

NOVEMBER 2022

VBA METHODOLOGY V0.2



Impact Statement

Downstream – Industry-Agnostic Guidance

NOTE ON THIS DOCUMENT

Downstream activities are often very complex and highly dependent on a company's business model. Therefore, the VBA Impact Statement methodology on downstream activities will be distinguished into general industry-agnostic and sector-specific guidance.

This document outlines industry-agnostic principles and a stepwise approach to help begin quantifying downstream impacts with consistent boundaries across all value chain levels, and to provide guidance on how the existing VBA Impact Statement methodology can be applied to companies' downstream activities. Since key questions and challenges around downstream are often related to measuring activities rather than applying monetary valuation, this document is focused on the quantification of downstream impact drivers.

We are aware that many additional matters regarding downstream (e.g. the positive impacts of companies' products or a comparison to industry averages) are not covered in this document. These aspects will be included in additional publications on sector-specific guidance.

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ABOUT THE VALUE BALANCING ALLIANCE

The Value Balancing Alliance e.V. (VBA) is a not-for-profit organisation that aims to change the way company performance is measured and valued. The alliance's objectives are to develop, test, and pilot standardised methodologies for the integration of sustainability in management accounting practices, incl. business decision making and steering. The methodology to measure and value sustainability performance is based on two pillars:

1. Value-to-Society: The inside-out perspective, or impact measurement and valuation (IMV), assesses the value contributions of a business model to society, environment, and the economy throughout the value chain.
2. Value-to-Business: The outside-in perspective assesses how sustainability impacts enterprise value, incl. companies' financial performance.

Analogous to financial accounting, sustainability accounting first provides information for business decision making. Elements of this information about positive and negative impacts are then disclosed and reported to the public. The alliance's methodology enables companies to meet the requirements of the currently developing reporting standards such as at IFRS or EFRAG.

Founded in June 2019, the Value Balancing Alliance represents a collection of large international companies, including Anglo American, BASF, Bayer, BMW, Bosch, Deutsche Bank, DPDHL, Dräger, Holcim, Kering, Kirchhoff, L'Oréal, Michelin, Mitsubishi Chemical, Novartis, Otto, Porsche, Posco, Roche, Sana Kliniken, SAP, Schaeffler, Shinhan Financial Group, SK, and ZF. The alliance is supported by the four largest professional services networks – Deloitte, EY, KPMG, and PwC – and by the OECD, the WEF, the WBCSD, and leading academic institutions, including the Impact-Weighted Accounts Initiative at Harvard Business School. Furthermore, in partnership with the Capitals Coalition, the alliance receives funding from the EU LIFE programme for the Environment and Climate Action,¹ is a member of the EU Platform Sustainable Finance (PSF), acts as interface between PSF and the EFRAG Task Force in the context of preparatory work for EU non-financial reporting standards (PTF-NFRS) and supports the G7 Impact Task Force. VBA's CEO, Christian Heller, has also been elected deputy Chair of the Sustainable Finance Advisory Committee of the German Federal Government.

The Value-to-Society, or inside-out perspective necessitates a standardised IMV methodology to foster long-term thinking and performance comparability but also to consolidate the knowledge already available in this field. Therefore, the VBA is building on the work of leading universities and well-known organisations such as the World Bank, the OECD, the Capitals Coalition, the WBCSD, the Impact Management Project, the GRI and the Value Reporting Foundation.

The envisioned transformation and system change will require the cooperation of all players in the business ecosystem. The Value Balancing Alliance will make its work available to the public, and we encourage more companies to join us along the way.

¹ The EU has provided the VBA with financial support to develop a first set of accounting principles and guidelines regarding environmental impacts for business. Over the next three years, the VBA (in partnership with the Capitals Coalition) will develop a standard for measuring and valuing companies' environmental impacts in monetary terms.

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1.

INTRODUCTION

1.1 RELEVANCE AND MAIN CHALLENGES OF DOWNSTREAM IMPACT VALUATION

The measurement and valuation of a company's social, economic, and environmental impacts should consider its whole value chain.²

For many companies, major elements of their impacts materialise in downstream activities, highlighting the importance of considering this part of the value chain in the efforts for impact valuation. A company's downstream describes activities which occur in products' life cycles subsequent to activities and processes owned or controlled by the reporting company (gate-to-grave).³ By considering downstream impacts in the overall organisational footprint, a company's impact measurement and valuation allows identification of topic or product-related hotspots across the full value chain (e.g. strong environmental impacts in downstream activities, while own operations or upstream show more positive socio-economic impacts). This enables a more holistic view in decision making and a critical assessment of the product portfolio, taking into account all parts of the value chain.

When considering downstream impacts, significant differences in business models make it difficult to standardise the assessment of such impacts and compare them across companies (e.g. the downstream activities of a car manufacturer differ significantly from those of a chemical company or a service provider). In addition, companies have less control over downstream activities than over their own operations or upstream, and they often struggle to track the entire downstream value chain.⁴

These difficulties may explain the current gap in impact measurement and valuation methodologies, as so little conceptual work exists on downstream activities compared to a company's own operations or its upstream activities. The small number of frameworks and approaches considering downstream activities focus mostly on environmental impacts or are too company-specific to be generalised. In addition, some approaches focus predominantly on the use phase of products.⁵ Thus, an approach that incorporates all downstream phases and which can guide companies in quantifying their downstream impacts, even with complex product portfolios, is still lacking.

The paper at hand aims to fill this gap in the assessment of downstream impacts by providing industry-agnostic guidance on how the VBA Impact Statement methodology can be applied to downstream activities of companies, with a special focus on the quantification of impacts.

2 Value Balancing Alliance, 2021b

3 British Standards Institution, 2008; WRI/WBCSD, 2011

4 Natural Capital Coalition, 2016

5 E.g., Impact Weighted Account Initiative - Serafeim & Trinh, 2021

1.2 SCOPE AND STRUCTURE OF THE PAPER

This paper builds on existing concepts and methodological approaches to provide guidance on quantifying downstream impacts. The quantification of downstream impacts then enables their valuation in accordance with the VBA Impact Statement methodology, as described in companion papers.⁶ This paper emphasises assessment of the existing topics of the VBA Impact Statement methodology and an industry-agnostic view on downstream phases.⁷ Nevertheless, it recognizes the fact that important downstream impacts are not covered within the existing VBA topics (e.g. positive societal impacts through product use) and are more company or sector specific. The paper at hand introduces general guidance and a structured approach to help quantify the downstream impacts of the reporting company, acknowledging consistent boundaries across the value chain. Additional company or industry-specific impacts (e.g. related to product use) are excluded from this document and will be covered in future publications. As positive socio-economic impacts of product use will be addressed in the sector-specific guidance, the topic of Gross Value Added described in the VBA Impact Statement methodology is excluded from the industry-agnostic guidance for downstream.

This paper is structured as followed (see Figure 1): In chapter 2, definitions for downstream activities and related constructs are provided to gain a common understanding of the theoretical background. Based on an extensive review (see Appendix 5.1), chapter 3 describes a 3-Step approach to quantifying downstream impacts:

- **Step 1** – clusters the existing product portfolio to determine representative products and to define the scope of the downstream assessment.
- **Step 2** – models more detailed downstream processes by outlining all activities related to the representative products for each downstream phase. Additionally, necessary assumptions and the linkage to relevant topics of the VBA Impact Statement methodology, which are affected by the outlined activities, are summarised.
- **Step 3** – is dedicated to the quantification of downstream impacts by determining resulting data needs and highlighting possible data sources.

The three steps should be seen as an iterative process. Finally, an outlook section discusses aspects for further development and limitations of the presented methodology.

