

How to Measure carbon? Start your journey today

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- 1 Introduction to BCI Global**
- 2 Background of carbon and changing European regulations**
- 3 The first step: How to create visibility**
- 4 From emissions modelling to emissions accounting**
- 5 Overall conclusions**
- 6 Contact details**

1 Introduction to BCI Global









Profile

- 38 years in business
- Leading International specialized consulting and implementation firm
- Global presence
- Access to over 200 Supply Chain Professionals across the globe
- Worked in more than 50 countries on 5 continents
- Worked for 50%+ of Gartner's Top 25



A International expansion and value chain assessment	B Supply Chain Consulting Services	C Manufacturing footprint Optimization & Site Selection	D Implementation and change
<ul style="list-style-type: none"> ● Go to market strategy ● International expansion ● Benchmarking ● Business case development 	<ul style="list-style-type: none"> ● Supply chain strategy ● Distribution network design ● Facility design ● Strategic outsourcing / 3PL selection ● Freight & warehouse benchmarking and optimization ● Sales, inventory and operations planning ● Supply Chain Analytics ● Carbon footprint strategies 	<ul style="list-style-type: none"> ● Manufacturing Footprint optimization ● Location advice for Plants, DCs and Offices ● Incentives assessment & negotiations ● Corporate real estate advice 	<ul style="list-style-type: none"> ● Project management ● Engineering support ● Change management ● Interim management

Our Industries Segments and Clients

Life style & Ecom	Food/FMCG/CPG	Technology	Automotive/ Industrial	Healthcare	3PLs
					

2 Background of carbon and changing European regulations

Topic	Timeline	Remark(s)
Corporate Sustainability Reporting Directive (CSRD)	2022 2023 2024 2025	Adoption by the European Parliament Preparing data sources Start of measuring emissions First report to be published (on 2024 numbers)
Carbon Border Adjustment Mechanism (CBAM)	2024 2025	Expansion of product scope to chemicals and polymers Expansion of product scope to other products Centralizing of central EU CBAM authority
EU ETS in Freight Transport	2030-ish	Expanding cap and trade emission rights system from production to transportation companies as well – resulting in ‘the costs of carbon’

All with the same purpose: “To keep global warming to no more than 1.5°C” (Paris Agreement, 2015)

Practical challenges

I have my warehousing under control, but no clue about inbound transport

I'll be responsible for the ESG part of business

I will start an RFQ, how do I include carbon?

