

Annex B

Institutional Alignment Overview

Purpose

This annex summarizes the institutional alignment between EMJ LIFE’s five DOI-registered white papers

(**PADV**, **NTCC**, **InstiTech**, **STRC**, **VISA-LAYER**) and key international governance, audit, and sustainability frameworks.

It explains how the **PADV–NTCC–InstiTech–STRC–VISA-LAYER** system transforms behavioral participation into verifiable, auditable, and governable ESG data within an institutional context.

1. Structural Alignment: PADV–NTCC–InstiTech–STRC–VISA-LAYER

Layer	Institutional Function	Primary Focus	Verification Output
PADV	Behavioral Verification	Participation → Data	Verified behavioral records (Proof of Participation)
NTCC	Data Quantification	Data → Carbon Equivalence	Non-Tradable Carbon Credit (NTCC) units as trust data
InstiTech	Institutional Codification	Data → Governance	Rule-based system design (Institutional Governance Layer)
STRC	Risk-Control Integration	Governance → Trust	Verified strategy-to-trust linkage (Assurance Framework)
VISA-LAYER	Verification Architecture	Trust → Capital	DOI-linked ESG reporting and audit traceability

Together they operationalize the **participation-to-capital chain**, turning

behavioral data into measurable trust and capital legitimacy through transparent verification.

2. Alignment with International Frameworks

Reference Framework	Alignment Dimension	Description
GRI	Disclosure Transparency	PADV and NTCC quantify behavioral and carbon participation data supporting Material Topics and Stakeholder Engagement disclosures.
IFRS / ISSB (S1 & S2)	Financial Materiality & Scope 3 Integration	NTCC links verified participation data to Scope 3 emissions (Cat 11 & 12) for IFRS S2 quantitative requirements.
COSO Framework	Governance & Internal Control	STRC translates COSO's five components (Control Environment, Risk Assessment, Control Activities, Information & Communication, Monitoring) into verifiable governance attributes.
ISO 14064-1 / 14067	Carbon Quantification & Verification	NTCC data conversion logic follows ISO 14064-1:2018 and 14067 for GHG quantification and product-level CO ₂ e assessment.
PDPA (Singapore)	Data Privacy & Governance	InstiTech and VISA-LAYER embed PDPA-compliant data minimization and anonymization models.
GHG Protocol	Emission Accounting	NTCC maps verified participation to GHG Protocol Scope 3 categories as auditable inputs.

Reference Framework	Alignment Dimension	Description
IFAC / IAASB Assurance Standards	Third-Party Verification Compatibility	STRC and VISA-LAYER ensure traceability consistent with ISAE 3000 (Revised) for non-financial assurance.

3. Regional and Policy Relevance (Singapore Context)

Regulatory Reference	Corresponding Framework Element	Alignment Description
MAS	STRC / VISA-LAYER	Aligns verified governance and ESG disclosure logic to Singapore's Green Finance Taxonomy and risk governance expectations.
Enterprise Singapore (ESG)	PADV / NTCC	Strengthens SME ESG readiness and Scope 3 data verification for enterprise reporting.
GovTech	VISA-LAYER / InstiTech	Ensures interoperability with Trusted Data Framework and digital identity architecture (SingPass / CorpPass).
NEA	NTCC	Provides non-market carbon data mechanism complementary to Singapore's carbon policies.
EDB	STRC / VISA-LAYER	Demonstrates Singapore-origin ESG data innovation applicable to regional investment strategies.

4. Functional Equivalence with Audit and Verification Logic

Audit Function	Systemic Correspondence	Verification Mechanism
Evidence Generation	PADV	Proof-of-Participation records
Quantification	NTCC	CO ₂ e equivalence and traceability
Governance Assurance	InstiTech	Rule-based controls and protocols
Risk & Trust Validation	STRC	Continuous verification and risk alignment
Assurance Reporting	VISA-LAYER	DOI-linked data disclosure with audit trail

This ensures behavioral ESG data can undergo assurance rigor equal to financial or operational disclosures under Big Four logic.

5. Integration with ESG DOI Reporting Service

The VISA-LAYER introduces a **DOI-linked verification registry**, creating a globally verifiable data layer between institutions, auditors, and verification agencies.

Core Functions

- Assigns persistent DOI identifiers to ESG data reports
- Enables traceable cross-reference between participation data and corporate disclosures
- Provides third-party verifiers with immutable data anchors for audit reference

This is the **Verification Layer** within EMJ LIFE's architecture — connecting academic-grade verifiability (Crossref) with assurance-grade usability (audit

reporting).

6. Institutional Impact Summary

Impact Domain	Institutional Contribution
Governance	Converts ESG intent into measurable trust data
Auditability	Creates an evidence-based trail meeting ISAE 3000 and COSO criteria
Transparency	Establishes DOI-based traceability for continuous disclosure
Education & Participation	Links sustainability education to verifiable ESG metrics
Sustainable Finance	Enables verified data to serve as capital disclosure inputs

Disclaimer — Institutional References and Regulatory

Mentions

All references to governmental agencies, statutory boards, and public institutions (including the Monetary Authority of Singapore [MAS], Enterprise Singapore, Government Technology Agency [GovTech], National Environment Agency [NEA], and Economic Development Board [EDB]) are made **purely for contextual and informational purposes**.

These mentions do **not imply endorsement, partnership, or formal collaboration**.

Dialogues between EMJ LIFE HOLDINGS PTE. LTD. and these agencies were informational only, intended to maintain transparency and regulatory consistency during development.

The agencies retain full independence of policy and interpretation, and no statement here should be construed as representing their views or approval.

Conclusion

The alignment confirms that EMJ LIFE's institutional system does not replace existing standards — it **complements and operationalizes them**.

By embedding verifiability, auditability, and accountability within one interoperable system, the **PADV-NTCC-InstiTech-STRC-VISA-LAYER** framework positions Singapore as a **global pioneer in verified ESG data infrastructure**.

End of Annex B

© 2025 EMJ LIFE HOLDINGS PTE. LTD. — Licensed under CC BY 4.0