Chapter 1: Introduction

Why impact measurement matters for climate finance, and what the SUI solves.

What is a Scalable Unit of Impact?

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> **Core Definition:** The *Scalable Unit of Impact (SUI)* is the smallest measurable, attributable, and independently verifiable increment of environmental or social outcome produced by a single application of a company's core product or service, defined at a level of granularity sufficient to (a) distinguish the enterprise's contribution from counterfactual outcomes, (b) accumulate across applications to produce auditable aggregate impact, and (c) serve as the basis for financial instrument design and investor risk pricing.

Why "Unit"?

Impact measurement has long operated at the portfolio or programme level — reporting aggregate tonnes of CO? avoided, number of beneficiaries reached, or hectares restored. This aggregate view serves narrative purposes but fails investors who need to price risk at the asset level. The SUI concept borrows from the logic of the **unit of account** in accounting and the **unit test** in software engineering: before you can trust the aggregate, you must be able to verify the smallest repeatable element.

A SUI is, in essence, the *atomic unit* of an enterprise's impact claim. If the SUI is well-defined, the enterprise's total impact claim is simply the count of successful SUI applications multiplied by the per-application magnitude — an equation any investor or auditor can verify.

Why "Scalable"?

The word "scalable" does two things in this definition:

1. **Replicability:** The same unit — defined with the same parameters and verified against the same baseline — must be producible in application 1 and application 1,000,000. If the unit changes materially as the enterprise scales, it is not a SUI; it is a project-specific estimate.
2. **Financial leverage:** A verified, replicable unit of impact is the building block for financial instruments — green bonds, blended finance tranches, results-based payments — that reward scale. The SUI is scalable not just operationally but *financially*.

What a SUI Is Not

Concept	What it measures	Why it is not a SUI
ESG Score	Portfolio-level rating	No attribution to a single product application; not verifiable at unit level
Carbon Credit	Verified tonne of CO?e avoided or removed	Closest analogue, but credits are typically aggregated project-level, not per-application
SDG Alignment	Goal-level contribution claim	No quantitative unit; does not support financial instrument design
KPI / Output Metric	Activity measure (units sold, sessions held)	Outputs, not outcomes; no baseline or counterfactual
IRIS+ Metric	Standardised indicator (e.g., PI7685)	Defines what to measure but not the per-application verification protocol

The SUI in One Sentence

If a company can say: *"Every time a farmer applies one dose of our biostimulant to one hectare, we displace 102.4 kg CO?e of synthetic fertiliser — verified against a documented counterfactual by an independent third party, recorded in our Single Source of Truth system, and accumulated into an auditable impact ledger"* — that company has a SUI.

Historical Context

The SUI concept emerges from the convergence of three trends that matured between 2018 and 2025:

1. **Impact measurement standardisation** — IRIS+ 5.x, TNFD, IFVI, and AIMM created common taxonomies that made cross-company comparison possible for the first time.
2. **Blended finance structuring** — Results-based finance instruments (Development Impact Bonds, Green Outcome Bonds) demonstrated that verified impact units could trigger financial flows, creating demand for reliable unit-level verification.
3. **Climate startup ecosystems** — Accelerators like ClimateLaunchpad and MassChallenge began encountering hundreds of startups making impact claims that investors could not price. The SUI emerged as a practical answer to the question: "What is the smallest verifiable thing your product does?"

The Valuation Gap in Climate Finance

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> **The Core Problem:** Climate startups with genuine, large-scale environmental impact routinely raise capital at higher costs than comparable companies in traditional sectors — not because their impact is uncertain, but because it is *unverifiably communicated*. This is the valuation gap.

The Asymmetric Information Problem

Classical finance theory (Akerlof, 1970; Myers & Majluf, 1984) tells us that information asymmetry between founders and investors raises the cost of capital. When an investor cannot independently verify a startup's core value claim, they apply a risk premium that reflects this uncertainty. For technology startups, the core value claim is usually a product or market thesis that can be tested with pilots and revenue data. For **climate startups**, the core value claim is an impact thesis — and that is vastly harder to verify.

