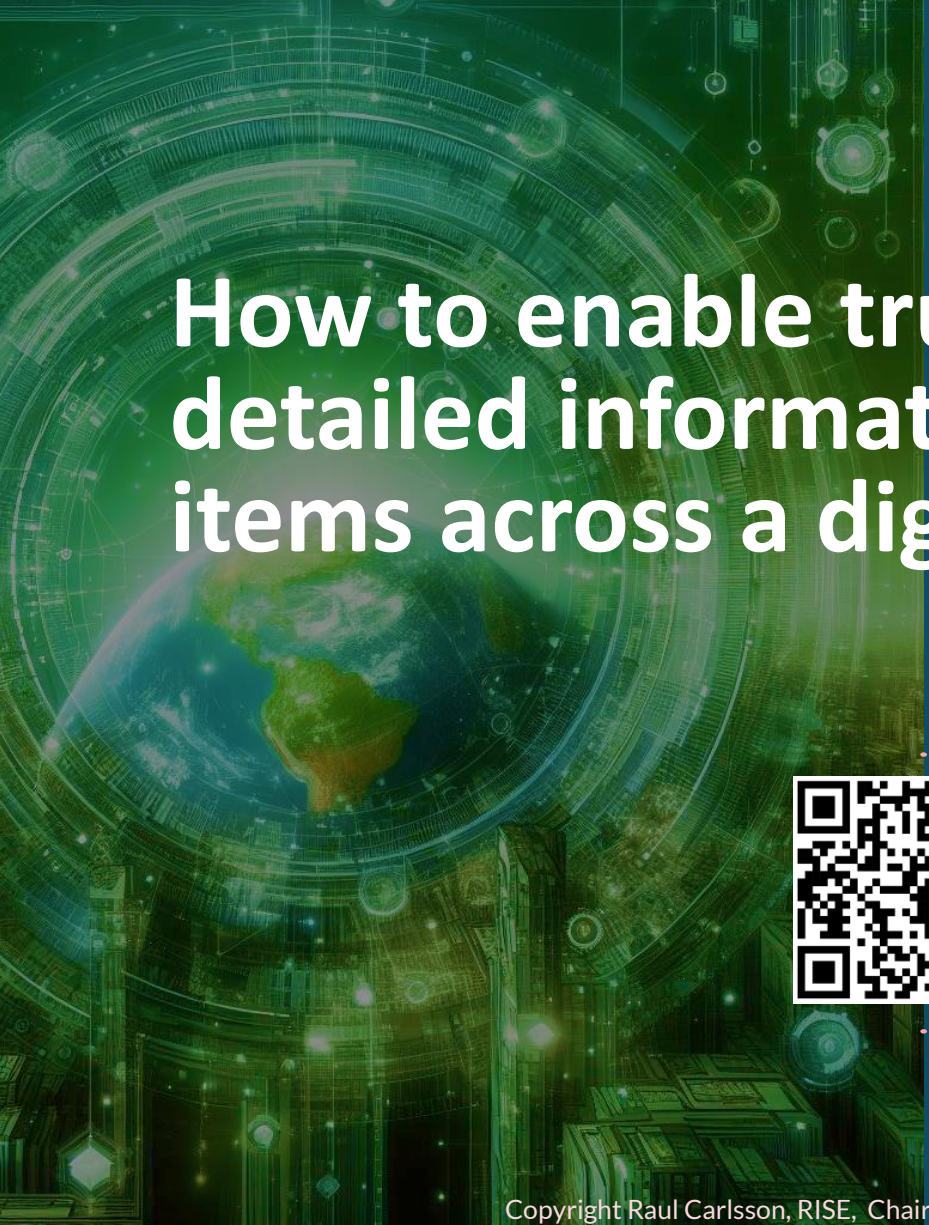


How to enable trust without sharing detailed information about individual items across a digital product life cycle

Raul Carlsson
Senior researcher, Certification, RISE
Chairman CEN/TC 473 Circular economy

Content

- RISE – Research institutes of Sweden
- CEN TC 473 European standardization of Circular economy and its relations to Digital Product Passports
- Experiences to draw from
- The circular economy quality infrastructure
- Combining into system
- Summary

RI.SE
Research Institutes of Sweden

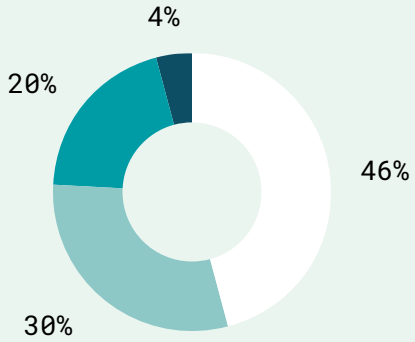
Competitiveness and sustainable transition based on science

€ 400

million, net sales

Operating results: € 2,2 million

Operating margin: 0,6%



Distribution of net sales

Business sector	€ 183 M
Public funds	€ 120 M
State funds	€ 81 M
EU funds	€ 17 M

Nearly

3,300

employees

130+

Testbeds and demonstration environments

We are represented at

35

locations around Sweden

78

Customer Satisfaction Index

Alla siffror avser 2022.

