

SUSTAINABILITY ACCOUNTING IN ACTION

Revealing the hidden costs & benefits
of Food Service Distribution

METRO

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EXECUTIVE SUMMARY

Challenge

Comparing externalities – the hidden costs and benefits – of METRO's Food Service Distribution (FSD) business model with those of its traditional Cash & Carry stores by quantifying and monetising their impacts on society and the environment.

Approach

Sustainability accounting using the Natural Capital and Social Capital Protocol. This approach allows the use of monetary value as a single metric, integrating natural and social impacts into a company's overall financial results.

Key results

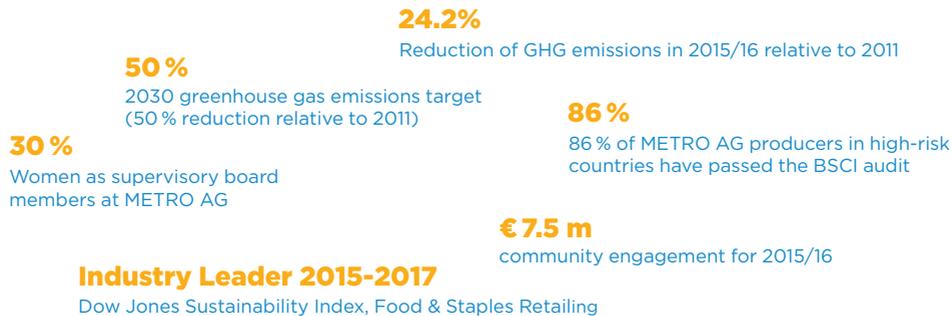
1. FSD offers additional positive impacts on customers, society and environment versus the traditional Cash & Carry operations, equal to € 68 per €1,000 of sales.
2. The greatest benefit derives from the time saved by business customers who do not need to travel to shop. This makes up for 78% of the total benefits.
3. Additional benefits derive from avoidance of food waste during transport and more donations to food banks.
4. The FSD model brings environmental and health benefits as well: It decreases overall environmental impacts caused by greenhouse gas (GHG) emissions, air pollution and noise as well as the human health costs due to traffic accidents.
5. The penetration of the FSD model within METRO is still relatively low. Its growth will lead to expanding the net positive change for society and environment compared to Cash & Carry.

Thus METRO's business model is becoming inherently more sustainable.

INTRODUCTION

With more than 750 stores in 25 countries, METRO Cash & Carry is the world's leading wholesaler and is the largest sales line of the METRO company. Its distinctive business concept is oriented towards helping professional customers run successful businesses. Along with the Cash & Carry model, METRO is also rolling out its delivery service. Currently with low penetration a strong growth is planned for FSD.

METRO has a clear responsibility to protect the environment and provide leadership on social sustainability issues, exemplified by its position as Industry Leader in the Dow Jones Sustainability Index in Food & Staples Retailing for three years in a row.



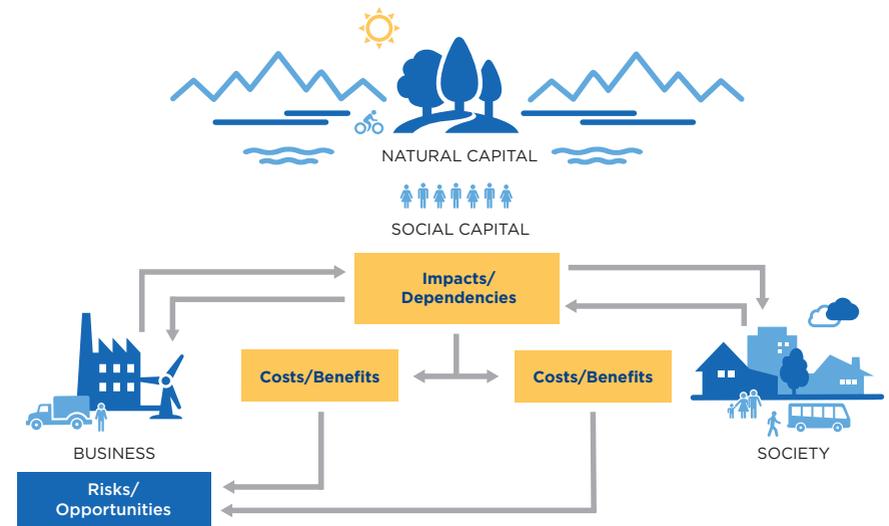
HEIKO HUTMACHER
Chief Human Resources
Officer and Labour Director

