thinkstep

WELLE

Organizational Water Footrpint Tool

Database documentation

GEFÖRDERT VOM

Bundesministerium
für Bildung
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1 Introduction

The WELLE Organizational Water Footprint Tool (WELLE tool) is developed as part of the research project *The Water Foorptint of Companies: Local Measures in Global Supply Chains (WELLE)* founded by the German Federal Ministry of Education and Research within the funding measure *Global Resource Water (GRoW)*. The project aims to develop methodological and practical solutions for determining the overall water scarcity footprint of companies (organizational water scarcity footprint). The WELLE project is initiated by the Chair of Sustainable Engineering at TU Berlin in partnership with thinkstep AG. Deutsches Kupferinstitut e.V., Evonik AG, Neoperl GmbH, and Volkswagen AG are participating industry partners that support the project with case studies.

For more information please visit: https://welle.see.tu-berlin.de/

Organizational water footprint method

The method was developed in a two-step approach. In a first publication, available tools to track the water-related environmental performance of companies were analysed via a multi-criteria approach evaluating e.g. their scientific soundness, environmental relevance, organizational system boundaries, and broadness of application (Forin et al. 2018). As a result, the product related water footprint method (according to ISO 14046 (ISO 2014a)) was chosen as a starting point to develop the organizational water footprint approach, in combination with organizational LCA (ISO/TS 14072 (ISO 2014b)). A further publication (Forin et al. 2019) discussed how both methods, based on ISO standards, can be hybridized. Moreover, application guidelines e.g. to prioritize data collection, are delivered.

Regionalized water inventory database

While most companies can monitor their internal activities comparatively easy, they rely on external data about the water consumption of their indirect upstream activities (material and energy supply chain). Thinkstep's life cycle inventory database GaBi 8 is used for this purpose. As a first step, relevant datasets are identified by the participating companies. These datasets are investigated comprehensively and modified to better meet the demand for detailedness expressed in the case studies. Important modifications include the allocation of generic processes to their typical location, and the disaggregation of datasets, allowing the selection of country specific energy and material mixes or market mixes based on several countries.

WELLE Organizational Water Footprint Tool

To facilitate the use of the provided inventory data, a web-based tool is provided and cat be accessed free of charge under http://wf-tools.see.tu-berlin.de/wf-tools/owf/#/calculation. The tool guides the user through the different compartments of the organizational water footprint. To assess direct water consumption, the user can enter water withdrawal and discharge data of production sites in high geographical resolution. In terms of indirect upstream and downstream activities, users can enter purchased goods and materials as well as water consumption during product's use phase. In combination with the water inventory database described above, the tool allows to assess the water consumption of an entire organization and weights the results by water scarcity in its respective locations, using the consensus-based impact assessment method AWaRe (Boulay et al. 2018). A detailed tool manual is provided here: http://wf-tools.see.tu-berlin.de/wf-tools/owf/#/manual.

The WELLE Organizational Water Footprint Tool is based on the GaBi Envision software and runs on a fully parameterised LCA GaBi model.

Disclaimer:

The WELLE Tool is not intended for conducting comparative assertions, as defined by the ISO 14040/44 Standards and Guidelines. The current release has not been externally reviewed for compliance with mentioned ISO standards.

thinkstep AG is not liable for the up-to-datedness, correctness, usability, completeness and quality of any calculations, conclusions and other results obtained through the use of the software provided by thinkstep AG and the user data. Any liability of thinkstep AG regarding the use of the calculations, conclusions and other results obtained through the software use is excluded. The user is solely responsible for the up-to-datedness, correctness, usability, completeness and quality of his data, any calculations, conclusions and other results obtained by his data and their subsequent use. He or she bears the sole risk of possible miscalculations, incompleteness, incorrectness and any further deficiencies. thinkstep AG is solely responsible for providing the software and the content already included therein as defined in the software licensing terms.

2 Data and Regionalization Approach

Thinkstep has published a comprehensive introduction into the water assessment terminology, and details on how water consumption and its environmental impact can be assessed using GaBi software and databases:

http://www.gabi-software.com/fileadmin/Documents/Introduction_to_Water_Assessment_V2.2.pdf

It is strongly recommended to consult this document before working with the WELLE tool, and it is also the basis to understand the following explanations about modifications made to the datasets to increase regional representativeness.

The water consumption and impact assessment values in the tool are based on GaBi data (version 8.7, service pack 36). Please refer to Annex I for a complete list of the original GaBi datasets used. **A detailed documentation of the inventory data of these datasets can be found online (see Annex I for details).** Please refer to the respective online documentation of the datasets for descriptions of system boundaries, technological representativeness, allocation procedures and other. The following section describes the modification of these datasets to increase regional representativeness.

As described in the “introduction into water assessment in GaBi” document (see above), only energy and agricultural materials GaBi datasets use regionally specific water flows. While these processes will cover the largest fraction of water consumption in most production systems, potentially a significant fraction of water consumption remains unspecified and is subject to large uncertainty regarding water scarcity. As part of the WELLE research project, the unspecified water consumption of a selection of datasets (identified in the related case studies) is investigated in more detail, and two different approaches (depending on the material group) are taken to allocate it to a specific region.

The first approach is to modify existing datasets to increase regional representativeness (i.e. unspecific flows changed to country specific flows). Country specific inventories are maintained, accounting for country specific water consumption intensity. This approach can be summarized as “bottom-up” approach. This approach was preferred if the structure of the datasets and the confidentiality of data allowed it. In some cases, following this approach was not possible, either because the underlaying country and industry specific data is confidential, or did not cover the most important production regions. In these cases, an average water consumption is derived from the available data and then mapped to different countries according to production statistics (“top-down” approach).

In addition, the tool allows the user to allocate the water consumption according to their

own supply chain data.

The following section describes the regionalization approach applied for each material group separately.

General Remark:

The selection of materials and countries displayed in the tool is based on the case studies that accompanied the development of the tool. While many organizations might find it useful to use the tool as a first screening assessment of their own activities, others might find that regions and/or materials important to them are missing. In this cases thinkstep offers a customization of the tool. Please refer to the contact details given at the end of this document.

2.1 Indirect Upstream - Purchased Fuels and Energies

Fuel and energy datasets are available in GaBi in a regional specific version, the original datasets were not modified.

2.2 Indirect Upstream – Purchased Goods and Materials - Agricultural Products

Agriculture is the single largest contributor to global water consumption (UN Water 2019[1]). The regional variation on water consumption of agricultural crops is very large (starting with the differentiation whether a crop is rainfed or irrigated). Also, agricultural products exist in a large variety. Therefore, only two example products were added to the tool. A generic data entry point allows to add water consumption and location from other data sources.

