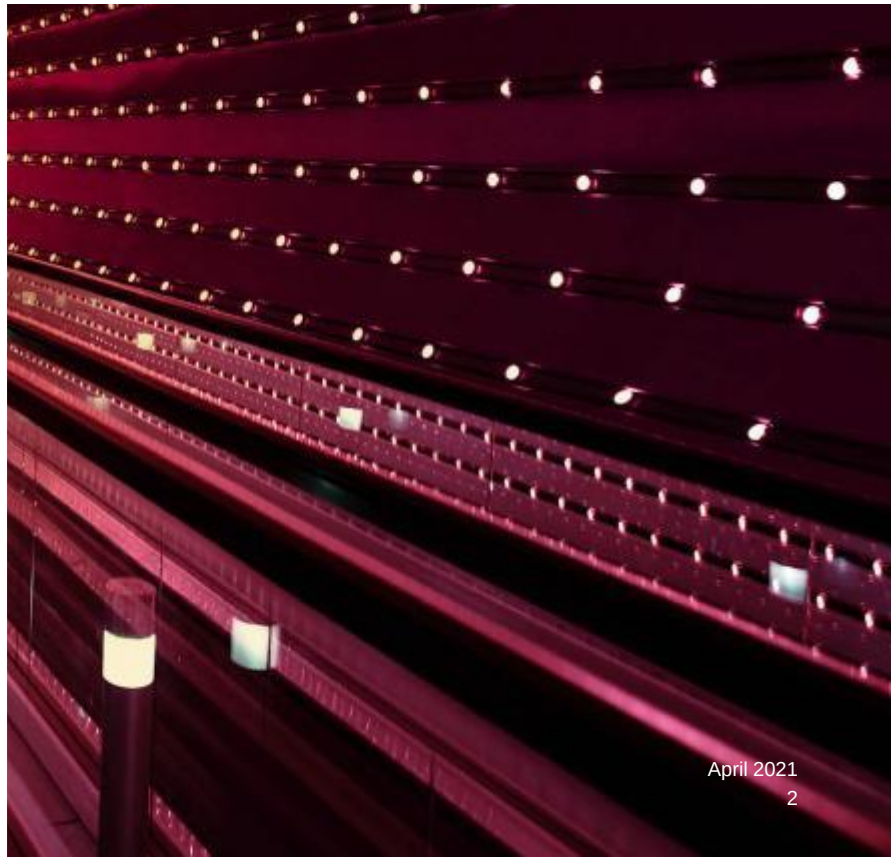
Vejen til bæredygtig acceleration

- datadreven og robust forsyningskæde i et globalt lys

April 2021

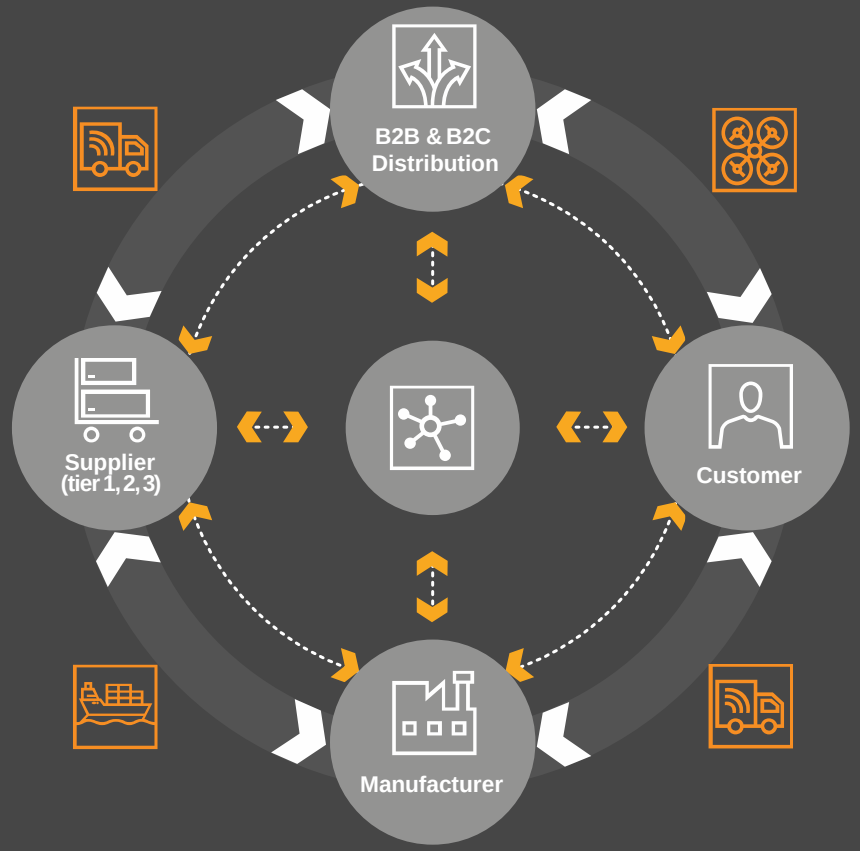
Connected and autonomous supply chain ecosystems 2025



pwc

Supply chain transparency is a catalyst for greater sustainability, enabled by digitalization

Supply chain transparency makes it possible for companies to track what is actually happening across the supply chain ecosystem



- **360° supply chain data network capturing supply chain data and their relationships end-to-end**
- **Near real-time track and trace including dynamic ETAs and proactive alerting**
- **End-to-end traceability and chain of custody of products**
- **End-to-end supply chain visibility (e.g. inventory, capacity, planning)**
- **Cost-to-serve visibility down to transactional level**
- **Smart and AI enabled control tower enabling end-to-end collaboration, optimisation and automated decisions**

Technology is a key enabler to gain supply chain transparency

72%

Technology is a key enabler, Digital Champions are way ahead in this race. 72% of Digital Champions have implemented technologies to gain transparency across their supply chain compared to only 13% of Digital Novices.

Technology choices

- When implementing supply chain transparency and control tower solutions, 87% of Digital Champions and 76% of all companies rely on **standard software solutions** – the highest share of standard solution usage across all supply chain technologies.

Q13. Are you developing the technologies in-house or do you rely on standard software?
Base: 1,601 companies

32%

Investing into supply chain transparency also sets the foundation to get a better handle on achieving a circular and sustainable supply chain – which is the top supply chain challenge for Digital Champions (32%) over the next 5 years.

Q22. What are the biggest challenges your supply chain faces in the next five years? (Select up to three) Base: 1,601 companies

Blockchain is spurring interest, but hasn't yet gained much traction

5%

of all companies and 27% of Digital Champions have already implemented Blockchain

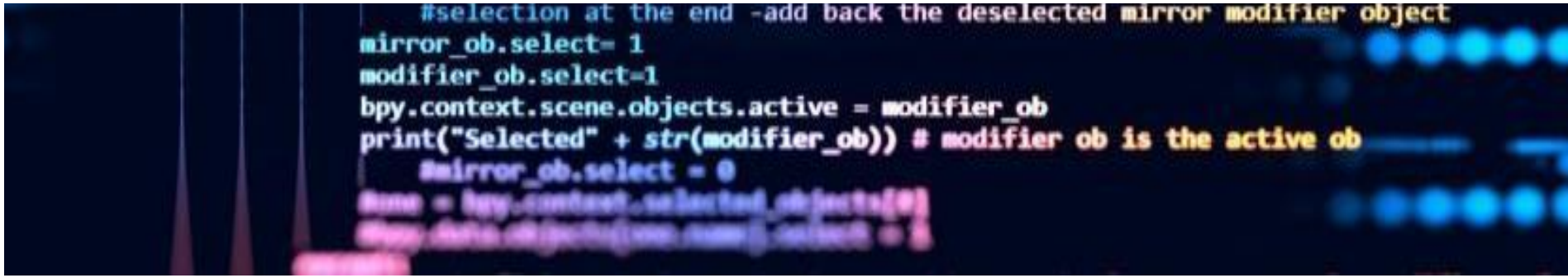
There's clear interest in exploring the possibilities, especially from Digital Champions

- 70% of Digital Champions have either already begun piloting blockchain solutions (37%) or are planning to do so within the next five years (33%)
- That compares with around half of companies overall (49%) who are piloting blockchain or expressed interest in doing so

There's still a great deal of uncertainty about the best way to pursue such initiatives though

- 64% of companies overall haven't yet decided whether to develop a solution in-house or purchase standard software, far more than for any of the other software-based supply chain technologies
- Our experience suggests that for many companies, there are also still challenges involved in developing a clear business case for blockchain.

