

SUSTAINABLE VALUE CREATION

Sustainability Accounting along the value chain

CONTENTS

1	Executive summary	4
2	Business model	6
3	Context	8
4	Results	14
5	Discussion	22
6	Methodology	26
7	Acknowledgements	32
8	Room for thoughts	34

EXECUTIVE SUMMARY

Challenge

Building a comprehensive and comparable picture of METRO's impacts on economic, natural and social capital along the entire value chain for financial year 2016/17 – from agricultural production (upstream), through METRO's stores and warehouses (own operations), to professional wholesale customers (downstream). Included are the activities of METRO Wholesale in the following (METRO). However, economic, social and environmental impacts are typically measured in very different ways, which makes such analysis challenging.

Approach

Preparing a study of Sustainable Value Creation using impact modelling and monetary valuation techniques based on the guidance of the Natural and Social Capital Protocols.

Input-output models are used for identifying the impacts of products, occurring upstream and downstream in the value chain, by taking into account the interconnectedness of the global economy and linking this to the use of natural and social capital. For own operations, primary data from METRO Financial and Corporate Responsibility departments complete the picture. State-of-the-art country-specific impact factors are used for assessing damages to human and ecosystem health, which are valued based on best practice from existing high-profile studies.

Key results

METRO's activities along the value chain bring slightly less than €1 of net positive impacts across the economy, society and environment for each €1 of turnover. Each €3 of economic value created by METRO causes a negative impact of €1 on society and the environment.

METRO's global contribution is net positive

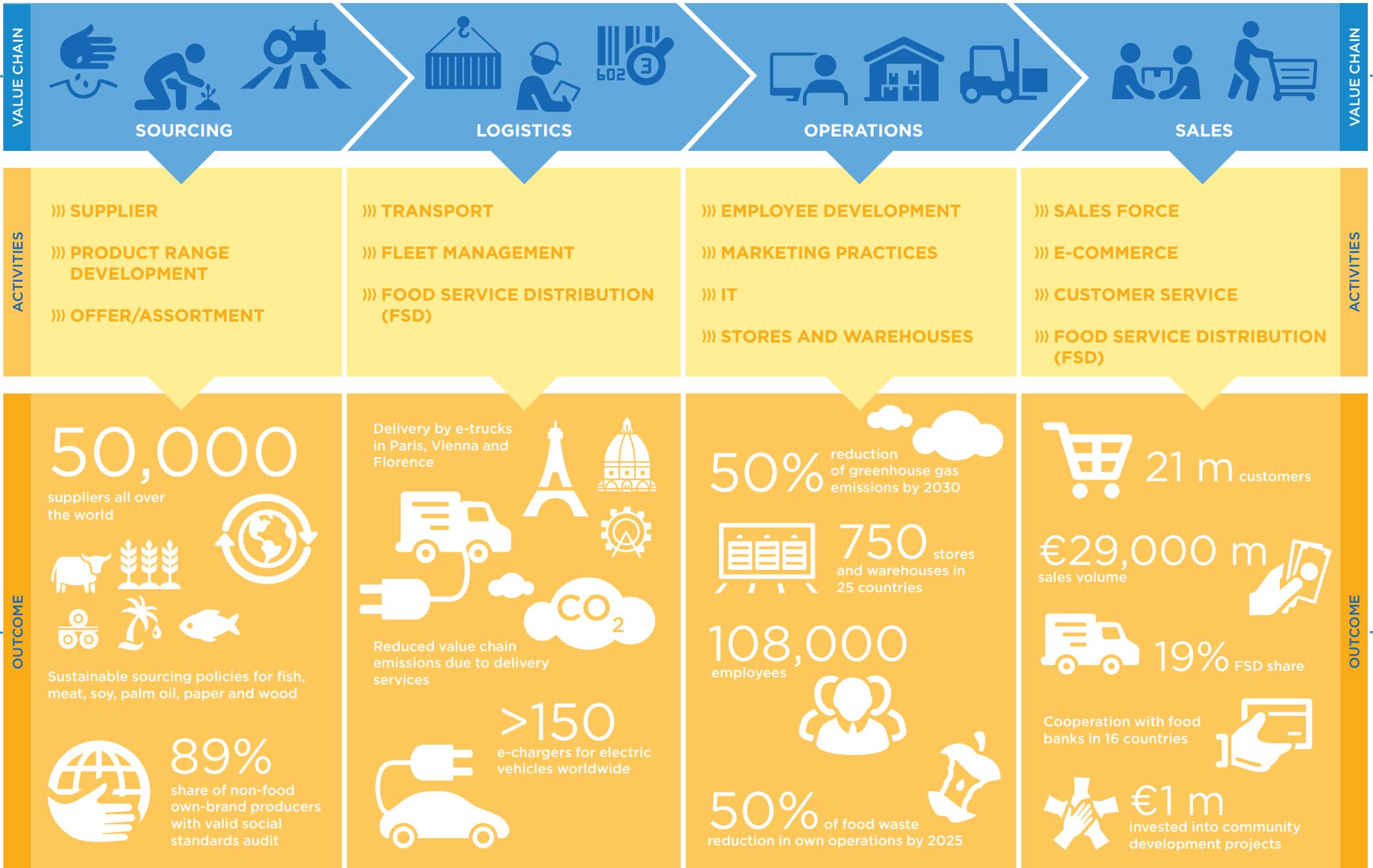
The most material issues are concentrated outside store doors in the upstream (product sourcing) and downstream (customer activities) parts of the value chain, showing the potential for leveraging METRO's global influence (21 million professional customers and about 50,000 suppliers) towards mainstreaming sustainable business by aiming to create economic value while improving social and environmental impacts.

Economic value creation is the most material impact category throughout the value chain. Nearly 58% of economic value is created upstream and nearly 34% downstream, highlighting the importance of METRO for its suppliers and customers, as well as the scope of and potential for METRO's influence.