2.3 Indirect Upstream – Purchased Goods and Materials – Chemicals/plastics

A selection of different plastics is available in the tool. The original datasets in the GaBi database refer to specific countries (e.g. Germany, US), but the WELLE tool intends to represent global supply chains. The supply chains of chemicals are very complex and almost impossible to track after Tier 1 (final processing by direct supplier). Therefore, the tool allows to select the region of the final processing stage, and the water and energy mix in this process step will be adjusted accordingly. All energy and water use processes in the supply chain (Tier 2 and beyond) for each material were adapted to a global production mix, based on data from the world input output database (WIOD[2]; manufacture

[1] https://www.unwater.org/water-facts/water-food-and-energy/

[2] http://www.wiod.org/database/wiots16

of chemicals and chemical products, value added share). The Top 10 countries (by value added) were selected (representing 85% of value added, see Table 1) and scaled to 100%. The list of GaBi datasets used can be found in Annex I.

Table 1: Global production mix for chemicals/plastic used as a proxy for supply chain modelling (tier 2 and beyond)

Country	Share
China	47%
USA	19%
Japan	7%
Korea	6%
Germany	6%
India	4%
Brazil	4%
France	3%
Italy	2%
Spain	2%

2.4 Indirect Upstream – Purchased Goods and Materials – Metals

In the section metals, the user should be able to select the main countries of origin for each respective material. When no specifications are made, a global mix is used as default. The list of the (original) GaBi datasets used can be found in Annex I and used to retrieve the full documentation of the datasets online. The list of main producing countries is based in data from the U.S. Geological Survey, Mineral Commodity Summaries[3] for the year 2015 or more recent, unless stated otherwise.

[3] https://www.usgs.gov/centers/nmic/commodity-statistics-and-information

2.4.1 Aluminium

An Aluminum sheet is assumed (AlMg4.5Mn0.7). For the Aluminum ingot, LCA datasets from the International Aluminium Institute (IAI)[4] are used, as implemented in the GaBi database. Some of the published datasets refer to regions above country level (e.g. South America, North America, Oceania). The respective datasets have been used as proxies for specific countries (see Table 2). A global dataset is available and is used as default in the tool. It is also used as a proxy for India, with re-regionalization (i.e. water consumption value used from global dataset and mapped to India).

Table 2: Regional IAI datasets used as proxies for specific countries

Country in the tool (main production countries)	IAI dataset
Australia	Oceania
Brazil	South America
China	China
Global	Global
India	Global
Russia	Russia and Other Europe
USA	North America

It should be noted that the IAI has assessed the water scarcity footprint of aluminium on sub-country level, resulting in much lower figures than those based on the country average as available in GaBi (see “introduction into water assessment in GaBi” and Buxmann et al. (2016). For technical and consistency reasons, the tool uses the values available in GaBi DB. If identified as hotspot, the values should be refined using data from the IAI LCA report[3].

2.4.2 Cast Iron

The original GaBi dataset is used, referring to iron scrap (secondary material) melted in an electric furnace. Electricity and thermal energy used in the process are adapted

[4] http://www.world-aluminium.org/media/filer_public/2018/02/19/lca_report_2015_final_26_june_2017.pdf

according to the selected region. The global production mix (default setting) is based on data from worldsteel 2018 (world steel in figures 2018[5]).

2.4.3 Steel non alloyed

The original GaBi dataset is used (BF steel billet/slab/ bloom), referring to processing via blast furnace route. The dataset assumes an input of secondary material of 20%. The tool allows the selection of the country of origin of iron ore as primary material, and the country of the steel production. For Iron ore, a “re-regionalization approach” is taken, i.e. the aggregated water consumption of the process is mapped to the selected country. For steel production, the energy provision dataset is selected according to the region chosen and the direct water use mapped accordingly. The global production mix (default setting) is based on data from worldsteel 2018 (world steel in figures 2018[4]).

2.4.4 Steel alloyed

See 3.4.3, assumed alloy is 4340 (Mn 0.75% *, Si 0.225%, Cr 0.8%, Mo 0.25%, Ni 1.8%).

2.4.5 Stainless Steel

The water consumption values based on an average of different datasets from the European Steel Association Eurofer (stainless steel cold rolled coil (316), stainless steel quarto plate (316) and stainless-steel white hot rolled coil (316)) are used. The datasets consider content of recycled material for the steel and its alloys. As nickel (ferronickel) is a main contributor to water consumption, the tool allows to specify the country of origin for nickel separately. Please see section 2.4.10 for details about the nickel dataset used. The global production mix (default setting) is based on data from worldsteel 2018 (world steel in figures 2018[4]).

2.4.6 Brass

The GaBi Brass dataset (red brass; anode furnace and casting, 85% copper, 6% zinc, 2% lead, 7% tin) is used. The dataset assumes a secondary material input of 90% (10% primary material). The dataset allows specification of the country for final processing to brass, and the country of origin of copper as the largest contributor to water consumption.

For processing to brass, water is regionalized following the top-down approach. As no data for a global production mix of brass were available, the main producing countries (CN, IN, US according to expert judgement) were assumed to contribute equally to global production as a proxy. For the production of copper, please see section 2.4.11 for details

[5] https://www.worldsteel.org/en/dam/jcr:f9359dff-9546-4d6b-bed0-996201185b12/World+Steel+in+Figures+2018.pdf

about the dataset used.

2.4.7 Lead

The dataset is based on lead production in China (main producing country according to U.S. Geological Survey, Mineral Commodity Summaries), 100% primary material. The tool allows re-regionalization (top-down, i.e. water consumption value for CN mapped to different countries). The global production mix is based on data from the U.S. Geological Survey, Mineral Commodity Summaries.

2.4.8 Silver

The GaBi dataset (global silver mix; from electrolysis, primary) is used. The dataset was modified to increase regional representativeness (bottom-up, i.e. unspecific flows changed to country specific flows where applicable). The global dataset is used as default in the tool. The tool allows re-regionalization (i.e. global average water consumption value can be mapped to different countries).

2.4.9 Gold

The GaBi dataset (global gold mix; primary) is used. The dataset was modified to increase regional representativeness (bottom-up, i.e. unspecific flows changed to country specific flows were applicable). The global dataset is used as default in the tool. The tool allows re-regionalization (i.e. global average water consumption value can be mapped to different countries).

