**Appendix B**

**Details of background system data used for each waste material recycling foreground system process.**

## Glass

**Table B1**

Inventory data sources used in the glass cullet preparation process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Lubricating oil | - | Defra *et al.* (2013) | UK | 2013 |
| Transport, lorry | Transport, road, lorry | EA (2010) | UK | 2007 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B2**

Inventory data sources used in the glass cullet remelting (production of packaging glass) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Refractory bricks | - | Defra *et al.* (2013) | UK | 2013 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Natural gas | Heat, natural gas, at boiler modulating >100kW | ecoinvent data v2.2 | Europe | 2000 |
| Heavy fuel oil | Heavy fuel oil, burned in industrial furnace 1MW, non-modulating | ecoinvent data v2.2 | Europe | 2000 |
| Light fuel oil | Light fuel oil, burned in industrial furnace 1MW, non-modulating | ecoinvent data v2.2 | Europe | 2000 |
| Residuals, to disposal (landfill) | Disposal, municipal solid waste, 22.9% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

## Paper & card

**Table B3**

Inventory data sources used in the collected paper and card sorting process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B4**

Inventory data sources used in the ONP reprocessing (newsprint production) process model.

| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| --- | --- | --- | --- | --- |
| Wood | Industrial wood, softwood, under bark, u=140%, at forest road | ecoinvent data v2.2 | Europe | 2002 |
| Industrial wood, Scandinavian softwood, under bark, u=140%, at forest road | ecoinvent data v2.2 | Scandinavia | 2000 |
| Industrial residue wood, softwood, forest-debarked, u=70%, at plant | ecoinvent data v2.2 | Europe | 1996 |
| Chips, Scandinavian softwood (plant-debarked), u=70%, at plant | ecoinvent data v2.2 | Scandinavia | 2000 |
| Sulphite pulp | Sulphate pulp, average, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Kaolin | Kaolin, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Aluminium sulphate | Aluminium sulphate, powder, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Malusil | Malusil, at plant | ecoinvent data v2.2 | Europe | 2000 |
| De-inking emulsion | Deinking emulsion, in paper production, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Anhydrous sodium dithionite | Sodium dithionite, anhydrous, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Nitrogen | Nitrogen, liquid, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Sodium silicate | Sodium silicate, spray powder 80%, at plant | ecoinvent data v2.2 | Europe | 1995 |
| Sodium hydroxide | Sodium hydroxide, 50% in H2O, production mix, at plant | ecoinvent data v2.2 | Europe | 2000 |
| White phosphorus | Phosphorus, white, liquid, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Sulphur dioxide | Sulphur dioxide, liquid, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Quicklime | Quicklime, milled, loose, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Bentonite | Bentonite, at processing | ecoinvent data v2.2 | Germany | 2000 |
| Fatty acids | Fatty acids, from vegetarian oil, at plant | ecoinvent data v2.2 | Europe | 1995 |
| Ethylene diaminetetra-acetic acid (EDTA) | EDTA, ethylenediaminetetra-acetic acid, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Diethylene triamine penta-acetic acid (DTPA) | DTPA, diethylenetriaminepenta-acetic acid, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Retention acids | Retention aids, in paper production, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Organic chemicals | Chemicals organic, at plant | ecoinvent data v2.2 | Global | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Hard coal | Hard coal, at regional storage | ecoinvent data v2.2 | Western Europe | 1989 |
| Heavy fuel oil | Heavy fuel oil, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Natural gas | Natural gas, high pressure, at consumer | ecoinvent data v2.2 | UK | 2000 |
| Lignite briquettes | Lignite briquettes, at plant | ecoinvent data v2.2 | Germany | 1992 |
| Disposal, wood ash | Disposal, wood ash mixture, pure, 0% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, sludge | Disposal, sludge from pulp and paper production, 25% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, ash from deinking | Disposal, ash from deinking sludge, 0% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, ash from paper production | Disposal, ash from paper prod. Sludge, 0% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B5**

Inventory data sources used in the residual mixed paper (RMP) and old corrugated cardboard (OCC) sorting process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B6**

Inventory data sources used in the paper and card reprocessing (testliner corrugated board base paper production) process model.

| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| --- | --- | --- | --- | --- |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Aluminium sulphate | Aluminium sulphate, powder, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Phosphoric acid | Phosphoric acid, industrial grade, 85% in H2O, at plant | ecoinvent data v2.2 | Europe | 1994 |
| Hydrochloric acid | Hydrochloric acid, 30% in H2O, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Sodium hydroxide | Sodium hydroxide, 50% in H2O, production mix, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Biocides | Biocides, for paper production, unspecified, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Ethoxylated alcohols | Ethoxylated alcohols, unspecified, at plant | ecoinvent data v2.2 | Europe | 1995 |
| Lubricating oil | - | Defra *et al.* (2013) | UK | 2013 |
| Alkyl ketene dimer (AKD) sizer | AKD sizer, in paper production, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Urea (as N) | Urea, as N, at regional storehouse | ecoinvent data v2.2 | Europe | 1999 |
| Potato starch | Potato starch, at plant, DE | ecoinvent data v2.2 | Germany | 2002 |
| Core board | Core board, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Flat pallet (wood) | EUR-flat pallet | ecoinvent data v2.2 | Europe | 2002 |
| PET, granulate | Polyethylene terephthalate, granulate, amorphous, at plant | ecoinvent data v2.2 | Europe | 2000 |
| HDPE, granulate | Polyethylene, HDPE, granulate, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Cold-rolled steel | Steel, converter, unalloyed, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Sheet rolling, steel | ecoinvent data v2.2 | Europe | 2002 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Heavy fuel oil | Heavy fuel oil, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Light fuel oil | Light fuel oil, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Compressed natural gas (CNG) | Natural gas, high pressure, at consumer | ecoinvent data v2.2 | UK | 2000 |
| Hard coal | Hard coal, at regional storage | ecoinvent data v2.2 | Western Europe | 1989 |
| Lignite briquettes | Lignite briquettes, at plant | ecoinvent data v2.2 | Germany | 1992 |
| Disposal, wood ash | disposal, wood ash mixture, pure, 0% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, sludge | disposal, sludge from pulp and paper production, 25% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, ash | disposal, ash from paper prod. sludge, 0% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B7**

Inventory data sources used in the RMP and OCC reprocessing (wellenstoff corrugated board base paper production) process model.

| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| --- | --- | --- | --- | --- |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Aluminium sulphate | Aluminium sulphate, powder, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Phosphoric acid | Phosphoric acid, industrial grade, 85% in H2O, at plant, RER | ecoinvent data v2.2 | Europe | 1994 |
| Hydrochloric acid | Hydrochloric acid, 30% in H2O, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Sodium hydroxide | Sodium hydroxide, 50% in H2O, production mix, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Biocides | Biocides, for paper production, unspecified, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Ethoxylated alcohols | Ethoxylated alcohols, unspecified, at plant, RER | ecoinvent data v2.2 | Europe | 1995 |
| Lubricating oil | - | Defra *et al.* (2013) | UK | 2013 |
| Urea (as N) | Urea, as N, at regional storehouse, RER | ecoinvent data v2.2 | Europe | 1992 |
| Potato starch | Potato starch, at plant, DE | ecoinvent data v2.2 | Germany | 2002 |
| Core board | Core board, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Flat pallet (wood) | EUR-flat pallet, RER | ecoinvent data v2.2 | Europe | 2002 |
| PET, granulate | Polyethylene terephthalate, granulate, amorphous, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| HDPE, granulate | Polyethylene, HDPE, granulate, at plant, RER | ecoinvent data v2.2 | Europe | 2001 |
| Cold-rolled steel | Steel, converter, unalloyed, at plant, RER | ecoinvent data v2.2 | Europe | 2001 |
|  | Sheet rolling, steel, RER | ecoinvent data v2.2 | Europe | 2002 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Heavy fuel oil | Heavy fuel oil, at regional storage, RER | ecoinvent data v2.2 | Europe | 2000 |
| Light fuel oil | Light fuel oil, at regional storage, RER | ecoinvent data v2.2 | Europe | 2000 |
| CNG | Natural gas, high pressure, at consumer, GB | ecoinvent data v2.2 | UK | 2000 |
| Hard coal | Hard coal, at regional storage, WEU | ecoinvent data v2.2 | Western Europe | 1989 |
| Lignite briquettes | Lignite briquettes, at plant, DE | ecoinvent data v2.2 | Germany | 1992 |
| Disposal, sludge | Disposal, wood ash mixture, pure, 0% water, to sanitary landfill, CH | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, wood ash | Disposal, ash from paper prod. Sludge, 0% water, to residual material landfill, ch | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, ash | Disposal, sludge from pulp and paper production, 25% water, to sanitary landfill, CH | ecoinvent data v2.2 | Switzerland | 2000 |

