

From Sourcing to Reporting:

Navigating the Land Sector and Removals Standard Through Traceable Cotton Supply Chains

By: The U.S. Cotton Trust Protocol

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Contact: info@TrustUSCotton.org

Executive Summary

The Greenhouse Gas (GHG) Protocol has set a new bar for how companies report emissions and removals tied to agricultural land use. The Land Sector and Removals (LSR) Standard is voluntary, but inventories claiming GHG Protocol conformance must apply the standard for reporting periods beginning on or after January 1, 2027. The standard requires companies to report emissions categories separately rather than combining into a single net figure, and any claimed carbon removal must meet defined conditions for traceability, monitoring, and reversal accounting. While the LSR is voluntary itself, it is also expected to become a practical requirement through frameworks built on GHG Protocol accounting, including the Science Based Targets initiative (SBTi) Forest, Land and Agriculture (FLAG) Standard and Carbon Disclosure Project (CDP), although the International Sustainability Standards Board (ISSB) and European Sustainability Reporting Standards (ESRS) do not yet formally reference it.

This changes the relationship between sourcing and reporting. Companies reporting on a calendar-year basis will publish their first LSR Standard-conforming inventories in 2028 (covering the 2027 reporting year), but the data available for that reporting depends on sourcing decisions made well before then. A cotton contract signed this year, built on a specific fiber pathway, determines what a company can defensibly disclose two reporting cycles later. Broad industry averages can still fill estimation gaps, but they can no longer substantiate claims tied to specific sourcing, so sourcing and reporting need a shared understanding of the standard's requirements ahead of the effective date.

For the cotton sector, this raises the level of evidence required behind a sustainability claim. Outcomes vary by farm, region, and management practice, and a national or global average says little about the specific fields that produced the fiber in a specific product. At the same time, the standard's emphasis on traceable, field-level data favors programs already built to supply it.

The U.S. Cotton Trust Protocol's farm-level verification article-level traceability through the Protocol Consumption Management Solution (PCMS), and five years of aggregate field-level data provides brands a practical basis for LSR Standard-era reporting. Its three sourcing pathways - Tracked U.S. Cotton, Protocol Cotton, and U.S. Regen™ Cotton - offer different levels of verification and traceability, so brands can align sourcing to their evidence needs before the January 2027 effective date.

Section 1

Agricultural Carbon Reporting Is Entering a New Phase

Companies are under growing pressure to show not just what their emissions and removals numbers are, but how those numbers were calculated, what boundaries were used, and how they connect back to real sourcing activity. Regulators, investors, and customers are asking for a clear line from each claim to the evidence behind it.

This pressure is showing up directly in European Union (EU) law, through two distinct but related tracks. The Corporate Sustainability Reporting Directive (CSRD) governs disclosure: it determines whether and how a company must report sustainability performance. Its scope is based on company size and turnover thresholds and, for non-EU groups, the scale of their operations and presence in the EU.

The second track governs claims. Directive (EU) 2024/825, the "Empowering Consumers for the Green Transition" Directive (EmpCo), entered into force in March 2024 and becomes fully applicable to business-to-consumer marketing claims across the EU beginning September 27, 2026. It governs what a company is allowed to say and bans vague or generic environmental claims, terms like "eco-friendly," unless a company can provide robust, verifiable, and objective evidence. It also restricts claims of neutral or reduced climate impact that rely mainly on emissions offsetting outside a product's own value chain. This directive applies specifically to companies making B2C claims in the EU market; it sits with brand and marketing teams as much as with reporting teams, and a company can be exposed to one directive without being exposed to the other.

These two tracks are only part of a broader EU regulatory shift now reaching the cotton value chain. The Corporate Sustainability Due Diligence Directive, the Ecodesign for Sustainable Products Regulation and its Digital Product Passport, and the revised Textile Labelling Regulation are moving in parallel, each raising the evidentiary bar in a different part of the value chain. For a fuller look at how these policies interact and what they mean for sourcing and claims, see the U.S. Cotton Trust Protocol's companion brief, Soil to Shelf: How EU Sustainability Policies Are Shaping the Cotton Value Chain.

