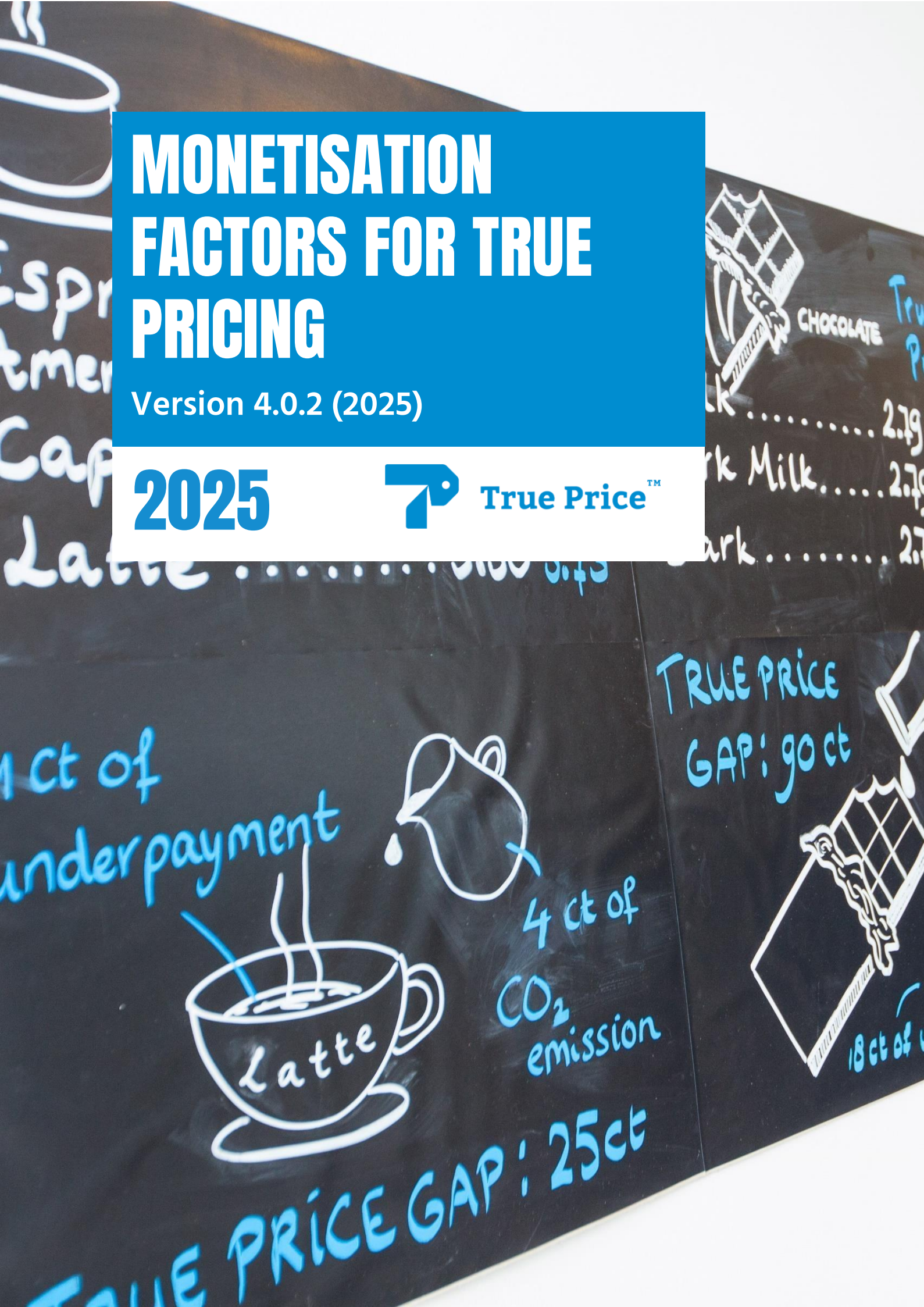
MONETISATION FACTORS FOR TRUE PRICING

Version 4.0.2 (2025)

2025

True Price™



Monetisation Factors for True Pricing

Version 4.0.2 (2025) – November 2025

About True Price Foundation

True Price Foundation is a nonprofit organisation based in the Netherlands that works to promote the understanding and implementation of true pricing.
The Foundation has three core activities

a. To develop and maintain the True Price Standard.
b. To activate governments, civil society organisations, trade unions, knowledge institutions and companies for the adoption of true prices, for example with the Global Partnership on the True Price of Food.
c. To mobilise the demand for true prices among consumers through the True Price Movement.

For more information visit: www.truepricefoundation.org.

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Change log

True Price aims for its monetisation factors to be the most representative approximation of external costs given the latest knowledge and available data. As such, when more representative methods of calculation or more accurate data are identified, the existing monetisation factors are updated accordingly. We welcome feedback from valuation and true cost accounting specialists and users. We would be grateful for you to send your input to info@trueprice.org.

1 (2020)	First version
2.0.3 (2021)	Second version
3.0.0 (2023)	Third version
4.0.2 (2025)	Current version

The current revision focuses primarily on updating two things: 1) child labour monetisation factors, and 2) climate change monetisation factors. This new version also incorporates a new base year and updates all values to 2024 prices. Table 1 details the changes that have been made between the current and the previous version of this work.

Table 1: Log of changes from previous version 3.0.0 to current version 4.0.2

#	Change	Description of change	Monetisation factor(s) affected
1	New child labour monetisation factors	The newly published Child labour methodology (van Veen et al, 2025) is integrated in this report. This new method has just three indicators: hours of hazardous child labour, hours of non-hazardous child labour, and FTEs to be audited for child labour (latter one being unchanged from the previous version).	• Child labour
2	Updated contribution to climate change monetisation factor	In past versions, the impact of Contribution to climate change was classified as a reversible impact, and therefore a *restoration cost*, marginal abatement cost (MAC), was used for monetisation. In 2025, this approach was re-evaluated based on partner and user feedback received, on changes in political landscape and lagging progress on the Paris Agreement's 2 degrees target. As of this version, Contribution to climate change is classified as irreversible impact, leading to the use of a *compensation* cost, the social cost of carbon.	• Contribution to climate change
3	Nitrogen deposition monetisation removed	The NH3 NOx Nitrogen deposition indicators of Air pollution are removed from this version. These factors (as published in Galgani et al, 2023) can still be used, but it is not recommended to use them in combination with other NH3 and NOx related Air pollution monetisation factors to avoid double counting.	• Air pollution: Nitrogen deposition
4	All factors inflated to 2024	Factors in this publication are at 2024 price levels[1].	• All factors

[1] Inflation adjustments use consumer price index (CPI) data . Source: World Bank. *World Development Indicators*, accessed August 2025.

5	Change of base year	The monetisation factors bring together monetary data points expressed in different currencies and from different years. To harmonize this while keeping the results stable, we select a *base year* where all currency conversion is done[2]. The base year used to be 2016 in previous versions and it has now been updated to 2024.	• All factors

[2] Exchange rate conversions use official exchange rate data. Source: World Bank. *World Development Indicators*, accessed August 2025.