2.4.10 Nickel

The water consumption value based on the nickel (Class 1, 99.95%, primary) ILCD 2017 dataset from the Nickel Institute is used. As association data, it is representing the industry average well, but disaggregation of the data to different regions is not possible due to confidentiality. Therefore, the tool allows re-regionalization (top-down, i.e. global water consumption value can be mapped to different countries).

2.4.11 Copper

The GaBi dataset (global copper mix, 99,999%, from electrolysis, primary) is used. The dataset was modified to increase regional representativeness (bottom-up, i.e. unspecific flows changed to country specific flows were applicable). The global dataset is used as default in the tool. The tool allows re-regionalization (i.e. global average water consumption value can be mapped to different countries).

2.4.12 Tin

The GaBi dataset (tin, primary) is used. The dataset was modified to increase regional representativeness (bottom-up, i.e. unspecific flows changed to country specific flows were applicable). The global dataset is used as default in the tool. The tool allows re-regionalization (i.e. global average water consumption value can be mapped to different countries).

2.5 Indirect Upstream – Purchased Goods and Materials – Other purchased materials

2.5.1 Wooden Pallet

The water consumption is based on the GaBi dataset “wooden pallets (EURO, 40% moisture)”. The tool allows re-regionalization (top-down, i.e. average water consumption value can be mapped to different countries).

2.5.2 Cardboard

The water consumption is based on the GaBi dataset “Corrugated board 2015, 84.5% recycled fibre, for use in cut-off EoL”. The tool allows re-regionalization (top-down, i.e. average water consumption value can be mapped to different countries).

2.5.3 Silicone

The water consumption is based on the GaBi dataset “Silicone fluids (low viscosity); from organosilane”. The tool allows re-regionalization (top-down, i.e. average water consumption value can be mapped to different countries).

2.5.4 Generic Product/ Other

A generic data entry point allows to add water consumption and location from other data sources.

2.6 Indirect Upstream – Purchased Services

In the category “purchased services” the values of water consumption and location need to be entered directly, no datasets are used in the background.

2.7 Direct Activities

In the category “direct activities” the values of water consumption and location need to be entered directly, no datasets are used in the background. Use of tabwater or de-inonised water accounts for additional water consumed in provision of water from external sources (average based on GaBi datasets for provision of tab water and de-ionised water), similar, waste water treatment accounts for water losses before release.

2.8 Indirect Downstream Activities

In the category “Indirect Downstream Activities” the values of water consumption and location need to be entered directly, no datasets are used in the background.

2.9 Supporting Activities

Supporting activities are assessed either by direct data entry or by default datasets. Where water use data is entered directly, location specific characterization factors can be added in addition to the possibility of selecting countries. No additional regionalization was conducted for the default datasets. This means, that only water use related to energy or agriclutre is regionalized, other water use is classified as “unspecified”. Given the large variety of datasets and possible supply chains with expected low contribution to overall results, this is assumed to be an acceptable simplification. The following table gives an overview of the regionalization approach for supporting activities.

Table 3: Regionalization approaches for supporting activities

Activety	Can regionalization be changed?	Comment
Business Travels	Yes	Energy datasets selected based on country selection
Employee Commuting	Yes	Energy datasets selected based on country selection
Canteen	No	Default datasets for meals, agricultural water use is regionalized
Capital equipment	No	Default datasets for materials used in builing, machinery and company cars, might contain unspecified flows
Working environment - Work places	No	Default datasets for materials used electronic devices, table, chair, might contain unspecified flows
Working environment – Adminstration, cleaning services, gardening, R&D	Yes	Water use needs to be entered directly, country can be selected or specific characterization factor can be applied

2.9.1 Business Travel and Employee Commuting

The fuel/ electricity consumption values per km are based on the following GaBi datasets (see Annex 1 for full reference): distance travelled by plane; distance travelled by ICE train; Car, diesel, Euro 6. Datasets for the provision of diesel, kerosene and electricity are selected based on the chosen country. Provision of fuel datasets are fully regionalized in

GaBi per default and were not modified.

2.9.2 Canteen

The water consumption of meals is defined using unpublished GaBi datasets. As the documentation cannot be retrieved online, more details are provided in the following. **The datasets are proxies compiled to assess the contribution of the canteen to an organizational water footprint (which is usually low). They should not be used to make comparative assertions regarding different diets.**

All meals refer to freshly made canteen food prepared on an electric stove and to a value of 735 kcal per meal (functional unit). The selection and amount of food products / ingredients is based on a mix of fat, protein and carbohydrates, following an approximate proportion of 1/4 protein, 1/4 vegetables and 1/2 starch.

The average meal consists of an average of three different dishes each with a distinct composition of ingredients (see Table 4). The food products are sourced from different countries in the world to represent a global average.

Table 4: Ingredients of the canteen meals

Meal	Vegan	Vegetarian	Meat
weight of ingredients per meal	698.8g	737.3g	453.5g
Food products used (ingredients).	* rice * soy bean * barley * sweet corn * carrot * tomato * olive oil * cashew nut * wheat	* wheat * oat * milk * potato * carrot * tomato * cashew nut * olive oil * mozzarella * butter * cheddar	* beef * poultry * pork * rice * soy bean * potato * carrot

The assumed electric energy consumption for cooking the meals is 0.6kWh per 400g of ingredients. The following processes are not included in the datasets:

- tap water input for cooking
- use of salt, pepper and herbs
- tap water input for washing
- production of equipment like stove, knives and spoons
- packaging of food products
- transportation of food products
- end-of-life treatment of food residues during cooking and post consuming

The soft drink dataset refers to a non-alcoholic drink provided as beverage in a canteen for lunch. The amount per soft drink is defined as 0.2l (200g). The average drink composition is defined as:

- 40 wt% water = 80g
- 35 wt% of apple juice = 70g
- 20 wt% of orange juice = 40g
- 5 wt% of sugar = 10g

The following processes are not included in the dataset:

- Packaging of drinks and related waste
- Possible refrigeration of drinks in the canteen and related electric energy
- Production and distribution of drinks (e.g. filling stations and transportation to canteen)

2.9.3 Capital Equipment

Building

A list of different building materials is available in this category. Table 5 provides the materials, the respective dataset used (see Annex 1 for complete reference and online documentation for details) and the default value of material used per m² and year capital equipment if no specific values are entered. The default lifetime of the building is assumed to be 50 years. This value can be customized in the WELLE tool.