Our world is changing faster all the time. Global challenges such as political crises, climate change and population growth, as well as the increasing wealth gap and advancing digitisation, call for new discourses, bold solutions and active engagement. As an international retail company with some 150,000 employees and millions of customers, METRO and its sales lines bear a special responsibility. A company of our size, with the great number of transactions we conduct daily, has both the opportunity and the duty to achieve sustainable transformation. And that is our aspiration: we want to create added value for our customers while also caring for our environment as much as for our people and the long term financial success of our company.

KEY CONCEPTS

The concept of sustainability accounting has emerged in recent years as a means to assess the net impact of businesses and projects on the environment and society. Standard accounting captures the financial performance of companies. However, business activities can cause additional impacts (externalities), both positive and negative, that are not accounted for in financial transactions. Sustainability accounting offers a new opportunity to holistically evaluate company performance.

To put the concept into action, a global coalition of organizations has prepared two standards - the Natural Capital (launched 2016) and Social Capital Protocols (launched 2017) - to help businesses generate timely, trusted, credible, and actionable information and assessments that guide holistic corporate decision making.



Adapted from the Natural Capital Protocol

Business, environment and society are intrinsically linked. By enabling “apples-to-apples” comparisons with financial metrics, sustainability accounting bridges the gap between different ecological and social metrics as well as financial performance.

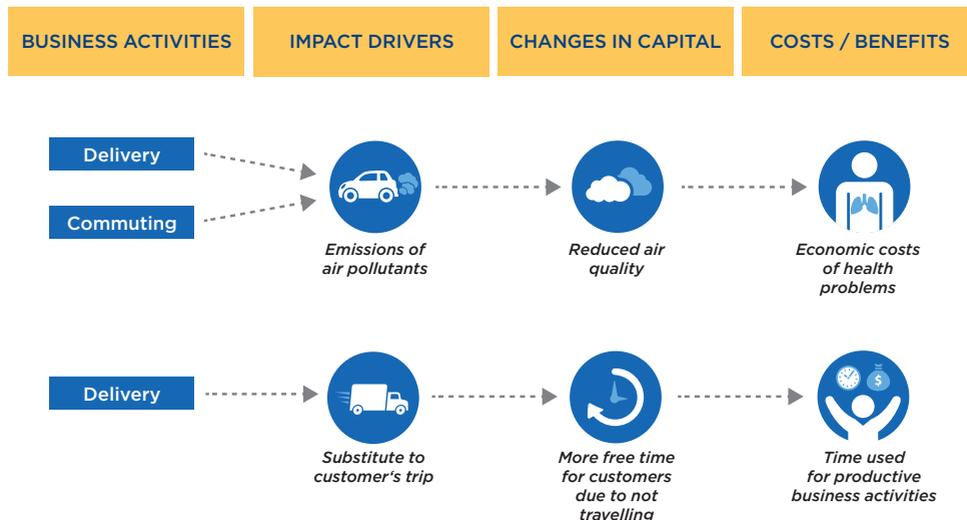
THE IMPACT PATHWAY CONCEPT

The core concept for establishing the financial value of environmental and social costs and benefits is the impact pathway concept. Via so-called impact and valuation factors, identified links between business activities and natural and/or social capital are quantified and respectively assigned a monetary value.



