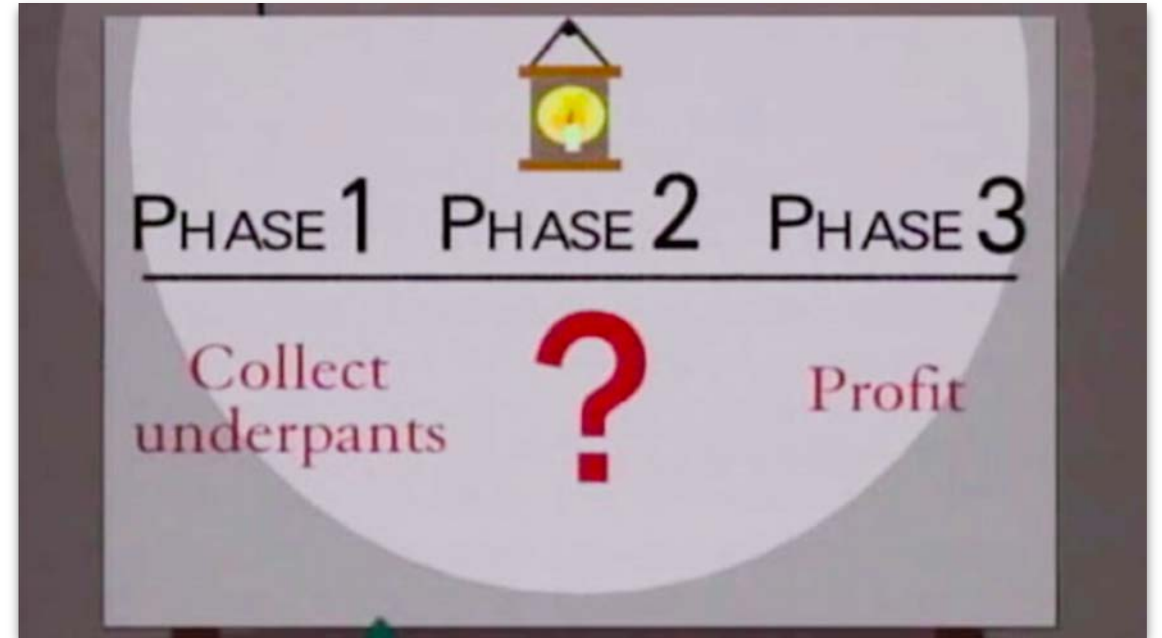# CLARITY AI

Was bringt AI für ESG (wirklich)?

Use Cases aus der Praxis

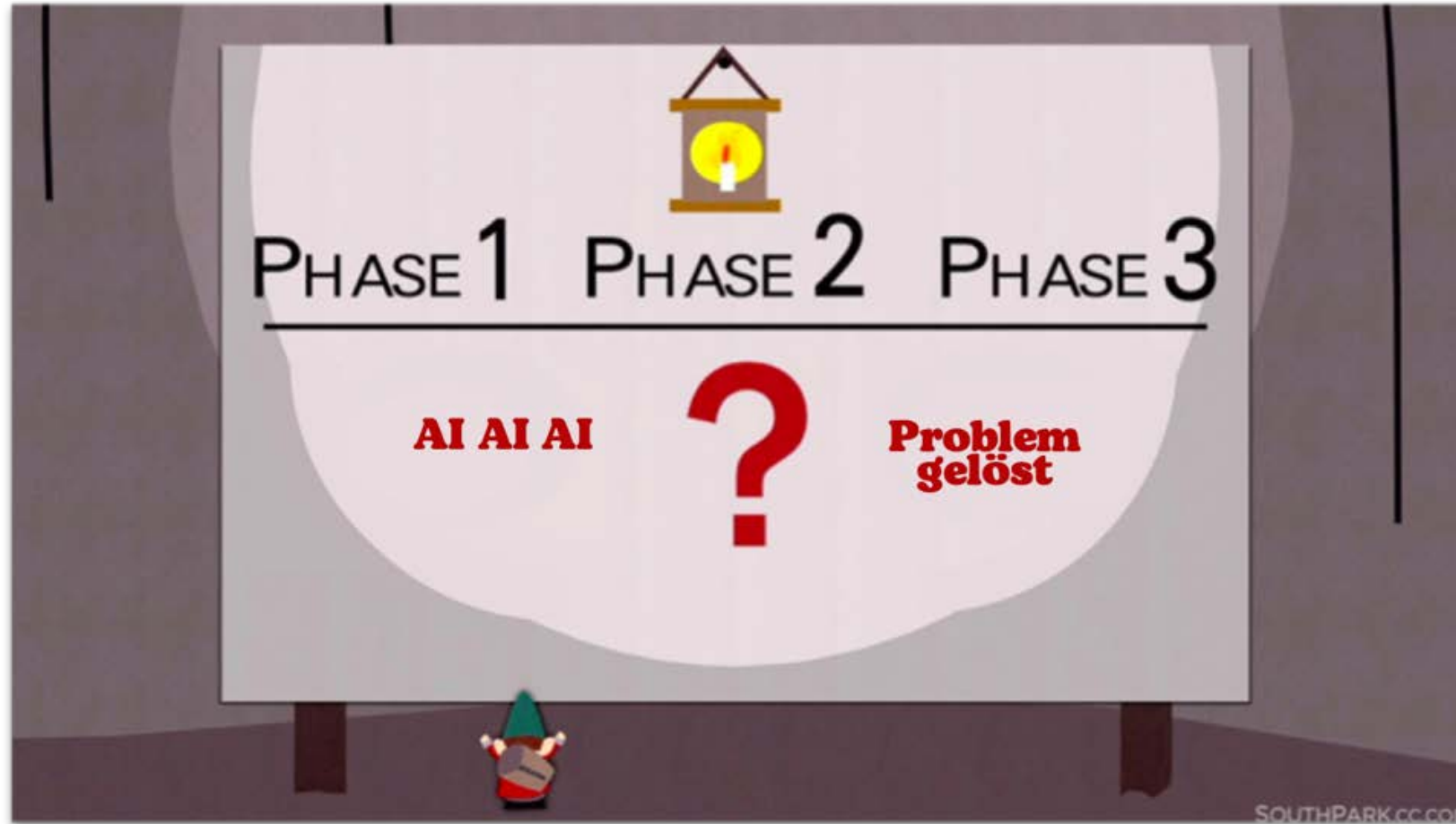*21. Juni 2023, Andri Stocker*

Wie ESG und wozu AI?

Ist es wirklich so einfach?

Oder vielleicht so?