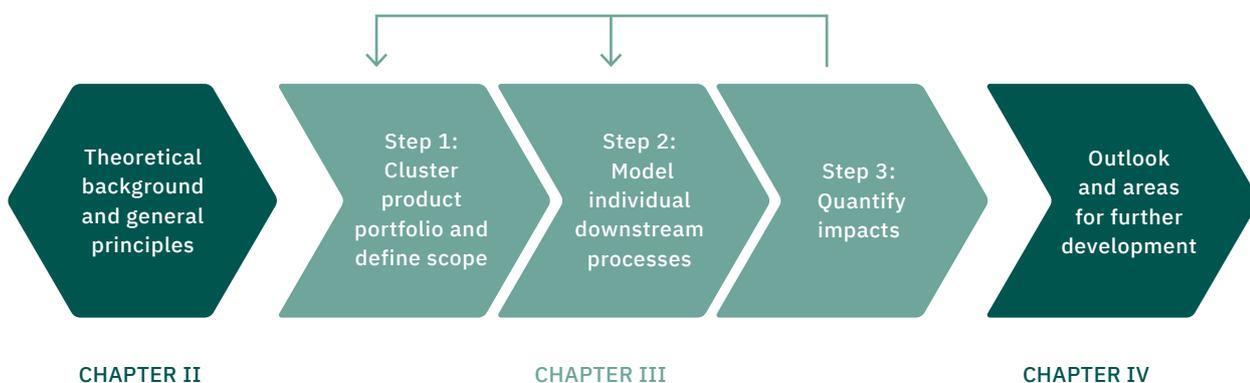


Figure 1: Overview of the Paper's Structure

⁶ See all methodology papers of the Value Balancing Alliance: <https://www.value-balancing.com/en/downloads.html>

⁷ Value Balancing Alliance, 2021b

2.

THEORETICAL
BACKGROUND AND
GENERAL PRINCIPLES

2.1 THEORETICAL BACKGROUND AND TERMINOLOGY

Downstream activities vary significantly across companies, depending on both industry and business model (the position that companies occupy along the value chain). In general, downstream covers activities linked to the purchase, use, reuse, recovery, recycling, and final disposal of a business' goods and services.⁸

A common understanding of downstream and its phases

As a first step towards a common language for measuring and valuing downstream impacts, we define the following downstream phases, which are derived from the Greenhouse Gas Protocol⁹ and are consistent with the logic of Life Cycle Assessments¹⁰ and Organisational Environmental Footprinting.¹¹

The classification used throughout this document is illustrated in Figure 2.

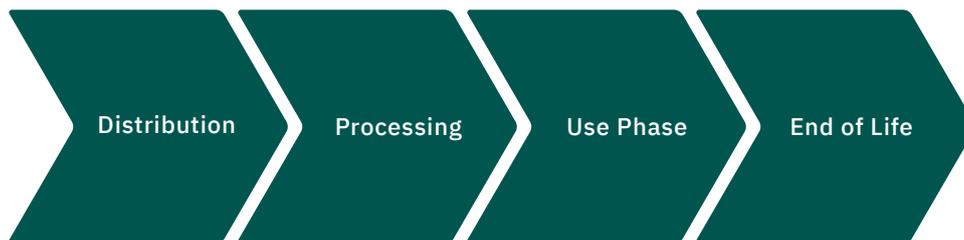


Figure 2: Illustration of Downstream Phases

- 1. Distribution:** The distribution phase covers all activities that start with products leaving the production facility of the user of this methodology and ends when the consumer takes possession of the product. In this phase, all distribution or storage activities which may occur for the products should be considered. Please note that only distribution activities which are not paid by the user of this methodology should be included. All distribution services purchased by the user of this methodology should be included in the assessment of *upstream* impacts.

Examples of processes in the distribution and storage phase include (non-exhaustive list):

- Storage at a distribution centre
- Refrigeration at a warehouse
- Shipping of products

8 WRI & WBCSD, 2011

9 WRI & WBCSD, 2011

10 ISO, 2006

11 European Commission & Joint Research Centre - Institute for Environment and Sustainability, 2012

2. **Processing:** Usage of goods and services as input for the production of other goods and services. This phase is only relevant for companies that produce parts or intermediate products and services that are not for end consumers – see definition of intermediate products below.
3. **Use:** This phase covers the use of goods and services by a consumer or end user. It ends with the product being discarded for transport to end-of-life treatment. To apply the methodology presented, it is necessary to distinguish between commercial and private use of goods and services.

Examples of processes in the use phase include (non-exhaustive list):

- Resource consumption during the use of the product (e.g. electricity or water)
- Maintenance or repair of the product during use

4. **End-of-Life Treatment:** End-of-life treatment includes all processes whenever the used product is discarded by the consumer or end user until the product is returned to nature or integrated in other products' life cycles (e.g. through recycling).

Examples of processes in the end-of-life treatment phase include (non-exhaustive list):

- Collection of products for end-of-life treatment
- Waste management
- Dismantling of products

A common understanding of product types

The introduced 3-Step approach distinguishes between intermediate products and final products:¹²

Intermediate products are inputs to the production of other goods or services that require further processing, transformation, or inclusion in another product before use by the end consumer. Intermediate products are not consumed by the end user in their current form.

Final products are goods and services that are consumed by the end user in their current form, without further processing, transformation, or inclusion in another product/service. Final products include:

- Products consumed by end consumers
- Products sold to retailers for resale to end consumers (e.g. consumer products)
- Products consumed by businesses in their current form (e.g. office supplies or software)

Considering future impacts

Future impacts need to be accounted for (e.g. increase in costs for GHG emissions has to be considered). A social discount rate can be used in this context to convert future damage costs to their present value. Such future impacts are especially important to consider for the use phase and the end-of-life of products. Details on the accounting for impacts that occur in the future are described in the General Paper of the Impact Statement methodology.¹³

¹² Definitions are based on WRI & WBCSD, 2011, p. 39

¹³ Value Balancing Alliance, 2021b

2.2 PRINCIPLES

The user of this methodology should comply with the following principles¹⁴ as well as the general rules outlined in the General paper and the topic-specific papers on socio-economy and environment of the VBA Impact Statement methodology.¹⁵

Accuracy: Make sure that quantified impacts are not systematically greater than or less than actual impacts and that uncertainties are reduced as far as practicable.

Completeness: Ensure that the assessment covers the impacts of all products within the specified boundaries; disclose and justify all assumptions and excluded aspects of the assessment.

Consistency: Choose assumptions, approaches, models, and data that allow for meaningful comparison of results over time.

Reliability: Select data sources, data collection methods, and verification procedures which ensure that used data are dependable.

Representativeness: Ensure that datasets, assumptions, and boundaries of the assessment reflect the true population of interest (i.e. geographical, temporal, and technological coverage) and actual downstream activities.

Transparency: Address any relevant issue in a factual and coherent manner, based on a clear audit trail; disclose any assumptions and make appropriate references to the approaches and data sources used.

¹⁴ In line with ISO, 2006; WRI & WBCSD, 2011

¹⁵ See all published methodology papers of the Value Balancing Alliance here: <https://www.value-balancing.com/en/downloads.html>

3.

THE 3-STEP APPROACH
TO QUANTIFY
DOWNSTREAM IMPACTS

3.1 INTRODUCTION TO THIS SECTION

In this chapter, the 3-Step approach to quantification of downstream impacts is described (see Figure 3). This 3-Step approach is designed to consider downstream impacts independent of the industry or individual business model. Each step consists of guidance intended to provide orientation for the user of this methodology to support downstream assessment in line with the above-defined principles. In addition, for each step, instructions for practical application are given. The three steps should be understood as an iterative process.

