

Methodology of Societal Impact Calculations



Methodology of our Societal Impact Calculations

1. Signify societal impact

Introduction to the Value Creation Model, the advantage of monetization and an overview of our societal impact.

2. Methodology for calculating our societal impact

Section providing information on the metrics, sources and shadow prices used for our impact calculation.

I. Signify societal impact

Value Creation Model

At Signify, sustainability is central to our company, strategy, and purpose. Our aim is to balance economic, social, and environmental considerations. We strive to maximize long-term value-creation along these three dimensions.

To guide our efforts and measure our progress, we have made our approach towards long-term value creation more transparent by preparing our Annual Report in line with key-elements of the International Integrated Reporting Council's (IIRC) Integrated Reporting framework.

At the core of our reporting approach is the value creation model, included under section 3 of our 2021 Annual report. This model shows how our business activities draw on various financial, environmental, and social resources that get converted to outputs. Our activities and their outputs lead to outcomes in terms of the impact on our stakeholders and society at large.

By expressing these impacts in monetary terms, we can better compare the financial, social, and environmental effects of our business. This enables more effective and efficient decision making and gives a holistic view on our most prominent risks and opportunities. It also provides further transparency to our stakeholders on our company performance.



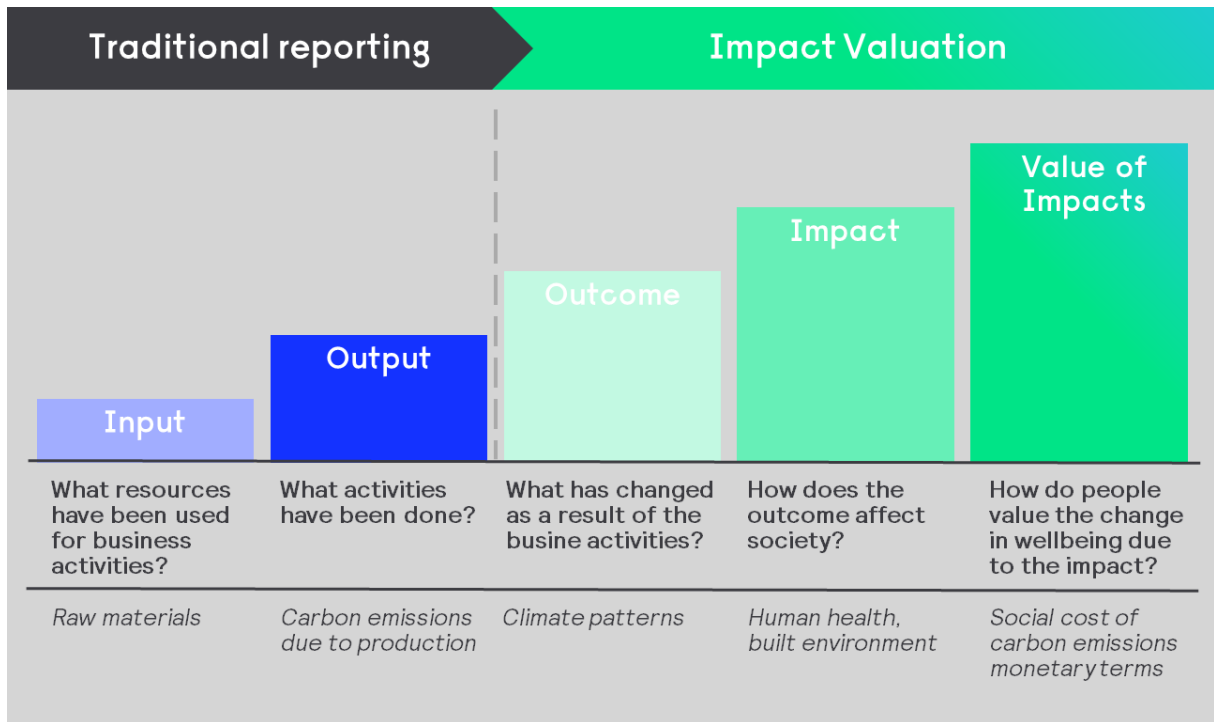
Impact Valuation

Impact valuation is a way to identify, understand, improve, and demonstrate the value and cost of our business activities on society – such as the cost to society of our operational carbon emissions and the value to society of our tax payments.

