

Trust in Automatically Generated LCA Studies

07.07.2025 – LCA Discussion Forum 93

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**Add value.
Inspire trust.**

TÜV SÜD at a glance



~160

Years of safety,
security & sustainability



1,000+

Locations
worldwide



~30,000

TÜV SÜD
employees



€3.4

Billion in
annual revenue



100%

Independent
& impartial



**Testing and
product
certification**



**Auditing and
system
certification**



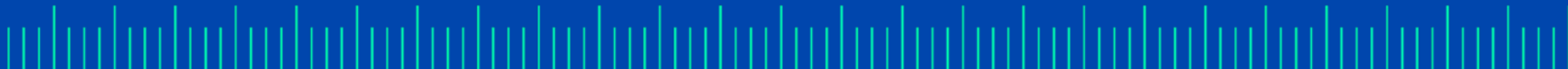
Inspection



**Advisory
and
training**



**Verification
and
validation**



We substantiate claims for circular & sustainable products



RAW MATERIALS

1



Mitigate risk of materials and substances of concern

- Chemical safety testing (RoHS, POP, REACH regulatory)
- Biological safety testing
- Packaging and packaging waste directive testing
- Microplastics testing
- **Bio-based content testing**
- Recyclate testing

END OF LIFE

4



Reduce waste and increase secondary material use

- **Recycled content verification/certification**
- Biodegradability testing/certification
- **Recyclability verification**
- WEEE directive testing/certification

PRODUCTION

2



Establish resource-efficient production processes

- Facility environmental audits
- Energy efficiency testing
- Eco-design/ErP Directive testing
- Wastewater/sludge testing

PRODUCT USE

3



Extend product lifetime and enable re-use

- Performance and endurance: durability, functions, handling, maintenance
- Reliability and performance (mechanical and physical)
- Lifetime simulation testing
- Reparability testing



OVERARCHING

- Life Cycle Assessment (LCA) Critical Review
- Product Carbon Footprint (PCF) Verification
- Sustainability Software Evaluation
- Product Environmental Footprint (PEF) Verification
- Product Water Footprint (PWF) Verification
- Training Program

07/07/2026

There is no alternative to scaling LCA and Product Carbon Footprints



Lack of experts



Manual effort



Complex products

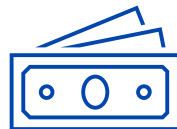


Non-transparent
supply chains

Lack of product
specific data



High investment
costs



Pressure from
stakeholders



Report writing
effort



Conformity assessments – basis for assurance



Conformity assessment — ISO 17000 definition

Definition

“demonstration that specified requirements are fulfilled”

In practice

Assurance against standards, regulations and laws

General types of conformity assessment (ISO 17000)

First-party

WHO PERFORMS IT

Provider organization assesses its own conformity object.

EXAMPLE

Internal QM audit

STAKEHOLDER TRUST

Low

Second-party

WHO PERFORMS IT

User-interest organization assesses the conformity object.

EXAMPLE

Supplier audit

STAKEHOLDER TRUST

Medium

Third-party

WHO PERFORMS IT

Independent organization assesses the provider's conformity object.