Heutige Fragestellung

Wo liegen die größten ESG Herausforderungen und wie kann AI konkret helfen, *diese sinnvoll und effizient* zu lösen?

Wo liegen die größten ESG Herausforderungen?

1 Lösungen für komplexe Probleme erfordern vergleichbare (und verständliche) Informationen

2 Umfassende Lösungen erfordern eine breite Daten Abdeckung

3 Daten müssen zuverlässig sein, um sie für belastbare Entscheidungen nutzen zu können

4 Was Unternehmen sagen vs. was sie wirklich tun

5 Nutzer und Kunden müssen komplexe Entscheidungen verstehen

Wie vergleichbar sind reportete Informationen?

KPI		Unit	2022	2021	Notes and comments
Europe					EU27, United Kingdom, Norway and Iceland
	Gas drives (natural gas and LPG)	number of vehicles produced/percentage change	15,240/ −56.4	34,917/ −23.6	
	Hybrid drives	number of vehicles produced/percentage change	166,415/ −16.2	198,550/ +46.7	
	All-electric drives	number of vehicles produced/percentage change	340,952/ +17.8	289,389/ +65.0	
	Alternative drives (total)	number of vehicles produced/percentage change	522,607/ 0.0	522,856/ +46.7	
Product carbon footprint (DCI)		in metric tons of CO_2/vehicle	48.0	48.4 (45.9)	See also Decarbonization Index note
Scope 1 GHG emissions (absolute)[1]		in million metric tons of CO_2	4.46	4.67	
	of which Volkswagen AG	in million metric tons of CO_2	2.02	2.22	
Scope 1 GHG emissions (specific)		in kg of CO_2/vehicle	415	476	Passenger cars and light commercial vehicles
	in Volkswagen AG	in kg of CO_2/vehicle	3,024	3,507	Adjustment of figure for 2021 due to incorrect unit
Scope 2 GHG emissions (absolute)[1]		in million metric tons of CO_2	2.11	2.41	
	of which Volkswagen AG	in million metric tons of CO_2	0.11	0.14	
Scope 2 GHG emissions (specific)		in kg of CO_2/vehicle	236	288	Passenger cars and light commercial vehicles
	in Volkswagen AG	in kg of CO_2/vehicle	167	223	
Scope 3 GHG emissions		in million metric tons of CO_2	395.62	364.14	

	2020		2021		2022	
Scope 3	Specific CO_2 in t/car	Absolute CO_2 in million t[4]	Specific CO_2 in t/car	Absolute CO_2 in million t[4]	Specific CO_2 in t/car	Absolute CO_2 in million t[4]
Procured goods[6]	8.1	17.0	8.4	17.0	8.7	17.7
Logistics	1.0[2]	2.1[2]	1.1[2]	2.2[2]	1.1[2]	2.2[2]
Business travel	0.006	0.012	0.009	0.019	0.028[7]	0.057[7]
Employee traffic	0.060	0.125	0.053	0.107	0.052	0.107
Use phase of our products (well-to-tank)	5.6	11.8	6.3[3]	12.7[3]	6.6[3]	13.6[3]
Use phase of our products (tank-to-wheel)	33.7	70.4	32.2	65.5	30.7	62.7
Dismantling and waste treatment[6]	0.4	0.8	0.4	0.8	0.4	0.8
Scope 1 and 2						
Manufacture	0.8	0.9[4]	0.7	0.7[4]	0.3	0.4[4]
Total	**49.7**	**103.2**	**49.1**	**99.2**	**47.9**	**97.8**

Welche Informationen stecken in Tabellen und Texten?

Left table:

Targets	Target horizon	Status as of 2022
Climate protection in vehicles and services		
Mercedes-Benz offers battery-electric vehicles (BEVs) in all segments where the brand is represented	2022	13 models
Increase the share of plug-in hybrids and all-electric vehicles to up to 50%[1]	By mid-decade	Cars 16% Vans 4%
All new vehicle architectures are electric	2025	According to plan
There is an all-electric alternative for every model offered by Mercedes-Benz	2025	According to plan
Mercedes-Benz is all-electric — wherever market conditions allow	By the end of the decade	According to plan
Reduction of the CO_2 emissions per car in the new vehicle fleet by at least 50% along all stages of the value chain[1,2]	By the end of the decade	According to plan
A fleet of new Mercedes-Benz vehicles that are CO_2-neutral on the balance sheet along all stages of the value chain	2039	According to plan
Climate protection in the supply chain		
Mercedes-Benz plans to procure only balance sheet carbon-neutral production materials	2039	86% of suppliers[3]
Climate protection in production		
CO_2-neutral on the balance sheet production in company-owned Mercedes-Benz production plants worldwide	2022	Achieved
Reduce CO_2 emissions in the Mercedes-Benz plants (Scope 1 and 2) by 50%[4]	2030	Achieved
Increase the share of the energy requirement in own Mercedes-Benz production plants which is met through renewable energies: – Cars 70% – Vans 80%	2030	According to plan

Right text:

progress with regard to CO_2 targets down to model series level and, for the first time, to present climate-relevant emissions down to the last nut and bolt. At the same time, the fleet level can also be analysed. The CO_2 monitoring tool maps two central perspectives on the company's climate protection activities: firstly, the strategic view of management and investors; this looks at the annual development of CO_2 emissions of all vehicles sold and shows whether the company is on target. Secondly, the detailed view of the design engineers and procurement personnel within the model series support function; with the help of this tool, they can ascertain what emissions are currently attributable to the battery of an EQS, and by what percentage this value must be reduced with regard to the company's own CO_2 targets.

CO_2 emissions along the entire value chain
GRI 305-1/-2/-3
To evaluate how environmentally compatible a vehicle is, the Mercedes-Benz Group conducts ecological assessments: the company systematically analyses the generated CO_2 emissions and other environmental impacts along the entire value chain of a vehicle – from raw material extraction through production and use to recycling. Among other things, these analyses have shown that as more and more vehicles are electrified, the focus is shifting towards other factors such as production of the high-voltage battery and generation of the electricity for charging the battery. Since the launch of the EQS, battery cells have been produced with electricity that is CO_2-neutral on the balance sheet, while the Group continues to drive forward efforts to promote battery charging with electricity from sustainable sources.
↗ Life cycle assessment of the EQE 350+

The Mercedes-Benz Group collates and publishes the key figures for the CO_2 emissions on corporate level based on the ⊙ Greenhouse Gas (GHG) Protocol framework.

