

How are we performing? Supporting companies in interpreting their Carbon Footprint with industry benchmarks



5.7 Sustainability Assessments in Industry Creating Meaningful Information

Jasmin Tesch | Dr. Silvia Forin

About WifOR

Worldwide presence



-  In 5 countries and 6 locations: Germany (Berlin, Darmstadt), Greece, Ireland, Latin America and the USA
-  Active projects in 35 countries - global, regional and national analyses

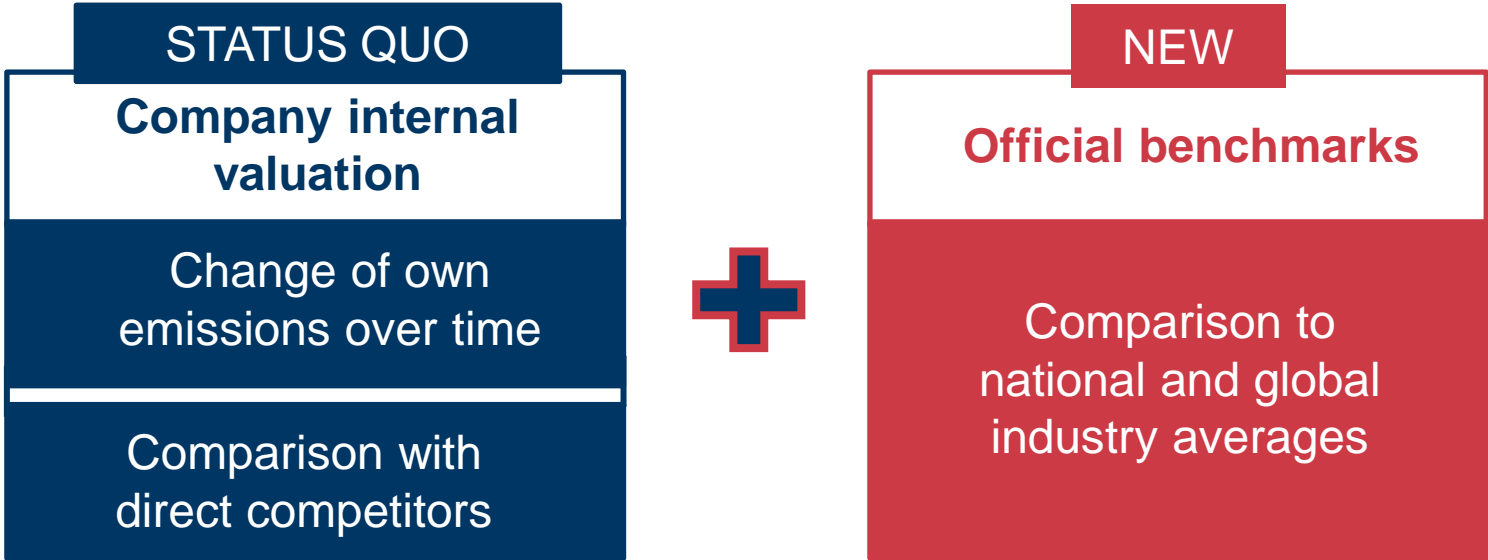
Facts & Figures

- ▶ Economic Research Institute
- ▶ Spin-off from Department of Public Economics & Economic Policy at Technical University of Darmstadt, Germany
- ▶ 55 Employees
- ▶ Over 385 successful projects for companies, associations and ministries