European standardization
CEN TC 473 Circular economy and its relations to CEN CLC/JT 24 Digital Product Passports

CEN/TC 473 Circular economy

Framework, terminology and information sharing for European circular economy

Further specified in product specific delegated acts, such as
- Batteries
- Electronics
- Textile
- Construction sector

CEN CLC/JTC24 Digital product passport

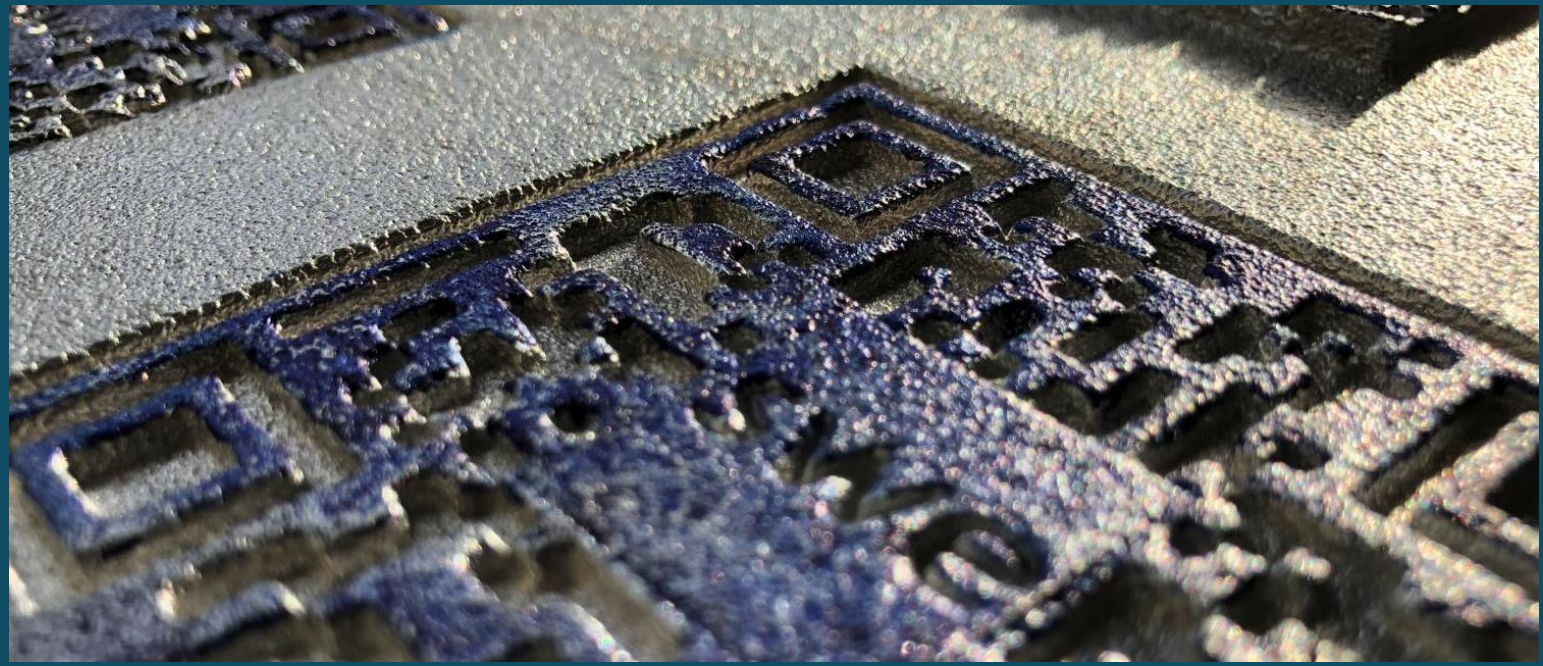
Harmonized digital system to enable secure and effective data sharing

Meeting specific requirements, such as
- Product data related to specific product
- Cross sectoral data sharing
- Product content and history
- Product manuals and advice

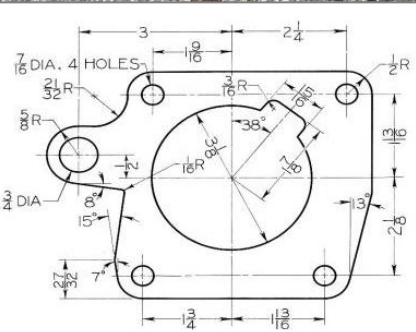
Experiences to draw from

- Label/digitally tag a component during metal castings
- Conceptualizing smart metals and internet of materials
- Utilizing concept of consecutive certification

