

TrustlessMark Interoperability Layer — Extended Edition v1.0 (2025)

We will have a lot more for TrustlessMark.org to consider.

Purpose: This extended edition provides the complete interoperability registry for the TrustlessMark standard, mapping 24 active certifications into verifiable Open Coffee Proof (OCP) schema objects. This document is intended for foundational reference during standards committee and implementation reviews.

| Certification / Badge | Governing Body | Verification Type | TrustlessMark Claim Type | Proof Format | OCP Proof Level | Status |
|------------------------------------|-----------------------------------|-----------------------|----------------------------|--------------|-----------------|----------|
| USDA Organic | USDA NOP | Third-party audit | OrganicProduction | JSON + PDF | Extended Proof | Core |
| Fair Trade Certified | Fair Trade USA | License / Audit | FairTradeEthics | JSON | Partner Node | Core |
| Rainforest Alliance | Rainforest Alliance | License / Field audit | RainforestSustainability | JSON | Partner Node | Core |
| Smithsonian Bird Friendly | Smithsonian Migratory Bird Center | Farm audit | BirdFriendlyAgriculture | PDF + JSON | Extended Proof | Core |
| Carbon Neutral Certified | Climate Neutral / SCS Global | Audit | CarbonNeutralProduction | JSON | Extended Proof | Core |
| Non-GMO Project Verified | Non-GMO Project | Lab test | NonGMO_Purity | JSON | Extended Proof | Core |
| Specialty Coffee Association (SCA) | Specialty Coffee Association | Grading | CupQualityGrading | JSON | Base Proof | Core |
| Direct Trade | Brand-defined | Self-verified | DirectTradeTransparency | JSON | Base Proof | Core |
| B Corp | B Lab | Evaluation | CorporateEthics | JSON | Partner Node | Core |
| Gluten-Free Certified | GFCO / NSF | Lab + audit | GlutenFreeSafety | JSON | Extended Proof | Core |
| Vegan Certified | Vegan Action / V-Label | Label audit | VeganComposition | JSON | Extended Proof | Core |
| Kosher Certified | OU / Kof-K | Inspection | KosherCompliance | JSON | Extended Proof | Core |
| Halal Certified | IFANCA / ISA | Inspection | HalalCompliance | JSON | Extended Proof | Core |
| Compostable Packaging Certified | TÜV Austria / BPI | Lab test | CompostablePackaging | JSON | Extended Proof | Core |
| 1% for the Planet | 1% for the Planet | Documentation | DonationCommitment | JSON | Base Proof | Core |
| Texas Veteran-Owned Business | Texas Veterans Commission | Registration | VeteranOwnership | JSON | Base Proof | Core |
| TrustlessMark Verified | TrustlessMark Foundation | Digital signature | TrustlessVerification | JSON | Partner Node | Core |
| GS1 / UPC Traceability | GS1 Global | Registration | TraceabilityIdentity | JSON | Base Proof | Core |
| UTZ Certified (Legacy) | Rainforest Alliance (Legacy UTZ) | License / Field audit | UTZSustainability | JSON | Partner Node | Optional |
| Carbon Trust / PAS 2060 | Carbon Trust (UK) | Audit | CarbonNeutralityValidation | JSON | Extended Proof | Optional |
| Women-Owned / WBENC | WBENC / WEConnect International | Registration | WomenOwnedCertification | JSON | Extended Proof | Optional |

| PDO / PGI | EU GI System | Registration | GeographicIndication | JSON | Extended Proof | Optional |
|-------------------------------------|------------------|-----------------------|--------------------------|------|----------------|----------|
| ISO 22000 Food Safety | ISO / SGS | Audit | FoodSafetyManagement | JSON | Extended Proof | Emerging |
| Plastic Neutral / rePurpose Global | rePurpose Global | Documentation + Audit | PlasticNeutralCommitment | JSON | Extended Proof | Emerging |
| RE100 / Renewable Energy Commitment | ReCarbon + CDP | Documentation | RenewableEnergySource | JSON | Extended Proof | Emerging |

TrustlessMark → OCP Schema Mapping

Each certification maps to a structured JSON-LD claim object compatible with Open Coffee Proof (OCP) and schema.org definitions.

```
{ "@context": "https://schema.org", "@type": "Certificate", "claimType": "USDA Organic", "issuedBy": "USDA NOP", "verificationMethod": "Third-Party Audit", "trustlessmark:hash": "sha256-hex-string", "trustlessmark:signature": "https://verify.trustlessmark.org/fcc/certifications/usda-organic.sig", "trustlessmark:version": "OCP-v1" }
```

Governance & Proof Hierarchy

TrustlessMark supports three proof levels to ensure traceability and interoperability across the supply chain:

- **Base Proof** — Simplified JSON claim (self-attested)
- **Extended Proof** — Includes third-party lab or audit verification
- **Partner Node Proof** — Direct validation via external certifier APIs

Appendix — Shopify Metafield Linkage

TrustlessMark integrates directly into Shopify metafields to provide machine-verifiable data display:

- fcc.manifest_url — Proof file
- fcc.signature_url — Cryptographic signature
- fcc.certificate_verified — Boolean flag
- trustlessmark.claim_type — Certification claim