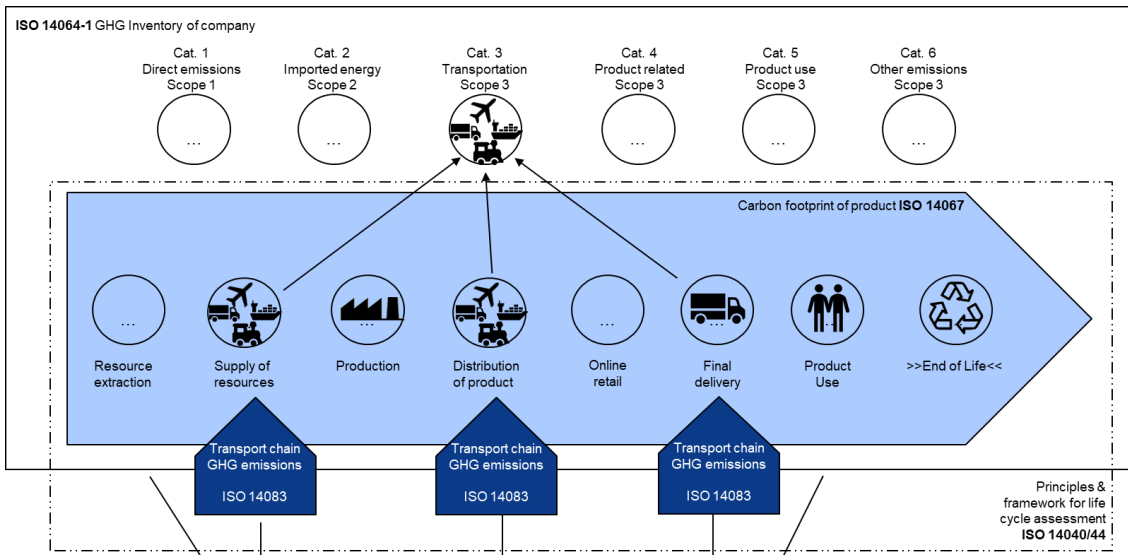
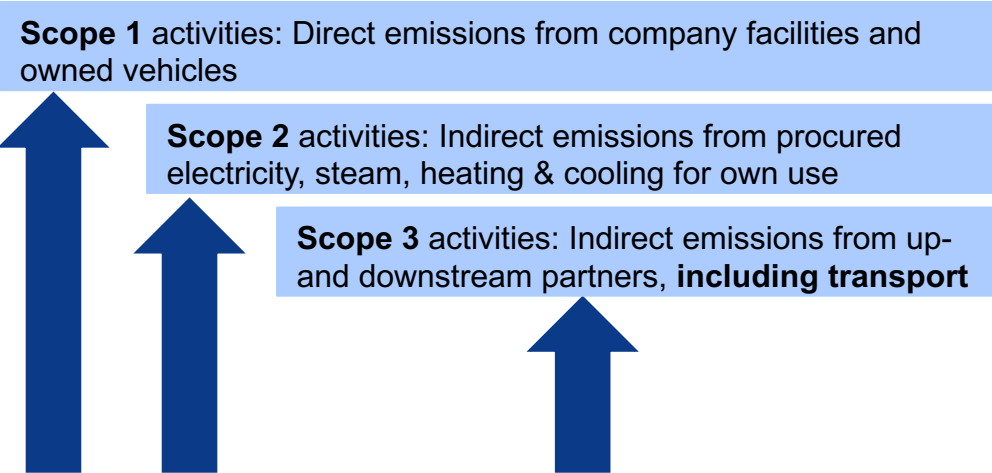
It's impossible for me to compare different (partner) inputs



What is a good dashboard that I can use?

Conclusion: every journey starts with the first step

Zooming in: emissions scope and supply chain partners



Who to report?

- Being the shipper
 - €40M net-revenue
 - €20M on the balance sheet
 - Average of >250 employees
- Being the transporter
 - Reporting emissions to your supply chain partners



When to report?

- 2024 is the first year to be captured
- 2025 is the first year to be reported

What is the impact on your operations? This is what you will need to do:

- Measuring corporate emissions
- Measuring emissions from value chain partners
- Identifying risks in relation to the emissions and carbon footprint (CFP)
- Report on performance and plans to mitigate / reduce the CFP

Source: ISO14083 on GHG emission quantification in freight transport and hub operations, ISO, 2022