The Mercedes-Benz Group differentiates its greenhouse gas emissions according to three categories – the so-called Greenhouse Gas Scopes. Scope 1 includes all emissions that the company itself produces when it burns energy media at its production sites – for example, when it generates electricity and heat in the company's own power plants. Scope 2 includes all

emissions caused by external providers from whom energy is purchased in forms such as electricity and district heating. Scope 3 includes all the emissions that are generated before (upstream of) or after (downstream of) business operations. For example, Scope 3 includes the CO_2 emissions that arise in the supply chain (purchased goods and services), through the vehicles' operation in customers' hands (the use phase, including the production of fuel and electricity), and in the recycling phase of the vehicles.

The GHG Protocol specifies a total of 15 categories of Scope 3 emissions. The emissions are determined on the basis of comprehensive methodological consider-ations and complex calculations. The reported Scope 3 categories are selected after a review of relevance and data availability. At 78%, the majority of the Scope 3 emissions reported for the Mercedes-Benz Group occur in the utilisation phase, in other words during fuel and electricity production (⊙ well-to-tank) and the operation of its products (tank-to-wheel). Around 17% of indirect Scope 3 emissions are attributable to the supply chains that provide the company with goods and services.

The company determines the CO_2 emissions in the utilisation phase of Mercedes-Benz vehicles on the basis of its worldwide sales figures and the average, standardised CO_2 fleet value. An annual mileage of 20,000 km is assumed for each vehicle, for an assumed usage period of ten years. In total, the mileage therefore amounts to 200,000 km per vehicle.
↗ Scope 1, 2 and selected Scope 3 CO_2 emissions in t per vehicle Mercedes-Benz Cars 2022
↗ Scope 1, 2 and 3 emissions worldwide Mercedes-Benz Cars

Measures

An all-electric product range
The Mercedes-Benz Group's goal is to accelerate the pace of expansion of its range of electric vehicles. Its commitment to research and development work is correspondingly great. Altogether, the Mercedes-Benz Group wants to invest more than €60 billion between 2022 and 2026 for the transformation towards an all-electric and software-driven future.
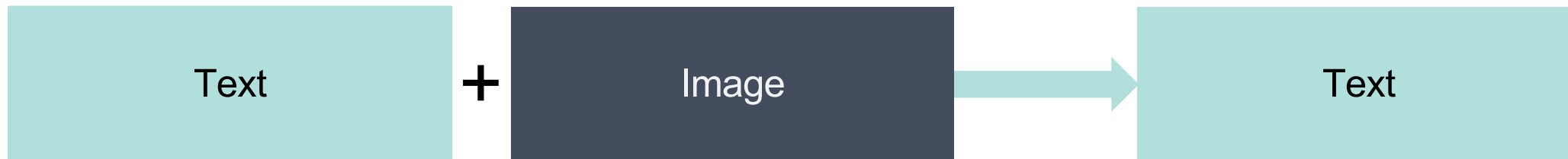
Und was ist mit Graphen und Bildern?
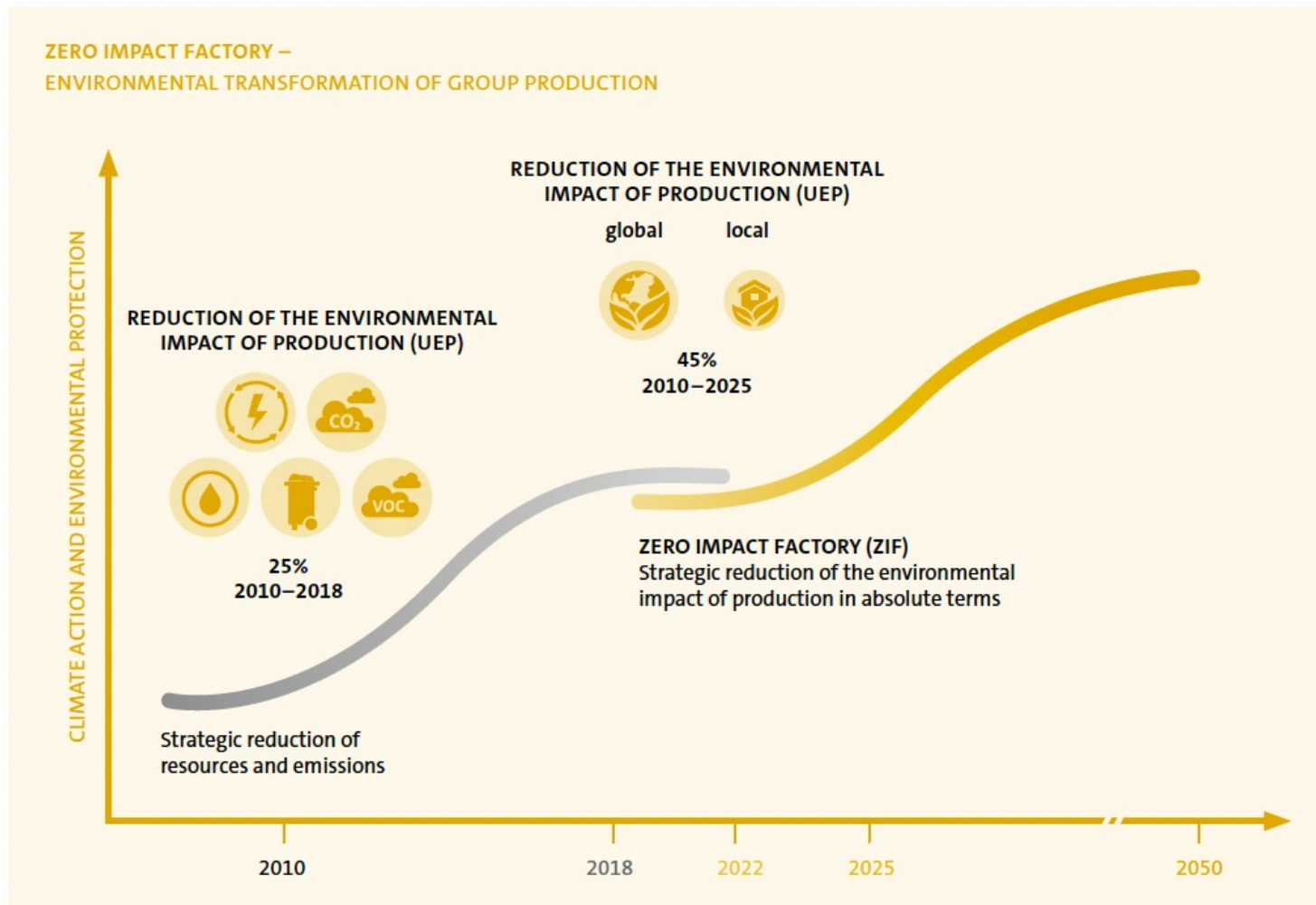
AI kann aus unstrukturierten Daten vergleichbare Informationen generieren