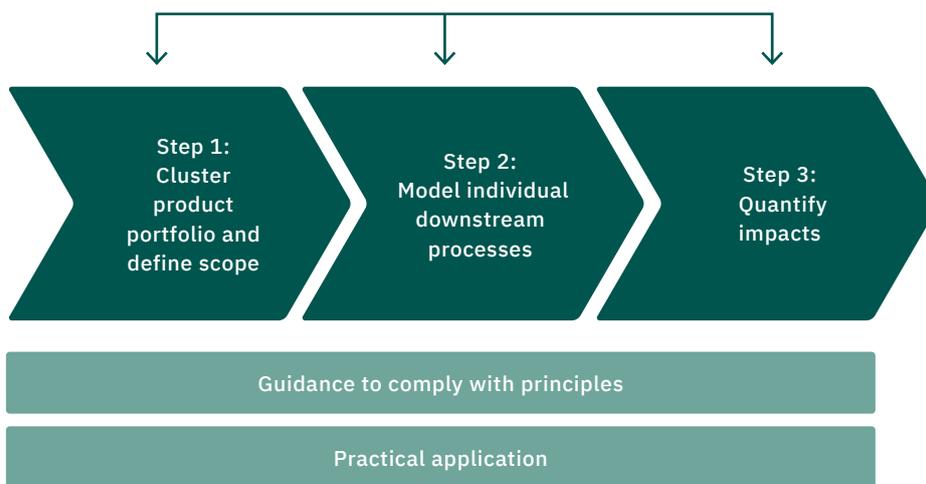


Figure 3: Illustration of the 3-Step Approach

3.2 STEP 1: CLUSTER PRODUCT PORTFOLIO AND DEFINE SCOPE

Especially for broad and diverse product portfolios, determining all downstream activities can be challenging. Therefore, the goal of this step is to reduce complexity and define the scope of the downstream impacts assessment. The user of this methodology should use a top-down approach to cluster the product portfolio:

- by sounding their complete product portfolio and all relevant product groups according to the organisational boundaries;
- creating representative products for all product groups; and
- identifying all downstream phases that should be considered.

Guidance on Step 1

To cluster the product portfolio, create representative products, and identify all relevant downstream phases, users of this methodology should comply with the following guidance in Table 1:

Principle	Guidance to comply with principles
Accuracy and Representativeness	→ Ensure that representative products aggregate individual products that share certain characteristics, such as similar product applications, sales region, customer industry, consumer habits, dominant production technology, or size and packaging. ¹⁶
Completeness	→ Ensure that the assessment includes all attributable downstream phases for the product portfolio. ¹⁷ → Make sure that the assessment includes all goods and services sold in the fiscal year of the assessment.
Consistency	→ Ensure that the organisational boundaries of the assessment are the same as for upstream and operations, i.e. aligned with financial reporting. ¹⁸
Reliability	→ Derive internal data (e.g. the company's own defined product classification) from reliable systems. ¹⁹
Transparency	→ Disclose and justify every exclusion of attributable downstream processes. Downstream processes may be excluded from the assessment if all of the following statements are true: ²⁰ <ul style="list-style-type: none"> → Primary or secondary data cannot be collected, leading to a data gap, → The data gap cannot be filled by extrapolated and proxy data, → Estimation determines data as insignificant (applied estimation technique and insignificant threshold should be disclosed).

Table 1: Guidance on Step 1 to Comply with Principles

¹⁶ UNEP, 2015, p. 59; European Commission, 2013, p. 45f.

¹⁷ Adapted from WRI & WBCSD, 2011 – only for downstream activities

¹⁸ WRI & WBCSD, 2011

¹⁹ WRI & WBCSD, 2011

²⁰ WRI & WBCSD, 2011 - see section 6.4 for guidance on disclosing and justifying exclusions of downstream emissions from sold intermediate goods when their eventual end use is unknown; WRI & WBCSD, 2013, p. 55 ff.

Practical application for Step 1

Users of this methodology should perform the following steps to cluster their product portfolio, create representative products, and set the boundaries of the assessment of downstream impacts (see summary in Figure 4):

1. Use the company's product portfolio with existing segments or product groups as a starting point.
2. Check for applicability of company product data for a downstream assessment in terms of similarities regarding transportation systems, B2B-customers, use scenario and end-of-life treatments.
3. Create representative products, either according to existing product segments/groups or based on defined characteristics, such as
 - sales region,
 - consumer habits,
 - customer industry,
 - similar product applications,
 - dominant production technology,
 - size and packaging,
 - electricity or water consumption,
 - intensity of use,
 - lifespan, and
 - waste management practices in the region.

Especially for intermediate products, where product applications can vary significantly, representative products/product applications could be defined by customer industries.

4. Indicate all relevant downstream phases for each representative product/product application (e.g. some product groups or applications may not have a processing phase) and thereby set the overall landscape of the downstream value chain.
5. Indicate for each representative product whether data is accessible for each relevant downstream phase (e.g. for intermediate products, the reporting company might not have any information on further processing beyond their direct customers and therefore no information of the final use of the product). Thus, the combination of relevant downstream phases and data accessibility sets the boundaries for the assessment of downstream impacts.
6. Determine for all representative products where information is accessible whether they are used in a commercial or non-commercial context. If representative products are used in a commercial context, indicate the ratio of commercial use of the representative product (see Figure 4).
7. Illustrate the share of the representative product on the overall downstream activities by indicating the related sales volume. The indicated sales volumes should add up to the overall sales volume and can also be used to assess whether the representative products reflect the complete downstream activities.