The impact pathway makes visible the hidden costs and benefits of doing business. This gives companies the necessary tool for integrating environmental and social concerns within their overall management framework.

Examples of impact pathways



DESCRIPTION OF THE PILOT PROJECT

METRO's pilot project was carried out based on the best practice guidelines outlined in the Natural and Social Capital Protocols.

Frame

The key aim of the project was to assess the differences in environmental and social costs and benefits between METRO's Cash & Carry and FSD business models.

Thus, the unit of measurement used is the net environmental and social costs and benefits per €1,000 of sales for each business model.

Scope

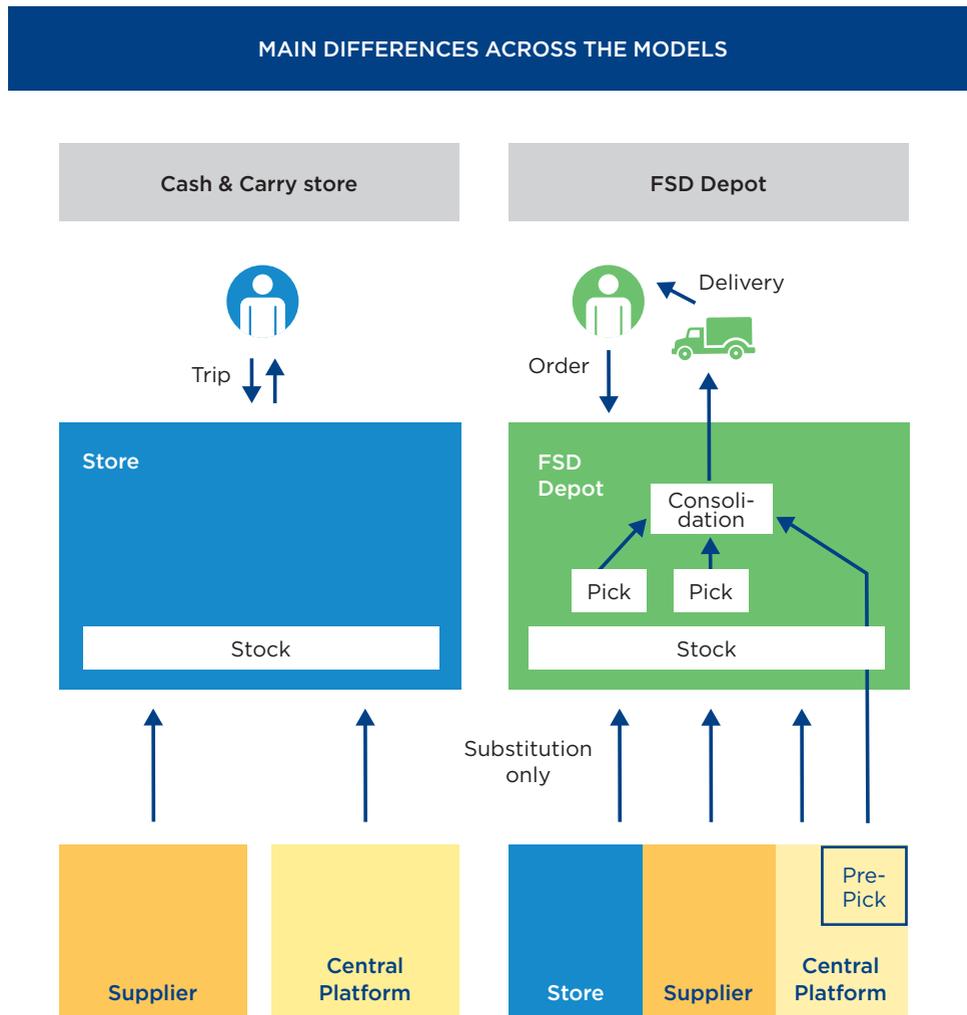
The assessment covers METRO Cash & Carry business in Germany and the differences between distribution models as such, including business from the store or depot to the customer's door, plus relevant parts of METRO's social engagement.



