thinkstep
GaBi
Product Sustainability
Performance

Database Service Pack 28

Changelog GaBi Service Pack 27 to 28

October 2015

thinkstep

Content

Introduction

GaBi Service Packs comprise a collection of updates, enhancements or fixes to the following GaBi objects: flows, quantities, units, contacts, interpretations and references/citations. This document provides detailed information on what will be changed/added/deleted with the installation of the Service Packs.

If you need further information or if special questions should arise which have not been adequately described in this document, please feel free to send an e-mail to support@gabi-software.com.

1. New environmental quantities

Folder	Quantity
CML 2015	CML2001 - Apr. 2015, Photochem. Ozone Creation Potential (POCP) CML2001 - Apr. 2015, Eutrophication Potential (EP) CML2001 - Apr. 2015, Freshwater Aquatic Ecotoxicity Pot. (FAETP inf.) CML2001 - Apr. 2015, Acidification Potential (AP) CML2001 - Apr. 2015, Marine Aquatic Ecotoxicity Pot. (MAETP inf.) CML2001 - Apr. 2015, Ozone Layer Depletion Potential (ODP, steady state) CML2001 - Apr. 2015, Terrestric Ecotoxicity Potential (TETP inf.) CML2001 - Apr. 2015, Human Toxicity Potential (HTP inf.) CML2001 - Apr. 2015, Global Warming Potential (GWP 100 years) CML2001 - Apr. 2015, Global Warming Potential (GWP 100 years), excl biogenic carbon CML2001 - Apr. 2015, Abiotic Depletion (ADP elements) CML2001 - Apr. 2015, Abiotic Depletion (ADP fossil) CML2001 - Apr. 2015, Global Warming Potential (GWP 100), Land Use Change only, no norm/weight CML2001 - Apr. 2015, Global Warming Potential (GWP 100), excl bio. C, incl LUC, no norm/weight CML2001 - Apr. 2015, Global Warming Potential (GWP 100), incl bio. C, incl LUC, no norm/weight

2. Changed characterization factors

For ongoing compliance with the developments in the European Produce Environmental Footprint (PEF), especially for the use in PEF supporting studies starting in autumn 2015, the ILCD/PEF recommended LCIA methods are updated to the latest published version v1.06.

- Impacts ILCD/PEF recommendation:
  The Characterization Factors (CFs) v1.06 replace the v1.03 formerly implemented in GaBi. The two Excel files published by JRC that are the basis for this implementation are:
  ILCD2011-LCIA-method-documentation-FILE-1-final_v1.0.6_February2015
  ILCD2011-LCIA-method-documentation-FILE-2-final_v1.0.6_February2015
  The naming for all quantities was changed so that they now directly match the naming in the Excel files.

  The following quantities also changed regarding CFs and reference units:

  Differences for Ionizing radiation
  - New reference unit kBq Uranium equivalents instead of kg Uranium equivalents
  - Changes visible but clearly not relevant (4th digit of the results) in test datasets

  Differences for Land use
  - Some changes in CFs
  - 3 new flows got CFs (Transformation, from urban, continuously built, Transformation, from urban, discontinuously built, Transformation, to unspecified)
  - Still a couple of CFs are missing in the JRC Excel v1.06 and may lead to inconsistencies in the results
  - Since land use according to the SOM method is not used in thinkstep standard datasets up to now, there are no changes of your background data.
  - Please contact thinkstep in cases of implausible results of your foreground system (e.g. negative results)

  Differences for Eutrophication fresh water
  - Added CF for Phosphoric acid [Inorganic emissions to fresh water]
  - Might lead to slightly higher values, but no changes visible in test datasets

  Differences for Resource depletion mineral, fossil and renewables
  - 2 CFs new (magnesium and gallium)
  - 1 CF changed (uranium)
  - Changes visible but clearly not relevant (4th digit of the results) in test datasets

  Differences for Water depletion
  - **Fundamental changes**
  - “Input” method instead of “delta” method (analogy: blue water use instead of blue water consumption)
  - CFs from UBP 2013 instead of UBP 2006

- Rain water not included
- Turbined water (output) is subtracted from the inputs (even if it is an input method…)
- Reference unit changed from UBP to **m³ Equivalents**

Differences for Acidification & Eutrophication terrestrial:

- No CF for "nitrogen oxides [emissions to air]" in Excel files → CF for nitrogen dioxide used according to agreement with JRC, since this solution gives
  a) plausible results and
  b) is consistent to the flow matching between GaBi and ILCD format

- EDIP 2003 POCP was completely reworked. The characterization factors for POCP impact on human health were all a factor 10 too high, which was corrected. Furthermore, 3 single VOCs were characterized wrong for POCP impact on vegetation by approx a factor 2 each. This was also corrected.

Flow	Folder	Quantity	Service pack 27 factor	Service pack 28 factor
Total organic bounded carbon	Analytical measures to fresh water	UBP 2013, Non radioactive waste to deposit	8400	-
Carbetamide	Pesticides to agricultural soil	Ecotoxicity freshwater midpoint (v1.06)	243,104159208407	-
Methane (biotic)	Organic emissions to air (group VOC)	Climate change midpoint (v1.06)	22,25	25

3. Updated processes from extension database VI: Precious metals

Together with Sercive Pack 28 we send out a database update for extension database VI: Precious metals. This update will fix an issue we found for the three processes of Palladium, Platinum and Rhodium.

The electricity consumption "per ore mass mined" in South African mining operations was updated in the GaBi 2013 Upgrade according to the “Anglo Platinum Sustainabilty Report 2012”, which uses new industrial information. Benchmarking to recent projects in this industry sector showed conspicuous differences and revealed that the electricity consumption for the South African extraction process was not properly implemented in the GaBi model and not adapted to decreasing ore concentrations in Platinum group metals (PGM). This leads to significant more but realistic energy intensity of the extraction process, alongside with higher but realistic CO2 emissions in relation to latest figures released.

However, e.g. for Platinum, it leads to still about 13% improvement (from 40 t GWP) compared with values prior to the “Anglo Platinum Sustainabilty Report 2012” update (to now to ca. 35 t GWP). For Palladium and Rhodium, this improvement shows similar changes in the numbers.

Please be aware that the changes that will be delivered in the upgrade 2015 in December (e.g. rework of the prices for price allocation and rework of the background energy datasets used) are not part of this delivery now. The results are anticipated to again change with the upgrade 2015.

4. Combined flows

We combined a couple of flows to get rid of doublets:

Service pack 27 flow	Folder	Action	Service pack 28 flow	Folder
Indoxacarb	Pesticides to agricultural soil	merged to	DP-MP062	Pesticides to agricultural soil
DP-MP062	Pesticides to agricultural soil			
Isocyanide acid	Inorganic emissions to air	merged to	Isocyanic acid	Other emissions to air
Isocyanic acid	Other emissions to air			
Monocrotophos	Pesticides to agricultural soil	merged to	Azodrin	Pesticides to agricultural soil
Azodrin	Pesticides to agricultural soil			
Perlite	Non renewable resources	merged to	Perlite (Rhyolithe)	Non renewable resources
Perlite (Rhyolithe)	Non renewable resources			
Raw pumice	Non renewable resources	merged to	Natural pumice	Non renewable resources
Natural pumice	Non renewable resources			
Sodium chlorate	Inorganic emissions to air	merged to	Sodium chlorate	Pesticides to air
Sodium chlorate	Pesticides to air			
Sulfosate	Pesticides to agricultural soil	merged to	Glyphosate-trimesium	Pesticides to agricultural soil
Glyphosate-trimesium	Pesticides to agricultural soil			
Uranium ecoinvent	Uranium (resource)	merged to	Uranium, in ground	Uranium (resource)

Uranium, in ground	Uranium (resource)			
Carbon dioxide (land use change)	Inorganic emissions to air	merged to	Carbon dioxide (land use change)	Inorganic emissions to air
Carbon dioxide, land transformation	Inorganic emissions to air			

5. New elementary flows

Most of the flows are already available in the ecoinvent 3.1 extension database. In all other databases they are created during the installation of Service Pack 28.

