ACCOUNTABILITY DOCUMENT IMPACT BASED REPORTING

This document has been aligned as closely as possible with the accountability documents of other infrastructure companies, particularly those of network operators in the Netherlands. Therefore, the same structure has been maintained, and some standardized texts have been included in this document.

Introduction

At Gasunie, a high priority is given to safety, health, and the environment. Gasunie's activities have significant societal impact on the environment, specifically on the economy, nature, and safety within society.

Gasunie makes these societal effects visible by quantifying and valuing them (expressed in a single unit: €). The goal is to enhance the understanding of Gasunie's societal value through transparent and externally verifiable reports. Gasunie collaborates with various infrastructure companies on the development, expansion, and harmonization of impact measurement. For instance, Gasunie, along with other energy network operators, worked on an update of the "Handboek Impactmeting Infrabedrijven" (initially published as "Handboek Impactmeten Netwerkorganisaties" in September 2020 on the Impact Institute website). This revised version (published in November 2023 on the Impact Institute website) includes additional information on measuring and reporting biodiversity, the impact of procurement and waste, and the impact of work accidents and absenteeism. With the new handbook, impact calculations have been further harmonized. Through collaboration, Gasunie aims to increase the transparency of its reports, enabling informed decision-making and value creation in the long term.

BUILDING ON EXISTING METHODS

Measuring impact aligns with integrated reporting and represents the next step in this process. Gasunie reports these figures in accordance with the previously mentioned *Handbook for Impact Measurement in Infrastructure Companies* (November 2023). This handbook includes some harmonized elaborations and guidelines related to basic concepts, process steps, and impact calculations, and lays the groundwork for agreements regarding consistent measurement and reporting on impact. The handbook builds upon the *Framework for Impact Statements* (2019) and the *IP&L Assessment Methodology Core* (2020) from the Impact Institute, which themselves build upon principles of integrated annual reports.

Scope

To determine the positive and negative contributions made by Gasunie, an assessment was conducted using the six capitals model of the IIRC (International Integrated Reporting Council) to identify relevant impacts. For a selection of these impacts, quantification was performed. The selection of impacts was based on an analysis of materiality, feasibility, and strategic focus from the standard list of defined impacts in the handbook; refer to the table below. Gasunie's participations are included in the energy value and climate damage calculations.

Capital	Impacts
Manufactured	Contribution of gas transportation to consumer wellbeing
	Economic added value of energy transmission for business customers
	Value of goods purchased for gas transportation
Natural	Contribution to climate change
Human	Work-related employee absence and accidents

The following table shows which indicators have been used to determine the impacts.

Contribution of gas transportation to consumer wellbeing	External component - gas - households
	Internal component - gas - households
	Interne component - gas - industry
	Internal component - gas - other final consumers (incl. energy sector)
	Welfare gains from green gas supply
Economic added value of energy transmission for business customers	Economic added value of energy transmission for business customers
Value of goods purchased for gas transportation	Value of goods purchased for gas transportation - industry
	Value of goods purchased for gas transportation - other final consumers (incl. energy sector)
	Value of goods purchased for gas transportation - households
	External component - gas – households suppliers
Contribution to climate change	Contribution to climate change from greenhouse gas emissions grid operator (direct - own organisation)
	Contribution to climate change from greenhouse gas emissions grid operator (indirect - upstream)
	Contribution to climate change from greenhouse gas emissions chain emissions gas (indirect - upstream)
	Climate change mitigation (direct)
	Climate change mitigation (indirect)
Work-related employee absence and accidents	Accidents without a fatal outcome
	Accidents with a fatal outcome
	Other work-related dropouts

Method

To carry out the impact assessment, impacts are first quantified. Subsequently, the portion of the quantified impact attributed to Gasunie is determined. This process is referred to as attribution.