The dominant negative impacts upstream and in own operations are environmental: water use is the largest of such impacts upstream (44% of negative impacts), owing to METRO's large reliance on agriculture in its food assortment. For own operations, air quality is most material, followed by greenhouse gases (together nearly 90% of negative impacts). Downstream, the most material negative impact is social risk (with 69%), owing to the fact that the business of METRO's customers relies much more strongly on social capital as opposed to natural capital.

The study methodology is conservative by its nature, taking into account its limitations. As such, results mostly serve as a baseline, as they do not yet take into account METRO's ongoing initiatives for sustainable sourcing, as well as social risk auditing and compliance activities in the upstream value chain. This will be integrated into the model in the near future.

METRO SUSTAINABLE VALUE CREATION MODEL - ACTIVITIES AND OUTCOME



3 CONTEXT

3.1 Background

METRO is an internationally leading specialist in wholesale, operating more than 750 wholesale stores in 25 countries. As such, METRO has a significant global presence. However, this presence extends far beyond store doors; the activities that METRO induces along its value chain can have significant impacts.

As a champion for independent business, METRO strives to create economic value for both customers and suppliers. What is more, METRO is committed to protecting the environment and leadership on social sustainability issues. This is exemplified by its position as Industry Leader in the Dow Jones Sustainability Index in Food and Staples Retailing for 3 years in a row.

Sustainability is core to METRO's business operations, managed by its Sustainability Committee, aiming to mainstream sustainability aspects in the day-to-day business of the entire company. Sustainability aspects are integrated across the entire supply chain, such as through optimised and localised procurement, as well as concrete goals for sustainable sourcing of fish, palm oil, paper and wood. Social sustainability is actively pursued via third-party audits according to the amfori BSCI monitoring process.

Given the large scope of METRO's impacts and responsibilities – encompassing economic value, environmental protection and social sustainability – a holistic approach is needed for assessing the full breadth of METRO's global influence.

METRO seeks to overcome this via the concept of Sustainability Accounting. Sustainability Accounting attempts to measure economic, social and environmental impacts in the language business best understands – that of monetary value. This enables METRO to compare between different types of impacts. It also aids in communicating risks and opportunities and in gaining a more complete picture of the impact of its operations. In this assessment, METRO sought to not only capture the impacts of its own operations, but also the impacts arising upstream and downstream. METRO calls this model of Sustainability Accounting “Sustainable Value Creation”.

The results of such an assessment are not intended to be interpreted in the same way as financial results; they do not represent a cost or liability to METRO in a conventional sense. Rather, they are a novel and more holistic way of estimating a business' influence on the economy, environment and ultimately society.

Such a holistic view is in line with METRO's commitment and aspiration for being a responsible company. The Sustainable Value Creation approach represents METRO's strong commitment in managing its impacts towards a more sustainable society.

SUSTAINABILITY ACCOUNTING IN ACTION: METRO'S PREVIOUS EXPERIENCE

In 2017, METRO conducted a pilot Sustainability Accounting project for comparing the impacts of its traditional cash-and-carry operations with its novel Food Service Delivery (FSD) business model. Leveraging the Natural and Social Capital Protocols and focusing on Germany, the study compared the 2 business models from the point of view of natural and social capital. Included were environmental impacts such as GHGs, air quality, noise and waste, as well as social impacts such as the time saved by customers.

In brief, the study found that for every €1,000 of sales, FSD offers an additional €68 of positive impacts on society and the environment compared to cash-and-carry. The greatest impact was found to be the time saved by business customers who do not need to travel to shop. Additionally, FSD was found to have lower GHG, air quality and noise impacts, as well as lower impacts due to traffic accidents.

While the penetration of the FSD model within METRO is still relatively low, the project showed that its planned increasing future penetration will contribute to the sustainability of METRO's business.

The successful implementation of this approach and the novel insights gained have led METRO to widen the scope and attempt to monetise where possible, the full impact of METRO's own operations, as well as those upstream and downstream from its stores and warehouses.

3.2 Aim

The present Sustainable Value Creation assessment is based on the guidance of the Natural and Social Capital Protocols and seeks to utilise the concept of Sustainability Accounting in order to evaluate the total net impact of METRO's value chain on society – in terms of economic, social and environmental impacts. The scope of the assessment can be described as the impact from farm to plate: from the planting of agricultural crops, through the entire process of converting them to products that METRO sells, through the activities of operating METRO's stores, down to the impacts of the businesses that METRO supplies – those in the HoReCa (hotels, restaurants and catering) and Traders (reseller) sectors.

The assessment aims to capture, where possible, the full breadth of positive and negative impacts arising from these activities. It aims to be conservative by its nature, so as to not overestimate positive impacts and conversely not to underestimate negative impacts. Limitations to the chosen approach due to data gaps and assumptions are acknowledged throughout and detailed in a dedicated Method note (please see section 6).

3.3 Key stakeholders

The scope of the assessment can most clearly be visualised through the stakeholders that are impacted by METRO's activities.

- Upstream from METRO are its suppliers, who include a diverse range of agricultural producers, as well as associated manufacturing operations, logistics and other service providers.
- Downstream from METRO, its wholesale customers have been considered – herein the HoReCa business and the Traders sector.
- Finally, there are METRO's own operations and associated stakeholders. First and foremost, these are its employees. Additionally, this includes shareholders (who receive dividends), creditors (who receive interest) and governments (who receive taxes).

3.4 Scope and boundary

METRO's activities have both positive and negative impacts. Some are related to stakeholders themselves, such as health and safety impacts on employees, others are the results of stakeholders' activities, such as the environmental and social impacts of suppliers and wholesale customers. The scope of the study is divided into 3 parts:

- Upstream: activities of suppliers and service providers. This includes agricultural production as well as manufacturing, logistics and all other economic activities that are linked to these (such as fuel production for use in agriculture).
- Own operations: all activities of METRO's stores, warehouses and other facilities, as well as logistics.
- Downstream: activities of wholesale customers, i.e. HoReCa and Traders customers.

3.5 Included impacts

Economic value includes the value METRO contributes to the economy from its own operations, as well as the value it induces for suppliers (upstream) and customers (downstream). Its basis are the payments included in METRO's profit and loss accounting.