Table 5: Capital equipment, building, materials and default values

Material	GaBi Dataset	Default (kg freshwater/m²*yr)
Aluminium	Aluminium extrusion profile (AlCu4SiMg)	0.15
Cement	Cement mix	6.75
Concrete	Concrete bricks (EN15804 A1-A3)	6.30
Copper	Copper mix (99,999% from electrolysis)	0.15
Wood	Sawmill, lumber hardwood	0.24
Glass	Float flat glass	0.15
Stone	Fire proof stones (alumina-rich)	1.01
Steel	EAF Steel Billet	0.38

Machinery

A list of different building materials is available in this category. Table 6 provides the materials, the respective dataset used (see Annex 1 for complete reference and online documentation for details) and the default value of material used per kg and year machinery equipment if no specific values are entered. The default lifetime of the machinery is assumed to be 10 years.

Table 6: Capital equipment, machinery, materials and default values

Material	GaBi Dataset	Default (kg freshwater/kg material)
Aluminium	Aluminium extrusion profile (AlCu4SiMg)	0.2
Copper	Copper mix (99,999% from electrolysis)	0.2
Plastics	Polyvinyl chloride granulate (Suspension; S-PVC) mix	0.2
Stainless steel	Stainless steel sheet (including stamping and bending)	0.2

Steel	EAF Steel Billet	0.2

Company cars

The manufacturing of a car is assessed based on the GaBi dataset “passenger car (medium, gasoline, 1 piece)”.

2.9.4 Working Environment

Work place

Each workplace assumes one table, one chair, one laptop and one display.

The materials used in the table and chair are considered based on the background report “Revision of Ecolabel and Green Public Procurement criteria for the product group Wooden Furniture” from the JRC[6]. The laptop and display are modelled based on a list of GaBi datasets for electronics, which are provided on a per piece basis (see Annex 1).

Other working environment

In the category “Administration”, “Cleaning Services”, “Gardening” and “R&D” the values of water consumption and location need to be entered directly, no datasets are used in the background.

[6] https://susproc.jrc.ec.europa.eu/furniture/docs/Background_report_Furniture_September_2013.pdf

References

Boulay A-M, Bare J, Benini L, Berger M, Lathuillière MJ, Manzardo A, Margni M, Motoshita M, Núñez M, Pastor AV, Ridoutt B, Oki T, Worbe S, Pfister S (2018) The WULCA consensus characterization model for water scarcity footprints. Assessing impacts of water consumption based on available water remaining (AWARE). Int J Life Cycle Assess 23(2):368–378. doi:10.1007/s11367-017-1333-8

Buxmann K, Koehler A, Thylmann D (2016) Water scarcity footprint of primary aluminium. Int J Life Cycle Assess 21(11):1605–1615. doi:10.1007/s11367-015-0997-1

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Forin S, Mikosch N, Berger M, Finkbeiner M (2019) Organizational water footprint. A methodological guidance. Int J Life Cycle Assess 46(7):4091. doi:10.1007/s11367-019-01670-2

ISO (2014a) ISO 14046: Environmental management – Water footprint – Principles, requirements and guidelines

ISO (2014b) ISO/TS 14072: Environmental management – Life cycle assessment – Requirements and guidelines for organizational life cycle assessment

Annex I: Original GaBi Datasets

The following section provides the name of the original datasets related to the different data entry points in the tool. For most datasets the documentation can be retrieved online (please refer to the Original GaBi dataset name)[7]:

http://www.gabi-software.com/international/databases/gabi-data-search

The tool database is based on GaBi version 8.7, service pack 36.

Indirect Upstream Activities - Purchased Fuels and Energies

Tool		Original GaBi dataset and GUID			Documentation
Crude Oil	Belgium	BE	Crude oil mix	d94dd6a7-5aef-4ca9-b230-a93ad36beeba	Online
Crude Oil	Chile	CL	Crude oil mix	e417cc39-499f-4bdf-b138-1692fd493be2	Online
Crude Oil	China	CN	Crude oil mix	ad54a4b6-c9bb-40a1-866d-9d57981ef958	Online
Crude Oil	Germany	DE	Crude oil mix	5eae7362-a5c0-4493-a6ef-9ba948bf72c6	Online
Crude Oil	EU-28	EU-28	Crude oil mix	9941ad21-08ce-4139-96e6-997d75dd8058	Online
Crude Oil	France	FR	Crude oil mix	d47001bc-d98c-4dae-a711-ec6a0646fe2e	Online
Crude Oil	Great Britain	GB	Crude oil mix	102b8bd9-a287-4635-8f4c-8fac57afdd63	Online

[7] Datasets might also be searched with the following link and exchanging the GUID (in red): http://gabi-documentation-2019.gabi-software.com/xml-data/processes/d94dd6a7-5aef-4ca9-b230-a93ad36beeba.xml

Crude Oil	USA	US	Crude oil mix	0da1a0f1-e156-46ad-a5d9-4079c044450c	Online
Crude Oil	South Africa	ZA	Crude oil mix	817741b2-4c79-44dc-b3b7-b521f8008796	Online
Diesel	China	CN	Diesel mix at refinery	d4895001-c3e1-4f58-afd0-8cb464868508	Online
Diesel	EU-28	DE	Diesel mix at refinery	a0140c70-4135-4039-a587-7996dfb33137	Online
Diesel	France	EU-28	Diesel mix at refinery	244524ed-7b85-4548-b345-f58dc5cf9dac	Online
Diesel	Germany	FR	Diesel mix at refinery	392fcdbc-2765-4d9d-85fe-f139411bc00c	Online
Diesel	Great Britain	GB	Diesel mix at refinery	b12d25d6-5eeb-46be-8a74-2d9284fb3e86	Online
Diesel	United States of America	US	Diesel mix at refinery	452a3926-2850-47db-809d-753095ed7dac	Online
Diesel	South Africa	ZA	Diesel at refinery	54c67034-a9bf-4126-a289-a8d57ab87bc0	Online
Hard Coal	Belgium	BE	Hard coal mix	92c4a1d0-1d72-4ee6-b1a3-b99bf3343a4a	Online
Hard Coal	Chile	CL	Hard coal mix	378c81b6-0650-4a00-a4fd-be76d8c1eb04	Online
Hard Coal	China	CN	Hard coal mix	a7bddf0b-69f3-4d86-9b82-69ac14102518	Online
Hard Coal	EU-28	DE	Hard coal mix	9b8f8237-c6d3-4976-bc14-300e25b755b5	Online
Hard Coal	France	EU-28	Hard coal mix	fd9db250-4998-11dd-ae16-0800200c9a66	Online
Hard Coal	Germany	FR	Hard coal mix	2c3014d0-6b31-4bb6-ac58-1913172a1d83	Online
Hard Coal	Great Britain	GB	Hard coal mix	27c4ca8f-245e-4be5-a74b-2e8fa4fbd0f1	Online

