

PEACE ENGINEERS

**THE TREATY FOR REGENERATIVE PEACE AND
HUMAN SOVEREIGNTY**

Volume IV

Technical Standards Manual

*Metrics, certification, data architecture, interoperability, and verification for the
Twelve Resource Realms.*

Prepared for leaders, tribal nations, states, cities, institutions, companies, investors, builders, and
communities seeking to make peace practical.

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Publisher Notice and Drafting Status

This five-volume package is a first working edition of the PEACE Treaty framework. It is drafted for diplomatic, tribal, municipal, corporate, philanthropic, and technical review. It is not legal advice, does not create binding obligations until adopted by a competent signatory authority, and should be reviewed by counsel in each jurisdiction before use.

The framework is designed as an opt-in protocol treaty and multi-stakeholder compact. It can be adopted by nation-states, tribal nations and Indigenous governments, regional coalitions, municipalities, public agencies, corporations, universities, nonprofits, investors, and ReGen Hubs. The design intentionally uses incentives, open standards, transparent measurement, and self-enforcing economics rather than coercive global bureaucracy.

Technology performance claims, business-stage descriptions, energy-cost targets, and jurisdictional claims referenced from PEACE Ecosystem materials remain subject to independent technical, legal, financial, and scientific verification before any binding deployment decision.

Table of Contents

- 1 Standards Philosophy
- 2 Metric Architecture
- 3 Twelve Realm Standards
- 4 Data and API Requirements
- 5 Certification and Audit Protocol
- 6 Technology Verification Levels
- 7 Cybersecurity, Privacy, and Data Sovereignty
- Appendix** Standard Data Dictionary

1. Standards Philosophy

The Treaty standards are designed to be useful before they are perfect. They must support first action, fair comparison, honest uncertainty, and continuous improvement. Every metric should be measurable with tools available now, while allowing more precise instrumentation later.

The standards follow five rules: measure outputs, measure dependency, measure distribution, measure resilience, and measure dignity. A technology is not regenerative merely because it is new. It is regenerative when it improves the relevant realm without degrading another realm or extracting value from the community.

2. Metric Architecture

Each realm standard contains a primary index, input variables, accepted data sources, confidence score, reporting interval, certification thresholds, and cross-realm effects. Pe aggregates realm improvement. CVI verifies human vitality.

Standard Field	Definition
Primary Index	The headline metric for each realm.
Numerator	Local regenerative output or positive human condition.
Denominator	Demand, dependency, scarcity, debt, or burden.
Confidence Score	High, medium, or low data confidence based on source quality and verification.
Distribution Check	Whether benefits reach households, local businesses, vulnerable populations, and future generations.
Cross-Realm Effects	Positive or negative effects on other realms.
Audit Evidence	The records required to verify the claim.

3. Twelve Realm Standards

I. Energy - Energy Autonomy Ratio (EAR)

Purpose: End fuel dependency and make energy abundance the upstream driver of all other realms.

Initial formula: Local clean generation / total demand.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.

Component	Standard
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

II. Water - Water Sovereignty Index (WSI)

Purpose: Make watersheds resilient through harvesting, reuse, restoration, and clean distribution.

Initial formula: Locally harvested or regenerated water / consumed water.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

III. Food - Local Nutrition Ratio (LNR)

Purpose: Shift from calories as commodities to nourishment as local resilience.

Initial formula: Local regenerative nutrition / nutritional need.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.

Component	Standard
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

IV. Health - Wellness Autonomy Index (WAI)

Purpose: Build community health that lowers crisis dependency and improves vitality.

Initial formula: Preventive and local care capacity / health need.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

V. Shelter - Housing Integrity Score (HIS)

Purpose: Make shelter durable, efficient, affordable, non-toxic, and locally maintainable.

Initial formula: Safe regenerative shelter / household need.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.

Component	Standard
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

VI. Waste - Circularity Index (CI)

Purpose: End the concept of away by turning outputs into inputs.

Initial formula: Materials reused, repaired, composted, or regenerated / total material throughput.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

VII. Education - Knowledge Liberation Index (KLI)

Purpose: Convert education into actual capability, systems literacy, and practical skill.

Initial formula: Applied useful knowledge / knowledge consumed.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.

Component	Standard
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

VIII. Communication - Free Flow Ratio (FFR)

Purpose: Protect sovereign communication, open knowledge, and resilient mesh coordination.

Initial formula: Open truthful signal flow / total information dependency.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

IX. Transportation - Mobility Autonomy Factor (MAF)

Purpose: Move people and goods without binding communities to extractive fuel or fragile logistics.

Initial formula: Local clean mobility capacity / mobility need.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.