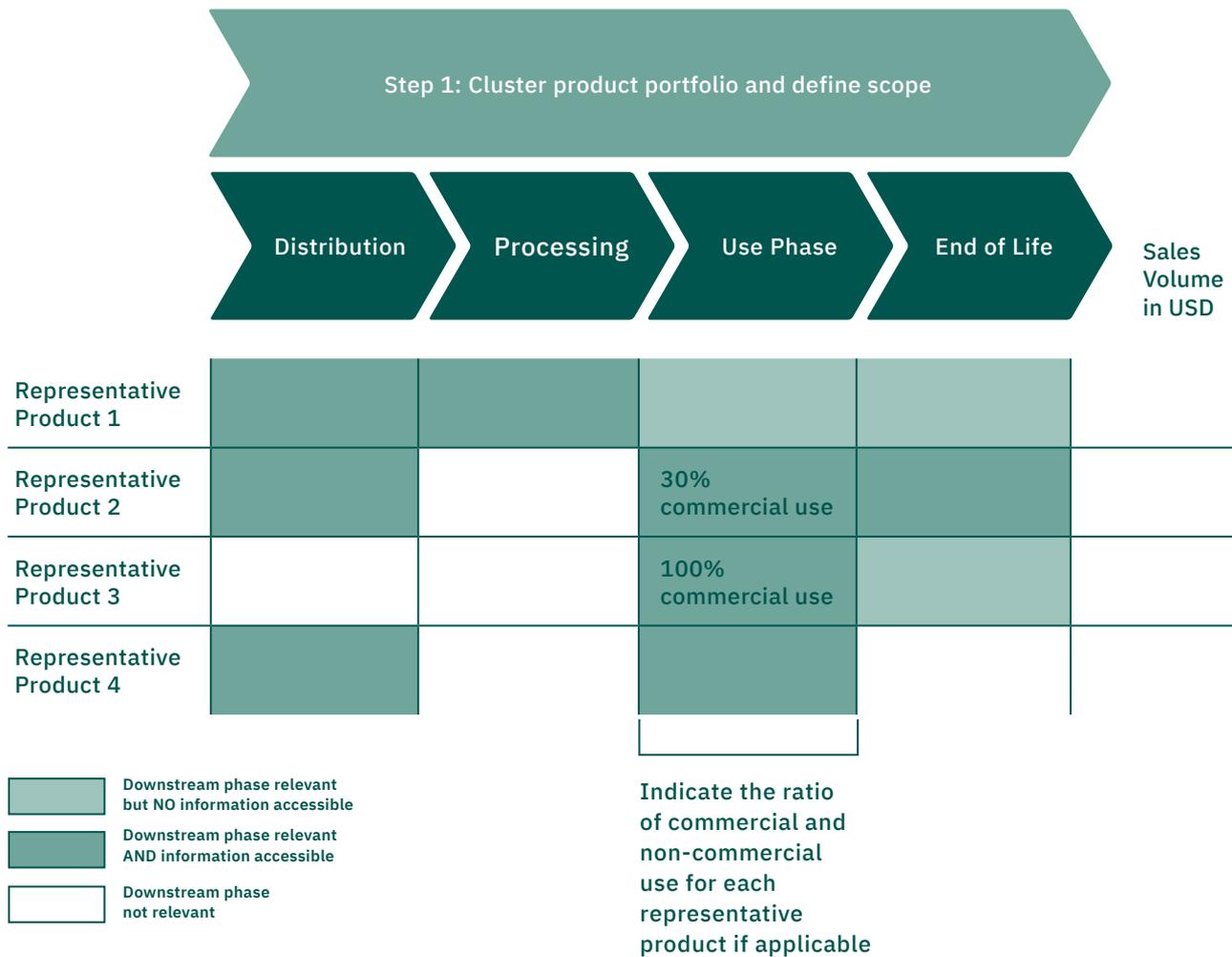


Figure 4: Summary of Step 1

3.3 STEP 2: MODEL INDIVIDUAL DOWNSTREAM PROCESSES

In order to quantify downstream impacts, all processes related to a company’s products have to be considered. Building on Step 1, defined representative products and the scope of the assessment help the user of this methodology to recognise and summarise all activities associated with these representative products for every relevant downstream phase. In this way, downstream processes are described in greater detail, enabling the identification of relevant VBA Impact Statement methodology topics for each downstream phase.

To model the individual downstream processes, the user of this methodology should:

- summarize relevant activities associated with the representative products in each downstream phase, including made assumptions; and
- identify all topics of the Impact Statement methodology affected by these activities.

Guidance on Step 2

To summarize related activities, the user of this methodology should comply with the following guidance in Table 2:

Principle	Guidance to comply with principle
Accuracy and Representativeness	<ul style="list-style-type: none"> → Ensure that activities in each downstream phase, associated with the representative product, reflect the true downstream processes as far as possible. → Consider the product durability or expected product lifetime and the possibility that the product can become part of different products, which in turn means different metrics (e.g. best and worst case) when defining use scenarios. → Incorporate actual use patterns in created use scenarios, which are assessed by customer surveys or recommendations by manufacturers (e.g. user manual) to reflect the true processes.²¹ → Consider necessary assumptions to reduce uncertainties as far as possible for all activities associated with the representative product in every downstream phase.
Completeness	<ul style="list-style-type: none"> → Describe all relevant activities linked to the defined representative products per downstream phase and highlight all related assumptions. → If no information on activities associated with the representative product during a downstream phase are available and no valid assumptions can be made, these downstream phases could be excluded from the assessment.
Consistency	<ul style="list-style-type: none"> → Ensure that assumptions are consistent across different representative products and downstream phases.
Reliability and Transparency	<ul style="list-style-type: none"> → Justify use scenarios with published technical information, including international standards, national or industry guidelines, market surveys, or other market data.²² → Justify assumptions connected to representative products and their activities in each downstream phase using scientific evidence to the extent possible, or build on sector guidance and product rules that incorporate generally accepted information.²³

Table 2: Guidance on Step 2 to Comply with Principles – Summary of Relevant Activities

²¹ European Commission & Joint Research Centre - Institute for Environment and Sustainability, 2012, p. 42f.

²² European Commission & Joint Research Centre - Institute for Environment and Sustainability, 2012, p. 42f.

²³ WRI & WBCSD, 2011

To link outlined activities associated with the representative product to relevant topics of the Impact Statement methodology for each downstream phase, the user of this methodology should comply with the following guidance in Table 3:

Principle	Guidance to comply with principle
Completeness and Representativeness	<ul style="list-style-type: none"> → Consider the following topics of the VBA Impact Statement methodology for the downstream assessment: Greenhouse Gas Emission, Air Pollution, Water Consumption, Water Pollution, Land Use, Waste, Occupational Health & Safety, Child Labour, Forced Labour, and Living Wage.²⁴ → Map all relevant topics to the summarised activities in each downstream phase (see Figure 5). → If major downstream impacts of the representative products are not covered by the Impact Statement topics, assess additional topics by employing appropriate approaches (sector-specific guidance will be provided in future publications; see also 4.1).
Transparency	<ul style="list-style-type: none"> → Critically reflect on the significance of topics for downstream activities in the different phases.²⁵

Table 3: Guidance on Step 2 to Comply with Principles – Linking Downstream Activities to Impact Statement Topics

Please note, the topic of Gross Value Added (GVA) of the VBA Impact Statement methodology is not in scope for industry agnostic guidance for downstream. GVA is typically associated with purchasing power and spending triggered by a company’s expenditures for procurement (upstream) and its employees (own operations). Downstream GVA effects would be difficult to attribute to a company’s business activities and this would imply the risk of overstating positive impacts. In line with this, positive impacts through product use will be covered in future publications on sector specific guidelines.

Practical application for Step 2

To model the downstream activities associated with each representative product for each downstream phase, users of this methodology should perform the following steps:

1. Outline all activities related to the representative product per downstream phase. Make assumptions where necessary, e.g. on different use scenarios. Only activities directly related to the representative product of the reporting company should be outlined. Thus, activities connected to the direct maintenance and use of the representative product should be in scope of the assessment. Other activities which enable distribution, maintenance, or use processes can be excluded. For example, for textiles as representative product, the production of a washing machine or a container for distribution could be

²⁴ Value Balancing Alliance, 2021a, 2021b, 2022

²⁵ WBCSD, 2016

excluded from the scope of the assessment. The exclusion of activities can be based on the ability to calculate the share of existing causal claims and the possibility to determine the share of the representative product in the enabling processes.

2. Identify the relevant topics of the VBA Impact Statement methodology for each downstream phase, with a reciprocal approach considering both perspectives (topic and activity):
 - For each representative product the activities should be analysed with regards to how they could reflect or influence the topics' impact drivers,
 - For each representative product all relevant downstream phases should also be analysed from the perspective of a topic and its sub indicators.

For social topics of the VBA Impact Statement methodology, such as Occupational Health & Safety, Child Labour, Forced Labour, and Living Wage, impacts related to the product use phase are relevant only if the product has a commercial use (see also Step 1: practical application, paragraph 6).

3. If no information on activities associated with the representative product during a downstream phase is available and no valid assumptions can be made, these downstream phases could be excluded from the assessment. For intermediate products with no information on the follow-up activities on customer level, customer industry and/or country averages could be used as basis for further modelling.

Figure 5 illustrates the practical approach for the representative product.