Q13. Are you developing the technologies in-house or do you rely on standard software? Base: 1,601 companies



Joe Henderson

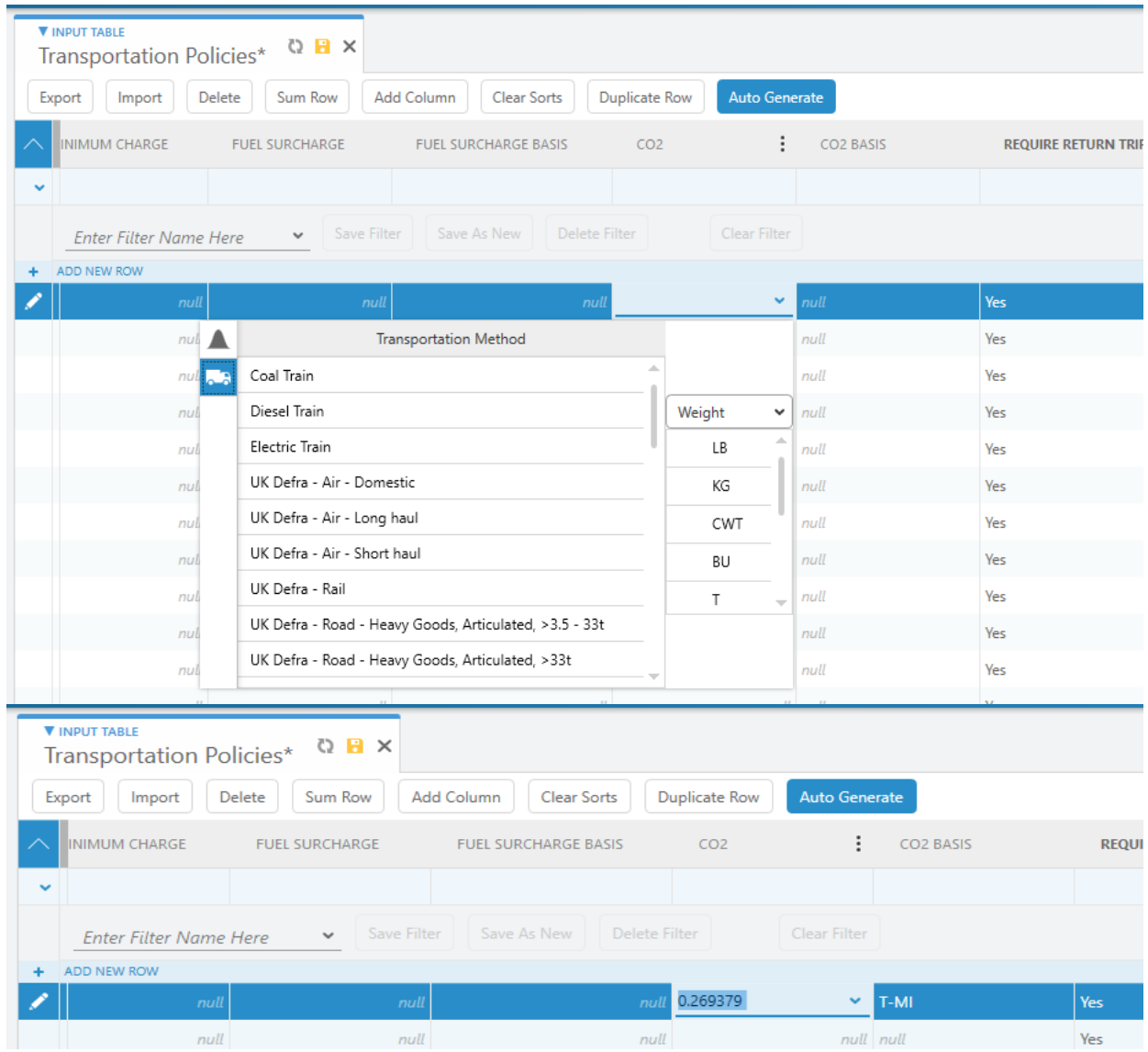
Principal, Value Solutions Consultant,
Coupa Software

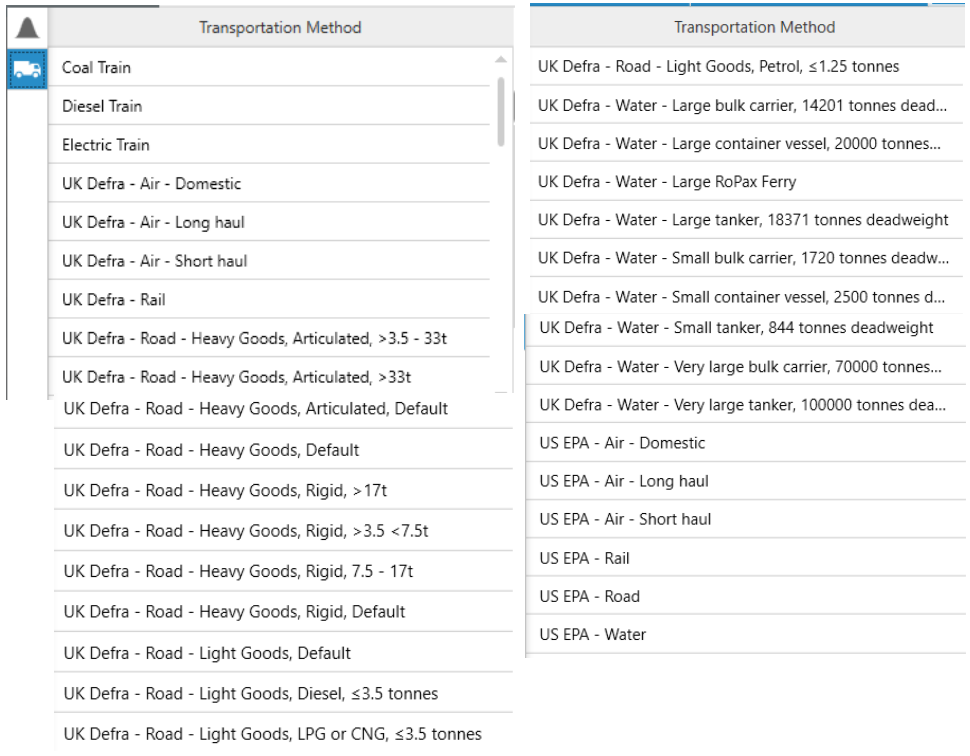
April 2021

Supply Chain Sustainability

Designing for Balanced Supply Chain Impacts

Integrated Standard Benchmark Emissions Values





CO2 fields have a button for adding a benchmark value which updates the quantity and basis fields automatically. US EPA and UK Defra data included in Supply Chain Modeler.

What Would You Analyze?

Can I estimate my vendor's **emissions**?

What is the impact of **vendors** being poor partners?

Are my customers **sensitive** to my activities? How much demand is at **risk**?

Are my distribution networks staying within **regulatory** emission limits?

What modes of transportation am I using?

Do I have good **benchmarks** for their footprint?

What **materials** are being used in the warehouse?

What **by-products** am I producing?

How am I disposing of **obsolete** inventory?

How much **waste** am I producing, and can it be **recycled**?

coupa

SUPPLY CHAIN MODELER
EMISSIONS MODELING

Driving Value for Sustainability, CSR & Supplier Inclusion

Environmental
Ecological, Resources, Circular

- Agriculture
- Air & Water Pollution
- Carbon/GHG Emissions
- Circular Economy
- Deforestation
- Food Security
- Hazardous Materials
- Land & Ocean
- Renewable Energy
- Waste/Sanitation

Social
Community, Health, Safety

- Child Labor
- Conflict Minerals
- Customer Privacy
- Data Security
- Diversity & Inclusion
- Employee Safety
- Human Rights
- Labor Practices
- Modern Slavery
- Safety

Governance
Economic, Business, Risk

- Business Ethics
- Climate Change Risk
- Collaboration
- Critical Incident Risk
- Ethics & Governance
- Legal/Regulatory
- Product Quality & Safety
- Recycled & Renewables
- Sourcing
- Suppliers

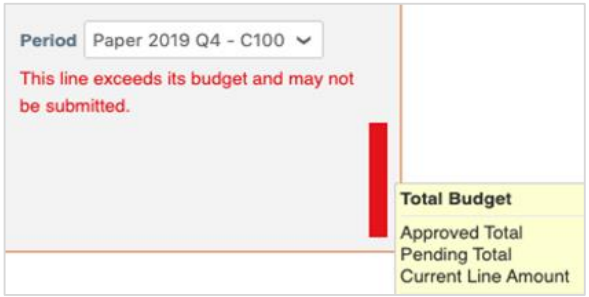
- ✓ Are we buying, **consuming** and **disposing responsibly**?
- ✓ Is my supply chain **environmentally** sound?
- ✓ Are my employees, policies and suppliers **socially** responsible?
- ✓ Are my suppliers and their suppliers **diverse**?
- ✓ Are we spending wisely with proper **governance**?
- ✓ Are we minimizing our supply chain **risk**?