3 The first step: How to create visibility

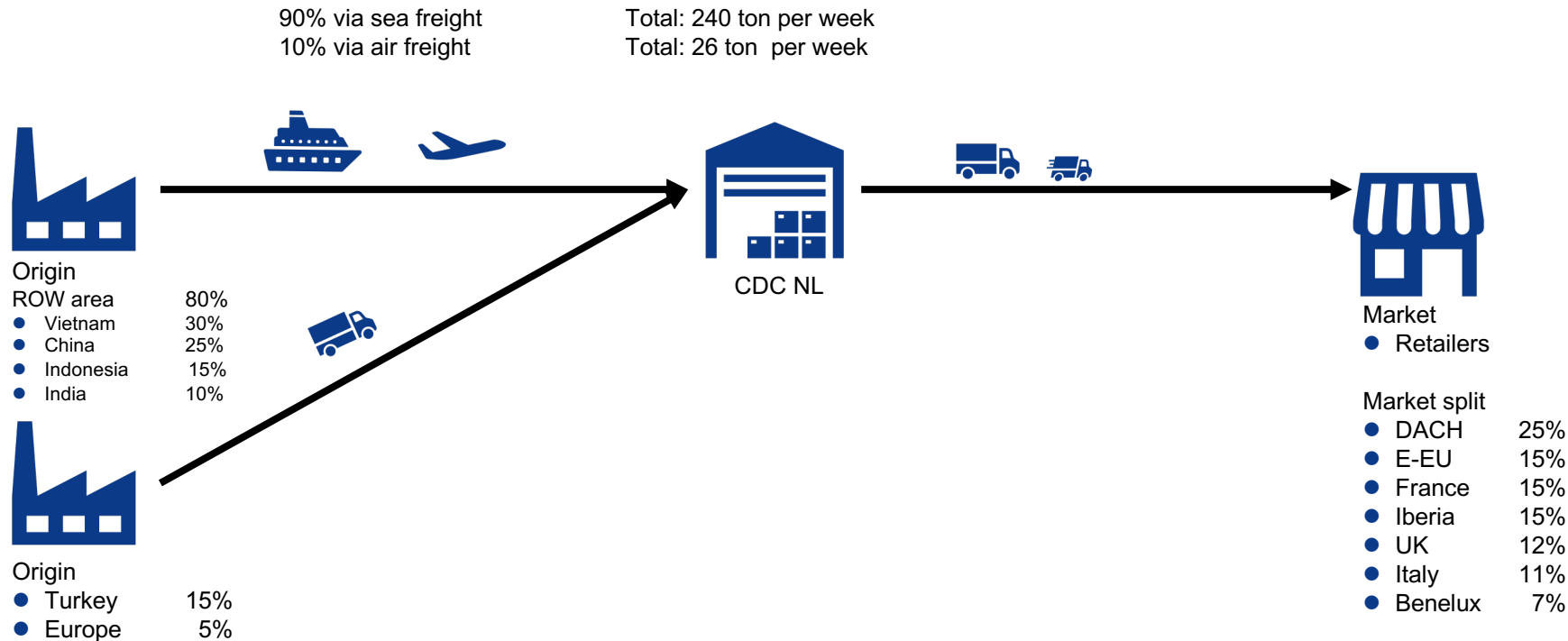


1 Footprint baseline	2 Calculate	3 Model results	4 Carbon strategy
Start by creating your footprint baseline 3C: 1 Carbon footprint 2 Costs 3 Customer	Calculate your baseline including carbon footprint	Determine the most sensitive carbon areas of your supply chain	Prioritize and create your carbon reduction agenda

What's the added value of measuring 3C?

- 1 Measuring of environmental impact
- 2 Competitive advantage
- 3 Identifying cost savings
- 4 Identifying service performance opportunities
- 5 Regulatory compliance

Start by creating your footprint baseline: a Fashion example



Volumes on a yearly basis
(indicative numbers)

- Total inbound volumes 1250 FCL 40ft. eq.
- Warehouse size m² 75K m²
- Number of outbound shipments 2.8 M
- Number of employees 375
- Average inventory value €3 M
- 20% safety stock