Agricultural commodities such as cotton attract particular scrutiny under these rules because outcomes vary widely by geography, farm management practice, and the quality of the underlying data. A national average tells very little about what happened on the specific fields that produced the fiber in a specific product.

The result is a shift in what "good" reporting looks like.

The question is no longer simply, "What number should we report?" It is, "Can we show where this number came from, and will it hold up if someone checks?"

Timeline

September 27, 2026

EmpCo Directive becomes fully applicable to B2C marketing claims across the EU. Any consumer-facing "eco-friendly" or offset-based climate claim must meet the new evidentiary bar from this date.

January 1, 2027

Inventories claiming GHG Protocol conformance must apply the standard for reporting periods beginning on or after this date, including disaggregated emissions categories, separate reporting of removals, and the required conditions on the accounting and reporting of any removal claim.

2028

Companies reporting on a calendar-year basis publish their first LSR Standard-conforming inventories, covering 2027 data.

CSRD phase-in (ongoing, company-specific)

CSRD obligations apply on a phased timeline based on company size and revenue thresholds and EU presence, independent of the LSR Standard's own effective date. The 2025 Omnibus amendments delayed the second reporting wave to 2028 (covering FY2027) and raised the mandatory scope thresholds to 1,000 employees and €450 million net turnover. Confirm your company's specific phase-in wave with legal or compliance.

Brands can also reference the U.S. Cotton Trust Protocol's Carbon Reporting Advantage summary, which distills why field-level, traceable carbon data is becoming a baseline market expectation and outlines priority actions for brands preparing ahead of the LSR Standard's effective date.

Section 2

Introduction to the LSR Standard

The GHG Protocol's Land Sector and Removals (LSR) Standard is the first comprehensive GHG Protocol framework for quantifying, reporting, and tracking land-related emissions and CO_2 removals. The LSR Standard was published on January 30, 2026, with a minor update (version 1.1) and separate implementation guidance released on June 30, 2026. Currently, it applies to agriculture and CO_2 removal technologies such as direct air capture and geologic storage; it does not yet apply to forestry or non-productive lands. As cotton fiber is a harvested biogenic product, the standard's biogenic product provisions are particularly relevant to apparel brands, especially regarding the accounting of carbon contained in products.

Overview of what has changed:

Generic averages carry less evidentiary value.

The standard discourages reliance on broad, highly aggregated global or national average emission factors for carbon-related claims, and increases the value of localized, supplier-specific data. Secondary data remain permitted for estimation where primary data are unavailable, but their quality must be disclosed, and they cannot substantiate removals or sourcing-specific claims.

Emissions categories must be shown separately.

Companies must disaggregate their land-sector inventory into distinct categories, including land use change emissions, land management net biogenic CO_2 emissions, land management production emissions, and biogenic product emissions, rather than collapsing them into a single net figure. Land-use change emissions in particular must be accounted for using mandatory linear discounting. Under linear discounting, carbon stock losses from conversion are allocated over a 20-year assessment period with annually declining weights, so recent conversion carries more emissions than historical conversion. Companies must also report land occupation, in hectares, as a separate metric.

Removals reporting is optional, but strictly conditioned.

Reporting carbon removals is not required. If a company chooses to report them, it must meet defined requirements for traceability, monitoring, data quality, and reversal safeguards, and gross emissions must remain visible rather than being netted away inside a single number. The standard also introduces a new required metric for land carbon leakage, covering cases where high-leakage-risk activities displace food or feed production outside a company's value chain.

Traceability is required; the chain-of-custody options are flexible.

The Standard's own hierarchy is spatial, not data-type based: land management unit, sourcing region, jurisdiction, global, supported by chain-of-custody models (identity preserved, segregated, controlled blending, mass balance). Book-and-claim certificates do not qualify for land emissions or removals.