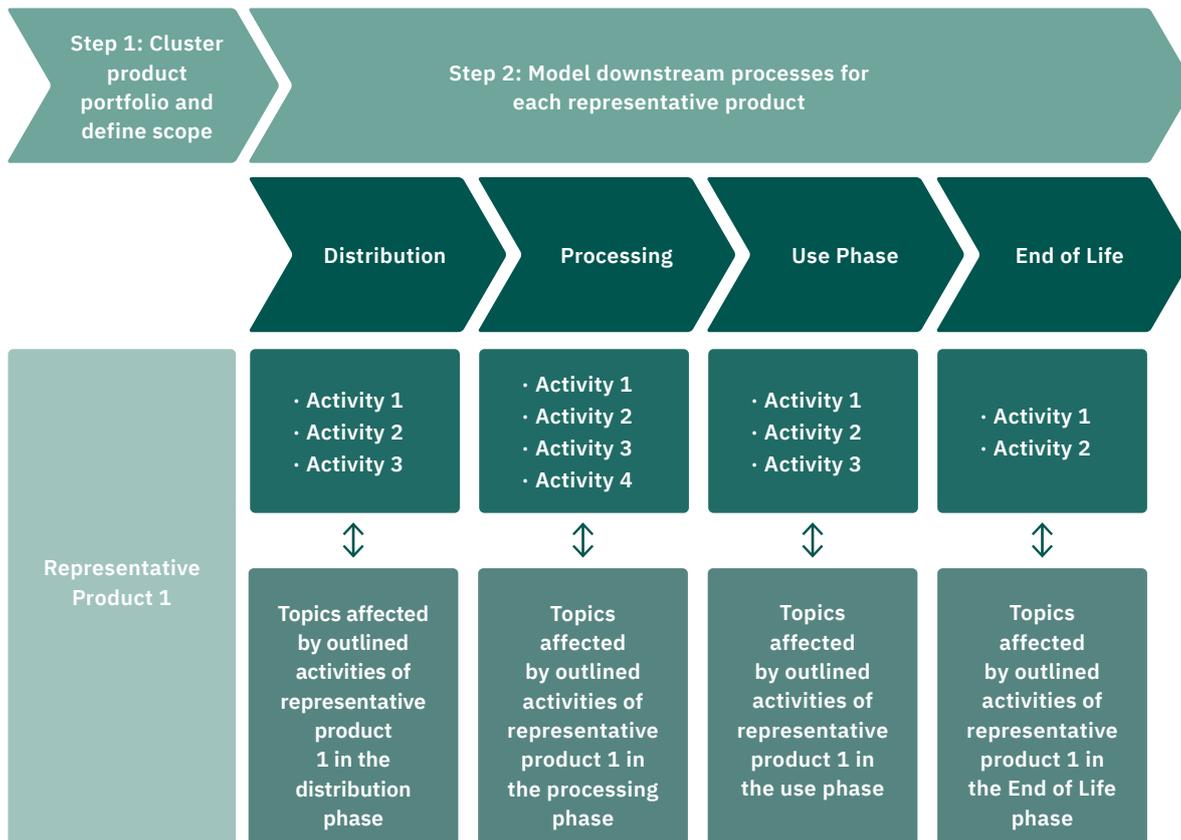


Figure 5: Exemplary Modelling of Downstream Processes for a Representative Product

3.4 STEP 3: QUANTIFY IMPACTS

In Step 1 and Step 2, downstream processes and respective activities were modelled for the defined representative products. In addition, relevant assumptions were made and the VBA Impact Statement topics impacted by the activities were identified.

When assessing downstream impacts, most of the required measurements cannot be captured directly but must be calculated or estimated by the user of this methodology. To calculate or estimate the required measurements, different data types are needed. These data types include direct company data, such as sales and product data, and supplementary data external to the company, e.g. industry data or other statistical data (see Figure 6).

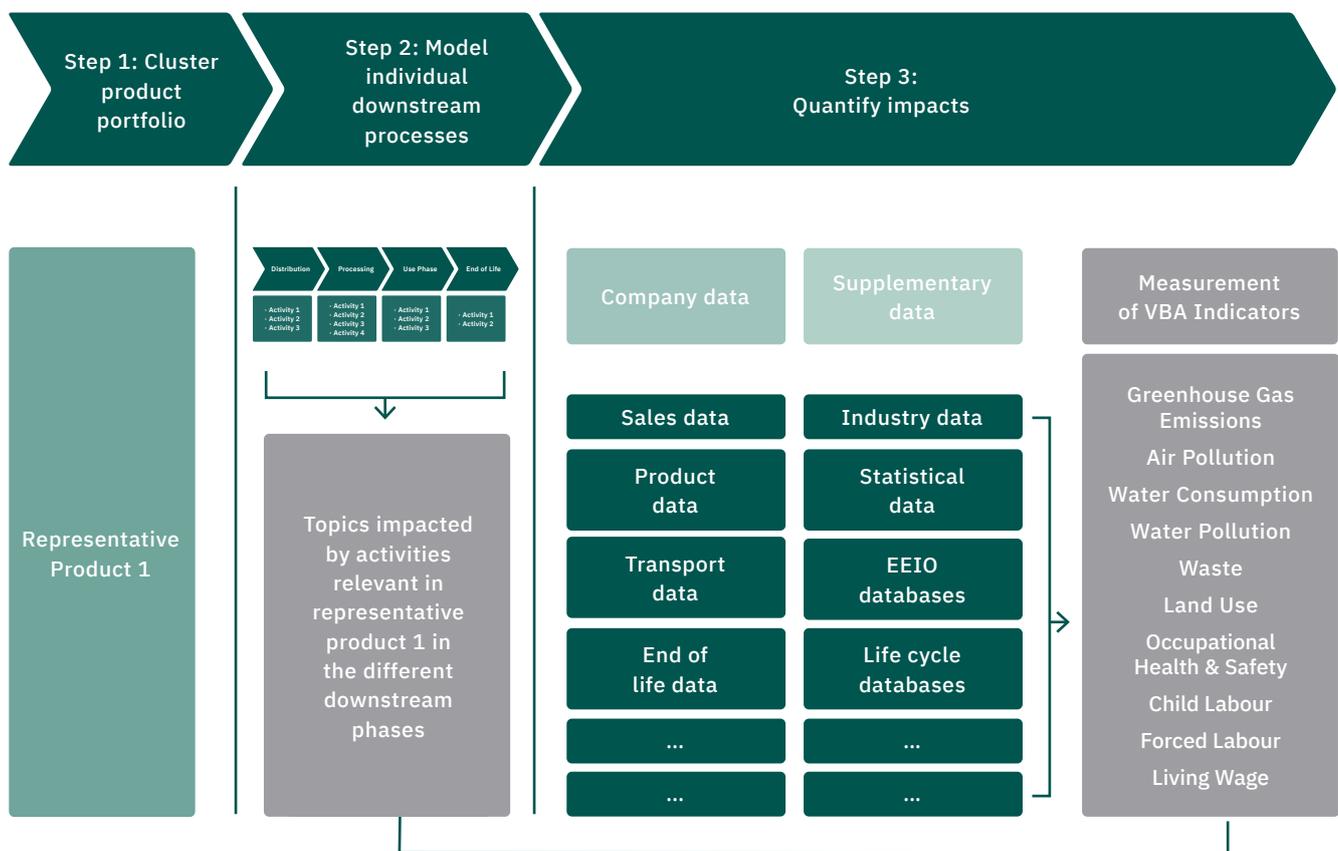


Figure 6: Data Types Needed for Step 3

Guidance and principles on Step 3

To quantify the VBA Impact Statement indicators, the user of this methodology should comply with the following guidance in Table 4:

Principle	Guidance to comply with principle ²⁶
Accuracy	<ul style="list-style-type: none"> → Ensure that collected data is free from fatal flaws. → Use direct data whenever possible and secondary data or estimates if primary data is not available.
Completeness	<ul style="list-style-type: none"> → Ensure that all necessary data is included to capture a realistic picture of all activities associated with the representative products. → All future impacts should be considered which occur due to the sold products in the reporting year.
Consistency	<ul style="list-style-type: none"> → Select appropriate data sources for the quantification and use consistent sources across different topics when considering the same downstream phase. → Apply the same allocation methods for similar inputs and outputs.
Reliability	<ul style="list-style-type: none"> → Identify the main risk drivers in the data collection process and address them with verification procedures and control actions (e.g. content controls, validation of data, plausibility checks). → Risks of transmission errors and incorrect links can also be addressed by control actions in the reports generated by the database regarding missing values, outliers, and inconsistencies.
Representativeness	<p>Ensure that data reflects the actual</p> <ul style="list-style-type: none"> → technological process (technological representativeness), → geographic location of the processes related to downstream activities and set system boundaries (geographical representativeness), and → time of the processes (time-related representativeness).
Transparency	<ul style="list-style-type: none"> → Document any changes to data, as to inventory boundaries, methods, or other relevant factors. → Disclose and justify any data exclusion. → Document all relevant assumptions as well as calculation methods and data sources.