Abbreviations

1,4-DB	1,4-Dichlorobenzene
CFC11	Trichlorofluoromethane
CHRB	Corporate Human Rights Benchmark
CO_2	Carbon Dioxide
Cu	Copper
DALY	Disability Adjusted Life Year
eq	equivalent
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FTE	Full Time Equivalent
GHG	Greenhouse Gas
H&S	Health and Safety
ha	hectare
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
IPEC	International Programme on the Elimination of Child Labour
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
m^3	cubic meters
MSA	Mean Species Abundance
N	Nitrogen
NH_3	Ammonia
NMVOC	Non Methane Volatile Organic Compounds NO_x Nitrogen Oxides
OECD	Organisation for Economic Cooperation and Development
OHCHR	Office of the High Commissioner for Human Rights
P	Phosphorus
PEF	Product Environmental Footprint
PM	Particulate Matter
$PM_{2.5}$	Fine particulate matter (2.5 microns or less in diameter)
PTSD	Post-Traumatic Stress Disorder
RIVM	The National Institute for Public Health and the Environment (Rijksinstituut voor Volksgezondheid en Milieu
SAI	Social Accountability International
SOC	Soil Organic Carbon

SO_2	Sulphur Dioxide
TEEB	The Economics of Ecosystems and Biodiversity
tkm	tonne-kilometre
TPMD	True Price Monetization Database
TPS	True Price Standard
UN	United Nations
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
VSL	Value of a Statistical Life
WHO	World Health Organization
WWF	World Wildlife Fund

1 Introduction

1.1 Content of this publication

This publication presents monetisation factors for the accounting of both environmental and social external costs. The first Monetisation Factors for True Pricing document was published in 2020. The aim of the original publication was to facilitate the adoption and application of true pricing, fill a gap in the literature and accelerate standardisation. This fourth edition serves the same purpose and provides improved and updated monetisation factors. A full overview of changes compared to the previous version can be found in the change log at the start of this document.

Monetisation factors are estimates of the remediation cost of the social and environmental impacts that must be included to estimate the true price of a product. These impacts are measured by a set of footprint indicators[3] and every footprint indicator can be converted to a monetary unit using the corresponding monetisation factor. When all footprint indicators are measured and monetised for a product, the true price can be calculated.

This publication provides monetisation factors for ten environmental and ten social true price impacts and their footprint indicators and sub-indicators, along with an explanation of the interpretation and sources. The monetisation factors are all expressed in 2024 price levels. Ideally, monetisation factors should be regional, as an impact in one place may be different from the same impact elsewhere. In this publication, global values are provided. Unless otherwise stated, these represent a global average of different countries or regions. Methodologies to derive regional/country-specific factors are available in other publications (see Section 14).

1.2 Methodological foundation

A brief overview of the methods used is given in Section 2. For an explanation of the principles and framework used to select the footprint indicators and monetisation factors, refer to the Principles for True Pricing (True Price Foundation, 2020). A detailed justification is available in separate impact modules. A Valuation Framework (Galgani, Woltjer, de Adelhart Toorop, & de Groot Ruiz, 2021b) and True Pricing Assessment Method for Agri-Food Products (Galgani, van Veen, et al., 2023) are also available[4].

1.3 What the monetisation factors can be used for

The monetisation factors included in this publication are to be used primarily in the context of true pricing following the True Pricing Assessment Method. They provide the key to expressing external costs (negative social and environmental impacts) in monetary terms.

True Price Foundation ultimately wants to enable everyone to calculate and publish true prices and work towards sectoral guidelines that would allow anyone to get started. This publication forms part of the True Price Standard. *The True Price Standard consists of normative foundations, calculation methods, monetisation factors and guidance on implementation.*

The monetisation factors can also be applied in various applications outside of true pricing, including

[3] The indicators are comparable to the impact category mid-point and end-point indicators of an LCA.

[4] More information and all the method documents can be found on www.truepricefoundation.org and in section 2.8.

(i) to monetise negative externalities in true cost accounting and impact assessments, (ii) to monetise impacts pertaining to the welfare dimension *respect of basic rights* for Integrated Profit & Loss statements, in line with the Impact-Weighted Accounts Framework (IWAF)[5] and (iii) as weighting factors for LCA.

The monetisation factors provided in this publication are a work in progress. We invite you to check regularly for updates on www.truepricefoundation.org.

1.4 Who should use this publication

This publication is intended mainly for experts, researchers and practitioners who are active in the field of true pricing, impact assessment, impact-weighed accounts, true cost accounting or LCA.

1.5 Reader's guide

This publication consists of four sections: this section is an introduction; Section 2 briefly discusses the concept of true pricing and the methodology used to derive the monetisation factors; Section 3 provides an overview of the impacts relevant for true pricing, along with their definitions; Section 4 provides the footprint indicators and the monetisation factors.

In addition, this publication includes a glossary of key terms at the end and a change log at the beginning to track updates from the previous version.

[5] The Impact-Weighted Accounts – or IWAs – are a way for organisations to quantitatively assess their impact: how they create value for all stakeholders. The Impact-Weighted Accounts Framework is incubated by the Impact Economy Foundation (IEF). For more information visit: https://impacteconomyfoundation.org/

2 About the true pricing methodology

This section provides a brief discussion about true pricing methodology, focusing on the most important concepts to derive and apply monetisation factors. For more information on the principles and framework behind this methodology, see Section 2.8.

2.1 What is the true price?

The true price is a way to make the external costs of producing and consuming a product explicit. *External costs* are the costs associated with negative externalities. These are the negative effects on external stakeholders who did not participate in the production or consumption of that product (or, if they did, did not do so sufficiently freely). Externalities include effects on the environment, such as climate change and water pollution, and on people, such as health and safety accidents and child labour.

True pricing makes external costs explicit by assessing them on a per-unit basis and by monetising them— that is, expressing them in a monetary way (e.g., in euros or dollars), just as with conventional costs. The sum of all external costs assessed in this way is called the "true price gap". The true price gap can be compared directly to the market price of the product: the two are added together to get to the true price. The true price can be interpreted as how much the product would *truly cost* if it would respect internationally accepted rights and sustainability goals. It includes costs to the buyer (the market price) and the unpaid costs to society (the true price gap).

We believe true pricing—expressing externalities as discussed above—can contribute to the transformation towards a more sustainable economy. For more on the applications of true pricing by businesses, consumers and governments, see A roadmap for true pricing (True Price Foundation, 2019).

2.2 How the true price is calculated

Calculating the true price of a product means calculating the true price gap and adding that to the market price. Calculating the true price gap in turn requires expressing all relevant externalities in monetary terms. This raises two questions: how to assess which externalities should be taken into account, and how to quantify and monetise them.

For the first question, the true price method takes a rights-based approach. Internationally accepted rights and agreements are taken as a starting point in determining which externalities should be included. The resulting subset of externalities—referred to as 'unsustainable externalities' or 'unsustainable impacts'—is the set of negative effects of producing and consuming products that should be factored into the true price gap.

Rights that are considered are the basic rights of all people as specified by international conventions, and include human rights, fundamental labour rights and environmental rights. True pricing is based on the normative idea that, to reach sustainability, the rights of all stakeholders, including future generations, should be respected by markets and the economy.[6] The second question is how to

[6] The rights-based framework is explained in the Valuation Framework and detailed in full in the Principles for True Pricing (In particular, Chapter 1 presents the normative foundations, Annex A contains principles and definitions, and

quantify and monetise these externalities. For each of the relevant impacts, the size of the impact in natural unit (or 'footprint indicators') can be measured or estimated using primary or secondary sources (e.g., LCAs). Examples of footprints are the emission volumes of greenhouse gases per unit product (for determining the contribution to climate change), and hours of child labour per unit product. The impact expressed in its natural units (or footprint indicators) can then be multiplied by the monetisation factor for that impact.

