

Solar Stewardship Initiative Supply Chain Traceability Standard Draft Version

August 2024



Foreword

The Solar Stewardship Initiative (SSI) and its members are unwavering in their commitment to responsible practices in the solar value chain. Our core values are built upon the protection of the environment and respect for human rights, recognising that these principles are fundamental to the sound governance of the solar sector. We are dedicated to accelerating the clean energy transition and delivering solutions to the immediate climate and energy crises. These values must be reflected at all steps of our industry's value chain; they are fundamental to the long-term success of any solar business operating today.

Solar is a reliable, sustainable, and renewable source of energy, critical to addressing climate change and improving energy security.

Today, solar is growing rapidly; it is expected to be the main electricity source in Europe by 2050. With its growth, the opportunity to foster green economic development also increases. Developing a responsible, transparent, and sustainable solar value chain is central to delivering this clean energy transition.

The SSI has been designed to clearly set out expectations on environmental, social and governance (ESG) practices, and supply chain transparency. Its purpose is to strengthen confidence in how the materials and products in the solar supply chain are manufactured and used. It aims to establish and communicate verifiable information on the ESG practices and transparency of businesses along the length of the solar supply chain.

The publication of the SSI ESG Standard in October 2023 was a significant step in achieving these objectives. The SSI Supply Chain Traceability Standard represents another crucial milestone in pursuing a transparent value chain for photovoltaic solar modules. The SSI ESG Standard can certify a 'link' – i.e. a production site – in the solar supply chain. The SSI Supply Chain Traceability Standard is the first step to show precisely where the materials used at each link come from and how they are traced. With the combination of the SSI ESG and SSI Supply Chain Traceability Standards, stakeholders along the solar value chain will be reassured that the silicon used in the solar modules was produced responsibly.

More information can be found at: www.solarstewardshipinitiative.org

Foreword signed by:

Guido Agostinelli, Co-Chair of the Traceability Working Group, International Finance Corporation (World Bank Group)

Justin Thesiger, Co-Chair of the Traceability Working Group, Low Carbon

Máté Heisz, Chair of the SSI Board, SolarPower Europe

Alexia Ruvoletto, Head of the SSI Secretariat, SolarPower Europe

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Version History

Version	Date	Description
Draft	August 2024	First draft version issued

This document is the first draft in the development of the SSI Supply Chain Traceability Standard.

The document has been prepared as the basis for stakeholder review and comment within a process of a public consultation that will comply with the ISEAL Code of Good Practice for Setting Social and Environmental standards.

About this Standard

The SSI Supply Chain Traceability Standard together with the SSI ESG Standard are designed to support the responsible production and sourcing in the solar value chain as tools for the achievement of the SSI's mission. Supply Chain Traceability certification is mandatory for the SSI manufacturing members and complements certification against the SSI ESG Standard.

This is a 'living document' and the SSI reserves the right to revise this standard based on implementation experience and emerging good practices. The version posted on the SSI website supersedes all other versions.

Please see www.solarstewardshipinitiative.org

Public Consultation and Pilots

The SSI is seeking comments from stakeholders on all aspects of this first draft of Supply Chain Traceability Standard and will carry out pilot testing over the coming months. Please use this form to share your feedback during the public consultation available at <https://forms.office.com/e/8Eqwx1q6P7>.

If your organisation is interested in participating in the pilot test at one or more of your manufacturing sites, please contact the SSI Secretariat at contact@solarstewardshipinitiative.org as soon as possible.

Antitrust Statement

SSI Members undertake to fully comply with all applicable laws, including antitrust and competition laws in relation to the SSI.

Without limiting the scope of the foregoing, the SSI Members commit in particular to the following:

1. The SSI's mission is to further develop a responsible, transparent and sustainable solar value chain and it does not engage with matters relating to the SSI Members' commercial strategy, such as pricing, terms or conditions of sale, production or sales levels, salaries, customers or suppliers. No recommendations of any kind related to the SSI Members' commercial strategy shall be made in the context of the SSI.
2. The SSI Members are fully aware of the concerns, under applicable competition laws, raised by the exchange of competitively sensitive information, including, but not limited to, (i) current or future pricing or costs, (ii) supply requirements, (iii) strategies or policies related to purchasing, costs, new products, markets, or competition; (iv) analyses or formulas used to determine costs, prices, output, or (v) information on actual and potential trading partners. The SSI Members anticipate that no such competitively sensitive information is required to be exchanged in the context of the SSI. If, however, it would appear that the exchange of any such information between the SSI Members would be indispensable, the exchange shall at all times be strictly limited to such information that is necessary and proportionate to pursue the mission of the SSI and the SSI Members shall establish in advance appropriate safeguards for the sharing of such information, in order to ensure compliance with competition laws.
3. The SSI Members agree that any meeting in the context of the Solar Stewardship Initiative shall be held in compliance with best practices for meetings with competitors. SSI Members should not hesitate to voice any concerns they may have regarding the conduct of others at meetings that are convened in the context of the SSI.
4. Participation in the SSI is on a voluntary and non-exclusive basis. Participants remain free to apply higher sustainability standards than the SSI Standards.

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INTRODUCTION

Background

The SSI works with manufacturers, developers, installers, and purchasers across the global solar value chain to collaboratively foster responsible production, sourcing, and materials stewardship. The SSI's mission is to enhance end-to-end transparency, sustainability, and ESG performance across the solar supply chain. Businesses actively involved in the solar value chain can apply to join the SSI and get certified against the SSI Standards.

The SSI's core objectives are to:

- Ensure the energy transition is just and inclusive, and respects human rights.
- Establish mechanisms to enhance supply chain integrity in the global solar industry.
- Enable continuous improvement of ESG performance.
- Build confidence among regulators, customers, and business partners in the sustainability of the solar value chain.

About the Standard

The SSI Certification programme provides assurance against two Standards: the [SSI ESG Standard](#) and the SSI Supply Chain Traceability Standard.

The SSI ESG Standard defines environmental, social and governance requirements that address sustainability issues in the solar value chain. [As of August 2024, SSI Manufacturer Members that have joined the SSI in 2024 are required to complete an assessment against the SSI ESG Standard for at least two production sites within one year of joining the SSI.]¹

The SSI Supply Chain Traceability Standard (this Standard) complements the SSI ESG Standard and is also mandatory for the SSI Manufacturer Members. The Standard sets out requirements for maintaining a traceability system with a future goal of enabling an 'unbroken' Chain of Custody (CoC) through the solar value chain. A CoC is a documented sequence of physical and legal possession of material as it moves through a supply chain.

The Standard defines a 'segregated' chain of custody model for specific silicon supply chain tiers and requires a traceability system to demonstrate a chain of entities to supply the material. The material may have been produced at a number of separate SSI-certified sites; however, it cannot be mixed with other uncertified materials. This way, any product user can be confident that the material they receive has been made at sites that meet the requirements of the SSI Standards.

¹ This requirement will be updated with regards to the SSI Members joining in 2025 and later.

Conformance to the Supply Chain Traceability Standard is assessed following the [SSI Assurance Manual](#). Before the standard launches, the Assurance Manual will be updated to include the assurance process for certification against the SSI Supply Chain Traceability Standard.

At this stage, the SSI does not require SSI Members to use any particular tool for traceability purposes; however, the tool used needs to meet the SSI Supply Chain Traceability Standard requirements. The SSI recognises and encourages the use of digital systems that facilitate the tracing of the material and can support the objectives and implementation of the SSI Supply Chain Traceability Standard.

The SSI Supply Chain Standard is consistent with the International Standard *ISO 22095 Chain of Custody – General terminology and models*, subject to additional SSI requirements identified herein.

Current Purpose

The SSI Supply Chain Traceability Standard aims to support responsible production and sourcing in the solar value chain by:

- Increasing transparency in the solar value chain.
- Providing a common set of requirements for the SSI Members to implement a traceability system in its solar value chain and trace silicon as it moves between producers from the quartz mines to solar modules.
- Setting requirements that can be independently audited to grant SSI Supply Chain Traceability Certification.
- Allowing stakeholders to be confident that the silicon used in the solar modules was produced responsibly.

Scope

The SSI Supply Chain Traceability Standard defines requirements for entities implementing traceability management systems.

The Standard has a global geographical scope.

The Standard is implemented and assessed at the site level and applies to SSI Manufacturer Members who purchase certified material or a product containing the certified material and wish to make assurance claims.