Label/make identifiable with a digital tag an item and associate it with data



Traceability
Cast metal components with digital tag



Technical specifications

Production data

Quality check log

Geographical scan log

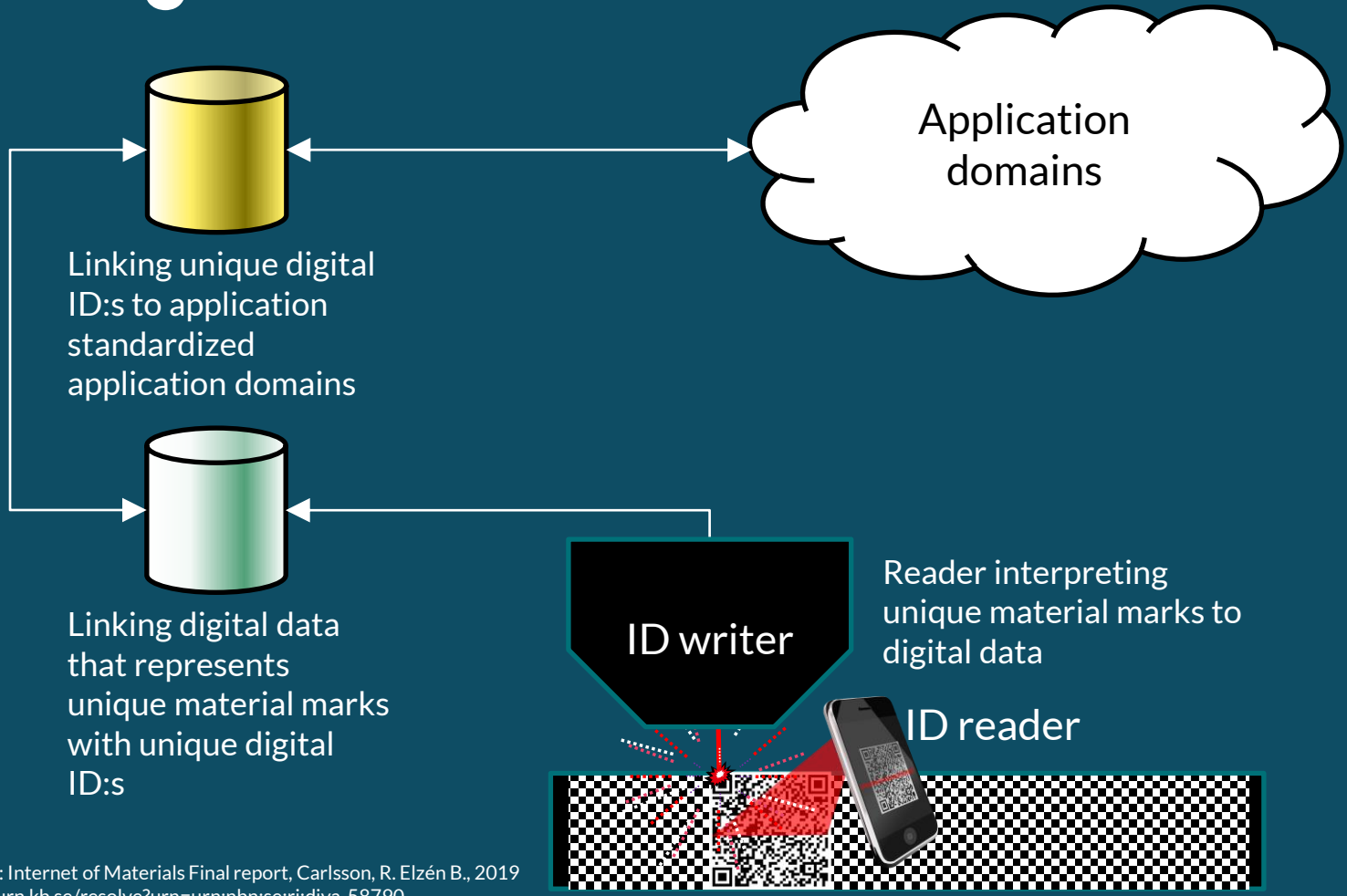
Identity:

- Manufacturer
- Article number
- Serial number

R. Carlsson, Presented at LCIC 2018, Berlin 29-31 August 2018

Label/make identifiable with a digital tag an item and associate it with data

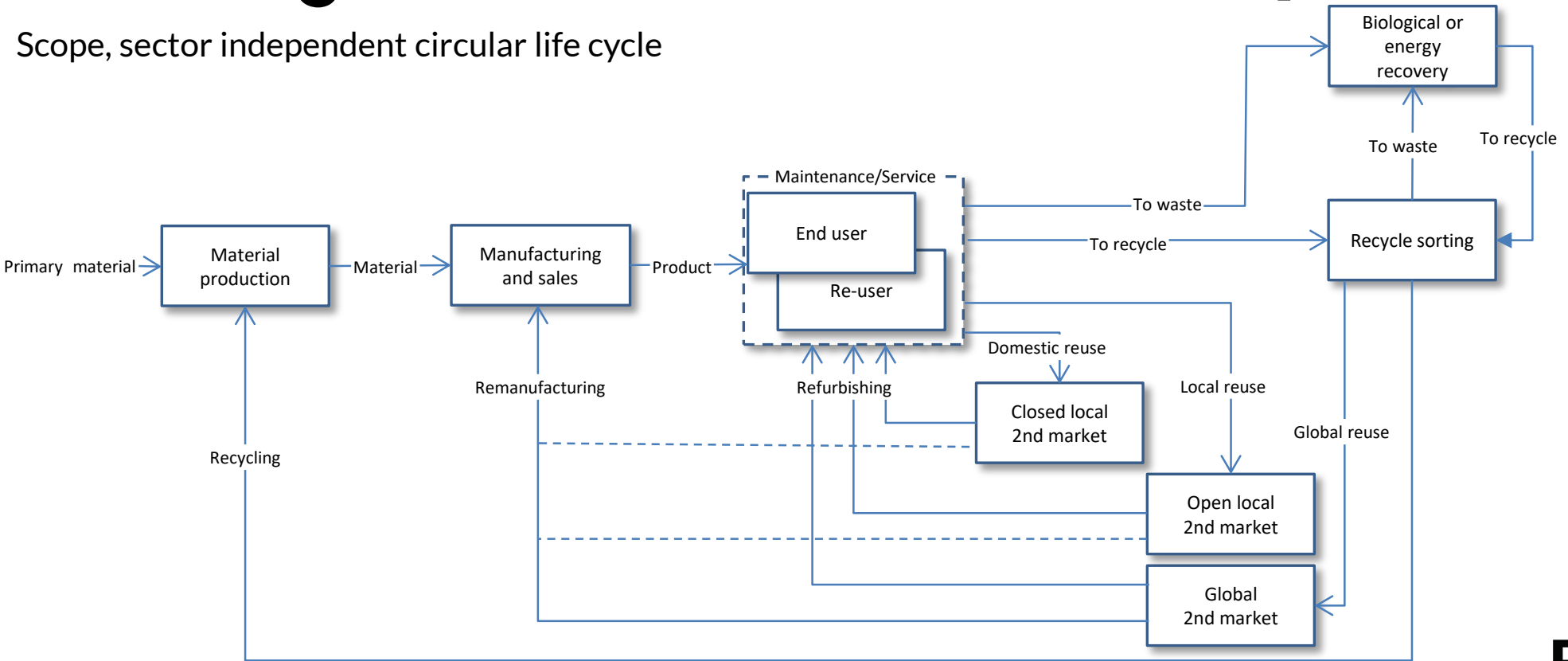
Generalization: Circular traceability
Digital material –> Internet of Materials



Source: Internet of Materials Final report, Carlsson, R. Elzén B., 2019
http://urn.kb.se/resolve?urn=urn:nbn:se:ri:diva-58790