Calculate your baseline

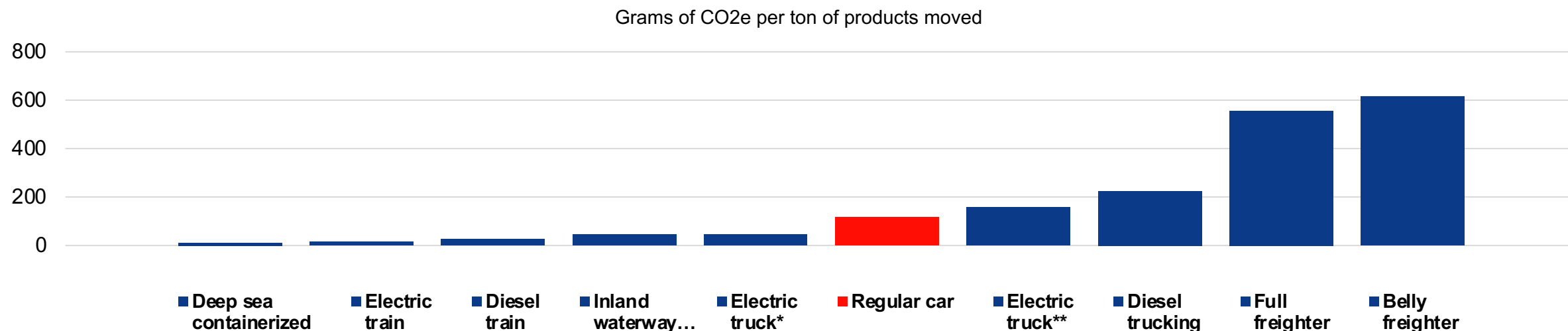
UID	Origin	Market	X-dock city	Volume share	Country share	Volume break-down	Inbound mode	Inbound		Warehousing CDC				Outbound					
								Inbound transport Costs	Carbon (ton)	Leadtime	Fixed WC labour costs	Variable blue collar labour costs	Space Costs-Fixed warehousing(m2)	Carbon(ton)	Costs (replen to X-Dock)	Carbon(ton)	Costs final mile	Carbon final mile (ton)	Leadtime
1	CN	DE	Kassel	19%	25%	0,48%	Air	€ 145.483,59	514	3	€ 4.901	€ 31.507	€ 27.734,38	12	€ 2.351,17	4	€ 46.550,00	19	1
2	CN	AT	Linz	3%	25%	0,08%	Air	€ 22.971,09	81	3	€ 774	€ 4.975	€ 12.438	2	€ 1.252,39	2	€ 6.300,00	2	2
3	CN	CH	Basel	3%	25%	0,08%	Air	€ 22.971,09	81	3	€ 774	€ 4.975	€ 12.438	2	€ 884,04	1	€ 6.300,00	2	2
4	CN	FR	Paris	18%	25%	0,45%	Air	€ 137.826,56	487	3	€ 4.843	€ 29.849	€ 19.406,25	11	€ 4.420,20	7	€ 47.250,00	39	2
5	CN	ES	Madrid	14%	25%	0,35%	Air	€ 107.198,4	379	3	€ 3.611	€ 23.216	€ 15.093,75	9	€ 12.032,75	19	€ 41.650,00	24	4
6	CN	PT	Lisbon	4%	25%	0,10%	Air	€ 10.728,13	37	3	€ 1.032	€ 6.633	€ 4.312,50	2	€ 4.321,97	7	€ 11.200,00	3	5
7	CN	GB	London	15%	25%	0,38%	Air	€ 11.835,47	406	3	€ 3.869	€ 24.874	€ 16.171,88	9	€ 3.683,50	6	€ 39.375,00	15	2
8	CN	IT	Milano	15%	25%	0,38%	Air	€ 114.855,47	406	3	€ 3.869	€ 24.874	€ 16.171,88	9	€ 5.156,89	8	€ 36.750,00	48	2
9	CN	BE	Brussels	5%	25%	0,11%	Air	€ 34.456,64	122	3	€ 1.161	€ 7.462	€ 4.851,56	3	€ 442,02	1	€ 8.662,50	2	1
10	CN	NL	Venlo	5%	25%	0,11%	Air	€ 34.456,64	122	3	€ 1.161	€ 7.462	€ 4.851,56	3	€ 11,05	0	€ 7.402,50	4	1
11	VN	DE	Kassel	19%	30%	0,57%	Air	€ 206.322,19	728	3	€ 5.881	€ 37.808	€ 24.581,25	14	€ 3.079,40	5	€ 55.860,00	23	1

Example from BCI modelling tool

In the model, you need to consider:

- Volumes coming in and out
- Different transport modalities
- Cost structures for different supply chain parts (transport versus warehousing)
- Lead-times for different supply chain parts
- The right emission CPIs (Carbon Performance Indicator)