Where possible, the project is based on data from financial year 2015/16. As METRO's FSD is still in an early development stage, some data is estimated by extrapolation to a full year.

METRO's distribution activities also include two intermediate models – the Out-of-Store and Depot-in-Store concepts, where in both models delivery is done from the store. This makes them very similar to the Cash & Carry model, which is why the three have been considered together as one.

The key differences between the two distribution models are shown in the following graphic:

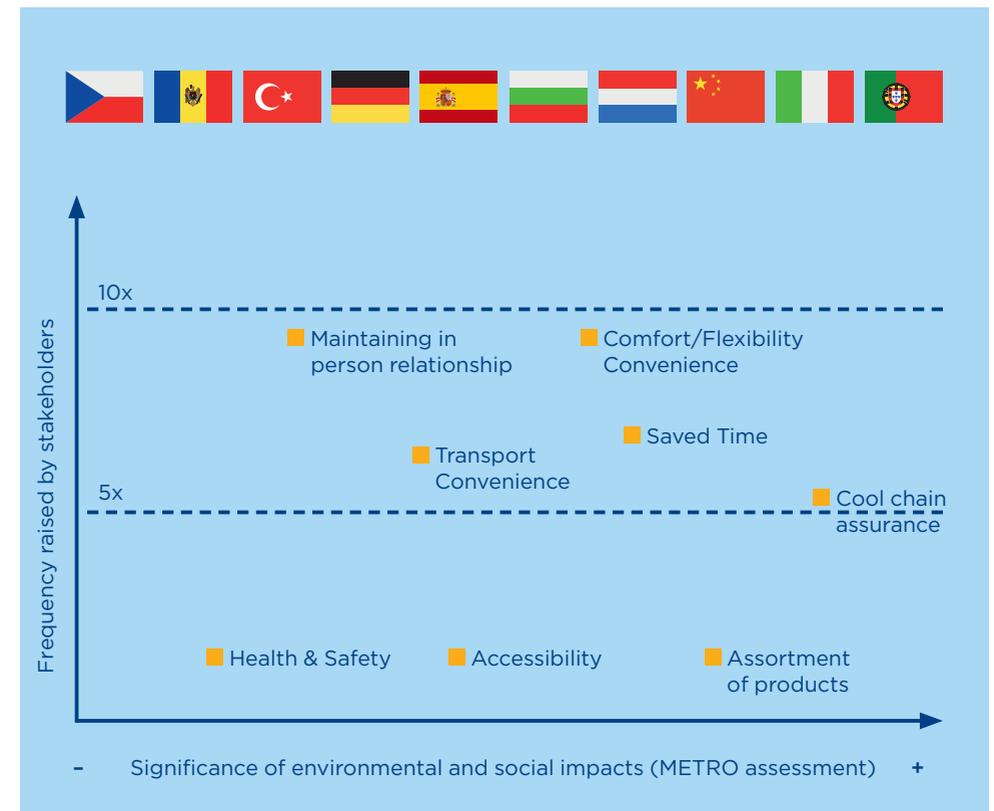


Materiality

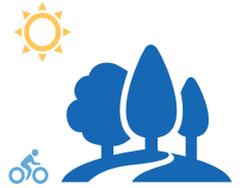
In carrying out sound and useful sustainability accounting, stakeholders' views are key in order to decide on which impacts are worth considering (material) from a business and societal perspective.

An internal Materiality analysis workshop was conducted with key METRO personnel in order to identify main areas of impact to include in the analysis. This was supplemented by an internal stakeholder survey with experts in the wholesale and distribution business in 10 different METRO countries.

The stakeholder survey served to both validate the decided project scope, as well as to expand it where necessary in order to provide a more comprehensive view of METRO's full societal impact.