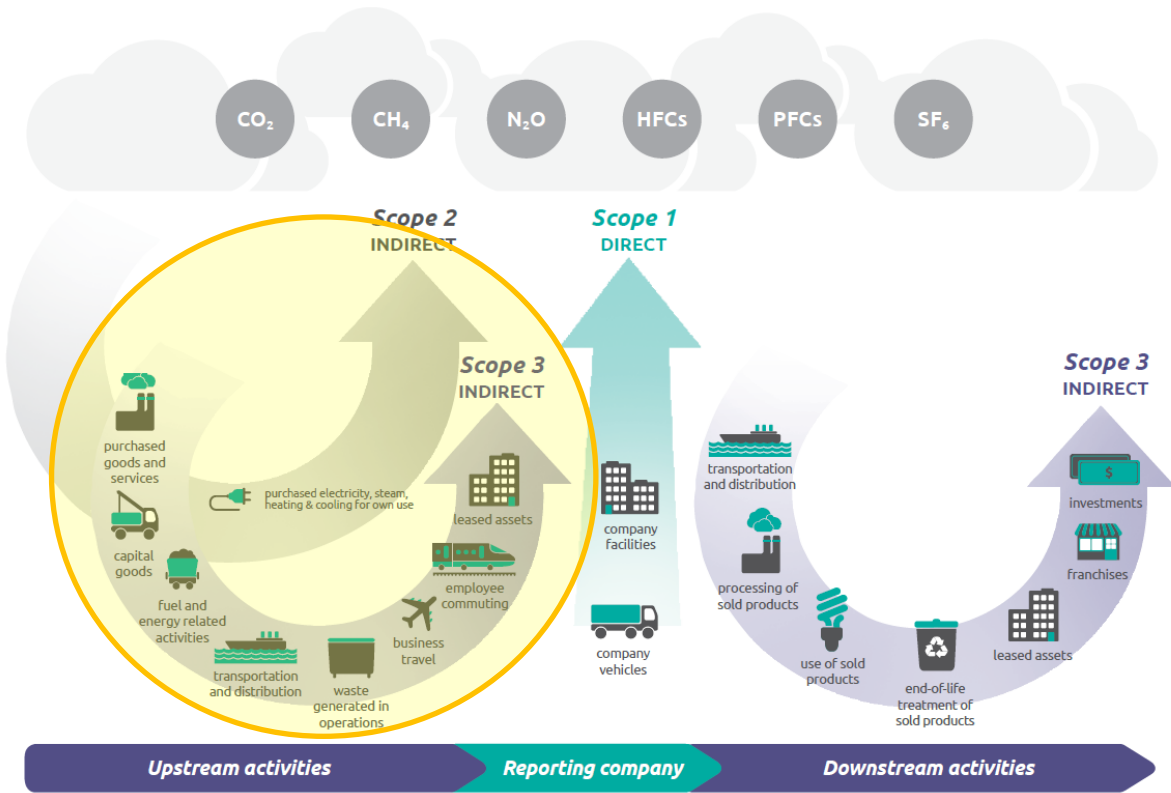
Labour market	Health
Sustainability	Social Policy
Value	Digitalisation
Innovation, Research & Development	Sports
Education	

How is our supply chain performing?

- ▶ Supply chain emissions (i.e. upstream Scope 3) are on average 11.4 times higher than operational emissions
- ▶ An increasing number of companies assess and disclose emissions but have limited options to rank and grade their organizational carbon footprint.



Which upstream scope 3 categories can be depicted for industries with Environmentally Extended Input-Output Analysis (EEIO)?