Example CPIs for different modalities

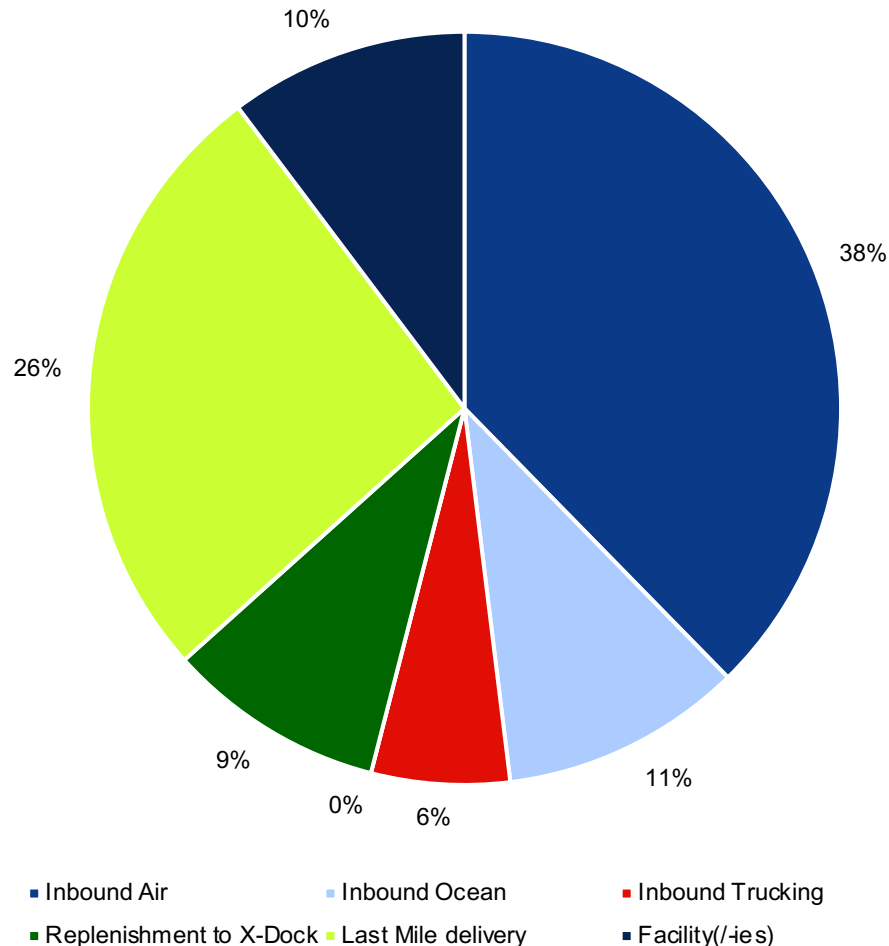


Modality	Remark	Type	Capacity	Example route	Used parameter (gr. CO2e / ton*km)
Air freight	Long distance (> 6.000 km)	Belly freight	60 ton	MFG USA -> CDC Venlo	572
	Long distance (> 6.000 km)	Full Freighter	111 ton	MFG China -> CDC Venlo	525



The results of your carbon modelling

Origin of carbon emission
(standard warehouse, economy service)



Areas of impact according the modelling exercise

- ~55% of emissions are **inbound airfreight & last mile** related

To keep in mind

- Only 10% of volumes (KGs) travel via air

Remarks

- A green warehouse is often considered ‘the solution’
- Even though it helps, it might not be the impact you’re looking for

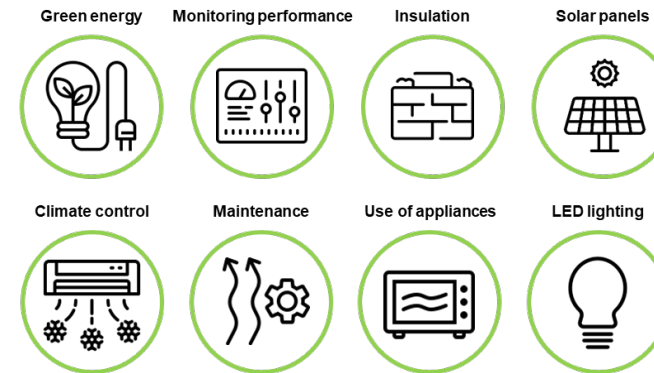
Conclusion

- Now you know the ballpark of your emissions
- Top impact: Air freight and final mile delivery

Create your carbon strategy

Inbound air freight and final mile distribution have been identified as largest fields of impact, followed by facilities

Level of measure	Example measures	Agenda
Strategic	<ol style="list-style-type: none"> 1 Redesign of SC network footprint (near-shoring) 2 Green (warehouse) facilities 	2024 Q1 2023 Q3
Tactical	<ol style="list-style-type: none"> 1 Modal shift (air-ocean) 2 Order and service policy aligning 	2023 Q2 Etc.
Operational office	<ol style="list-style-type: none"> 1 Consolidation of multiple orders 2 Harmonizing service levels / lead-times 	...
Operational 'in the field'	<ol style="list-style-type: none"> 1 Driving awareness and behaviour 	...