aktuell / single modal

| Text | → | Text |
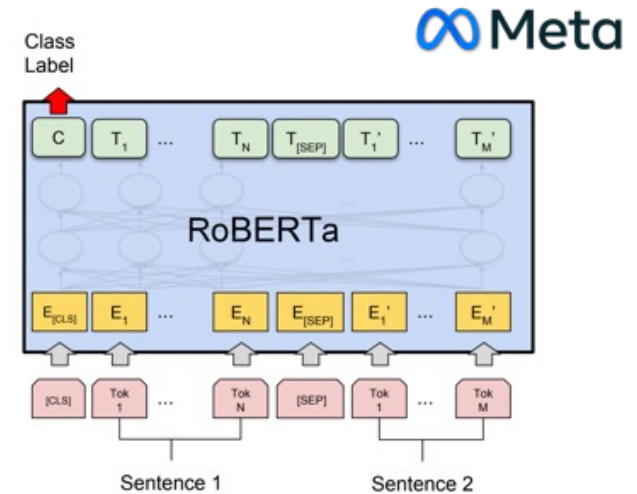
zukünftig / multi modal

| Text | + | Image | → | Text |

Die größten ESG Herausforderungen

1 Lösungen für komplexe Probleme erfordern vergleichbare (und verständliche) Informationen

2 Umfassende Lösungen erfordern eine breite Daten Abdeckung

3 Daten müssen zuverlässig sein, um sie für belastbare Entscheidungen nutzen zu können

4 Was Unternehmen sagen vs. was sie wirklich tun

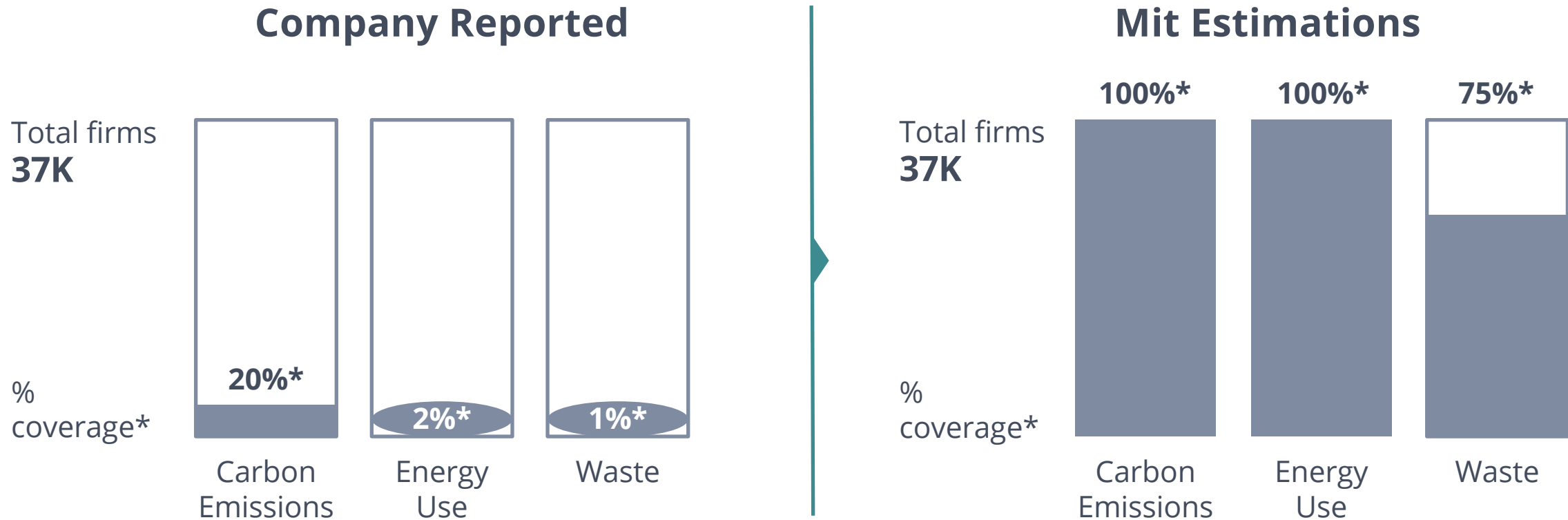**5** Nutzer und Kunden müssen komplexe Entscheidungen verstehen
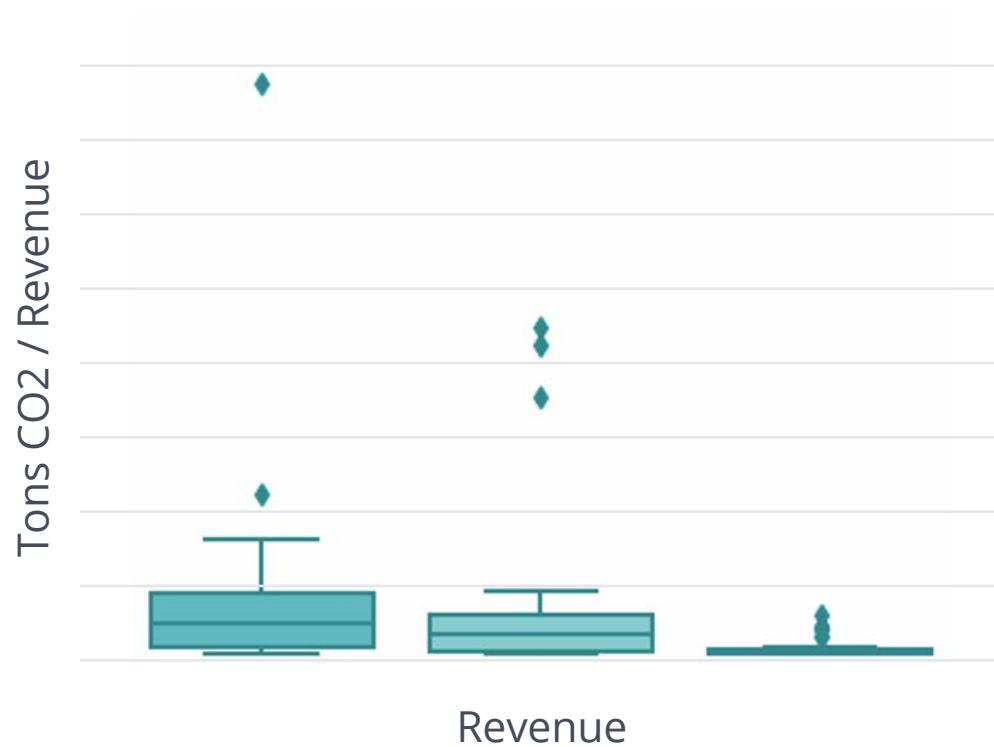
Wie gut ist unsere Datenabdeckung?