2.3 What monetisation factors are based on

Principles on what perspective to take are needed to determine the monetisation factor for an impact. For example, greenhouse gas emissions contribute to climate change, which imposes significant costs on society (damage or compensation costs, also referred to as the costs of inaction). Many effects of climate change could be avoided today by implementing a set of costly mitigation measures (abatement costs, also referred to as the costs of action). Both the long-term societal costs of climate change and the costs of preventive measures are associated with carbon emissions, but they represent different types of costs.. So, it is important to use a coherent framework to define the monetisation factors used in true pricing.

The Principles for True Pricing document defines the principle of remediation that monetisation can be based on. This is inspired by, among others, the UN Guiding Principles on Business and Human Rights (UN OHCHR, 2011) and links directly to the rights-based approach.

Article 22 in the *UN Guiding Principles* reads,

> Where business enterprises identify that they have caused or contributed to adverse impacts, they should provide for or cooperate in their remediation through legitimate processes.

What remediation entails is explained further in the commentary to Article 25:

> Remedy may include apologies, restitution, rehabilitation, financial or non-financial compensation and punitive sanctions (whether criminal or administrative, such as fines), as well as the prevention of harm through, for example, injunctions or guarantees of non-repetition.

The true price methodology implements the principles of remediation based on the idea that, to remediate an impact, reversible damage should be restored, irreversible damage should be compensated, and illegal externalities should also be priced through retribution cost (legal penalties), reflecting moral and justice obligations when violations occur. Additionally, for irreversible and severe effects, a prevention of re-occurrence cost should be considered, too. The sum of the applicable costs for any given impact in violation with Human, Labour, Environmental or other applicable rights is the *remediation cost*, represented by these monetisation factors.

Therefore, the following four types of costs are identified: 1) Restoration costs, 2) Compensation costs, 3) Prevention of re-occurrence costs and 4) Retribution costs.

1) Restoration costs

Restoration costs are the cost of bringing people's health, wealth, circumstances, capabilities, or

Annex C contains a (preliminary) list of all impacts.

environmental stocks and qualities to the state they would have been in the absence of the social and environmental damage associated with an impact (e.g., cost of ecosystem restoration). Restoration cost is applied for impacts where restoration is feasible, or feasible and more economically efficient than compensation, when the damage to people or communities is not severe.

2) Compensation costs

Compensation costs are the cost of compensating affected people for economic and/or non-economic damage caused by the social and environmental impacts of producing or consuming a product. In the valuation literature, this is also called "damage cost" (e.g., compensating for denied income, or the value of lost human health). Non-economic damage can be assessed using the best available stated and revealed preference valuation techniques. Compensation costs are part of the remediation costs for impacts where restoration is not considered feasible.

3) Prevention of re-occurrence cost

Prevention of re-occurrence cost represents the upfront cost that should be incurred to avoid, avert or prevent the identified social and environmental impacts of a product from occurring again in the future (e.g., the cost of introducing human rights audits in a supply chain). Prevention of re-occurrence cost is part of the remediation costs, in addition to restoration or compensation, when the damage is considered more severe and irreversible. Whereas the other types of costs refer to realised damage, this cost relates to the *prevention* of future damage. It finds its basis in, among others, the *UN Guiding Principles* mentioned above that acknowledge a responsibility to prevent the re-occurrence of human rights breaches (UN OHCHR, 2011).

4) Retribution cost

Retribution costs are the cost associated with fines, sanctions or penalties imposed by governments for certain violations of legal or widely accepted obligations. They represent the damage to society caused by the breaking of laws. For impacts that correspond to the breach of a legal or a widely accepted obligation, retribution costs are part of remediation costs, over and above restoration, compensation and/or prevention of re-occurrence costs.

2.4 How monetisation factors are derived

To derive monetisation factors for a given impact, the following approach is followed:

1. The types of damage that are associated with the impact are determined based on existing literature.
    - Damage can be either damage to people or to the environment. In some cases, the damage has already occurred (i.e., damage in the past; it is irreversible).
    - In other cases, the future damage *might* occur unless it is prevented (namely, reversible future damage), or is *certain to occur* (namely, irreversible future damage).
    - The damage can also be assessed as severe or non-severe.
    - Which of the four types of remediation cost (i.e., Restoration, Compensation, Prevention cost of re-occurrence or Retribution) applies is assessed from the rules in Section 2.3.
    - More than one type of cost might be relevant (e.g., both Compensation costs and Prevention costs of re-occurrence). In some cases, the choice of cost may vary, depending

on the country or region where the impacts take place, leading to different monetisation factors in different geographies.

2. The relevant costs are quantified, based on economic modelling and data available in the literature, in a way that can be attributed linearly to one unit of impact, as measured by the footprint indicators.
    - For impacts that have only one footprint indicator, this is a single monetisation factor. For impacts that have a set of distinct footprint indicators, there are monetisation factors for each.
    - The quantified cost(s) are summed to form monetisation factors.
    - The monetisation factors bring together monetary data points from a variety of sources, expressed in different currencies and from different years. To express everything in the same currency and year, we use World Bank data[7]. To harmonize this while keeping the results stable, we select a base year where all currency conversion is done (2024, as of this version), and we update World Bank data and the base year of choice only every 5+ years.

These steps are carried out for each of the social and environmental impacts considered, resulting in 76 monetisation factors. Section 4 show the results of this procedure for the true price indicators that have been assessed so far.

2.5 Example of the derivation of monetisation factor

This section provides an example to show the process of identifying elements that contribute to the monetisation factors.

Child labour

The child labour method (van Veen at al., 2025) aims to account for the remediation cost of child labour based on research and data on some of the negative effects that can be quantified.

In brief, the monetisation factors for child labour combine compensation costs, prevention costs, and retribution costs. These costs are calculated separately for hazardous and non-hazardous child labour.

1. Compensation costs for hazardous and non-hazardous child labour cover:
    - Loss of childhood and quality of life, based on an estimate of quality of life loss and valuation of a life year. This is higher for hazardous child labour than non-hazardous, because of the negative health effects.
    - Lost future earnings due to missed education, based on the expected relation between education and future wages.
2. Prevention of re-occurrence costs cover:
    - The cost of providing education to reduce the incidence of child labour.
    - The cost of investing in support and eradication programs for children in hazardous work.
    - Audits to monitor labour in the value chain.
3. Retribution costs cover:

[7] And more specifically: Inflation, consumer prices (annual %), https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG, Official exchange rate (LCU per US$, period average), https://data.worldbank.org/indicator/PA.NUS.FCRF and PPP conversion factors for private consumption, https://data.worldbank.org/indicator/PA.NUS.PRVT.PP. Accessed August 2025

- Legal penalties or fines for violating child labour laws, with higher costs for hazardous child labour.

These elements are first quantified separately per year of child labour, then summed, and finally divided by a typical amount of yearly labour hours for a child labourer, to calculate monetisation factors per hour of hazardous and non-hazardous child labour. Audit costs to monitor labour however are not proportional to hours of child labour, but to the total size of the considered value chain, and therefore they are calculated per FTE in the value chain. Table 22 presents the results.