QUANTIFYING IMPACT

In the following sections, we elaborate on impact indicators through impact calculations. We explain how these impacts are constructed. The following principles apply to the calculated impacts:

- *Indicator.* Defines the impact indicator.
- *Impact.* Positive and negative impacts are analyzed and quantified per indicator (expressed in social costs and benefits), as they cannot be directly offset against each other.
- *Limitations.* When calculating impacts, criteria, assumptions, and principles are applied and, if applicable, separately explained.
- *Calculation.* The explanation of the financial valuation of impact, expressed in social costs and benefits, and the transparent presentation of used sources. Consultation with experts (Impact Institute) and network operators determined the most suitable valuation technique, associated indicators, and available information.
- *Sources.* The input sources for the calculation and an explanation of the choice of these sources, assuming recent data.
- *Attribution.* The decision to distribute impact across stakeholders in the value chain.

ATTRIBUTION OF IMPACT

Attributing impact is a crucial part of measuring impact within the value chain to estimate the portion of impact that can be attributed to Gasunie. Impact occurs not only within Gasunie but also in collaboration with suppliers (goods and services). We allocate a portion of the value of Gasunie's work to these suppliers. Without attributing a share of this impact to Gasunie, the impact could be disproportionately large. The value chain encompasses activities from gas extraction to gas utilization. Downstream, there are Gasunie's business and household customers. Upstream, there are gas suppliers, material suppliers to Gasunie, and, of course, Gasunie itself. Impact is distributed through attribution, dividing the total impact based on responsibility within the value chain.

Currently, there is no widely adopted or accepted method for impact attribution. Therefore, transparency regarding the choices made in this process is essential. Infrastructure companies (including Gasunie) follow the method described in the Integrated Profit & Loss Assessment Methodology (IAM) Supplement Impact Contribution (Handboek Impactmeting Infrabedrijven). The impact within the value chain is allocated based on a) chain responsibility and b) economic added value.

First and foremost, impacts are categorized based on the responsibility of value chain players regarding the impact that occurs. Here, a distinction is made between full responsibility and shared responsibility. In the case of shared responsibility, further differentiation is made between impacts primarily attributable to one's own organization, impacts primarily attributable to other organizations in the value chain, and impacts without a clearly identifiable primary responsible party. Next, the segment of the value chain is approached based on economic added value. For energy transport, the added value is calculated using the share of network prices in the total energy price, followed by the share of Gasunie within the network price.

Finally, the impact is assigned using an attribution factor. This attribution factor is determined based on the identified responsibility of the organization within the value chain and, if relevant, the economic added value. The calculation of attribution factors is designed such that the impact of all organizations summed together equals the total impact of the chain (no double counting or omission). Additionally, when an organization with primary responsibility can be identified, it is allocated the majority (> 50%) of the impact. This process occurs as follows:

Responsible for activity that makes impact:	Gasunie IP&L	(sum of) IP&Ls of chain partners	Total impact
Only Gasunie	Attribution factor 1: 100%	No attribution: 0%	=100%
Primarily Gasunie	Attribution factor 2a: 50% + 50% * proportion of added value	Attribution factor 2b: 50% * proportion of added value	=100%
Primarily chain partners	Attribution factor 2b: 50% * proportion of added value	Attribution factor 2a: 50% + 50% * proportion of added value	=100%
Supply chain responsability	Attribution factor 3: Proportion of added value	Attribution factor 3: Proportion of added value	=100%

Financial Capital Impact Assessment

FINANCIAL CAPITAL

Definition and Impact Description

Within the realm of financial capital, we include the financial cash flows distributed across various categories. These impact indicators are calculated as direct absolute impacts, with no consideration of alternative activities as reference points. The impacts accounted for under financial capital can be directly traced back to the consolidated annual report of N.V. Nederlandse Gasunie.

Description	Financial cash flows between the organisation and affected stakeholder groups.
Stakeholder group	Government, the organisation and investors, employees, suppliers, customers.
Delineation of activities	Financial transactions.
Valence (valuation)	Combination of negative (for incoming cash flows) and positive (for outgoing cash flows).
Attribution	Direct (internal) impacts where responsibility lies with Gasunie; these impacts are 100% attributed to Gasunie.

Calculation and Limitation

The impacts are calculated based on the profit and loss statement and cash flow statement of Gasunie. Valuation-wise, these impact indicators represent financial data (hence, not monetized).

Sources

The profit and loss statement and cash flow statement from the annual report of N.V. Nederlandse Gasunie serve as the data source. These figures align with the consolidated profit and loss statement and cash flow statement. They encompass both incoming and outgoing cash flows for Gasunie.