The result: two startups with identical financial profiles but different impact verification capabilities will receive different valuations. The one with verified, auditable impact units receives a lower risk premium. The one whose impact is asserted but not verified pays a cost-of-capital penalty that compounds over every subsequent financing round.

Scale of the Problem

Convergence Finance (2024) tracked 1,123 blended finance transactions totalling $213 billion since 2010. Yet demand for climate finance is estimated at $4–7 trillion annually through 2030 (IPCC AR6). The gap is not a supply problem — institutional capital has declared commitments of trillions — it is a **deployment problem**. Capital cannot flow at speed to assets it cannot price.

- Only 2% of total climate finance has reached Least Developed Countries (LDCs) despite their outsized vulnerability
- Early-stage climate startups (pre-Series A) represent less than 8% of climate finance flows despite producing the majority of innovative solutions

- The average time from climate startup founding to first institutional impact investment is 6.2 years (Pitchbook, 2024) — a pipeline drying period where many startups pivot to conventional markets or collapse

Three Layers of the Valuation Gap

Layer 1: The Communication Gap

Startups use inconsistent vocabularies to describe impact. One company calls its product "carbon-neutral"; another claims "net-zero supply chain"; a third reports "avoided emissions." These terms are not interchangeable, do not map to a common taxonomy, and cannot be aggregated by a portfolio manager. Investors cannot compare, so they discount all equally.

Layer 2: The Verification Gap

Even when startups use standard terms (e.g., IRIS+ indicators), the underlying data is typically self-reported without third-party verification. The impact number in a pitch deck is almost never auditable against a documented methodology, a baseline, and a counterfactual. Without this, the investor's legal department cannot include impact claims in fund documentation — so impact does not affect pricing.

Layer 3: The Instrument Design Gap

Impact-linked financial instruments (Green Bonds, Social Impact Bonds, Results-Based Finance) exist and are growing. But they require *pre-agreed, verifiable metrics* as trigger conditions. A startup without a defined SUI cannot access these instruments, even if its underlying impact is substantial. It is locked out of the fastest-growing segment of impact capital because it cannot speak the instrument's language.

The Cost: A Back-of-Envelope Calculation

Consider a climate startup that raises a $5M Series A at a 25% equity dilution. If verified impact reduced investor uncertainty and brought dilution to 20% — a conservative greenium estimate — the founder retains an additional 5% of the company. At a $50M exit, that is $2.5M in value destroyed purely by the verification gap. Across a portfolio of 100 such startups, the aggregate value destruction exceeds $250M — none of it inevitable.

How SUI Addresses Each Layer

Gap Layer	SUI Response
Communication Gap	SUI forces mapping to an established taxonomy (IRIS+, TNFD, AIMM) at definition time, creating a common language

Gap Layer	SUI Response
Verification Gap	SUI requires third-party validation against a Single Source of Truth (SSOT) — the impact claim is auditable by design
Instrument Design Gap	A verified SUI is a ready-made trigger metric for results-based financial instruments; the startup can engage instrument designers immediately

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Next: How SUI Solves the Cost of Capital Trap — the SUI-WACC hypothesis explained.

How SUI Solves the Cost of Capital Trap

How SUI Solves the Cost of Capital Trap

> **The SUI-WACC Hypothesis:** When a startup's SUI is verified via SSOT audit and aligned to MDB-compatible taxonomies, the resulting reduction in investor uncertainty converts "informational impact" into "price-forming impact" — creating conditions for preferential access to blended finance structures, green bond instruments, and MDB co-investment, thereby reducing the startup's long-term Weighted Average Cost of Capital (WACC).

Understanding WACC for Climate Startups

The Weighted Average Cost of Capital is the blended rate a company must return to its capital providers — equity holders and debt holders — weighted by their respective shares of the capital structure. For a climate startup:

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WACC = (E/V) × Re + (D/V) × Rd × (1 - Tc)

Where:
  E = Equity value
  D = Debt value
  V = E + D (total capital)
  Re = Cost of equity (investor required return)
  Rd = Cost of debt (interest rate)
  Tc = Corporate tax rate
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For early-stage climate startups, the cost of equity (Re) dominates because debt is rarely available. Re is largely determined by perceived risk. The SUI framework targets Re directly by reducing informational uncertainty — the single largest component of risk premium for impact enterprises.

