comprehensive VSME Module

Feature	Description
Scope 3 GHG	Numeric fields capturing estimated emissions
Climate Targets	Year-based milestone tracking
Transition Plan	Uploadable field for written or visual action plans
Due Diligence	Text inputs for human rights/environmental due diligence steps
Supply Chain Screening	Dropdown to indicate screening mechanisms
ESG Governance	Checkbox/select indicating presence of ESG responsibilities at executive level
Engagement Metrics	Field to capture employee engagement levels in sustainability
Training Scope	Field to track % of staff trained in ESG topics

4. Non-Functional Requirements (MVP1)

- **Accuracy:** Emission calculations must use correct factors and formulas per GHG Protocol. The system should use **up-to-date emission factors (2024/2025 versions)** from reliable sources like EPA or Defra. The double materiality logic should reflect ESRS guidance.
- **Performance:** The dataset sizes in MVP1 are small (some thousands of data points at most), so a fast web application with near-instant navigation is expected. Calculations and report generation should complete within a few seconds.
- **Scalability:** Not a big concern for MVP1 (single-company use), but the architecture should allow multi-company use in one instance for SaaS. Keep data segregated by account.

- **Usability:** MVP1's success relies on making a complex reporting process simpler. The UI should be clean, not overwhelmed by jargon. Use step-by-step flows. Early user feedback will be gathered (if possible) from pilot users to adjust wording and help text.
- **Compliance:** The output report should **comply with CSRD/ESRS requirements**. This means covering all required disclosures either with data or an explanation of omission. Also, if possible, align formatting (e.g., including required statement that it's in accordance with ESRS). MVP1 should allow a company to confidently declare compliance for general, E1, S1, G1.

5. MVP 1 Deliverables

At the end of MVP1, the deliverables include:

- A working web-based application (or accessible platform) where users can input required data and generate an **ESRS and VSME report**.
- **Documentation:** Quick-start guide for users (since timeline is short, at least an inline help or short PDF explaining how to use the tool to get their CSDR report done,

Embedded EFRAG-compliant guidance per question).

- Emission factor dataset (embedded or as reference) used for calculations, for transparency.
- **Template output – ensuring the format matches regulatory expectations and supports XBRL/iXBRL formatting.**

Success Criteria: MVP1 is successful if a pilot user can go through the entire process – enter organizational and emissions data, determine material topics, and export a report – and that report **satisfies the core requirements of ESRS** (per feedback from an ESG expert or auditor). We expect at least a 60% reduction in effort compared to doing this manually (as estimated, since the tool auto-calculates emissions and provides structured templates, similar to IBM Envizi's claim of boosting efficiency with automation. The data should be **audit-ready and finance-grade** meaning calculations are traceable and numbers tie out with source data.

6. User Flows (MVP 1)

1. Onboarding Flow

1. New user visits Carbon Aegis and clicks "Get Started."
2. Chooses sign-up method: Email, LinkedIn, or Google.
3. Fills out company profile form (name, sector, size, country).
4. System recommends applicable frameworks (e.g., CSRD/ESRS).
5. User chooses which modules to activate (GHG, DMA, ESRS).
6. System provisions a pre-structured Notion workspace with:
 - Materiality templates
 - Stakeholder meeting notes
 - Task tracker & audit log
7. User enters dashboard and sees guided setup steps (checklist).
8. Tour overlays explain key modules and next actions.

2. GHG Calculation Flow

1. User logs in and accesses GHG module.
2. Select Scope (1, 2, or 3) and category.
3. Enter activity data manually or via spreadsheet.
4. System auto-applies correct emission factor.
5. CO₂e is calculated and saved.
6. Breakdown and total emissions are shown in dashboard.

3. Double Materiality Assessment Flow

1. User navigates to DMA module.
2. Reviews predefined topic list (based on ESRS).
3. Scores each on impact and financial materiality (1–5).

4. Optionally adds stakeholder comments (from Notion).
5. System generates matrix and flags material topics.
6. Result is used to show/hide disclosure sections.

4. ESRS Report Builder Flow

1. User navigates to "ESRS Report."
2. Sees only the topics flagged as material.
3. For each section:
 - Enters narrative text.
 - Views pre-filled data (e.g., GHG totals for E1).
 - Uploads supporting files.
4. System shows completion progress bar.
5. Upon 100%, user clicks "Export."
6. System generates PDF/Word doc + content index.

5. Notion Workspace Integration Flow

1. Admin sets up shared Notion workspace.
2. Templates for survey input, meeting notes, and stakeholder logs are pre-filled.
3. User can:
 - Sync materiality insights from Notion to platform.
 - Import text blocks (e.g., strategy description).
 - Store versioned records linked to each disclosure.
4. Data is used in final report generation.

6. VSME Module Flow

1. User logs in and navigates to VSME module.
2. System pulls already-filled company profile from general modules (e.g., org. structure).

3. User selects **Basic or Comprehensive** VSME module.
4. System presents a **pre-loaded form** with mandatory disclosures.
5. User fills out the form with relevant numeric, text, or upload entries.
6. Completion tracker updates with color indicators.
7. User previews final report, then downloads it in desired format (PDF, HTML, Word).

7. MVP 2 – Preview (Non-Functional Teaser in UI)

Planned Features in MVP 2 (Non-functional Preview, Locked in UI):

- Automated Data Ingestion from ERP, HR, Finance, and Utility Systems (SAP, Oracle, NetSuite)
- Expanded Scope 3 Category Library (AI-based gap estimation)
- Supplier Engagement Module (questionnaires, onboarding)
- Multi-language Report Builder (FR, NL, IT, ES planned)
- Consultant View

These features are displayed as "Coming Soon" banners or locked modules in UI to drive anticipation but are not available in MVP1.