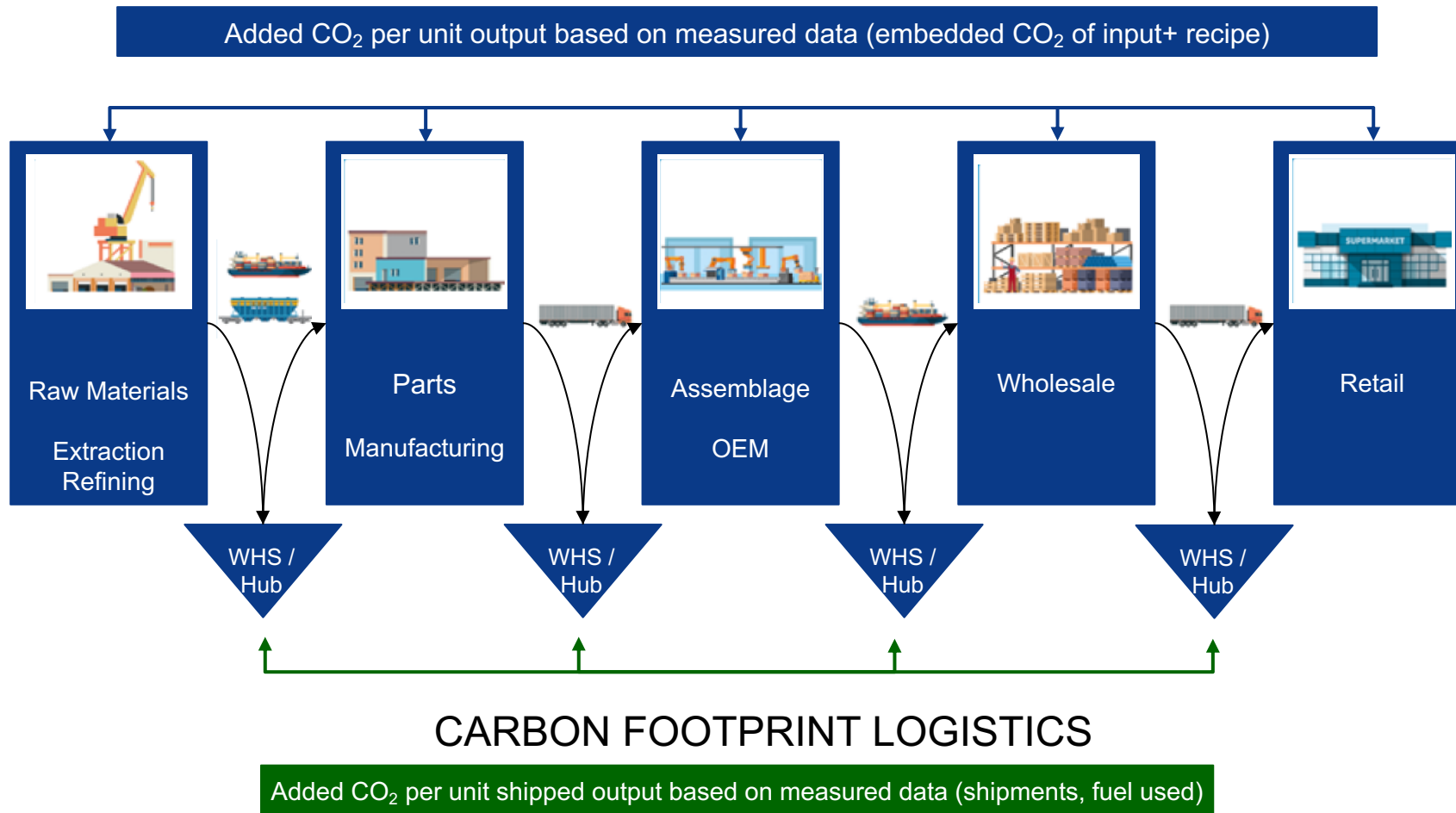
4 From emissions modelling to emissions accounting



Accounting, in the near future, will become the standard. How do you get there?