Average eligibility & alignment for the revenue & CAPEX KPIs for 400 companies with reported data from 2022

Legend:
- Eligibility (% of revenue)
- Alignment (% of revenue)
- Eligibility (% of CAPEX)
- Alignment (% of CAPEX)

Categories (x-axis): Utilities (N = 25), Real Estate (N = 14), Industrials (N = 127), Materials (N = 39), Energy (N = 12), Communication Services (N = 19), Information Technology (N = 35), Consumer Discretionary (N = 47), Health Care (N = 40), Consumer Staples (N = 40)

Companies from the Financial sector have not been included in the figure because they are not expected to publish alignment until 2024. Opex reported data has been excluded for simplicity as it is redundant compared to revenue and CAPEX

Ist die Herausforderung einheitlich groß?
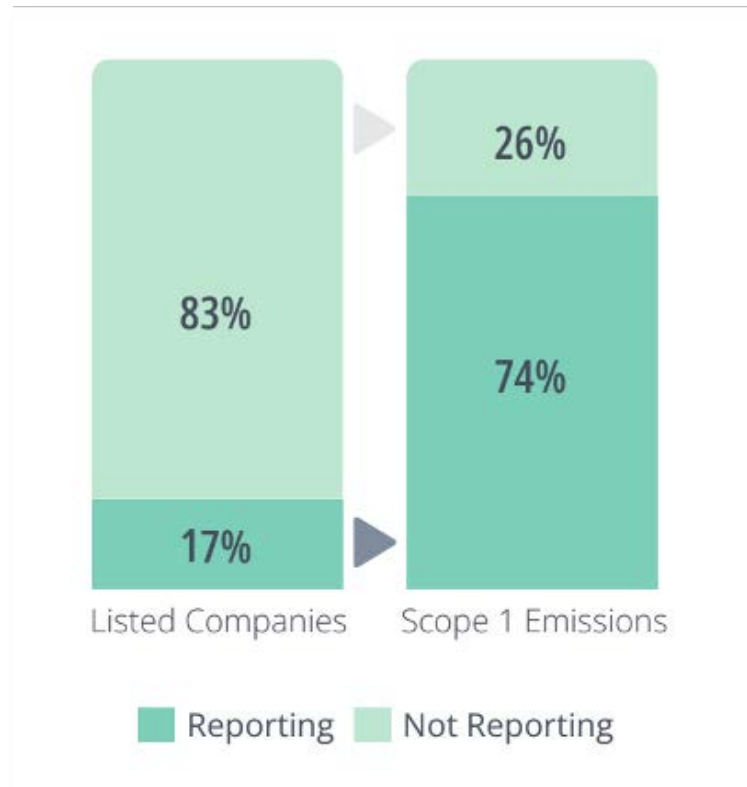
Schätzungen können die Datenabdeckung deutlich erhöhen