Some uncertainties remain, including the pace of market adoption, how assurance expectations will evolve, how regulators will interpret emerging carbon removal claims, and how different reporting frameworks will continue to align with one another in practice.

Before LSR Standard, many companies could report a single blended carbon number for a commodity like cotton, built on industry averages, without showing their work. Under the LSR Standard, that number has to be taken apart: what was emitted, where, under what land-use conditions, and, if a removal is being claimed, provide proof that it occurred on identifiable land and will still be there over time.

Section 2

From Estimated Footprints to Connected Reporting

Before LSR Standard

One blended number

Cotton emissions:

2.1 tons CO_2e

per ton of fiber

(illustrative global average, applied uniformly regardless of source)

No visibility into:

- Where the cotton was grown
- What land-use conditions applied
- Whether any removal is embedded in the number
- Whether the figure would hold up under audit

Under the LSR Standard

A disaggregated, source-linked inventory

Land management production emissions (gross):
reported separately, traced to specific sourcing region

Land-use change emissions:
accounted for using mandatory linear discounting

Soil carbon removal (if claimed):
reported separately, never netted against gross emissions; requires permanence monitoring and reversal accounting

Visible and checkable:

- Sourcing region and supplier
- Land-use category
- Removal status and evidence trail

Section 3

Why Sourcing Decides Reporting — Traceability, Eligibility, and the Data-Quality Hierarchy

That separation no longer holds. Reporting quality now depends on sourcing quality, meaning every sourcing decision has become a reporting decision. A brand cannot credibly claim a low-carbon or regenerative benefit in a disclosure unless it can show where that cotton came from, how it was produced, whether any removal claim can be substantiated, and whether the underlying evidence would survive an audit.

Section 3

Good reporting data shares a few characteristics regardless of the framework: it is traceable to a specific source, consistent over time so trends can be evaluated, transparent about its methodology and boundaries, verifiable by an independent third party, and repeatable year over year. Each of these matters because LSR Standard-era reporting is being built to withstand scrutiny, not simply to produce a number.

A practical data-quality hierarchy for cotton reporting

Historically, sourcing and reporting ran on separate tracks. Procurement teams bought cotton fiber based on price, quality, and lead time. Sustainability teams calculated a footprint afterward, usually using industry-average data, largely disconnected from the specific sourcing decisions that had been made months earlier.

LSR Standard tier	What is known about origin	Data permitted	Chain of custody required	What it can support	Where U.S. Cotton Trust Protocol pathways land
Global	Origin unknown	Secondary data; global default factors	None	Scope 3 estimation only, with data quality disclosed. No sourcing-specific claims, no removals	Untracked conventional cotton
Jurisdiction / country	Country of production known	Secondary data; country-level factors (e.g. a U.S. average)	None required for the data tier itself	Improved estimation; not a basis for sourcing specific reduction or removal claims tied to sourcing	Tracked U.S. Cotton: U.S.-average factors applied to physically traced, U.S.-origin-validated volume
Sourcing region	Spatially explicit supply area, traced to first point of aggregation	Primary data aggregated across the region, or regional factors; hybrid mass balance permitted with allocation safeguards	Physical traceability to first point of aggregation (gin)	Supply-chain-specific emissions figures; intervention outcomes; removals recognition possible with safeguards	Protocol Cotton: aggregate verified field data allocated through PCMS
Land management unit (farm or field)	The specific farm or field	Primary data required (farmer-reported activity data run through models; soil carbon via measure-and-model)	Physical traceability to the farm (identity preserved, segregated, or controlled blending)	Strongest basis for reduction claims; removals with monitoring and reversal accounting	
Harvested area	The exact harvested area, documented	Primary data with area documentation	Physical traceability to the documented area	Direct land use change assessment; removal claims tied to identifiable land	U.S. Regen™ Cotton: field-level verification through the Field Partner Program

Removals face the same four conditions at every tier where they are allowed: primary data, traceability to the specific land, ongoing storage monitoring, and reversal accounting. A lapse in monitoring means reporting the full removal as reversed.