Table 22: Build up of child labour monetisation factors. Sums might not add up due to rounding. (from Van Veen et al. 2025)

			Footprint indicators		
			Amount of child labour		**Labour force to be audited**
Remediation cost type	**Cost sub-type**	**Unit**	**Hazardous**	**Non-hazardous**	
Compensation	Future income loss	EUR/year of child labour	€ 16,000	€ 16,000	
	Life quality loss	EUR/year of child labour	€ 49,100	€ 15,100	
Retribution	Penalty	EUR/year of child labour	€ 27,300	€ 2,700	
Prevention of re-occurrence	Education	EUR/year of child labour	€ 326	€ 326	
	Reintegration	EUR/year of child labour	€ 1,200		
	Audit cost	EUR/FTE/year (all workers, not only child workers)			€ 8.75
Monetisation factor per year of child labour		EUR/year of child labour	€ 93,926	€ 34,126	
Monetisation factor per hour of child labour *based on 2240 working hours/year*		EUR/hour of child labour	€ 41,95	€ 15.25	

2.6 Key limitations

The monetisation factors contained in this publication and the true price methodology are a work-in-progress. There are various limitations associated with the current factors that should be mentioned:

- The list of monetisation factors included here is not complete with respect to all impacts mentioned in the Principles for True Pricing. The coverage of the current impacts is more complete for impacts related to environmental rights and worker rights. Impacts related to rights of local and indigenous communities and society at large have not yet been covered. There are also some gaps for environmental impacts, particularly for impacts not commonly assessed in LCA, such as biodiversity loss (other than that related to land use change or pollution). Furthermore, as mentioned, many factors are local and this publication addresses only global factors.
- The methodology is new and contains various normative assumptions. Translating principles into measurable targets and remediation categories thus requires interpretation.
- Significant model and data uncertainties exist regarding the estimates of restoration, compensation (damage), prevention and retribution costs. In particular, retribution cost is an innovation in valuation and damage cost is not always available. In many cases, a best estimate based on proxy data was used, although there may be some impacts that have not been modelled. This leads to a possible underestimate of the remediation cost.
- This database depends on datapoints from a very large variety of sources for social and environmental impact measurement and valuation. Even though significant effort has been put into standardizing assumptions and modelling choices used across indicators, including exchange rates, inflation rates, discount rates and valuation coefficients of human health and biodiversity, the presence of small inconsistencies cannot be excluded.
- Alignment with the many existing standards and methods for sustainability reporting and impact measurement would be desirable, when developing a method that aims to be useful to many types of businesses and is applied to many types of products. As much as possible efforts have been made to work towards this end.

While care was taken to come to the present version of monetisation factors, these can and will, no doubt, be improved. True Price and its partners are committed to developing these standards and methods.

2.7 How to access the data

Next to the tables in chapter 4 of this report, a database of the monetisation factors and calculation trees are made publicly available on our open data repository available at https://github.com/Truepricemethod/Monetisation_factors. The report is shared under a Creative Commons license CC BY ND 4.0 and the data under a CC BY 4.0 license.

2.8 Other publications relating to monetisation factors

More background on how the monetisation factors are developed, as well as methods to derive country-specific factors when applicable, can be found in the following documents.

The **methodological foundations** are also introduced in section 2.2 and 2.3:

Valuation Framework (Galgani, Woltjer, de Adelhart Toorop, & de Groot Ruiz, 2021b)

True Pricing Assessment Method for Agri-Food Products (Galgani, van Veen, et al., 2023)

Principles for True Pricing (True Price Foundation, 2020)

The **natural impact modules** (published at the time of writing) are:

- Contribution to climate change[8] (Galgani, Woltjer, de Adelhart Toorop, de Groot Ruiz, et al., 2021a)
- Land use, land use change, biodiversity and ecosystem services (Galgani, Woltjer, de Adelhart Toorop, de Groot Ruiz, et al., 2021b)
- Soil degradation (Galgani, Woltjer, de Adelhart Toorop, Varoucha, et al., 2021)
- Scarce water use (Galgani, Woltjer, Kanidou, de Adelhart Toorop, et al., 2021)
- Air, soil and water pollution (Galgani, Woltjer, et al., 2023)
- Fossil fuel and other non-renewable material depletion (Galgani, Woltjer, de Adelhart Toorop, & de Groot Ruiz, 2021a)

The following **social and human capital impact modules** have already been published:

- Child labour (van Veen at al., 2025)
- Occupational Health and Safety (Galgani et al., 2022)
- Living Income (van Veen & Galgani, 2022)

[8] An update of the *Contribution to Climate Change* module with the new monetisation factor is under development at the time of writing.

3 Impact definitions

3.1 Environmental impacts

Table 3 provides definitions of all true pricing environmental impacts that are in scope of this publication. A total of 10 impacts is provided. Indicators and sub-indicators required to quantify these impacts are presented in the next Section, together with the Monetisation factors.

Table 3: Overview of environmental impacts in true pricing.

Impact	Definition
Contribution to climate change	Contribution to climate change from emissions of greenhouse gases (carbon dioxide, methane, nitrous oxide and others). Emissions of greenhouse gases increase their atmospheric concentration (ppb), which increases the radiative forcing capacity and consequently increases the global mean temperature. Ultimately, extreme weather patterns, reduced agricultural yields and increased frequency of natural disasters can result in damage to the economy, human health – e.g., increased risk of diseases, natural disasters and ecosystems (Huijbregts et al., 2016).
Air pollution	Impacts caused by emissions to air other than climate change, including acidification, photochemical oxidant formation, particulate matter formation, nitrogen deposition from emissions to air, ozone layer depletion, terrestrial and aquatic ecotoxicity and human toxicity from toxic emissions to air. Pollutants related to the first four impacts are sulphur dioxide (SO2), fine particulate matter (PM2.5), ammonia (NH3), nitrogen oxides (NOx) and Non Methane Volatile Organic Compounds (NMVOC). An extensive number of pollutants contributes to ozone layer depletion, ecotoxicity and human toxicity.
Water pollution	Emissions to water contributing to ecotoxicity and human toxicity, as well as eutrophication of marine- and freshwater. Eutrophication occurs due to the runoff and discharge of nutrients, for example from leaching of plant nutrients into soil, marine and freshwater bodies and the subsequent rise in nutrient levels, i.e., of phosphorus (P) and nitrogen (N).
Soil pollution	Eco- and human toxicity caused by emissions to soil. Soil pollution occurs due to the runoff and discharge of contaminants, for example heavy metals and pesticides