MANUFACTURED CAPITAL

As described, manufactured capital encompasses various impacts. These impacts include the following indicators: Contribution to Consumer Well-being in Gas Transport; Value of Energy Transport for Business Customers; Value of Goods Procurement for Gas Transport. These indicators are subsequently combined after attribution. In the remainder of this section, we will elaborate on these impacts, followed by an explanation of the applied attribution factors in the Attribution chapter.

CONTRIBUTION TO CONSUMER WELL-BEING IN ENERGY TRANSPORT

By supplying gas to consumers and business clients, Gasunie adds value to society. However, the value differs between households and business customers. Therefore, it is essential to make this distinction. Research on price elasticities generally reveals that the well-being value of obtaining gas exceeds the actual price paid by our consumers. This surplus value is known as the consumer surplus. For household customers, this surplus is quantified and attributed to the energy chain. For business customers, the ultimate surplus lies in the products they deliver to end consumers. This aspect falls outside the scope of impact measurement. To calculate the maximum willingness to pay for gas, we utilized the average transaction prices for Germany determined by Destatis. Since the transaction price for 2022 was not yet available, we used data from 2021 as the most recent year. Additionally, to align the maximum willingness to pay in the Netherlands with the same year's data used for Germany, we also relied on 2021 data for sector prices and final energy consumption. The price increase in 2022 is not reflected in the results as a result of this approach.

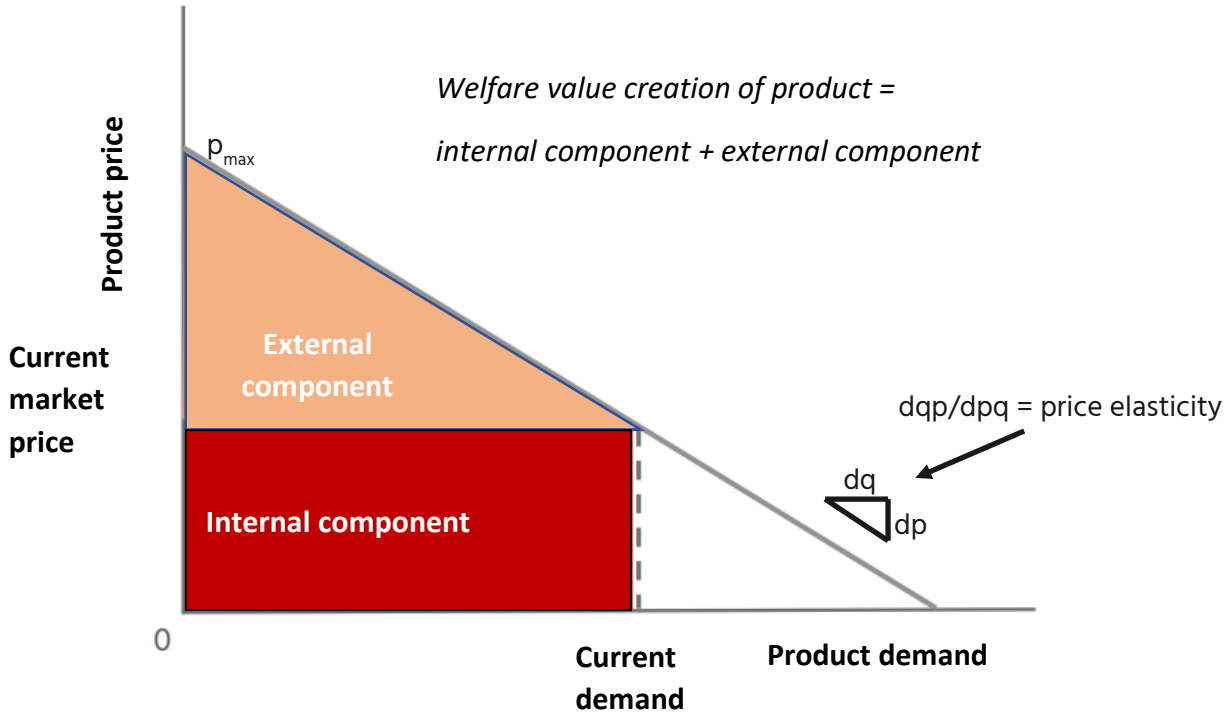
Definition and Impact Description

The well-being of consumers when consuming gas is higher than just the price paid for its consumption. The contribution of gas transport to consumer well-being is estimated based on the

