

The logo for econvent, featuring a white circle that is open on the right side, with the word "econvent" in a lowercase, sans-serif font positioned to its right.

econvent

The background of the entire page is a complex network of nodes and lines. The nodes are represented by small white and pink spheres, while the connecting lines are thin, glowing blue and orange. The overall effect is a dense, interconnected web of data points, set against a dark blue background with some blurred light spots.

**The trusted database  
for environmental  
transparency**



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# Life Cycle Inventory Data

“What are the environmental gains and losses of subsidising electric vehicles in my country?”

“Which type of packaging can lower the environmental impact of my product?”

“Which stage of my supply chain causes the most greenhouse gas emissions?”

**ecoinvent** answers all these questions and helps you make truly sustainable decisions, based on fully transparent, reliable data.

**The ecoinvent database** is a global library of human activities, which includes thousands of processes that supply goods and services across all industrial sectors. These activities consume both natural resources from the environment as well as products from other human activities. At the same time they release emissions to water, soil and air.

ecoinvent supports your assessments with comprehensive data on the environmental impacts of activities and products, reaching far beyond CO<sub>2</sub> footprints. Water consumption, biodiversity loss, human toxicity or resource depletion are only a few of the aspects ecoinvent allows you to consider.

**This brochure** provides an overview of the data ecoinvent offers for different industrial sectors, ranging from resource extraction to waste treatment, while introducing you to the key features and benefits of working with ecoinvent.





## ecoinvent Use

### Highlights

- Use ecoinvent for numerous types of environmental assessments and standards.
- ecoinvent is trusted by thousands of users in industries and science worldwide.

**Use ecoinvent for** any level of detail you might require, from screening for rough, initial answers to in-depth, ISO compliant studies.

More than 3000 organisations worldwide, ranging from multinational corporations to leading research institutes already trust in ecoinvent. They use the database for a variety of purposes. For example:

- Carbon footprinting
- Circular economy assessments
- Environmental performance monitoring
- Environmental Product Declarations (EPDs)
- Life Cycle Assessment (LCA)
- Life Cycle Management (LCM)
- Product Design and ecoDesign
- Scope 3 greenhouse gas emission reporting
- Water footprinting

**Environmental Standards** ecoinvent is compatible with:

- EN15804 for Environmental Product Declarations (EPDs)
- ISCC Certifications
- ISO 14000 series for Environmental Management
- ISO/TC 207/SC 1, 3, 4, 5, 7 and 17
- PAS 2050, GHG Protocol and other scope 3 greenhouse gas reporting standards





## ecoinvent Quality

### Highlights

- Reliable data compiled and reviewed by recognised institutes and experts.
- Annual release of new and updated data.

### High-Quality Datasets

Our high-quality Life Cycle Inventory datasets are based on trusted industrial and research data, compiled by internationally renowned research institutes, industrial associations and Life Cycle consultants.

### Consistent & Reliable

All new datasets are subject to a thorough review procedure by both internal and external experts. This ensures data quality throughout the whole database.

Moreover, the consistent linking between processes ensures that improvements in one dataset immediately translate into improvements in all other connected datasets.

### Detailed Documentation

Meta-data in every dataset helps you follow and comprehend how the data was generated and how it is implemented. This comprises descriptions of the processes and products as well as their modelling in the database. It is supported by explanations and references to literature or statistical sources.

### Yearly Releases

The ecoinvent database is updated on an annual basis with new and up-to-date data as well as general improvements to the database.





# ecoinvent Methodology



## Highlights

- Trace back and understand the calculations and sources behind every data point.
- Complex modelling choices are broken down in predefined models: two attributional, one consequential.

## Transparency from unit process to impact results

- **Unit Process:** The basic building blocks of the database are individual unit processes of human activities and their exchanges with the environment (also known as gate-to-gate inventories).
- **Cumulative Life Cycle Inventories:** Individual processes are linked into supply chains, constituting cumulative life cycle inventories (also known as cradle-to-gate inventories).
- **Impact Assessment Results:** Matching these inventories with characterisation factors reveals the impact assessment results over a product's entire life cycle (LCIA results), e.g. the carbon and water footprint.