EXAMPLE

TÜV SÜD audit

STAKEHOLDER TRUST

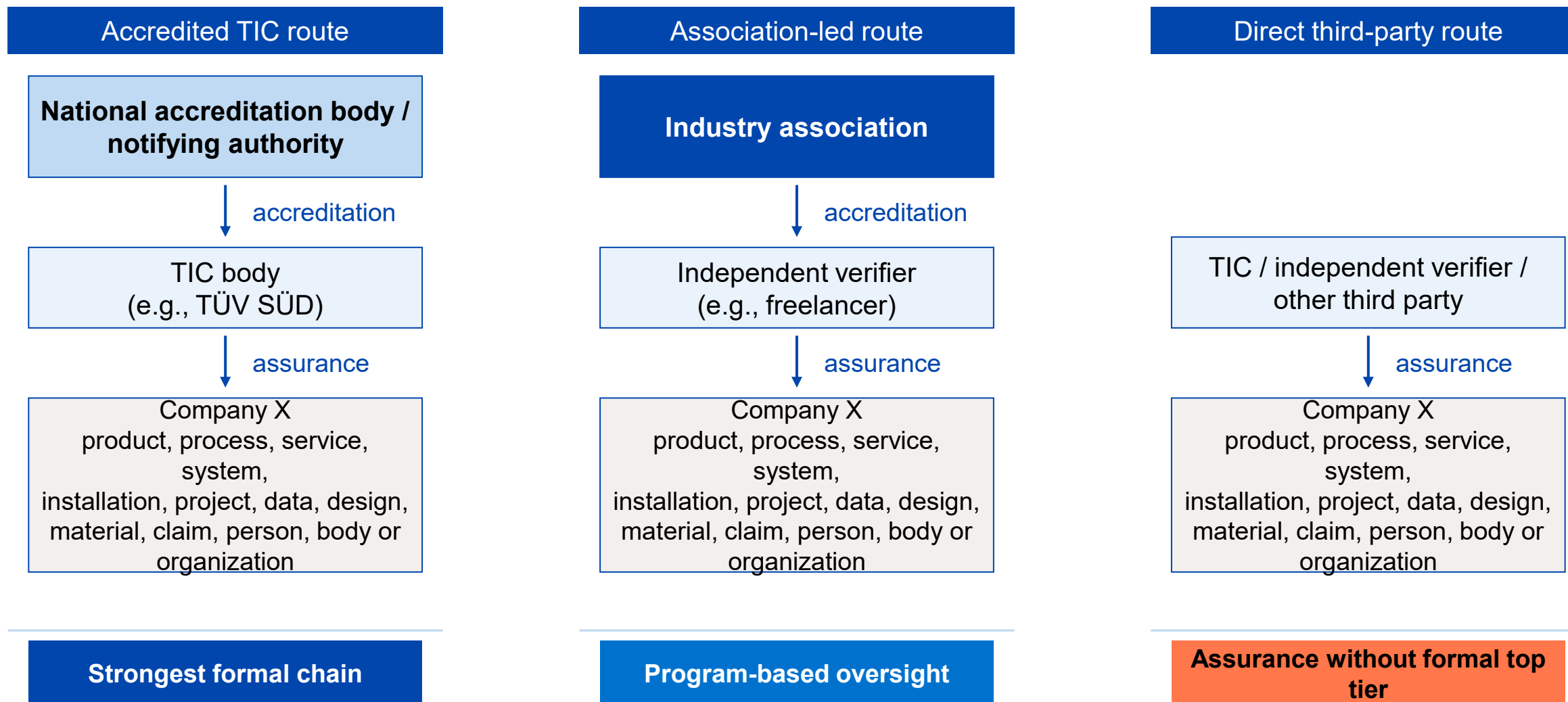
High

Higher independence → higher stakeholder assurance

Conformity assessments – chain of trust examples



3 Typical third-party assurance routes



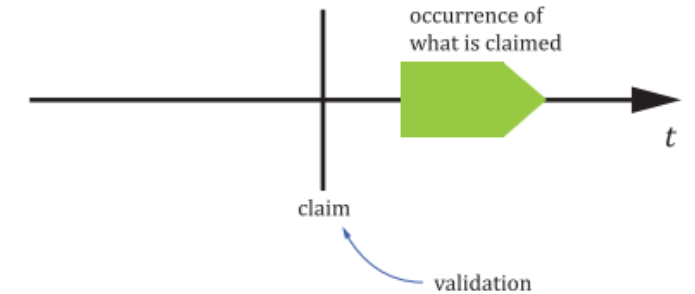
Validation, verification, certification

Definitions from ISO 17029, 17065

Validation (confirmation of plausibility)

