


83rd LCA Discussion Forum

Scope 3 
Environmental
Data at Siemens
Opportunities, Challenges & Solutions

Presenter: Ursula Grunder, Siemens Switzerland LTD

Agenda

Siemens Sustainability Insight	Scope
Design and Implementation Benefits, Opportunities and Risks	Example: LCA for Service
One Siemens LCA Databox	Way forward and Conclusion

Scope 3 Environmental Data at Siemens Opportunities, Challenges & Solutions



**Siemens Sustainability
Insight**

SIEMENS

Transforming the
everyday to create a
sustainable tomorrow

Siemens sustainability track record

More than 15 years of leadership...



2003
UN Global Compact



2015
Carbon-neutral pledge



2018
Charter of Trust



2021
SBTi commitment



2008
Environmental Portfolio



2016
Business to Society®



2020
Eco-efficiency @Siemens



2021
Siemens DEGREE



2022
Step up CO₂ ambitions

Responsible Business Practices

Supply Chain and Human Rights

Clear requirements for our suppliers

35 bn € of goods and services purchased from ~150 countries (FY22)

66.000
Suppliers

4.912
Self-assessment of suppliers

321
Quality audits of suppliers

426
External sustainability audits

Risk-based approach to supplier management

Degree Targets

ESG-secured supply chain

We respect human rights along our value chain

Business Conduct Guidelines

Code of Conduct for Suppliers

Responsible sourcing of minerals

- Commitment driven by top management and monitored by Executive Board and Sustainability Board; regular assessment of material human rights issues
- Comprehensive ESG due diligence with respect to customer-facing business (ESG radar) in addition to best due diligence practices with respect to supply chain and in-house operations
- Regular stakeholder dialog with external human rights advisors, investors, rating agencies, and NGOs
- External collaborative dialogs, including the Global Business Initiatives on Human Rights (GBI), the UN Global Compact, the UN Guiding Principles



econsense

Our DEGREE Framework sets clear priorities for Sustainability at Siemens



Our DEGREE Framework

is substantiated with clear ambitions

Decarbonization

- Net zero operations by 2030 in line with SBTi pathway
- Net zero supply chain by 2050, 20% emissions reduction by 2030

Ethics

- Striving to train 100% of our people on Siemens' Business Conduct Guidelines every three years

Governance

- ESG secured supply chain based on supplier commitment to the Supplier Code of Conduct
- Long-term incentives based on ESG criteria¹

Resource efficiency

- Next-level robust eco-design for 100% of relevant Siemens product families by 2030
- Natural resource decoupling through increased purchase of secondary materials for metals and resins
- Circularity through waste-to-landfill reduction of 50% by 2025 and towards zero landfill waste by 2030

Equity

- 30% female share in Top Management by FY25
- Access to employee share plans: maintain high level and expand globally to 100%²
- Global commitment to the New Normal Working Model

Employability

- Double digital learning hours by 2025
- Access to employee assistance program: maintain high level and expand globally to 100% by 2025
- 30% improvement in Siemens' globally aggregated LTIFR³ by 2025