Mapping standardization needs for enabling circular data traceability

Scope, sector independent circular life cycle



Source: Internet of Materials Final report, Carlsson, R. Elzén B., 2019
http://urn.kb.se/resolve?urn=urn:nbn:se:ri:diva-58790

Mapping standardization needs for enabling circular data traceability

Result, identifying several existing standards and missing links

Resilient and sustainable business and society

Circular economy

Digital Product Passports CEN

Internet of materials

Sector Standards

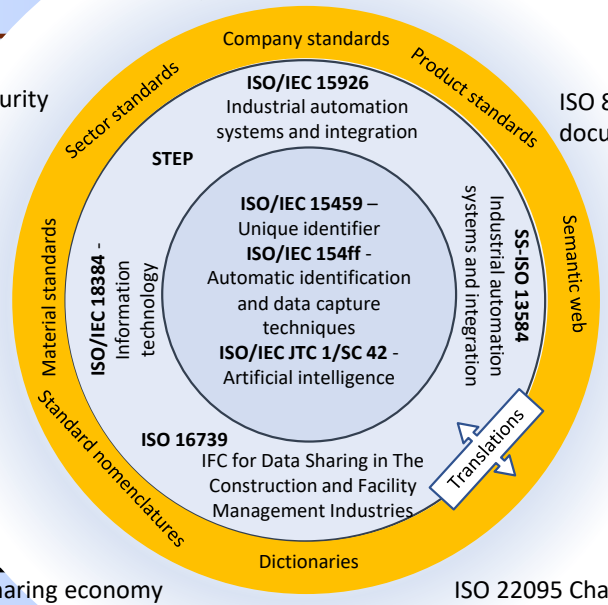
Sector independent standards

ISO/IEC 27000
Information security

ISO 55000 Asset management

ISO/TC 324 Sharing economy

ISO/TC 323 Circular economy
CEN /TC 473



ISO 8887 Technical product documentation

ISO/TC 307 Blockchain and distributed ledger technologies

ISO 22095 Chain Of Custody

Consecutive phase-wize certification allows data protection and trust

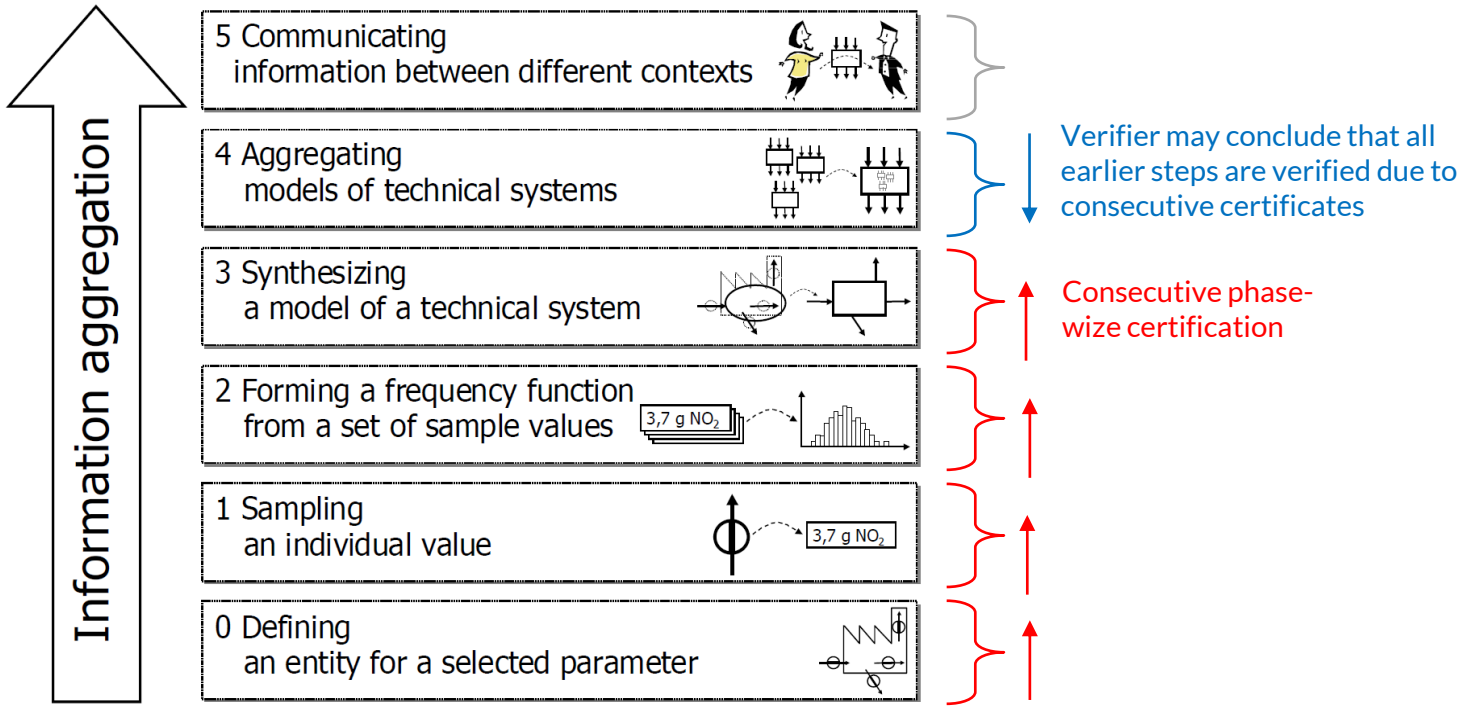
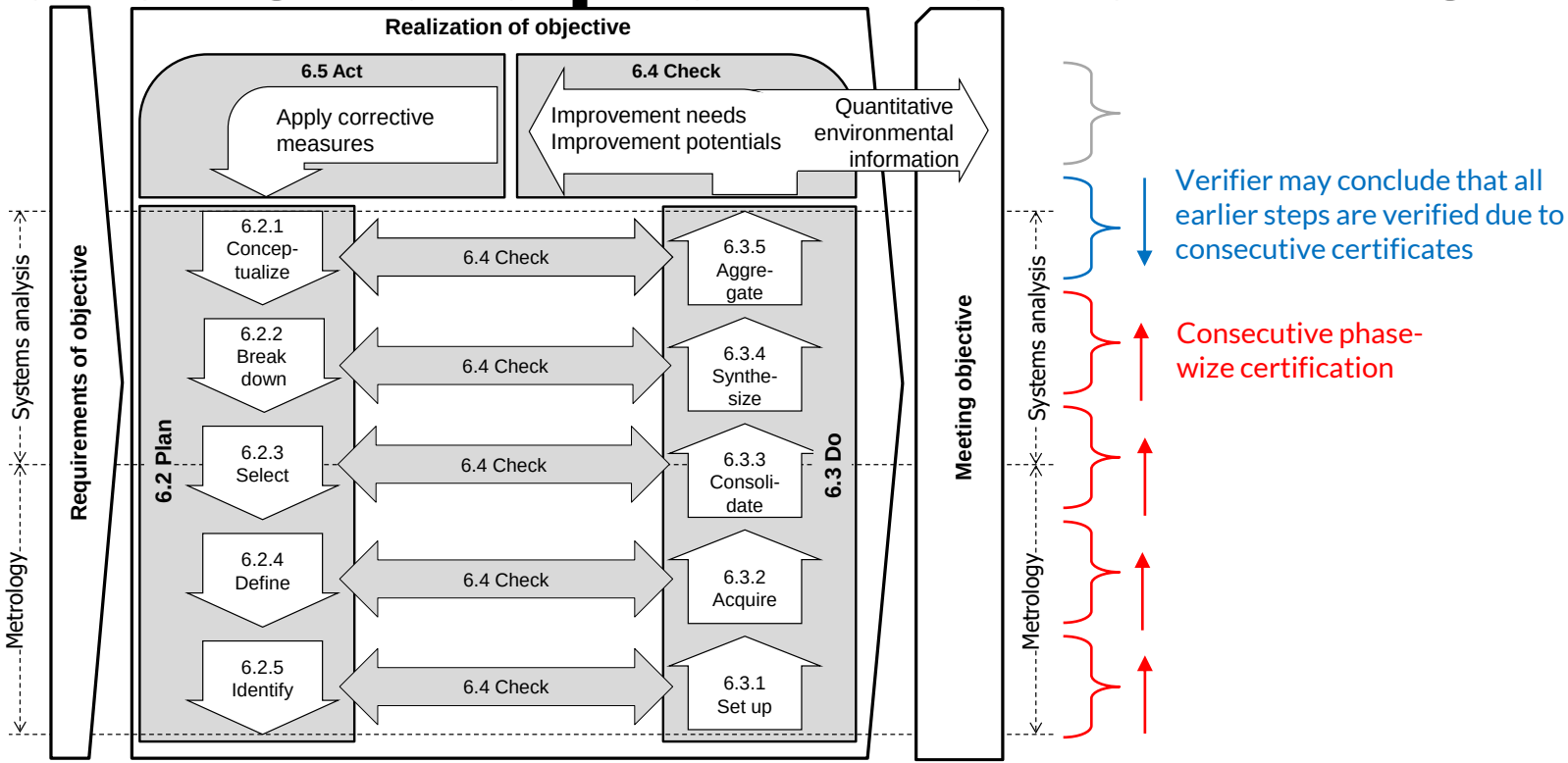