ISO 17029

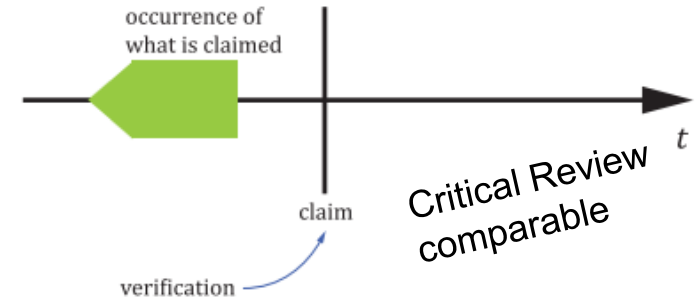
confirmation of a claim, through the provision of objective evidence, that the requirements for a **specific intended future use** or application have been fulfilled



Verification (confirmation of truthfulness)

ISO 17029

confirmation of a claim, through the provision of objective evidence, that specified requirements have been fulfilled



Certification

ISO 17065 / 17067

= attestation of conformity for a defined period. applicable when there is a known standard or specification that is either nationally or internationally recognized. Unlike verification, certification includes **ongoing surveillance**. Any deviation of improvement from the manufacturing process or specification may result in certification being withdrawn.

Conformity assessments – varying definitions



Conformity assessment for LCA/PCF				
Critical Review	Verification/Validation	Verification	Verification/Validation	Certification
	ISO 17029 ISO 14065 (ENV)	ISO 14025 (EPD)		ISO 17065
ISO 14071 (LCA)	ISO 14064-3 (GHG)	GPI -program operator shall establish the appropriate verification procedure	RECOMMENDATION (EU) 2021/2279 (PEF)	Required accreditation for some EPD program operators
Assessment of LCA/PCFs mainly through the assessment of documents	Confirmation of a claim , through the provision of objective evidence, that specified requirements have been fulfilled	Independent verification procedure shall as a minimum be appropriate to determine whether the Type III environmental declaration is in conformance with: ISO 14020, GPI, PCR	Conformity assessment process carried out by an environmental footprint verifier to demonstrate whether the PEF study has been carried out in compliance with Annex I	Confirmation of a product, person, system for a defined period with ongoing surveillance
TIC checks a claim, that was made by another party		TIC or independent verifier checks a claim, that was made by another party		TIC makes a claim about a product
Specific study from the past is checked, statement refers to this specific study and is valid without time limit		Validity period defined by programme operator ~ 5 years	Validity up to 3 years	Ongoing surveillance, certificate is usually valid 3-5 years

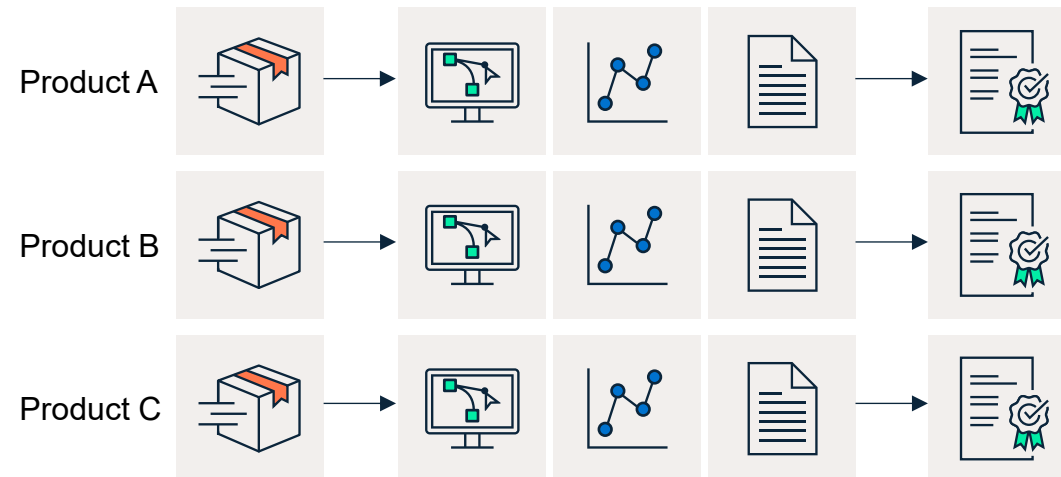
The need for scalable LCA calculations



Classic Approach

“Single”