To facilitate comparability, the impacts and external effects of business activities are measured and valued in monetary terms. By nature, financial, social, and environmental impacts are positive or negative. By applying shadow prices to the impacts of activities, societal costs and benefits are determined.

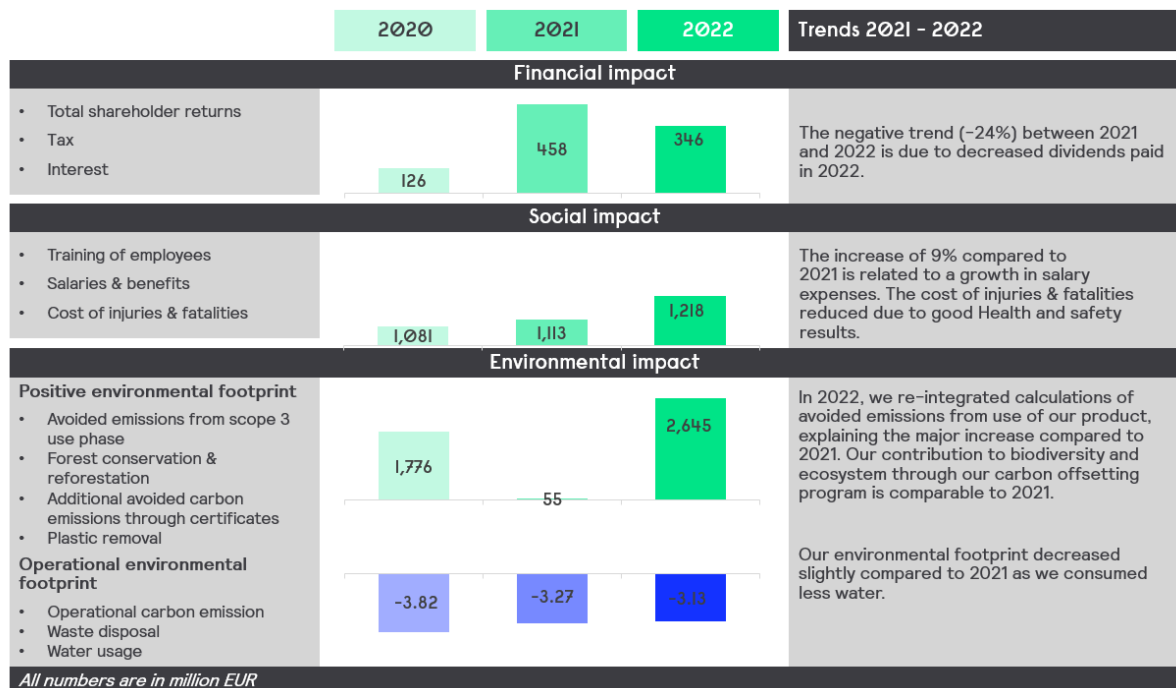
By publishing the results of our analysis and methodology, context and underlying assumptions are made transparent to our stakeholders. We strive to contribute to a global shift from traditional reporting to impact analysis via global standards based on the Impact Valuation Roundtable¹.

¹ [IVR_Impact_Valuation_White_Paper.pdf \(wbcsd.org\)](#)



Signify societal impact trend

The table below provides an overview of our societal impact and the trend over time. Signify is on a journey to measure all its business impacts along the economic, social, and environmental dimensions. Where possible, we aim to extend the scope of our analysis on an annual basis as our insights increase further.



2. Methodology for calculating our societal impact

Scope of impact analysis

The table below shows which metrics were included in our analysis to determine societal impacts.