Figure 2. The phases in the PHASETS model

Carlson R., Pålsson A-C.; Industrial environmental information management for technical systems, Journal of Cleaner Production, 9 (2001) 429-435

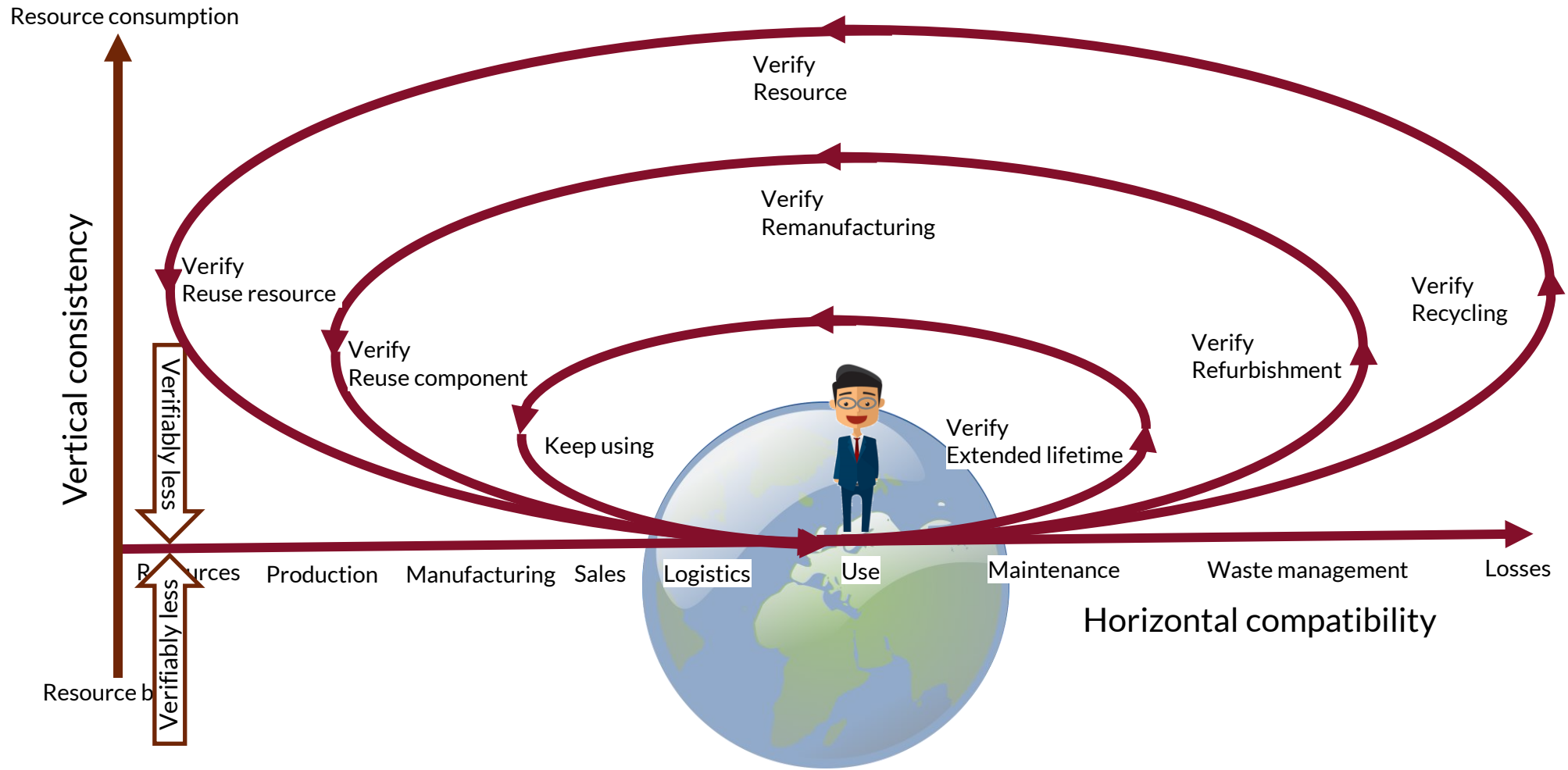
Consecutive phase-wize certification allows data protection and trust