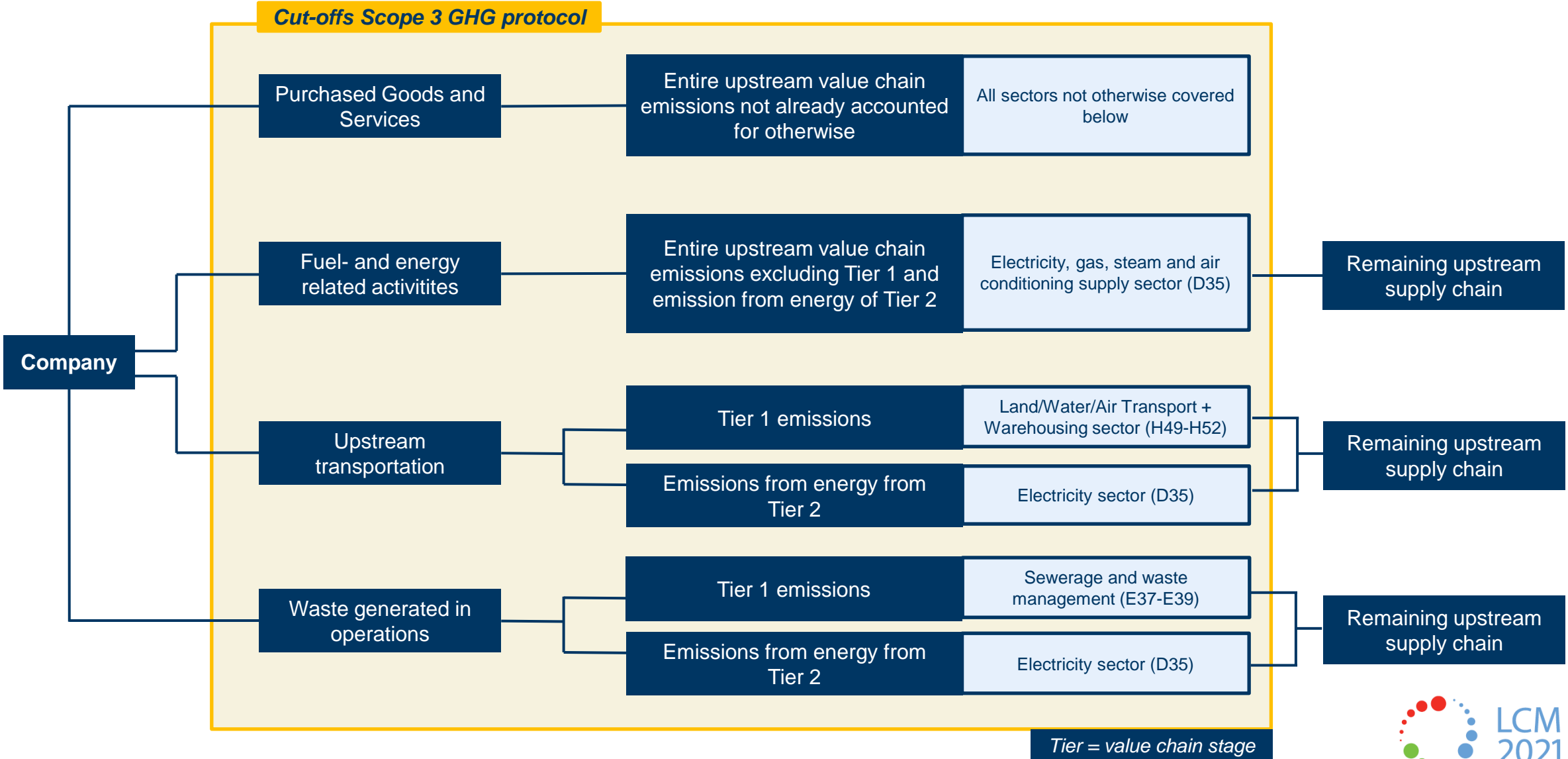


Upstream Scope 3 categories	
Purchased goods and services	✓
Capital goods	✗
Fuel-and energy related activities	✓
Upstream transportation	✓
Waste generated in operations	✓
Business travel	✗
Employee commuting	✗
Upstream leased assets	✗

Source: GHG Protocol



Modeling the scope 3 categories into the EEIO framework



How are carbon industry benchmarks calculated?