## Metal

**Table B8**

Inventory data sources used in the ferrous metals smelting in an electric arc furnace (EAF) (secondary steel production) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Heat, natural gas | Heat, natural gas, at industrial furnace >100kw | ecoinvent data v2.2 | Europe | 2000 |
| Heat, heavy fuel oil | Heavy fuel oil, burned in industrial furnace 1MW, non-modulating | ecoinvent data v2.2 | Europe | 2000 |
| Ferro-silicon | MG-silicon, at plant | ecoinvent data v2.2 | Norway | 2002 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Light fuel oil | Light fuel oil, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Hydraulic oil (lubricant) | - | Defra *et al.* (2013) | UK | 2013 |
| Detergent | Chemicals organic, at plant | ecoinvent data v2.2 | Global | 2000 |
| Lime | Lime, hydrated, packed, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Additives (alloys) | Copper, at regional storage | ecoinvent data v2.2 | Europe | 2003 |
| Disposal, hazardous waste | Disposal, hazardous waste, 0% water, to underground deposit | ecoinvent data v2.2 | Germany | 1999 |
| Disposal, inert waste | Disposal, inert waste, 5% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 1995 |
| Disposal, filter dust | Disposal, filter dust Al electrolysis, 0% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B9**

Inventory data sources used in the aluminium melting, alloying, and casting (secondary aluminium billet production) process model.

| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| --- | --- | --- | --- | --- |
| Water | - | Defra *et al.* (2013) | UK | 2013 |
| Chlorine | Chlorine, liquid, production mix, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Copper | Copper, at regional storage | ecoinvent data v2.2 | Europe | 2003 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Heat, heavy fuel oil | Heat, heavy fuel oil, at industrial furnace 1MW, RER | ecoinvent data v2.2 | Europe | 2000 |
| Heat, natural gas | Heat, natural gas, at boiler modulating >100kw, RER | ecoinvent data v2.2 | Europe | 2000 |
| Light fuel oil | Light fuel oil, at regional storage, RER | ecoinvent data v2.2 | Europe | 2000 |
| Nitrogen | Nitrogen, liquid, at plant, RER | ecoinvent data v2.2 | Europe | 2001 |
| Sodium chloride | Sodium chloride, powder, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Silicon | MG-silicon, at plant, NO | ecoinvent data v2.2 | Norway | 2002 |
| Hydrochloric acid | Hydrochloric acid, 30% in H2O, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Lime | Lime, hydrated, packed, at plant, CH | ecoinvent data v2.2 | Switzerland | 2002 |
| Sodium hydroxide | Sodium hydroxide, 50% in H2O, production mix, at plant, RER | ecoinvent data v2.2 | Europe | 2000 |
| Sulphuric acid | Sulphuric acid, liquid, at plant, RER | ecoinvent data v2.2 | Europe | 2001 |
| Zinc | Zinc, primary, at regional storage, RER | ecoinvent data v2.2 | Europe | 2003 |
| Disposal, filter dust | Disposal, filter dust Al electrolysis, 0% water, to residual material landfill, CH | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, hazardous waste | Disposal, hazardous waste, 0% water, to underground deposit, DE | ecoinvent data v2.2 | Germany | 2000 |
| Disposal, inert waste | Disposal, inert waste, 5% water, to inert material landfill, CH | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, residual waste | Disposal, municipal solid waste, 22.9% water, to sanitary landfill, CH | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B10**

Inventory data sources used in the ferrous metals smelting in an electric arc furnace (EAF) (secondary steel production) process model.

| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| --- | --- | --- | --- | --- |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Natural gas | Heat, natural gas, at industrial furnace >100kw | ecoinvent data v2.2 | Europe | 2000 |
| Refractory | Refractory, fireclay, packed, at plant | ecoinvent data v2.2 | Germany | 2001 |
| Quicklime | Quicklime, milled, loose, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Electrodes (graphite) | Graphite, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Alloys | - | - | - | - |
| Disposal, dust | Disposal, dust, alloyed EAF steel, 15.4% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, inert waste | Disposal, inert waste, 5% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, sludge | Disposal, sludge, pig iron production, 8.6% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

## Plastic

**Table B11**

Inventory data sources used in the mixed plastics sorting (plastic film separation and near infra-red (NIR) optical sorting) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B12**