Flow	Folder
1,4-Butanediol	ecoinvent long-term to air
1,4-Butanediol	ecoinvent long-term to fresh water
1-Pentanol	ecoinvent long-term to air
1-Pentanol	ecoinvent long-term to fresh water
1-Pentanol	Organic emissions to sea water
1-Pentene	ecoinvent long-term to air
1-Pentene	ecoinvent long-term to fresh water
1-Pentene	Organic emissions to sea water
2-Aminopropanol	ecoinvent long-term to air
2-Aminopropanol	ecoinvent long-term to fresh water
2-Aminopropanol	Organic emissions to sea water
2-Methyl-1-propanol	ecoinvent long-term to air
2-Methyl-1-propanol	ecoinvent long-term to fresh water
2-Methyl-2-butene	ecoinvent long-term to air
2-Methyl-2-butene	ecoinvent long-term to fresh water
2-Methyl-2-butene	Organic emissions to sea water
2-Methylpentane	ecoinvent long-term to air
2-Nitrobenzoic acid	ecoinvent long-term to air
2-Propanol	ecoinvent long-term to air
2-Propanol	ecoinvent long-term to fresh water
3-Methyl-1-butanol	ecoinvent long-term to air
3-Methyl-1-butanol	ecoinvent long-term to fresh water
3-Methyl-1-butanol	Organic emissions to sea water
4-Methyl-2-pentanol	ecoinvent long-term to fresh water
4-Methyl-2-pentanol	Organic emissions to sea water
4-Methyl-2-pentanone	ecoinvent long-term to air
4-Methyl-2-pentanone	ecoinvent long-term to fresh water
Acenaphthene	ecoinvent long-term to air
Acenaphthene	ecoinvent long-term to fresh water
Acenaphthylene	ecoinvent long-term to fresh water
Acetaldehyde	ecoinvent long-term to air
Acetaldehyde	ecoinvent long-term to fresh water
Acetamide	Pesticides to sea water

Acetic acid	ecoinvent long-term to air
Acetic acid	ecoinvent long-term to fresh water
Acetic acid, trifluoro-	ecoinvent long-term to air
Acetic acid, trifluoro-	Group NMVOC to air
Acetone	ecoinvent long-term to air
Acetone	ecoinvent long-term to fresh water
Acetonitrile	ecoinvent long-term to air
Acetonitrile	ecoinvent long-term to fresh water
Acetonitrile	Organic emissions to sea water
Acetyl chloride	ecoinvent long-term to fresh water
Acetyl chloride	Organic emissions to sea water
Acid (as H+)	Other emissions to agricultural soil
Acid (as H+)	Other emissions to air
Acid (as H+)	Other emissions to fresh water
Acid (as H+)	Other emissions to industrial soil
Acidity, unspecified	ecoinvent long-term to fresh water
Acidity, unspecified	Other emissions to sea water
Acifluorfen	Pesticides to agricultural soil
Acifluorfen	Pesticides to air
Acrolein	ecoinvent long-term to air
Acrylate, ion	ecoinvent long-term to fresh water
Acrylic acid	ecoinvent long-term to air
Acrylonitrile	ecoinvent long-term to air
Acrylonitrile	ecoinvent long-term to fresh water
Actinides, radioactive, unspecified	ecoinvent long-term to air
Actinides, radioactive, unspecified	ecoinvent long-term to fresh water
Actinides, radioactive, unspecified	Radioactive emissions to fresh water
Adsorbable organic halogen compounds (AOX)	Halogenated organic emissions to air
Aerosols, radioactive, unspecified	ecoinvent long-term to air
Aldehydes, unspecified	ecoinvent long-term to air
Allyl chloride	Organic emissions to fresh water
Aluminium	ecoinvent long-term to air
Aluminium	Inorganic emissions to fresh water
Americium-241	ecoinvent long-term to air
Americium-241	ecoinvent long-term to fresh water
Americium-241	Radioactive emissions to industrial soil
Ametryn	Pesticides to agricultural soil
Amitraz	Pesticides to agricultural soil
Ammonia	ecoinvent long-term to air

Ammonium	Inorganic emissions to agricultural soil
Ammonium	Inorganic emissions to industrial soil
Ammonium carbonate	ecoinvent long-term to air
Aniline	ecoinvent long-term to air
Aniline	ecoinvent long-term to fresh water
Anthracene	ecoinvent long-term to fresh water
Anthranilic acid	ecoinvent long-term to air
Antimony	ecoinvent long-term to air
Antimony-122	ecoinvent long-term to fresh water
Antimony-122	Radioactive emissions to sea water
Antimony-124	ecoinvent long-term to air
Antimony-124	ecoinvent long-term to fresh water
Antimony-125	ecoinvent long-term to air
Antimony-125	ecoinvent long-term to fresh water
AOX, Adsorbable Organic Halogen as Cl	ecoinvent long-term to fresh water
Apatite	Non renewable resources
Argon-40	Radioactive emissions to air
Argon-41	ecoinvent long-term to air
Arsenic	ecoinvent long-term to air
Arsine	ecoinvent long-term to air
Barite	ecoinvent long-term to fresh water
Barite	Inorganic emissions to fresh water
Barite, 15% in crude ore, in ground	Non renewable resources
Barium	ecoinvent long-term to air
Barium-140	ecoinvent long-term to air
Barium-140	ecoinvent long-term to fresh water
Barium-140	Radioactive emissions to sea water
Benazolin	Pesticides to agricultural soil
Benfluralin	Pesticides to agricultural soil
Benzal chloride	ecoinvent long-term to air
Benzal chloride	ecoinvent long-term to fresh water
Benzaldehyde	ecoinvent long-term to air
Benzene	ecoinvent long-term to air
Benzene	ecoinvent long-term to fresh water
Benzene, chloro-	ecoinvent long-term to fresh water
Benzene, dichloro	ecoinvent long-term to air
Benzene, ethyl-	ecoinvent long-term to air
Benzene, ethyl-	ecoinvent long-term to fresh water
Benzene, hexachloro-	ecoinvent long-term to air

Benzene, pentachloro-	ecoinvent long-term to air
Benzo(a)pyrene	ecoinvent long-term to air
Benzo(b)fluoranthene	Group NMVOC to air
Benzo(b)fluoranthene	Hydrocarbons to fresh water
Benzo(k)fluoranthene	ecoinvent long-term to fresh water
Benzyl alcohol	ecoinvent long-term to fresh water
Benzyl alcohol	Hydrocarbons to sea water
Beryllium	ecoinvent long-term to air
Beta-butyrolactone	Organic emissions to fresh water
Borate	ecoinvent long-term to fresh water
Borate	Inorganic emissions to sea water
Boric acid	ecoinvent long-term to air
Boron	ecoinvent long-term to air
Boron	Inorganic emissions to agricultural soil
Boron	Inorganic emissions to industrial soil
Boron carbide	ecoinvent long-term to air
Boron carbide	ecoinvent long-term to fresh water
Boron carbide	Inorganic emissions to air
Boron carbide	Inorganic emissions to fresh water
Boron carbide	Inorganic emissions to sea water
Boron trifluoride	ecoinvent long-term to air
Bromacil	Pesticides to agricultural soil
Bromate	ecoinvent long-term to fresh water
Bromate	Inorganic emissions to sea water
Bromide	ecoinvent long-term to fresh water
Bromide	Inorganic emissions to air
Bromide	Inorganic emissions to fresh water
Bromide	Inorganic emissions to sea water
Bromine	ecoinvent long-term to air
Butadiene	ecoinvent long-term to air
Butane	ecoinvent long-term to air
Butanol	ecoinvent long-term to air
Butanol	ecoinvent long-term to fresh water
Butene	ecoinvent long-term to air
Butene	ecoinvent long-term to fresh water
Butene	Hydrocarbons to sea water
Butyl acetate	ecoinvent long-term to air
Butyl acetate	ecoinvent long-term to fresh water
Butylcarbamate, iodopropynyl	Group NMVOC to air