The Five Mechanisms of WACC Reduction

Mechanism 1: Greenium Access

Studies of the green bond market document a "greenium" — a yield discount (i.e., lower borrowing cost) for bonds that meet verified green criteria. The evidence is consistent across markets:

- Zerbib (2019): 2 bps average greenium across 135 matched pairs of green and conventional bonds
- EU Green Bond Standard impact assessments: 3–18 bps for bonds with robust third-party verification
- IFC/World Bank analysis: up to 40 bps for sovereign green bonds with strong disclosure regimes
- Critical addition: third-party verification alone adds approximately 7.5 bps to the greenium (Kapraun et al., 2021)

A startup whose SUI is independently verified can access green bond financing that a startup with unverified impact cannot. At $10M in debt financing, a 15 bps reduction in interest rate saves $150,000 annually — compounding into material WACC reduction.

Mechanism 2: Blended Finance First-Loss Layers

Blended finance structures use concessional capital (grants or subordinated debt from DFIs, foundations, or governments) to de-risk commercial investment. The first-loss layer absorbs initial losses, allowing commercial investors to participate at lower required returns. To trigger first-loss provision, a startup must demonstrate verified impact milestones. The SUI is the milestone definition mechanism.

Example: A startup with a verified SUI of "102.4 kg CO?e per hectare treated" can contractually agree: "When we reach 5,000 hectares treated and verified, the first-loss guarantee converts to equity at pre-agreed terms." This clarity makes DFIs willing to provide first-loss capital they would never offer to an unverified impact claim.

Mechanism 3: MDB Co-investment Eligibility

Multilateral Development Banks (IFC, IDB Invest, AIIB, ADB) have explicit taxonomy alignment requirements for co-investment. The EU Taxonomy, the Climate Bonds Initiative taxonomy, and IFC's EDGE standard all require demonstrable, measurable environmental outcomes. A startup with a SUI aligned to these taxonomies is immediately eligible for MDB co-investment pipelines — which typically offer below-market rates and long tenors that commercial investors cannot match.

Mechanism 4: Reduced Due Diligence Cost

Impact due diligence is expensive — a standard ESG/impact assessment costs $15,000–$75,000 per transaction. Investors conducting multiple rounds of due diligence on the same startup multiply these costs. A startup with a pre-verified, auditable SSOT system reduces due diligence cost for every future investor — and part of that saving can be captured as a higher pre-money valuation (lower effective equity cost).

Mechanism 5: Narrative Premium with Institutional LPs

Venture capital funds with impact mandates face pressure from their Limited Partners (LPs — pension funds, endowments, family offices) to demonstrate portfolio-level impact. A startup with a verified SUI improves the fund's impact reporting quality, which matters for LP retention and follow-on fundraising. Funds that can demonstrate high-quality portfolio impact are increasingly able to raise at better terms — and some of that LP value translates back to portfolio companies as more patient capital and lower dilution requirements.

The Compounding Effect

These five mechanisms do not operate independently. A startup that achieves verified SUI status gains access to blended finance (Mechanism 2), which brings MDB co-investors (Mechanism 3), which signals credibility to commercial investors who reduce their required return (Mechanism 1 via reputation), which reduces due diligence costs for each subsequent round (Mechanism 4), which improves the fund's LP story (Mechanism 5). The WACC impact compounds across the startup's lifecycle.

Conservative modelling suggests a climate startup with a verified SUI framework — all else equal — could reduce its Series A WACC by 300–500 basis points relative to an equivalent startup without verification. Over a 7-year venture lifecycle, this difference translates to a substantially larger equity value at exit.

Continue to Chapter 2: The SUI Framework — the five criteria in detail.