Environmental value encompasses damages to human and ecosystem health due to greenhouse gas emissions, air and water pollution, water use and land use along the value chain.

Social value is comprised of the effects of food and other donations, employee training and health and safety impacts (for own operations), as well as the impacts of social risk¹ from activities of suppliers and customers in the value chain (upstream and downstream). The analysis does not yet include the impacts from METRO's on-going BSCI auditing and supplier development activities, nor does it include major activities such as the METRO Academy offering training possibilities for customers. As such, results mostly serve as a baseline with conservative estimates.

¹ Herein, social risk refers to the amount of work hours employed persons are exposed to risk of unfair labour practices (social risk hours), as defined by the standards for decent work developed by the International Labour Organisation (ILO). This is detailed in the online method note accompanying this report.

METRO SUSTAINABLE VALUE CREATION MODEL - CAPITALS AND IMPACT



Financial Year 2016/17; numbers may not exactly add up due to rounding

4 RESULTS

4.1 Main findings

The Sustainable Value Creation model of METRO reveals the following main findings for the financial year 2016/17:

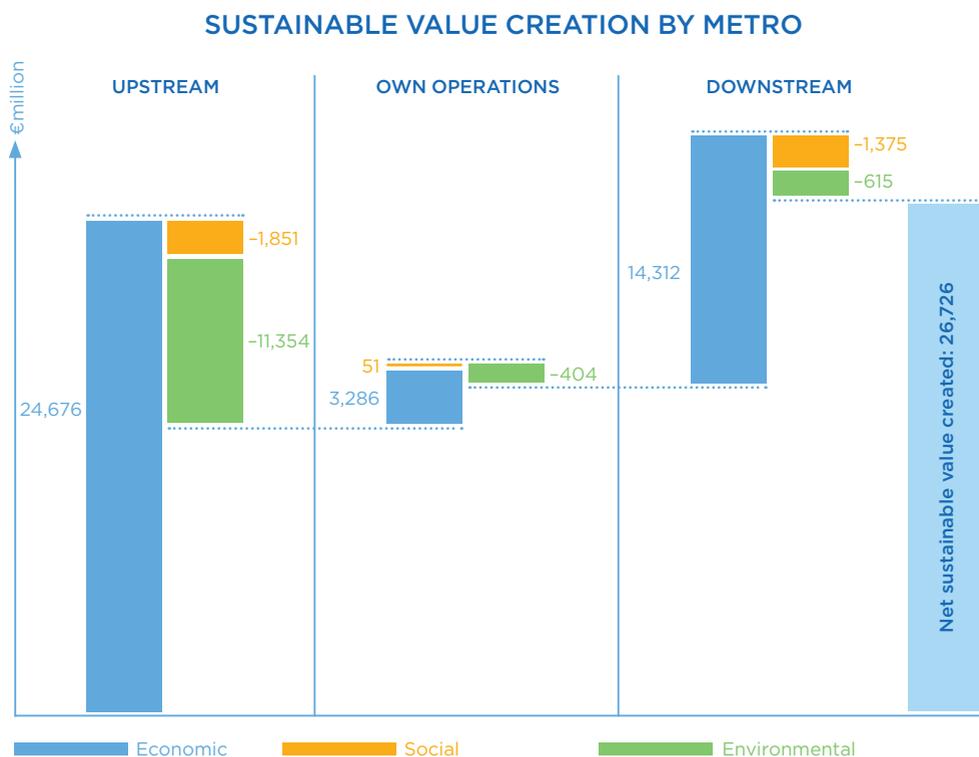


Figure 1: Net results of the assessment, divided into scopes and impact dimensions.

The net impact of METRO's value chain on society totals in a positive €26.7 billion. This means that for every €1 of turnover, METRO's activities result in slightly less than 1 additional euro of positive net impact across the economy, the environment and society. Each €3 of economic value created by METRO causes a negative impact of €1 on environment and society.

Upstream and downstream activities dominate the global picture, with a net impact of €11.5 billion and €12.3 billion respectively (as visible in figure 2 and figure 4). Together this represents approximately 89% of total net impacts. The impacts of METRO's own operations account for around 11% of total net impacts. Negative value is strongly concentrated upstream, which can be explained by the high impact of the supply chain, such as production of agricultural goods, manufacturing in risk countries and the global scope of METRO's sourcing.

Environmental impacts across the value chain (€-12.4 billion) are approximately 4 times higher than the sum of social impacts. The upstream scope expectedly contributes the most to environmental impacts in the value chain (approximately 92%) due to product sourcing being the most intensive activity with respect to natural capital. In addition to this, upstream social impacts (€1.9 billion) are approximately 35% higher than downstream. These results can be explained by the fact that METRO's product sourcing upstream relies heavily on international linkages to labour-intensive sectors such as agriculture, which have proportionately much higher impacts than the HoReCa and Traders industries downstream.

Though environmental impacts have a bigger influence on the total result, the impact assessment shows that social impacts can be important, especially downstream, where they comprise nearly 70% of all negative impacts.