The Draft Version of the Standard covers silicon and other photovoltaic semiconducting materials. The aim is also to extend the scope of the Standard in the future to cover other materials used in solar panels, such as glass, aluminium, and copper, as well as other products, such as inverters. Where relevant in the future, the SSI will seek to recognise other existing CoC Standards covering materials in question.

Applicability

SSI Manufacturer Members are required to complete an assessment for at least two of their sites against the SSI Supply Chain Traceability Standard within 12 months of joining the SSI, or, in the case of Members that joined before its publication, within 12 months from the publication of the SSI Supply Chain Traceability Standard with the goal to increase the number of sites assessed in subsequent years as defined in the commitments of the SSI membership by the SSI Board each year.

The SSI Supply Chain Traceability Standard has been designed based on a phased, progressive approach. Specific progressive goals are under discussion with the SSI Board and the Traceability Working Group.

The SSI aims to recognise the leading efforts of the SSI Members undergoing certification. The Assurance Manual explains the different certification levels to be awarded: gold, silver, and bronze, depending on the maturity level of the site's traceability management system, with a minimum requirement to trace to polysilicon.

Certification

The SSI Supply Chain Traceability Standard is designed for the SSI Manufacturing Members who are certified against the SSI ESG Standard to be able to make claims about the silicon source (and subsequent material) in their product.

More detailed information and guidance on the Assessment Process, roles and responsibilities is provided in the SSI Assurance Manual.

Any SSI member trading or handling products from an SSI-certified facility is eligible to have the certification. The certification is a requirement for each entity in the supply chain taking legal ownership of certified products that wishes to make a claim on the source of the material, up until the point where the product is delivered to the final buyer.

Supporting Documentation

The following documents provide supporting information to assist with implementation of this SSI Standard:

- The SSI Supply Chain Traceability Standard Guidance (to be developed in 2025 before the first assessments against the SSI Supply Chain Traceability Standard).
- The SSI Assurance Manual (to be updated in Q4 2024 to reflect edits relevant for the SSI Supply Chain Traceability Certification).
- The SSI Claims Guide (to be updated in Q4 2024 to reflect edits relevant for the SSI Supply Chain Traceability Certification).

Standard Development

Formal and transparent public stakeholder consultation processes and pilots at selected sites will underpin the development of this Standard.

The SSI is grateful for the time, expertise and valuable input of the many individuals and organisations who contributed to this Standard and its assurance system elements.

Draft Version of the Standard has been prepared and updated by the SSI Secretariat based on the input from the SSI Traceability Technical Working Group and independent technical experts.

The Draft Version of the Standard is shared in its current form to continue gathering input from a wide range of stakeholders during the public consultation and pilots at sites across the solar value chain.

It is not a finished document, and it has not been approved by the SSI Board as a final version of the Standard.

Status and Effective Date

[To be added after the SSI Board approval.]

Review

The SSI will undertake a formal review of its Standard at the latest by 2027, no more than two years after the publication, in line with our Standard Review Procedure.

The SSI will continue to work with stakeholders to ensure that its Standard is relevant, achievable, and in line with its objectives. Stakeholders can submit proposals for revisions or clarifications at any time, and the SSI will document these for consideration in the next review process.

STANDARD REQUIREMENTS

1. Management System and Responsibilities

- 1.1 SSI Membership. The Facility seeking the SSI Supply Chain Traceability Certification shall be a current SSI Member, certified against the SSI ESG Standard or in the process of obtaining the SSI ESG certification in parallel with the SSI Supply Chain Traceability Certification.
- 1.2 Management System. The Facility shall have a documented management system appropriate to its size and complexity of operations and that addresses all applicable requirements of the standard in all facilities within its Certification Scope that have custody of certified material.
- 1.3 Leadership and Management Representation.
- 1.3.1 The Facility shall ensure senior management commitment and accountability for the implementation and effectiveness of the management system.
- 1.3.2 The Facility shall assign at least one management representative with overall responsibility and authority for the Facility's Conformance with all applicable requirements of the SSI Supply Chain Traceability Standard.
- 1.4 Communications and Training. The Facility shall establish and implement communications and regular training that make relevant personnel aware of and competent in their responsibilities under the SSI Supply Chain Traceability Standard. Training records shall be kept.
- 1.5 Record Maintenance. The Facility shall maintain up-to-date records covering all applicable requirements of the SSI Supply Chain Traceability Standard and shall retain them for a minimum of ten (10) years or for as long as defined by national regulatory requirements, whichever is longer.
- 1.6 Verification. The Facility shall have systems in place that enable it to respond to reasonable requests for verification of the CoC transfer documents it issues.
- 1.7 Management System Review.
- 1.7.1 The Facility shall conduct at least annual reviews of the management system's effectiveness to ensure that its management systems are appropriate and up to date.
- 1.7.2 The Facility shall use the results from the reviews to plan for continuous improvement and updates of the management system to address potential areas of non-conformance.
- 1.8 Inconsistencies and complaints. The Facility shall develop and implement a process to identify, investigate, and address complaints raised by