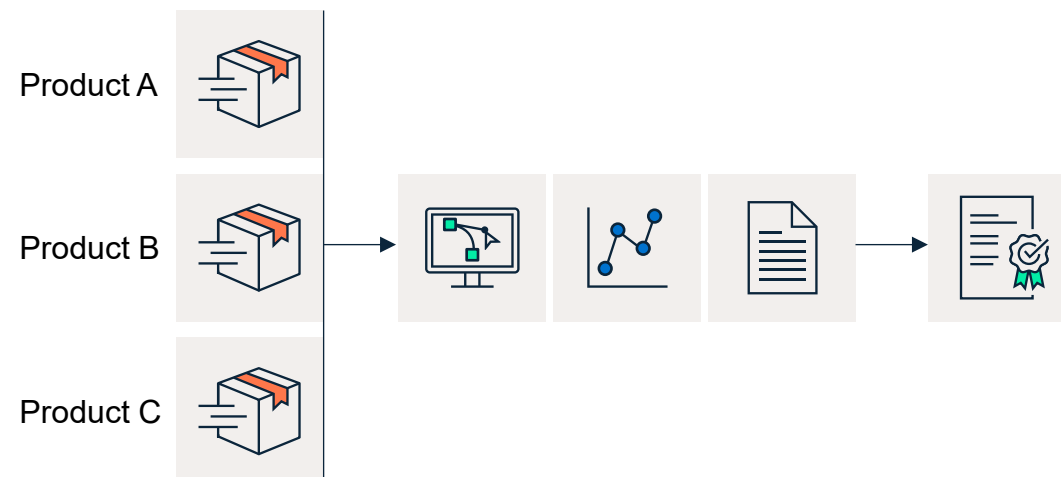
- Conducting LCA/PCF studies (modelling, calculation, reporting) for single products
- Third-party assessment of the single studies by TIC (Critical Review or Verification)
- High effort and high costs per product



Efficient Approach

“System”

- Development of a general calculation methodology for LCA/PCF, which is applied for all products in the same way (automation and digitalization is key)
- Third-party assessment of the calculation methodology by third party (Critical Review / Validation / Certification) → on this basis simplified assessment for single products
- Lower effort and lower costs per product compared to classic approach (if many products are assessed)



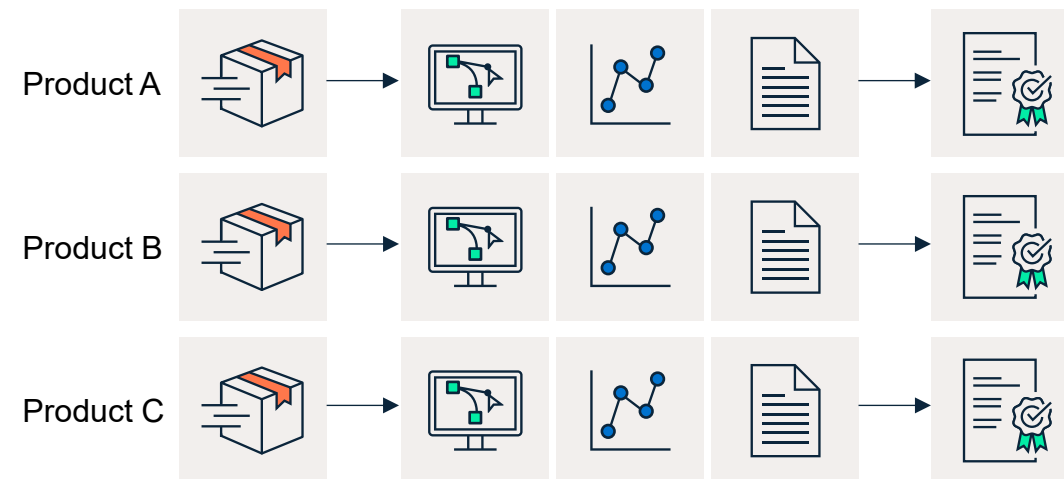
Single vs. system assurance



Classic Approach

“Single”