Land occupation	The decreased availability of land for purposes other than the current one, through land occupancy. Land occupation by agriculture displaces habitats and ecosystems and therefore leads to biodiversity loss and loss of ecosystem services (Alkemade et al., 2009; de Groot et al., 2012; Milà i Canals et al., 2007)
Land transformation	Changes in land-cover that can affect ecosystem services and the climate system. This impact includes the number of natural ecosystems – i.e. (tropical) forest, woodland, grassland, and (inland and coastal) wetland - that are transformed in a certain period of time. Land transformation reduces the size of habitats and ecosystems and therefore leads to biodiversity loss and loss of ecosystem services.
Fossil fuel depletion	The consequence of the primary extraction of fossil fuels linked to fuel use, energy use and to produce other inputs, such as mineral fertilizer. Extraction of crude oil, hard coal and natural gas bears external societal costs because the stock of these materials is reduced for present and future generations (Huijbregts et al., 2016). In this method, fossil fuel depletion is considered separately from the depletion of other non-renewable materials in line with LCA methodologies.
(Other) non-renewable material depletion	The consequence of the primary extraction of scarce, non-renewable resources besides fossil fuels, such as minerals. These bear external societal costs because the stock of these materials is reduced for present and future generations.
Scarce water use	Concerns the use of blue water in such a way that the water is evaporated, incorporated into products, transferred to other watersheds or disposed into the sea, in areas where water is scarce (Falkenmark & Rockström, 2004). Water that is used as such is not available anymore in the watershed of origin for humans nor for ecosystems (Huijbregts et al., 2016). Scarcity of water depends on the watershed of origin and the geographical context (WWF, n.d.) .
Soil degradation	Soil degradation is defined as the physical, chemical and biological decline in soil quality driven by productive activities, like excessive use of irrigation or unbalanced use of fertilisers, and it can manifest itself in multiple ways, for example as loss of nutrients, loss of organic matter, increased soil erosion (from water or wind), soil compaction, waterlogging and salinisation (Lal, 2009). Soil quality is the capacity of a soil to have the desired soil functions sufficiently available under varying conditions for a combination of objectives such as food production, an efficient nutrient cycle and the preservation of biodiversity (Hanegraaf et al., 2019).

3.2 Social impacts

Table 4 provides the list and definitions of all true pricing social impacts that are in scope of this publication. A total of 10 impacts is provided. The set of social impacts is based on the Principles for True Pricing (True Price Foundation, 2020, Annex C) and largely in line with labour rights, Human Rights and corporate responsibility standards for business and existing social LCA frameworks (Benoit-Norris et al., 2012; CHRB, 2018; Croes & Vermeulen, 2015; ISO, 2010; SAI, 2014; UNEP, 2009; van der Velden & Vogtländer, 2017). The set of social footprint indicators to measure these impacts, developed by True Price, is presented in the next section, together with the Monetisation factors.

Table 4: Overview of social impacts in true pricing.

Impact	Definition
Child labour	Child labour is work that deprives children of their childhood, their potential and their dignity, and is harmful to physical and mental development and/or interferes with their schooling. Work can interfere with children's schooling by depriving them of the opportunity to attend school; obliging them to leave school prematurely; or requiring them to attempt to combine school attendance with excessively long and heavy work (ILO, n.d.).
Forced labour	Forced labour concerns all physical and psychological damage from work or service that is claimed under threat of punishment and for which the person concerned is not autonomously participating. Forced labour includes practices such as the use of compulsory prison labour by private business entities, debt bondage, indentured servitude and human trafficking (ILO, 2019).
Gender discrimination	Gender discrimination concerns the effect of discriminating, nullifying or impairing equality of opportunity or treatment based on gender and/or sex. Gender discrimination includes insufficient provision of maternity leave and benefits, different pay for the same work between employees of different genders/sexes and different opportunities to access higher pay job based on gender and/or sex.
Underpayment in the value chain	Underpayment occurs when the actual wages of employees over standard working hours, including financial wages and some forms of in-kind compensation, lie below the legal minimum wage or a decent living wage. Underpayment in the value chain can also include underpayment of child labourers and forced labourers. It excludes underpaid overtime, which is included under 'Excessive and underpaid overtime'.

Lack of social security	Negative effects of lack of social security (where this is obliged by law). Social security includes protection against certain life risks and social needs, such as guaranteed income security and health protection. It is provisioned through cash or in-kind transfers, intended to ensure access to medical care and health services as well as income security through one's life, particularly in the event of illness, unemployment, employment injury, maternity, family responsibilities, invalidity, loss of the family breadwinner, as well as during retirement and old age (ILO, n.d.-a).
Excessive and underpaid overtime	Overtime hours worked by employees that are carried out in violation of legal regulations or compensated below legal requirements. It does not include underpayment, the gap between liveable and actual wages, for standard working hours.
Insufficient income	Concerns smallholder farmers and other small entrepreneurs in the value chain that have an income below the so-called living income. Living income is "the net annual income required for a household in a particular place to afford a decent standard of living for all members of that household." (The Living Income Community of Practice, n.d.). A decent standard of living means "being able to afford food, water, decent housing, education, healthcare, transportation, clothing, and other essential needs including provision for unexpected events." (The Living Income Community of Practice, n.d.).
Occurrence of harassment	Negative effects of workplace harassment, including verbal and non-verbal, sexual and non-sexual. The term of "harassment" encompasses any act, conduct, statement or request which is unwelcome and could, in all the circumstances, reasonably be regarded as harassing behaviour of a discriminatory, offensive, humiliating, intimidating or violent nature or an intrusion of privacy. This impact includes bullying/mobbing and sexual harassment (ILO, 2013).
Lack of freedom of association	Workers that are not given the right of freedom of association: the extent to which workers have the right to establish and to join organisations of their choice without prior authorisation, to promote and defend their interests, and to negotiate collectively with other parties. They should be able to do this freely, without interference by other parties or the state, and should not be discriminated against as a result of union membership. The right to organise includes the right of workers to strike and the rights of organisations to draw up constitutions and rules, to freely elect representatives, to organise activities without restriction and to formulate programmes (UNEP, 2009).

Negative effects of employee health & safety	Negative effects on workers' health and safety at work, specifically the extent to which working in the value chain negatively affects the safety and overall health status of the workers. The term health, in relation to work, indicates not merely the incidence of occupational disease or infirmity, but also includes the physical and mental elements affecting health, which are directly related to safety and hygiene at work (Goedkoop et al., 2018; ISO, 2010). Safety is understood as the extent to which working can lead to fatal and non-fatal injuries, as well as the application of prevention measures and management practices to reduce their incidence

4 Monetisation factors for true pricing

4.1 Environmental impacts

Table 5 provides the monetisation factors for all environmental impacts and corresponding footprint indicators and sub-indicators in true pricing. The indicators and sub-indicators are partly based on the ReCiPe Life Cycle Impact Assessment method (Huijbregts et al 2016). Each monetisation factor represents a restoration, compensation, prevention or retribution cost, or a combination of those, as explained in Section 1.9. An explanation of the types of costs and sources is also provided. All values are expressed in euro 2024 and International $ 2024 and rounded.

Table 5: Monetisation factors for environmental impacts in true pricing. CO: compensation cost, RS: restoration cost, PR: prevention cost, RT: retribution cost.

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
Contribution to climate change	Greenhouse gas (GHG) emission^{CO}		kgCO2eq	0.312	0.337	A compensation cost, based on a social cost of carbon estimate which synthesizes a meta-analysis of 147 studies complemented by an expert survey. It should be interpreted as a meta-analysis-derived estimate that more closely matches expert assessments of appropriate model structure. The discount rate is a distribution with central value just above 2% (Moore et al. 2024).
Air pollution	Toxic emissions to air	Human toxicity^{CO}	DALY	129,000	140,000	A compensation cost which expresses the value of a Disability Adjusted Life Year (DALY) based on a meta-analysis of the Value of Statistical Life (VSL) from 92 willingness-to-pay studies, carried out by the OECD (Biausque, 2012). This global value is applicable to all countries.