Company Reported

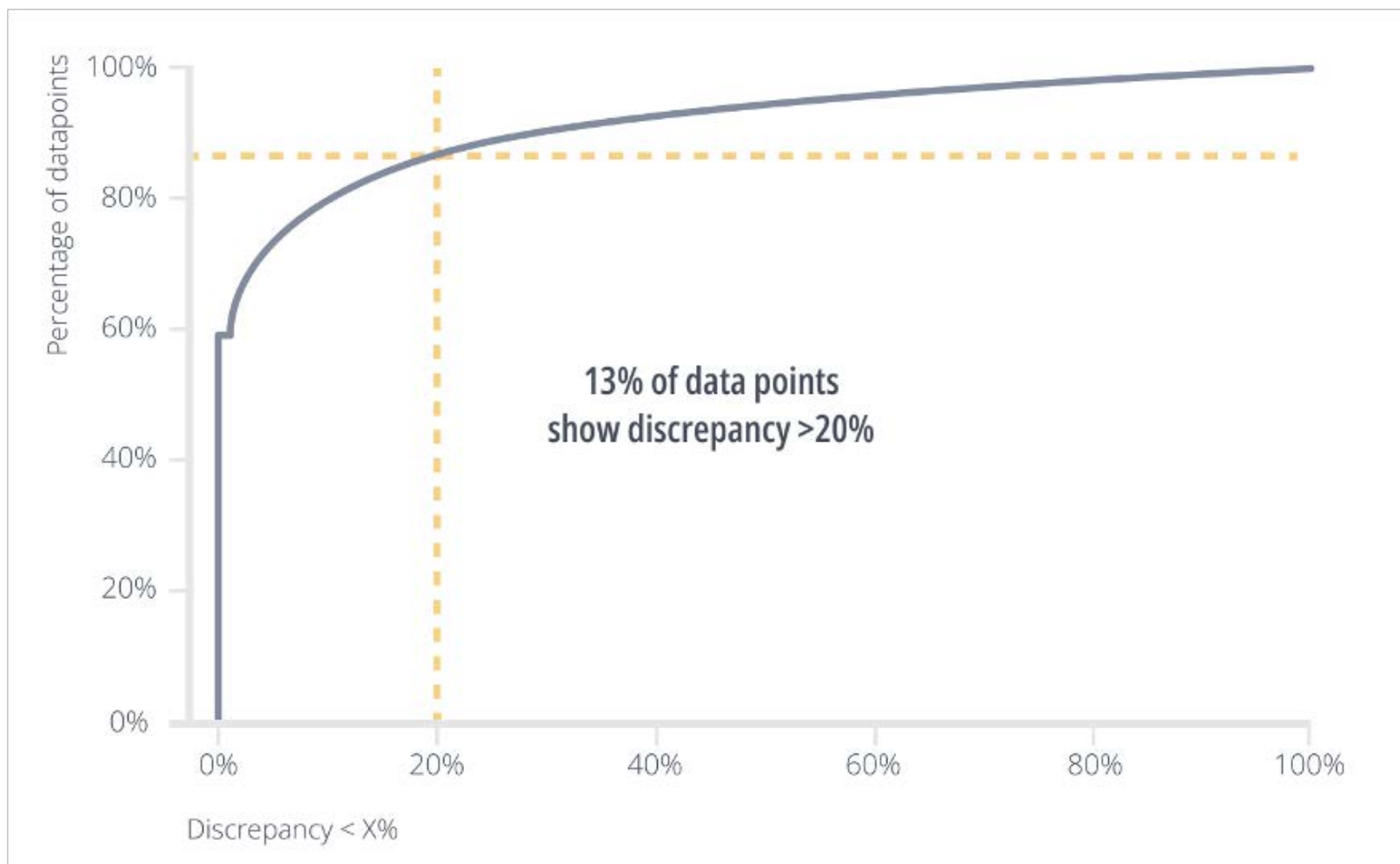Total firms
37K

% coverage*

- Carbon Emissions: **20%***
- Energy Use: **2%***
- Waste: **1%***

Mit Estimations

Total firms
37K

% coverage*

- Carbon Emissions: **100%***
- Energy Use: **100%***
- Waste: **75%***

Schätzungsmodelle erweitern die Abdeckung sinnvoll

Reported Scope 1 Emissions

Tons CO2 / Revenue

Revenue

Estimated Scope 1 Emissions
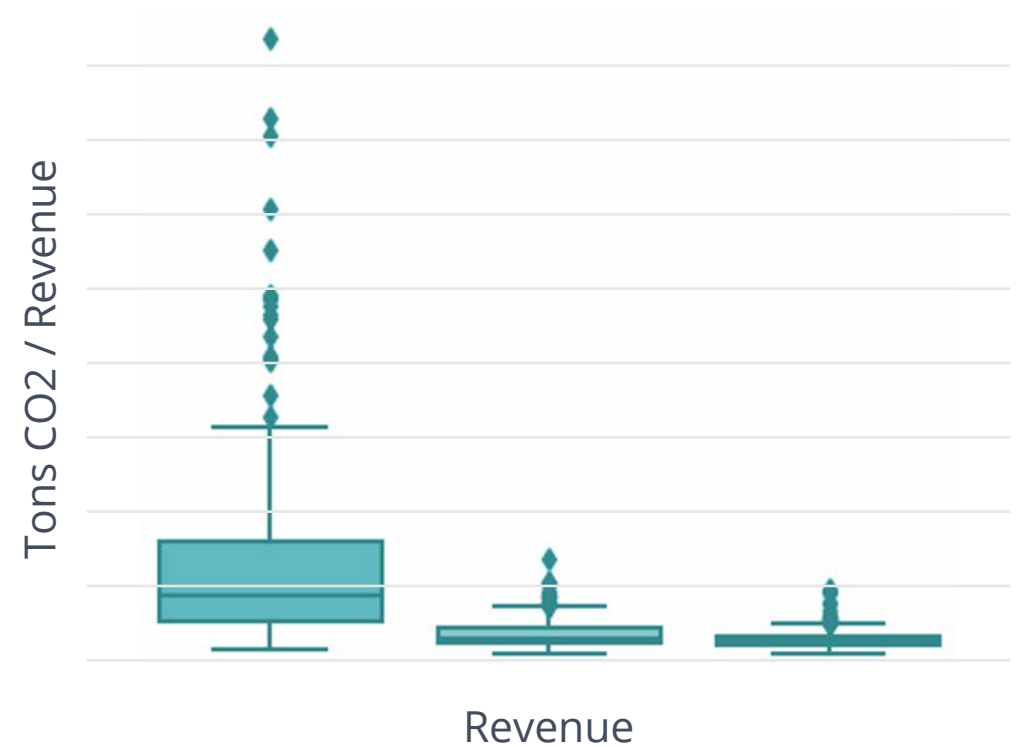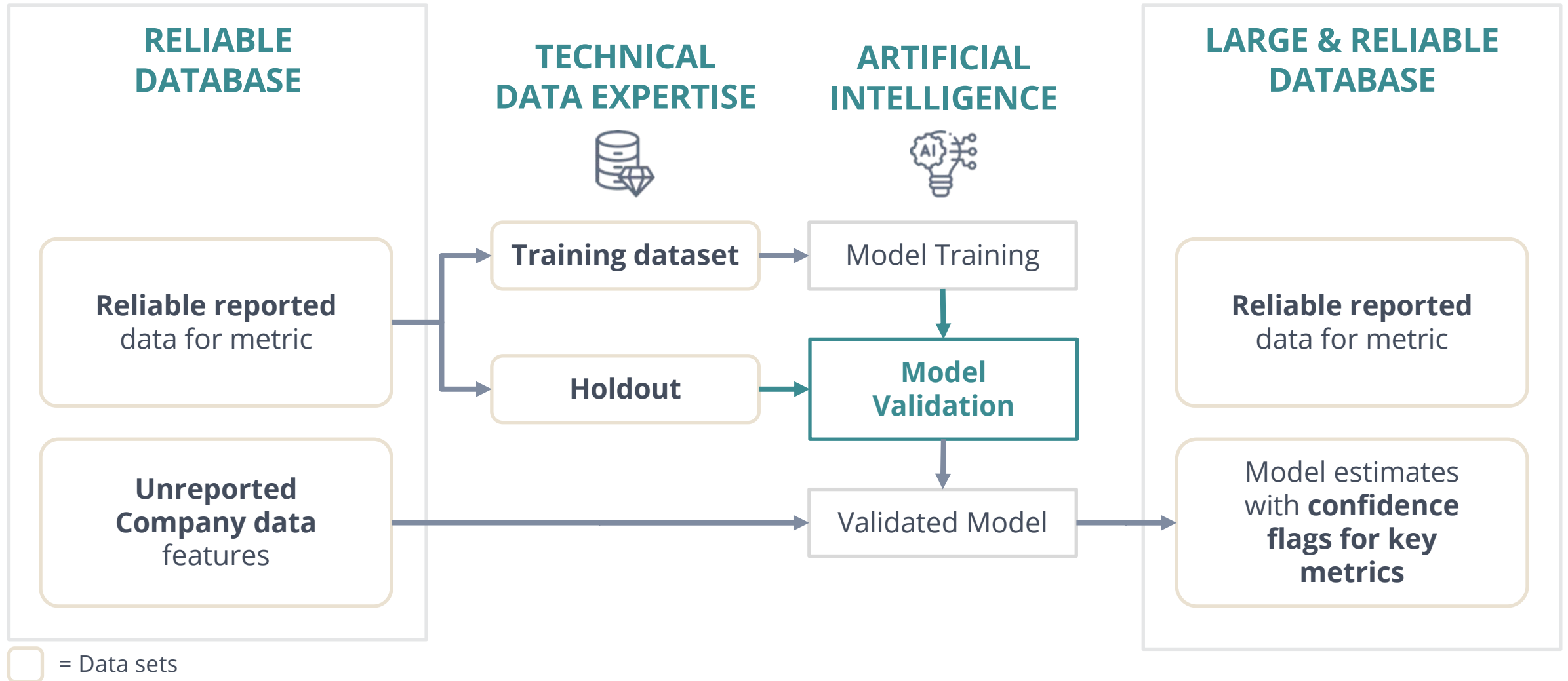
Tons CO2 / Revenue