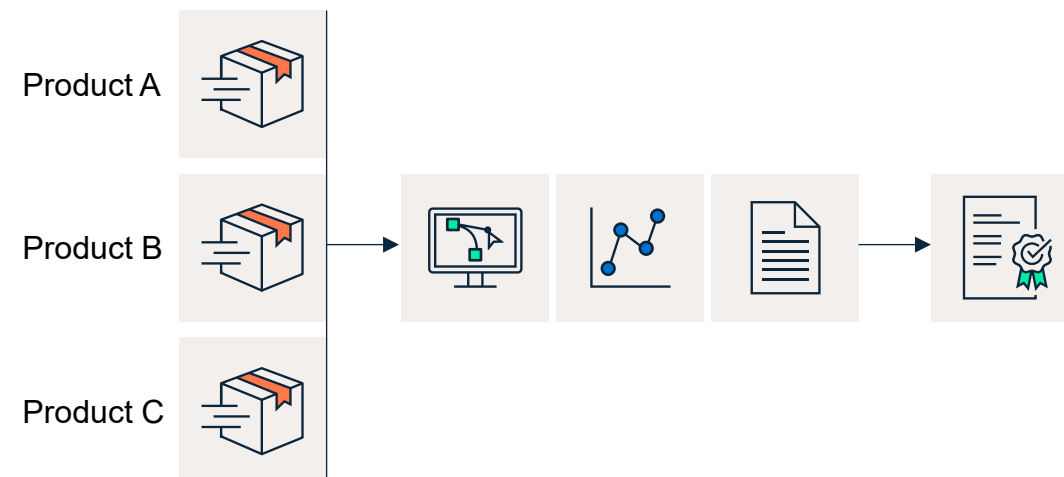
- Focusing on data, calculations and reporting
- Each products LCA result is “correct”
- Deviations can be identified along the whole LCA process
- → **high level of trust**
(especially if done in acc. to ISO 14064-3)



Efficient Approach

“System”

- Focusing on data management, procedures and quality controls
- Systematic errors can lead to many “wrong” LCAs
- Data input is not verified (shit in, shit out)
- → **lower level of trust**



Industry demand for system assurance is rising



Drivers for system assurance:

- Limited personnel capacity for conducting single LCA and for assurance services
- Systematic approaches can help to maintain a certain level of quality and comparability throughout big product portfolios
- System assurance service often cheaper if >5 LCA have to be assessed, but implementing costs can still be a dealbreaker
- Risks of system assurance are neglected by some stakeholders → hurdles vanish with new standards
- New standards for system assurance making it also more accessible → Catena-X PCF program certification

Regulation is still often requiring single verification



(upcoming) Regulatory requirements for LCA/PCF		
Battery Regulation (EUBR)	Construction Products regulation (CPR)	Ecodesign for sus. Products regulation (ESPR)
- DA draft requires “full” verification - European Accreditation sets ISO 17029 as overarching standard	Harmonized standards missing	Verification by using harmonized standards or other reliable, accurate and reproducible methods
Clear rules missing, but no direct indication of system assurance!		