Butylcarbamate, iodopropynyl	Organic emissions to fresh water
Butyrolactone	ecoinvent long-term to air
Butyrolactone	ecoinvent long-term to fresh water
Butyrolactone	Hydrocarbons to sea water
Cadmium	ecoinvent long-term to air
Cadmium-109	ecoinvent long-term to fresh water
Cadmium-109	Radioactive emissions to fresh water
Cadmium-109	Radioactive emissions to sea water
Calcite, in ground	Non renewable resources
Calcium	ecoinvent long-term to air
Calcium	Inorganic emissions to agricultural soil
Calcium	Inorganic emissions to air
Calcium	Inorganic emissions to air
Calcium	Inorganic emissions to fresh water
Calcium	Inorganic emissions to industrial soil
Calcium hydroxide	ecoinvent long-term to air
Calcium hydroxide	Inorganic emissions to air
Carbetamide	Pesticides to industrial soil
Carbon dioxide, fossil	ecoinvent long-term to air
Carbon dioxide, from soil or biomass stock	ecoinvent long-term to air
Carbon dioxide, non-fossil	ecoinvent long-term to air
Carbon dioxide, to soil or biomass stock	Inorganic emissions to agricultural soil
Carbon dioxide, to soil or biomass stock	Inorganic emissions to industrial soil
Carbon disulfide	ecoinvent long-term to air
Carbon disulfide	ecoinvent long-term to fresh water
Carbon monoxide, fossil	ecoinvent long-term to air
Carbon monoxide, from soil or biomass stock	ecoinvent long-term to air
Carbon monoxide, non-fossil	ecoinvent long-term to air
Carbon-14	ecoinvent long-term to air
Carbon-14	ecoinvent long-term to fresh water
Carbonate	ecoinvent long-term to fresh water
Carboxylic acids, unspecified	ecoinvent long-term to fresh water
Carboxylic acids, unspecified	Inorganic emissions to sea water
Carboxylic acids, unspecified	Organic emissions to fresh water
Carfentrazone-ethyl	Pesticides to agricultural soil
Carnallite	Non renewable resources
Cerium-141	ecoinvent long-term to air
Cerium-141	ecoinvent long-term to fresh water
Cerium-141	Radioactive emissions to sea water

Cerium-144	ecoinvent long-term to air
Cerium-144	ecoinvent long-term to fresh water
Cerium-144	Radioactive emissions to sea water
Cesium	ecoinvent long-term to fresh water
Cesium-134	ecoinvent long-term to air
Cesium-134	ecoinvent long-term to fresh water
Cesium-136	ecoinvent long-term to fresh water
Cesium-136	Radioactive emissions to sea water
Cesium-137	ecoinvent long-term to air
Cesium-137	ecoinvent long-term to fresh water
Chloramine	ecoinvent long-term to air
Chloramine	ecoinvent long-term to fresh water
Chloramine	Organic emissions to sea water
Chlorate	ecoinvent long-term to fresh water
Chlorfenvinfos	Pesticides to agricultural soil
Chloride	Inorganic emissions to agricultural soil
Chlorimuron-ethyl	Pesticides to air
Chlorinated solvents, unspecified	ecoinvent long-term to fresh water
Chlorinated solvents, unspecified	Halogenated organic emissions to air
Chlorinated solvents, unspecified	Organic emissions to fresh water
Chlorinated solvents, unspecified	Organic emissions to sea water
Chlorine	ecoinvent long-term to air
Chlorine	ecoinvent long-term to fresh water
Chloroacetic acid	ecoinvent long-term to air
Chloroacetic acid	ecoinvent long-term to fresh water
Chloroacetic acid	Organic emissions to sea water
Chloroacetyl chloride	ecoinvent long-term to fresh water
Chloroacetyl chloride	Organic emissions to sea water
Chloroform	ecoinvent long-term to air
Chloroform	ecoinvent long-term to fresh water
Chlorosilane, trimethyl-	ecoinvent long-term to air
Chlorosilane, trimethyl-	ecoinvent long-term to fresh water
Chlorosilane, trimethyl-	Halogenated organic emissions to fresh water
Chlorosilane, trimethyl-	Halogenated organic emissions to sea water
Chlorosulfonic acid	ecoinvent long-term to air
Chlorosulfonic acid	ecoinvent long-term to fresh water
Chlorosulfonic acid	Organic emissions to sea water
Chromium	ecoinvent long-term to air
Chromium IV	Heavy metals to air

Chromium VI	ecoinvent long-term to air
Chromium, ion	ecoinvent long-term to fresh water
Chromium-51	ecoinvent long-term to air
Chromium-51	ecoinvent long-term to fresh water
Chromium-51	Radioactive emissions to sea water
Clethodim	Pesticides to air
Cloransulam-methyl	Pesticides to air
Cobalt	ecoinvent long-term to air
Cobalt-57	ecoinvent long-term to air
Cobalt-57	ecoinvent long-term to fresh water
Cobalt-57	Radioactive emissions to air
Cobalt-57	Radioactive emissions to sea water
Cobalt-58	ecoinvent long-term to air
Cobalt-58	ecoinvent long-term to fresh water
Cobalt-60	ecoinvent long-term to air
Cobalt-60	ecoinvent long-term to fresh water
COD, Chemical Oxygen Demand	ecoinvent long-term to fresh water
Copper	ecoinvent long-term to air
Copper, ion	ecoinvent long-term to fresh water
Copper, ion	Heavy metals to fresh water
Copper, ion	Heavy metals to sea water
Cu-HDO	Other emissions to fresh water
Cumene (isopropylbenzene)	ecoinvent long-term to air
Cumene (isopropylbenzene)	ecoinvent long-term to fresh water
Curium	Radioactive emissions to industrial soil
Curium alpha	ecoinvent long-term to air
Curium alpha	ecoinvent long-term to fresh water
Curium-242	ecoinvent long-term to air
Curium-242	Radioactive emissions to air
Curium-242	Radioactive emissions to air
Curium-244	ecoinvent long-term to air
Curium-244	Radioactive emissions to air
Cyanide	ecoinvent long-term to air
Cyanide	ecoinvent long-term to fresh water
Cyanoacetic acid	ecoinvent long-term to air
Cyclohexane	ecoinvent long-term to air
Cyclohexane	ecoinvent long-term to fresh water
Cyhalothrin, gamma-	Pesticides to agricultural soil
Cyhalothrin, gamma-	Pesticides to air

Decane	Organic emissions to fresh water
Dibenzofuran	Hydrocarbons to fresh water
Dibenzothiophene	Hydrocarbons to fresh water
Diborane	ecoinvent long-term to air
Diborane	ecoinvent long-term to fresh water
Diborane	Inorganic emissions to air
Diborane	Inorganic emissions to fresh water
Diborane	Inorganic emissions to sea water
Dichlobenil	Pesticides to agricultural soil
Dichromate	ecoinvent long-term to fresh water
Dichromate	Inorganic emissions to sea water
Diethyl ether	ecoinvent long-term to air
Diethylamine	ecoinvent long-term to air
Diethylamine	ecoinvent long-term to fresh water
Diethylamine	Organic emissions to sea water
Diethylene glycol	ecoinvent long-term to air
Diethylene glycol	ecoinvent long-term to fresh water
Diflubenzuron	Pesticides to air
Diisobutyl ketone	ecoinvent long-term to fresh water
Diisobutyl ketone	Organic emissions to sea water
Dimefuron	Pesticides to agricultural soil
Dimethyl ether	ecoinvent long-term to air
Dimethyl ether	ecoinvent long-term to fresh water
Dimethyl ether	Hydrocarbons to sea water
Dimethyl malonate	ecoinvent long-term to air
Dimethylamine	ecoinvent long-term to air
Dimethylamine	ecoinvent long-term to fresh water
Dimethylamine	Organic emissions to sea water
Dinitrogen monoxide	ecoinvent long-term to air
Dioxins, measured as 2,3,7,8-tetrachlorodibenzo-p-dioxin	ecoinvent long-term to air
Dioxins, measured as 2,3,7,8-tetrachlorodibenzo-p-dioxin	ecoinvent long-term to fresh water
Dipropylamine	ecoinvent long-term to air
Dipropylamine	ecoinvent long-term to fresh water
Dipropylamine	Organic emissions to sea water
Disinfectants, unspecified	ecoinvent long-term to fresh water
Disinfectants, unspecified	Other emissions to fresh water
Disinfectants, unspecified	Other emissions to sea water
Dissolved solids	ecoinvent long-term to fresh water
DOC, Dissolved Organic Carbon	Analytical measures to fresh water