consumer surplus. The well-being value of energy and gas can be divided into two parts: an internal and an external component. Part of the well-being value of gas transport is embedded in Gasunie's prices. This part corresponds to the revenue from households and is referred to as the internal component of the value of gas transport. The remaining well-being value represents the money that consumers would be willing to pay for gas, reduced by what they actually pay. This net well-being gain is approximated using an estimate of the consumer surplus: the difference between the value and the price of gas for households. We refer to this part as the external component of the value of gas transport.

The figure below clarifies this relationship.

The sector-wide demand curve for the product



Limitations

To calculate consumer surplus, estimates regarding the gas demand curve have been used. Additionally, estimates have been made regarding average market prices for gas in 2022.

For the demand curve, data is available on the elasticity around common household gas consumption levels. However, for more extreme situations, such as price elasticity at very low supply, less information is known. We utilize price elasticities as calculated by CE Delft and extrapolate them to low and high quantities. This results in a linear line under which we estimate consumer surplus.

To compare consumer surplus across different network operators, we have chosen to determine the maximum willingness to pay for gas by consumers for the entire sector. To facilitate comparisons between impact assessments from different years, this willingness to pay is calculated as a rolling average over the past 3 years. Subsequently, the demand curve is determined as a linear function

based on willingness to pay, the most recent sector price, and the transported volume over the time span.

Internal component gas transport households	Net turnover network operator gas households (EUR/year)
External component gas transport households	(Maximum willingness to pay for gas in sector based on running average years t-1, t-2 and t-3 (EUR/m^3) -/- Transaction price gas households sector year t-1 (EUR/m^3)) * Volume of gas transported by network operator to households (m^3/year)