Scope

Our Environmental Scope is not only on Products It is on PSSS

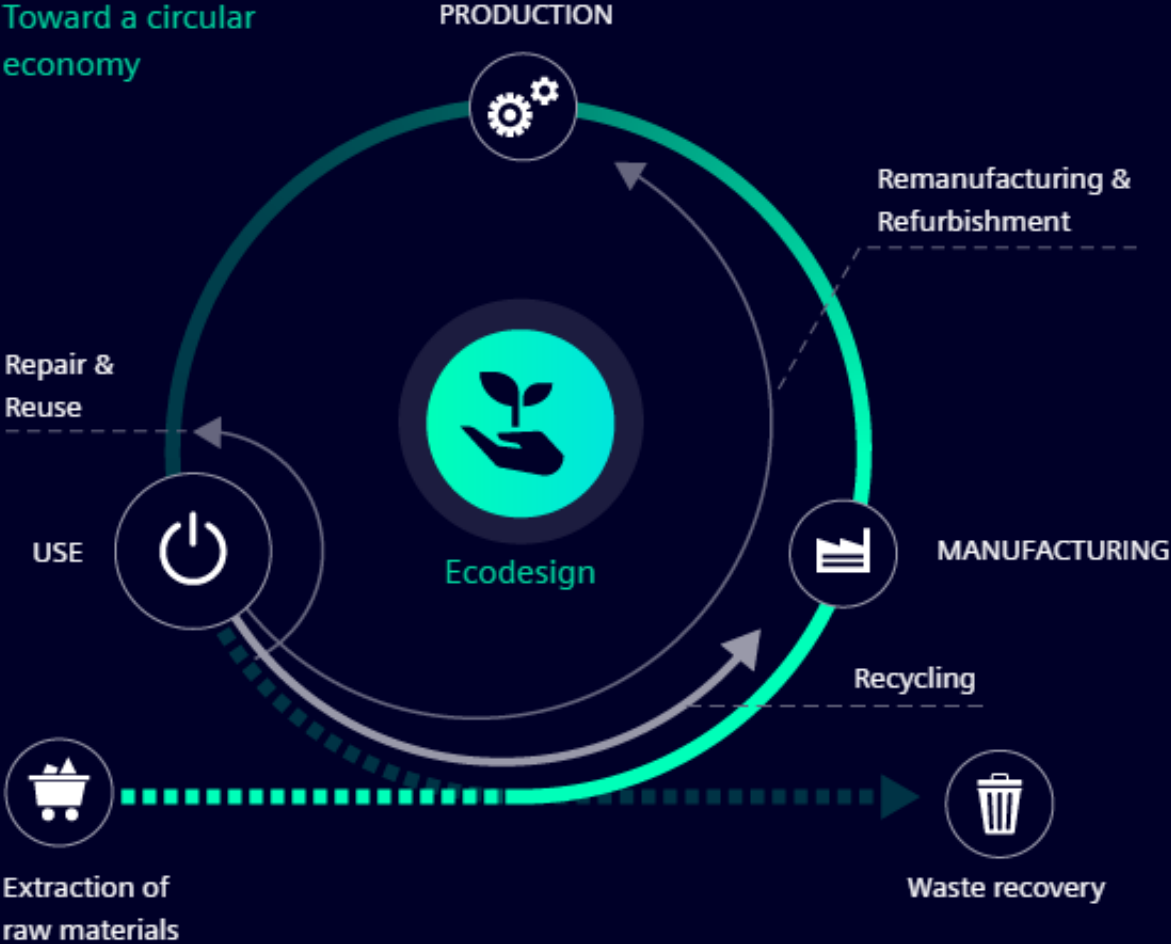


What do we do to meet the needs and expectations of the markets and the customers regarding Eco Efficiency?

* The term PSSS refers to all Siemens business types (products, systems, solutions and services), including inter alia software and digital applications.

Quantifying environmental impacts

Toward a circular economy



Linear economy



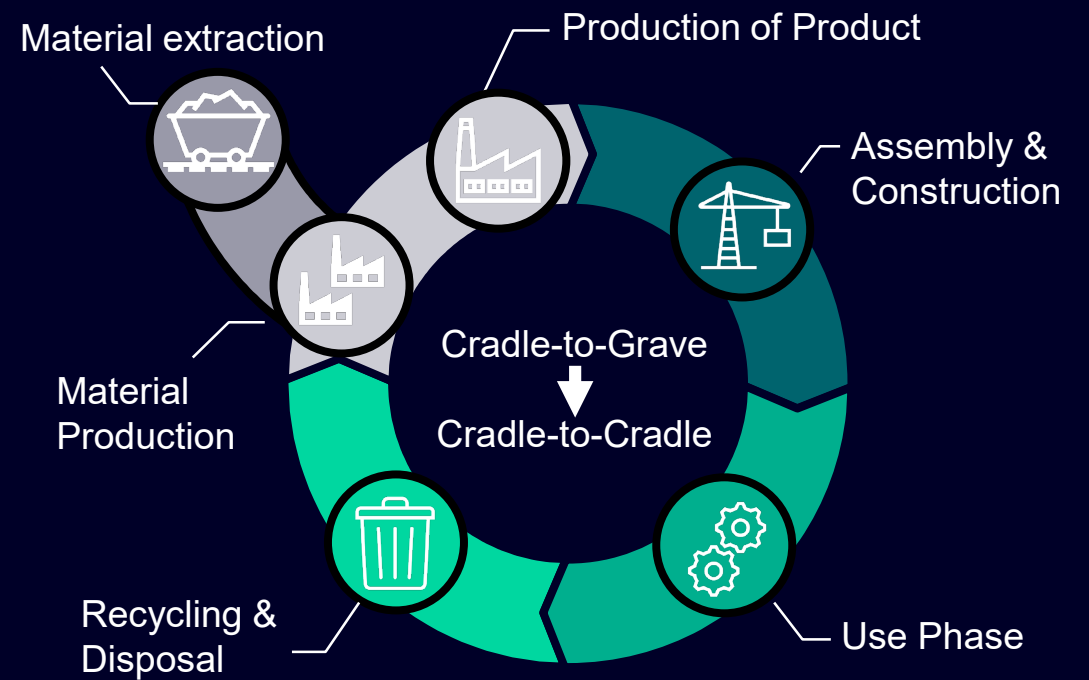
Solid Foundation is about quantifying the environmental impacts – over an entire life cycle.