Dust (> PM10)	Particles to fresh water
Dust (> PM10)	Particles to sea water
Dust (PM10)	Particles to fresh water
Elemental carbon	Inorganic emissions to air
Elemental carbon	Inorganic emissions to fresh water
Elemental carbon	Inorganic emissions to industrial soil
Epichlorohydrin	ecoinvent long-term to air
Ethane	ecoinvent long-term to air
Ethane thiol	ecoinvent long-term to air
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	ecoinvent long-term to air
Ethane, 1,1,1-trichloro-, HCFC-140	ecoinvent long-term to air
Ethane, 1,1,1-trichloro-, HCFC-140	ecoinvent long-term to fresh water
Ethane, 1,1,1-trifluoro-, HFC-143a	ecoinvent long-term to air
Ethane, 1,1,2-trichloro-	ecoinvent long-term to air
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	ecoinvent long-term to air
Ethane, 1,1-dichloro-1-fluoro-, HCFC-141b	ecoinvent long-term to air
Ethane, 1,1-difluoro-, HFC-152a	ecoinvent long-term to air
Ethane, 1,2-dichloro-	ecoinvent long-term to air
Ethane, 1,2-dichloro-	ecoinvent long-term to fresh water
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-, CFC-114	ecoinvent long-term to air
Ethane, 1-chloro-1,1-difluoro-, HCFC-142b	ecoinvent long-term to air
Ethane, 2,2-dichloro-1,1,1-trifluoro-, HCFC-123	ecoinvent long-term to air
Ethane, 2-chloro-1,1,1,2-tetrafluoro-, HCFC-124	ecoinvent long-term to air
Ethane, chloropentafluoro-, CFC-115	ecoinvent long-term to air
Ethane, hexachloro-	ecoinvent long-term to fresh water
Ethane, hexachloro-	Halogenated organic emissions to sea water
Ethane, hexafluoro-, HFC-116	ecoinvent long-term to air
Ethane, pentafluoro-, HFC-125	ecoinvent long-term to air
Ethanol	ecoinvent long-term to air
Ethanol	ecoinvent long-term to fresh water
Ethene	ecoinvent long-term to air
Ethene	ecoinvent long-term to fresh water
Ethene, chloro-	ecoinvent long-term to air
Ethene, chloro-	ecoinvent long-term to fresh water
Ethene, tetrachloro-	ecoinvent long-term to air
Ethene, tetrachloro-	ecoinvent long-term to fresh water
Ethene, trichloro-	ecoinvent long-term to air
Ethene, trichloro-	ecoinvent long-term to fresh water
Ethyl acetate	ecoinvent long-term to air

Ethyl acetate	ecoinvent long-term to fresh water
Ethyl cellulose	ecoinvent long-term to air
Ethylamine	ecoinvent long-term to air
Ethylamine	ecoinvent long-term to fresh water
Ethylamine	Organic emissions to sea water
Ethylene diamine	ecoinvent long-term to air
Ethylene diamine	ecoinvent long-term to fresh water
Ethylene glycol monoethyl ether	ecoinvent long-term to air
Ethylene glycol monoethyl ether	ecoinvent long-term to fresh water
Ethylene glycol monoethyl ether	Organic emissions to sea water
Ethylene oxide	ecoinvent long-term to air
Ethylene oxide	ecoinvent long-term to fresh water
Ethyne	ecoinvent long-term to air
Fenamiphos	Pesticides to agricultural soil
Fenoxaprop	Pesticides to air
Fenoxycarb	Pesticides to agricultural soil
Fenpiclonil	Pesticides to industrial soil
Fluazifop-p-butyl	Pesticides to air
Flufenacet	Pesticides to air
Flumetsulam	Pesticides to air
Flumiclorac-pentyl	Pesticides to agricultural soil
Flumiclorac-pentyl	Pesticides to air
Fluoboric acid	ecoinvent long-term to fresh water
Fluoboric acid	Inorganic emissions to fresh water
Fluoboric acid	Inorganic emissions to sea water
Fluorine	ecoinvent long-term to air
Fluorochloridone	Pesticides to agricultural soil
Fluoroglycofen-ethyl	Pesticides to agricultural soil
Fluosilicic acid	ecoinvent long-term to air
Fluosilicic acid	ecoinvent long-term to fresh water
Fluosilicic acid	Inorganic emissions to sea water
Formaldehyde	ecoinvent long-term to air
Formaldehyde	ecoinvent long-term to fresh water
Formamide	ecoinvent long-term to air
Formamide	ecoinvent long-term to fresh water
Formamide	Organic emissions to sea water
Formate	ecoinvent long-term to fresh water
Formate	Organic emissions to sea water
Formic acid	ecoinvent long-term to air

Formic acid	ecoinvent long-term to fresh water
Formic acid	Organic emissions to sea water
Fresh water (obsolete)	Other emissions to fresh water
Fuberidazole	Pesticides to agricultural soil
Fungicides, unspecified	ecoinvent long-term to fresh water
Fungicides, unspecified	Pesticides to agricultural soil
Fungicides, unspecified	Pesticides to fresh water
Fungicides, unspecified	Pesticides to sea water
Furan	ecoinvent long-term to air
Furathiocarb	Pesticides to agricultural soil
Glutaraldehyde	ecoinvent long-term to fresh water
Gold	ecoinvent long-term to fresh water
Gold	Heavy metals to fresh water
Gold	Heavy metals to sea water
Haloxyfop- (R) Methylester	Pesticides to agricultural soil
Helium	ecoinvent long-term to air
Heptane	ecoinvent long-term to air
Herbicides, unspecified	ecoinvent long-term to fresh water
Herbicides, unspecified	Pesticides to fresh water
Herbicides, unspecified	Pesticides to sea water
Hexaconazole	Pesticides to agricultural soil
Hexamethyldisilizane	ecoinvent long-term to air
Hexamethyldisilizane	Group NMVOC to air
Hexane	ecoinvent long-term to air
Hexane	ecoinvent long-term to fresh water
Hexazinone	Pesticides to agricultural soil
Hydramethylnon	Pesticides to agricultural soil
Hydrazine	ecoinvent long-term to fresh water
Hydrazine	Inorganic emissions to sea water
Hydrocarbons (unspecified)	Organic emissions to industrial soil
Hydrocarbons, aliphatic, alkanes, cyclic	ecoinvent long-term to air
Hydrocarbons, aliphatic, alkanes, unspecified	ecoinvent long-term to air
Hydrocarbons, aliphatic, alkanes, unspecified	ecoinvent long-term to fresh water
Hydrocarbons, aliphatic, unsaturated	ecoinvent long-term to air
Hydrocarbons, aliphatic, unsaturated	ecoinvent long-term to fresh water
Hydrocarbons, aromatic	ecoinvent long-term to air
Hydrocarbons, aromatic	ecoinvent long-term to fresh water
Hydrocarbons, chlorinated	ecoinvent long-term to air
Hydrocarbons, unspecified	ecoinvent long-term to fresh water

Hydrocarbons, unspecified	Organic emissions to industrial soil
Hydrogen	ecoinvent long-term to air
Hydrogen carbonate	Inorganic emissions to sea water
Hydrogen chloride	ecoinvent long-term to air
Hydrogen fluoride	ecoinvent long-term to air
Hydrogen peroxide	ecoinvent long-term to air
Hydrogen peroxide	ecoinvent long-term to fresh water
Hydrogen peroxide	Inorganic emissions to fresh water
Hydrogen peroxide	Inorganic emissions to sea water
Hydrogen sulfide	ecoinvent long-term to air
Hydrogen sulfide	Inorganic emissions to fresh water
Hydrogen-3, Tritium	ecoinvent long-term to air
Hydrogen-3, Tritium	ecoinvent long-term to fresh water
Hydroxide	ecoinvent long-term to fresh water
Hypochlorite	ecoinvent long-term to fresh water
Imazalil	Pesticides to agricultural soil
Imazamox	Pesticides to air
Imazaquin	Pesticides to agricultural soil
Imazaquin	Pesticides to air
Imazethapyr	Pesticides to air
Indeno(1,2,3-cd)pyrene	ecoinvent long-term to fresh water
Insecticides, unspecified	ecoinvent long-term to fresh water
Insecticides, unspecified	Pesticides to fresh water
Insecticides, unspecified	Pesticides to sea water
Iodide	Inorganic emissions to air
Iodide	Inorganic emissions to industrial soil
Iodine	ecoinvent long-term to air
Iodine	Inorganic emissions to fresh water
Iodine-129	ecoinvent long-term to air
Iodine-129	ecoinvent long-term to fresh water
Iodine-129	Radioactive emissions to industrial soil
Iodine-131	ecoinvent long-term to air
Iodine-131	ecoinvent long-term to fresh water
Iodine-133	ecoinvent long-term to air
Iodine-133	ecoinvent long-term to fresh water
Iodine-133	Radioactive emissions to sea water
Iodine-135	ecoinvent long-term to air
Iron	ecoinvent long-term to air
Iron, ion	ecoinvent long-term to fresh water