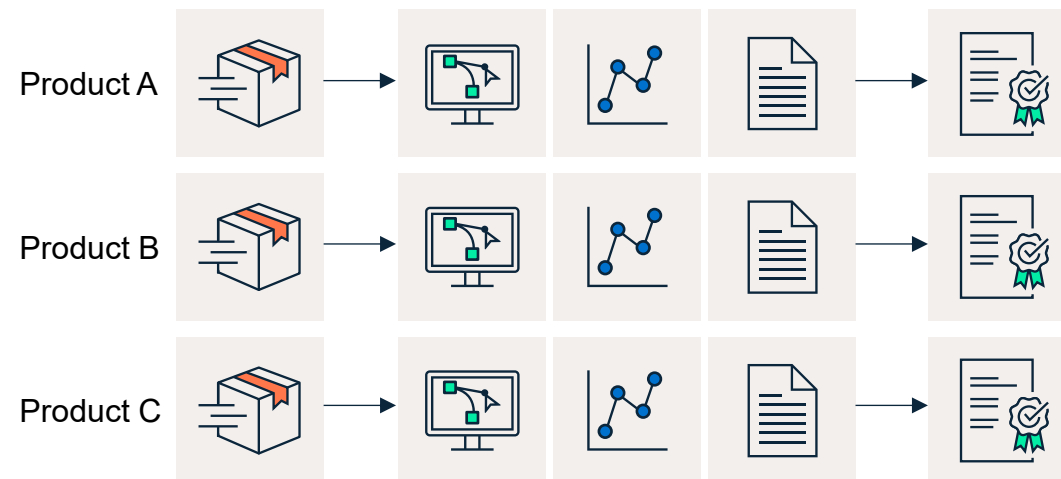
A compromise can be part of the solution



Classic Approach

“Single”