Supply Chain Design and Plan → **Source Contract Evaluate Risk** → **Buy Invoice Expense Pay** → **Enable Suppliers** → **Visibility and Insights**

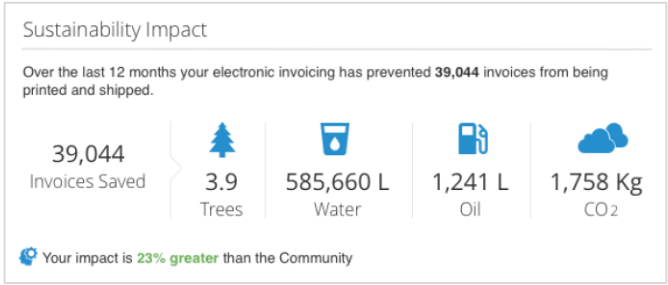
Sustainable Supply Chains

Sustainable Sourcing & Procurement

Governance & Controls



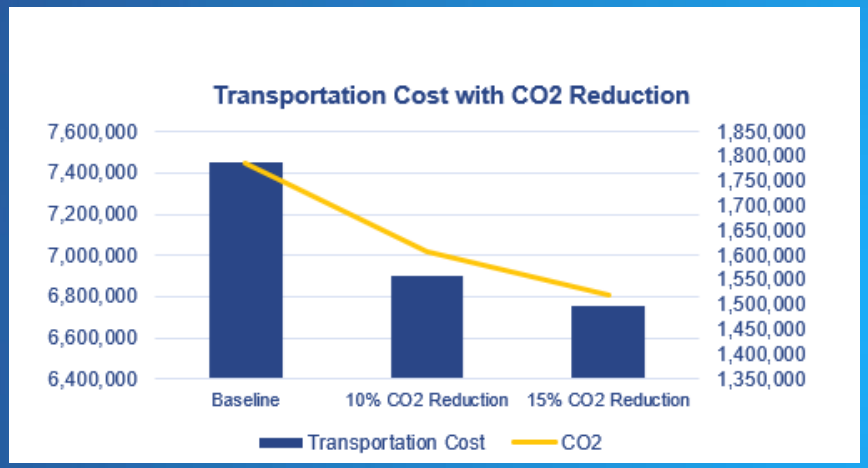
Broad Visibility



Large Industrial Manufacturer

Reduced carbon footprint by 95MT using end-to-end supply chain modeling

Detailed Road Route Carbon Analysis



Challenges

- Reduce carbon emissions in end-to-end supply chain while meeting customer demands
- Develop reductions scenarios to take into consideration the high cost of investing in new equipment with lower emissions

Solutions

- Leveraged CO2 modeling with transportation factors and production emissions per unit
- Prioritized largest opportunities with end-to-end model
- Balanced production lines to meet sustainability goals and demand

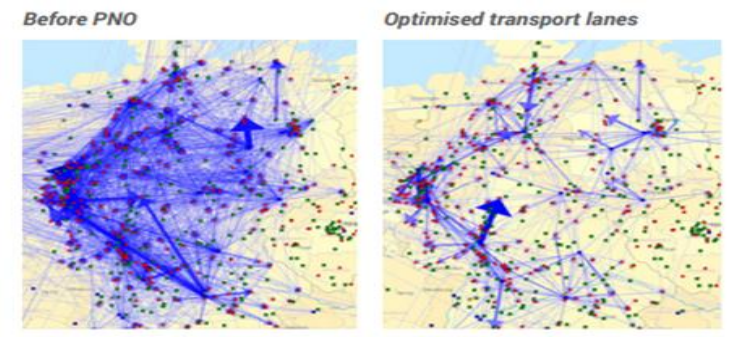
Results

- Reduced 25 MT CO2e in operations
- Avoided 70 MT CO2e for customers utilizing lower emission gas
- Met goal of 50% of revenue from GHG reduction product

coupa

Respected brand delivers world-class continuous sustainability improvement

CHEP
A Brambles Company



We have an inherently sustainable business model, but that's not enough. What can we do beyond that? In our reports, we had focused on miles reduced, but **now we actually report on CO2 reduction."**

-Jonathan Brooks, Senior Director, Global Supply Chain Optimization and Design

Challenges

CHEP made a commitment to the market in 2007 to address the impact of their business from the replacement of the raw materials to the transportation needed to move their service into and out of their customer's supply chains.

Solutions

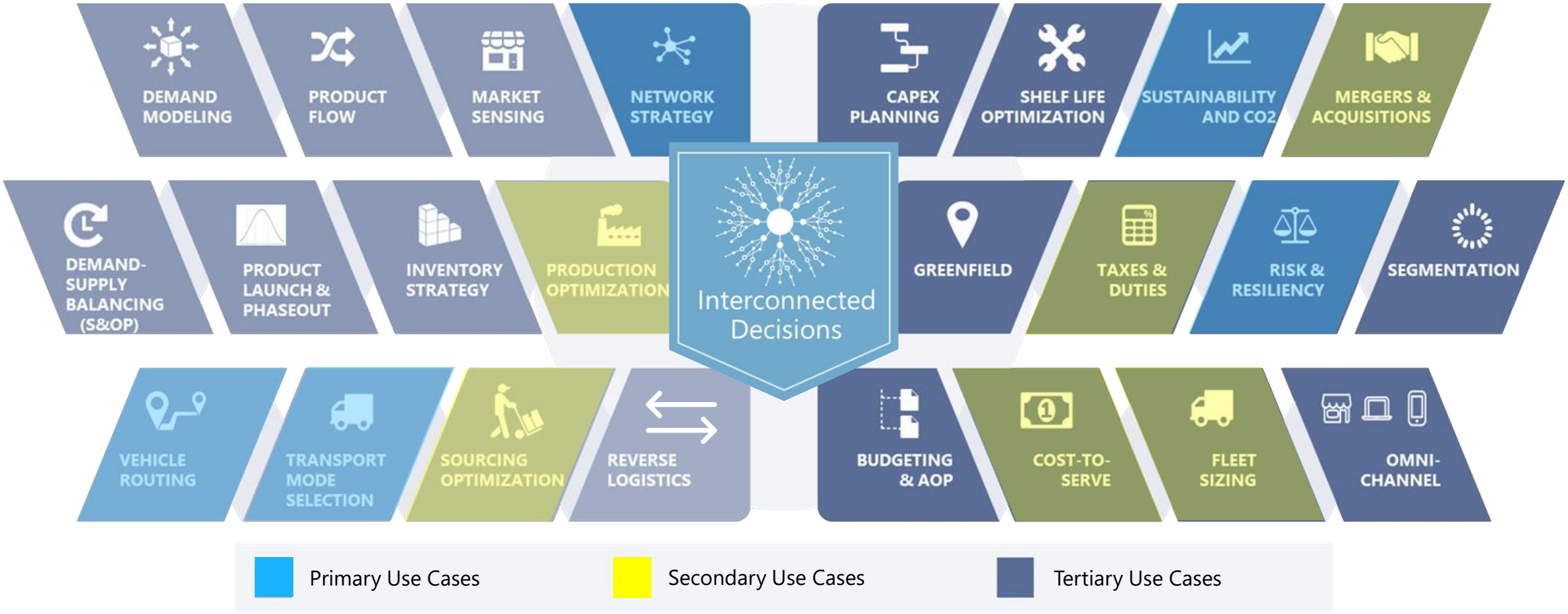
- Transportation modeling in Europe internally and as a service
- Container Modeling for CO2 emissions on ships vs road transport
- CO2 analysis on London plant

Results

- 33% reduction in CO2 per delivered unit
- 2.0mm tons of CO2 removed from customer's supply chains
- 75.8m km's reduce through collaboration

coupa

Environmental concerns can influence any solution



Sustainable Supply Chains

- All supply chains can be analyzed - and optimized - through a **sustainability lens**
  - Efficiency improvements reduce footprint and waste
  - Identify supply chain risk and build resilience
  - Support strategic growth and brand-building
- **Coupa products can already do this!**
  - ✔ Carbon footprint modeling + trade-offs
  - ✔ Fleet Electrification and routing
  - ✔ Returns, Repairs, and Recycling
- **Facilitate connections** between different parts of customer's organizations

Morten Storgaard

Global Project Lead, Corporate Environmental Strategy,
Novo Nordisk

April 2021

Reducing carbon emissions from our supply chain

Morten Storgaard

Global Project Lead

Zero impact
is our ambition

circular FOR zero

7 projects with targets toward 2030

1 Reduce supplier footprint

All Novo Nordisk supply based on 100% renewable power

2 Ensure circular procurement

3 Get operations to zero CO_2

Zero CO_2 from own operations and transport

4 Eliminate waste of energy, water and materials

5 Support affiliates going green

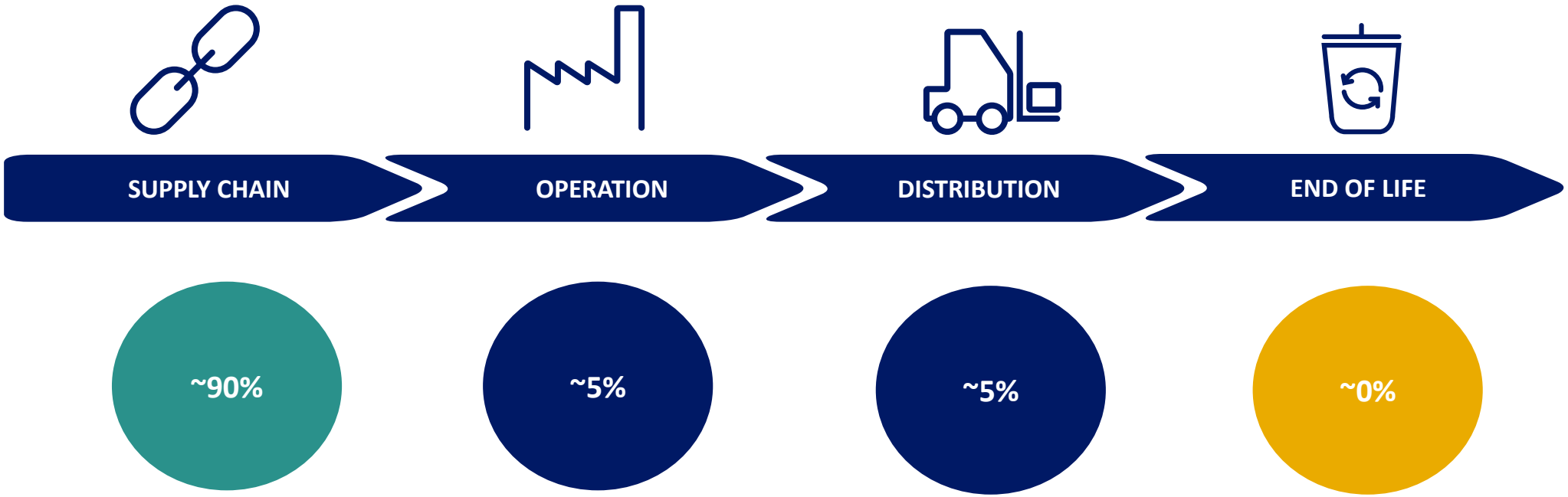
6 Design products for circularity

7 Solve end-of-life product challenge

Focus today

circular FOR zero

90% of our total CO_2 footprint comes from the supply chain



24

Reaching circular supply through supplier engagement

Our learnings

1

Organizational embedding

Anchor process with individual procurement units

2

Utilize your leverage

Leverage varies, utilize it where you can

3

Keep it simple

Commitments for renewable power is a good place to start


Thank you

Edward Brent

Manager, PwC UK

April 2021

Measuring Scope 3 missions in your Upstream Supply Chain

Edward Brent
PwC UK

Measuring sustainability footprints in your upstream supply chain – the case of carbon emissions