Iron, ion	Heavy metals to fresh water
Iron, ion	Heavy metals to sea water
Iron-59	ecoinvent long-term to air
Iron-59	ecoinvent long-term to fresh water
Iron-59	Radioactive emissions to sea water
Isocyanic acid	ecoinvent long-term to air
Isoprene	ecoinvent long-term to air
Isopropylamine	ecoinvent long-term to air
Isopropylamine	ecoinvent long-term to fresh water
Isopropylamine	Organic emissions to sea water
Krypton-85	ecoinvent long-term to air
Krypton-85	ecoinvent long-term to fresh water
Krypton-85	Radioactive emissions to fresh water
Krypton-85	Radioactive emissions to sea water
Krypton-85m	ecoinvent long-term to air
Krypton-87	ecoinvent long-term to air
Krypton-88	ecoinvent long-term to air
Krypton-89	ecoinvent long-term to air
Lactic acid	ecoinvent long-term to air
Lactic acid	ecoinvent long-term to fresh water
Lactic acid	Organic emissions to sea water
Lactofen	Pesticides to air
Lanthanum	ecoinvent long-term to air
Lanthanum-140	ecoinvent long-term to air
Lanthanum-140	ecoinvent long-term to fresh water
Lanthanum-140	Radioactive emissions to sea water
Lead	ecoinvent long-term to air
Lead	ecoinvent long-term to fresh water
Lead-210	ecoinvent long-term to air
Lead-210	ecoinvent long-term to fresh water
Lenacil	Pesticides to agricultural soil
Lithium carbonate	ecoinvent long-term to air
Lithium carbonate	Inorganic emissions to air
Lithium, ion	ecoinvent long-term to fresh water
Lithium, ion	Inorganic emissions to fresh water
Lithium, ion	Inorganic emissions to sea water
Magnesium	ecoinvent long-term to air
Magnesium	Inorganic emissions to agricultural soil
Manganese	ecoinvent long-term to air

Manganese	ecoinvent long-term to fresh water
Manganese-54	ecoinvent long-term to air
Manganese-54	ecoinvent long-term to fresh water
Manganese-55	ecoinvent long-term to fresh water
Manganese-55	Radioactive emissions to sea water
Mecoprop-P	Pesticides to agricultural soil
Mercury	ecoinvent long-term to air
Mercury	ecoinvent long-term to fresh water
Metalaxyl-M	Pesticides to agricultural soil
Metaldehyde	Organic emissions to industrial soil
Methane	Organic emissions to fresh water
Methane, bromo-, Halon 1001	ecoinvent long-term to air
Methane, bromochlorodifluoro-, Halon 1211	ecoinvent long-term to air
Methane, bromotrifluoro-, Halon 1301	ecoinvent long-term to air
Methane, chlorodifluoro-, HCFC-22	ecoinvent long-term to air
Methane, chloro-fluoro-, HCFC-31	ecoinvent long-term to air
Methane, chloro-fluoro-, HCFC-31	Halogenated organic emissions to air
Methane, chlorotrifluoro-, CFC-13	ecoinvent long-term to air
Methane, dichloro-, HCC-30	ecoinvent long-term to air
Methane, dichloro-, HCC-30	ecoinvent long-term to fresh water
Methane, dichlorodifluoro-, CFC-12	ecoinvent long-term to air
Methane, dichlorofluoro-, HCFC-21	ecoinvent long-term to air
Methane, dichlorofluoro-, HCFC-21	ecoinvent long-term to fresh water
Methane, difluoro-, HFC-32	ecoinvent long-term to air
Methane, fossil	ecoinvent long-term to air
Methane, from soil or biomass stock	ecoinvent long-term to air
Methane, monochloro-, R-40	ecoinvent long-term to air
Methane, non-fossil	ecoinvent long-term to air
Methane, tetrachloro-, R-10	ecoinvent long-term to air
Methane, tetrachloro-, R-10	ecoinvent long-term to fresh water
Methane, tetrafluoro-, R-14	ecoinvent long-term to air
Methane, trichlorofluoro-, CFC-11	ecoinvent long-term to air
Methane, trifluoro-, HFC-23	ecoinvent long-term to air
Methanesulfonic acid	ecoinvent long-term to air
Methanol	ecoinvent long-term to air
Methanol	ecoinvent long-term to fresh water
Methiocarb	Pesticides to agricultural soil
Methoxyfenozide	Pesticides to agricultural soil
Methyl acetate	ecoinvent long-term to air

Methyl acetate	ecoinvent long-term to fresh water
Methyl acetate	Organic emissions to sea water
Methyl acrylate	ecoinvent long-term to air
Methyl acrylate	ecoinvent long-term to fresh water
Methyl acrylate	Organic emissions to sea water
Methyl amine	ecoinvent long-term to air
Methyl amine	ecoinvent long-term to fresh water
Methyl amine	Organic emissions to sea water
Methyl borate	ecoinvent long-term to air
Methyl borate	ecoinvent long-term to fresh water
Methyl borate	Organic emissions to fresh water
Methyl borate	Organic emissions to sea water
Methyl ethyl ketone	ecoinvent long-term to air
Methyl formate	ecoinvent long-term to air
Methyl formate	ecoinvent long-term to fresh water
Methyl formate	Organic emissions to sea water
Methyl lactate	ecoinvent long-term to air
Methyl pentane	ecoinvent long-term to fresh water
Methyl pentane	Organic emissions to sea water
Methyl tert-butylether	ecoinvent long-term to air
Methyl tert-butylether	ecoinvent long-term to fresh water
Molybdenum	ecoinvent long-term to air
Molybdenum-99	ecoinvent long-term to fresh water
Molybdenum-99	Radioactive emissions to sea water
Monochloroethane	ecoinvent long-term to air
Monochloroethane	ecoinvent long-term to fresh water
Monochloroethane	Halogenated organic emissions to sea water
Monoethanolamine	ecoinvent long-term to air
m-Xylene	ecoinvent long-term to air
m-Xylene	ecoinvent long-term to fresh water
N-Bromoacetamide	ecoinvent long-term to air
N-Bromoacetamide	Halogenated organic emissions to air
Neptunium-237	ecoinvent long-term to air
Neptunium-237	ecoinvent long-term to fresh water
Neptunium-237	Radioactive emissions to sea water
Nickel	ecoinvent long-term to air
Niobium-95	ecoinvent long-term to air
Niobium-95	ecoinvent long-term to fresh water
Niobium-95	Radioactive emissions to sea water

Nitrate	ecoinvent long-term to air
Nitrate	Inorganic emissions to agricultural soil
Nitrate	Inorganic emissions to industrial soil
Nitrobenzene	ecoinvent long-term to air
Nitrobenzene	ecoinvent long-term to fresh water
Nitrogen	ecoinvent long-term to fresh water
Nitrogen fluoride	ecoinvent long-term to air
Nitrogen oxides	ecoinvent long-term to air
Nitrogen, organic bound	ecoinvent long-term to fresh water
NMVOC, non-methane volatile organic compounds, unspecified origin	ecoinvent long-term to air
Noble gases, radioactive, unspecified	ecoinvent long-term to air
Noble gases, radioactive, unspecified	Radioactive emissions to air
Occupation, annual crop	Hemerobie ecoinvent
Occupation, annual crop, flooded crop	Hemerobie ecoinvent
Occupation, annual crop, greenhouse	Hemerobie ecoinvent
Occupation, annual crop, irrigated	Hemerobie ecoinvent
Occupation, annual crop, irrigated, extensive	Hemerobie ecoinvent
Occupation, annual crop, irrigated, intensive	Hemerobie ecoinvent
Occupation, annual crop, non-irrigated	Hemerobie ecoinvent
Occupation, annual crop, non-irrigated, extensive	Hemerobie ecoinvent
Occupation, annual crop, non-irrigated, intensive	Hemerobie ecoinvent
Occupation, bare area (non-use)	Hemerobie ecoinvent
Occupation, cropland fallow (non-use)	Hemerobie ecoinvent
Occupation, field margin/hedgerow	Hemerobie ecoinvent
Occupation, forest, extensive	Hemerobie ecoinvent
Occupation, forest, primary (non-use)	Hemerobie ecoinvent
Occupation, forest, secondary (non-use)	Hemerobie ecoinvent
Occupation, forest, unspecified	Hemerobie ecoinvent
Occupation, grassland, natural (non-use)	Hemerobie ecoinvent
Occupation, grassland, natural, for livestock grazing	Hemerobie ecoinvent
Occupation, heterogeneous, agricultural	Hemerobie ecoinvent
Occupation, inland waterbody, unspecified	Hemerobie ecoinvent
Occupation, lake, natural (non-use)	Hemerobie ecoinvent
Occupation, permanent crop	Hemerobie ecoinvent
Occupation, permanent crop, irrigated	Hemerobie ecoinvent
Occupation, permanent crop, irrigated, extensive	Hemerobie ecoinvent
Occupation, permanent crop, irrigated, intensive	Hemerobie ecoinvent
Occupation, permanent crop, non-irrigated	Hemerobie ecoinvent