4.1.2 Upstream

SUSTAINABLE VALUE CREATION BY METRO - UPSTREAM

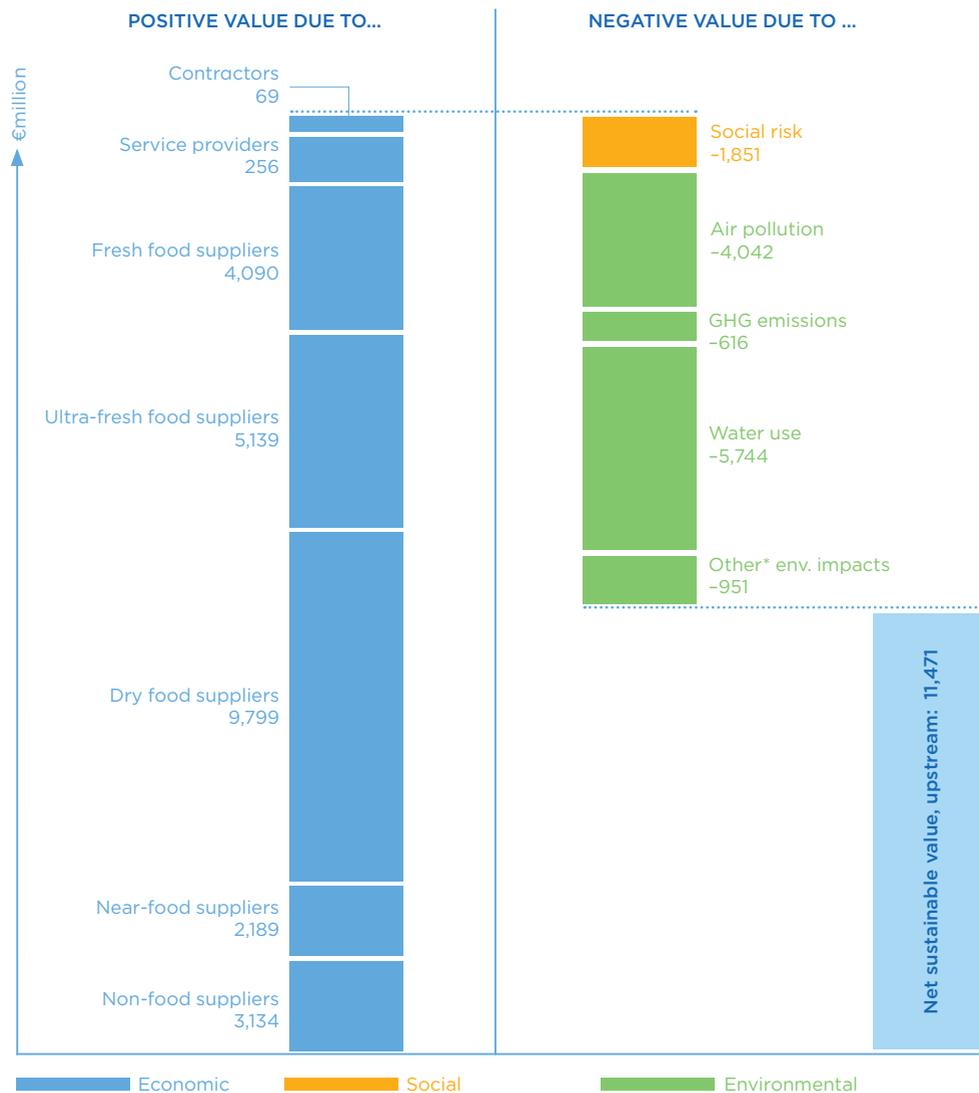


Figure 2: Upstream results broken down by impact category.

*Other includes: land use and water pollution.

Upstream impacts are valued at €11.5 billion and make up nearly 43% of METRO's net impact on society. Both the largest negative and the largest positive impacts can be found upstream. METRO procures goods and services from across the globe, supporting economic activity worldwide, as evidenced by the results for positive economic value in this report. Summing up environmental and social impacts for the whole value chain, nearly 84% of these occur upstream.

The single-largest negative impact is water use (44% of upstream negative impacts) – not unexpected given METRO's wide range of food assortment. This result highlights the importance of ongoing efforts such as the development of the METRO Strategy on Water. Air pollution is also significant (31%), which could be attributed to sourcing from developing countries, where older technologies and fossil fuel use are more prevalent. It should be noted that results are based on generic supply chain information and do not yet take into account METRO's sustainable sourcing policies.

Social impacts are also significant – the third-largest negative impact upstream (14%). This impact represents an aggregation of potential exposure to exploitative labour practices in the value chain and is based on international statistics. As such, it does not yet reflect METRO's ongoing social risk audits via the BSCI monitoring process. These results are thus conservative in nature.

In summary, for every €1.9 of economic value created upstream (paid to goods and service suppliers), METRO's activities induce €1 of negative environmental and social impacts. The results upstream highlight the importance of METRO's commitments to a more sustainable supply chain.

WHAT ARE METRO'S OWN BRANDS?

METRO's own brands comprise 16.3% of total sales for 2016/17. These include METRO Chef, METRO Professional, METRO Premium, Aro as well as Fine Life, Rioba, Sigma and Tarrington House.

SUSTAINABILITY:

Own brands are a core aspect of METRO's sustainability efforts. Sustainability impacts such as minimum standards for compliance or aspects offering social or environmental benefits have been considered for all own brands.

COMMITMENTS & TARGETS:

METRO's non-food own-brand products are monitored for social risks via the amfori BSCI monitoring process (or equivalent international standards), supplemented by METRO's deal-breaker procedures regarding child and forced labour, fire safety or unethical behaviour. Deal-breaker incidents lead to supplier suspension unless an acceptable social standard audit is passed.

METRO's own-brand commitments also include a target of 100% sustainably sourced palm oil by 2020, as well as a commitment for reviewing some 10,000 own-brand articles by 2018 for packaging and incorporating FSC®-certified materials in all own-brand drinks packaging.