Revenue

15

ML kann die Datenverfügbarkeit deutlich erhöhen

RELIABLE DATABASE

TECHNICAL DATA EXPERTISE

ARTIFICIAL INTELLIGENCE

LARGE & RELIABLE DATABASE

Reliable reported data for metric

Training dataset → Model Training

Holdout → **Model Validation**

Unreported Company data features

Validated Model

Reliable reported data for metric

Model estimates with **confidence flags for key metrics**

= Data sets

CLARITY AI

Die größten ESG Herausforderungen

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Wie zuverlässig sind verfügbare Daten?

Percentage of datapoints (y-axis) vs. Discrepancy < X% (x-axis)

13% of data points show discrepancy >20%

Wo liegen die Gründe für diese Abweichungen?

Exkurs: Die Auswirkungen von Datenfehlern

ERROR 1
Human Reporting Errors

A leading data provider inaccurately reported Scope 1 emissions, by misreading a table from a publicly available Global Emissions Report.

Correct value
613,000 Tons

Reported value by leading provider
1,208,000 Tons

Data Discrepancy Impact

Comparable to the yearly emissions of Puerto Rico, with an impact on industry benchmark
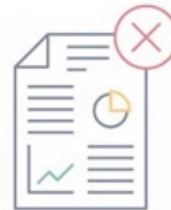
ERROR 2
Inconsistent Reporting Boundaries

A leading data provider failed to account for joint ventures in total Scope 1 emissions, applicable in this case.

Correct value
1,998,000 Tons

Reported value by leading provider
1,396,000 Tons

Data Discrepancy Impact

The missing Scope 1 emissions for this company are equivalent to the building and running of 2 gas fired power plants for an entire year
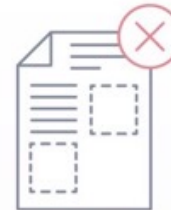
ERROR 3
Incomplete Disclosures

A leading provider included only 45% of the company's Scope 1 and 2 emissions in its dataset, failing to include all the subsidiaries.

Correct value
220,000,000 Tons

Reported value by leading provider
103,000,000 Tons

Data Discrepancy Impact

Comparable to Belgium's yearly emissions, and representing a 50 points difference in this company's ESG score

ML kann die Zuverlässigkeit von reporteten Daten erhöhen

- Ein trainiertes, kalibriertes, validiertes und überwachtes maschinelles Lernmodell wählt die zuverlässigsten Datenpunkte aus und filtert unzuverlässige Daten heraus.

- Die Funktionen des Modells stellen die Unternehmensdaten in den Kontext anderer Daten:

  o Wenn das Unternehmen diese Kennzahl bereits seit mehreren Jahren berichtet hat, ist der neue ESG-Datenpunkt mit der **bisherigen Berichterstattung** vereinbar?

  o Ist sie angesichts der Größe und anderer Faktoren des berichtenden Unternehmens mit seiner **Branche** vereinbar?

  o Stimmt der Datenpunkt mit anderen Quellen für dasselbe **Unternehmens-Metrik-Jahr** überein?

Konsistenz mit der Berichtshistorie

Konsistenz zwischen den Anbietern
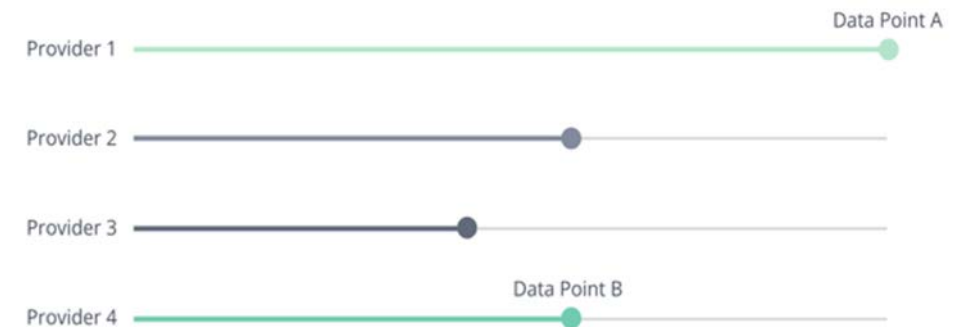
Die größten ESG Herausforderungen

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Kontroversen schaffen mehr Transparenz

May 23, 2022, 11:30 AM

Companies Face Billions in Damages as PFAS Lawsuits Flood Courts

DEEP DIVE

Andrew Wallender
Reporter

Total PFAS liabilities could reach $30 billion in a "worst-case scenario" for the company, according to some estimates.

"It's looking like 3M is going to bear the most liability, if there is any," Bloomberg Intelligence analyst Holly Froum said. It becomes more apparent as the court splits defendants into the different roles they had in manufacturing PFAS-containing products, she said.

"Some of them only made surfactant and some were the finished product manufacturers. 3M did everything."

... doch wer soll das alles lesen?