- Reducing upstream sustainability footprints in general - and carbon emissions in supplier networks in particular - has proved to be a massive challenge for many companies.
- To make things worse, external spend accounts for appr. 50-70% of most companies total costs and reductions of carbon emissions potentially affect 7 UN SDG out of a total of 17 UN SDG.
- Enabling a data driven and structured solution to this issue as part of a general category management framework remains top of the CPO/CSCO agenda

PwC has developed a tool for estimating Scope 3 footprints in your upstream supply chain

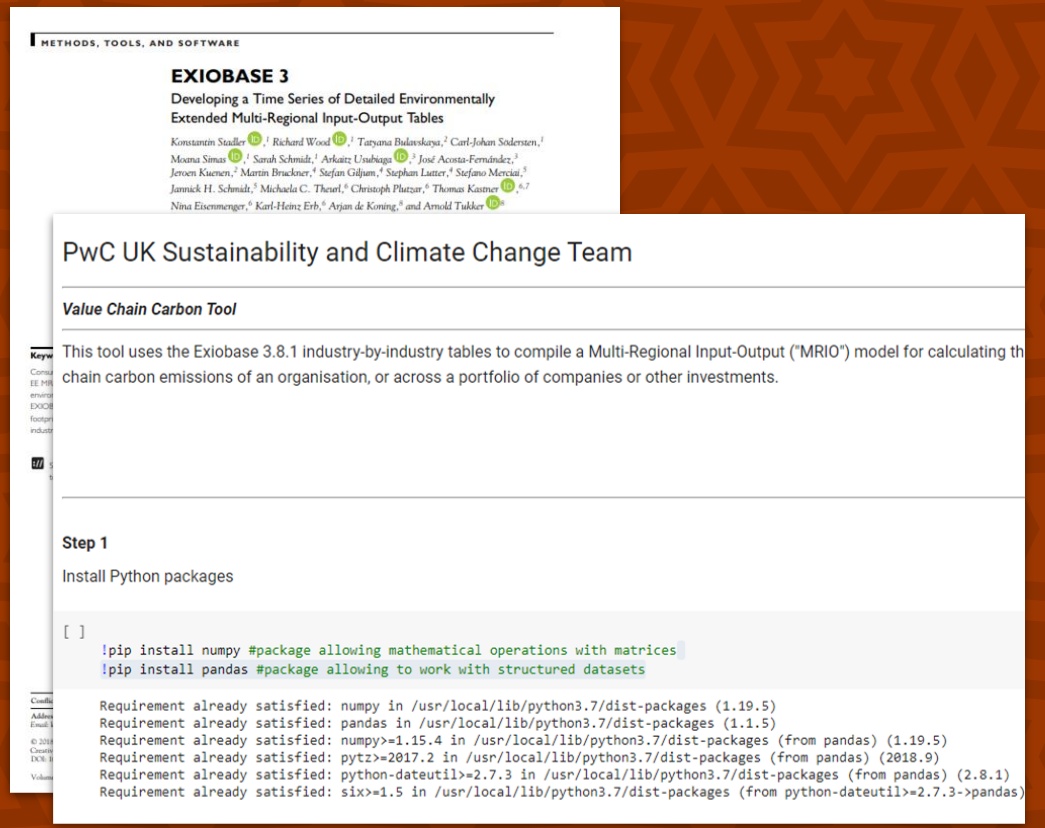
- For many of our clients, there is still some way to go to achieve end-to-end traceability and visibility of emissions data in their supply chain, including supplier networks.

- However, they are aware that the most significant contribution to their overall footprint is from their supply chain and they want to have a handle on their supply chain impacts.

- In response, we have developed a tool to provide a first estimate of a complete Supply Chain Scope 3 footprint, beyond direct vendors, that is...
    i. Built using cutting edge techniques and datasets,
    ii. Powered by readily available business data,
    iii. Ready to use for hotspotting the most material sources of emissions in your supply chain and supplier network and planning targeted traceability/decarbonisation activities within a specific supply chain or procurement setting.

Built using cutting edge techniques and datasets

- Our supply chain Scope 3 tool uses the Exiobase 3.8.1 industry-by-industry tables to compile an Environmentally Extended, Multi-Regional Input-Output ("MRIO") model for calculating the upstream carbon emissions of an organisation.
- The calculation approach is aligned with the GHG protocol and produces a results file with emissions mapped to the Scope 3 (and Scope 2) categories.
- The tool is written in Python for high performance with big datasets, detailed enough to provide insight across your procurement categories or even suppliers.



Powered by readily available business data

How the tool can be applied

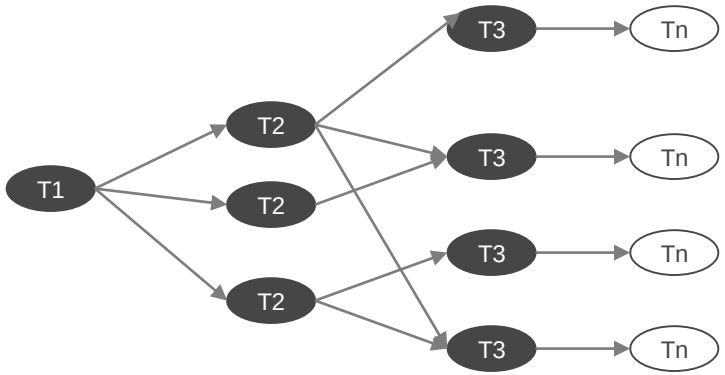
- The tool takes your procurement spend as an input.
- We would typically work with spend data extracted from your ERP system in a form that reflects the use case / decision need for the analysis.
- For example, the spend data could be divided up by procurement category, or individual suppliers, with a record of supplier countries and sectors.

Procurement Category	Supplier Country	Supplier Sector	Spend (2020 EUR)
e.g. Construction	*e.g. UK*	*e.g. Professional services*	XXXX
e.g. Construction	*e.g. UK*	*e.g. Manufacture of machinery and equipment*	XXXX
e.g. Construction	*e.g. UK*	*e.g. Manufacture of construction materials*	XXXX
e.g. Construction	*e.g. UK*	*e.g. Production of electricity by gas*	XXXX

Powered by readily available business data

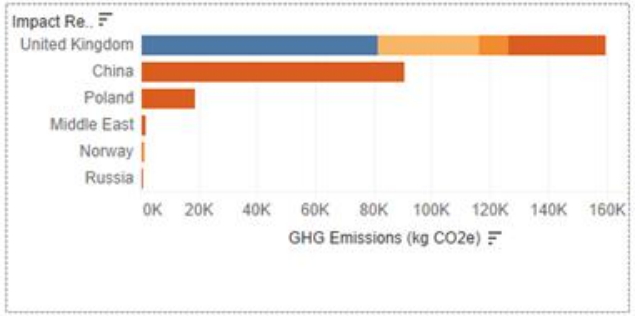
How the tool can be applied

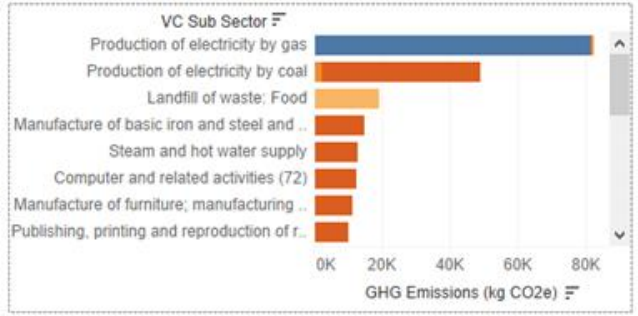
- In the language of EE-MRIO, your procurement spend provides a description of the structure of the first tier of your supply chain (your direct vendors).
- The Exiobase database is used to estimate the flow of money beyond your tier one suppliers, examining trade linkages to sectors globally.
- Data on the average GHG emission intensities of these sectors are used to estimate and attribute emissions within your supply chain, contributing to your Scope 3 footprint.