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
		Terrestrial ecotoxicity^{CO}	kg 1,4-DB emitted to industrial soil eq	0.000294	0.000423	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at ecosystems damage. Ecosystems damage is valued looking at the value of ecosystems services lost. The endpoint valuation of ecosystem damage represents the annual value of ecosystem services (ESS) of one hectare of nature, based on the median annual value per hectare of ecosystem services of six terrestrial biomes. These values are based on a published meta-analysis of the TEEB database (de Groot et al., 2012). Recipe 2016 midpoint to endpoint conversion factors for terrestrial, marine and freshwater ecotoxicity are utilised to derive the monetisation factors (Huijbregts et al., 2016). A global value for endpoint valuation is used rather than location specific values, due to the high uncertainty and the fact that the quantification of ecosystems damage from Recipe is not location specific (e.g., it is not specified where the damage occurs, only the size of the damage).
		Freshwater ecotoxicity^{CO}	kg 1,4-DB emitted to freshwater	0.0472	0.0680	
		Marine ecotoxicity^{CO}	kg 1,4-DB emitted to seawater eq	0.00215	0.00310	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Particulate matter (PM) formation[CO]		kg PM2.5 eq	81.3	88.0	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at human health damage (morbidity, i.e., sickness and disease, and premature mortality). The endpoint valuation of human health is based on valuation of a DALY (Disability Adjusted Life Year) as described above for Human Toxicity. Recipe 2016 midpoint to endpoint conversion factors for PM formation are utilised to derive the monetisation factors (Huijbregts et al., 2016). At midpoint level, the indicator has only global monetisation. Country-specific conversion factors can be derived for individual gases (NOx, SOx, NMVOC), with the method described in (Galgani, Woltjer, et al., 2023).
	Photochemical oxidant formation (POF)	Photochemical oxidant formation (POF): human health damage[CO]	kg NOx eq	0.118	0.127	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at ecosystems damage. Ecosystems damage is valued looking at the value of ecosystems services lost,as described for ecotoxicity. Recipe 2016 midpoint to endpoint conversion factors for ecosystem damage due to ozone formation are utilised to derive the monetisation factors (Huijbregts et al., 2016).. At midpoint level, the indicator has only global monetisation. Country-specific conversion factors can be used for individual gases (NOx, SOx, NMVOC), with the method described in (Galgani, Woltjer, et al., 2023).

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
		Photochemical oxidant formation (POF): ecosystems damage[CO]	kg NOx eq	3.33	4.79	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at ecosystems damage. Ecosystems damage is valued looking at the value of ecosystems services lost,as described for ecotoxicity. Recipe 2016 midpoint to endpoint conversion factors for ecosystem damage due to ozone formation are utilised to derive the monetisation factors (Huijbregts et al., 2016).. At midpoint level, the indicator has only global monetisation. Country-specific conversion factors can be used for individual gases (NOx, SOx, NMVOC), with the method described in (Galgani, Woltjer, et al., 2023).
	Acidification[CO]		kg SO2eq	5.47	7.87	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at ecosystems damage. Ecosystems damage is valued looking at the value of ecosystems services lost, as described above for ecotoxicity. Recipe 2016 midpoint to endpoint conversion factors for acidification are utilised to derive the monetisation factors (Huijbregts et al., 2016). At midpoint level, the indicator has only global monetisation. Country-specific conversion factors can be used for individual gases (NH3, SOx, NOx), with the method described in (Galgani, Woltjer, et al., 2023).

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Ozone layer depleting emissions[CO]		kg CFC-11 eq	70.4	76.8	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at human health damage (morbidity, i.e., sickness and disease, and premature mortality). The endpoint valuation of human health is based on valuation of a DALY (Disability Adjusted Life Year). The global Recipe 2016 midpoint to endpoint conversion factor for Ozone layer depleting emissions is utilised to derive the monetisation factor (Huijbregts et al., 2016). The monetisation factor for ozone layer depleting emissions also includes the cost of damage to agricultural crops taken from CE Delft (De Bruyn et al., 2018). The cost of damage to agricultural crops represents average damage costs for ozone depletion for an average emission source in the Netherlands. Although the damage could be different in different geographies, for example because of different thickness of the ozone layer, at the moment the value is used without adjustments for different countries due to the lack of an appropriate coefficient for regional adjustments.
Water pollution	Toxic emissions to water	Human toxicity[CO]	DALY	129,000	140,000	A compensation cost which expresses the Value of Statistical Life (VSL) based on a meta-analysis of the Value of Statistical Life (VSL) from 92 willingness-to-pay studies, carried out by the OECD (Biausque, 2012). This global value is applicable to all countries.

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
		Terrestrial ecotoxicity^{CO}	kg 1,4-DB emitted to industrial soil eq	0.000294	0.000423	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at ecosystems damage. Ecosystems damage is valued looking at the value of ecosystems services lost. The endpoint valuation of ecosystem damage represents the annual value of ecosystem services (ESS) of one hectare of nature, based on the median annual value per hectare of ecosystem services of six terrestrial biomes. These values are based on a published meta-analysis of the TEEB database (de Groot et al., 2012). Recipe 2016 midpoint to endpoint conversion factors for terrestrial, marine and freshwater ecotoxicity are utilised to derive the monetisation factors (Huijbregts et al., 2016). A global value for endpoint valuation is used rather than location specific values, due to the high uncertainty and the fact that the quantification of ecosystems damage from Recipe is not location specific (e.g., it is not specified where the damage occurs, only the size of the damage).
		Freshwater ecotoxicity^{CO}	kg 1,4-DB emitted to freshwater eq	0.0472	0.0680	
		Marine Ecotoxicity^{CO}	kg 1,4-DB emitted to seawater eq	0.00215	0.00310	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Freshwater eutrophication[CO,RS]		kg P eq to freshwater	239	343	A combination of restoration and compensation costs based on a literature review on the costs of eutrophication. Restoration costs express average abatement cost for bringing nutrient levels to a regulatory target, for the impacts that are reversible. Compensation costs express other damage (economic damage, damage to human health and biodiversity loss), for residual impacts after restoration has taken place. Country specific factors can be derived based on water basin-level risk of eutrophication.
	Marine eutrophication[CO,RS]		kg N eq to marine water	16.6	23.8	A combination of restoration and compensation costs based on a literature review on the costs of eutrophication. Restoration costs express average abatement cost for bringing nutrient levels to a regulatory target, for the impacts that are reversible. Compensation costs express other damage (economic damage, damage to human health and biodiversity loss), for residual impacts after restoration has taken place.
Soil pollution	Toxic emissions to soil	Human toxicity[CO]	DALY	129,000	140,000	A compensation cost which expresses the value of a Disability Adjusted Life Year (DALY) based on a meta-analysis of the Value of Statistical Life (VSL) from 92 willingness-to-pay studies, carried out by the OECD (Biausque, 2012).
		Terrestrial ecotoxicity[CO]	kg 1,4-DB emitted to industrial soil eq	0.000294	0.000423	A compensation cost which expresses the social cost of pollution and indicates the occurring loss of economic welfare when pollutants are emitted to the environment, looking at ecosystems damage. Ecosystems damage is valued looking at the value of ecosystems services lost. The endpoint valuation