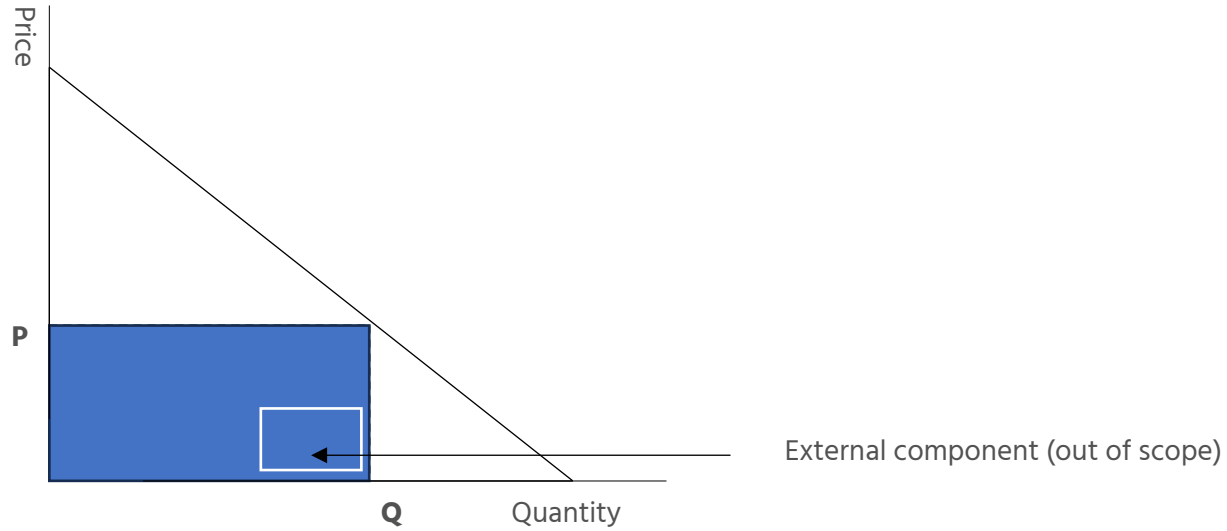
Sources

Volume of energy transported	Annual report N.V. Nederlandse Gasunie
Price elasticity of energy	CE Delft (2012) (electricity -0.20; gas -0.15) [% delta quantity]/[% delta price].
Sector price (incl. energy tax and VAT)	CBS: • Sector price including energy tax and VAT electricity - households - 2019 EUR/kWh 0.205 • Sector price including energy tax and VAT gas - households - 2019 EUR/GY 26.207 • Sector price including energy tax and VAT electricity - households households - 2020 EUR/kWh 0.139 • Sector price including energy tax and VAT gas - households - 2020 2020 EUR/GY 27.815 • Sector price including energy tax and VAT electricity - households households - 2021 EUR/kWh 0.134 • Sector price including energy tax and VAT gas - households - 2021 EUR/GY 28.103
Net turnover network operator gas (EUR/year)	Annual report N.V. Nederlandse Gasunie
Quantities of gas transported (m^3/year)	Annual report N.V. Nederlandse Gasunie

ENERGY TRANSPORT VALUE FOR BUSINESS CUSTOMERS

Definition and Impact Description

The method for this is still under development; therefore, only the internal portion of the consumer surplus is considered in this impact assessment. This is based on revenue figures, adjusted for sales and energy taxes (which are attributed to Gasunie). The figure below clarifies this relationship1.



Calculation and limitation

Net sales of gas for wholesale customers are equated with the internal energy transmission component for business customers. The willingness to pay of business customers is more difficult to determine. Therefore, it is conservatively assumed that the value of energy for business customers is equal to the amount paid, i.e. the external component for business customers is set equal to zero.

Calculation

Internal component gas transport business customers	Net turnover network operator gas business customers (EUR/year)

Sources

Net turnover network operator gas business customers (EUR/year)	Jaarverslag N.V. Nederlandse Gasunie

VALUE OF GOODS PURCHASED FOR ENERGY TRANSPORT

This impact is also part of the impact Contribution of energy transport well-being consumers. The impact indicates what part of the value creation can be attributed to suppliers. It is thus a corrective item for manufactured capital.

Calculation

Value of goods purchased gas transport	External component gas households attributed to suppliers (EUR/year) + Purchases of goods for gas transport (EUR/year)

Sources

Cost of work contracted out, materials and other external costs (EUR/year)	Annual report N.V. Nederlandse Gasunie
Net turnover network operator gas (EUR/year)	Annual report N.V. Nederlandse Gasunie

INCREASE IN WELFARE DUE TO GREEN GAS SUPPLY

These impacts are part of the impact Contribution of energy transport welfare consumers. The impact of Gasunie enabling delivery of green gas consists mainly of the increased welfare of using greener energy. The well-being of households using green gas increases due to the consumption of renewable energy instead of natural gas and the associated contribution to environmental problems such as climate change. This increase in welfare is reflected by the higher willingness-to-pay (WTP) for renewable energy compared to conventional energy.

Calculation

Welfare gains from green gas supply	WTP for renewables * Volume of green gas transported

Sources

WTP for renewables	Rogiers et al. (2015)
Getransporteerd volume groen gas	Jaarverslag N.V. Nederlandse Gasunie

NATURAL CAPITAL

As previously described, natural capital encompasses the following impacts:

- Contribution to Climate Change
- Mitigation of Climate Change
- Ecological Damage from Material Procurement

In the remainder of this section, we will delve into these impacts, followed by an explanation of the applied attribution factors in the Attribution chapter.

CONTRIBUTION TO CLIMATE CHANGE

Contribution to climate change is defined as the emission of greenhouse gases by the organization itself and throughout its value chain, resulting in climate change—a negative impact on people and ecosystems. The impact of contribution to climate change is calculated based on greenhouse gas emissions from the organization and its value chain. This aligns with the scopes outlined in the Greenhouse Gas (GHG) Protocol for electricity and gas extraction and production phases (and partially includes the usage phase).

- Direct Greenhouse Gas Emissions from Own Operations: Corresponds to scope 1 emissions reported by Gasunie.
- Indirect Greenhouse Gas Emissions from Direct Suppliers: Corresponds to scope 2 and 3 emissions reported by Gasunie.