## Full Transparency

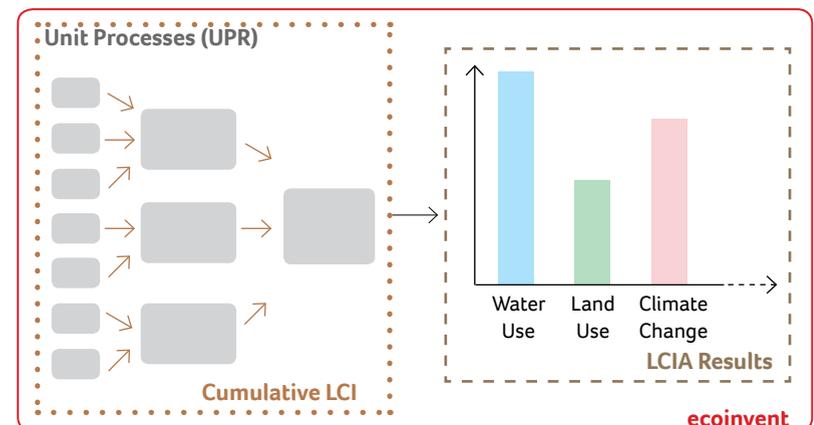
ecoinvent stands for transparency. This means you have access to mathematical relations, product properties, parameters, uncertainties, etc. which underlie individual data points. Detailed data documentation provides explanations and guidance.

## Modelling Choices

What concerns you more, the environmental impact of an average product produced today or that of a marginal unit produced in the future? Who shall be responsible for the benefits and burdens of recycled materials, the primary or the secondary user?

Choices like these are inevitable in environmental assessments. ecoinvent facilitates this choice by offering three predefined models.

The ecoinvent data structure visualised:





# Resource Extraction



## Highlights

- Reliable data on winning, refining, preparation & processing of numerous resources.
- Worldwide data coverage of the major supplying regions.

## Where it all begins

No matter how sophisticated a supply chain may be, its very beginning traces back to the extraction of renewable or non-renewable resources from the environment.

We continuously expand our data on numerous resources with the aim to represent all major production regions worldwide. For example, our hard coal inventories represent 95% of global hard coal supply chains.

## Extract data on these resources from ecoinvent:

### Fossil fuels

- Hard coal
- Lignite
- Natural gas
- Petroleum
- Uranium

### Minerals

- Basalt
- Bentonite
- Gypsum
- Ilmenite
- Limestone
- Molybdenite
- Perlite

### Metals

- Aluminium
- Copper
- Gold
- Iron
- Lead
- Nickel
- Platinum Group Metals
- Silver
- Zinc

### Others

- Gravel
- Salt
- Sand
- Timber





## Construction Materials



### Highlights

- Trusted by many national databases for environmental declarations of construction materials.
- Region-specific data for region-specific materials.

**ecoinvent's comprehensive data** on construction materials allows you to construct customised inventories of your buildings and infrastructure as well as assess the related life cycle impacts.

This is recognised by renowned national databases for environmental declarations of construction materials, which rely on ecoinvent as their background database. For example:

- the Swiss KBOB
- the Austrian BAU-EPD
- the UK-based Building Research Establishment (BRE)

### Construction materials

- Asphalt
- Ceramics
- Clay
- Clinker
- Gravel
- Gypsum
- Insulation materials
- Mortar
- Plaster
- Sand
- Veneer
- Wood beams

### Intermediate products & building components

- Bricks
- Coatings
- Doors
- Glazing
- Paints
- Pipes
- Tiles
- Ventilation systems
- Windows

### Cement & Concrete

Cement and concrete are locally produced materials and therefore differ from region to region. This is reflected in ecoinvent by region-specific data on the production of numerous compositions and qualities, which are used for distinct purposes.

### Wood

Azobe, beech, birch, eucalyptus, meranti, oak, pine or spruce? Whatever suits you best; our forestry datasets cover multiple hardwood and softwood species to choose from. Data on wood processing-steps, such as planing or laminating, reveal the impacts of the resulting products, for example, beams, sawnwood, laths or several qualities of fibreboard.





## Metals



### Highlights

- Data from international industry associations such as the International Aluminium Institute.
- Regular updates of our fully transparent data reflect the reality of a dynamic industry.