ISO 14033:2018 – Environmental management – Quantitative environmental information

The circular economy quality infrastructure

Circular economy requires identifiable flow of material objects



Combining into system

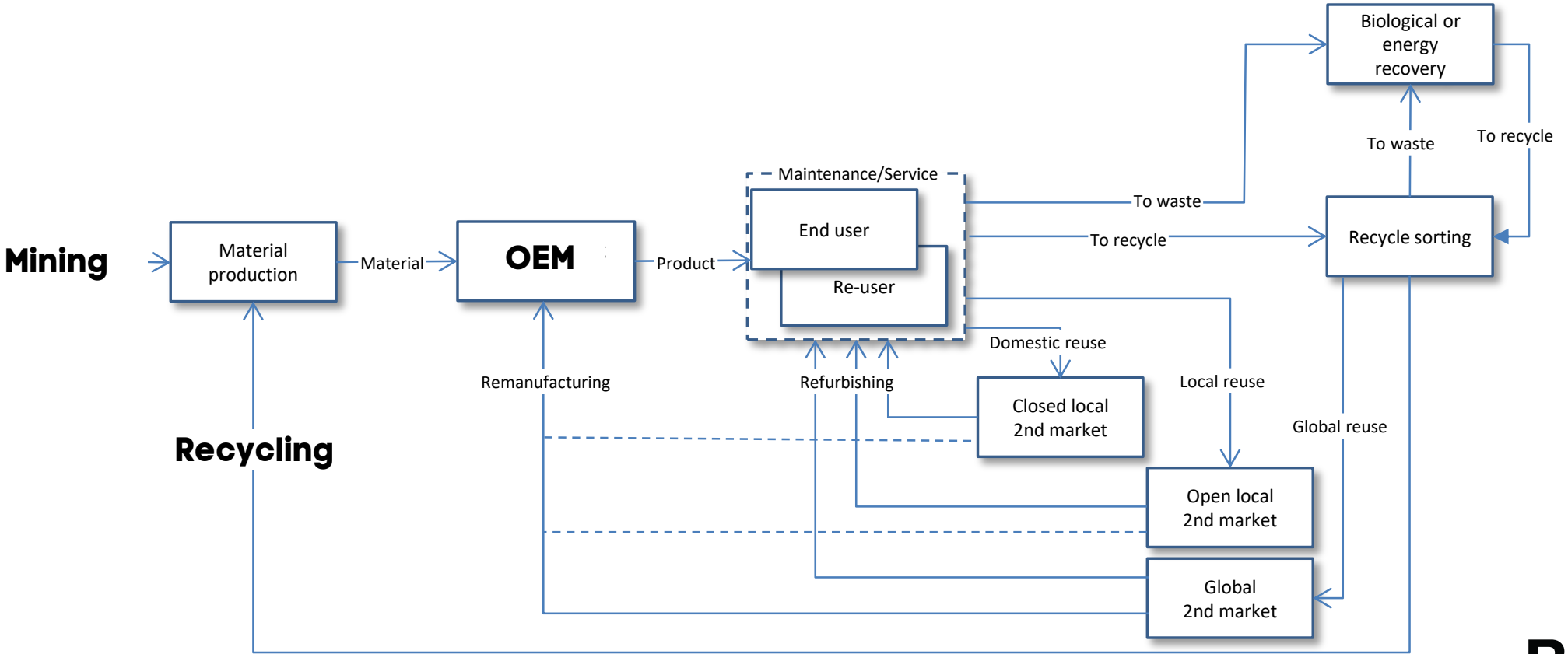
An example with

mining, recycling and OEM (Original Equipment Manufacturer)