Move from	To
Generalized SC archetypes	The blueprint of your supply chain
Common warehouse locations	Your geo-locations
Averaged indicators for modalities	Your use of natural gas, diesel, and gasoline
Country-based emissions per m2	Your energy suppliers' invoices
Product-split assumptions	Your SKU 'recipe' (BOM)
Averages for carbon origin	In-depth analysis of your compounds
Emissions associated with plants	Emissions allocated to your SKUs, per period

Scope of emissions accounting



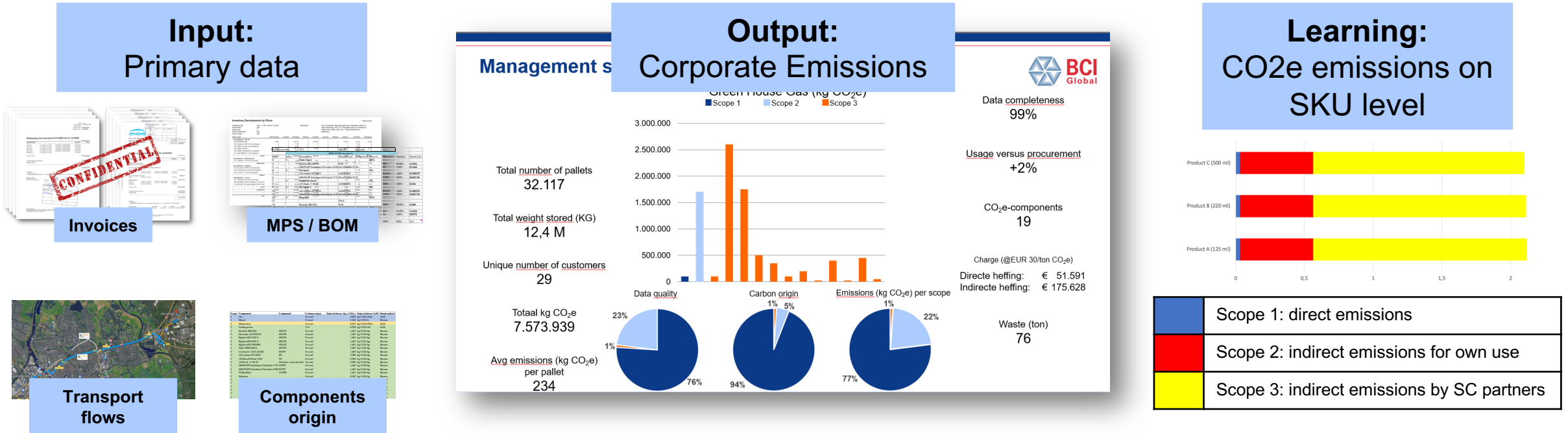
Calculating and allocating:

- Own emissions
- Upstream emissions
- Downstream emissions
- Emissions per product

Similar to the principles of VAT

Combined inputs for a corporate carbon footprint

- Main question: how to assign emissions to products to identify reduction opportunities?



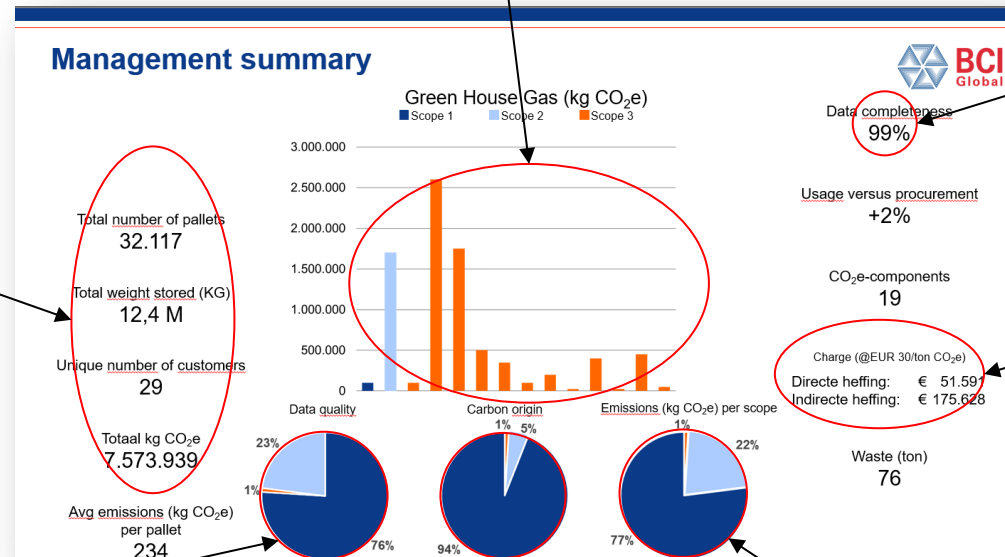
- Assigning of emissions to products is possible, **you have the majority on data already**
- Majority of emissions are scope 3 (indirect from partners (transport, supply))
- Partners are crucial in your Roadmap to Net Zero – you will need their data too

What can we learn?