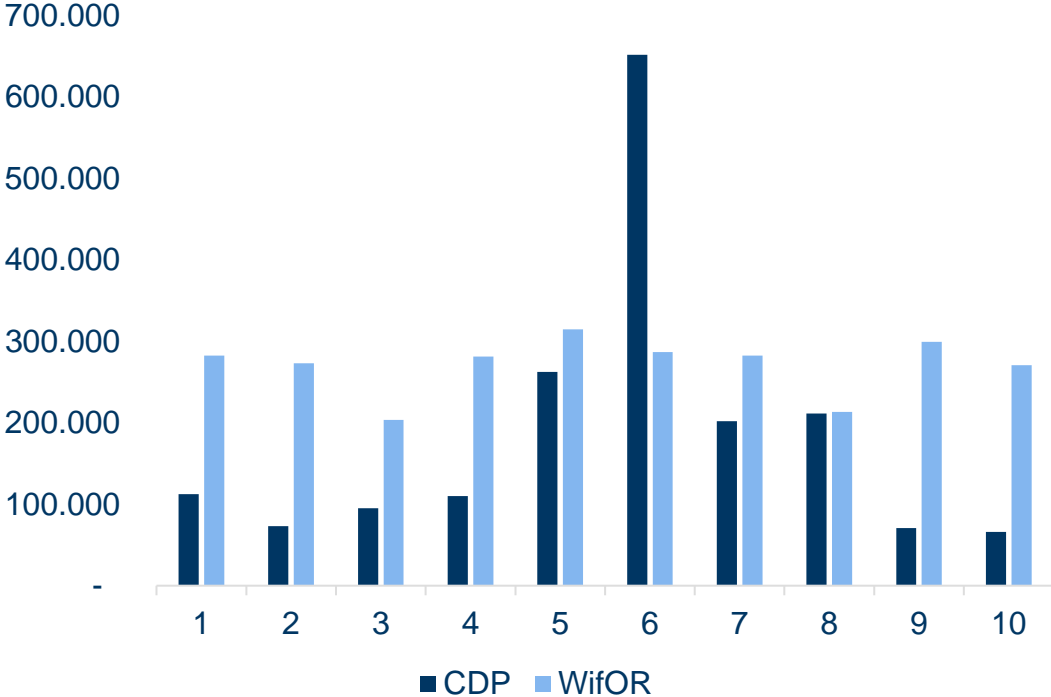
- ▶ GHG intensities per scope 3 category can be derived through environmental extensions of IO-tables, specific for every sector and land combination

$$\frac{\text{Total GHG (kgCO}_2\text{e)}}{\text{Total production value (mio. \$)}}$$

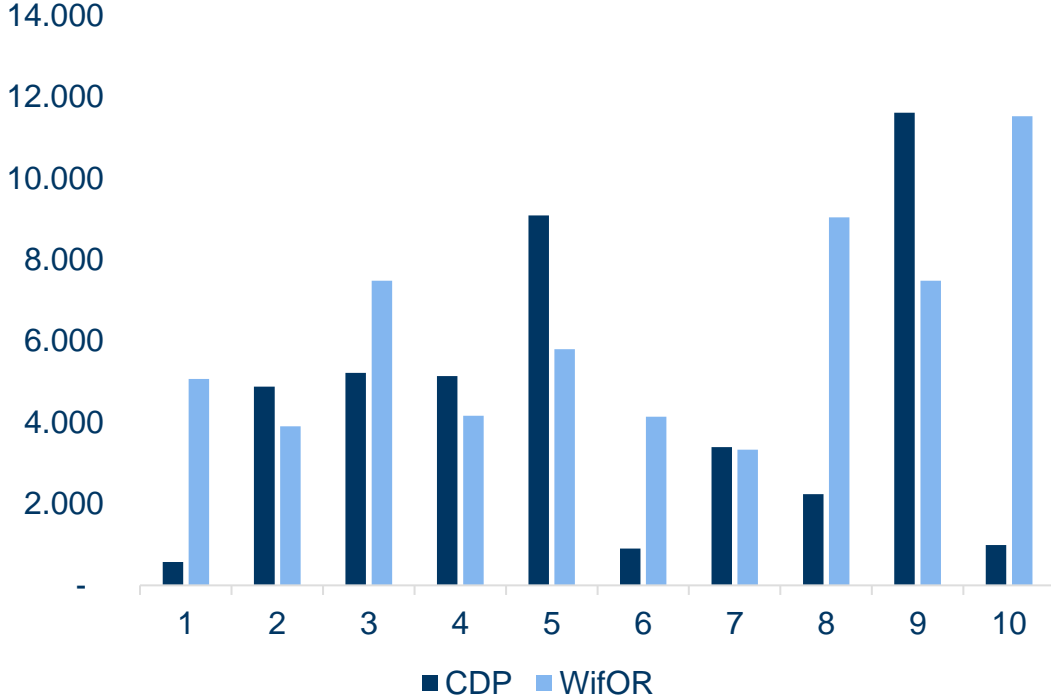
- ▶ Application of Scope 3 benchmarks for...
 - ▶ National company: *Use country and industry specific GHG intensity multiplier*
 - ▶ Multinational company: *Use consolidated and country adjusted GHG intensity multiplier*
 - Country mix of GHG intensity multipliers. Allocation of revenue to countries based on location of operation. Scope 1 emissions are used as a proxy
 - Correction factor for “Purchased Goods and Services” applied to consolidate intra-company trade