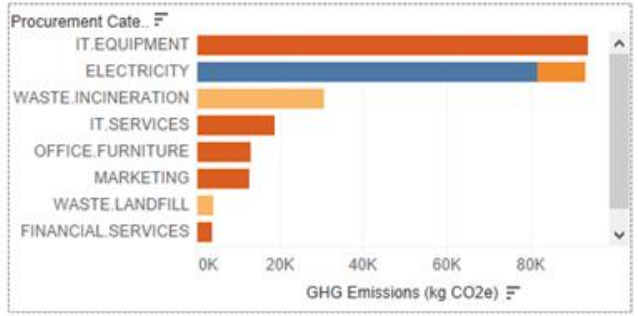


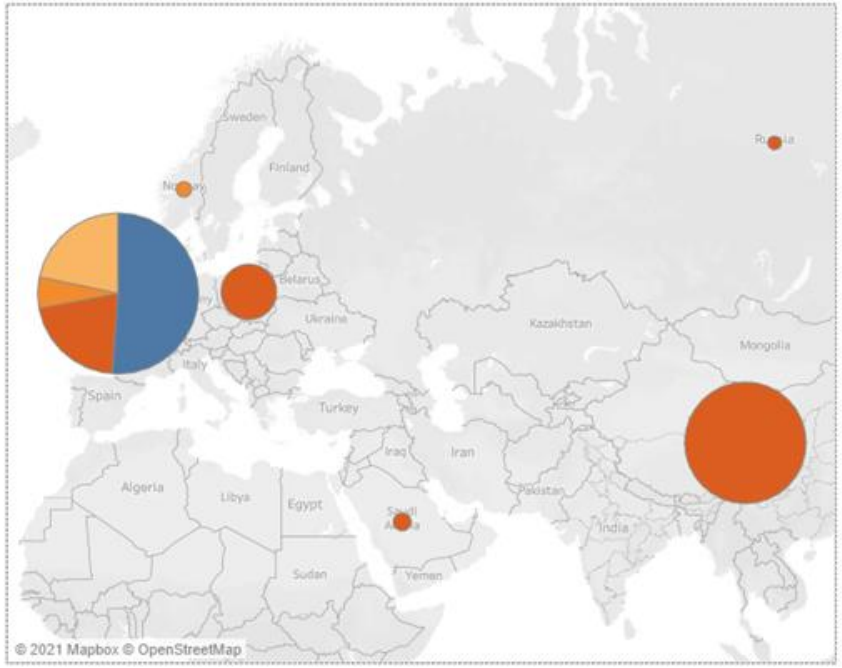
The results help to hotspot the most material sources of emissions in your supply chain

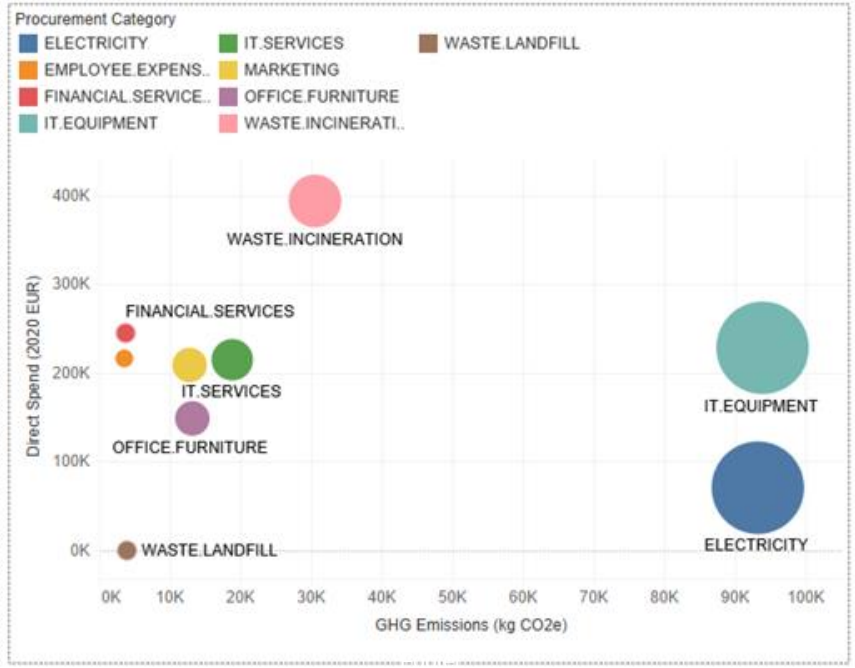
GHG Scope: (All) | VC Sub Sector: (All) | Procurement Category: (All) | Impact Region: (All)







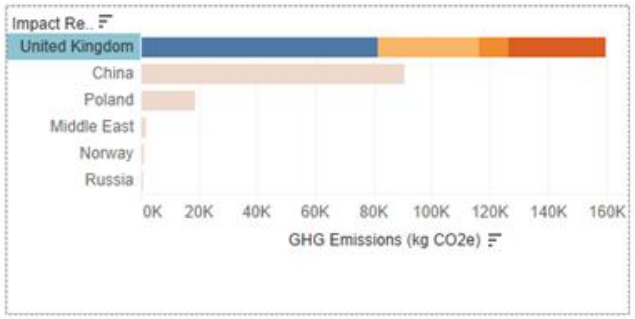


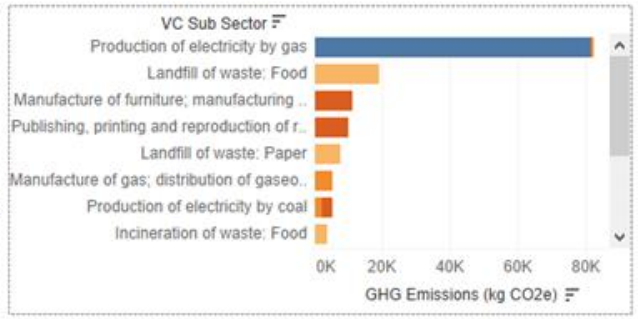


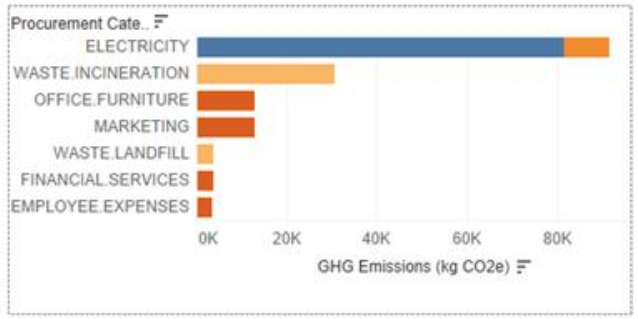
Procurement Category	GHG Scope	Impact Region	Activity Generated (2020 EUR)	Direct Spend (2020 EUR)	GHG Emissions (kg CO2e)
IT.EQUIPM..	Scope 3 - Cat. 1	China	283,523	228,184	90,707
		Middle East	1,235	0	1,979
		Russia	506	0	1,136
ELECTRICI..	Scope 2	United Kingdom	70,698	70,698	81,640
	Scope 3 - Cat. 3	Norway	7,246	0	1,476
		United Kingdom	18,488	0	10,039
WASTE.INC..	Scope 3 - Cat. 5	United Kingdom	406,452	393,820	30,631
IT.SERVICES	Scope 3 - Cat. 1	Poland	235,303	214,966	18,945
OFFICE.FU..	Scope 3 - Cat. 1	United Kingdom	148,580	148,312	13,127
MARKETING	Scope 3 - Cat. 1	United Kingdom	211,023	209,432	12,852
WASTE.LA..	Scope 3 - Cat. 5	United Kingdom	1,712	0	3,986
FINANCIAL..	Scope 3 - Cat. 1	United Kingdom	246,269	244,142	3,782
EMPLOYEE..	Scope 3 - Cat. 1	United Kingdom	215,735	215,735	3,514

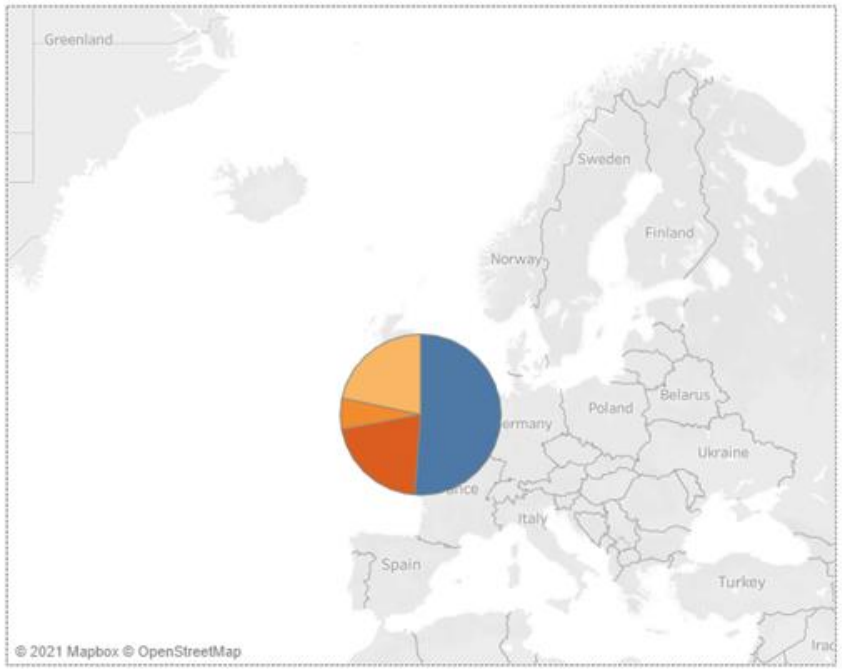
So you can explore key drivers… by region… *[e.g. Scope 2 electricity generation in the UK]*