Section 3

Annual field-level measurement builds a stronger foundation than a one-time estimate because it lets a company show a trend, not just a snapshot, and because it gives auditors, customers, investors, and regulators something concrete to check against. A single-year estimate is a claim. A multi-year, field-level dataset is evidence.

Applying these principles to cotton

Average Pathway

Farm (unknown, unspecified) → **Gin** → **Mill** → **Manufacturer** → **Brand**

Evidence attached: one number, applied at the end — a national or global average emission factor, added at the reporting stage with no link back to any specific field

Result: A single estimate with no chain of custody behind it

Field-Level, Traced Pathway

Farm (specific, verified field data via Fieldprint Calculator) → **Gin** (bale-level record) → **Mill** (transaction record) → **Manufacturer** (article-level record) → **Brand** (full chain of custody)

Evidence attached at every stage:

field data → **bale ID** → **transaction record** → **article-level tracking** → **brand-level reporting**

Result: A multi-year, auditable dataset connected to real sourcing activity

Same supply chain, same finished product category. One version can only produce a number. The other can produce a number and prove where it came from.

Section 4

The U.S. Cotton Trust Protocol Approach

Sourcing and reporting teams are, in effect, asking the same question from different sides: can this data survive scrutiny? For a sourcing team, that means knowing which suppliers, farms, and volumes sit behind a claim before it is made. For a reporting team, it means having a single source of primary data credible enough to stand behind that claim once it is published.

The U.S. Cotton Trust Protocol was built to answer both questions from the same dataset. Its combination of farm-level verification, article-level traceability, and national scale is intended to give brands one consistent source of information to support sourcing, reporting, and stakeholder communications.

What the data looks like today:

- Participating growers contribute annual field-level information through the program's Fieldprint Calculator, building a growing dataset. For the 2026 crop year, 2.34 million planted acres — nearly one in four U.S. cotton acres — provided field-level data through the program.
- The program has been collecting field-level data since 2020, providing a five-year (and growing) historical dataset that supports year-over-year analysis.
- The U.S. Cotton Trust Protocol's traceability solution enables brands to follow cotton through the supply chain at the article level, from bale to finished product.
- The U.S. Cotton Trust Protocol measures gross greenhouse gas emissions from cotton production on an annual basis as part of the six key sustainability metrics against a 2015 baseline. Beginning in 2026, participating farms growing U.S. Regen™ Cotton will also report separate soil carbon sequestration indicators from regenerative practices through the Field Partner Program Data as distinct data points. In conformance with LSR Standard requirements, these are reported separately and not combined into a single net emissions figure.

What today's soil-carbon data can and cannot support

The LSR Standard sets a high bar for any carbon removal claimed in an inventory. To count, a removal must be backed by physical traceability to specific land, ongoing monitoring of the stored carbon over time, and a reversal accounting mechanism that recognizes it in the inventory if that carbon is later lost. Generic "book and claim" certificates are not accepted.

The U.S. Cotton Trust Protocol's soil-carbon sequestration indicators are a genuine and valuable measure of what is happening on participating regenerative farms. The U.S. Cotton Trust Protocol provides both inventory and intervention-based carbon removal metrics supported through third-party Measurement, Reporting, and Verification (MRV) processes. Permanence monitoring, reversal accounting, and long-term storage verification against LSR Standard requirements have also been developed across the program.

Brands sourcing through the U.S. Cotton Trust Protocol can also access separately verified carbon insets generated through intervention-based regenerative agriculture programs. These insets are disclosed apart from the physical GHG inventory and are never netted against it, consistent with GHG Protocol guidance on avoiding double counting. Brands should look at inset data and physical inventory data as two distinct evidence streams, each with its own reporting treatment.

The Three-Tier Sourcing Pathways — Choosing the Right Level of Data and Verification

That puts procurement teams in an unfamiliar position: balancing budget, volume, and lead time against the brand's climate ambition, often before the reporting team has finished defining exactly what evidence it will need.