... creates **Product Environmental Footprint** transparency and encompasses the entire product lifecycle

Product Environmental Footprint with **multiple impact categories**



Product Lifecycle from **Cradle-to-Grave**

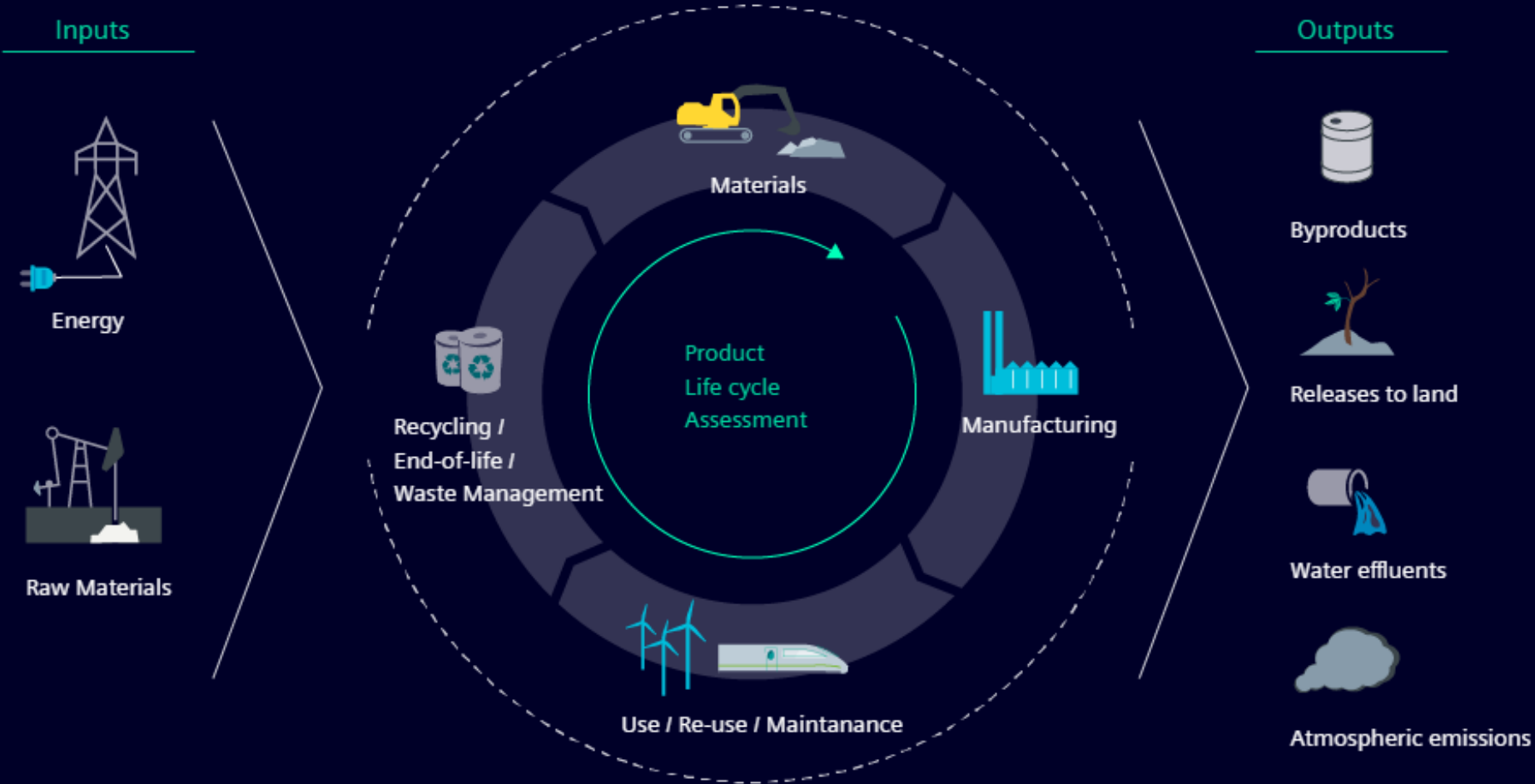