Table 4: Guidance on Step 3 to Comply with Principles

²⁶ In line with ISO, 2006; WRI & WBCSD, 2011

Practical application for Step 3

To quantify the necessary VBA Impact Statement topics in each downstream phase, users of this methodology may find it helpful to follow these steps:

1. Derive data needs
 - Determine data needs per representative product (for each product/application group), based on outlined activities, topics matched to the activities, made assumptions, and downstream phases (see Table 5).
 - Identify possible internal and external data sources and check quality and consistency of sources (see Table 6 for possible external data sources).
 - Identify data needed for the allocation of impacts²⁷ (i.e. physical factors, economic factors, other factors).
2. Assess data availability and formulate strategy for data gaps
 - Assess availability of internal and external data and set up a plan for the data collection.
 - Identify data gaps and examine whether and how data gaps could be filled or what activities/downstream phases need to be excluded (see criteria of Step 1).
 - Identify the main risk drivers in data collection and calculation processes which could lead to incomplete and inaccurate data.
3. Collect internal and external data
 - Collect internal and external data and document all data sources.
 - Collect information related to assumptions made (e.g. product life span, use scenario, etc.).
 - Document data sources, all assumptions, and reasons for exclusions.
 - Assess data quality (exemplary data requirements are listed in Table 5).
4. Perform calculations to derive measurement of VBA indicators
 - Process and harmonize data from different sources.
 - Calculate measurements (GHGs in t CO₂e, etc. – see topic-specific papers²⁸) for the reporting period.
5. Accounting for future inputs/outputs through product use
 - Include all impacts in the reporting year associated with the representative product that occur over its lifetime.
 - Consider the representative products' average lifetimes and related outputs to calculate the measurements.

²⁷ Allocation refers to the attribution of impacts to a specific product or organisation which cannot be directly assigned according to source.

²⁸ Value Balancing Alliance, 2021a, 2022

6. Allocate impacts

- Allocation is required when an activity, a production line, a business unit, or a facility produces multiple goods and services, but the measurements/indicators are quantified only for the whole system. Wherever possible, subdivision²⁹ or system expansion³⁰ should be used to avoid allocation. But if this is not possible, the measurements must be attributed to (or apportioned among) the different products or services.
- According to EN ISO 14044:2006, the inputs and outputs should be partitioned in a way that reflects the underlying physical relationship (e.g. mass, volume, energy, chemical composition, number of units) between them, i.e. they should reflect the way in which the inputs and outputs are changed by quantitative changes in the products or functions.³¹
- Where physical relationship alone cannot be used as the basis for allocation, different relationships can be chosen. For example, input and output data might be allocated between co-products in proportion to the economic value of the products. Here, the market price can be used as a weighting factor for the allocation to the products. If there are significant price fluctuations for the product under consideration, average values should be calculated for the reference period.

7. Apply controls and plausibility checks (missing values, outliers, and inconsistencies) to address risks in data collection and calculation process (see Table 5 for exemplary data needs).

Exemplary data needs

Table 5 shows thought-provoking impulses for determining data needs. With respect to company data, users of this methodology must take into account that the departments, and thus also the availability of certain data, can vary greatly.

²⁹ Subdivision refers to disaggregating multifunctional processes or facilities to isolate the input flows directly associated with each process or facility output. European Commission, 2018a, p.61ff.

³⁰ System expansion refers to expanding the system by including additional functions related to the co-products. European Commission, 2018a, p.61ff.

³¹ ISO, 2006

Table 5: Exemplary Data Needs

	Distribution	Processing	Use	End-of-Life
Overarching	<p>Sales data: → Sales volume (in units sold and EUR/USD/etc.; if material: defective units, rejects, etc.) → Location and customer industry: origin (production sites or warehouses) and destination (sold to) Customer data (e.g. customer industry or consumer habits) Product data (e.g. potential product applications or dominant production technology)</p>			
Greenhouse Gas Emissions	<p>If specific distribution activities are known:</p> <p>Energy use and emission factors e.g. via</p> <ul style="list-style-type: none"> → Mode of transport (air, shipping, road, train) split → Tonne-kilometres (distance & weight) <p>or</p> <ul style="list-style-type: none"> → Location pairs (origin – destination) → External calculation tool such as EcoTransit 	<p>If processing activities are known:</p> <ul style="list-style-type: none"> → Processing steps modelled in LCA databases → Average product weights or number of units sold → Emission factors for relevant processing activities <p><i>Allocation based on industry data regarding energy in processing and process emissions</i></p>	<p>If end product is known:</p> <ul style="list-style-type: none"> → Typical product characteristics (e.g. energy use) → Average number of uses over product lifetime → Average number of units sold → Emission factors based on sales countries and/or published emission factors <p><i>Allocation based on industry data regarding energy in processing and process emissions</i></p>	<p>If end product is known and disposal routes are known:</p> <ul style="list-style-type: none"> → Typical characteristics of disposal routes (emission factor of waste treatment methods) → Ratio of total waste by waste treatment method (landfill, incineration, etc.) → Number of and details on volume and packaging of units sold
	<p>If specific distribution activities are unknown:</p> <p>Energy use and emission factors e.g. via estimate of energy use per run - scaled up by number of products</p>	<p>If specific processing activities are unknown:</p> <ul style="list-style-type: none"> → Sales volume split by customer industry → Extended input-output models 	<p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion 	<p>If end product is known and disposal routes are unknown:</p> <ul style="list-style-type: none"> → Typical characteristics of disposal routes (emission factor of waste treatment methods) → Average disposal characteristics per country → Average number of units sold per country
Air Pollution	As GHG emissions	As GHG emissions	As GHG emissions	As GHG emissions
Water Consumption	As GHG emissions	As GHG emissions	As GHG emissions	As GHG emissions

Table 5 continued.

	Distribution	Processing	Use	End-of-Life
Water Pollution	As GHG emissions	As GHG emissions	As GHG emissions	As GHG emissions
Waste	As GHG emissions	As GHG emissions	As GHG emissions	As GHG emissions
Land Use	e.g. estimate for number of warehouses and typical size in m ²	e.g. estimate for number of facilities and typical size in m ²	Not typically relevant	<ul style="list-style-type: none"> → Typical characteristics of disposal routes → Number of and details on volume and packaging of units sold <div style="background-color: #e0e0e0; padding: 5px;"> <ul style="list-style-type: none"> If end product is unknown: → Justified exclusion </div>
Gross Value Added	Excluded from industry-agnostic methodology for quantification of downstream impacts; risks of being seen by critical stakeholders as overstating positive impacts; positive impacts through product use should be covered through other indicators (sector-specific guidance – see 4.1)			
Training	Not typically relevant			
Occupational Health & Safety	<ul style="list-style-type: none"> → Internal information from quality management → Industry averages for incidents 	<ul style="list-style-type: none"> → Sales volume by industry → Industry averages for incidents 	<p>If end product is known and product has a commercial use:</p> <ul style="list-style-type: none"> → Sales volume and location of customer industries → Industry averages for incidents <div style="background-color: #e0e0e0; padding: 5px;"> <p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion </div>	<ul style="list-style-type: none"> → If end product is known: → Typical characteristics of disposal routes → Number of and details on volume and packaging of units sold → Country and disposal route averages for incidents from published studies <div style="background-color: #e0e0e0; padding: 5px;"> <p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion </div>
Living Wage	e.g. industry averages for wages from international data on labour-related topics in transportation sector	<ul style="list-style-type: none"> → Sales volume by industry → Industry averages for wages from international data on labour-related topics 	<p>If end product is known and product has a commercial use:</p> <ul style="list-style-type: none"> → Sales volume by industry → Industry averages for wages from international data on labour-related topics <div style="background-color: #e0e0e0; padding: 5px;"> <p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion </div>	<p>If end product is known:</p> <ul style="list-style-type: none"> → Typical characteristics of disposal routes → Number of and details on volume and packaging of units sold → Country and disposal route averages for wages from published studies <div style="background-color: #e0e0e0; padding: 5px;"> <p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion </div>

Table 5 continued.