Through its Field Partner Programs, the U.S. Cotton Trust Protocol has established a formal approach for recognizing regenerative agriculture practices at the field level. The Field Partner Program enhances value for growers while providing brands and retailers with verified sourcing options to scale traceable regenerative cotton and support their sustainability commitments.

U.S. Regen™ Cotton is produced by Protocol grower members who grow cotton in a way that aligns with Field to Market's regenerative agriculture definition and five core principles: minimizing soil disturbance, maintaining living roots, continuously covering bare soil, maximizing microbial and crop diversity, and integrating livestock where feasible. No single practice qualifies a field as regenerative; credibility comes from the combination of practice criteria, field data, third-party assurance, and traceability together.

The U.S. Cotton Trust Protocol's three fiber pathways are designed to make that trade-off visible up front, so sourcing and reporting teams can have the conversation early before volumes are already committed.

The three U.S. Cotton Trust Protocol fiber pathways

Attribute	Tracked U.S. Cotton	Protocol Cotton	U.S. Regen™ Cotton
U.S. origin validation	Yes	Yes	Yes
Article-level traceability	Yes	Yes	Yes
Verified field-level data	Yes*	Yes	Yes
Continuous improvement measurement	No	Yes	Yes
Regenerative practice requirements	No	No	Yes
Verified regenerative outcomes	No	No	Yes

**Subject to change in 2027, applicable data set for U.S. Cotton to be confirmed.*

Section 5

Practical sourcing considerations:

Protocol Cotton has longer lead times than Tracked U.S. Cotton because of demand relative to supply; brands and retailers are advised to plan sourcing decisions well ahead of the roughly fifteen-month farm-to-shelf cycle. U.S. Regen™ Cotton, sourced through the Field Partner Program, is scaling from a 2025 pilot crop toward broader availability beginning with the 2026 crop year, with a goal of a field-level certification pathway from the 2027 crop year. Brands with regenerative cotton sourcing interest for the 2026 crop should signal demand to Field Partners as early as possible.

Each pathway provides a different level of traceability, verification, and reporting capability depending on a brand's objectives. Brands do not need to select only one pathway. Procurement can blend across all three to balance budget, volume, and decarbonization targets — using higher-verification pathways where the strongest claims are needed, and broader pathways to meet volume where they are not.

Section 6

The Step-by-Step Sourcing-to-Disclosure Playbook

This is a practical starting point for ESG and sourcing leads to work through together, ahead of the LSR Standard's January 1, 2027, effective date.

Step 1: Map and baseline current exposure.

Sourcing teams should ask: Which suppliers currently provide our cotton, and which fiber pathway does each supplier fall into? What are current lead times and contract renewals for each?

Reporting teams should ask: What data quality currently underpins our cotton-related emissions figures — field-level, supplier-specific, regional model, or generic average? Does our current reporting boundary match what the LSR Standard will require us to disclose separately?

Section 6

Step 2: Identify what can move without disrupting supply.

Sourcing teams should ask: Which volumes currently on generic averages could realistically shift to Protocol Cotton or U.S. Regen™ Cotton at the next contract renewal, without disrupting near-term supply? Treat this as a phased transition tied to contract renewal cycles rather than an all-at-once switch.

Reporting teams should ask: Which specific claims (Scope 3 figures, SBTi FLAG targets, CSRD disclosures) depend on that shift happening on a particular timeline?

How this could be applied

A mid-size apparel brand sources 40% of its cotton on generic global averages, reports Scope 3 emissions using those averages, and has committed to an SBTi FLAG-aligned target for 2030. Under the LSR Standard, that 40% becomes the weakest part of its inventory: not because the number is wrong, but because it cannot be traced, disaggregated, or defended if a customer, regulator, or auditor asks where it came from.