Design and Implementation

Benefits, Opportunities and Risks

Huge Investment in Change Management



Are LCAs comparable?

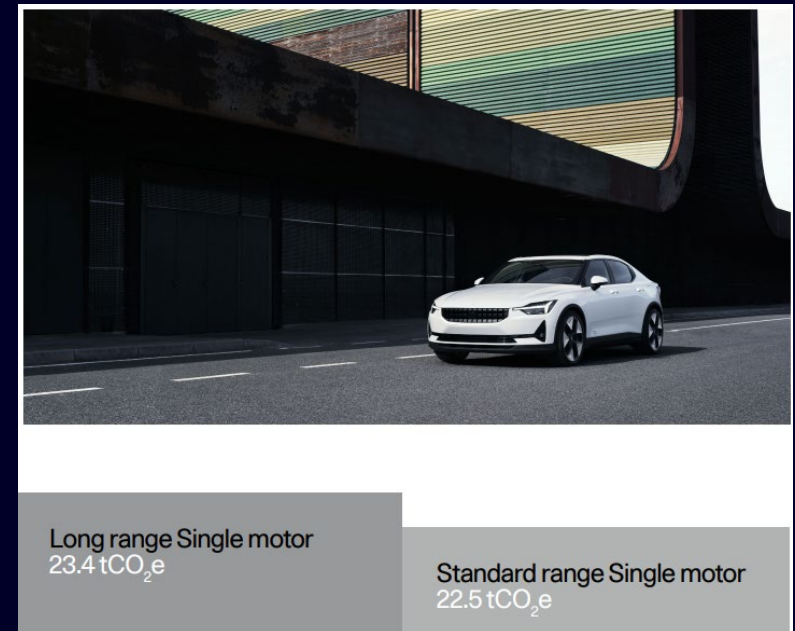
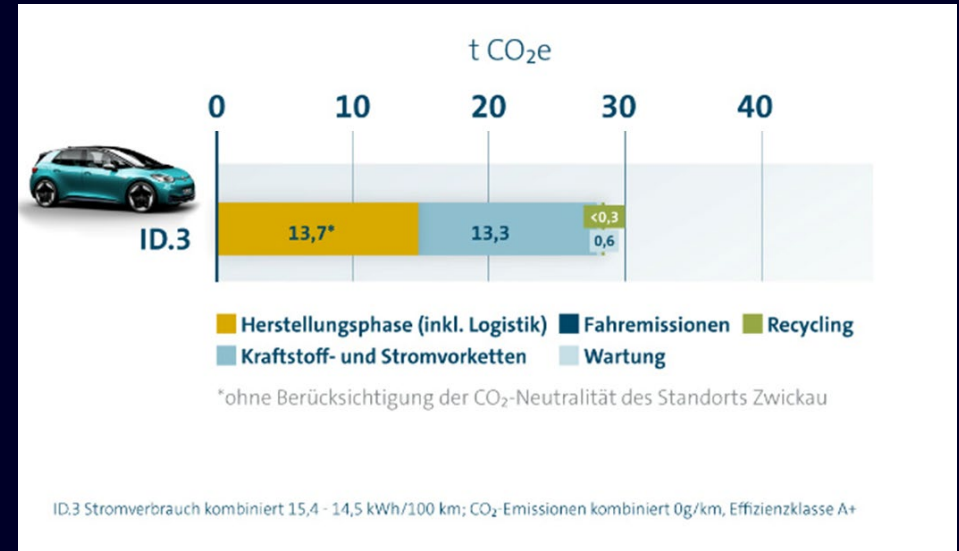
Can you compare these two results?