	Distribution	Processing	Use	End-of-Life
Child Labour and Forced Labour	e.g. industry averages for number of child or forced labour cases from international data on labour-related topics in transportation sector	<ul style="list-style-type: none"> → Sales volume by industry → Industry averages for number of child or forced labour cases from international data on labour-related topics 	<p>If end product is known and product has a commercial use</p> <ul style="list-style-type: none"> → Sales volume and location of customer industries → Industry averages for number of child or forced labour cases from international data on labour-related topics 	<ul style="list-style-type: none"> → Typical characteristics of disposal routes → Number of and details on volume and packaging of units sold → Country and disposal route averages for child or forced labour cases from published studies
			<p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion 	<p>If end product is unknown:</p> <ul style="list-style-type: none"> → Justified exclusion

Exemplary data sources

Given the range of business models and related downstream activities to be covered by this methodology, it is not feasible to define generally applicable data sources for all impact drivers. Nevertheless, guidance on possible sources for the respective data is provided below. Table 6 shows exemplary sources for secondary data. It does not claim to be complete.

Type of secondary data	Data sources (not exhaustive)
Statistical data	<ul style="list-style-type: none"> → Living Wage Database → Global Health Data Exchange → Data Distribution Centre (DDC) of the Intergovernmental Panel on Climate Change (IPCC) → OECD Statistics → UNICEF Data → EMEP/CEIP Emission Data (Europe only) → UNEP GEO Data Portal → World Bank Environment Data → WRI climate data → APEC Energy Database → IEA Energy Statistics → ILOSTAT → WageIndicator
Industry data and process-oriented data	<ul style="list-style-type: none"> → Eco transit
Extended input-output (EEIO) databases	<ul style="list-style-type: none"> → EXIOBASE extension → Global Trade Analysis Project (GTAP) <p><i>Additional databases for EEIO are listed in the VBA Methodology Paper on Extended Input-Output Modelling ³²</i></p>
Life cycle databases	<ul style="list-style-type: none"> → Global LCA Data Access network (GLAD) → European Platform on Life Cycle Assessment → GaBi → ecoinvent → Social Hotspots Database → DEFRA → PROBAS

Table 6: Exemplary Data Sources

³² Value Balancing Alliance, 2021c

4.

OUTLOOK AND AREAS
FOR FURTHER
DEVELOPMENT

This document provides industry-agnostic guidance for the assessment of downstream impacts and outlines a structured approach to apply the VBA Impact Statement methodology for a company's downstream activities. The outlined 3-Step approach offers orientation to assess the existing topics of the VBA Impact Statement methodology and responds to fundamental questions, e.g. regarding the scope of the downstream assessment or the allocation of impacts. Nevertheless, further development is needed to acknowledge the complexity of downstream activities and company/sector-specific components, such as positive impacts through the use of products. The following section discusses areas for future development and limitations of the presented approach.

4.1 CONSIDERING (POSITIVE) IMPACTS OF PRODUCT USE

The use of goods and services may lead to specific positive socio-economic impacts which have not been covered by the existing VBA Impact Statement methodology and its topics. Depending on the business model, these impacts can represent an important share of the overall corporate footprint and a company's downstream activities.³³ The paper at hand aims to provide general, industry-agnostic guidance and recognises the fact that users of this methodology should go beyond the existing topics of the VBA Impact Statement methodology to measure and value impacts specifically related to product use. These additional impacts are often less generalisable and differ on product or sector level, leading to the need for sector-specific guidelines. Future methodology development may conceptualise sector-specific guidance outlining a structured and comparable way to identify, measure and value impacts related to product use.

4.2 INTEGRATING INVESTMENTS AS DOWNSTREAM PHASE

This paper introduces a 3-Step approach, providing users of the VBA Impact Statement methodology orientation to assess their impacts in different sub-phases of their downstream activities (e.g. distribution, use phase, or end-of-life). However, not all relevant downstream activities of the financial sector are reflected in this approach. Especially activities related to investments (e.g. equity investment, debt investment, or project finance) or financial services³⁴ were not included as a separate downstream phase in the current version of the methodology. Future updates need to incorporate investments as an additional phase in the 3-Step approach.

4.3 A CIRCULAR ECONOMY VIEW ON DOWNSTREAM

In recent years, increasing efforts were put into the development of closed loop systems, where products are designed in a way that materials are kept in use and waste or pollution are eliminated.³⁵ This development is known as *circular economy movement*³⁶ and has important implications for the assessment of downstream impacts. Future methodology development may conceptualise

33 Serafeim & Trinh, 2021: Impact accounting for product use: A framework and industry-specific models

34 See downstream definition according to WRI & WBCSD, 2011

35 WBCSD, 2021, p. 11

36 The circular economy is based on three principles: (1) Design out waste and pollution, (2) Keep products and material in use, (3) Regenerate natural systems; see Ellen MacArthur Foundation, 2019; WBCSD, 2021

how conserved resources or avoided energy consumption can be reflected in the quantification of downstream impacts and how these impacts should be allocated between the user of this methodology and other downstream actors. The introduction of a circular economy view in downstream methodology may also be linked to potential positive impacts of product use (see 4.1).

5.

APPENDICES

5.1 OVERVIEW OF EXISTING METHODS AND APPROACHES

Existing methods and approaches published by business practices and academia have been reviewed and evaluated with regard to applicability to the VBA Impact Statement methodology and with special focus on the quantification of impacts. Central aspects covered by the review are:

1. Rules or guidance to define the scope of the downstream assessment and the relevant value chain boundaries (e.g. cut-off criteria);
2. Recognition of characteristics of varying business models (e.g. sector-specific guidance);
3. Approaches to reduce the complexity in quantifying downstream impacts (e.g. how to deal with a broad and complex product portfolio);
4. Guidelines for the allocation of downstream impacts (e.g. possible factors that could be used as a basis for allocation);
5. Dimensions covered (i.e. environmental, social, economic);
6. Aspects that match with existing VBA Impact Statement topics (e.g. GHG emissions or occupational health and safety); and
7. Data requirements named by the approach.

The results of the review process indicate existing approaches that are focused on environmental impacts (e.g. Organisation Environmental Footprint³⁷) or are industry specific, considering the needs of a given business model (e.g. case studies). Although these first methodological approaches to assess downstream impacts provide a basis for further developments, they often are not applicable to the existing VBA Impact Statement methodology, lack publicly available details to be applied, or are too complex for practical application. An overview of the most relevant approaches can be found in Table 7.