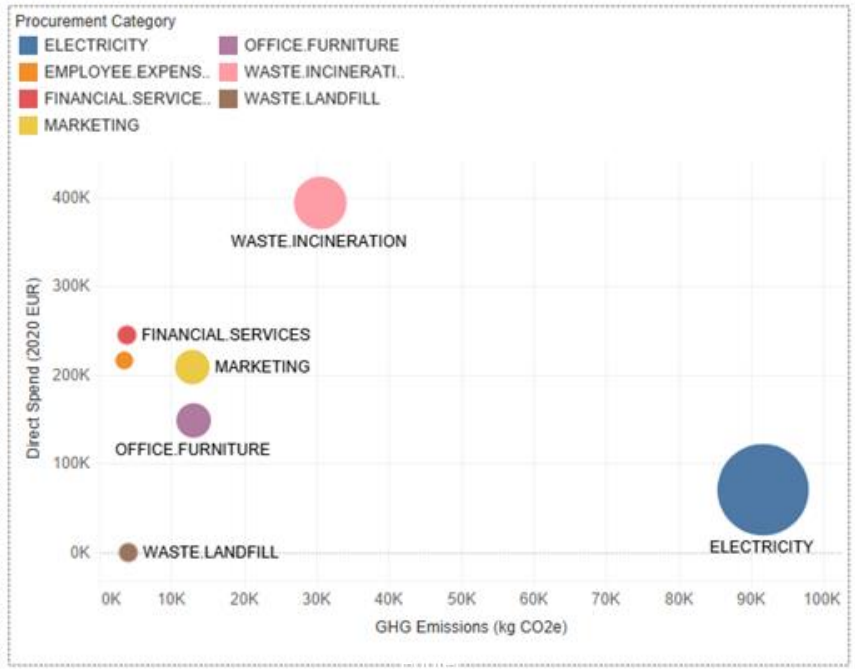
GHG Scope (All) | VC Sub Sector (All) | Procurement Category (All) | Impact Region (All)









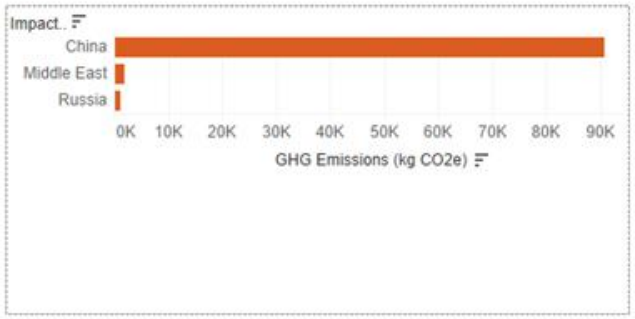


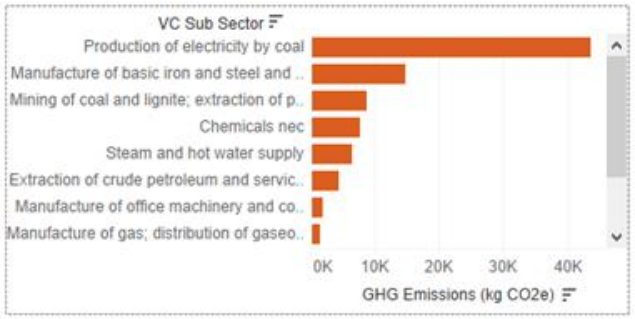
Procurement Category	GHG Scope	Impact Region	Activity Generated (2020 EUR)	Direct Spend (2020 EUR)	GHG Emissions (kg CO2e)
ELECTRICI..	Scope 2	United Kingdom	70,698	70,698	81,640
	Scope 3 - Cat. 3	United Kingdom	18,488	0	10,039
WASTE.INC..	Scope 3 - Cat. 5	United Kingdom	406,452	393,820	30,631
OFFICE.FU..	Scope 3 - Cat. 1	United Kingdom	148,580	148,312	13,127
MARKETING	Scope 3 - Cat. 1	United Kingdom	211,023	209,432	12,852
WASTE.LA..	Scope 3 - Cat. 5	United Kingdom	1,712	0	3,986
FINANCIAL..	Scope 3 - Cat. 1	United Kingdom	246,269	244,142	3,782
EMPLOYEE..	Scope 3 - Cat. 1	United Kingdom	215,735	215,735	3,514

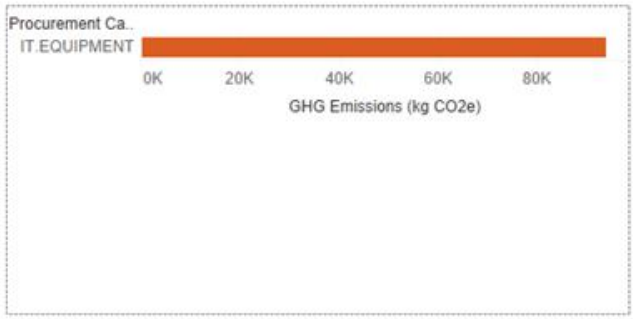
Dashboard

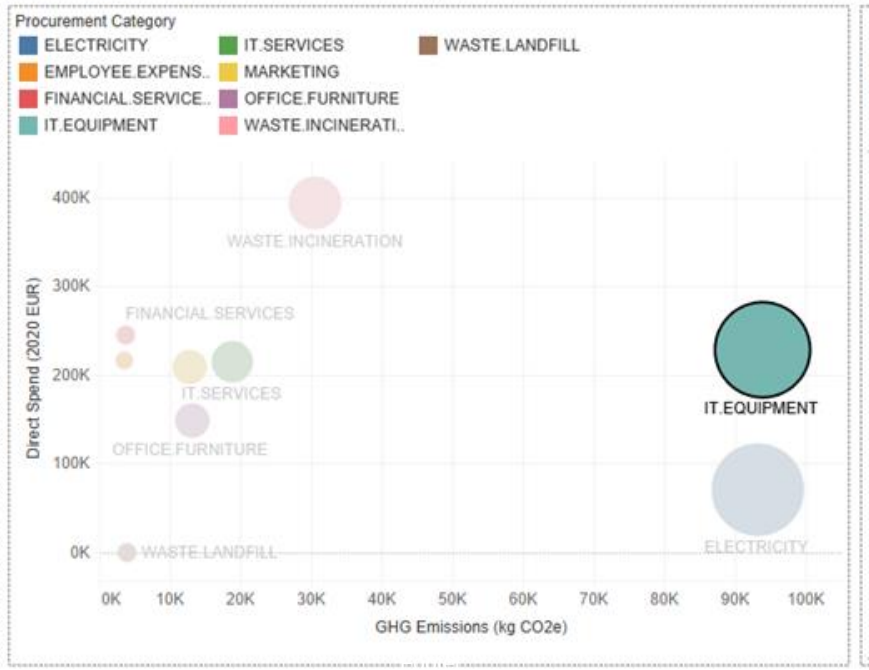
… and by procurement category… *[e.g. IT Equipment category emissions driven by energy use in China]*

GHG Scope: (All) | VC Sub Sector: (All) | Procurement Category: (All) | Impact Region: (All)









Procurement Category	GHG Scope	Impact Region	Activity Generated (2020 EUR)	Direct Spend (2020 EUR)	GHG Emissions (kg CO2e)
IT.EQUIPM..	Scope 3 - Cat. 1	China	283,523	228,184	90,707
		Middle East	1,235	0	1,979
		Russia	506	0	1,136

Dashboard

Future developments for our tool...

- Seamless integration with reporting of emissions sources / categories where there is already visibility.
- Direct links to third party datasets with vendor reported emissions.
- Coverage of the entire value chain including estimated downstream emission categories.
- Expansion in coverage of impact areas beyond GHGs with capacity for impact valuation to assess societal costs.

These developments mitigate the disadvantages of using static sector average emissions data, allowing you to substitute modelled data for actuals in the results set.

As you build visibility in your supply chain the results resemble reality more and more closely.