No, because we know nothing about what is behind of this data. How was the **functional unit** defined (*Lifecycles, use phase, calculation rules etc?*)

What were the respective system boundaries?

Only products with the same **functional unit** and same Life Cycle Impact Assessment method and calculation rule can be compared.

As you can see that the **most important thing is transparency** and documentation. Whether in the preparation of the LCA or in the communication of the results.



Life Cycle Assessments and Environmental Product Declarations

It is a long way in front of us



Siemens' strategy

- Quantitative assessment of environmental impacts related to the life cycle of a product, system, solution or service



Output

- End of FY22: 71 LCAs and 1,294 EPDs for our products, systems, solutions and services
- Tracked by our reporting tool SESIS (Siemens Environmental and Safety Information System)
- Individual LCAs / EPDs remain the property of the businesses



Measures

- Life Cycle Assessments (LCA) according to ISO 14040/44
- Environmental Product Declarations (EPD) according to ISO 14021 or 14025
- A wide range of possible impacts on climate change and the environment are considered

How to profit from Eco Efficiency analysis



Save money

Reduction of sales cost through more efficient sourcing and operation



Make profit

Increase in competitiveness through additional selling points in new and saturated markets



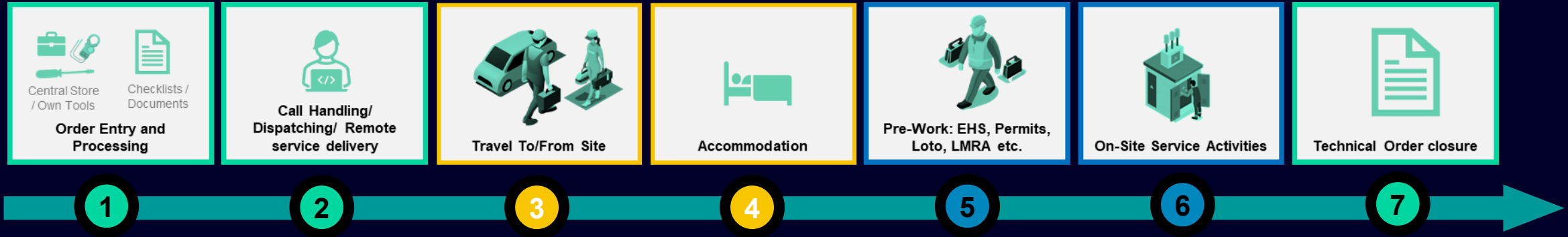
Avoid risks

Maintain revenue in environmentally sensitive markets; Safeguard public procurement



Example: LCA for Service

PHASE I: System boundaries of Service Agreement Non-digital Corrective for one service intervention



All steps are considered from PM 080 onwards and include:

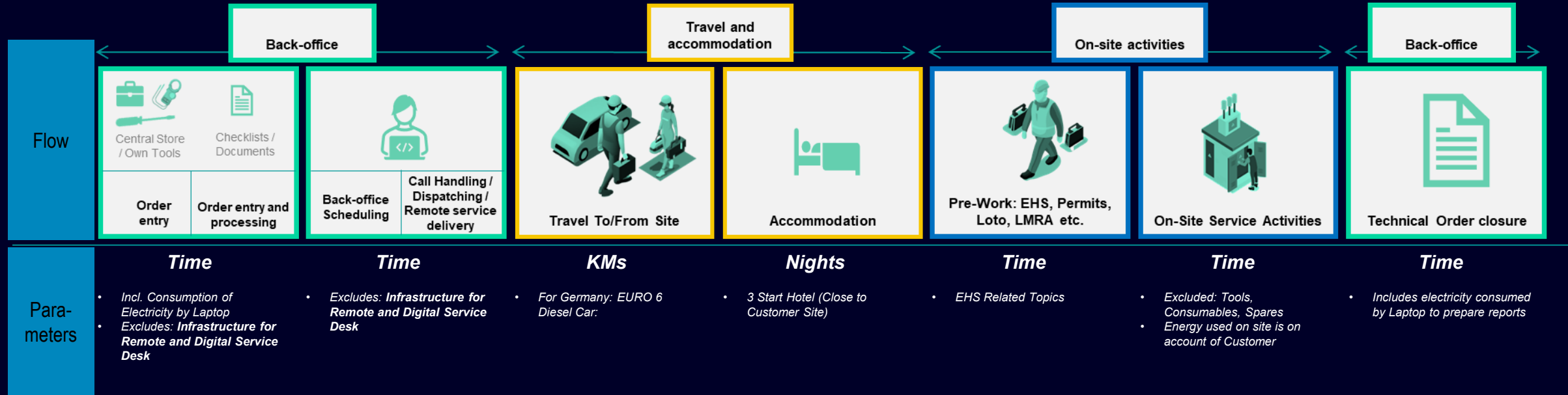
1. Order Entry and Processing
2. Call Handling/ Dispatching/ Remote service delivery
3. Travel
4. Accommodation
5. Pre-site activities
6. Maintenance
7. Finalization and report to back-office

Note:

- Corrective similar to on-site/ on-call service
- Logistics (materials/ tools) – negligible (similar assumptions for logistics and warehouse apply as on-site/ on-call)
- Back-office (technician prep) – negligible
- PM080 means starting from order entry.

■ Back office ■ Travel and accommodation ■ On-site activities

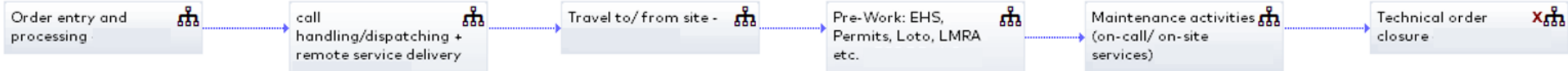
PHASE II: Life Cycle Inventory of Non-digital Corrective Service Agreements



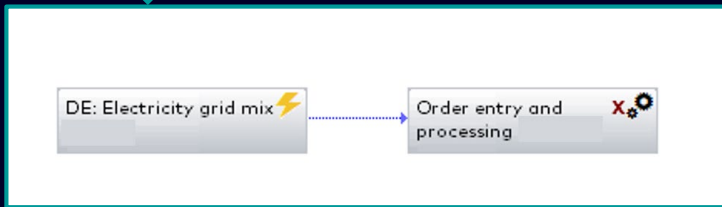
	Preventive	Corrective	Preventive	Corrective	Preventive	Corrective	Preventive	Corrective	Preventive	Corrective	Preventive	Corrective	Preventive	Corrective
RSS AT	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min
RSS CH	X min	X min	X min	X min	X min X km	X min X km	-	-	X min	X min	X min	X min		
RSS DE	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min
RSS FR	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min
SI EA CS DE	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min	X min

PHASE III: GaBi Model

LCI data were entered in the LCA tool GaBi (vx.x) and modelled as shown



Each life cycle step is linked to the database via different subplans



Example of subplan 1

GLO: Car, diesel, Euro 6, engine size up to 1,4l

Object Edit View Help

Name: GLO: Car, diesel, Euro 6, engine size up to 1,4l

Parameters

Parameter	Formula	Value	Minimum	Maximum	Standard	Comment
driving_perfor		1,5E005			0 %	[km] Life

Inputs

Parameter	Flows	Quantities	Amount	Factor	Units	Tr	Standard	Origin	Comment
spec_dies	Diesel [Refinery products]	Mass	0,0312	1	kg	X	0 %	Literature	
driving_sh	Vehicle [Material systems]	Number of pie	6,67E-006	1	pcs.	X	0 %	Literature	

Outputs

Parameter	Flows	Quantities	Amount	Factor	Units	Tr	Standard	Origin	Comment
driving_sh	Vehicle [Material systems]	Number of pie	6,67E-006	1	pcs.	X	0 %	Literature	
driving_sh	Vehicle kilometers [Others]	Length	1E003	1E003	m	X	0 %	Literature	