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
		Freshwater ecotoxicity^{CO}	kg 1,4-DB emitted to freshwater eq	0.0472	0.0680	of ecosystem damage represents the annual value of ecosystem services (ESS) of one hectare of nature, based on the median annual value per hectare of ecosystem services of six terrestrial biomes. These values are based on a published meta-analysis of the TEEB database (de Groot et al., 2012). Recipe 2016 midpoint to endpoint conversion factors for terrestrial, marine and freshwater ecotoxicity are utilised to derive the monetisation factors (Huijbregts et al., 2016). A global value for endpoint valuation is used rather than location specific values, due to the high uncertainty and the fact that the quantification of ecosystems damage from Recipe is not location specific (e.g., it is not specified where the damage occurs, only the size of the damage).
		Marine ecotoxicity^{CO}	kg 1,4-DB emitted to seawater eq	0.00215	0.00310	
Land occupation		Tropical forest^{CO}	(MSA*ha*yr)	2,470	3,560	A compensation cost which expresses the opportunity cost of land occupation based on the value of ecosystem services for main biomes based on a meta-analysis from TEEB (de Groot et al., 2012). Country-specific factors can be derived based on biome cover per country.
		Other forest^{CO}	(MSA*ha*yr)	1,180	1,700	
		Woodland/shrubland^{CO}	(MSA*ha*yr)	1,600	2,300	
		Grassland/savannah^{CO}	(MSA*ha*yr)	2,830	4,080	
		Inland wetland^{CO}	(MSA*ha*yr)	17,400	25,000	
		Coastal wetland^{CO}	(MSA*ha*yr)	12,800	18,400	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
Land transformation		Tropical forest^{CO}	(MSA*ha*yr)	4,510	4,880	A restoration cost which expresses the average cost of ecosystem restoration projects in different biomes based on a review of case studies (TEEB, 2009). Costs include capital investment and maintenance of the restoration project.
		Other forest^{CO}	(MSA*ha*yr)	3,120	3,380	
		Woodland/shrubland^{CO}	(MSA*ha*yr)	1,290	1,400	
		Grassland/savannah^{CO}	(MSA*ha*yr)	340	368	
		Inland wetland^{CO}	(MSA*ha*yr)	43,100	46,700	
		Coastal wetland^{CO}	(MSA*ha*yr)	3,770	4,080	
Fossil fuel depletion	Fossil fuel depletion^{CO}		kg oil eq	0.560	0.606	A compensation cost which expresses the future loss of economic welfare due to increased extraction costs of fossil fuels in the future (Huijbregts et al., 2016).
(Other) non-renewable material depletion	(Other) non-renewable material depletion^{CO}		kg Cu eq	0.283	0.307	A compensation cost which expresses the future loss of economic welfare due to increased extraction costs of non-renewable materials in the future (Huijbregts et al., 2016).
Scarce water use	Scarce blue water use^{RS}		m3	1.62	1.75	A restoration cost which expresses the annualized cost of desalination, including the cost of operation and maintenance, electrical and thermal energy, as well as the cost of covering and repaying initial capital and operational costs of desalination (World Bank, 2012).

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
Soil degradation	Soil organic carbon (SOC) loss^{CO}		SOC loss	0.0353	0.0509	A compensation cost which expresses the damage cost for the chemical, physical, biological and ecological decline of soil due to loss of SOC, based on a study on the shadow prices of soil quality by TNO and Wageningen University (Ligthart & van Harmelen, 2019).
	Soil loss from wind erosion^{CO}		Soil loss	0.0343	0.0371	A compensation cost which expresses the cost of soil erosion based on an extensive review on the costs of soil erosion by (FAO, 2014). The costs include on-site damage such as loss of nutrients, reduced harvests and reduced value of the land, and off-site damage such as the silting up of waterways, flooding and repairing public and private property.
	Soil loss from water erosion^{CO}		Soil loss	0.0268	0.0291	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR_{2024}/ footprint unit)	Monetisation factor ($\$PPP_{2024}$/ footprint unit)	Explanation
	Soil compaction[CO]		Corrected tkm	0.644	0.927	A damage cost based on lost future crop yields. Other off-site costs such as flooding, water pollution and increased GHG emissions, associated with subsoil compaction, are not included in the monetisation factor. The damage cost from soil compaction is calculated based on the average gross revenue of crop production lost due to irreversible subsoil compaction. This is quantified as the present value future crop yield losses (over 100 years) that are due to one year of machinery use. Average yearly loss (%) of crop yield per corrected tkm per ha over 100 years of production is provided in Stoessel et al. (2018), with country- and region-specific factors. Average value of annual gross production per hectare (in euro/ha) is estimated from data collected from FAOSTAT for all crops produced in each country (FAOSTAT, n.d.). Since the average yearly loss is given for 100 years of production, future crop production losses (0.12 eur/corrected tkm) are discounted to determine the present value, with a discount rate equal to 3% (Werkgroep discontovoet, 2015) and summed over 100 years.

4.2 Social impacts

Table 6 provides the monetisation factors for all social impacts and corresponding footprint indicators in true pricing. Each monetisation factor represents a restoration, compensation, prevention or retribution cost, or a combination of those, as explained in Section 1.9. An explanation of the types of costs and sources is also provided. All values are expressed in euro and International $ 2024 and rounded.

Table 6: Monetisation factors for social impacts in true pricing. CO: compensation cost, RS: restoration cost, PR: prevention cost, RT: retribution cost.