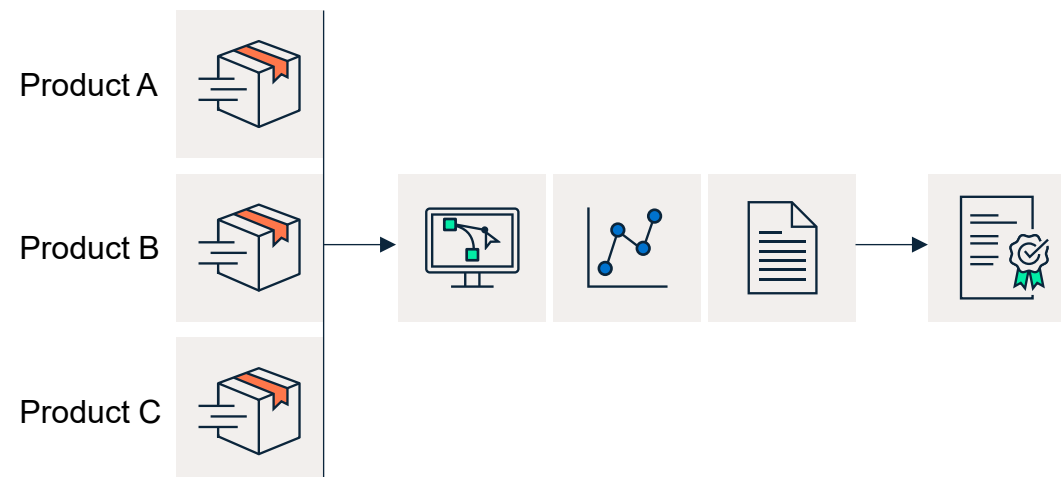
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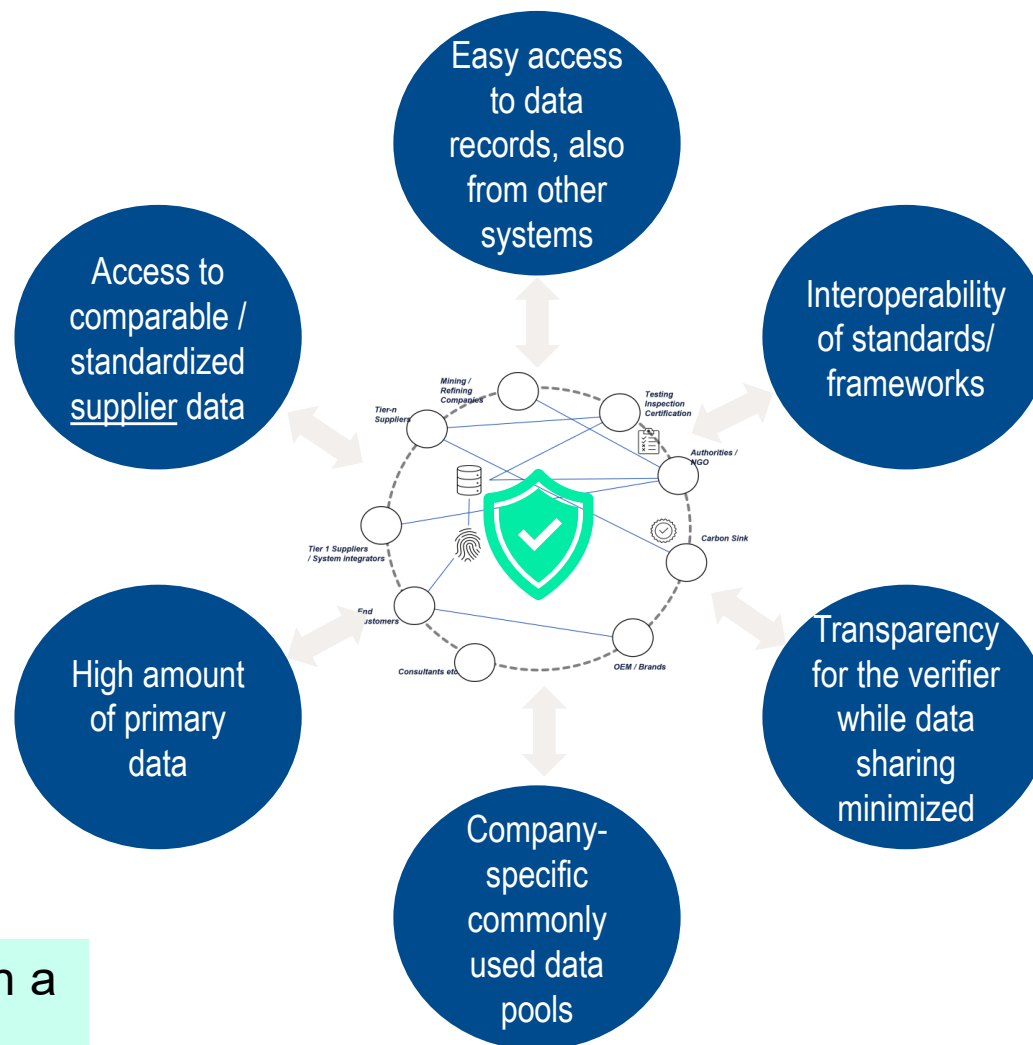
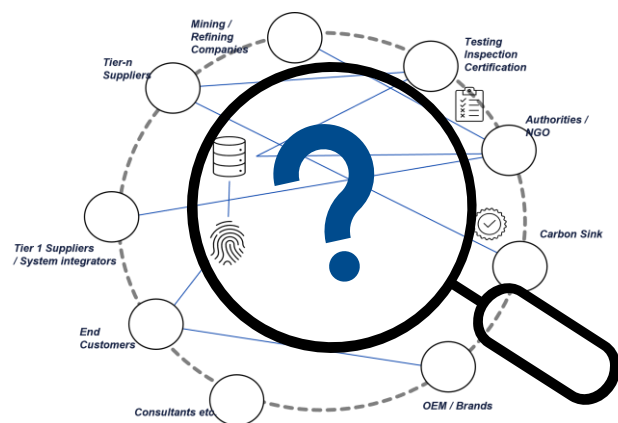
Efficient Approach

“Quasi-System”

- Optimized verification process possible
- Aggregating similar products to groups
- Make effective use of existing efficiency potentials
 - Energy related Data often on plant level
 - --> Synergies even with “single” verifications
 - One audit for several products
 - Same reporting template for all products



Trust goes beyond trusted LCA Results...