Example of subplan 2

Order entry and processing - Country

Object Edit View Help

Name: Order entry and processing

Parameters

Parameter	Formula	Value	Minimum	Maximum	Standard	Comment
Completeness		No statement				

Inputs

Flows	Quantities	Amount	Units	Tr	Standard	Origin	Comment
Customer call [Ecoinvent]	Time	0,17	h	X	0 %	(No statement)	
electricity, production mix Di	Energy (net ca)	0,43	MJ	X	0 %	(No statement)	

Outputs

Flows	Quantities	Amount	Units	Tr	Standard	Origin	Comment
Back office [Ecoinvent]	Time	0,17	h	X	0 %	(No statement)	

In case no secondary data were available in the GaBi database, extra modelling was done using literature values from reliable external sources related to the same region.

Datasets: GaBi Professional Data and literature data

GaBi Professional

- Energy mix Country
- Diesel mix Country
- Car euro 6, up to 1.4 l, diesel engine

Other literature data

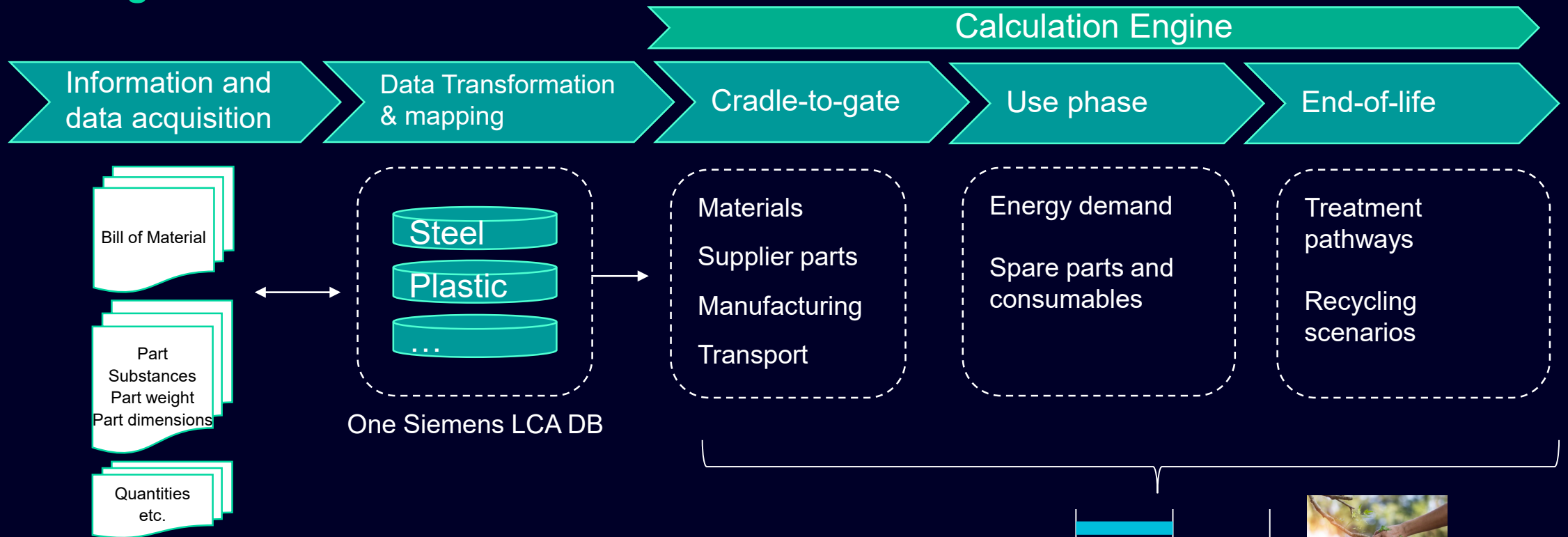
- WindVOE AP 5.1 Beschreibung der Methode zur Bewertung des Carbon Footprint von Projekten
- Plausibility with Country office energy consumption from SINTEF EN