Dimension	Indicator	Summarized consideration	Boundary
Environmental impacts	Carbon emissions	Impact on climate due to emitted greenhouse gas emissions in scope 1, 2 and 3 – business travel and logistics	Own operations
		Impact on climate due to avoided greenhouse gas emissions through our energy efficient LED lamps & luminaires.	Products
	Waste disposal	Impact on environment due to waste disposal	Own operations
	Biodiversity	Biodiversity and ecosystem services conserved and restored through carbon offsetting program	Society
	Plastic	Impact on environment due to the elimination of plastic in consumer packaging	Products
	Water usage	Impact on water scarcity due to water consumption	Own operations
Social impacts	Injuries & fatalities	Impact on workers & communities due to occupational injuries and fatalities	Own operations
	Training investments	Impact due to training & development of our employees and entrepreneurs trained by the Signify Foundation	Own operations & value chain
	Salaries & benefits	Impact on economy through remuneration of employees	Own operations
Financial impacts	Interest	Impact on economy through interest payments to suppliers of capital	Own operations
	Taxes	Impact on economy through corporate income tax payments in countries where we operate	Own operations
	Shareholder returns	Impact on economy through shareholder returns to shareholders	Own operations

Detailed considerations

The following section highlights per indicator the boundaries to determine shadow prices, references to the academic sources, and the base price that was applied.

Environmental impacts

This section explains the different metrics that were included in determining our environmental impact.

Carbon emissions

Signify reports in line with the Greenhouse Gas Protocol (GHGP). The market-based method of reporting is used as a reference for calculating our carbon footprint.

Scope 1 – direct CO₂ emissions – is based on direct emissions from our industrial and non-industrial sites in full.

Scope 2 – indirect CO₂ emissions – is based on indirect emissions from our industrial and non-industrial sites in full.

Scope 3 – other CO₂ emissions related to activities not owned or controlled by Signify is based on indirect emissions from Business travel, Logistics.

Scope 4 – avoided CO₂ emissions – is based on use of our LED lamps & luminaires replacing conventional lighting and the resulting reduced electricity consumption. Avoided emissions are calculated per year for the reporting year (not for lifetime).

When we mention carbon emission, we refer to our carbon dioxide equivalent emissions calculations. We convert all Kyoto gasses (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) into CO₂ emissions while calculating our environmental footprint.

Shadow price considerations: Costs of changes in net agricultural productivity, human health, property, damages from increased flood risk due to climate change.

Shadow price sources:

- EPA’s SC-CO₂
- S. Dietz et al. (2018), LSE
- Base price applied:
€120.54 per tonne CO₂

Additional information for Scope 4 – Avoided CO₂ emissions

The avoided emissions related to scope 3-use phase. To calculate the avoided emissions from LED lamps & luminaires, the following is determined:

- The weighted average wattage of Signify’s conventional portfolio sold as benchmark of market reference for conventional.

- The weighted average wattage of Signify LED sold as reference LED.
- The quantity of LED sold which is the total products, systems and services LED and Connected LED sold in the reporting year.
- The use hours of LED based luminaires. Signify uses the Guidance paper from Lighting Europe “Evaluating performance of LED based luminaires” to determine the use hours of LED based Luminaires. The report defines the average of default annual operation hour of all lighting applications of 4000 hours per year.
- The rate of LED replacing Conventional: 71%. The breakdown of the lighting market by technology replacing technology is Signify’s best estimate hereof, based on the market modeling done by the central Market & Competitive Intelligence team.

Formula developed by Signify:

Avoided emissions = [(weighted average wattage of runner conventional – weighted average wattage of runner LED)] * quantity of LED * use hours * emission factor * 71% LED replacing conventional

Biodiversity and ecosystem services conserved and restored through carbon offsetting program

Through carbon offsetting projects, Signify contributes to conserving and restoring forests. The ecosystem services these forests provide are extensive and contribute to enhancing or maintaining the biodiversity in those areas.

Shadow price considerations: Societal value produced by conserving and restoring forests in terms of the following ecosystem services which these forests provide: food, (fresh) water supply, raw materials, genetic resources, medicinal resources, ornamental resources, influence on air quality, climate regulation, moderation of extreme events, regulation of water flows, waste treatment/water purification, erosion prevention, nutrient cycling and maintenance of soil fertility, pollination, gene pool protection, and opportunities for recreation and tourism.

Shadow price sources: TEEB, 2010, adjusted for inflation

Base price applied:

€14,933.02 per ha of tropical forests conserved or restored (Brazil and Belize projects)

Elimination of plastic

Data used is the amount of plastic removed from consumer products packaging.