4.1.3 Own operations

SUSTAINABLE VALUE CREATION BY METRO - OWN OPERATIONS

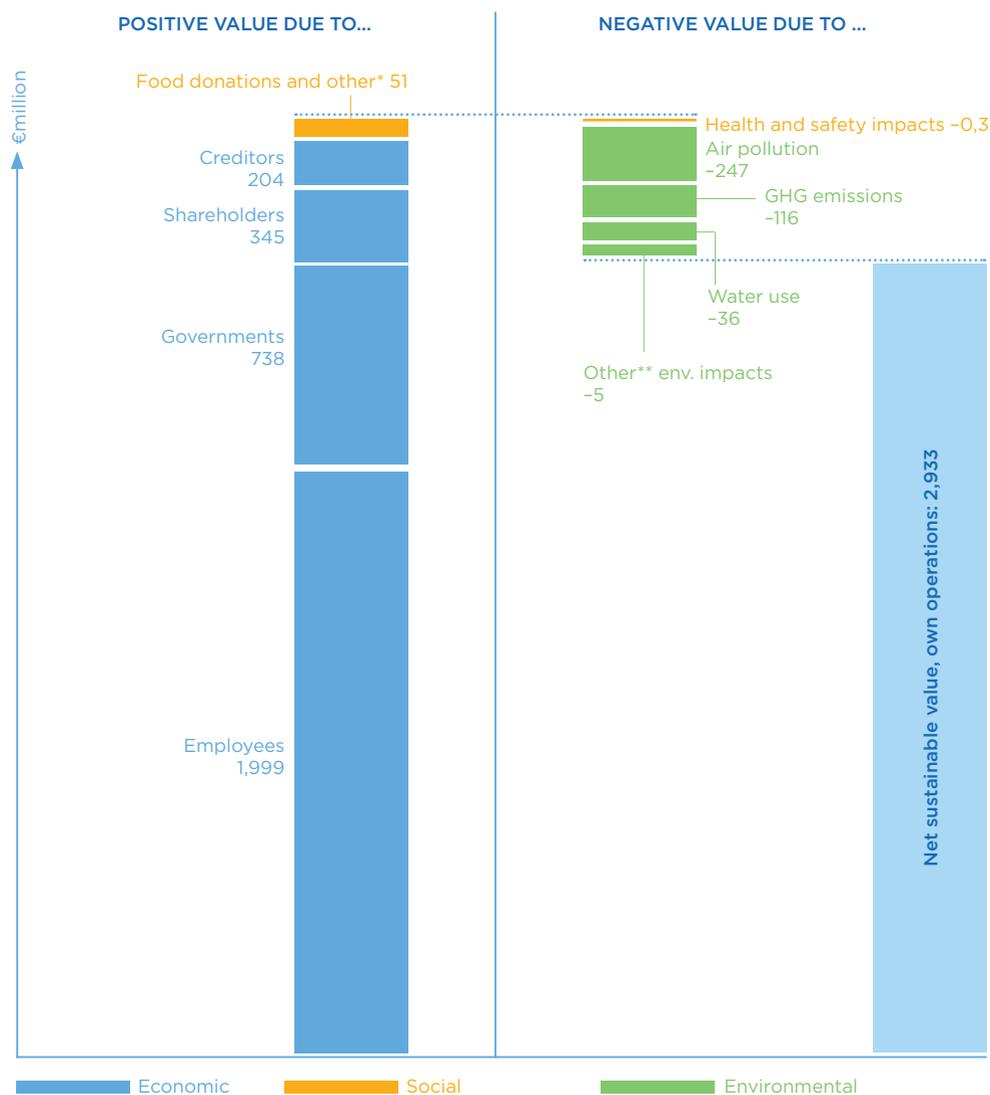


Figure 3: Own operations results broken down by impact category.

*Other includes: employee training, miscellaneous donations.
 **Other includes: land use and water pollution

The net impact of METRO’s own operations is €2.9 billion, nearly 11% of total net impact. Results are strongly influenced by the positive contribution of economic value towards employees (i.e. distributed salaries; €2 billion), highlighting the strong commitment in a people-centric business. Further economic impact of own operations (€1.3 billion) is from corporate payments (to shareholders, creditors and governments). As these are reported on a group level only, they cannot be disaggregated, while the rest of presented results cover METRO Wholesale only. Overall, positive economic impacts of own operations are approximately 8 times higher than combined environmental and social burdens.

Positive impacts are partly counteracted by a combined environmental and social value of €-404 million. The largest environmental impact linked to METRO’s own operations is air pollution (€-247 million), accounting for 61% of total negative impacts. The primary contribution to this impact derives from electricity use for facilities, influenced by the electricity production mix in the countries METRO operates in. Use of diesel fuel in transport also contributes strongly due to NOx emissions. However, the emission factors used are not specific to Euro standards for vehicles, so transport emissions are likely to be overestimated (detailed in section 6).

The second-largest in environmental impacts are GHG emissions (€-116 million), making up nearly 29% of the total environmental impact of own operations. This and the above result for air pollution show that ongoing activities such as energy-saving and energy awareness measures, METRO’s F-Gas Exit Programme, as well as own energy-production and fleet electrification efforts are all the more needed.

Overall, though negative impacts are relatively small compared to positive economic value created, they are in no way insignificant, as own sustainability efforts are the cornerstone for all other sustainability efforts along the value chain.