PROJECT SCOPE



NATURAL CAPITAL

ACTIVITY	IMPACT DRIVER	CHANGE IN CAPITAL	VALUE OF IMPACT
Energy use In-store cooling	Greenhouse gas emissions (CO2, HFCs)	Climate change	Various impacts (overall negative)
Employee commute			
Own & subcontractor transport			
Customer transport			
Employee commute	Air pollutant emissions (PM, NOx)	Decreasing air quality	Health costs
Own & subcontractor transport			
Customer transport			
Facilities	Land use	Decrease in ecosystem services	Lost value from ecosystem services
Employee commute	Vehicle noise	Noise pollution	Health costs
Own & subcontractor transport			
Customer transport			
Waste	Environmental impacts of treatment and disposal (incl. CO2)	Pollution impacts	Costs of environmental damages
Customer food waste	Food spoilage during transport	Food wasted	Value of meals lost



SOCIAL CAPITAL

ACTIVITY	IMPACT DRIVER	CHANGE IN CAPITAL	VALUE OF IMPACT
Donations to food banks	Food close to out-of-date	Decreased hunger	Value of meals provided
Employee commute	Traffic accidents	Decreased human capital	Cost of life/injuries (health costs, avoided productivity)
Own & subcontractor transport			
Customer transport			
Customer transport	Time spent traveling/shopping	Loss of productive time	Added value of work productivity

RESULTS

The results are clear – FSD offers not only higher economic efficiency but also additional positive impacts on customers, society and environment compared to Cash & Carry. The net positive change for natural and social capital equals to € 68 per €1,000 of sales.

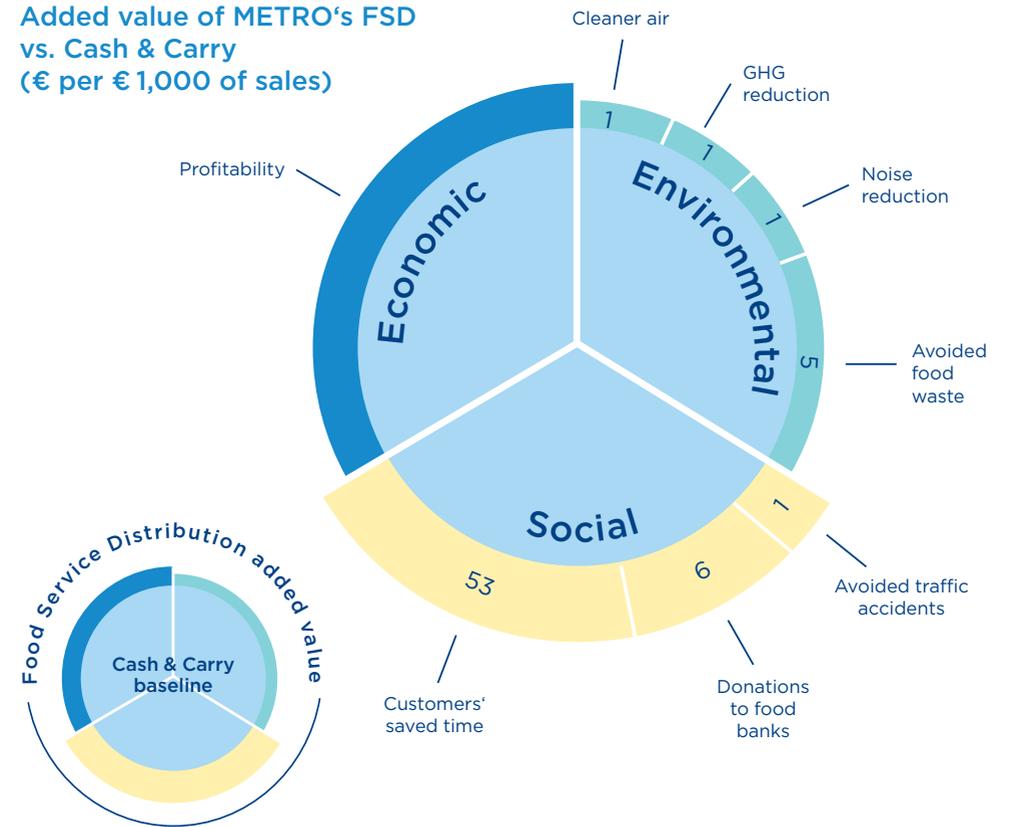
The greatest benefit comes from the time saved by business customers who do not need to travel to shop¹. This makes up to 78 % of the total added value, hence € 53 per €1,000 of sales. Additional benefits derive from avoidance of food waste during transport due to METRO Cash & Carry's state-of-the-art cool chain, as well as through more donations to food banks.