suppliers/customers regarding inconsistencies related to the production, transfer, receipt, or other handling of the SSI-certified material.

1.9 Reporting Obligations. The Facility shall report the following information (as applicable) to the SSI Secretariat by 30 June of the year following the end of each calendar year:

- Input and Output Quantities of certified Material/s to/from the Certified Facility over the calendar year.
- Inflow and Outflow Quantities of Non-certified Material/s to/from the Certified Facility over the calendar year.

2. Material Accounting System

2.1 SSI Certified Suppliers. The Facility shall have a process in place to ensure that it receives materials within the scope of the Standard only from suppliers who can demonstrate a traceability system meeting the requirements of the SSI Supply Chain Traceability Standard. In the future, the Facility shall have a process in place to ensure that all certified products are purchased from SSI Certified Suppliers.

2.2 Internal Material Control.

2.2.1 The Facility shall have a material accounting system designed to maintain controls of the certified material from the time it enters the Facility until the time the final product leaves the Facility.

2.2.2 Traceability records shall be able to link certified material at every stage between purchase and sale, including receipt, processing, transport, packing, storage, and dispatch.

2.3 Segregation & Labelling.

2.3.1 Certified and non-certified material shall not be mixed if the Facility wishes to make a claim about these certified products.

2.3.2 The Facility shall identify each point at which there is an opportunity for the certified material in its custody to become mixed with non-eligible and/or non-certified material and shall put controls in place to ensure segregation of the material, at all times.

2.3.3 The Facility shall be able to demonstrate that segregation is implemented effectively throughout the production process.

2.3.4 Certified material shall be identified as certified at all stages of purchasing, receiving, storing, manufacturing, packing, labelling, selling and delivering.

2.4 Reconciliation.

2.4.1 The Facility shall develop and implement an internal system to reconcile the total volume of the material in its custody with movements in and out of the inventory over the material accounting period.

2.4.2 The material accounting period shall not exceed 12 months.

2.4.3 The Facility shall be able to explain and document the reasonable losses from the production process.

2.5 Documentation.

2.5.1 The Facility's internal systems shall verify and document that the contents of each shipment of the material received from, or dispatched to, other certified entities or outsourcing contractors are accurately described by the applicable transfer document for that shipment. If an error is discovered after the material has been shipped, the entity and the other party shall document the error and take the agreed steps to correct it.

2.5.2 The Facility shall record the following information for each incoming material within the scope of the SSI Supply Chain Traceability Standard:

- Date material received
- Details of the supplier (e.g. supplier name, type, location etc.) of the material
- Description of the material
- Weight of the material excluding packaging
- Unique identification number of the material to be used in the production process
- Additionally, for the material received from the SSI Supply Chain Traceability certified supplier site, the Facility shall record the transfer record reference number issues by the supplier. To keep unbroken segregation chain of custody, the number should remain the same throughout the supply chain.

2.6 Transfer Records.

2.6.1 The Facility shall ensure that incoming certified material is accompanied by a valid transfer record.

2.6.2 The transfer record shall be physically or digitally attached to each shipment or transfer of the certified material sent to other SSI certified sites, outsourcing contractors or service companies.

2.6.3 The Facility shall confirm that the material received matches the information provided on the transfer record.

2.6.4 The Facility shall develop and implement a process to separate received material and not start processing the material till all documentation has been received, reviewed and validated.

2.6.5 Each time there is a change of custody of the certified material, there shall be updated transfer record, issued by the Facility that currently has custody of the certified material.

2.6.6 The transfer record remains valid as long the Facility that issued it continues to participate in the SSI Certification programme. The list of certified SSI sites is updated on the SSI website in real time. If the site no longer holds the valid SSI certification, the SSI Secretariat will notify the Standard users. The material supplied before the change of status of the site will not be affected and the sites along the supply chain are not expected to retroactively adjust their material accounting system. But the material

supplied after the change of status of the site will no longer be considered the SSI certified material.