Benchmarks applied for multinational pharmaceutical companies that reported emissions to the Carbon Disclosure Project (CDP)

Purchased goods and services
(kgGHG per mio. \$ revenue)



Fuel-and energy related activities
(kgGHG per mio. \$ revenue)

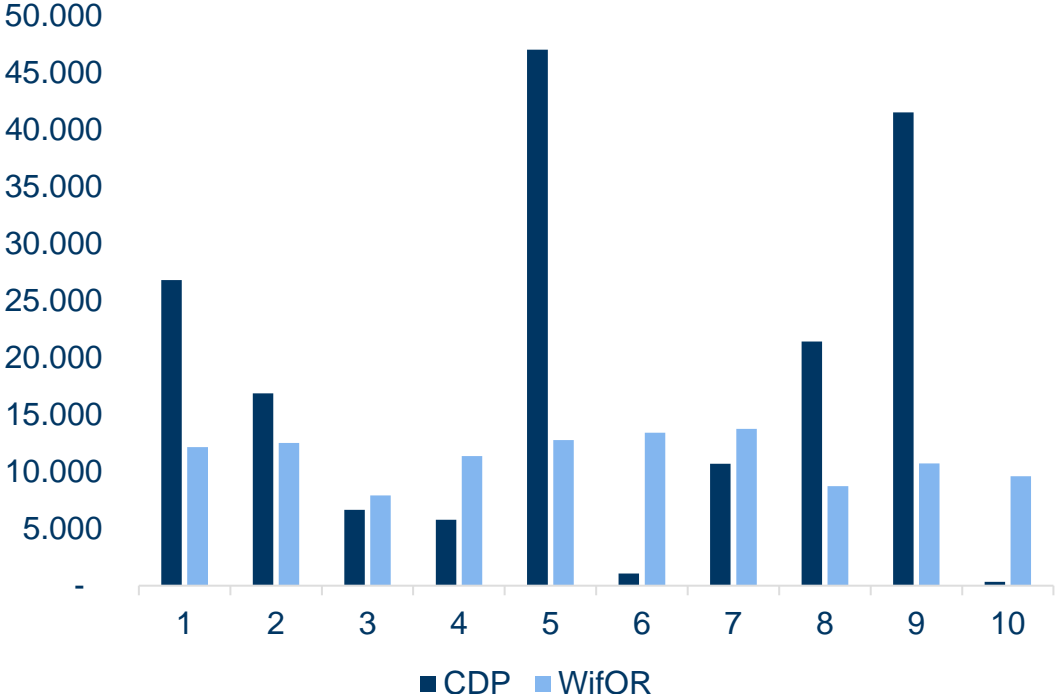


CDP Intensities are calculated by dividing reported emissions per category with reported revenue (all data extracted from CDP)
WifOR benchmarks are based on data from WIOD, Exiobase, EORA, Eurostat and OECD