Shadow price considerations:

Societal costs imposed on society due to the impacts from greenhouse gas emissions; air pollution; land and water pollution; water depletion; ocean impacts and other costs created throughout the plastics value chain.

Shadow price source:

TruCost (2016), adjusted for inflation
Base price applied: €112.82 per tonne of plastic removed

Waste disposal

Data consists of manufacturing waste that is delivered for landfill or incineration. Due to the residual value of recycling, this method of waste disposal is excluded from our calculations.

Shadow price considerations: Amenity costs (odor, visual impact, noise) and costs from emissions to air affecting global warming, health, damage to buildings and materials, and loss of agricultural production.

Shadow price sources: *Liu (2021)*, adjusted for inflation.

Base price applied:

€17.11 per tonne waste to landfill
€25.04 per tonne waste to incineration

Water usage

Data consists of water usage in our operations, both purchased and extracted from groundwater wells.

Shadow price considerations: water scarcity costs, impacting human health, net agricultural productivity, and environmental deterioration.

Shadow price sources: To understand water-related risks and quantify risks in financial terms, Signify used the Water Risk Monetizer tool developed by Ecolab in partnership with Trucost and Microsoft. Signify calculated the societal water price per location of its operations for the coming 10 years, taking into account water scarcity levels and societal implications of water usage in those locations.

Base price applied:

€2.60 per m³ water (on average)

Social impacts

This section explains the different metrics included in determining our social impact.

Work-related lost-time injuries

Lost-time injuries are occurrences where the injured employee is unable to work one or more days. These work-related injuries and illnesses predominantly occur in manufacturing operations and Field Services. All lost-time injury cases are reported for Signify staff and contractors working under the supervision of Signify.

Shadow price considerations: Costs of loss of current and future income, medical costs, costs for community, incl. lost revenue, social welfare payments, rehabilitation.

Shadow price sources: National Safety Council America/NSC (2019), adjusted for inflation.

Base price applied:

€46,461.97 per work-related lost-time injury

Work-related fatalities

Fatalities are reported for contractors working under the supervision of Signify and all Signify staff.

Shadow price considerations: Costs of loss of current and future income, costs for community, incl. lost revenue, social welfare payments.

Shadow price sources: National Safety Council America/NSC (2019), adjusted for inflation.

Base price applied:

€1,349,609.80 per work-related fatality

Learning and development of employees and entrepreneurs

Data covers all employees, including temporary employees and is based on the learning and development spent within the organization as registered through our center of excellence, The Signify Learning Center of Expertise.

Moreover, we include the investments made by the Signify Foundation for the trainings of entrepreneurs, which improves human capital outside our organization.

Shadow price considerations: Personal returns for employees: future wage-increase due to skill development at Signify. Social returns include increased productivity and spill-over effects of human capital to others in the surroundings.

Shadow price sources: Venniker (2000)

Base price applied:

€1.16 per €1 spend on learning and development



Salaries and wages paid to employees

Shadow price considerations: Enhanced purchasing power positively influences economic environment.

Base price applied: Cash transfers to employees (salaries) are reflected at a ratio of 1:1. We assume that every Euro transferred will be spent and therefore contributes to the (local) economy. Even if not all of the money transferred is spent, the assumption of the 1:1 multiplier is justified due to secondary and tertiary socio-economic ripple effects, caused by cash transfers through enhanced purchasing power.

Financial impacts

Economic impacts quantify the positive financial externalities of Signify. This consists of more than our own net profits, as we contribute to GDP in countries where we operate. Considering our Gross Value Add, Signify considers the following categories to be most relevant due to their direct increase in purchasing power: corporate income tax payments for governments, interest payments to providers of capital (including pensions interest), and shareholder returns to Signify's owners (through dividend payments and share buy-back).

Signify has reflected these contributions at a ratio of 1:1. We assume that every Euro transferred will be spent and therefore contributes to the (local) economy. Even if not all of the money that is transferred gets spent, the assumption of the 1:1 multiplier is justified due to secondary and tertiary socio-economic ripple effects caused by the cash transfers through enhanced purchasing power.

Sources:

[Adjusted price to inflation](#)

[Currency converter](#)