37 European Commission & Joint Research Centre - Institute for Environment and Sustainability, 2012

Table 7: Review of Existing Methods and Approaches

Institution/ Publication	Definition of Scope and Value Chain Boundaries	Accounting for Business Characteristics	Approach to Reduce Complexity in Quantification	Allocation of Downstream Impacts	Specifying Product/Service Lifespan	Pillars [Environmental Social Economic]	Match with Existing VBA Topics	Data Requirements
WRI/WBCSD: The Green House Gas Protocol	distribution & storage, product use, end-of-life	sector-specific guidance	functional units and reference flow	physical/economic/other factors	guidance for product/service lifespan in use and end-of-life treatment	Environmental	GHG Emissions; other air emissions	clear requirements and guidance for emission related data collection
HBS: Impact-Weighted Accounts Initiative	product use, end-of-life	guidance for several sectors	n/a	allocation based on product reach and other framework dimensions	n/a	Environmental, Social	GHG emissions, other air emissions, water usage, water pollution	general and sector specific guidance for required data
Capitals Coalition: Natural Capital Protocol	product use, end-of-life	general guidance	n/a	n/a	n/a	Environmental	GHG Emissions; other air emissions; Water pollution; Waste	none for downstream
EU Commission: Organisational Environmental Footprint (OEF)	distribution & storage, processing, use, end-of-life, other DS activities	n/a	representative products/ focus on specific parts of the product portfolio	Guidance for allocation of impacts	referred to other guidelines	Environmental	GHG emissions, other air emissions, water consumption, water pollution, land use	data quality criteria defined; requirements for general and specific data collection defined
EU Commission: Product Environmental Footprint (PEF)	see OEF	sector-specific guidance is provided	representative products	Guidance for allocation of impacts for different sectors	information available	Environmental	GHG emissions, other air emissions, water consumption, water pollution, land use	data quality criteria defined; requirements for general and specific data collection defined

Table 7 continued.

Institution/ Publication	Definition of Scope and Value Chain Boundaries	Accounting for Business Characteristics	Approach to Reduce Complexity in Quantification	Allocation of Downstream Impacts	Specifying Product/Service Lifespan	Pillars [Environmental Social Economic]	Match with Existing VBA Topics	Data Requirements
LCI/UNEP: Social life cycle assessment of products and organizations	focus on product use; clear cut-off criteria	n/a	n/a	n/a	referred to LCA	Social	(occupational) health & safety, corruption, human rights	data quality criteria defined; requirements for general and specific data collection defined
Social & Human Capital Coalition: Social Capital Protocol	product use, (end-of-life)	general guidance with several examples	n/a	comparison with baseline scenario	n/a	Social	(occupational) health & safety, training	general guidance on data requirements
WBCSD: Addressing the avoided emissions challenge	distribution & storage, use, end-of-life	intermediate products	centred around the functional unit; focus on emissions	qualitative approach, based on the significance of contribution (defined in the study)	n/a	Environmental	GHG emissions	referred to ISO 14044
Roundtable for Product Social Metrics: Hand- book for Product Social Impact Assessment	product use, end-of-life	general guidance with several examples	definition of functional units	referred to PEF	n/a	Social	(occupational) health & safety, human rights	general requirements listed
WBCSD: Social Life Cycle Metrics for Chemical Products	product use, end-of-life; guiding questions for cut-offs	intermediate products	definition of functional units and reference flow	n/a	n/a	Social	(occupational) health & safety	general data requirements

5.2 LIST OF TABLES AND FIGURES

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5.3 LIST OF ACRONYMS AND ABBREVIATIONS

- CO₂ – Carbon dioxide
 CO₂e – Carbon dioxide equivalent
 GHG – Greenhouse gas
 GRI – Global Reporting Initiative
 GVA – Gross value added
 IMP – Impact Management Project
 IIRC – International Integrated Reporting Framework
 IWAI – Impact-Weighted Account Initiative
 NFRD – Non-financial Reporting Directive
 OEF – Organisation Environmental Footprint
 PEF – Product Environmental Footprint
 SASB – Sustainability Accounting Standards Board
 VBA – Value Balancing Alliance

5.4 GLOSSARY

Term	Definition	Source
Activity	Actions taken or work performed through which inputs, such as funds, technical assistance and other types of resources, are mobilized to produce specific outputs.	DAC/OECD (2010)
Allocation	Allocation refers to the attribution of impacts to a specific product or organisation which cannot be directly assigned according to source. Details on the allocation of impacts are described in Step 3.	WRI/WBCSD (2011)
Capital	Stocks of value on which all organizations depend for their success that serve as inputs to their business models and which are increased, decreased, or transformed through the organisation's business activities and outputs. The capitals are categorised in this Framework as financial, manufactured, intellectual, human, social and relationship, and natural.	IIRC (2013)
Discount rate	Definition that must be used for calculating the amount of provisions: pre-tax rate (or rates) that reflect(s) current market assessments of the time value of money and the risks specific to the liability. The discount rate(s) should not reflect risks for which future cash flow estimates have been adjusted.	IFRS Foundation (2018) – IAS 37.47
Downstream	GHG emissions or removals associated with processes that occur in the life cycle of a product subsequent to the processes owned or controlled by the reporting company.	GHG Protocol (2011)
Driver (direct and indirect)	Any natural or human-induced factor that directly or indirectly causes a change in an ecosystem.	TEEB (2010)
Effects	Intended or unintended change directly or indirectly due to an intervention.	DAC/OECD (2010)
Final products	Final products are goods and services that are consumed by the end user in their current form without further processing, transformation, or inclusion in another product/service. Final products include: products consumed by end consumers, products sold to retailers for resale to end consumers (e.g. consumer products) and products consumed by businesses in their current form (e.g. office supplies).	GHG Protocol (2011)
Gate-to-grave	Product's life cycle including use, end-of-life treatment, recycling, and final disposal.	ISO 14007 (2019)
Greenhouse gases (GHG)	For the purposes of this Framework, GHGs are the seven gases covered by the UNFCCC: carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF ₆), and nitrogen trifluoride (NF ₃).	GHG Protocol (2011)

Gross value added (GVA)	Output (at basic prices) minus intermediate consumption (at purchaser prices). This is the balancing item of the national accounts' production account. GVA can be broken down by industry and institutional sector. The sum of GVA across all industries or sectors, plus taxes on products minus subsidies on products, gives gross domestic product. By subtracting the consumption of fixed capital from GVA, the corresponding net value added (NVA) is obtained. The concepts of „GVA at market prices“, „GVA at producer prices“, and „GVA at basic prices“ are not used in ESA 2010.	Eurostat (2020)
Impact	Positive and negative, primary and secondary long-term effects produced by a development intervention (directly or indirectly, intended or unintended).	DAC/OECD (2010)
Impact measurement	The measurement and management of the processes of creating social and environmental impacts in order to maximise and optimise them.	IMP (2020)
Input	The financial, human, and material resources used for a development intervention.	DAC/OECD (2010)
Intermediate products	Intermediate products are inputs to the production of other goods or services that require further processing, transformation, or inclusion in another product before use by the end consumer. Intermediate products are not consumed by the end user in their current form.	GHG Protocol (2011)
Monetary valuation	Procedure for determining monetary value.	ISO 14008 (2019)
Monetary value	Amount of money representing willingness to pay or willingness to accept compensation.	ISO 14008 (2019)
Output	The products, capital goods and services that result from a development intervention. May also include changes resulting from the intervention that are relevant for the achievement of outcomes.	DAC/OECD (2010)
Own operation	Gate-to-gate: environmental aspects and potential environmental impacts throughout a product's life cycle, starting with production (LCA addresses the environmental aspects and potential environmental impacts throughout a product's life cycle from raw material acquisition through production, use, end-of-life treatment, recycling, and final disposal (i.e. cradle-to-grave – e.g. use of resources and environmental consequences of releases)).	ISO 14044 (2006)
Upstream	Cradle-to-gate: environmental aspects and potential environmental impacts throughout a product's life cycle from raw material acquisition (LCA addresses the environmental aspects and potential environmental impacts (e.g. use of resources and environmental consequences of releases) throughout a product's life cycle from raw material acquisition through production, use, end-of-life treatment, recycling, and final disposal (i.e. cradle-to-grave)).	ISO 14044 (2006)
Upstream	GHG emissions or removals associated with processes that occur in the life cycle of a product prior to the processes owned or controlled by the reporting company.	GHG Protocol (2011)
Valuation	The process of estimating a value for a particular good or service in a given context in monetary terms.	TEEB (2010)

6.

SOURCES

SOURCES

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7.

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