Husen Kapasi

Manager, PwC DE

Europe Blockchain Lead

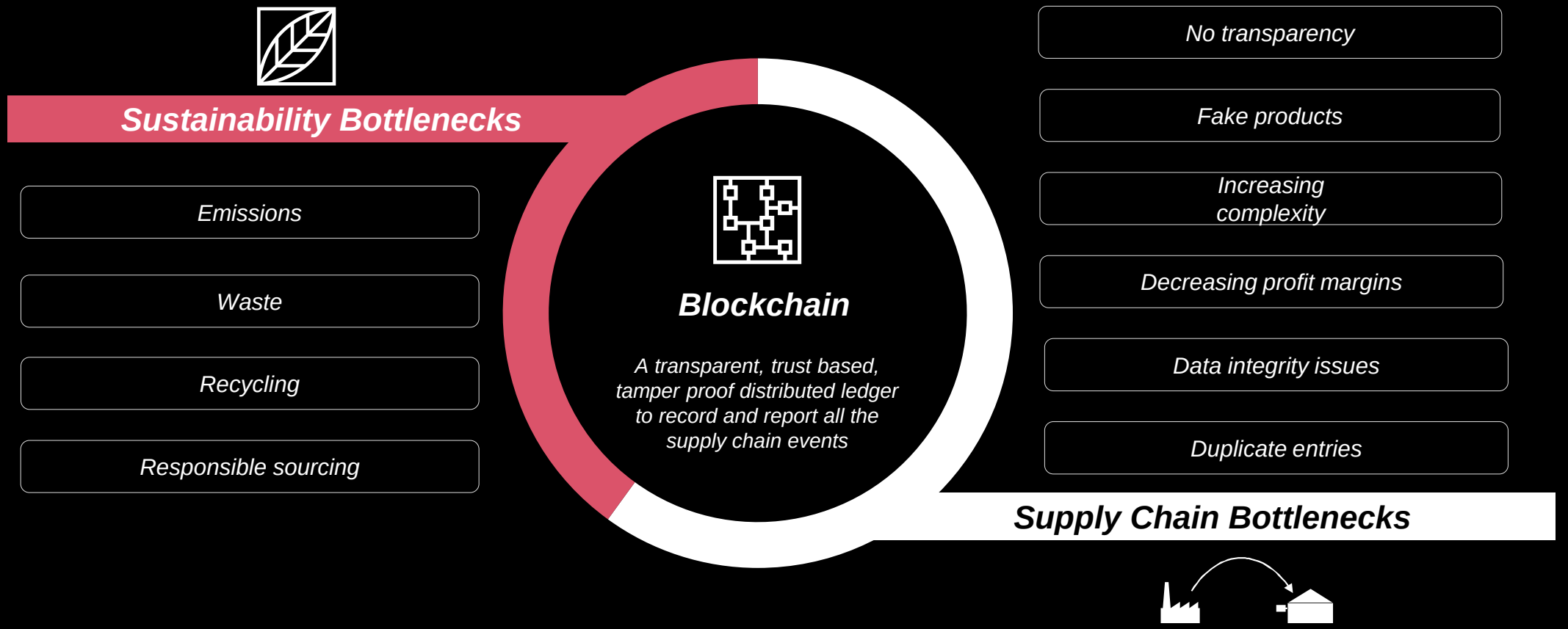
April 2021

Blockchain for Sustainability

April 2021

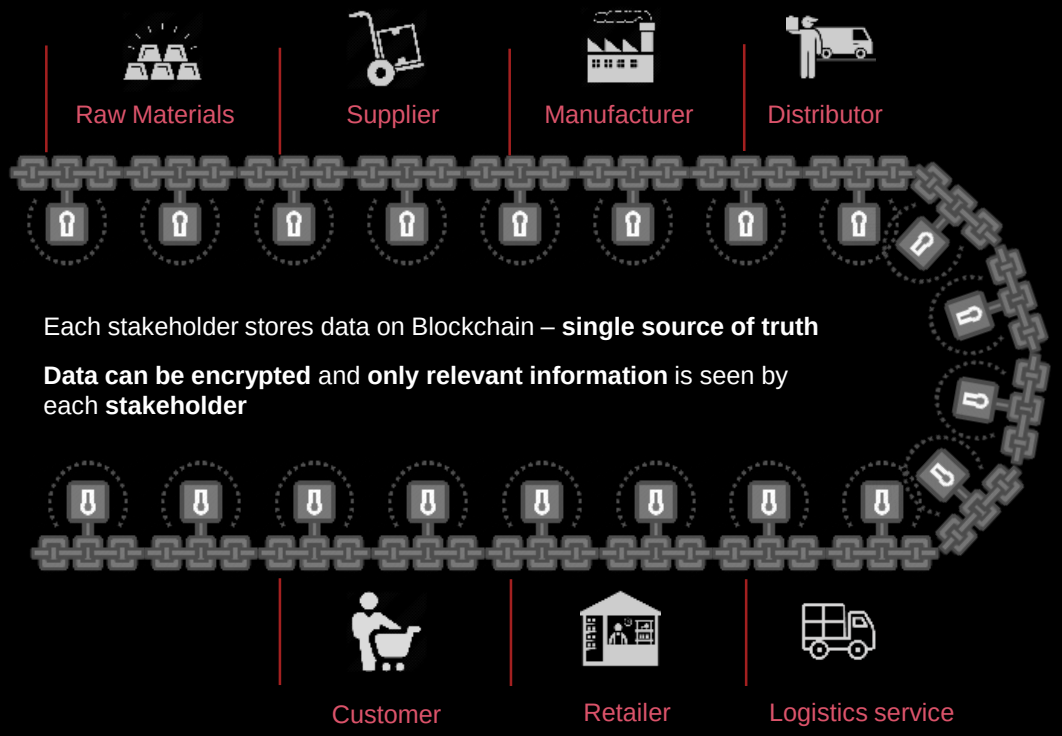
Husen Kapasi
PwC Europe Blockchain Lead

Blockchain with its core characteristics addresses some of the key challenges of sustainability as well as of supply chain



Blockchain provides single source of truth for E2E value chain and hence a game changer for waste and emission tracking

First hand information across the supply chain



Major benefits of Blockchain in supply chain

- Transparency & Provenance
- Reduction of costs & complexity
- Security & Immutability
- Automation of commercial processes
- Reduction of fraud
- Error free processes
- Trust
- Accelerate flow of goods

Blockchain use cases for Sustainability

Circular Economy

Circular economy entails **reducing materials** and **waste**, **reusing products** and **recycling materials** with a end goal of reduced usage of **natural resources, plastic** etc.

Circular economy can be targeted across the E2E **life cycle** of a **products / services i.e.** sourcing, production, product life cycle, recycling

Exemplary blockchain based circular economy use cases are

Blockchain based
- Battery sourcing
- Plastic production & recycling
- Food items or retail products provenance
- Paperless trade (digital document flow)

Reducing Carbon Footprint

Reducing carbon footprint focuses on how companies can redesign their manufacturing, supply chain and logistics processes

It focuses on reducing **energy waste, reduce carbon emissions** (via avoiding unnecessary transport), **use of renewable energy** for supply chain operations

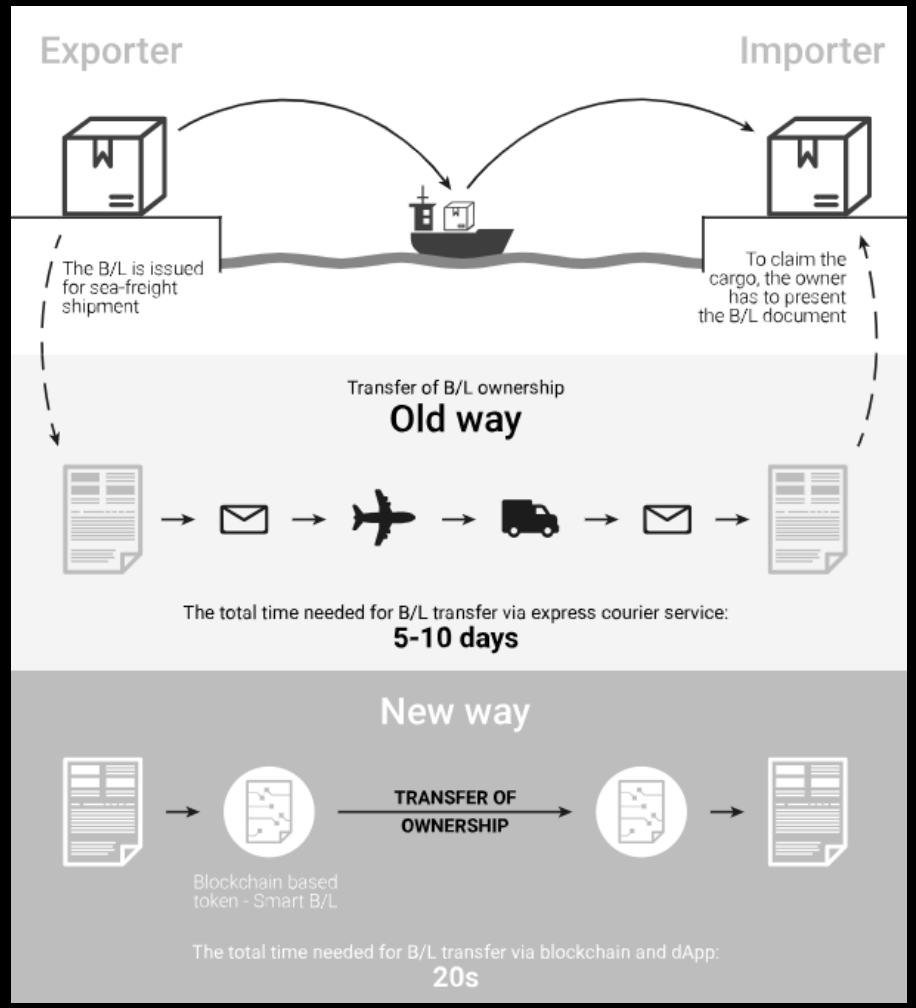
Exemplary blockchain based supply chain carbon footprint use cases are