&

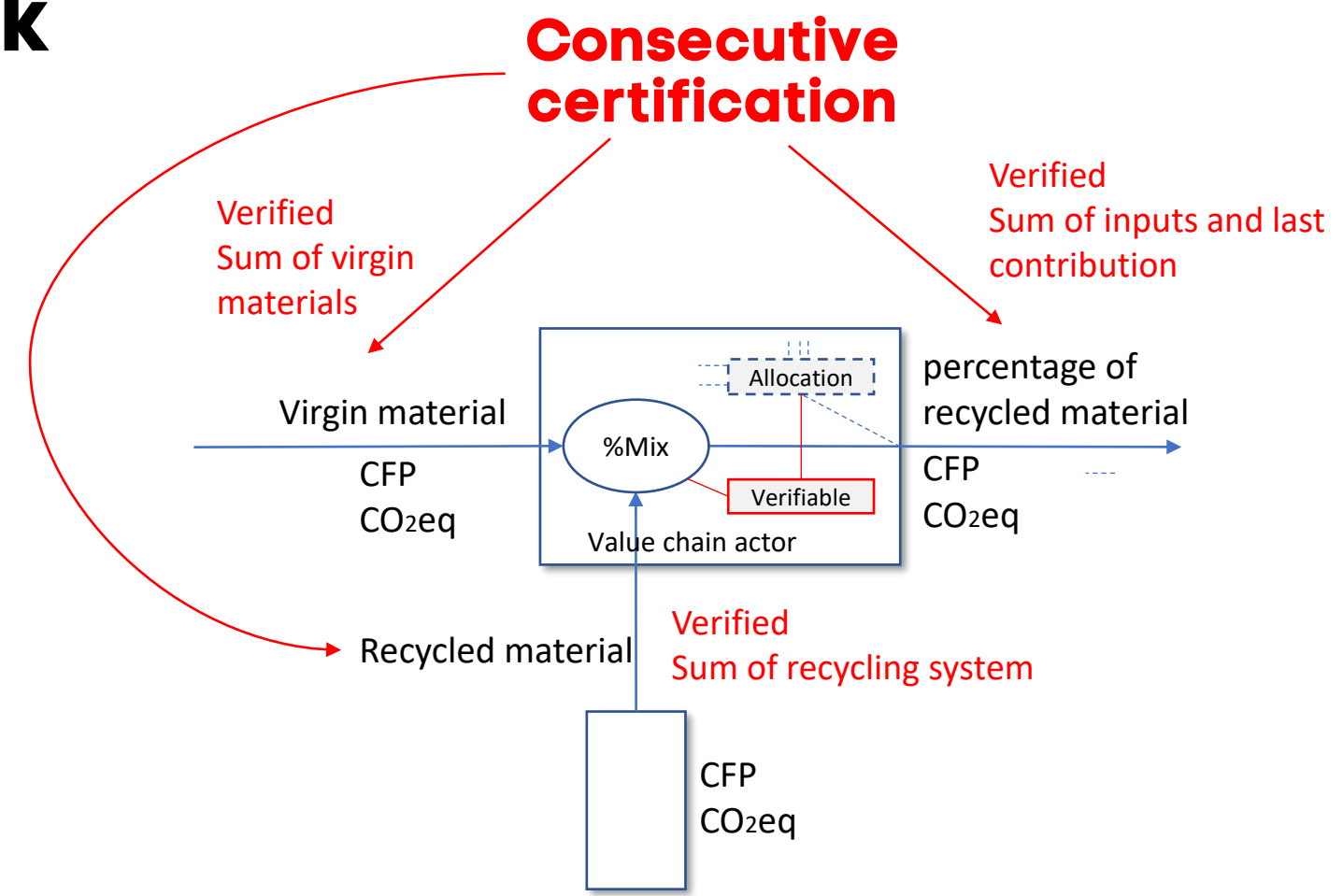
a certification system

As example: How OEM can trust and make claims about raw material sustainability specifications