AI kann mit Natürlicher Sprachverarbeitung (NLP) Kontroversen at scale erkennen und klassifizieren
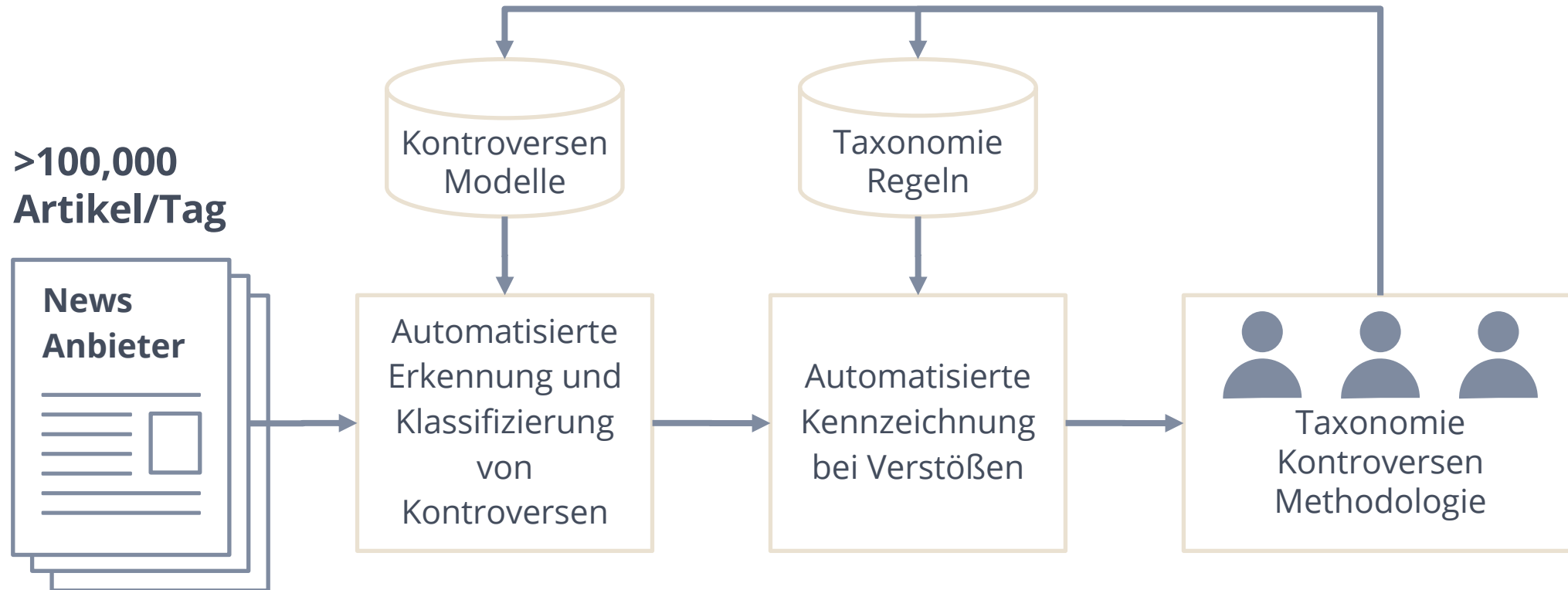
>100,000 Artikel/Tag

News Anbieter

Kontroversen Modelle

Taxonomie Regeln

Automatisierte Erkennung und Klassifizierung von Kontroversen

Automatisierte Kennzeichnung bei Verstößen

Taxonomie Kontroversen Methodologie

Die größten ESG Herausforderungen

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Anforderungen werden immer komplexer...

Beispiel Taxonomie Aktivität: "Data processing, hosting and related activities"

Die technischen Kriterien der EU-Taxonomie besagen: *"this category could be associated with NACE code J63.11"*

Aktivitäten unter NACE Code J63.11

Aktivitäten unter NACE Code J63.11
Provision of infrastructure for hosting, data processing services and related activities
Specialized hosting activities such as Web hosting
Data processing activities
Data entry, application service and time-share provisioning

Aktivitäten, die EU-Taxonomie entsprechen

✓ **Eine taxonomiefähige Aktivität**

⚠ ⚠ ⚠ **Es muss weiter geprüft werden, um Greenwashing zu vermeiden**

"The NACE codes should only be understood as indicative and should not prevail over the specific definition of the activity provided in its description" – *European Commission*

... und entsprechend auch die Methodologien

Contribution Method (Meeting any 1/3 criteria passes contribution)	Why should I use this classification criteria?	Clarity AI 3-steps Methodology Details for Article 2(17)		
		Contribute to Sustainable Objective	Do No Significant Harm	Good Governance
Use the principal adverse impact (PAIs) indicators to measure contribution	The European Supervisory Authorities (ESAs) have said **PAIs can be used to measure the sustainable impact** of financial products	Companies with at **least 2 applicable quantitative PAIs[1] in the top quartile[2]** are included in the % of sustainable investment for a fund or portfolio.	Verify that investee companies have: - No **negative exposure PAI[1]** - No **negative controversy products PAI[1]** - No other mandatory **PAIs[1] in bottom 5th percentile[2]** - No controversy related to **breaches of the minimum safeguards[3]**	Exclude companies with high/very high severity controversies around Management Structures (Shareholder Rights & Insider Dealing), Employee Relations (Working Conditions & Diversity), Remuneration of Staff (Employee Wages & Management Compensation) & Tax Compliance, covering **all topics in the regulation**
Leverage the EU Taxonomy module	Official classification system of EU **environmentally sustainable economic activities.** Disclosing % Taxo alignment is required	Use our EU Tax alignment metrics (including DNSH and Social Safeguards) that are aligned with the **specific technical criteria** defined in the regulation		
Contribution through Sustainable Revenue Alignment	Includes more environmental and social objectives (e.g., health, education) as well as supply chain	Companies with net positive impact through Products and Services or business lines that help resolve the largest sustainability issues. ≥ 20% of revenue attributable to SDGs or issues.		

AI kann Erklärungen generieren und Entscheidungen somit verständlicher machen

FAZIT: AI kann (Menschen) unterstützen, Entscheidungen sinnvoll und effizient zu treffen

1 AI kann aus unstrukturierten Daten vergleichbare Informationen generieren

2 Machine Learning kann die Datenverfügbarkeit deutlich erhöhen

3 ML kann die Zuverlässigkeit von reporteten Daten erhöhen

4 AI kann mit Natürlicher Sprachverarbeitung (NLP) Kontroversen erkennen und klassifizieren

5 AI kann Entscheidungen erklären und verständlicher machen

Und was ist mit Reinforcement Learning?

About Clarity AI

Clarity AI is a sustainability technology platform that uses machine learning and big data to deliver environmental and social insights to investors, organizations, and consumers. Clarity AI's capabilities are an essential tool for end-to-end sustainability analysis related to investing, corporate research, benchmarking, consumer ecommerce, and regulatory reporting. As of January 2023, Clarity AI's platform analyzes more than 70,000 companies, 360,000 funds, 198 countries, and 199 local governments, which represents the broadest data coverage in the market with up to 13 times more than other leading players. One way Clarity AI delivers on its mission to bring societal impact to markets is by ensuring its capabilities are delivered directly into clients' workflows through integrations with partners like BlackRock - Aladdin, Refinitiv an LSEG business, BNP Manaos, Allfunds, and Simcorp. Additionally, Clarity AI's sustainability insights reach more than 150 million consumers across more than 400,000 merchants on the Klarna platform. Clarity AI has offices in North America, Europe, and the Middle East, and its client network manages tens of trillions in assets for companies like Invesco, Nordea, PGIM, Santander, Wellington, and BNP Paribas.