Inventory data sources used in the HDPE reprocessing (production of secondary HDPE pellets) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| LPG | Light fuel oil, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Natural gas | Natural gas, high pressure, at consumer | ecoinvent data v2.2 | UK | 2000 |
| Antifoam | Polyurethane, flexible foam, at plant | ecoinvent data v2.2 | Europe | 1997 |
| Core board | Core board, at plant | ecoinvent data v2.2 | Europe | 2000 |
| PP | Polypropylene granulate (PP), production mix, at plant | ELCD database 2.0 | Europe | 1999 |
| LDPE | Polyethylene, LDPE, granulate, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Paper | Paper, newsprint, DIP containing, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Black carbon | Carbon black, at plant | ecoinvent data v2.2 | Global | 2000 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B13**

Inventory data sources used in the PET reprocessing (production of secondary PET flakes) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| PP | Polypropylene granulate (PP), production mix, at plant | ELCD database 2.0 | Europe | 1999 |
| Wood | EUR-flat pallet | ecoinvent data v2.2 | Europe | 2002 |
| Antifoam | Polyurethane, flexible foam, at plant | ecoinvent data v2.2 | Europe | 1997 |
| Steel | Steel, low-alloyed, at plant | ecoinvent data v2.2 | Europe | 2002 |
| PVC | Polyvinylchloride, suspension polymerised, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Polyvinylchloride, emulsion polymerised, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Engine oil | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B14**

Inventory data sources used in the LDPE (plastic film) reprocessing (production of secondary LDPE pellets) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Ferric sulphate | Iron sulphate, at plant | ecoinvent data v2.2 | Europe | 1993 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

## Textiles

**Table B15**

Inventory data sources used in the textiles recovery (reclamation and processing) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Liquefied petroleum gas | - | Defra *et al.* (2013) | UK | 2013 |
| Light fuel oil | - | Defra *et al.* (2013) | UK | 2013 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Steel | Steel, low-alloyed, at plant | ecoinvent data v2.2 | Europe | 2002 |
| Polypropylene | Polypropylene granulate (PP), production mix, at plant | ELCD database 2.0 | Europe | 1999 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B16**

Inventory data sources used in the textiles reprocessing (production of filling fibres) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Natural gas | Heat, natural gas, at industrial furnace >100kw | ecoinvent data v2.2 | Europe | 2000 |
| LPG | - | Defra *et al.* (2013) | UK | 2013 |
| Polypropylene | Polypropylene granulate (PP), production mix, at plant | ELCD database 2.0 | Europe | 1999 |
| Lubrication oil | - | Defra *et al.* (2013) | UK | 2013 |
| Paper | Kraft paper, unbleached, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Polyester | Polyethylene terephthalate, granulate, amorphous, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Miscellaneous waste textile fibres | - | Defra *et al.* (2013) | UK | 2013 |
| Disposal, aluminium | Disposal, aluminium, 0% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, plastics | Disposal, plastics, mixture, 15.3% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, dust (textile fibre) | Disposal, municipal solid waste, 22.9% water, to municipal incineration | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B17**

Inventory data sources used in the textiles reprocessing (production of filling fibres) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Liquefied petroleum gas | - | Defra *et al.* (2013) | UK | 2013 |
| Light fuel oil | Light fuel oil, at regional storage | ecoinvent data v2.2 | Europe | 2000 |
| Polypropylene | Polypropylene granulate (PP), production mix, at plant | ELCD database 2.0 | Europe | 1999 |
| Disposal, aluminium | Disposal, aluminium, 0% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, plastics | Disposal, plastics, mixture, 15.3% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, dust (textile fibre) | Disposal, municipal solid waste, 22.9% water, to municipal incineration | ecoinvent data v2.2 | Switzerland | 2000 |

## Wood

**Table B18**

Inventory data sources used in the wood recycling, microrelease process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Heat, natural gas | Heat, natural gas, at boiler modulating > 100kW | ecoinvent data v2.2 | Europe | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B19**

Inventory data sources used in the wood recycling, recycled MDF (rMDF) production process.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Disposal, wood ash | Disposal, wood ash mixture, pure, 9% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Disposal, sludge | Disposal, sludge from pulp and paper production, 25% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Heat, natural gas | Heat, natural gas, at boiler modulating > 100kW | ecoinvent data v2.2 | Europe | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B20**