### Metals in ecoinvent

- Aluminium
- Copper
- Iron & Steel
- Precious metals
- Tin
- Zinc

### Aluminium

The aluminium supply chains for all major regions of the world are regularly updated to give you access to the latest available data on primary aluminium production. We provide you this first-hand data in collaboration with our industry partners, such as the International Aluminium Institute.

### Iron & steel

More than 200 datasets give you full insight into every step of the entire iron & steel supply chain. This starts with the extraction of the iron ores, followed by the processing into pig iron or sponge iron, and ends with the production of different grades of steel.

### Precious metals

Whether you are modelling the production of electronic components, catalytic converters or jewellery, ecoinvent has data concerning the essential metals required for these products. Data for the mining and refining of metals, such as gold, silver, platinum, palladium and rhodium, is available for several locations around the world.

**Metals are irreplaceable** components of numerous products, such as infrastructure, vehicles, household appliances and electronic devices. ecoinvent data covers the production and the refining of the most widely used metals, ranging from industrial to precious and rare-earth metals as well as alloys.

Besides the smelting and refining steps, our data depicts the processes required to obtain final metal pieces; for example milling, drilling, hot rolling, turning, coating or impact extrusion.

Our fully transparent datasets thus enable you to model the customised metal components required for your unique product system.





# Electricity



## Highlights

- Present and future electricity mixes on a country or even state level for most countries of the world.
- Wide range of generation technologies, including new technologies such as concentrating solar power.

## Electricity sources

- Biomass
- Concentrating solar power
- Geothermal power
- Hard coal
- Hydro power
- Lignite
- Natural Gas
- Nuclear power
- Oil
- Photovoltaic
- Waste incineration
- Wind power

**Electricity supply is key** in the life cycle of countless products and services. At the same time, this sector is subject to constant changes due to altering electricity and fuel prices, weather and climate conditions as well as technological development.

Therefore, ecoinvent's electricity sector is continuously updated with the latest data for close to 100% of statistically represented, global electricity generation. Additionally, you can find inventories and impacts of future electricity mixes, based on the projections of (inter-)national energy authorities.

**142 countries** are represented in the database with their present and future electricity mix. Moreover, the electricity production of large economies, such as Brazil, Canada, China, India, and the USA, is broken down into smaller regions. With such a high level of granularity in terms of technologies and geographical coverage, ecoinvent electricity data models reality as close as possible.





## Heat



## Highlights

- Thermal energy generated from various primary sources or as by-product of industrial processes.
- From small scale domestic use to large scale industrial and district heating.

**Thermal energy**, after electric power, is the most common form in which households, businesses and industry consume final energy. This heat may be generated from the combustion of numerous fuels or result as by-product of industrial processes. It can be produced centrally and distributed via district heating networks, or generated in decentral boilers and furnaces at the place of use. ecoinvent reveals the environmental advantages and disadvantages of these systems.

- **Technologies:** ecoinvent data covers not only heat and steam supply from large facilities such as heat and power co-generation plants or combined cycle gas turbines, but also small furnaces, boilers and mini CHPs.
- **Scale:** Data ranges from small heating systems used at the household level, to large systems used at the district level or for industrial purposes.
- **Sources:**
  - agricultural wastes such as straw or bagasse
  - biogas
  - coal and lignite briquettes or coke
  - heavy fuel oil
  - light fuel oil
  - natural gas
  - waste incineration
  - waste wood
  - wood chips, pellets and logs



# Agriculture



## Highlights

- Wide range of crops, livestock and fish.
- Different types of production systems to choose from.
- Auxiliary data such as agricultural services, fertilisers and land use change complement the sector.

## Fishery & Aquaculture

As one of few LCI databases, ecoinvent features data on fishery & aquaculture. This includes the capture of anchovy, hake and tuna as well as the farming of trout and tilapia. You can also find data on the processing of fish into fish meal and oil, on canning, curing and freezing of fish.

## Fertilisers

You can choose from a variety of both mineral and organic fertilisers to realistically reflect your specific agricultural supply chain.

## Land use change

The transformation of land from one purpose to another, e.g. from forest to cropland or vice versa, goes hand in hand with environmental gains or losses such as greenhouse gas removals or biodiversity loss. ecoinvent data reveals the impact of direct and indirect land use change by considering crop and geography-specific mixes of land use change.