Component	Standard
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

X. Manufacturing - Regenerative Production Ratio (RPR)

Purpose: Restore local making, repair, tool ownership, and circular manufacturing capacity.

Initial formula: Local regenerative production / imported productive dependency.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

XI. Economics - Abundance Flow Index (AFI)

Purpose: Make money, credit, and ownership serve life, resilience, and sovereign production.

Initial formula: Commons-backed productive flow / debt-extractive flow.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.

Component	Standard
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

XII. Governance - Justice Coherence Index (JCI)

Purpose: Make governance participatory, accountable, lawful, transparent, and repair-oriented.

Initial formula: Transparent responsive decision capacity / governance burden.

Component	Standard
Minimum Data	Baseline demand, local output, imported dependency, cost per unit, reliability, ownership, and affordability.
Quarterly Evidence	Meter data, invoices, project logs, community survey, maintenance records, incident records.
Distribution Test	Benefits must be evaluated by household, geography, income, cultural group, and essential-service status where appropriate.
Resilience Test	Demonstrate performance under disruption: outage, shipping delay, price spike, climate event, or governance stress.
Certification Trigger	Improvement in the primary index plus no material harm to CVI or another realm.

4. Data and API Requirements

A Treaty data system should be simple enough for a village and rigorous enough for a national statistics office. The same fields should work in spreadsheets, JSON, public dashboards, and audit systems.

API Field	Description
party_id	Unique identifier for signatory party or hub.
reporting_period	Quarter or year covered by the report.
realm_id	I through XII.
metric_name	Primary or secondary metric name.

API Field	Description
numerator_value	Measured regenerative output or positive condition.
denominator_value	Demand, dependency, scarcity, debt, or burden.
metric_value	Calculated index value.
confidence_level	High, medium, or low.
data_source	Meter, invoice, survey, sensor, public record, audit, or estimate.
verification_status	Self-reported, community-reviewed, third-party audited, or disputed.
equity_notes	Distributional effects and community access notes.

5. Certification and Audit Protocol

Audit Stage	Action
Registration	Party files accession instrument, boundary, contacts, and certification intent.
Baseline Review	Auditor reviews baseline methods, missing data, and confidence levels.
Project Review	Auditor reviews project design, procurement, safety, consent, and finance.
Quarterly Review	Auditor checks changes in Pe, CVI, realm metrics, finance, and governance.
Community Review	Affected community validates whether reported benefits match lived experience.
Certification Decision	Tier awarded, deferred, suspended, or revoked with explanation.
Appeal	Party may submit corrections, additional evidence, or request mediation.

6. Technology Verification Levels

Level	Use in Treaty Projects
Level 0 - Concept	May be studied, not procured as critical infrastructure.
Level 1 - Lab Demonstration	May receive research support with clear

Level	Use in Treaty Projects
	uncertainty disclosure.
Level 2 - Field Pilot	May be deployed in non-critical or redundant systems with monitoring.
Level 3 - Verified Pilot	May support certified projects with independent performance data.
Level 4 - Commercially Proven	Eligible for procurement and financing subject to local due diligence.
Level 5 - Open Standard	Interoperable, widely verified, documented, maintainable, and eligible for rapid replication.

7. Cybersecurity, Privacy, and Data Sovereignty

Data architecture must never turn peace engineering into surveillance. Personal data should be minimized. Community data should be governed locally. Sacred, cultural, health, and Indigenous knowledge should be protected by consent protocols and community data trusts.

Requirement	Standard
Privacy by Design	Collect the least personal data necessary and publish aggregate data where possible.
Local Data Trusts	Communities control sensitive datasets and approve external access.
Open Code Preference	Public-interest infrastructure should prefer auditable open-source code when feasible.
Security Review	Critical systems require access control, backup, incident response, and audit logs.
Right to Explain	People affected by automated decisions must be able to understand and contest them.
Cultural Protection	Traditional knowledge is not open data unless the knowledge holders choose to make it so.

Appendix - Standard Data Dictionary

Term	Working Definition
Regenerative Output	A measurable flow that increases local capacity while preserving or improving source systems.
Dependency Factor	A measurable reliance on external, centralized, monopolistic, debt-based, or fragile provisioning.
Pe	Sum of regenerative output divided by

Term	Working Definition
	dependency across the twelve realms.
CVI	Health, dignity, and freedom divided by scarcity, debt burden, and dependency.
ReGen Hub	Regional implementation node for training, making, measuring, and governing PEACE Treaty deployment.
Certification	Public recognition that a party has met specified Treaty standards.
Corrective Plan	Public plan to repair a failed, misleading, or harmful implementation claim.

References and Source Notes

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