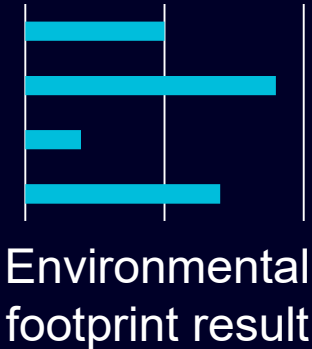
One Siemens LCA Databox

SIEMENS

Green Digital Twin



- Technical product information are matched through BOM import with centrally managed and aligned One Siemens LCA DB
- Within Calculation engine required information for different life cycle phases are considered and can be adjusted by the user
- Environmental footprint results are directly visible and can be downloaded as EPD report



Certification according to ISO 14040 & 14044 - Overview

Siemens input

- Documentation of the application
- Methodological choices
- Sample calculations
- Data used
- Data structure
- Impact assessment categories used
- Qualification of LCA specialists

TÜV verification

Check documentation and methods

Check calculation engine

Verify data model used and data quality

Check reporting

Certificate and online documentation on TÜV page



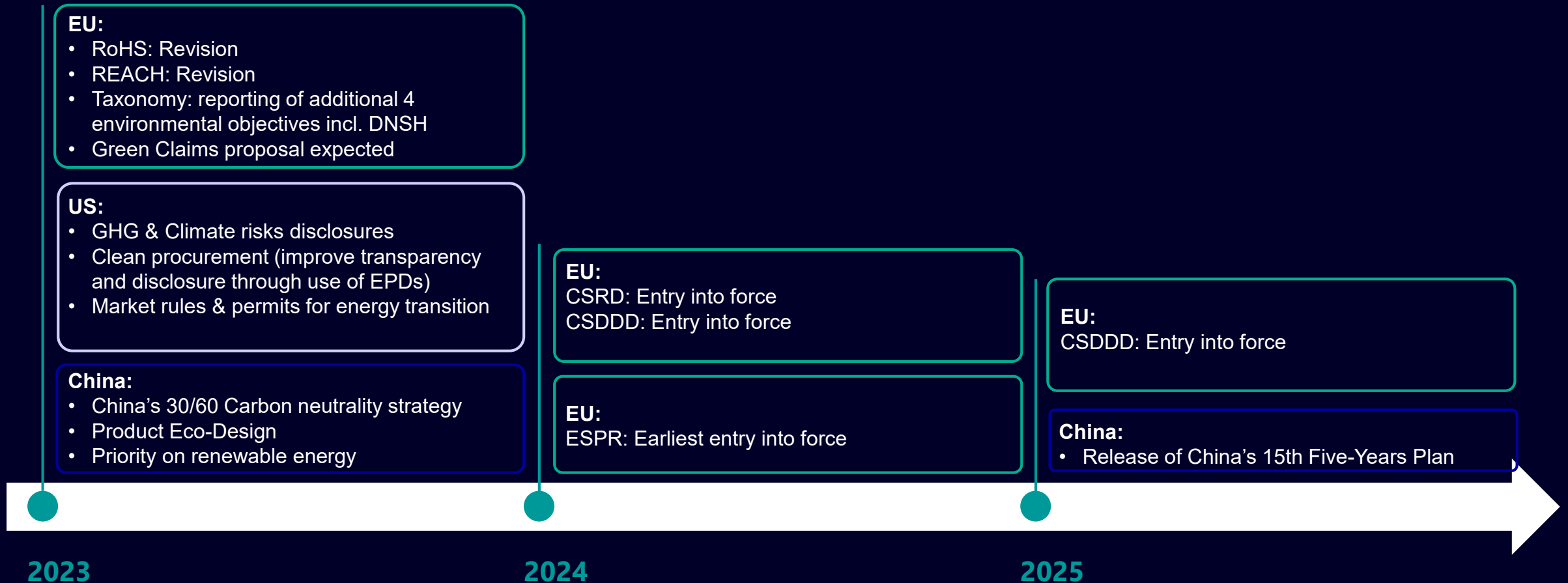
„GDT Web Application is suitable for calculations according to DIN EN ISO 14040 and 14044“



Way forward and Conclusion

Global regulatory “Tsunami” – It’s time to act now!

Companies need to improve in the fields of data transparency and sustainable product design



| Contact

Ursula Grunder

Head Environmental Protection, Health Management and Safety SI RSS EMEA
Theilerstrasse 1a
6300 Zug
Switzerland

Mobile +41 79 503 97 06

E-mail ursula.grunder@siemens.com