Summary of totals:
Check with sales, manufacturing & procurement

Emissions assigned to all components – procured and produced

Data completeness: did you consider all relevant topics?



Data quality: helping your accountant with the reliability of your inputs

Carbon origin: majority fossil, renewable, or recycled?

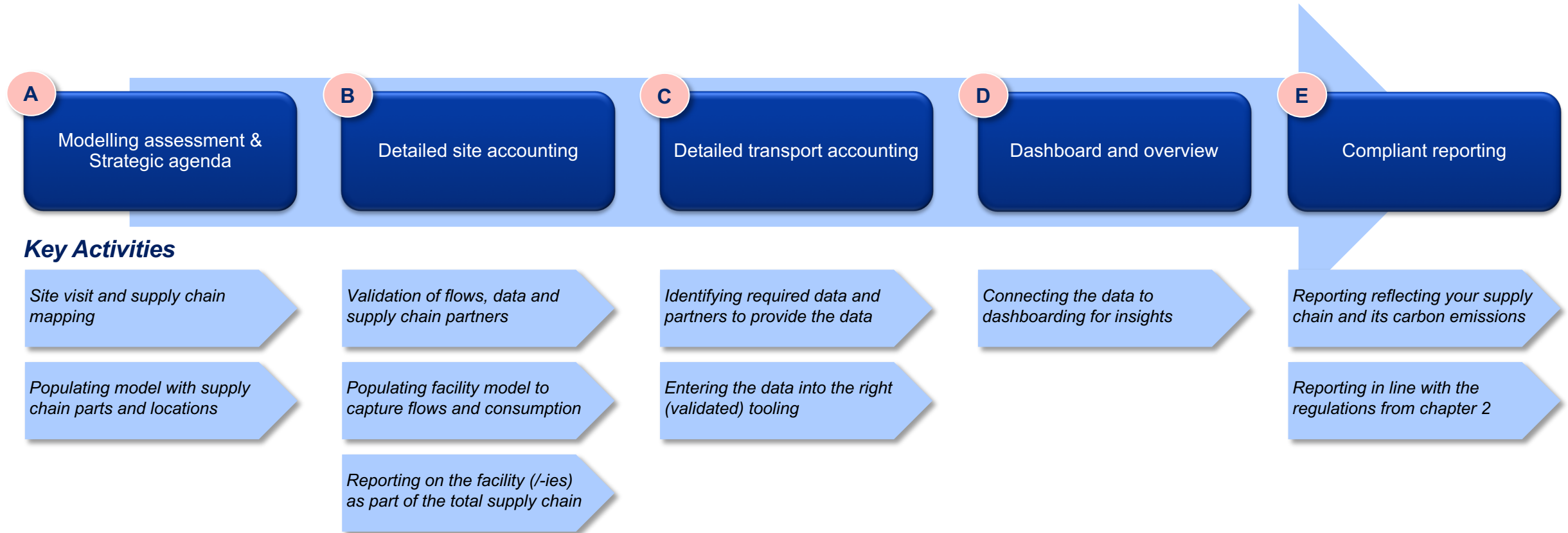
Emissions per scope: direct or indirect?

Costs of carbon: do we expect Carbon taxation? And by when?

5 Overall conclusions

- Modelling your supply chain helps in determining impact
- Your supply chain network design impacts not only costs and service levels but carbon footprint as well
- Part of the required data is available in-house
- Part of the required data needs to be provided by partners – this can be a challenge
- Real estate does not necessarily impact your carbon footprint on large scale
- New measuring methods help you to become aware and compliant
- Different supply chain parts require measures. Not all of them are transport or asset related

What's next? Towards Compliant Carbon Measuring



6 Contact details

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