- Chain Emissions from Gas and Electricity Production and Extraction: This involves a broader interpretation of scope 3 emissions—the emissions from chain partners that contribute to Gasunie's energy production phase until energy usage. The total emissions from gas usage are estimated by multiplying the distributed quantity by the relevant emission factors.

The six greenhouse gases defined in the Kyoto Protocol fall within the scope: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Contribution to climate change	Contribution to climate change from greenhouse gas emissions grid operator (direct - own organisation	Emissions Scope 1 * Monetisation coefficient (EUR/kg CO2 eq)
	Contribution to climate change from greenhouse gas emissions grid operator (indirect - upstream - grid losses)	Emissions Scope 2 * Monetisation coefficient (EUR/kg CO2 eq)
	Contribution to climate change from greenhouse gas emissions grid operator (indirect - upstream - excluding grid losses)	(Scope 2 emissions + Scope 3 emissions) * Monetisation coefficient (EUR/kg CO2 eq)
	Contribution to climate change from greenhouse gas emissions chain emissions gas (indirect - upstream)	((Transported volumes of gas (m^3/year) * Emission factor NL natural gas (WTW)) -/- Chain emissions own gas use) * Monetisation coefficient (EUR/kg CO2 eq)
Climate change mitigation	Climate change mitigation (direct)	Guarantees of origin * Monetisation coefficient (EUR/kg CO2 eq)

Valuation

True Price Monetisation factors 2022 EUR 0.152/kg CO2 eq

Sources

Starting point for the impact calculation are therefore the CO2 figures as reported in the CO2 footprint in the annual report of N.V. Nederlandse Gasunie.

CO2 emissions	Annual report N.V. Nederlandse Gasunie
Emission factor NL Natural gas (WTW)	CO2 emission factors 2022 (Emission factor natural gas (WTW) kg CO2-eq/m3 2.085)
Quantities of gas transported (m3 /year)	Annual report N.V. Nederlandse Gasunie

The secondary data consist of the emission factors for gas usage and the monetization coefficient. The Handbook for Impact Assessment in Infrastructure Companies states that network operators use a refresh cycle of 3 years for updating this data. However, Gasunie deviated from this practice and applied an update in 2022.

HUMAN CAPITAL

Gasunie employs approximately 1700 workers. Despite having comprehensive safety regulations, accidents can occur during work activities, such as cuts or falls. Therefore, the potential negative impact of work-related incidents is assessed. Work at Gasunie can also contribute to work-related absenteeism due to issues like back pain or burnout. The goal is to determine the impact of these accidents and work-related absences on the well-being of our employees.

EMPLOYEE ACCIDENTS AND ABSENCES

Definition and Description of Impact

The health effects of work-related absences and accidents among employees. The extent to which work-related incidents and absences negatively affect the overall health, well-being, and safety of employees. This includes both fatal and non-fatal work-related accidents within the workplace and the occurrence of chronic stress. It applies to incidents within the organization (direct impact) as well as in the value chain (indirect impact).

Calculation and Mitigation

The loss of employee well-being is measured using the Disability-Adjusted Life Year (DALY) indicator. DALY represents both the perceived loss of well-being and the loss of future income for an employee. DALYs for a disease or health condition are calculated as the sum of years of life lost due to premature death (Years of Life Lost, YLL) and years lost due to disability and/or illness (Years Lost due to Disability, YLD) (definition from WHO, 2020). Work-related dropouts and accidents of employees consist of three components: non-fatal accidents; fatal accidents; and other work-related dropouts. The three components are modelled separately, as shown below:

non-fatal accidents	Incidents within Gasunie are divided into the categories: pinch/punch/cut, fall/stumble, traffic, toxic substances ed., animals, aggression (people) mental/physical, fire and other to be combined with the DALY data associated with these types of health effects.
fatal accidents	Determined on the basis of the number of deaths due to work-related incidents within Gasunie, multiplying the number of deaths by the fatal incident valuation coefficient.
other work-related dropouts	Includes health loss not covered by the first two components. Work-related absenteeism is divided into mental and physical & ergonomic and other. The three forms of absenteeism are estimated using the number of absence days and a weighting factor of work disability. The weighting factor due to physical problems was estimated as a weighted average for upper limb, back and lower limb complaints. Total absenteeism in the three categories (mental, physical and other) is then multiplied by a corresponding factor for the reduced value of a year of life (disability weight) (definition from GBD, 2017). The sum of the categories thus

	gives an estimate of the number of Disability-Adjusted Life Year (DALY) caused by other work-related disability. Finally, the number of DALY is multiplied by the valuation coefficient of a DALY.