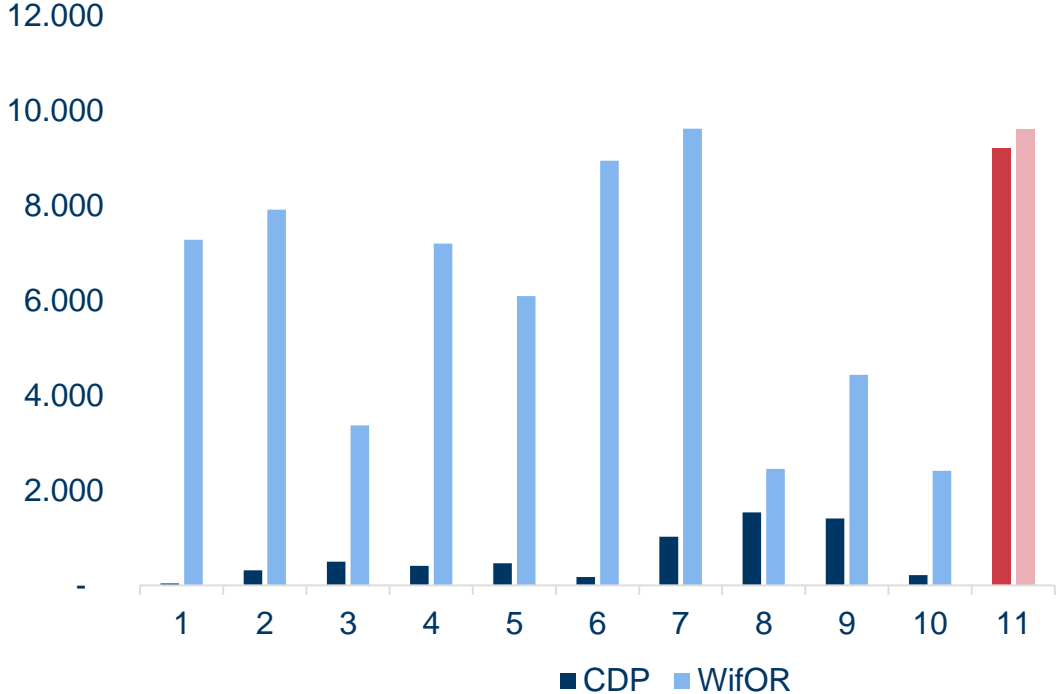


Benchmarks applied for multinational pharmaceutical companies that reported emissions to the Carbon Disclosure Project (CDP)

Upstream transportation
(kgGHG per mio. \$ revenue)



Waste from operations
(kgGHG per mio. \$ revenue)



CDP Intensities are calculated by dividing reported emissions per category with reported revenue (all data extracted from CDP)
WifOR benchmarks are based on data from WIOD, Exiobase, EORA, Eurostat and OECD



Conclusions

- ▶ GHG intensity benchmarks derived with EEIO can be a valuable addition to interpret organizational carbon footprints
- ▶ Comparability through benchmarks is dependent on standardized and meaningful assessed carbon footprints of companies (status quo: high degrees of freedom)
- ▶ More suitable for big corporations as representativeness of benchmarks increases with a broad and diverse product portfolio
- ▶ Method can be used as a preliminary hotspot analysis for an organizational carbon footprint

WifOR Berlin

Joseph-Haydn-Straße 1
10557 Berlin

 +49 30 232 566 6 – 50

 -

 -

 Jasmin.Tesch@wifor.com

www.wifor.com

Jasmin Tesch

Researcher

Dr. Silvia Forin

Senior Researcher

The image features a dark blue background with decorative geometric shapes in the corners. The bottom-left corner contains a cluster of overlapping triangles in red, dark blue, light blue, and pink. The bottom-right corner features a large red triangle pointing towards the center.

Back-up

What are possible sources of deviation except performance?

- ▶ **Purchased Goods and Services**
 - Big corporations likely buy less goods & services than we expect (internal corporate linkages)
 - Some companies use different cut-offs (e.g. only consider Tier 1 emissions)
 - Benchmarks includes many small companies with less resources to track and reduce emissions
 - Often national emission factors are used for an international analysis
- ▶ **Fuel- and energy related activities (not included in Scope 1+2)**
 - Model does not account for transmission and distribution losses
- ▶ **Upstream transportation**
 - Likely overestimation as other Scope 3 categories are included and cannot be shown differentiated (business travel, downstream transportation, employee commuting). These however only account for a small emission share in the manufacturing industry
- ▶ **Waste generated in operations**
 - Companies using emission factors from USA/UK instead of location of operation (coal instead of solar energy)
 - Model cannot yet depict recycling and energy recovery from incineration. Uses an average emission factor for all ways of disposal