4.1.4 Downstream

SUSTAINABLE VALUE CREATION BY METRO – DOWNSTREAM

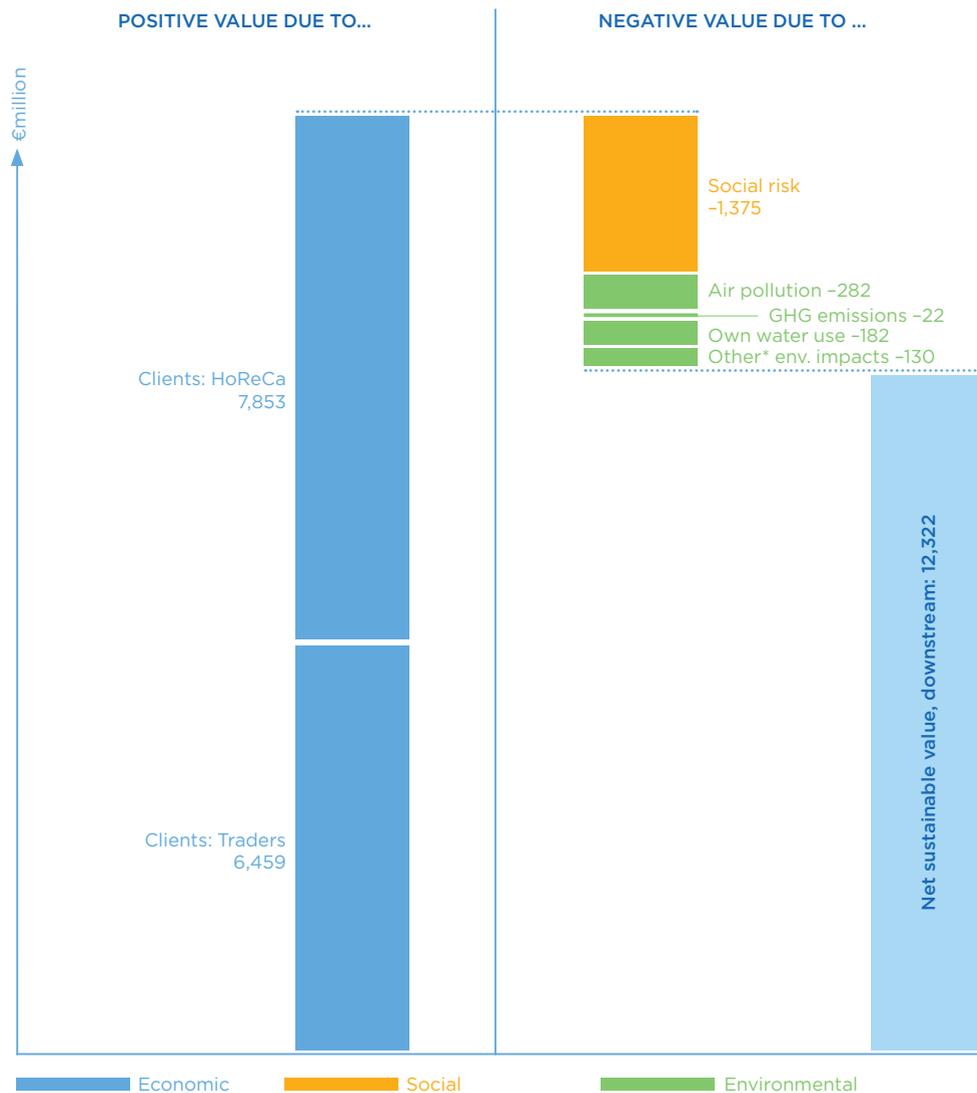


Figure 4: Downstream results broken down by impact category.

*Other includes: land use and water pollution

Downstream impacts are those linked to METRO's wholesale business – the impacts due to the activities of HoReCa and Traders customers. The net monetary value downstream totals in slightly over 12 billion, which is 46% of the net value for the entire value chain.

METRO understands that being a Champion for Independent Business means not only helping customers create value, but also bearing some responsibility for their impacts. This is why in the current study, METRO attributes to its net impact the full amount of negative impacts of its customers for every category in the study. For positive impacts (value created), METRO attributes to its net value only the part of value added which is paid to customers' employees (i.e. salaries). This is further elaborated in the Methodology section (section 6).

The economic value creation by customers that METRO sales induce is over 7 times larger than combined environmental and social impacts (€14 billion vs €-2 billion). This large ratio can be explained by the fact that the hospitality and retail industry is in general known to cause relatively smaller environmental impacts compared to its generation of economic value. This is in contrast to the upstream value chain, where more labour and resource-intensive activities occur.

The results for METRO's downstream value chain highlight METRO's positive contribution to business generation. However, they also highlight the potential for leveraging METRO's influence towards helping customers create truly sustainable value – one that generates economic benefits while also improving its environmental and social impacts.

5 DISCUSSION

5.1 Material impacts and METRO's activities

5.1.1 Upstream

The economic value of business with suppliers is the largest positive contribution to monetary value in the scope of the assessment. This is underpinned by METRO's aspirations for contributing to economic development in all markets in which it operates.

The single-greatest negative impact found is water use, accounting for 44% of negative upstream impacts. Most of this is due to agricultural production, which highlights the importance of working with suppliers at the very beginning of the value chain – at the farm level. METRO's Strategy on Water aims to take this into account and addresses the importance of the agricultural sector for total impacts. As part of this strategy and based on the integration of major suppliers into the CDP supply chain programme for water, METRO developed the METRO Water Initiative, which ran for the second time in 2018 on World Water Day.

Air pollution is found to contribute significant negative value, influenced strongly by the energy mixes in the individual countries METRO operates in and sources from. METRO's ongoing clean energy efforts serve to mitigate this for the company's own operations. However, managing the air pollution impacts from sourcing presents a more significant challenge to be addressed.

Social risks in the value chain are also highlighted as significant. This gives further weight to the importance of social risk management in product sourcing, such as via METRO's ongoing BSCI auditing of non-food own-brand suppliers.

Finally, some impacts are likely to be underestimated. GHG emission results do not take into account emissions of refrigerants (such as HFCs) due to lack of data in the EXIOBASE model. As refrigerants have very high global warming potentials, we can expect that GHG emissions in the upstream supply chain are in fact higher than stated in this assessment.

The water pollution model used is also likely to underestimate actual impacts, even though regional differences have been considered. This model is currently a top priority for improvement. In the future, the use of upcoming LC-IMPACT factors for water toxicity is planned.

5.1.2 Own operations

Within its own operations, the salaries that METRO pays to its employees and the value it brings to local governments are the most material positive impacts. METRO's human resource strategy focuses on 2 key aspects: on human resource management, which includes employee recruitment, retention and development, and on occupational health and safety management. METRO's objective is to attract the very best employees, to support them in accordance with their motivation and abilities and to strengthen their long-term loyalty to the company. Furthermore, METRO firmly believes that inclusion and diversity lead to better business results through an improved internal representation of the company's customers, access to a larger talent pool and greater employee initiative and development.

Air quality is the largest negative impact within own operations, accounting for 61% of negative impacts within this scope. GHG emissions make up an additional 29% of own operations' negative impacts. Ongoing programmes such as fleet electrification are important for lessening impacts in both categories. The increasing share of Food Service Distribution (FSD) can also be seen as a positive trend, as METRO's previous Sustainability Accounting experience has shown that FSD delivers benefits for GHG emissions and air quality compared to its cash-and-carry model.

Known limitations include health and safety impacts, which are likely underestimated due to suspected inconsistent reporting of workplace accidents across the METRO geographies. Finally, the calculation of value of impacts of "Other donations" can be further refined by taking into account the success of different types of donations in achieving lasting social outcomes. This can serve to better inform the company's social investments toward maximising added value to society.