Inventory data sources used in the virgin MDF fibre production process.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Heat, natural gas | Heat, natural gas, at boiler modulating > 100kW | ecoinvent data v2.2 | Europe | 2000 |
| Urea | Urea, as N, at regional storehouse | ecoinvent data v2.2 | Europe |  |
| Paraffin | - | Defra *et al.* (2013) | UK | 2013 |
| Transport, road lorry | Intermodal road transport | EA (2010) | UK | 2007 |
| Softwood | Industrial wood, softwood, under bark, u=140%, at forest road | ecoinvent data v2.2 | Europe | 2002 |
| Hardwood | Industrial wood, hardwood, under bark, u=80%, at forest road | ecoinvent data v2.2 | Europe | 2002 |
| Wood chip | Chips, Scandinavian softwood (plant-debarked), u=70%, at plant | ecoinvent data v2.2 | Scandinavia | 2000 |

## Rubble

**Table B21**

Inventory data sources used in the reprocessing of rubble (secondary aggregate production) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |

## Batteries

**Table B22**

Inventory data sources used in the mixed waste batteries sorting process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| HDPE | Polyethylene, HDPE, granulate, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Coke | Petroleum coke, at refinery | ecoinvent data v2.2 | Europe | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

**Table B23**

Inventory data sources used in the reprocessing of spent lead acid batteries process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Limestone | Limestone, milled, loose, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Iron scrap | Pig iron, at plant | ecoinvent data v2.2 | Global | 2002 |
| Sodium hydroxide | Sodium hydroxide, 50% in H2O, production mix, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Sodium nitrate | Chemicals inorganic, at plant | ecoinvent data v2.2 | Global | 2000 |
| Sulphur | - | - | - | - |
| Iron chloride | Iron (III) chloride, 40% in H2O, at plant | ecoinvent data v2.2 | Switzerland | 2001 |
| Slag | - | - | - | - |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Natural gas | Natural gas, high pressure, at consumer | ecoinvent data v2.2 | UK | 2000 |
| Coal coke | Petroleum coke, at refinery | ecoinvent data v2.2 | Europe | 2000 |
| Process water | - | Defra *et al.* (2013) | UK | 2013 |
| Disposal, slag | Disposal, inert waste, 5% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B24**

Inventory data sources used in the hydrometallurgical processing of spent alkaline batteries process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Sulphuric acid (92%) | Sulphuric acid, liquid, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Hyponitrite (N2O2) (30%) | Hydrogen peroxide, 50% in H2O, at plant | ecoinvent data v2.2 | Europe | 1995 |
| Antifoam | Chemicals organic, at plant | ecoinvent data v2.2 | Global | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Water supply | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |
| Disposal, residual | Disposal, paper, 11.2% water, to sanitary landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Process-specific burdens, residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B25**

Inventory data sources used in the pyrometallurgical processing of spent alkaline batteries process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Fuel oil | Light fuel oil, at regional store | ecoinvent data v2.2 | Europe | 2000 |
| Propane | Propane/ butane, at refinery | ecoinvent data v2.2 | Europe | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Water | - | Defra *et al.* (2013) | UK | 2013 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |
| Disposal, slag | Disposal, inert waste, 5% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

## Oil

**Table B26**

Inventory data sources used in the vegetable oil free fatty acids pre-treatment and alkali-catalysed transesterification (biodiesel production) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Water (process) | - | Defra *et al.* (2013) | UK | 2013 |
| Water (cooling) | - | Defra *et al.* (2013) | UK | 2013 |
| Methanol | Methanol, at plant | ecoinvent data v2.2 | Global | 2001 |
| Sodium hydroxide | Sodium hydroxide, 50% in H2O, production mix, at plant | ecoinvent data v2.2 | Europe | 2000 |
| Sulphuric acid | Sulphuric acid, liquid, at plant | ecoinvent data v2.2 | Europe | 2001 |
| Phosphoric acid | Phosphoric acid, industrial grade, 85% in H2O, at plant | ecoinvent data v2.2 | Europe | 1994 |
| Calcium oxide | Quicklime, milled, loose, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Glycerol | Glycerine, from vegetable oil, at esterification plant | ecoinvent data v2.2 | France | 2006 |
| Medium pressure stream (250°C) | Steam, for chemical processes, at plant | ecoinvent data v2.2 | Europe | 1995 |
| Low pressure stream (100°C) | Steam, for chemical processes, at plant | ecoinvent data v2.2 | Europe | 1995 |
| Disposal, salts | Disposal, inert waste, 5% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 2000 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