Mapping of NACE/ISIC industries to scope 3 categories

Code	Industry name	Mapping to...
A01	Crop and animal production, hunting and related service [...]	Purchased Goods and Services
A02	Forestry and logging	Purchased Goods and Services
A03	Fishing and aquaculture	Purchased Goods and Services
B	Mining and quarrying	Purchased Goods and Services
C10-C12	Manufacture of food products, beverages and tobacco products	Purchased Goods and Services
C13-C15	Manufacture of textiles, wearing apparel and leather products	Purchased Goods and Services
C16	Manufacture of wood and of products of wood and cork, [...]	Purchased Goods and Services
C17	Manufacture of paper and paper products	Purchased Goods and Services
C18	Printing and reproduction of recorded media	Purchased Goods and Services
C19	Manufacture of coke and refined petroleum products	Purchased Goods and Services
C20	Manufacture of chemicals and chemical products	Purchased Goods and Services
C21	Manufacture of basic pharmaceutical products and preparations	Purchased Goods and Services
C22	Manufacture of rubber and plastic products	Purchased Goods and Services
C23	Manufacture of other non-metallic mineral products	Purchased Goods and Services
C24	Manufacture of basic metals	Purchased Goods and Services
C25	Manufacture of fabricated metal products, except machinery [...]	Purchased Goods and Services
C26	Manufacture of computer, electronic and optical products	Purchased Goods and Services
C27	Manufacture of electrical equipment	Purchased Goods and Services
C28	Manufacture of machinery and equipment n.e.c.	Purchased Goods and Services
C29	Manufacture of motor vehicles, trailers and semi-trailers	Purchased Goods and Services
C30	Manufacture of other transport equipment	Purchased Goods and Services
C31_C32	Manufacture of furniture; other manufacturing	Purchased Goods and Services
C33	Repair and installation of machinery and equipment	Purchased Goods and Services
D35	Electricity, gas, steam and air conditioning supply	Fuel-and energy related activities
E36	Water collection, treatment and supply	Purchased Goods and Services
E37-E39	Sewerage; waste collection, treatment and disposal activities [...]	Waste generated in operations
F	Construction	Purchased Goods and Services
G45	Wholesale and retail trade and repair of motor vehicles [...]	Purchased Goods and Services

Code	Industry name	Mapping to...
G46	Wholesale trade, except of motor vehicles and motorcycles	Purchased Goods and Services
G47	Retail trade, except of motor vehicles and motorcycles	Purchased Goods and Services
H49	Land transport and transport via pipelines	Upstream transportation
H50	Water transport	Upstream transportation
H51	Air transport	Upstream transportation
H52	Warehousing and support activities for transportation	Upstream transportation
H53	Postal and courier activities	Purchased Goods and Services
I	Accommodation and food service activities	Purchased Goods and Services
J58	Publishing activities	Purchased Goods and Services
J59_J60	Motion picture, video and television programme production [...]	Purchased Goods and Services
J61	Telecommunications	Purchased Goods and Services
J62_J63	Computer programming, consultancy and related activities [...]	Purchased Goods and Services
K64	Financial service activities, except insurance and pension fundin	Purchased Goods and Services
K65	Insurance, reinsurance and pension funding [...]	Purchased Goods and Services
K66	Activities auxiliary to financial services and insurance activities	Purchased Goods and Services
L68	Real estate activities	Purchased Goods and Services
M69_M70	Legal and accounting activities; activities of head offices; [...]	Purchased Goods and Services
M71	Architectural and engineering activities; technical testing [...]	Purchased Goods and Services
M72	Scientific research and development	Purchased Goods and Services
M73	Advertising and market research	Purchased Goods and Services
M74_M75	Other professional, scientific and technical activities [...]	Purchased Goods and Services
N	Administrative and support service activities	Purchased Goods and Services
O84	Public administration and defence; compulsory social security	Purchased Goods and Services
P85	Education	Purchased Goods and Services
Q	Human health and social work activities	Purchased Goods and Services
R_S	Other service activities	Purchased Goods and Services
T	Activities of households as employers; undifferentiated goods [...]	Purchased Goods and Services
U	Activities of extraterritorial organizations and bodies	Purchased Goods and Services