Compared to Cash & Carry, the FSD model brings environmental and health benefits as well – it decreases environmental impacts such as GHG emissions (by 30 %), air pollution (by 64 %) and noise (by 40 %) as well as the human health costs due to traffic accidents (by 78 %).

The penetration of the FSD model within METRO Cash & Carry is still relatively low – it makes up only a small percentage of sales in financial year 2015/16. However, its projected strong growth will lead to expanding the net positive change on natural and social capital compared to the Cash & Carry distribution model.

Thus METRO's business model is becoming inherently more sustainable.

Added value of METRO's FSD vs. Cash & Carry (€ per €1,000 of sales)



EXAMPLARY MEASURES

- In the 2015/16 financial year, METRO Cash & Carry invested € 24.3 million in its METRO Cash & Carry energy saving programme, expecting more than € 6 million savings annually.
- In Germany, half of METRO's vehicles met the EURO 6 standard in the financial year 2014/15, with the remaining vehicles scheduled for replacement with the next two financial years.
- METRO Cash & Carry cooperates with food bank initiatives in 15 out of its 25 countries. In the remaining countries, METRO Cash & Carry is currently in communication with local political representatives and state aid organisations in order to push cooperation toward food donations.
- 100 % of METRO's delivery vehicles in Germany are refrigerated and in line with legal requirements. The company is committed to minimising food spoilage and waste.

¹As FSD is offered to professional HoReCa and trader/reseller customers only, the value of time saved by other customer groups has not been considered.

ADDED VALUE AND ASPIRATIONS

METRO is committed to continuing its work on sustainability accounting. There are multiple ways forward. Dialogue with external stakeholders can be leveraged for improving the methodology, honing the results and better understanding of their implications. Globally, the concept of sustainability accounting can be deployed in different markets, allowing evidence-based management of external impacts.

Locally, as METRO expands the use of the FSD model, the sustainability accounting method can be utilized to demonstrate the positive value of opening such facilities.

Finally, sustainability accounting can be utilized for scenario building, as a tool for understanding the implications of new investment decisions (such as expanding on-site renewable energy generation) and prioritizing actions toward holistic sustainable management.

SOME OF METRO AG'S ONGOING WORK FOR MAXIMISING NATURAL AND SOCIAL CAPITAL BENEFITS:

- Fleet management guideline incorporates the use of hybrid and electric cars.
- METRO deliveries within Vienna, Austria take only up to 3 hours and are only carried out via electric vans.
- In Paris, France one of METRO's stores is supplied by high-efficiency natural-gas powered trucks. Delivery from Paris stores is done via small electric trucks, while the sales force Paris is entirely comprised by electric cars.
- METRO AG joined the Electric Vehicle 100 (EV100) initiative with the aim to promote electro-mobility through contributions, like installing electric charging stations for customers and employees.

APPENDIX: DETAILED DATA OVERVIEW

All valuation factors used were sourced from robust and reliable sources such as national statistics and commonly used impact assessment databases. In addition, activity data was sourced from multiple METRO Cash & Carry departments.