Hard Coal	United States of America	US	Hard coal mix	8813f9a2-1b05-4aac-9088-5c796f5471c4	Online
Hard Coal	South Africa	ZA	Hard coal mix	db3f50be-6cfa-4fe5-8c66-2cc2e93c9024	Online
Heavy Fuel Oil (HFO) 1.0wt.% S	China	CN	Heavy fuel oil at refinery (1.0 wt.% S)	32f0067c-a74a-4cd6-84e0-203f7e87004e	Online
Heavy Fuel Oil (HFO) 1.0wt.% S	Germany	DE	Heavy fuel oil at refinery (1.0 wt.% S)	1a272035-3bb8-460e-88e1-9cdcd3194032	Online
Heavy Fuel Oil (HFO) 1.0wt.% S	EU-28	EU-28	Heavy fuel oil at refinery (1.0wt.% S)	50462b0d-7d2b-40d4-843e-9857061e3c08	Online
Heavy Fuel Oil (HFO) 1.0wt.% S	France	FR	Heavy fuel oil at refinery (1.0 wt.% S)	808d9760-8f49-4907-931b-bb14a57015b4	Online
Heavy Fuel Oil (HFO) 1.0wt.% S	Great Britain	GB	Heavy fuel oil at refinery (1.0 wt.% S)	97c0f3b2-6c68-4d1c-a505-acdacf789ed3	Online
Heavy Fuel Oil (HFO) 1.0wt.% S	South Africa	ZA	Heavy fuel oil at refinery (1.0 wt.% S)	90759e48-0d9d-4dcb-839a-2517bf80bb89	Online
Natural Gas	Belgium	BE	Natural gas mix	a8592685-fa9d-4997-ace6-ba497605edc2	Online
Natural Gas	Chile	CL	Natural gas mix	1852c696-8c08-4abe-997f-036a33fb508c	Online
Natural Gas	China	CN	Natural gas mix	d41aef42-f9f3-42b5-a3b1-50285171db5d	Online
Natural Gas	EU-28	DE	Natural gas mix	297d0f72-a589-4624-a088-b33e12ecca15	Online
Natural Gas	France	EU-28	Natural gas mix	c6387e19-933f-4726-a7ad-7a8050aa418c	Online

Natural Gas	Germany	FR	Natural gas mix	28027e17-1845-451e-a50a-2bee7e0757d7	Online
Natural Gas	Great Britain	GB	Natural gas mix	d67b8058-f299-40c1-a985-6c6f3f8b2646	Online
Natural Gas	United States of America	US	Natural gas mix	90be2ca7-96eb-4949-8e6d-c60dd58018aa	Online
Natural Gas	South Africa	ZA	Natural gas mix	c2f5a575-b467-4a11-bcae-a276faadba61	Online
Electricity from grid	Belgium	BE	Electricity grid mix	383a1240-40c5-483a-bfae-1dbe2cd63f92	Online
Electricity from grid	Chile	CL	Electricity grid mix	a7e9c47f-9aef-49e8-8f3a-72f88535089f	Online
Electricity from grid	China	CN	Electricity grid mix	124e9246-9e84-4352-86b5-c08837e8cf92	Online
Electricity from grid	France	FR	Electricity grid mix	c8d7f695-1c5b-4f9a-8491-8c58c20c190f	Online
Electricity from grid	Germany	DE	Electricity grid mix	48ab6f40-203b-4895-8742-9bdbef55e494	Online
Electricity from grid	Great Britain	GB	Electricity grid mix	00043bd2-4563-4d73-8df8-b84b5d8902fc	Online
Electricity from grid	United States of America	US	Electricity grid mix	6b6fc994-8476-44a3-81cc-9829f2dfe992	Online
Electricity from grid	South Africa	ZA	Electricity grid mix	12711ded-b092-4264-acfe-c65984b33b89	Online
Electricity from Biomass (solid)	Belgium	BE	Electricity from biomass (solid)	14cf8b1f-8571-4bc5-8006-c12aab4493a3	Online
Electricity from Biomass (solid)	Chile	CL	Electricity from biomass (solid)	a4462f57-031e-4aa4-94c9-d854657eee89	Online
Electricity from Biomass (solid)	China	CN	Electricity from biomass (solid)	85b5f7be-841f-49f3-8980-99bc152d2e1d	Online

Electricity from Biomass (solid)	France	DE	Electricity from biomass (solid)	61c386e2-65cf-4d79-af2f-1892799ac11b	Online
Electricity from Biomass (solid)	Germany	FR	Electricity from biomass (solid)	afc48658-7107-4963-8d8f-ab16ef800375	Online
Electricity from Biomass (solid)	Great Britain	GB	Electricity from biomass (solid)	58c017ff-21ef-42fa-965d-b952d862b683	Online
Electricity from Biomass (solid)	United States of America	US	Electricity from biomass (solid)	7d9d7452-0b7c-40ba-97d6-d6978481d3e3	Online
Electricity from Biomass (solid)	South Africa	ZA	Electricity from biomass (solid)	da63b9be-c178-4da8-8087-f5fa2bd1a96b	Online
Electricity from Hard Coal	Belgium	BE	Electricity from hard coal	110ee138-0b46-4c73-9e63-8e5b36e6586f	Online
Electricity from Hard Coal	Chile	CL	Electricity from hard coal	abec60bb-3545-4e5f-844d-50c8ee0433b2	Online
Electricity from Hard Coal	China	CN	Electricity from hard coal	cef5da69-a868-46b5-9147-97c31f62913f	Online
Electricity from Hard Coal	France	DE	Electricity from hard coal	3bff4276-bda6-4e4f-8d65-c8f1fa5ae91a	Online
Electricity from Hard Coal	Germany	FR	Electricity from hard coal	469f7bc3-f292-4d3d-88b1-0732347f916d	Online
Electricity from Hard Coal	Great Britain	GB	Electricity from hard coal	f9355d35-4685-4832-9d3b-d57a78f88da5	Online
Electricity from Hard	United States	US	Electricity from hard coal	39a9f2aa-ac36-4ca6-82e0-f3f19512c54c	Online