Digital tools can be a huge lever – but come with a lot of challenges in terms of trust promises

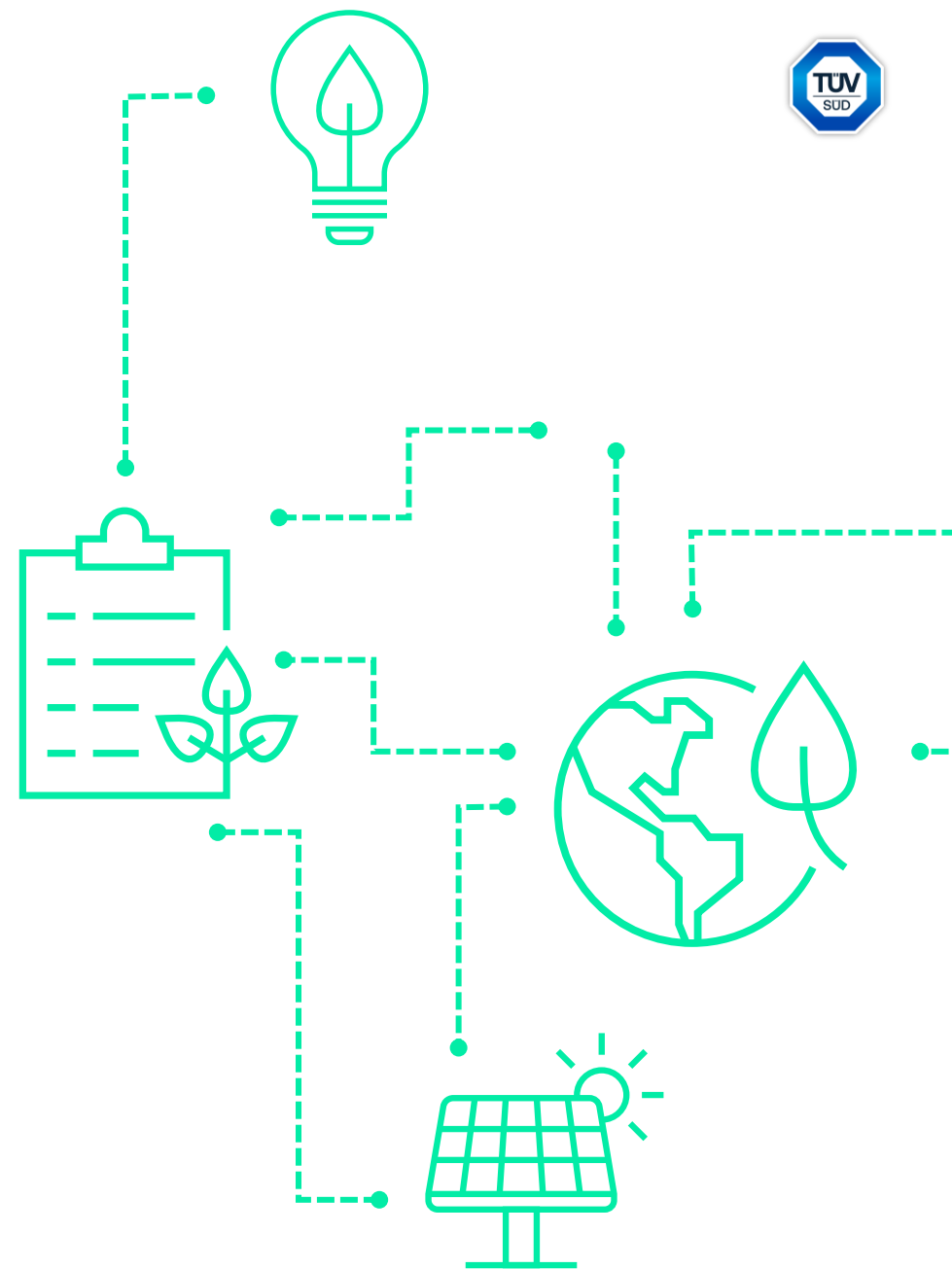
Conclusions



- Trust in LCA data is a key aspect for future conformity assessments
- There will always be the trade-off between very high levels of trust and scalability and cost-efficiency
- Single and system assurance will stay in parallel
- Regulation can still demand single assurance
- Silos must be overcome – isolated sustainability measures / standards / regulations limit scalability

Questions & Answers

Any open questions or points to discuss?



Thanks for listening!

Get in touch

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