## Paint

**Table B27**

Inventory data sources used in the mechanical shredding and sorting of post-consumer waste paint packaging process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Heat, light fuel oil | Light fuel oil, burned in boiler 100kw, non-modulating | ecoinvent data v2.2 | Switzerland | 2000 |
| Rolled steel | Steel, converter, unalloyed, at plant | ecoinvent data v2.2 | Europe | 2001 |
|  | Sheet rolling, steel | ecoinvent data v2.2 | Europe | 2002 |
| Hydraulic oil | - | Defra *et al.* (2013) | UK | 2013 |

**Table B28**

Inventory data sources used in the physico-chemical treatment of paint sludge process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Heat, natural gas | Heat, natural gas, at boiler modulating >100kw | ecoinvent data v2.2 | Europe | 2000 |
| Organic chemicals | Chemicals organic, at plant | ecoinvent data v2.2 | Global | 2000 |
| Inorganic chemicals | Chemicals inorganic, at plant | ecoinvent data v2.2 | Global | 2000 |
| Quicklime | Quicklime, milled, loose, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |
| Disposal, inert waste | Disposal, inert waste, 5% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

## Waste electronic and electrical equipment

**Table B29**

Inventory data sources used in the depolluting, dismantling, and sorting of WEEE process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B30**

Inventory data sources used in the chemical (metallurgical) processing of waste printed wiring boards (PWBs) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B31**

Inventory data sources used in the disassembly of fluorescent tubes and light bulbs process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Disposal, dust | Disposal, dust, unalloyed EAF steel, 15.4% water, to residual material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B32**

Inventory data sources used in the depolluting and shredding of CRT screens process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B33**

Inventory data sources used in the pyrometallurgical processing of CRT screens process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Silica sand | Silica sand, at plant | ecoinvent data v2.2 | Germany | 2001 |
| Disposal, slag | Disposal, glass, 0% water, to inert material landfill | ecoinvent data v2.2 | Switzerland | 2000 |

**Table B34**

Inventory data sources used in the depolluting and shredding of CRT screens process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B35**

Inventory data sources used in the refinement of copper scrap (production of secondary copper cathodes) process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Blister-copper | Copper, blister-copper, at primary smelter | ecoinvent data v2.2 | Europe | 2003 |
| Silica sand | Silica sand, at plant | ecoinvent data v2.2 | Germany | 2001 |
| Limestone | Limestone, milled, loose, at plant | ecoinvent data v2.2 | Switzerland | 2002 |
| Heat, hard coal | Hard coal, burned in industrial furnace 1-10MW | ecoinvent data v2.2 | Europe | 1992 |
| Heat, heavy fuel oil | Heavy fuel oil, burned in industrial furnace 1MW, non-modulating | ecoinvent data v2.2 | Europe | 2000 |
| Wastewater treatment | - | Defra *et al.* (2013) | UK | 2013 |

## Tyres

**Table B36**

Inventory data sources used in the reprocessing of waste tyres process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

## Soil

**Table B37**

Inventory data sources used in the landspreading of soil process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |

## Plasterboard

**Table B38**

Inventory data sources used in the processing of post-consumer waste plasterboard process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B39**

Inventory data sources used in the pre-processing (drying) of recovered gypsum process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Natural gas | Heat, natural gas, at industrial furnace > 100kW | ecoinvent data v2.2 | Europe | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

**Table B39**

Inventory data sources used in the pre-processing (drying) of mineral gypsum process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Natural gas | Heat, natural gas, at industrial furnace > 100kW | ecoinvent data v2.2 | Europe | 2000 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |

## Composite

**Table B40**

Inventory data sources used in the pre-processing (drying) of mineral gypsum process model.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inventory item name | Name of dataset used | Data source | Geographic coverage | Reference year |
| Diesel | - | Defra *et al.* (2013) | UK | 2013 |
| Electricity | - | Defra *et al.* (2013) | UK | 2013 |
| Light fuel oil | - | Defra *et al.* (2013) | UK | 2013 |
| Rolled steel | Steel, converter, unalloyed, at plant, RER | ecoinvent data v2.2 | Europe | 2001 |
| Sheet rolling, steel, RER | ecoinvent data v2.2 | Europe | 2002 |
| Hydraulic oil | - | Defra *et al.* (2013) | UK | 2013 |

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