## Agricultural services

Auxiliary services are essential to agricultural supply chains. Examples of such processes in the ecoinvent database are mowing, mulching, harvesting, fertiliser or pesticide spreading, or different types of tillage such as ploughing, harrowing and currying.

## Crops

In the crop sector, data on the production of various types of fruits, vegetables, cereals, rice, sugar, nuts and fibre crops covers more than 80% of the 50 most produced crops globally. For a growing number of crops this includes conventional and organic, irrigated and rainfed, open-air and greenhouse production systems.

## Livestock farming

Data on animal husbandry comprises several farming systems for the raising of cattle, pigs, sheep and poultry. The final products range from meat, milk, cheese, yoghurt and other dairy products to wool.





## Textiles

### Highlights

- Natural and synthetic fibres.
- From fibre production, to spinning of yarns, weaving of fibres, bleaching and dyeing.

**The global textile sector** has experienced a rapid growth over the past decades, raising ever more environmental concerns related to the production and disposal of fabrics. In the case of natural fibres, environmental impacts occur along complex agricultural supply chains, while synthetic fibres largely rely on fossil resources. Therefore, the comparison and trade-offs between alternative choices is not trivial and shall be well informed with our comprehensive data.

**ecoinvent's modular structure** allows you to choose from different fibre crop production systems, different processing steps and technologies.

#### Fibres

- Cotton (organic\*)
- Fleece
- Jute
- Kenaf
- Polyester\*
- Polypropylene\*
- Silk\*
- Viscose

#### Life cycle stages

- Bleaching
- Dyeing
- Growing of fibre crops
- Manufacturing of synthetic fibres
- Spinning of yarn
- Weaving of textile

\* Data available in ecoinvent v3.6 (2019).





# Chemicals



## Highlights

- Datasets are based on industry or research data.
- The European Union applies ecoinvent's chemical data for the Product Environmental Footprint (PEF) Standard.

**Chemicals are essential** ingredients to countless production processes in almost any manufacturing sector, particularly in the pharmaceutical, health care, cosmetics, consumer goods, food and textile industries as well as in waste treatment.

The ecoinvent database serves the needs of these industries by offering a large variety of chemical manufacturing data, ranging from bulk chemicals to specialty chemicals, as well as fertilizers and pesticides.

## Chemicals in ecoinvent

- Acids
- Bulk chemicals
- Detergents
- Fertilisers
- Paints
- Pesticides
- Plastics
- Polymers
- Resins
- Salts
- Synthetic fibres
- Synthetic rubber

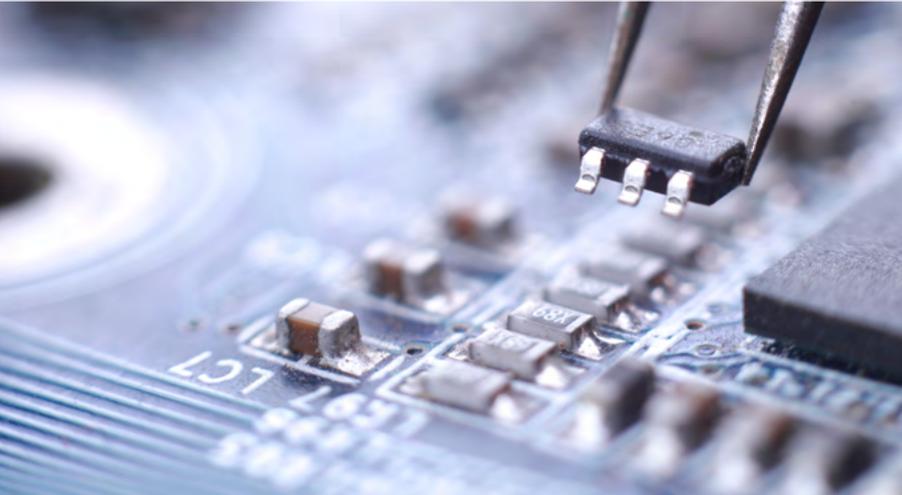
## ecoinvent chemicals for PEF

The high quality and transparency of ecoinvent's chemical data is acknowledged by the European Union that uses the data for the Product Environmental Footprint (PEF) standard.