The table below gives a full list of all sources used:

Impact theme	Impact/Valuation data	Value	Source
Environmental			
Clean air	Particulate matter (PM) & NOx emissions per km	Various based on EURO standard and vehicle type	EMEP/EEA Emission Inventory Guidebook 2016, Chapter 1.A.3.b.i-iv Road transport, Table 3.17: Tier 2 exhaust emission factors for passenger cars
Clean air	Cost of air pollution externalities	2016 Adjusted values: PM costs -€68/kg NOx costs - €18/kg 2010 Source values: PM costs -€62/kg NOx costs - €16/kg	Ecosense LE database, 2016 version. Costs estimates for Germany, urban areas, in 2010 EUR
GHG reduction	Internal cost of CO2	€25/t	METRO Energy Management
GHG reduction	Coolant leakage rate	10% p.a.	2006 IPCC Guidelines, Volume 3, Chapter 7, Table 7.9, Value for Medium & Large Commercial Refrigeration. Default range is 10-35%. The lower range has been chosen according to Germany's National Inventory Report
Land use	Value of ecosystem services (grasslands)	€2,071/ha	de Groot et al. 2012. Global estimates of the value of ecosystems and their services in monetary units. Ecosystem services, 1(1), pp.50-61.
Clean air, GHG reduction	Vehicle fleet & mileage	Various	METRO Germany, FSD, Controlling, Germany official statistics on the stock of vehicle fleet and annual mileages and fuel consumption
Waste	Cost of waste externalities	Incineration - €10/t; Treatment of organic waste - €-6/t; Materials recovery - €-2/t	EXIOPOL, 2009. Final report on waste management externalities in EU25. DELIVERABLE DII.5.B-2, p. 29
Avoided food waste in transport	Share of food waste at customer, share due to transport	2.5%, of which 20% due to transport	Stakeholder engagement - professional chef
Noise reduction	Cost of noise externalities	€0.01-€0.05/vehicle km	European Commission, 2014. <i>Update of the Handbook on external costs of transport</i>

Social			
Time saved by customers	Gross Value Added	HoReCa - €14/hour; traders - €22/hour	Germany official statistics - Ergebnis - 81000-0017, BWS in jew. Preisen je Erwerb.stunde (im Inland), 2015 Handel, Verkehr, Gastgewerbe
Avoided transport accidents	Value of a statistical life	€63,800/life year	Hein et al. 2016. Valuing a Statistical Life Year in Relation to Clean Air. Journal of Environmental Assessment Policy and Management, 18(04), p.1650025.
Avoided transport accidents	Disability-adjusted life years lost due to traffic accidents	-0.6 DALY/year	Global Burden of Disease database, 2015.
Noise reduction	Cost of noise externalities	€0.01-€0.05/vehicle km	European Commission, 2014. Update of the Handbook on external costs of transport
Value to society of provided meals	Average value of meal	€1.5/meal	METRO Germany and METRO France Controlling, Corporate Responsibility

All costs adjusted to EUR 2016 via GDP deflator, Purchasing Power Parity for Germany + exchange rates (World Bank)

APPENDIX: KEY ASSUMPTIONS

Issue	Method/Assumption	Rationale
Saved time	Using different GVA for HoReCa and retail. For other customers (private HoReCa GVA) no value is applied	No robust model for private customers - could be positive or negative
Food donations	Assuming 0.5 kg of donated food equals 0.5 kg of meals (in reality, there is some waste)	Assuming a % loss when producing a meal would require somewhat arbitrary assumptions
Vehicle fleet by EURO standard	<ul style="list-style-type: none"> Assumption of EURO standards based on total vehicle fleet in Germany (may not reflect customer fuel mix) Fuel usage - assumed 2:1 mix of Diesel: Gasoline based on NIR total fuel consumption 	No primary data is available for METRO customers vehicle fuel mix
Noise impacts	50:50 split between urban:suburban transport is assumed	The source study provides values of EUR/vkm for both, need to make an assumption shares
Health risk from transport injuries	Assume same risk for all types of transport (per vkm professional drivers may have smaller risk)	No primary data is available for assumptions on driver experience
Waste	<ul style="list-style-type: none"> 100 % of organic waste assumed to be MBT 100 % of recycling assumed to have heat and electricity recovery 	
Food waste at customer	<ul style="list-style-type: none"> 2.5 % of the food at HoReCa customers is wasted 20 % of those is due to transport 	No detailed studies on the topic, estimate provided by a professional chef (METRO internal)