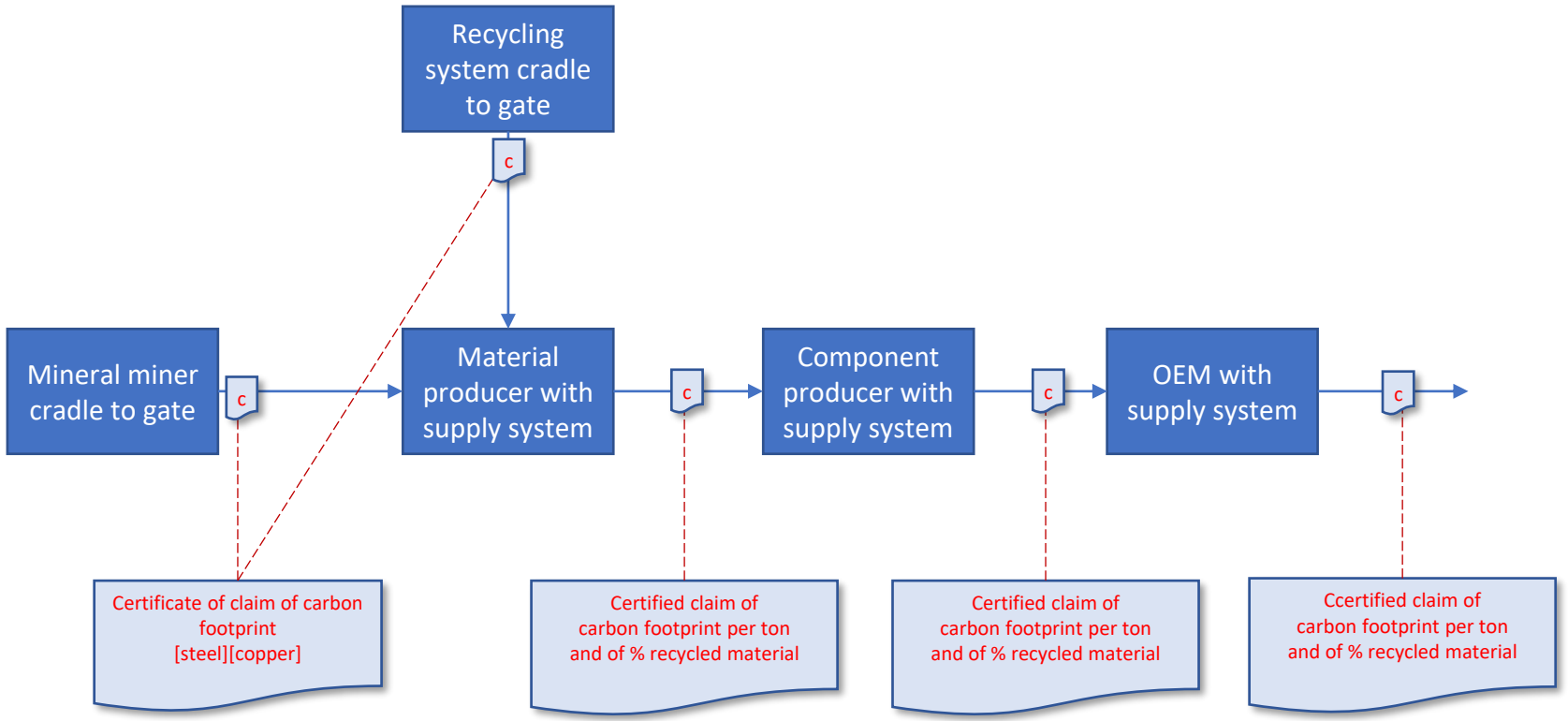


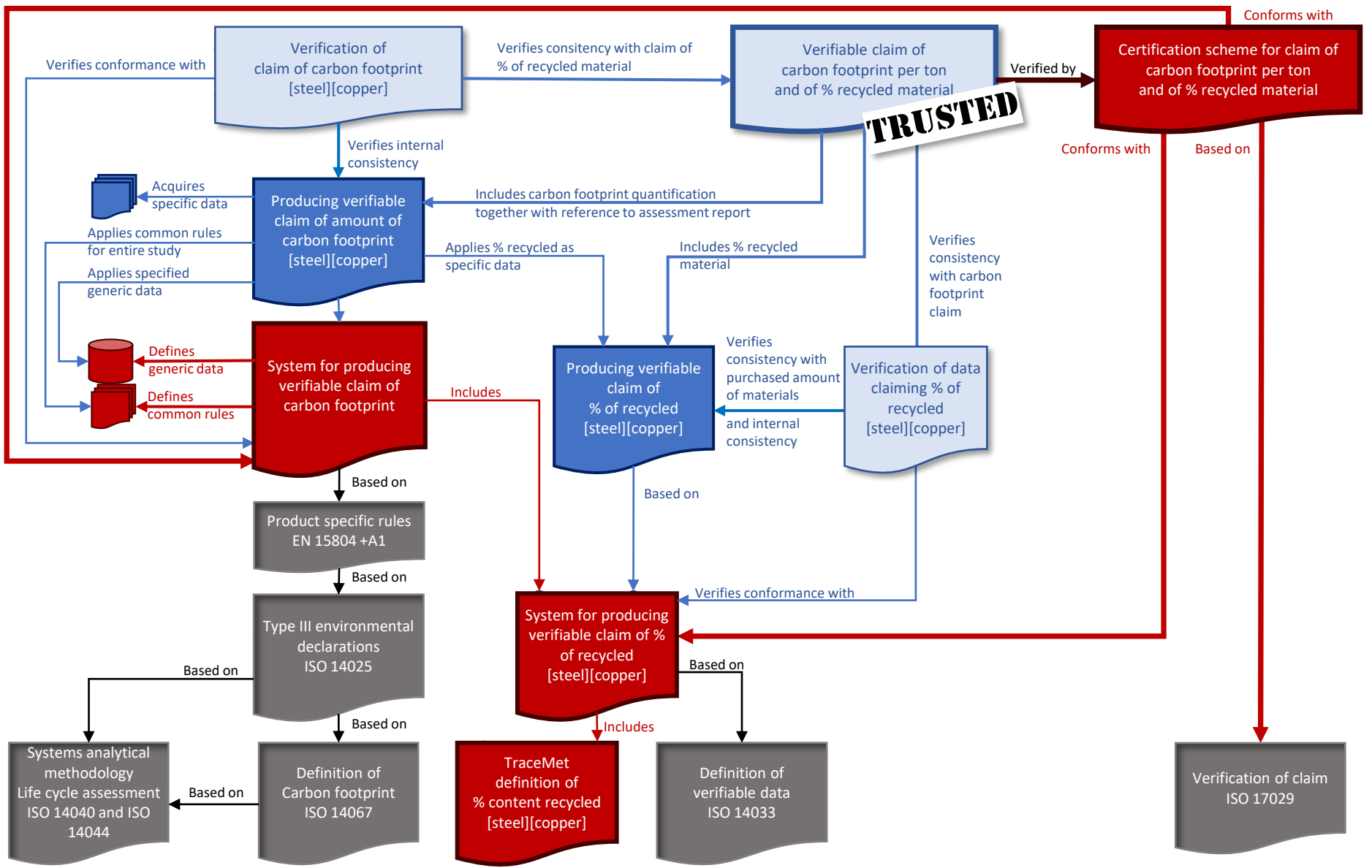
Source: Internet of Materials Final report, Carlsson, R. Elzén B., 2019
http://urn.kb.se/resolve?urn=urn:nbn:se:ri:diva-58790

Consecutively, each actor in the circular network



Consecutive modularized certificates





In summary, how to enable trust without sharing detailed information about individual items across a digital product life cycle:

- Labeling of individual products is necessary (to sufficient level of individuality)
- Use (international/sector independent) standardzed concepts and terms to inform about the product specifications
- Apply consecutive certification system (quality infrastructure) that enables modularized trusted summaries without revealing details.

RI.
SE

Thank you for your kind attention!

Questions?

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