Coal	of America				
Electricity from Hard Coal	South Africa	ZA	Electricity from hard coal	33c7fed9-b700-45ac-acdb-373c4e96f3fb	Online
Electricity from Heavy Fuel Oil (HFO)	Belgium	BE	Electricity from heavy fuel oil (HFO)	8bc7a251-e711-4dcd-b2cb-e161f74e4f45	Online
Electricity from Heavy Fuel Oil (HFO)	Chile	CL	Electricity from heavy fuel oil (HFO)	620c4791-2cb7-42ef-9eac-1f7e76953aa4	Online
Electricity from Heavy Fuel Oil (HFO)	China	CN	Electricity from heavy fuel oil (HFO)	7f5efe44-0d4e-417e-aaf5-2640413b8f73	Online
Electricity from Heavy Fuel Oil (HFO)	France	FR	Electricity from heavy fuel oil (HFO)	991ea307-2fb4-401f-8f9a-9c8bebf6a422	Online
Electricity from Heavy Fuel Oil (HFO)	Germany	DE	Electricity from heavy fuel oil (HFO)	cec6ed42-99f4-4cf2-89ee-d5810162c4fa	Online
Electricity from Heavy Fuel Oil (HFO)	Great Britain	GB	Electricity from heavy fuel oil (HFO)	a025869a-d69f-4042-8f67-d8b11d6b5218	Online
Electricity from Heavy Fuel Oil (HFO)	United States of America	US	Electricity from heavy fuel oil (HFO)	2faf0b97-dade-4fe1-af12-0d4873d85b1e	Online
Electricity from Heavy Fuel Oil (HFO)	South Africa	ZA	Electricity from heavy fuel oil (HFO)	c523e75c-02d4-47a4-8a51-dc6b39988b94	Online
Electricity from Hydro Power	Belgium	BE	Electricity from hydro power	514d1b4c-14e8-4bad-af36-e7c879ca9018	Online
Electricity from Hydro Power	Chile	CL	Electricity from hydro power	205efa73-1932-4133-a9c1-7827df16ef8d	Online

Electricity from Hydro Power	China	CN	Electricity from hydro power	66e21945-6c38-445f-a17b-16f909d0bd45	Online
Electricity from Hydro Power	Germany	DE	Electricity from hydro power	86a54b74-fc71-41fa-8bb0-4722e8c61357	Online
Electricity from Hydro Power	EU-28	EU-28	Electricity from hydro power	99aa831c-4c28-438f-a87a-82382f5ef5df	Online
Electricity from Hydro Power	France	FR	Electricity from hydro power	1d16489c-f2e3-4874-86c8-90684493105f	Online
Electricity from Hydro Power	Great Britain	GB	Electricity from hydro power	444ed33f-fc5f-4252-8f12-ca2d7d8d5932	Online
Electricity from Hydro Power	United States of America	US	Electricity from hydro power	b551703f-a21d-40a4-a018-e3b195d85e42	Online
Electricity from Lignite	Germany	DE	Electricity from lignite	abd47264-8f40-43b0-9e8d-b771b5b743d5	Online
Electricity from Lignite	United States of America	US	Electricity from lignite	92f6a93c-b435-49da-86d6-78f298f3a41b	Online
Electricity from Natural Gas	Belgium	BE	Electricity from natural gas	843653fa-ab6c-4fbc-916e-db2cc8174f6a	Online
Electricity from Natural Gas	Chile	CL	Electricity from natural gas	e94f0875-9ad2-492b-af48-4d6c6745eacf	Online
Electricity from Natural Gas	China	CN	Electricity from natural gas	803931a3-9264-4e18-8f7b-e3bdfce30695	Online
Electricity from	France	FR	Electricity from natural gas	22779be7-84d9-4c35-933a-e81a6b82cd01	Online

Natural Gas				
Electricity from Natural Gas	Germany	DE	Electricity from natural gas	74791898-31d9-418a-a595-e761a25ab4b2	Online
Electricity from Natural Gas	Great Britain	GB	Electricity from natural gas	35708815-362d-44ec-bef4-798f70c5c4d0	Online
Electricity from Natural Gas	United States of America	US	Electricity from natural gas	9f85bfd1-212b-43a5-99d5-b0563913f6cc	Online
Electricity from Nuclear	Belgium	BE	Electricity from nuclear	3ba692de-e0b2-4c58-8796-d4cb139b88fe	Online
Electricity from Nuclear	China	CN	Electricity from nuclear	5e1a18d7-277f-4dc4-ba1a-f50fe62d49f7	Online
Electricity from Nuclear	France	FR	Electricity from nuclear	a3c14f99-f3d5-49c0-adcb-83899399f3fd	Online
Electricity from Nuclear	Germany	DE	Electricity from nuclear	c2ed464d-d5dd-429a-8614-5c24c3d2213a	Online
Electricity from Nuclear	Great Britain	GB	Electricity from nuclear	a06756a1-cca1-4276-97a8-e505205e096d	Online
Electricity from Nuclear	United States of America	US	Electricity from nuclear	ca86ff71-7b51-4686-9d40-9f8e09739a4c	Online
Electricity from Nuclear	South Africa	ZA	Electricity from nuclear	6eb2a68a-6e6d-4f20-8a54-51d0849a34f4	Online
Electricity from Photovoltaic	Belgium	BE	Electricity from photovoltaic	3b012c9c-cecb-4e33-8b6c-347be054b0ab	Online

Electricity from Photovoltaic	Chile	CL	Electricity from photovoltaic	024a81d3-3563-4881-aa1b-34f6fdd20a82	Online
Electricity from Photovoltaic	China	CN	Electricity from photovoltaic	564dfebf-9d0a-42f6-a9c1-5524d00c277c	Online
Electricity from Photovoltaic	EU-28	EU-28	Electricity from photovoltaic	d2842400-7718-47e1-8fea-6b35dbce7b80	Online
Electricity from Photovoltaic	France	FR	Electricity from photovoltaic	5b51dbc1-49a9-447b-8224-d38fb4e5374c	Online
Electricity from Photovoltaic	Germany	DE	Electricity from photovoltaic	9e55ee0e-2539-4015-ab03-a01529a91e57	Online
Electricity from Photovoltaic	Great Britain	GB	Electricity from photovoltaic	a7523d4d-acb8-440a-a7ae-b3c820cfad27	Online
Electricity from Photovoltaic	United States of America	US	Electricity from photovoltaic	cae1568c-b25c-4a6f-9829-49644d8d29f9	Online
Electricity from Photovoltaic	South Africa	ZA	Electricity from photovoltaic	169c0556-cb2e-4735-a4ca-a49cf03cbc15	Online
Electricity from Wind Power	Belgium	BE	Electricity from wind power	7a4fe9a4-582b-40e2-9ef5-6921bb893d9f	Online
Electricity from Wind Power	Chile	CL	Electricity from wind power	6a48e8e2-ca6f-4871-b361-e17cee7316dc	Online
Electricity from Wind Power	China	CN	Electricity from wind power	2b25be3a-c0d7-4780-ad87-1ab78d9ffa58	Online
Electricity from Wind	EU-28	EU-	Electricity from wind power	fe1c3d03-072b-4da7-8fff-3505f9b01efc	Online