5.1.3 Downstream

The economic value of business with HoReCa and Traders customers dominates downstream results. METRO supports its customers by offering excellent value-for-money and specifically tailored products and services for professional users. What is more, activities such as the METRO Academy are at the forefront of METRO's mission of being a Champion for Independent Business.

However, METRO acknowledges that championing independent businesses also means influencing towards positive change. Social risk is the largest negative impact for the downstream scope, which underpins the role METRO can play. Through influencing customers, METRO strives to contribute to customers' development of sustainable business – one that maximises economic value while also minimising environmental and social harm.

5.2 Outlook

5.2.1 Use of results in decision-making

Sustainability Accounting puts monetary value behind the economic, social and environmental impacts along the value chain, thus supporting in showing the business case for sustainable business conduct. The results feed into METRO's materiality analysis, illustrating impacts along the value chain, highlighting where negative effects can be mitigated best and where positive effects linked to business activities can be improved. These insights help to inform METRO's sustainability strategy and provide a fundamental underpinning for strategic decisions. The results confirm the focus in METRO's supply chain and customers, though without losing track of the importance of employees and own operations.

METRO views monetisation of external impacts (both positive and negative) as a necessary first step for developing a more holistic view of company performance. This holistic view is a prerequisite for ensured long-term competitiveness and for net positive contribution to societal aspirations (such as the UN Sustainable Development Goals).

The present assessment has clearly shown the importance of METRO's supply chain as well as customer relations and will move the focus of its sustainability activities even more in this direction. A planned next step is a more precise analysis of the supply chain, with the aim of identifying more specific hotspots and enabling concrete actions.

5.2.2 Methodological development

Sustainability Accounting is a novel and developing field. Thus, the methodologies used should also strive to reflect the state of the art of available science in order to ensure maximal robustness and real-world representativeness. Some parts of the methodology used in this assessment can be mentioned for further development:

- The inclusion of refrigerants (such as HFCs) in calculation of GHG emissions via EXIOBASE upstream and downstream.
- Incorporation of upcoming LC-IMPACT factors for water pollution. Also, taking into account the impacts of untreated waste water in different countries. Water pollution modelling can be seen as the most underestimated impact in the present assessment. Its future development is a likely priority.
- Use of air pollution factors which take into account the breakdown of vehicle (Euro) standards (currently, such data is unavailable for external logistics).

- More detailed modelling of 'Other donations'.
- For own operations, resolving any discrepancies in health and safety reporting so as to ensure maximal representativeness.
- For social risks in general, improving the methodology used for taking into account ongoing social sustainability activities. Working towards more detailed modelling and more robust assumptions for the valuation of social impacts is also necessary to ensure truly representative results.

Finally, a general aspiration is to include more primary data from suppliers/ customers where possible in order to improve estimates upstream and downstream in the value chain.

6 METHODOLOGY

The present assessment seeks to assign a monetary value to the impact of METRO's activities and was conducted following the guidance of the Natural and Social Capital Protocols. The following section briefly outlines the key data sources used for impact modelling and valuation in this assessment.

METRO gratefully acknowledges the work of the original authors of all data sources used in this assessment. A full description of the study methodology and references used is available in a dedicated Method note online at: www.metroag.de/en/media-centre/publications?q=mcf_responsibility

6.1 Scope

It is typically recommended that impact valuation exercises cover at least a company's own controlled operations (as defined for financial reporting purposes) plus its direct suppliers. The present assessment seeks to go further and covers the activities along the entire value chain of METRO's wholesale operations in all 25 countries it operates in. This is divided into 3 parts:

- Upstream – the impacts due to activities induced by METRO's procurement of goods and services. These impacts are modelled 3 levels down, namely for 1) agriculture and raw materials production; 2) manufacturing and processing; 3) logistics. All additional economic activities such as production of fuels for energy used by the above industries is also included.
- Own operations – the impacts due to the activities of METRO's stores, warehousing and auxiliary operations, as defined for financial and sustainability reporting purposes. In this assessment, this covers the activities of METRO Wholesale for financial year 2016/17. For assessing economic value, corporate payments reflect the group of Metro as a whole and not just METRO Wholesale, as these are currently reported at the group level only and cannot be disaggregated.
- Downstream – the impacts due to activities induced by METRO's sales to wholesale customers. In the present study, this includes the HoReCa (hotels, restaurants and catering) and Traders (reseller) sectors. METRO's customer group 'SCO' (professional service companies and organisations, such as offices and institutions) is excluded. The rationale for exclusion is that it is not reasonable to link said customers' activities to the goods they purchase from METRO (such as office supplies).

The activities of own operations are included based on primary data from METRO accounting on energy, fuel and resource usage, as well as economic activities. Activities upstream and downstream are included via input-output modelling, which relates payments (upstream) and sales (downstream) figures to environmental and social impacts.

6.2 Impact modelling and valuation

In terms of materiality, the assessment aimed to be extensive and include the fullest possible range of impacts for the 3 main impact dimensions – economic, environmental and social. All impacts are modelled bottom-up for individual METRO countries and aggregated for the final results presented in this document. The table on the next page outlines the data sources used.

6.2.1 Impact modelling

The impact modelling approach in this study has been developed with the aim of offering comprehensiveness while also limiting the different data sources and methods utilised, so as to narrow down the sources of uncertainty in the derived results.

For economic impacts, simple macroeconomic calculations are performed via the World Input Output Database.

