Trustworthy Circularity

Combining Trust and Transparency for the Evolution of Circular Economies

In the world's multifaceted global interconnections, supply chains for products are becoming more and more complex. To establish a trustworthy circular economy, our endeavor is simple, yet complex: knowledge. Which materials have been used? Were materials gathered following ESG principles? To what extent have the materials been reused? How is the overall quality of the materials? To truly close the loop for a circular economy, we must extend our view beyond the supply chain to the entire life cycle, including disposition, disassembly, and recirculation.

Fostering collaboration and supporting businesses in this transformation requires not only expertise, but trust. Without trust, the potential for unfair competition, falsification, or greenwashing rises and a lack of trustworthy information deters successful transformation. By using concepts, technologies and solutions out of the Cybersecurity domain we can support to create and maintain such trust. Although a solution for trustworthy circularity at the first glance might appear simple, a real solution faces several challenges:

- **Confidentiality vs. Transparency:** Full transparency is often undesirable for businesses. Solutions must ensure transparency while preserving confidentiality and supporting various business models. Ensuring **data integrity and authenticity** of data, information can be proven as authentic, accurate and tamper-proof.
- **Collaboration and Democratization**: Siemens aims to provide solutions to shift businesses, but a truly sustainable trust model must be independent and standardized.
- **Continuity and Ease of Access:** The solution must account for product and business lifecycles: Access to a system for tracking material flows for new suppliers should be easy and information availability if any business ceases operations must be ensured.
- **Secure and resilient operations:** Technical challenges for such a system include handling a magnitude of commodity flows and exchanging information efficiently and secure, therefore a solution must be resilient, satisfy performance needs and be cost-efficient to operate.
- **Jurisdictional Complexity**: International relationships span multiple jurisdictions with different rules. A global solution must establish trust among enterprises and jurisdictions, translating transparency into a commonly trusted format.
- **Extensibility**: Technology to assess materials physically is not yet available on a broad scale, but that is a matter of time. Relying on data from envisioned sensors and agents rather than human intervention reduces the risk of error and manipulation. Incorporating conceptually such devices, with digital identities and trust, makes a holistic approach extensible and future proof.

By focusing on these Cybersecurity principles, we can create a trustworthy system that supports circular economy, fostering collaboration and innovation while maintaining the integrity and confidentiality of supply chain information.

What are we looking for?

We are looking for passionate teams, researchers or individuals eager to tackle our challenge with a holistic view. Your ideas and concepts should include a sound solution architecture, which considers the following dimensions:

- Assuming technological solutions exist for assessing the quality or composition of materials, create a trust chain for used materials within a product and their production batches.
- Address the privacy requirements by the different businesses, while still allowing to get information in case participants of such a system cease operations.
- Consider the existence of different jurisdictions and their implications, while still providing the necessary information, thus transparency.
- Reflect on the trust anchors and their distributed nature and democratize the access to such a system.
- Add a technical high-level solution design to account for the operational needs when implementing such an architecture.

The anticipated outcome should be twofold:

1. We look for a concept that genuinely fosters trust by adhering to established principles of transparency and Cybersecurity. The proposed solution should aim for broad acceptance and standardization to ensure its widespread adoption and seamless integration across various industries and jurisdictions.
2. In addition, we are seeking for a specific implementation of the described concept, either in whole or in part. For example, this can include, but is not limited to, aspects such as reliable data acquisition, data processing, and visualization.

To enhance trust in attestations for materials or compositions, it is crucial to rely more on information generated by trusted sensors and agents rather than human intervention. Considering the varying stages of availability and development of such sensors and agents, a trust model should include them without requiring their existence.

What is the technology impact?

At Siemens we have already taken meaningful steps to improve our sustainability footprint. Yet, we still have further steps to take on this journey. By having a proposed solution architecture available, the next step is to evaluate our own solutions and compare them with the proposed target state. As an input the given model potentially allows to improve and evolve our own services and endeavors.

ooming out from Siemens to existing other initiatives, like PACT, the organization or partnership to create carbon transparency, or Catena-X, as an industry-centric solution for supply chains: A solid but trustworthy solution design lifts transparency and trust from tracking carbon dioxide to track commodity flows, materials and resources and is a comprehensive step towards circular economies.

Join us in our mission to evolve to trustworthy circularity!

By combining existing technology and concepts, like digital identities, secure distributed systems and architectures, or cryptography and proving mechanisms, with innovative ideas, you can make a difference in mastering such a complex yet necessary field. Trust creates acceptance, acceptance drives transformation, and transformation leads to a more sustainable world!

Gather your TEAM, bring your PASSION and let´s hack our way to SUCCESS!
https://siemens.com/techforsustainability

Who are we?

We are part of a global team of experts, which addresses cyber threats through technological innovation, cutting-edge research and operational excellence. As Cybersecurity experts, we at Siemens are committed to both: to our organization and society.

Uwe Blöcher
Distinguished Key Expert
Cybersecurity and Trust

Martin Wimmer
Principal Key Expert Secure
Distributed Architectures

Peter Stoll
Director Siemens Security
Next Generation

Rolph Kreis
Cybersecurity Expert

Daniel Mayer
Cybersecurity Expert

Josephine Brand
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Siemens Tech for Sustainability Campaign 2025

Tech for Sustainability is a global initiative for students, researchers, startups,and innovative individuals to leverage technology to solve real-world sustainability challenges and shape our future alongside Siemens.

Leverage technology to shape a sustainable future

Siemens AG is a technology powerhouse that brings together the digital and real worlds to benefit customers and society and thus people around the globe. The company - having shaped each of the four industrial revolutions - focuses on intelligent infrastructure for buildings and decentralized energy systems, on automation and digitalization in the process and manufacturing industries, on cybersecurity, and on smart mobility solutions for rail transport, but also in financial services and software development. As a global ideation campaign, Tech for Sustainability is designed to engage innovators outside of Siemens in order to come up with unique solutions for problems with a focus on sustainability. In a hackathon, the innovators who have been particularly successful in the early stages of the Campaign will have the opportunity to create a proof-of-concept and proof-of-feasibility for their ideas.

"Sustainability is in our very DNA. It is not an option. It is a business imperative."

Judith Wiese, Chief People and Sustainability Officer, Member of the Managing Board of Siemens AG

Idea Submission
27th January – 10th March

Register on the platform and submit your idea on how you want to solve the proposed challenge.

Validation
11th March – 14th April

Experts will intensively review and evaluate the ideas, based on multiple criteria.

Co-Creation
5th May – 25th July

Together we will co-create the best solutions to drive impact.

Impact Generation
26th July – Mid January 2026

The best solutions receive, resources and mentorship, with clear agreements, leading up to a demo day.

Demo day
Mid January 2026

Celebrate achievements, with high-level management engaging and exploring, to foster communities.

What's in for you?

Win Prizes

EUR 30,000 total kick-start investments

Multiply impact in real world challenges

Solve real problems together for a sustainable future

Pitch in front of top management

Show your solution to Siemens Management

Follow-up in joint projects

Together, we make a lasting impact

How do you get to the next phase?

- Innovativeness: Incremental or disruptive innovation
- Sustainability: DEGREE and impact on the UN Sustainability Development Goals
- Feasibility: Degree of technical and/or economic feasibility
- Potential: Fit to Siemens processes, products and markets
- Implementation: General implementation efforts (Time to market, R&D costs, etc.)

Join the campaign and create impact on real problems together with go-getters and solution seekers of the world by submitting your ideas.

https://siemens.com/techforsustainability

Feel free to contact us if you have any questions!

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