# Manufacturing & Processing



## Highlights

- Processing of petroleum, coal, uranium, vegetable oil etc. to solid, liquid and gaseous fuels.
- Manufacturing of pulp and paper.
- Electronics and electrical equipment.

## Fibres, fabrics & textiles

ecoinvent data comprises the production of several types of organic and synthetic fibres, their processing into yarns, fabrics and textiles. For more details see [pages 20 and 21](#).

## Fuels

The refining of petroleum to liquid and gaseous fuels, as well as other petroleum products, involves a complex set of interdependent processes. To break this down for you into usable life cycle inventories and comprehensible impact results, we apply advanced models developed by scientists and industry experts.

Similarly, you can find data on the refining of vegetable oils, and on the processing of raw materials such as coal or uranium into coke, briquettes and other solid fuel.

## Pulp & paper

Are you considering procuring virgin or recycled paper, or perhaps a different material altogether? ecoinvent helps you uncover the environmental impacts of numerous grades of packaging and graphical paper, cartonboard and containerboard.

Data on the initial forestry of pulpwood as well as the production of chemical and mechanical pulp further reveals which stages of the paper supply chain contributes most to these impacts.

**The manufacture of intermediate and final products** is represented in the ecoinvent database with hundreds of processes across many sectors. Here are some of the more prominent examples you can find in the database:

## Electronics and electrical equipment

To assess environmental impacts of today's digital supply chains, data on essential hardware components cannot be omitted. ecoinvent provides you with data on the production of components such as capacitors, inductors, transistors, transformers, diodes, control systems, batteries, cables, accumulators, computers, printers and screens.





# Transport



## Highlights

- Freight and passenger transport.
- Modalities: road, rail, water, pipeline, air.
- Consider different types, sizes, technologies and emission standards of vehicles.

**Moving goods and people** around the globe may contribute significantly to the environmental impacts of products and services. To know how different transportation alternatives influence these impacts, ecoinvent provides you with data on a great range of transportation modalities, distances and vehicles:

- **Distances:** Whether your concern is the transport demand driven by an ever increasing urbanisation or the optimisation of your global supply chain logistics, ecoinvent provides the right data, ranging from urban, to regional, continental and intercontinental transport.
- **Modalities:** Does your supply chain require road, rail, water, conveyor, pipeline or air transport for freight or passengers? ecoinvent covers all of these modalities.
- **Vehicles:** Choose between cars running on electricity, biodiesel or conventional fuels, electric bicycles, trams, refrigerated trucks, tractors, high speed trains, inland water vessels, transoceanic ships and much more. In addition, you can take into account the size, technology and emission standard of vehicles.

## Transport in supply chains

For every product in the database you will find data and documentation on trade losses, average transport distances and modes. This helps you fill any transport data gaps you might have.





# Infrastructure & Machinery

## Highlights

- Components, construction and operation of infrastructure, machinery and equipment.
- Buildings, industrial sites, transport-related and grid-bound infrastructure.

**Infrastructure** and machinery are the backbone of every supply chain. Therefore, extensive data for their construction and operation is essential to understand the impacts of any product. The more than 250 infrastructure items in the ecoinvent database range from simple multi-storey buildings to specialised facilities.

- **Industrial sites**, for example, include quarries, mines, refineries, mills, factories, storage facilities, power plants, waste and wastewater treatment facilities.
- **Transportation** requires infrastructure such as ports, airports, roads and railways.
- **Agriculture** involves the construction of livestock housing-systems or greenhouses.
- **Grid-bound** infrastructure is available for electricity and natural gas as well as sewer systems.

**When it comes to machinery** and other industrial equipment, inventories of boilers, compressors, pumps, excavators, harvesters, saws, control and ventilation systems, vehicles and aircrafts are only some examples of what ecoinvent has to offer.



# Waste Treatment & Recycling



## Highlights

- Extensive data on treatment and recycling activities
- Formal and informal sectors.
- Waste categories: from household fractions to hazardous and industrial wastes as well as wastewater.