APPENDIX: GLOSSARY OF TERMS

Term	Definition/Explanation
BSCI	The Business Social Compliance Initiative is a leading supply chain management system that supports companies to drive social compliance and improvements within the factories and farms in their global supply chains.
Cool chain (or cold chain)	A temperature-controlled supply chain. An unbroken cool chain is an uninterrupted series of refrigerated production, storage and distribution activities, along with associated equipment and logistics, which maintain a desired low-temperature range.
Depot	Stock location that is not accessible to the customer. The depot is usually close to the Cash & Carry stores and often shares the same building/roof. Dedicated location or building, exclusively for a stable and limited assortment, fast moving articles.
Economic value	The importance, worth, or usefulness of something to people - including all relevant market and non-market values.
Externality	A consequence of an action that affects someone other than the agent undertaking that action, and for which the agent is neither compensated nor penalized. Externalities can be either positive or negative.
Food service distribution (FSD)	Delivery from a separate depot without customer access.
Gross value added (GVA)	The measure of the value of goods and services produced in an area, industry or sector of an economy. Employee productivity in different sectors is measured as GVA per manhour.
HoReCa customers	Hotels, Restaurants and Catering.
Materiality	A principle to help define and determine the business, social and environmental topics that matter most to a business and its stakeholders.
Natural capital	The stock of renewable and non-renewable natural resources (e.g., plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.
Social capital	Resources and relationships provided by people and society. This encompasses two distinctive sets - skills, knowledge and well-being (human capital) and relationships, shared values and institutions (societal capital).
Store	Stock location that is visited by customers. Multiple store formats (classic, eco, etc.) are available, which differ by size, assortment, etc..
Sustainability accounting	A subcategory of financial accounting that focus on the disclosure of non-financial information about a firm's performance to external parties. These represent the activities that have a direct impact on society, environment, and economic performance of an organisation.
Valuation	The process of estimating the relative importance, worth, or usefulness of natural / social capital to people (or to a business), in a particular context.

RESULTS DISCLAIMER

The current approach does not produce a stand-alone valuation of METRO's net impacts. It serves as an instrument for comparison of distribution models in terms of their impact on natural and social capital. Thus, positive values do not indicate that METRO has a net positive impact on natural capital in absolute terms. Further, the scope of the assessment does not cover the whole life-cycle of any specific METRO product.

Certain material topics have been excluded due to not finding robust ways of assessment - e.g. direct and indirect labour impacts. As the FSD business is offered to professional Horeca and Trader customers only, the value of time saved by other customer groups has not been considered either.

The precision of the results is also restricted by data availability, data quality and certain assumptions. As some data and assumptions are specific for Germany, the results cannot be directly extrapolated to other markets or businesses.

The project has been exercised in spring 2017.

ACKNOWLEDGEMENTS

This report is a product of cooperation between partners. We would like to thank our partners and colleagues who provided us with invaluable data and expertise.

- METRO project team: Veronika Pountcheva, Michael Goebbels & Géraldine Pierre-Louis
- denkstatt project team: Ivan Paspaldzhiev, Peter Seizov, Boyan Rashev & Willibald Kaltenbrunner
- Key stakeholders for materiality assessment
- Colleagues of MCC Germany providing data and information

We would also like to thank Ketchum Pleon who helped make this report possible.

IMPRINT

Publisher:
METRO AG
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Dialogue with our readers is important to us because it shows us what you expect of our company and where we can make further improvements. We would therefore like to hear any questions or comments you may have about this report and our sustainability activities in general.

To share your thoughts, use one of our online dialogue tools or send us an e-mail: CR@METRO.de