Power		28			
Electricity from Wind Power	France	FR	Electricity from wind power	0204e9b6-815e-40a3-873f-8acb35fddda2	Online
Electricity from Wind Power	Germany	DE	Electricity from wind power	f932f79b-6251-4a77-bf04-5ce9bfea759f	Online
Electricity from Wind Power	Great Britain	GB	Electricity from wind power	37b5447f-8bd7-49b6-9b6e-c2d4205c39d3	Online
Electricity from Wind Power	United States of America	US	Electricity from wind power	2396c794-75d3-48b3-8933-6eebb701d1b7	Online
Electricity from Wind Power	South Africa	ZA	Electricity from wind power	19d687d3-372a-4add-8174-90b151c25371	Online

Indirect Upstream Activities – Agricultural Products

Tool	Original GaBi dataset			Documentation
Corn grains US	US	Corn grains, at field (20% H2O content)	d742fed3-7b05-4719-975a-3f98e87049ff	Online
Soy bean oil US	US	Soybean oil, conditioned (economic allocation)	59117f00-d80b-49b9-8ff0-5e9489c6cfdd	Online

Indirect Upstream Activities - Purchased Goods and Materials - Chemicals/Plastics

Tool	Original GaBi dataset			Documentation
Acrylonitrile Butadiene Styrene Granulate (ABS) open	DE	Acrylonitrile-Butadiene-Styrene Granulate (ABS)	11f555e6-215b-4939-87b7-488ed8823822	Online
Polyvinylchloride Granulate (S-PVC) open	DE	Polyvinyl chloride granulate (Suspension; S-PVC) mix	e7b9c3ac-8292-4595-ae46-5e5b2a616a7c	Online
Polyethylene Terephthalate Fibres (PET) open	EU-28	Polyethylene terephthalate fibres (PET)	db00901c-338f-11dd-bd11-0800200c9a66	Online
Polybutylene Terephthalate Granulate (PBT) open	DE	Polybutylene Terephthalate Granulate (PBT)	4cbfbc4f-d0fd-4c28-a0c5-90630007e34b	Online
Polyethylene Low Density Granulate open	DE	Polyethylene Low Density Granulate	6de31fe6-71e3-41f9-a166-4afc89961653	Online

(LDPE/PE-LD)		(LDPE/PE-LD)		
Polyethylene high density granulate (HDPE/PE-HD)	open	EU-28	Polyethylene high density granulate (HDPE/PE-HD)	5b30a5ab-bc4e-4316-bb18-f6605b382648	Online
Polyoxymethylene Granulate (POM)	open	DE	Polyoxymethylene granulate (POM)	6bc8dff8-d52d-4f6d-9af5-56cd2edd15b2	Online
Polyamide 6.6 Granulate (PA 6.6) (HMDA)	open	DE	Polyamide 6.6 Granulate (PA 6.6) Mix	ece7efc0-b02a-4d80-9328-32a969bdab2c	Online
Polypropylene Granulate (PP)	open	DE	Polypropylene granulate (PP)	c8e9efd5-fd8f-4da2-89ed-5a78e7ba6e42	Online
Nitrile butadiene rubber (NBR)	open	DE	Nitrile butadiene rubber (NBR, 33% acrylonitrile)	794b5228-6948-4587-bbe6-af2ceb1544e7	Online
Polysulfone (PSU)	open	DE	Polysulfone (PSU)	8f4b926b-0d70-47d6-9f85-3c37ac6631b0	Online
Epoxy resin (EP)	open	DE	Epoxy Resin (EP) Mix	50125a08-978e-4156-bcc0-2d13ec3b49c7	Online
Polyethylene Cross-Linked (PEXa)	open	DE	Polyethylene Cross-Linked (PEXa)	0cb4a09e-0614-4754-8773-c9efa124c04e	Online
Polyethylene terephthalate granulate (PET)	open	DE	Polyethylene terephthalate granulate (PET via DMT)	d51b18f9-786f-45fe-8add-c300803d3e13	Online
Polyamide 6 Granulate (PA 6)	open	DE	Polyamide 6 Granulate (PA 6) Mix	6e078dba-bc25-44e6-bf33-364e72ca36fe	Online
Ethylene propylene	open	DE	Ethylene Propylene Diene Elastomer	78f45ae7-6b25-481c-8b7e-db906d566f50	Online

diene elastomer (EPDM)			(EPDM)		
	open				Online

Indirect Upstream Activities - Purchased Goods and Materials - Metals

Tool		Original GaBi dataset			Documentation
Aluminium	CN	CN	Alumina production mix IAI 2015	501eeb7d-b1c8-41df-992b-c5bacace2b11	Online
Aluminium	GLO, IN	GLO	Alumina production mix IAI 2015	46429004-7fd0-4536-84d8-c2fff1685fd7	Online
Aluminium	BR	RLA	Alumina production mix IAI 2015	a50bde74-7bf1-45ed-a32f-92caf1e15f4d	Online
Aluminium	US	RNA	Alumina production mix IAI 2015	e43fa3e5-de4d-45fc-bd0a-66bdd9837641	Online
Aluminium	RU	RU	Alumina production mix IAI 2015	ea47e593-2b5a-4b61-997e-201c2b6837a8	Online
Aluminium	AU	OCE	Alumina production mix IAI 2015	343a36b9-09d0-4eab-8146-f46d5f12042c	Online
Cast Iron Part	open	DE	Cast iron part (automotive)	5235d35a-f878-4b72-b970-f3b393c205a5	Online
Steel alloyed - Iron Ore	open	DE	Iron ore-mix	f5a7c0a7-507d-4de9-ba6b-bcbc7b787f77	Online
Steel alloyed - Steel production	open	DE	BF Steel billet / slab / bloom	7b79d1c5-6208-49b2-9ef1-5bfe86d310dd	Online
Steel non- alloyed - Iron Ore	open	DE	Iron ore-mix	f5a7c0a7-507d-4de9-ba6b-bcbc7b787f77	Online