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
Child labour	Amount of child labour	Hazardous child labour[CO PR RT]	Hour	42.0	52.5	A combination of compensation cost, prevention of re-occurrence and retribution cost. Compensation costs reflect both the loss of childhood quality of life caused by child labour (Weidema, 2006 Biausque 2012), and the loss of future earnings resulting from irrecoverable years of missed education (Impact Institute, 2025, IPEC & ILO, 2004). Prevention costs encompass investments in education and additional costs of implementing eradication and support programmes for children involved in hazardous labour (IPEC & ILO, 2004), and audits to monitor value-chain labour practices and reduce the risk of child labour. Finally, retribution costs are the legal costs related to breaches of child labour regulation (penalties), based on our database of legal sanctions and/or fines internationally.
		Non-hazardous child labour[CO PR RT]	Hour	15.3	19.5	
	Labour force to be audited for child labour[PR]		FTE	8.75	9.47	
Forced labour	Forced workers (least severe) [RS,RT]		FTE	14,000	20,100	A combination of restoration, compensation, prevention and retribution costs. The restoration cost expresses the restitution of past economic losses of forced workers in debt bondage, as well as other costs for reintegration (ILO,
	Forced workers (medium severe) [RS,RT]		FTE	76,600	110,000	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Forced workers (most severe) [RS,RT]		FTE	139,000	200,000	2009; Kara, 2012). The compensation cost expresses the cost of lost health valued using DALY for forced workers victims of abuse (Biausque, 2012). The prevention cost expresses the cost of generic auditing setup, to prevent future instances. Finally, the retribution cost represents a penalty for instances of forced labour based on the weighted average of penalties from various countries that expresses a global penalty. Restoration, retribution, and compensation costs for harassment may also be included, if abuse exists in the specific case.
	Forced workers who are in debt bondage[RS]		FTE	20,600	22,300	
	Forced workers who are victims of abuse [CO,RS,RT]		FTE	43,400	48,200	
	Labour force to be audited for forced labour[PR]		FTE	8.75	9.47	
Gender discrimination	Female workers without maternity leave provision[RT]		FTE	2,000	2,880	A combination of restoration, prevention, and retribution costs. The restoration cost represents the restitution of wage lost due to denied maternity leave, gender discrimination and unequal opportunities, corrected for an increase in consumer prices (annual inflation) due to delayed income. The prevention cost expresses the cost of generic auditing setup, to prevent future instances of discrimination. The retribution cost represents a penalty for the violation of denied maternity leave.
	Value of denied maternity leave[CO]		EUR	1.03	1.03	
	Wage gap from gender discrimination[CO]		EUR	1.03	1.03	
	Wage gap from unequal opportunities[CO]		EUR	1.03	1.03	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Labour force to be audited for discrimination[PR]		FTE	8.75	9.47	
Underpayment in the value chain	Wage gap of workers earning below minimum wage[CO,RT]		EUR	1.53	1.53	A combination of compensation, prevention, and retribution costs. The compensation cost expresses the gap to a decent living wage, corrected for an increase in consumer prices (annual inflation) due to delayed income. The prevention cost expresses the cost of generic auditing setup, to prevent future instances. The retribution cost represents a penalty for the amount of the wage gap that is below the legal minimum wage, based on the weighted average of penalties from various countries that expresses a global penalty.
	Wage gap of workers earning above minimum wage but below decent living wage[CO]		EUR	1.03	1.03	
	Labour force to be audited for insufficient wages[PR]		FTE	8.75	9.47	
Lack of social security	Workers without legal social security[RT]		FTE	2,650	3,820	A combination of compensation, prevention, and retribution costs. The compensation cost represents the restitution of the denied paid leave, corrected for an increase in consumer prices (annual inflation) due to delayed income. The prevention cost expresses the cost of generic auditing setup, to prevent future instances. The retribution cost represents a penalty for the workers without social security, in the case of a legal requirement by law, based on the weighted average of penalties from various countries that expresses a global penalty.
	Value of denied paid leave[CO]		EUR	1.03	1.03	
	Labour force to be audited for insufficient social security[PR]		FTE	8.75	9.47	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
Excessive and underpaid overtime	Workers performing illegal overtime[RT]		FTE	125	179	A combination of compensation, prevention, and retribution costs. The compensation cost represents the wage gap due to underpaid overtime, corrected for an increase in consumer prices (annual inflation) due to delayed income. The prevention cost expresses the cost of generic auditing setup, to prevent future instances. The retribution cost represents a penalty cost for overtime work above the maximum legal limit or paid under legal requirements based on the weighted average of penalties from various countries that expresses a global penalty.
	Workers performing underpaid overtime[RT]		FTE	125	179	
	Overtime pay gap[CO]		EUR	1.03	1.03	
	Labour force to be audited for illegal overtime[PR]		FTE	8.75	9.47	
Insufficient income	Living income gap [CO]		EUR	1.03	1.03	A compensation cost that represents the restitution of the income gap, corrected for an increase in consumer prices (annual inflation) due to delayed income.
Occurrence of harassment	Workers who experienced harassment	Workers who experienced non-physical non-sexual harassment[CO,RS,RT]	Worker	27,800	30,100	A combination of restoration, compensation, prevention, and retribution costs. The restoration cost represents average medical costs for injuries, anxiety, depression, and PTSD resulting from workplace harassment estimated for the Netherlands and adapted to other countries using value transfer (Chappell & Di Martino, 2006; RIVM, 2022; Stam, C.

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
		Workers who experienced non-physical sexual harassment[CO,RS,RT]	Worker	27,800	30,100	& Blatter, B., 2020; WHO, 2021). The compensation cost represents the cost of loss of future well-being due to long-term mental health impact of victims of harassment. The prevention cost expresses the cost of generic auditing setup, to prevent future instances. The retribution cost represents a penalty for instances of physical non-sexual and sexual harassment based on the weighted average of penalties from various countries that expresses a global penalty.
		Workers who experienced physical non-sexual harassment[CO,RS,RT]	Worker	68,500	75,500	
		Workers who experienced non-severe physical sexual harassment[CO,RS,RT]	Worker	76,800	87,400	
		Workers who experienced severe physical sexual harassment[CO,RS,RT]	Worker	86,100	101,000	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Labour force to be audited for harassment[PR]		FTE	8.75	9.47	
Lack of freedom of association	Instances of denied freedom of association[RT]		Violation	430	618	A combination of prevention and retribution cost. The prevention cost expresses the cost of generic auditing setup, to prevent future instances. The retribution cost expresses a penalty for denied freedom of association based on a review of penalties from five different legal systems and adjusted based on the square root of the corresponding countries' population to express a global penalty. Restoration and compensation are not included so as not to double count the impact of freedom of association with the other social impacts.
	Labour force to be audited to be audited for denied freedom of association[PR]		FTE	8.75	9.47	
Negative effects on employee health and safety	Non-fatal occupational incidents	Insured non-fatal occupational incidents[CO]	Incident	4,520	4,900	A combination of compensation, prevention, and retribution costs. The compensation cost represents the average cost of medical expenses for occupational injuries not covered by the employer estimated from Dutch data and adapted to other countries using value transfer (RIVM, 2022; Stam, C. & Blatter, B., 2020; WHO, 2021), the value of health (DALY) loss in the case of non-fatal incidents and the VSL in the cause of fatal incidents as a compensation to the family of the victim (Biausque, 2012). The prevention cost expresses the cost of generic auditing setup, to prevent future instances. The retribution costs represent a penalty for the cases in
		Uninsured non-fatal occupational incidents[CO]	Incident	4,670	5,110	
	Fatal occupational incidents[CO]		Incident	3,840,000	4,150,000	

Impact	Footprint indicator	Footprint sub-indicator	Footprint unit	Monetisation factor (EUR$_{2024}$/ footprint unit)	Monetisation factor (PPP_{2024}$/ footprint unit)	Explanation
	Occupational injuries with breach of H&S standards[RT]		Incident	4,790	6,900	which workers perform their duties in conditions which violate Health and Safety regulations, which is based on the weighted average of penalties from various countries that expresses a global penalty.
	Work performed in violation of H&S standards[RT]		FTE	2,160	3,110	
	Labour force to be audited for H&S[PR]		FTE	8.75	9.47	

Glossary

True price	The true price of a product is the sum of the market price and the true price gap of a product. It reflects the price a buyer would have to pay for a product if the cost of remediating its unsustainable impacts would be added on top of its price.
True price gap	The true price gap of a product is the sum of all the remediation costs of all unsustainable impacts caused by the production and consumption of that product.
Unsustainable impact	An unsustainable impact is a realised or expected harm to the Natural, Financial, Social, Human, Manufactured or Intellectual Capital flow or experienced well- being of people or communities due to a breach of one or more generally accepted universal rights. Can also be referred to as unsustainable externality.
Externality	A societal cost or benefit that affects a party who did not choose to incur this cost or benefit. A societal cost is a negative externality while a societal benefit is a positive externality.
Social impacts	Impact on people and communities caused by production and consumption. In the context of a true price gap assessment, social impacts are unsustainable externalities related to breaches of human rights and labour rights.
Environmental impacts	Impacts on the environment, people and communities caused by production and consumption. In the context of a true price gap assessment, environmental impacts are unsustainable externalities related to the breaches of environmental rights.
Footprint indicators	Variables that quantify the actual social and environmental impacts that are in scope to calculate the true price of a product. Footprint indicators can be monetized and compared meaningfully across different life cycle steps.
Monetisation factor	Estimate of the remediation cost of the impacts measured by the footprint indicators. In some cases, different monetisation factors may be country-dependent and be different for the same impact for different parts of the product life cycle (for example, if some damage cost coefficients are proportional to local income levels and the damage occurs in different countries).

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