3. Eligible Material

3.1 Silicon. The SSI Supply Chain Traceability Standard currently covers silicon as the certified material used in different forms in all tiers of the value chain starting from quartz mining through metallurgical grade silicon and polysilicon to ingots and wafers to cells and modules.

4. Outsourced Contractors

4.1 Use of Outsourced Contractors.

4.1.1 The Facility shall not transfer the CoC material to an Outsourced Contractor unless the following conditions have been met:

- The Facility shall retain ownership of all materials.
- The Facility shall conduct a risk assessment of potential non-conformance with the SSI Supply Chain Traceability Standard resulting from engaging each outsourcing contractor that takes custody of the site's certified material, and determine, based on that risk assessment, that the risk is acceptable.
- The Facility shall review the contractor's processes to understand the potential risks of mixing its certified material with non-certified material.
- The Facility shall require in its contract with the outsourced contractor use of segregation model to prevent mixing of the material. The outsourced contractor shall have in place a management system for internal material control in compliance with section 2 of this standard.
- The Facility shall prohibit outsourced contractors to sub-contract any activities to other companies related to the processing of the certified material.
- Outsourced Contractors considered high-risk, for example, contractors that mix materials, shall be subject to third-party or second-party audits to verify conformance with the contract requirements and requirements of the SSI Supply Chain Traceability Standard.

4.2 Material Return.

4.2.1 The Facility shall verify and record that each transfer it receives for the return of the material is consistent with the transfer document that it issued when the certified material was shipped to the outsourcing contractor or service company, subject to any changes to the certified material expected as a result of the outsourcing contractor's processing or manufacturing activities.

4.2.2 If there are inconsistencies, the Facility shall not issue any subsequent transfer documents for that material.

4.3 Scope. Any Outsourced Contractor which is not itself SSI certified that takes custody of the Facility's certified material shall be included in the Facility's certification scope.

4.4 Records. The Facility shall maintain a list of all outsourced contractors and records of risk assessment conducted to be provided during the certification assessment against the SSI Supply Chain Traceability Standard.

4.5 The Facility shall encourage its Outsourced Contractors to become SSI certified.

5. Claims

5.1 The Facility shall only promote products as certified or use the SSI logo or other trademarks if it has been granted approval to do so by the SSI.

5.2 If the Facility makes claims or representations about certified material in a solar panel, these shall be described in written form and shall not include information that is inconsistent with the transfer document(s) supplying the certified material.

5.3 The certified Facility's sites shall make claims in line with the SSI Claims Guide requirements.

Glossary

Term	Definition / Explanation
Certification scope	The Certification Scope includes: a. All Sites and associated activities under the Facility's control that it intends to use to process, manufacture, ship and receive CoC material. b. All outsourcing contractors that the facility intends to use to process and manufacture CoC material.
Chain of custody	A documented sequence of physical and legal possession of material as it moves through a supply chain.
Certified facility	An entity that is certified against the SSI Supply Chain Traceability Standard.
Certified Material	Material with an eligible material declaration from a certified facility that is transferred in accordance with the SSI Supply Chain Traceability Standard.
SSI Certified Suppliers	Suppliers who can demonstrate a traceability system meeting the requirements of the SSI Supply Chain Traceability Standard. SSI certified suppliers can be non-SSI members.

Transfer record	A document that shows the information required to transfer certified material to another entity, and that is issued by a certified facility in accordance with the SSI Supply Chain Traceability Standard.
Custody	The physical and legal possession of certified material for the purposes of producing, processing, manufacturing, packaging, labelling.
Eligible material	Material that is eligible to become certified material under the SSI Supply Chain Traceability Standard.
Facility	Entity responsible for implementing the SSI Supply Chain Traceability Standard.
Management system	A set of policies, procedures and practices an organization needs to follow in order to meet its own objectives.
Material accounting period	A defined period of time during which the eligible material is accounted for and reconciled.
Material accounting system	A system to track and record the total inputs and outputs of the eligible material.
Member	Refers to a legal entity that has a valid membership of the SSI.
Outsourced contractor	An individual or company or other third party that takes custody of material to process or manufacture it for another entity.
Site	Physical location that is in the Scope of Assessment.