Steel alloyed - Steel production	open	DE	BF Steel billet / slab / bloom	7b79d1c5-6208-49b2-9ef1-5bfe86d310dd	Online
Stainless Steel - Nickel	open	GLO	Nickel (Class 1, 99.95%) ILCD 2017	04dc7156-8fda-4c67-923e-e779abd20e49	Online
Stainless Steel – Steel production	open	EU-28	Stainless steel white hot rolled coil (316)	b0f1825c-4911-4154-b478-5877ab51d0cc	Online
		EU-28	Stainless steel cold rolled coil (316)	f16f6e7d-3e3b-4a43-8e6a-f95348df6d5c	Online
		EU-28	Stainless steel Quarto plate (316)	d8019466-63c1-4f22-b9eb-26ef5cb60df5	Online
Brass - Copper	open	GLO	Copper mix (99,999% from electrolysis)	301d375b-4f27-43f2-bbe0-89f87cae0df1	Online
Brass – Brass production	open	EU-28	Red brass	aec78fed-cfd4-4f84-bd2d-accd3c5d1e7f	Online
Lead	Open	CN	Lead production	c7cbf0b1-cdfc-4b44-9ab4-b5f5007eee1f	Online
Silver	Open	GLO	Silver mix	521f27f6-95cf-4a87-ae24-3d60124ebc20	Online
Gold	Open	GLO	Gold (primary)	21b5f6eb-4dbf-425b-a186-08f3fcae254e	Online
Nickel	Open	GLO	Nickel (Class 1, 99.95%) ILCD 2017	04dc7156-8fda-4c67-923e-e779abd20e49	Online
Copper	Open	GLO	Copper mix (99,999% from electrolysis)	301d375b-4f27-43f2-bbe0-89f87cae0df1	Online
Tin	Open	GLO	Tin	cd01e11a-8582-4e67-9a3c-f49192dcf753	Online

Indirect Upstream Activities - Purchased Goods and Materials - Other purchased materials

Tool		Original GaBi dataset		Documentation
Wooden Pallet	Open	EU-28	Wooden pallets (EURO, 40% moisture) 79bdeef3-bcf4-4e52-b4b0-8b5375961c5e	Online
Silicone	Open	EU-28	Silicone fluids (low viscosity) 6270432e-17f5-4555-b60d-2a1cbaef45a0	Online
Carboard	Open			Online

Supporting Activities – Business Travels and Employee Commuting

Tool		Original GaBi dataset			Documentation
Travel by plane	Open (fuel input according to region specified)	EU-28	Diesel consumption based on dataset: distance travelled by plane (1000 km) (indirect)	3c645573-fbcd-4ebb-86a5-c658706d62c1	Online
Travel by plane	Open (fuel input according to region specified)	DE	electricity consumption of passenger train based on dataset: distance travelled by ICE train >200 kmh (indirect)	68296794-70f8-4cc8-84cd-75d91ff7ce8d	Online
Purchased diesel	Open		See above, indirect Upstream Activities - Purchased Fuels and Energies		
Travel by car >2 L	Open (fuel input according to region specified)	GLO	Car diesel, Euro 6, engine size more than 2l	197b352d-c735-4680-b6c8-3e2e2cbc0bee	Online
Travel by car <2 L	Open (fuel input according to region specified)	GLO	Car diesel, Euro 6, engine size 1,4-2l ts	c439a3a5-d729-4369-a0c7-78df69cddcad	Online

Supporting Activities – Canteen

Datasets not published, see section 2.9.2.

Supporting Activities – Capital equipment

Tool		Original GaBi dataset			Documentation
Aluminium	Open	DE	Aluminium extrusion profile (AlCu4SiMg)	f4115ae4-2ae8-435d-b079-625ee28a352e	Online
Cement	DE	DE	Cement mix	0fc886a2-07c9-4477-abe2-52fcbf087cce	Online
Concrete	DE	DE	Concrete bricks (EN15804 A1-A3)	d4b01bd8-6c45-466f-a64c-a093ec81643a	Online
Copper	GLO	GLO	Copper mix (99,999% from electrolysis)	301d375b-4f27-43f2-bbe0-89f87cae0df1	Online
Wood	DE	DE	Sawmill, lumber hardwood	e155e2c4-2675-4954-842d-3716b5409d4c	Online
Glass	DE	DE	Float flat glass	88da9a04-272e-4f75-8b69-8472bbcc7c5c	Online
Stone	DE	DE	Fire proof stones (alumina-rich)	e218c3be-41ed-415f-8eb7-bc4d3f0275a5	Online
Steel	Open	DE	EAF Steel Billet	4adb03ff-6762-4a6d-9279-1a02a4a392a4	Online
Plastics	DE	DE	Polyvinyl chloride granulate (Suspension; S-PVC) mix	e7b9c3ac-8292-4595-ae46-5e5b2a616a7c	Online
Stainless steel	DE	DE	Stainless steel sheet (including stamping and bending)	cad1ca32-e6ec-4f11-8876-395087ee3919	Online
Company Cars	DE	GLO	Passenger car (medium, gasoline, 1 piece); construction of a passenger car; single route, at plant; material	b43ab68a-9c0e-4727-9e9f-6bbb8094b90c	Online

		quantities adjustable (en); upstream processes included from GaBi DB	

Supporting Activities – Working Environment - Laptop

Tool	Original GaBi dataset		Documentation
(included in working place)	GLO	Average Printed Wiring Board with Signal-Power Electronics (DfX-Compatible) a85ab330-50a9-4053-85ab-2464a4cfedd3	Online
	GLO	Average Printed Wiring Board with Signal Electronics (DfX-compatible) 32cbfe31-f0f2-4286-b66f-f6a63eec46b9	Online
	GLO	RAM Bar SO-DIMM 8 discrete ICs (68 mm x 32 mm, 200 PIN) bcde2ec1-9016-4c7e-8c25-ad41462d1523	Online
	DE	Fan HDD (120X25mm, PWM) 948da94b-1552-4acd-9b97-f17568c3dc8a	Online
	DE	Fan PSU (78X25mm, not PWM) d4de1222-ae97-4a9e-8357-ced256efa6e7	Online
	GLO	Hard disk drive (HDD), 2.5", 4 platters, 8 sides, 15 mm high df72e8f6-17ea-4d55-9630-a6fa61f84c5b	Online
	GLO	ODD Laptop a823ee05-b39d-4dd3-9d27-3be69b4d6acb	Online
	GLO	Display (Laptop) 8a02ee39-ce90-4c69-8963-f6abedbd1dba	Online