At the next contract renewal, the sourcing team shifts half of that volume, representing 20% of its total cotton volume, to Protocol Cotton. That single sourcing decision gives the reporting team field-level data and continuous improvement measurement for that volume, moving it up the data-quality hierarchy from "weakest basis for a claim" to "primary evidentiary base for Scope 3 disclosure." The remaining generic-average volume is flagged internally as a known gap with a plan to close it at the following renewal, rather than left unaddressed until the audit.

Step 3: Set a shared vocabulary and a shared point of contact.

Both functions should be able to explain, in the same terms, the difference between a physical inventory figure and an inset claim, and between a practice claim and a removal claim. Sourcing decisions should be made with reporting requirements in view, and reporting commitments made with realistic knowledge of what current sourcing can support.

Step 4: Build the long-term data strategy.

Set a phased, contract-cycle-timed plan for increasing the share of sourcing volume backed by verifiable, field-level or supplier-specific data, mapped against the LSR Standard's 2027 effective date and each subsequent reporting cycle.

Section 6

Illustrative Example: What a Completed Disclosure Can Look Like (Sample Data)

The figures below are illustrative only, drawn from a sample calculation exercise and do not represent any single brand's actual emissions profile. They are included to show the structure and level of detail the LSR Standard expects once sourcing and reporting are connected through traceable data.

For a hypothetical brand sourcing roughly 15.5 million kg of Protocol Cotton in a single Protocol Year, a completed Scope 3, Category 1 disclosure built on U.S. Cotton Trust Protocol data could be structured as follows:

Accounting Category	Sample Value / Unit
Total cotton volume tracked via PCMS	15,474,886 kg
Land use change emissions	0 tCO_2e
Land management production emissions (gross)	27,854.79 tCO_2e
Land management CO_2 removals	Not claimed (see note)
Land occupation	13,000 hectares
Intervention-based carbon insets (third-party verified, disclosed separately)	35,537.75 tCO_2e

Two disclosure decisions are worth highlighting. First, although participating farms are estimated to sequester carbon at a rate that would translate to roughly 2,012 tCO2e across this volume, that figure is not claimed as an inventory removal. The LSR Standard's permanence requirements, including ongoing monitoring and reversal accounting, are not yet built into the program at the inventory level, so the conservative and compliant approach is to report gross emissions without netting against unverified removals. Second, the carbon insets are reported as a separate, third-party-verified figure tied to specific intervention activities, not blended into the physical inventory. This separation, rather than reliance on a single blended number, is what the LSR Standard is designed to reveal.

A brand using this structure might disclose: "Our Scope 3, Category 1 cotton inventory includes land management production emissions of [X] MT CO_2e, based on physically traceable, field-level sourcing data. We do not currently claim inventory-based land management removals, pending program-wide implementation of permanence monitoring. Separately, we support [X] MT CO_2e in third-party-verified carbon insets through supply chain regenerative agriculture investments, disclosed independently of our physical inventory in accordance with GHG Protocol guidance."

Brands should work with their sustainability, reporting, and legal teams, and with the U.S. Cotton Trust Protocol team, to build a calculation specific to their sourced volumes and reporting boundary.

Conclusion: The Future of Carbon Reporting Starts Now

For years, sourcing and reporting were treated as separate functions with separate timelines. That distinction is no longer tenable under the LSR Standard and the evolving EU framework for sustainability disclosure (CSRD) and environmental claims (EmpCo).

Today, sourcing decisions determine what a company can disclose with confidence, months before the reporting team ever opens a model. The companies that adapt fastest will be the ones that provide sourcing and reporting teams with a shared dataset, a shared vocabulary, and a shared timeline before the next contract is signed.

The U.S. Cotton Trust Protocol offers one route to that connection: source assurance, article-level traceability, verified field-level data, and three sourcing pathways scaled to match a brand's ambition against its evidence needs.

The companies that adapt fastest will be the ones that provide sourcing and reporting teams with a shared dataset, a shared vocabulary, and a shared timeline before the next contract is signed.

info@TrustUSCotton.org | TrustUSCotton.org