**In every end there is a new beginning** – recycling activities can close the loop between one product's grave and another's cradle. But is this environmentally preferable over other treatment paths and over primary resource extraction? ecoinvent helps you to answer questions like this with extensive data on waste treatment and recycling.

### Formal sector

- Incineration
- Impoundment of tailings
- Recycling
- Landfilling:
  - Inert material
  - Residual material
  - Sanitary

### Informal sector

- Open burning of various fractions
- Open dumping of various fractions
- Unsanitary landfilling

### Waste categories

- Domestic waste fractions such as paper, plastic and glass
- Industrial wastes streams such as mining, metal smelting or hazardous wastes
- Wastewater

**Model your own treatment process:** For users with specific requirements, our free-of-charge waste modeling tool allows to create inventories for customised treatments and waste types.





## Trade & Distribution



### Highlights

- Production processes are linked into supply chains via consumption mixes. Product losses and transport requirements for trade and distribution are considered.
- For all products, average market prices are available.

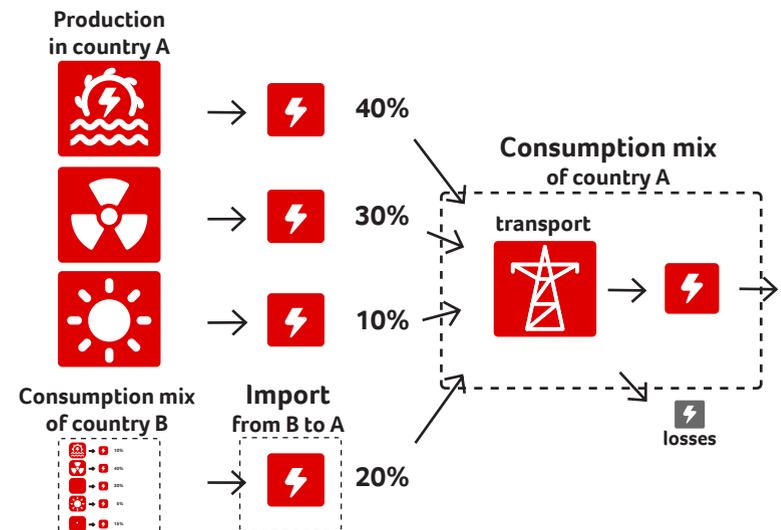
**Production mixes** or consumption mixes represent average mixes of product origin, where different suppliers or technologies are available for the same product.

**Transport requirements** for the average trade and distribution distances are specified for every product to help you fill your data gaps.

**International trade** of commodities such as hard coal, models the transfer of products from one geography to another in order to make sure you receive the right consumption mix. Here is an example of an electricity supply chain:

**All the data presented** on the previous pages does not reveal its full added value unless linked through trade and distribution practices. Often, the individual processes along global supply chains are performed by different actors at different locations. Intermediate and final products are traded on local or even global marketplaces. This obscures their technological and geographical origin.

**For example**, would you know how much of the coal, used to produce that kilowatt-hour of electricity you consume, comes from Australia, Colombia or South Africa? And how much of that kilowatt-hour is even generated from coal? How much is generated from nuclear, hydro or solar power? No idea? Don't panic, we can help you.





## ecoinvent Benefits & Access

### Highlights

- Prices, properties and metadata for every product facilitate the data use.
- All commercial Life Cycle software providers support the ecoinvent database.

**Other added values** of the ecoinvent database include:

- **Product Prices** are essential for economic allocation in Life Cycle Assessment and useful for multiple other purposes. Therefore, ecoinvent provides average market prices for each and every product.
- **Product Properties**, such as the fossil and non-fossil carbon content, wet and dry mass, are accessible for all products in the database.
- **Meta-information** provides transparent background information on all datasets to ensure you get the most out of the data.
- **Guidance** material on the use of the database supports you in the efficient and effective work with your ecoinvent license.

**Easy access** to thousands of datasets - buy a licence now!

- **Purchase directly through ecoinvent** to access and extract unit processes, life cycle inventories, impact results and documentation online. Please visit our [webpage](#) or [contact us](#) for more information.
- **Purchase through a reseller** to use the database in the LCA software tool of your choice. ecoinvent is trusted and supported by all commercial [Life Cycle Assessment software providers](#).

## Stay up-to-date

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## Get in touch



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