The calculation of the impacts of work-related employee absence and accidents (safety) is limited to direct effects; focusing on one's own organisation. An accident or illness may trigger other accidents or illnesses, which is not measured.

Accidents and employee drop-outs	Welfare loss due to non-fatal accidents own organisation (EUR/year) + Welfare loss due to fatal accidents own organisation (EUR/year) + Welfare loss due to work-related absenteeism own organisation (EUR/year)

Valuation

The valuation coefficients for DALYs and fatal accidents are related to each other. The monetisation of a fatal accident is estimated based on the Value of Statistical Life (VSL) from a meta-study by the Organisation for Economic Co-operation and Development (OECD) (2012). The monetisation of a DALY was then derived from this based on average life expectancy. The coefficient was updated based on inflation (World Bank, 2022)

Sources

Work-related absenteeism	HR report Absenteeism; TNO Health and Safety Balance 2018 (Share of occupational disease mental 39% Share of occupational disease bones, muscles and joints 42% Share of occupational disease unknown and other 18% Share of work-related absenteeism 46%)
Number of accidents	HSE VGWM Rapportage
Disability Weights	GBD (2017), 'Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2017'; Haagsma et al. (2016) (Disability weight Mentaal Verloren jaren/jaar 0,13 Disabilty weight Fysiek & ergonomisch Verloren jaren/jaar 0,09)

Attribution

Impacts are attributed, as described above, to stakeholders based on (a) responsibility and (b) share in the chain. The attribution calculation then proceeds in three steps.

STEP 1: CLASSIFICATION BASED ON RESPONSIBILITY

Attribution type	Description	Impact indicator
1	Predominantly internal effects	Impact within financial capital
		Internal component energy transport households
		Internal component gas transport business customers
		Purchasing goods for gas transportation
2a	Attribution factor for external impacts with primary responsibility with the grid operator (directly) related to the entire energy chain	Contribution to climate change from greenhouse gas emissions grid operator (direct - own organisation)
		Contribution to climate change from greenhouse gas emissions grid operator (indirect - upstream - grid losses)
		Climate change mitigation (direct)
		Non-fatal accidents
		Fatal accidents
		Other work related value
2b	Attribution factor for external impacts with primary responsibility not with grid operator (indirect) related to the entire energy chain	Contribution to climate change from greenhouse gas emissions grid operator (indirect - upstream - excl. grid losses)
		Contribution to climate change from greenhouse gas emissions chain emissions (indirect - upstream)
		Climate change mitigation (indirect)
3	Attribution factor for external impacts without primary responsibility throughout the energy chain	External component energy transport households (attributed to grid operator and suppliers)
		External component gas transportation (attributed to suppliers)

STEP 2: CALCULATION OF ECONOMIC VALUE ADDED

The value-added calculation distinguishes between value chains that differ by customer type - business customers and households.

This is done in three steps:

As a first step, the share of the gas transaction price attributable to Gasunie is determined based on Gasunie's turnover and transported volume. The transaction price for the Netherlands and Germany is determined based on CBS and Destatis respectively.

As a second step, Gasunie's added value is calculated. This is calculated by correcting the turnover for purchasing costs and investments. This corrected turnover is used to determine Gasunie's final share of the transaction price.

As a final step, a correction is made for energy tax.

For each value chain, multiplying these two shares approximates the economic Value Added (TW) factor.

Finally, an average TW factor is calculated.

STEP 3: CALCULATION OF ATTRIBUTION FACTORS

Attribution factors are determined as a combination of attribution type and (for type 2 and 3) the TW factor in the value chain affected by the impact (average TW factor, if not chain-specific). The combination of steps 1 and 2 according to methodology as described in IAM Supplement Impact Contribution (Handbook Impact Measurement Infra Companies) leads to the attribution factors per impact indicator.