Occupation, permanent crop, non-irrigated, extensive	Hemerobie ecoinvent
Occupation, permanent crop, non-irrigated, intensive	Hemerobie ecoinvent
Occupation, river, natural (non-use)	Hemerobie ecoinvent
Occupation, seabed, drilling and mining	Hemerobie ecoinvent
Occupation, seabed, infrastructure	Hemerobie ecoinvent
Occupation, seabed, natural (non-use)	Hemerobie ecoinvent
Occupation, seabed, unspecified	Hemerobie ecoinvent
Occupation, snow and ice (non-use)	Hemerobie ecoinvent
Occupation, traffic area, rail/road embankment	Hemerobie ecoinvent
Occupation, unspecified	Hemerobie ecoinvent
Occupation, unspecified, natural (non-use)	Hemerobie ecoinvent
Occupation, urban, continuously built	Hemerobie ecoinvent
Occupation, urban, green area	Hemerobie ecoinvent
Occupation, urban/industrial fallow (non-use)	Hemerobie ecoinvent
Occupation, wetland, coastal (non-use)	Hemerobie ecoinvent
Occupation, wetland, inland (non-use)	Hemerobie ecoinvent
o-Dichlorobenzene	ecoinvent long-term to fresh water
Oils, non-fossil	Organic emissions to agricultural soil
Oils, non-fossil	Organic emissions to fresh water
Oils, non-fossil	Organic emissions to industrial soil
Oils, unspecified	ecoinvent long-term to fresh water
o-Nitrotoluene	ecoinvent long-term to air
Orbencarb	Pesticides to industrial soil
Organic carbon	Inorganic emissions to industrial soil
Oryzalin	Pesticides to agricultural soil
Oxadixyl	Pesticides to agricultural soil
Oxygen	Inorganic emissions to fresh water
o-Xylene	ecoinvent long-term to air
o-Xylene	ecoinvent long-term to fresh water
Ozone	ecoinvent long-term to air
PAH, polycyclic aromatic hydrocarbons	ecoinvent long-term to air
PAH, polycyclic aromatic hydrocarbons	ecoinvent long-term to fresh water
PAH, polycyclic aromatic hydrocarbons	Organic emissions to industrial soil
Palladium	ecoinvent long-term to fresh water
Palladium (Pd 234m)	Radioactive emissions to industrial soil
Paraffins	ecoinvent long-term to air
Paraffins	ecoinvent long-term to fresh water
Particulates, < 2.5 um	ecoinvent long-term to air
Particulates, > 10 um	ecoinvent long-term to air

Particulates, > 2.5 um, and < 10um	ecoinvent long-term to air
Pentane	ecoinvent long-term to air
Perchlorate, ion	ecoinvent long-term to fresh water
Perchlorate, ion	Inorganic emissions to sea water
Pesticides, unspecified	Pesticides to agricultural soil
Phenol	ecoinvent long-term to air
Phenol	ecoinvent long-term to fresh water
Phenol, 2,4-dichloro	ecoinvent long-term to air
Phenol, pentachloro-	ecoinvent long-term to air
Phosphate	Inorganic emissions to agricultural soil
Phosphate	Inorganic emissions to industrial soil
Phosphine	ecoinvent long-term to air
Phosphoric acid	ecoinvent long-term to air
Phosphoruos-pent-oxide	Inorganic emissions to agricultural soil
Phosphoruos-pent-oxide	Inorganic emissions to industrial soil
Phosphorus	ecoinvent long-term to air
Phosphorus	ecoinvent long-term to fresh water
Phosphorus trichloride	ecoinvent long-term to air
Phthalate, butyl-benzyl-	ecoinvent long-term to fresh water
Phthalate, dibutyl-	ecoinvent long-term to fresh water
Phthalate, dimethyl-	ecoinvent long-term to fresh water
Phthalate, dioctyl-	ecoinvent long-term to fresh water
Platinum	ecoinvent long-term to air
Plutonium	Radioactive emissions to industrial soil
Plutonium-238	ecoinvent long-term to air
Plutonium-238	Radioactive emissions to fresh water
Plutonium-241	ecoinvent long-term to air
Plutonium-241	ecoinvent long-term to fresh water
Plutonium-241	Radioactive emissions to sea water
Plutonium-alpha	ecoinvent long-term to air
Plutonium-alpha	ecoinvent long-term to fresh water
Polonium-210	ecoinvent long-term to air
Polonium-210	ecoinvent long-term to fresh water
Polychlorinated biphenyls	ecoinvent long-term to air
Potassium	ecoinvent long-term to air
Potassium	Inorganic emissions to agricultural soil
Potassium	Inorganic emissions to air
Potassium	Inorganic emissions to industrial soil
Potassium chloride	ecoinvent long-term to air

Potassium chloride	Inorganic emissions to air
Potassium hydroxide (potash)	ecoinvent long-term to air
Potassium hydroxide (potash)	Inorganic emissions to air
Potassium, ion	ecoinvent long-term to fresh water
Potassium, ion	Inorganic emissions to fresh water
Potassium, ion	Inorganic emissions to sea water
Potassium-40	ecoinvent long-term to air
Potassium-40	ecoinvent long-term to fresh water
Promethium-147	ecoinvent long-term to air
Propanal	ecoinvent long-term to air
Propanal	ecoinvent long-term to fresh water
Propane	ecoinvent long-term to air
Propanol	ecoinvent long-term to air
Propanol	ecoinvent long-term to fresh water
Propanol	Hydrocarbons to fresh water
Propanol	Hydrocarbons to sea water
Propene	ecoinvent long-term to air
Propene	ecoinvent long-term to fresh water
Propene	Hydrocarbons to sea water
Propiconazole	Pesticides to air
Propionic acid	ecoinvent long-term to air
Propionic acid	ecoinvent long-term to fresh water
Propionic acid	Organic emissions to sea water
Propylamine	ecoinvent long-term to air
Propylamine	ecoinvent long-term to fresh water
Propylamine	Organic emissions to sea water
Propylene oxide	ecoinvent long-term to air
Propylene oxide	ecoinvent long-term to fresh water
Protactinium-234	ecoinvent long-term to air
Protactinium-234	ecoinvent long-term to fresh water
Protactinium-234	Radioactive emissions to sea water
Pyraclostrobin	Pesticides to air
Pyrene	Group PAH to air
Pyrene	Hydrocarbons to fresh water
Pyrethrin	Pesticides to agricultural soil
Pyrimethanil	Pesticides to agricultural soil
Pyrolusite, in ground	Non renewable resources
Quizalofop-ethyl	Pesticides to air
Quizalofop-p-ethyl	Pesticides to agricultural soil

Radiation, electromagnetic	ecoinvent long-term to air
Radiation, electromagnetic	Other emissions to air
Radioactive species, alpha emitters	ecoinvent long-term to fresh water
Radioactive species, alpha emitters	Radioactive emissions to fresh water
Radioactive species, alpha emitters	Radioactive emissions to sea water
Radioactive species, from fission and activation	ecoinvent long-term to fresh water
Radioactive species, from fission and activation	Radioactive emissions to fresh water
Radioactive species, from fission and activation	Radioactive emissions to sea water
Radioactive species, Nuclides, unspecified	ecoinvent long-term to fresh water
Radioactive species, Nuclides, unspecified	Radioactive emissions to fresh water
Radioactive species, Nuclides, unspecified	Radioactive emissions to sea water
Radioactive species, other beta emitters	ecoinvent long-term to air
Radioactive species, other beta emitters	Radioactive emissions to air
Radium-224	ecoinvent long-term to fresh water
Radium-226	ecoinvent long-term to air
Radium-226	ecoinvent long-term to fresh water
Radium-226	Radioactive emissions to industrial soil
Radium-228	ecoinvent long-term to air
Radium-228	ecoinvent long-term to fresh water
Radon-220	ecoinvent long-term to air
Radon-222	ecoinvent long-term to air
Rotenone	Pesticides to agricultural soil
Rubidium	ecoinvent long-term to fresh water
Rubidium	Inorganic emissions to sea water
Ruthenium-103	ecoinvent long-term to air
Ruthenium-103	ecoinvent long-term to fresh water
Ruthenium-106	ecoinvent long-term to air
Ruthenium-106	ecoinvent long-term to fresh water
Salt water (obsolete)	Other emissions to sea water
Scandium	ecoinvent long-term to air
Scandium	Inorganic emissions to agricultural soil
Scandium	Inorganic emissions to industrial soil
Scandium	Inorganic emissions to sea water
Selenium	ecoinvent long-term to air
Sethoxydim	Pesticides to air
Silicon	ecoinvent long-term to air
Silicon	ecoinvent long-term to fresh water
Silicon	Inorganic emissions to agricultural soil
Silicon	Inorganic emissions to fresh water