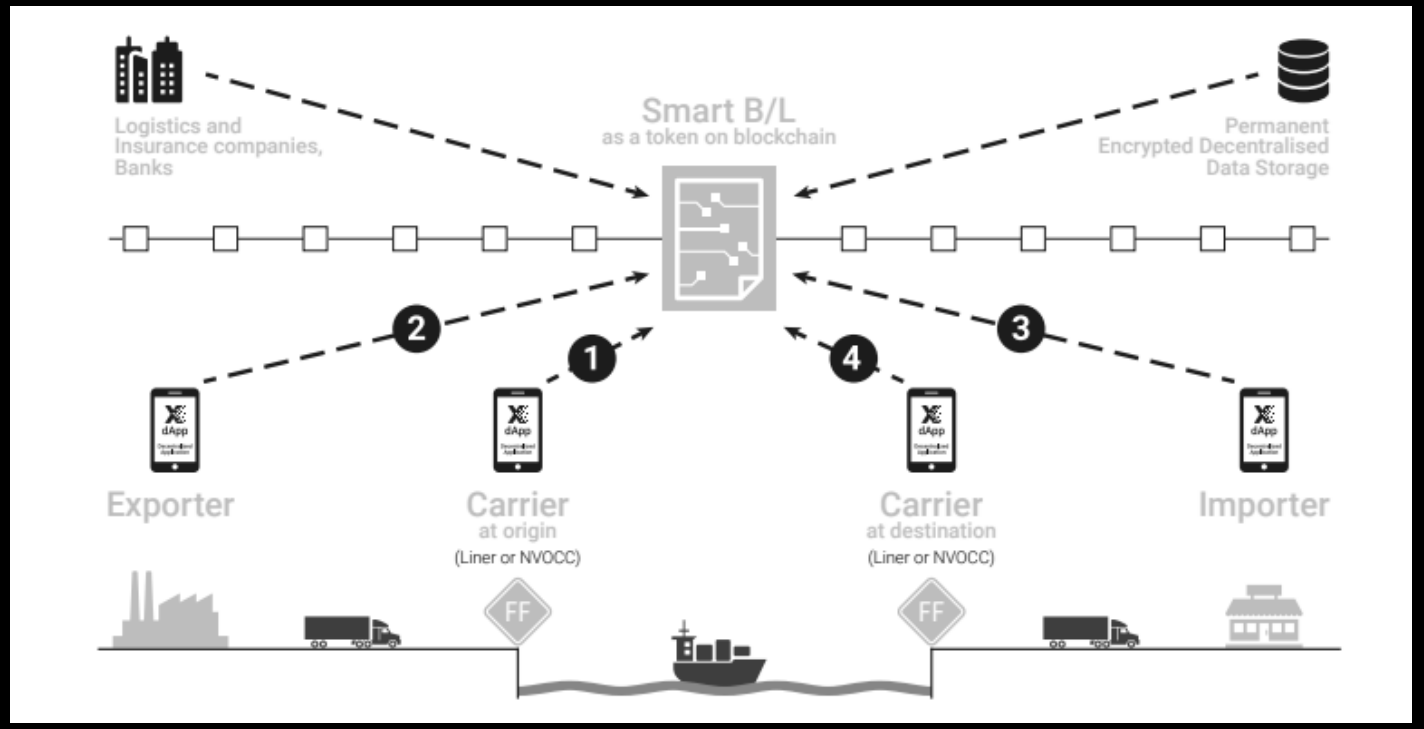
Blockchain based
- Carbon credit trading platform
- Digital emission /GHG/compliance certificate
- Water rights trading
- Green energy certificate

Blockchain technology connects value chain partners end-to-end and offers valuable market insights for plastic recycling

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Value Chain	Oil & Gas	Chemicals	Converters	Brand Owners	Retailers	Consumers	Recyclers
Physical Object	Feedstock	Plastic	Plastic Packaging	Packaged Goods	Packaged Goods	Plastic Waste	Recycled Plastics
Digital Object							
Block-chain	1	1 2	1 2 3	1 2 3 4	1 2 3 4	1 2 3 4 5	1 2 3 4 6 5
Value Levers	Oil & Gas producers registers type, quality and origination of feedstock as digital asset.	Plastic manufacturers register batches of plastic resin, additives used and compounding processes and transforms product into digital asset.	Converters register additional compounding steps, additives and final plastic packaging product.	Brand owners track the provenance of plastic packaging products, align with sustainability & quality goals and registers final application.	Retailers register the receipt & quality of finished products and sale to end-consumer.	Consumers dispose plastic packaging in smart dustbin and registers trash bag before disposing.	Recyclers registers the receipt of the plastic trash, validates integrity, traces plastic properties to determine processing procedure & adds recycling process.

Blockchain based global trade platform can improve supply chain in-efficiencies of paper based processes

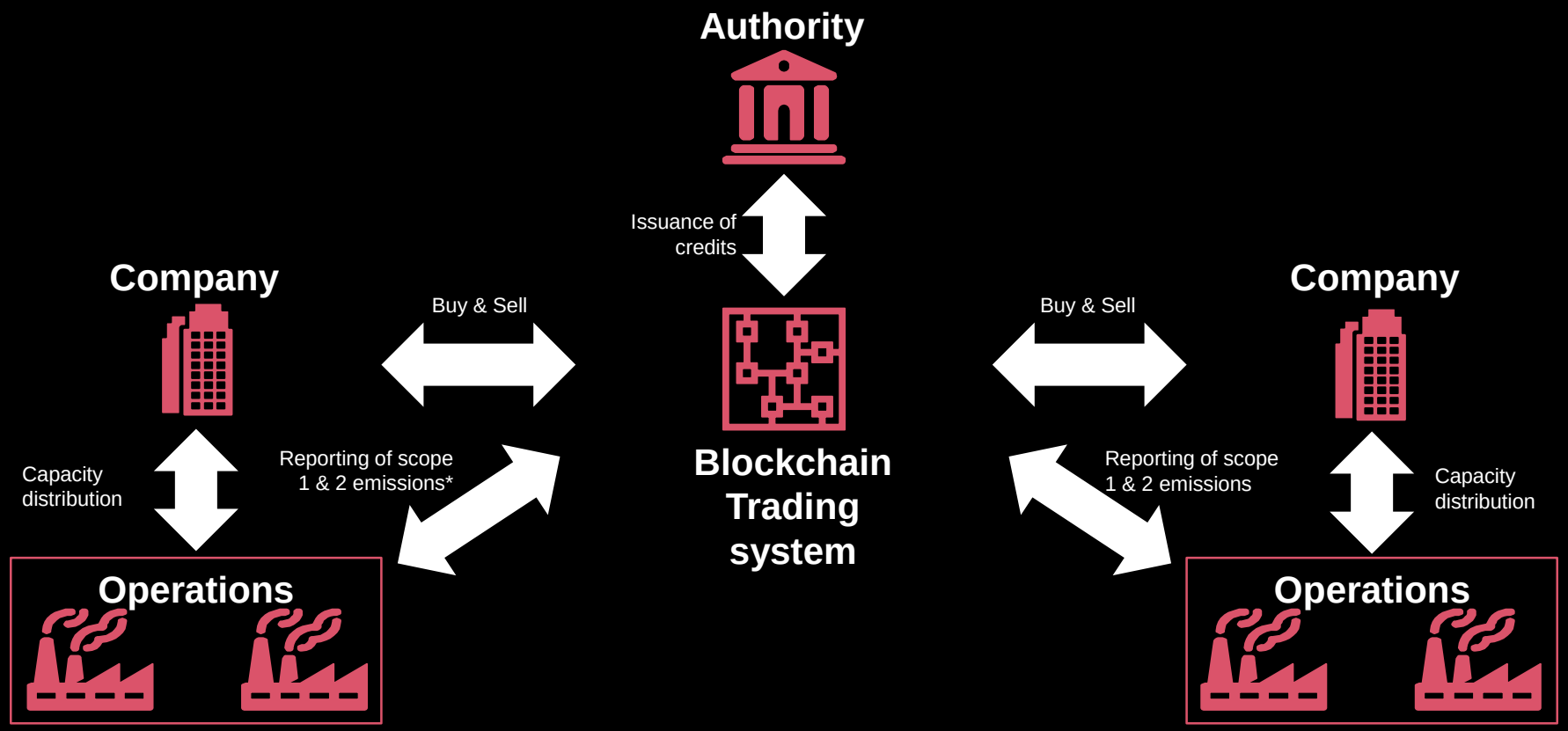




- Taking trade documents on Blockchain can save approx. **$300 per container**
- The avg. cost to send a **Bill of Lading (B/L)** is around **$100** which is fully saved by Blockchain solutions
- It enables secure document transfer and ultra fast ownership transfer process
- It provides single source of truth as well as real-time update to everyone participating in ecosystem

Source: Tradelens, CargoX

Achieving emission reduction targets via a blockchain based ecosystem to track carbon emission & trade carbon credits



*Scope based on carbon emission classification Scope 1= direct emission Scope; 2= indirect emission; Scope 3= emission from value chain

Thank you.

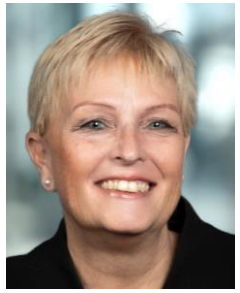
Spørgsmål?

Kontakt

Mød vores eksperter til en uforpligtende dialog om jeres muligheder og udfordringer.

Bæredygtighed i 2021

Læs også om de øvrige webinarer i rækken om bæredygtighed på pwc.dk/webinar-sustainability



Susanne Stormer
Partner, PwC DK
Head of Sustainability
T: +45 2334 6283
E: susanne.stormer@pwc.com

Jens Johansen
Director, PwC DK
Sustainable Supply Chains
T: +45 4042 4550
E: jens.johansen@pwc.com

Thomas Thoning
Senior manager, PwC DK
Sustainable Consulting
T: +45 3945 9369
E: thomas.thoning@pwc.com

Thomas Brask
Director, PwC DK
Sustainable Procurement
T: +45 2331 3526
E: thomas.abel.brask@pwc.com

Tak for i dag