For the environmental category, impacts are ultimately transformed to:

- Damage to human health (in Disability-adjusted life-years; DALYs)
- Damage to ecosystem health (in Potentially disappeared fractions of species; PDFs)

	CATEGORY	IMPACT	DATA INPUT	IMPACT MODELLING	VALUATION
UPSTREAM	Economic	Value to suppliers	Value of purchases from goods suppliers	-	World Input-Output Database
		Value to contractors	Value of services purchased (e.g. consultancy)	-	World Input-Output Database
		Value to service providers	Value of services purchased (e.g. maintenance, cleaning, waste management)	-	World Input-Output Database
	Social	Social risk from exploitative labour	Value of purchases from goods suppliers	estell model by Sustain (based on i.a. EXIOBASE 2.2, ILO)	Value of exploitative labour
Environmental	<i>As for own operations</i>	<i>As for economic value</i>	estell Model by Sustain (based on EXIOBASE 2.2), LC-IMPACT*	<i>As for own operations except for land use (damage to ecosystem health used)</i>	
OWN OPERATIONS	Economic	Value to stakeholders	Distributed dividends	-	Taken 1:1
		Value to creditors	Paid interests	-	Taken 1:1
		Value to employees	Paid salaries	-	Taken 1:1
		Value to national and local government	Paid taxes and fees (incl. social security)	-	Taken 1:1
	Social	Value of employee training	Investments in training	-	Multiplied by employee turnover
		Health and safety	Days lost due to accidents	-	Damage to human health
		Food donations	Value of food donated	Gustavsson et al. (2011) + ExternE (2008)	METRO value of a meal (METRO France)
		Other donations	Value of donations	-	Taken 1:1
	Environmental	Greenhouse gases	METRO GHG accounting (Scope 1, 2 and 3)	-	METRO GHG price
		Air pollution	Energy use (facilities), fuel use (logistics)	EMEP/EEA inventory guidebook, Tier 1 + LC-IMPACT	Damage to human health Damage to ecosystem health
		Water use	Water use (blue water)	LC-IMPACT	Damage to human health Damage to ecosystem health
		Water pollution	Water use (blue water)	ecoinvent v3.4 + ReCiPe2016	Damage to human health Damage to ecosystem health
Land use	Floor area of facilities and parking lots	LC-IMPACT	Value of grassland ecosystem services		
DOWNSTREAM	Economic	Value to clients	Value of sales to HoReCa and Traders	World Input-Output Database (turnover)	World Input-Output Database (share of employee compensation only)
	Social	<i>As for upstream</i>	<i>As for economic value</i>	Derived from upstream + vulnerable employment rate (ILO)	<i>As for upstream</i>
	Environmental	<i>As for upstream</i>	<i>As for economic value</i>	<i>As for upstream</i>	<i>As for upstream</i>

*With the exception of water pollution - modelled in the same way as for Own operations

The following environmental categories are modelled:

- Air pollution – particulate matter (as PM_{2.5} equivalent), NO_x, SO_x, NH₃ and NMVOCs; respiratory effects as well as photochemical ozone formation and terrestrial acidification
- Water use – water stress effects on malnutrition and on aquatic and riparian habitats
- Water pollution – human health toxicity as well as aquatic and marine eutrophication and toxicity
- Land use – biodiversity loss

All are modelled via country-specific factors from the LC-IMPACT FP7 project. Noted exceptions are Own operations – Greenhouse gases, Own operations – Land use, and Water pollution for all scopes (included via ecoinvent data and the ReCiPe impact method).

Greenhouse gases for own operations follow METRO's internal GHG accounting procedure³ and include Scopes 1, 2 and 3 under the Greenhouse Gas Protocol. The latter most notably excludes the GHG footprint of METRO's product assortment, which is included in the upstream scope. For own operations – land use, LC-IMPACT factors

are not used due to not being representative of METRO's land use. This is further detailed in the online Method note for this assessment.

Finally, social impacts are modelled via a collection of approaches for own operations and based on the concept of social risk hours developed by Sustain for upstream and downstream scopes.

Social risk hours are the amount of hours employed persons are exposed to risk of unfair labour practices, as defined by the ILO standards on decent work.

6.2.2 Valuation

The following table details the valuation factors used in this assessment. Please refer to the dedicated online Method note for further details, including references to data sources used.

Where appropriate, adjustments for purchasing power and inflation (based on GDP deflators) were carried out via data from the World Bank World Development Indicators.

³https://www.metroag.de/-/assets/metro/documents/responsibility/metro-carbon-footprint-methodology_en.pdf

VALUATION FACTOR	MAGNITUDE	SOURCE	USED FOR	ADJUSTMENTS
Value of a statistical life year (VOLY)	€69,750 per disability-adjusted life year	Upper range from ExternE, CAFE and NEEDS (EU projects)	Damage to human health	For inflation since 2005. No purchasing power adjustment (considered unethical).
Ecosystem damage restoration cost	€1.37 per potentially disappeared fraction value for Germany. Separate values used for EU25 countries.	NEEDS	Damage to ecosystem health	For inflation since 2006. For purchasing power for non-EU countries. Aligned with LC-IMPACT (see online Method note).
Value of exploitative labour	€2,745 per social risk year (average value)	International Labour Organisation	Social risk from exploitative labour	Converted from USD. For inflation since 2012.
METRO GHG price	€25 per ton CO ₂ equivalent	METRO GHG accounting	Greenhouse gases	-
Value of a donated meal	€1.52/500 g	METRO Cash & Carry France	Value of food donations	For purchasing power
Value of grassland ecosystem services	€0.24/m ²	de Groot et al. (2012)	Own operations – land use	For inflation since 2006
Attributable salaries	% of employee compensation to total induced turnover for HoReCa or Traders	World Input-Output Database	Downstream economic value	-

7 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: Michael Goebbels and Chantal Wagner
- denkstatt project team: Ivan Paspaldzhiev, Boyan Rashev, Peter Seizov, Florian Krautzer and Willibald Kaltenbrunner
- Colleagues of METRO AG Corporate Controlling and Finance providing data and information

The project team gratefully acknowledges the contribution of Sustain Consulting GmbH for quantifying upstream emissions, resource use and social risk.
<https://en.sustain.com/estell/>

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

Publisher:

METRO AG
Metro-Straße 1
40235 Düsseldorf
Germany
+49 211 6886-4252
www.metroag.de
@METRO_News

Status:

August 2018



www.denkstatt.eu

CORPORATE RESPONSIBILITY

E-mail: CR@METRO.de