Silicon	Inorganic emissions to industrial soil
Silicon	Inorganic emissions to sea water
Silicon tetrafluoride	ecoinvent long-term to air
Silver	ecoinvent long-term to air
Silver, ion	ecoinvent long-term to fresh water
Silver, ion	Heavy metals to fresh water
Silver, ion	Heavy metals to sea water
Silver-110	ecoinvent long-term to air
Silver-110	ecoinvent long-term to fresh water
Sodium	Inorganic emissions to air
Sodium	Inorganic emissions to industrial soil
Sodium (+I)	ecoinvent long-term to air
Sodium (+I)	Inorganic emissions to air
Sodium chlorate	ecoinvent long-term to air
Sodium chlorate	ecoinvent long-term to fresh water
Sodium chlorate	Inorganic emissions to sea water
Sodium dichromate	ecoinvent long-term to air
Sodium formate	ecoinvent long-term to air
Sodium formate	ecoinvent long-term to fresh water
Sodium hydroxide	ecoinvent long-term to air
Sodium hypochlorite	ecoinvent long-term to air
Sodium perchlorate	ecoinvent long-term to air
Sodium perchlorate	Inorganic emissions to air
Sodium tetrahydridoborate	ecoinvent long-term to air
Sodium-24	ecoinvent long-term to fresh water
Sodium-24	Radioactive emissions to sea water
Solids, inorganic	ecoinvent long-term to fresh water
Starane	Pesticides to agricultural soil
Steatite, in ground	Non renewable resources
Stibnite, in ground	Non renewable resources
Strontium	ecoinvent long-term to air
Strontium-89	ecoinvent long-term to air
Strontium-89	ecoinvent long-term to fresh water
Strontium-89	Radioactive emissions to air
Strontium-89	Radioactive emissions to sea water
Strontium-90	ecoinvent long-term to air
Strontium-90	ecoinvent long-term to fresh water
Strontium-90	Radioactive emissions to industrial soil
Styrene	ecoinvent long-term to air

Styrene	ecoinvent long-term to fresh water
Sulfate	Inorganic emissions to fresh water
Sulfate, ion	Inorganic emissions to fresh water
Sulfentrazone	Pesticides to air
Sulfide	ecoinvent long-term to fresh water
Sulfide	Inorganic emissions to fresh water
Sulfite	ecoinvent long-term to fresh water
Sulfite	Inorganic emissions to fresh water
Sulphate	ecoinvent long-term to air
Sulphur	ecoinvent long-term to fresh water
Sulphur dioxide	ecoinvent long-term to air
Sulphur dioxide	Inorganic emissions to agricultural soil
Sulphur hexafluoride	ecoinvent long-term to air
Sulphur trioxide	ecoinvent long-term to air
Sulphuric acid	ecoinvent long-term to air
t-Butylamine	ecoinvent long-term to air
t-Butylamine	ecoinvent long-term to fresh water
t-Butylamine	Organic emissions to sea water
Tebuconazole	Pesticides to air
Tebufenpyrad	Pesticides to agricultural soil
Tebutam	Pesticides to industrial soil
Technetium-99	ecoinvent long-term to air
Technetium-99	ecoinvent long-term to fresh water
Technetium-99	Radioactive emissions to fresh water
Technetium-99	Radioactive emissions to industrial soil
Technetium-99	Radioactive emissions to sea water
Technetium-99m	ecoinvent long-term to fresh water
Technetium-99m	Radioactive emissions to sea water
Teflubenzuron	Pesticides to industrial soil
Tellurium-123m	ecoinvent long-term to air
Tellurium-123m	ecoinvent long-term to fresh water
Tellurium-123m	Radioactive emissions to air
Tellurium-123m	Radioactive emissions to sea water
Tellurium-132	ecoinvent long-term to fresh water
Tellurium-132	Radioactive emissions to sea water
Terbacil	Pesticides to agricultural soil
Terpenes	ecoinvent long-term to air
Tetramethyl ammonium hydroxide	ecoinvent long-term to air
Thallium	ecoinvent long-term to air

Thifensulfuron	Pesticides to air
Thiocyanate, ion	ecoinvent long-term to fresh water
Thiocyanate, ion	Organic emissions to fresh water
Thiocyanate, ion	Organic emissions to sea water
Thiodicarb	Pesticides to agricultural soil
Thorium	ecoinvent long-term to air
Thorium-228	ecoinvent long-term to air
Thorium-228	ecoinvent long-term to fresh water
Thorium-230	ecoinvent long-term to air
Thorium-230	ecoinvent long-term to fresh water
Thorium-230	Radioactive emissions to industrial soil
Thorium-230	Radioactive emissions to sea water
Thorium-232	ecoinvent long-term to air
Thorium-232	ecoinvent long-term to fresh water
Thorium-234	ecoinvent long-term to air
Thorium-234	ecoinvent long-term to fresh water
Thorium-234	Radioactive emissions to sea water
Tin	ecoinvent long-term to air
Titanium	ecoinvent long-term to air
Titanium, ion	ecoinvent long-term to fresh water
Titanium, ion	Heavy metals to fresh water
Titanium, ion	Heavy metals to sea water
TOC, Total Organic Carbon	ecoinvent long-term to fresh water
Toluene	ecoinvent long-term to air
Toluene	ecoinvent long-term to fresh water
Toluene, 2-chloro	ecoinvent long-term to air
Toluene, 2-chloro	ecoinvent long-term to fresh water
Tolylfluanid	Pesticides to agricultural soil
Total reduced sulphur compounds	Inorganic emissions to air
Transformation, from annual crop	Hemerobie ecoinvent
Transformation, from annual crop, flooded crop	Hemerobie ecoinvent
Transformation, from annual crop, greenhouse	Hemerobie ecoinvent
Transformation, from annual crop, irrigated	Hemerobie ecoinvent
Transformation, from annual crop, irrigated, extensive	Hemerobie ecoinvent
Transformation, from annual crop, irrigated, intensive	Hemerobie ecoinvent
Transformation, from annual crop, non-irrigated	Hemerobie ecoinvent
Transformation, from annual crop, non-irrigated, extensive	Hemerobie ecoinvent
Transformation, from annual crop, non-irrigated, intensive	Hemerobie ecoinvent
Transformation, from bare area (non-use)	Hemerobie ecoinvent

Transformation, from cropland fallow (non-use)	Hemerobie ecoinvent
Transformation, from dump site	Hemerobie ecoinvent
Transformation, from field margin/hedgerow	Hemerobie ecoinvent
Transformation, from forest, primary (non-use)	Hemerobie ecoinvent
Transformation, from forest, secondary (non-use)	Hemerobie ecoinvent
Transformation, from grassland, natural (non-use)	Hemerobie ecoinvent
Transformation, from grassland, natural, for livestock grazing	Hemerobie ecoinvent
Transformation, from inland waterbody, unspecified	Hemerobie ecoinvent
Transformation, from lake, artificial	Hemerobie ecoinvent
Transformation, from lake, natural (non-use)	Hemerobie ecoinvent
Transformation, from pasture, man made	Hemerobie ecoinvent
Transformation, from pasture, man made, extensive	Hemerobie ecoinvent
Transformation, from pasture, man made, intensive	Hemerobie ecoinvent
Transformation, from permanent crop	Hemerobie ecoinvent
Transformation, from permanent crop, irrigated	Hemerobie ecoinvent
Transformation, from permanent crop, irrigated, extensive	Hemerobie ecoinvent
Transformation, from permanent crop, irrigated, intensive	Hemerobie ecoinvent
Transformation, from permanent crop, non-irrigated	Hemerobie ecoinvent
Transformation, from permanent crop, non-irrigated, extensive	Hemerobie ecoinvent
Transformation, from permanent crop, non-irrigated, intensive	Hemerobie ecoinvent
Transformation, from river, artificial	Hemerobie ecoinvent
Transformation, from river, natural (non-use)	Hemerobie ecoinvent
Transformation, from seabed, drilling and mining	Hemerobie ecoinvent
Transformation, from seabed, infrastructure	Hemerobie ecoinvent
Transformation, from seabed, natural (non-use)	Hemerobie ecoinvent
Transformation, from seabed, unspecified	Hemerobie ecoinvent
Transformation, from snow and ice (non-use)	Hemerobie ecoinvent
Transformation, from traffic area, rail network	Hemerobie ecoinvent
Transformation, from traffic area, rail/road embankment	Hemerobie ecoinvent
Transformation, from traffic area, road network	Hemerobie ecoinvent
Transformation, from unspecified, natural (non-use)	Hemerobie ecoinvent
Transformation, from urban, continuously built	Hemerobie ecoinvent
Transformation, from urban, discontinuously built	Hemerobie ecoinvent
Transformation, from urban, green area	Hemerobie ecoinvent
Transformation, from urban/industrial fallow (non-use)	Hemerobie ecoinvent
Transformation, from wetland, coastal (non-use)	Hemerobie ecoinvent
Transformation, from wetland, inland (non-use)	Hemerobie ecoinvent
Transformation, to annual crop	Hemerobie ecoinvent
Transformation, to annual crop, flooded crop	Hemerobie ecoinvent

Transformation, to annual crop, greenhouse	Hemerobie ecoinvent
Transformation, to annual crop, irrigated	Hemerobie ecoinvent
Transformation, to annual crop, irrigated, extensive	Hemerobie ecoinvent
Transformation, to annual crop, irrigated, intensive	Hemerobie ecoinvent
Transformation, to annual crop, non-irrigated	Hemerobie ecoinvent
Transformation, to annual crop, non-irrigated, extensive	Hemerobie ecoinvent
Transformation, to annual crop, non-irrigated, intensive	Hemerobie ecoinvent
Transformation, to bare area (non-use)	Hemerobie ecoinvent
Transformation, to field margin/hedgerow	Hemerobie ecoinvent
Transformation, to forest, extensive	Hemerobie ecoinvent
Transformation, to forest, primary (non-use)	Hemerobie ecoinvent
Transformation, to forest, secondary (non-use)	Hemerobie ecoinvent
Transformation, to grassland, natural (non-use)	Hemerobie ecoinvent
Transformation, to grassland, natural, for livestock grazing	Hemerobie ecoinvent
Transformation, to inland waterbody, unspecified	Hemerobie ecoinvent
Transformation, to lake, natural (non-use)	Hemerobie ecoinvent
Transformation, to permanent crop	Hemerobie ecoinvent
Transformation, to permanent crop, irrigated	Hemerobie ecoinvent
Transformation, to permanent crop, irrigated, extensive	Hemerobie ecoinvent
Transformation, to permanent crop, irrigated, intensive	Hemerobie ecoinvent
Transformation, to permanent crop, non-irrigated	Hemerobie ecoinvent
Transformation, to permanent crop, non-irrigated, extensive	Hemerobie ecoinvent
Transformation, to permanent crop, non-irrigated, intensive	Hemerobie ecoinvent
Transformation, to river, natural (non-use)	Hemerobie ecoinvent
Transformation, to seabed, drilling and mining	Hemerobie ecoinvent
Transformation, to seabed, infrastructure	Hemerobie ecoinvent
Transformation, to seabed, natural (non-use)	Hemerobie ecoinvent
Transformation, to seabed, unspecified	Hemerobie ecoinvent
Transformation, to snow and ice (non-use)	Hemerobie ecoinvent
Transformation, to traffic area, rail/road embankment	Hemerobie ecoinvent
Transformation, to unspecified, natural (non-use)	Hemerobie ecoinvent
Transformation, to urban, continuously built	Hemerobie ecoinvent
Transformation, to urban, green area	Hemerobie ecoinvent
Transformation, to urban/industrial fallow (non-use)	Hemerobie ecoinvent
Transformation, to wetland, coastal (non-use)	Hemerobie ecoinvent
Transformation, to wetland, inland (non-use)	Hemerobie ecoinvent
Tributyltin compounds	ecoinvent long-term to fresh water
Trichlorosilane	ecoinvent long-term to air
Trichlorosilane	ecoinvent long-term to fresh water

Trichlorosilane	Group NMVOC to air
Trichlorosilane	Halogenated organic emissions to fresh water
Trichlorosilane	Halogenated organic emissions to sea water
Tridemorph	Pesticides to agricultural soil
Triethylene glycol	ecoinvent long-term to fresh water
Trifloxystrobin	Pesticides to air
Triforine	Pesticides to agricultural soil
Trimethylamine	ecoinvent long-term to air
Trimethylamine	ecoinvent long-term to fresh water
Trimethylamine	Organic emissions to sea water
Tungsten	ecoinvent long-term to air
Tungsten	Heavy metals to agricultural soil
Tungsten	Heavy metals to industrial soil
Tungsten	Heavy metals to sea water
Uranium	Radioactive emissions to air
Uranium alpha	ecoinvent long-term to air
Uranium alpha	ecoinvent long-term to fresh water
Uranium-234	ecoinvent long-term to air
Uranium-234	ecoinvent long-term to fresh water
Uranium-234	Radioactive emissions to industrial soil
Uranium-235	ecoinvent long-term to air
Uranium-235	ecoinvent long-term to fresh water
Uranium-235	Radioactive emissions to industrial soil
Uranium-238	ecoinvent long-term to air
Uranium-238	ecoinvent long-term to fresh water
Uranium-238	Radioactive emissions to industrial soil
Urea	ecoinvent long-term to fresh water
Urea	Inorganic emissions to sea water
Vanadium	ecoinvent long-term to air
VOC, volatile organic compounds, unspecified origin	ecoinvent long-term to fresh water
Waste heat	ecoinvent long-term to air
Water	ecoinvent long-term to air
Water	ecoinvent long-term to fresh water
Water	Other emissions to fresh water
Water	Other emissions to sea water
Water, cooling, unspecified natural origin	Water
Water, in air	Water
Water, lake	Water
Water, river	Water

Water, salt, ocean	Water
Water, unspecified natural origin	Water
Water, well, in ground	Water
Wood, unspecified, standing	Renewable resources
Xenon-131m	ecoinvent long-term to air
Xenon-133	ecoinvent long-term to air
Xenon-133m	ecoinvent long-term to air
Xenon-135	ecoinvent long-term to air
Xenon-135m	ecoinvent long-term to air
Xenon-137	ecoinvent long-term to air
Xenon-138	ecoinvent long-term to air
Xylene	ecoinvent long-term to air
Xylene	ecoinvent long-term to fresh water
Yttrium-90	ecoinvent long-term to fresh water
Yttrium-90	Radioactive emissions to fresh water
Yttrium-90	Radioactive emissions to sea water
Zeta-cypermethrin	Pesticides to agricultural soil
Zeta-cypermethrin	Pesticides to air
Zinc	ecoinvent long-term to air
Zinc-65	ecoinvent long-term to air
Zinc-65	ecoinvent long-term to fresh water
Zinc-65	Radioactive emissions to sea water
Zirconia, as baddeleyite, in ground	Non renewable resources
Zirconium	ecoinvent long-term to air
Zirconium-95	ecoinvent long-term to air
Zirconium-95	ecoinvent long-term to fresh water
Zirconium-95	Radioactive emissions to industrial soil
Zirconium-95	Radioactive emissions to sea water

6. New valuable substance flows

Flow	Folder
Calcium carbonate (> 63 microns)	Minerals
Continuous filament glass fibre	Minerals
Continuous filament glass fibre	Minerals
Continuous filament glass fibre	Minerals
Continuous filament glass fibre	Minerals
Engineered I-joists	Materials from renewable raw materials

Feed	Materials from renewable raw materials
GCC dry	Minerals
Glued laminated timber	Materials from renewable raw materials
Graphic paper (typical European)	Materials from renewable raw materials
Kaolin coarse filler	Minerals
Medium density fiberboard (MDF)	Materials from renewable raw materials
Oriented strandboard (OSB)	Materials from renewable raw materials
PCC slurry - dry matter	Minerals
Polyethylene low density foil (PE-LD)	Plastics
Redwood Decking (California)	Materials from renewable raw materials
Softwood lumber	Materials from renewable raw materials
Softwood plywood	Materials from renewable raw materials
Very fine milled silica sand d50 = 20 micrometer	Minerals
Water in slurry	Minerals

7. New production residue flows

Flow	Folder
Heavy metals (unspecified)	Hazardous waste