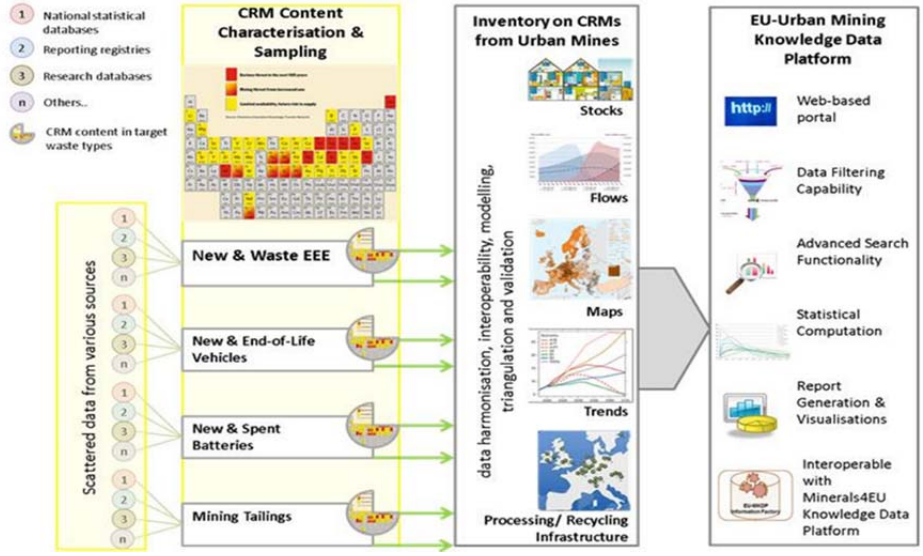
ProSUM Harmonisation paper for external feedback and consultation Annex 1 - Definitions



Project	Prospecting Secondary raw materials in the Urban mine and Mining waste
Acronym	ProSUM
Grant Agreement	641999
Funding Scheme	Horizon 2020
Webpage	http://www.prosumproject.eu/
Report Title	ProSUM Harmonisation paper for external feedback and consultation **Annex 1 - Definitions**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 641999.

Contents

1 Definitions

Unless stated otherwise the definitions in this chapter are ProSUM working definitions and project terminology. Where they are available standard terms have been used e.g. those described in legislation.

1.1 Data Organisation

Classification
Organisation and arrangement of items into groups according to their similarities (Adapted from the Oxford English Dictionary, 2015).

Classification System
A system which organises the classes according to their common relationships or affinities (Adapted from the Oxford English Dictionary, 2015).

Code List
A type of controlled vocabulary containing a finite list of codes and meanings that represent the only allowed values for a particular data item. This list can be extended in certain conditions.

Correlation
The process of establishing a relationship or connection between two or more things (Oxford English Dictionary, 2015).

Data Consolidation
Data consolidation refers to the collection and integration of data from multiple sources into a single destination. During this process, different data-sources are put together, or consolidated, into a single data store (Techopedia 2015).

Data Quality
Characteristics of data that relate to their ability to satisfy stated requirements, as defined by ISO 14044. Data quality evaluates whether the accompanying characteristics are in accordance with the objective: time-related, geographical and technology coverage, precision, completeness, consistency, reproducibility, sources of data and uncertainty (Biemann et al., 2013).

Data uncertainty
The range of possible values within which the true value of the measurement lies (Oxford English Dictionary, 2015).

Database
A collection of structured data held on a computer. Data is organised to allow for easy access, management and updating (Oxford English Dictionary, 2015).

Diffusion Database
Database optimised for diffusion. This central database contains all of the data retrieved (harvested) from the project databases and is used to provide services on top of the EU-UMKDP (search facilities, maps, statistics etc). The optimisation provides end-users with the best experience with the platform.

Dublin Core
The Dublin Core Metadata descriptors are a set of vocabulary terms which can be used to describe resources for the purposes of discovery. The original set of 15 classic Metadata terms, known as the Dublin Core Metadata Element Set are endorsed in the following standards documents:

- IETF RFC 5013
- ISO Standard 15836-2009

- NISO Standard Z39.85

EU Member States/Countries
For spatial data, the ISO 3166 alpha-2 list is going to be used for reporting and the alpha-3 list in the databases.

EPA
Environmental Protection Agency interchangeable with Ministry of Environment or Government Department. Each Member State has their own arrangements for which of these organisations collects data concerning environmental Directives.

EU-MKDP
European Minerals Knowledge Data Platform, created by the Minerals4EU project to 'house' data on minerals.

EU-UMKDP
European Urban Mine Knowledge Data Platform, being created by the ProSUM project to 'house' data on secondary raw materials. Both platforms will be linked to allow for comparisons between primary and secondary resources.

Harmonisation
Adjustment of differences and inconsistencies among different measurements, methods, procedures, schedules, specifications, or systems to make them uniform or mutually compatible.

Harvesting Database
Database making the bridge between the project databases used to stored harmonised data and the Diffusion database. This database allows for the retrieval and consistent formatting of data from different sources before being sent to the Diffusion database.

Knowledge Base
Systematically organised or structured repository of indexed information (usually as a group of linked data files) that allows easy retrieval, updating, analysis, and output of data. Stored usually in a computer, this data could be in the form of graphics, reports, scripts, tables, text, etc., representing almost every kind of information, structured and unstructured (adapted from Wikipedia 2015).

Metadata
Metadata uses descriptors to describe other data-sources, and acts as label for cataloguing and indexing purposes.

Metadata Descriptors (see Annex 7)
Metadata descriptors are the elements of Metadata (ISO 16642).

NSI
National Statistical Institute

Output Query
A precise request for information retrieval from a database.

Project Database
Database coming from activity within the project used as raw data for feeding the Knowledge base.

Properties (Database Field)
Properties describe the value and format of a database field.

PropertyType
Code list that allows for further description of the (compositional) properties (of products and components).

Relations (and types)
An association or connection between objects.

Split-factors
Multipliers that are used to convert a value or number into various values that sum up to the original value.

Unified Data model
A unified data model is an abstract model that organizes elements of data and standardizes how they relate to one another (Len Silverstone & Paul Agnew 2008).

User defined output lists
Retrieval of information from a database in pre-defined format based on user demands, by means of using specific output queries.

1.2 General terms

BATT (BATT)
A 'battery' or 'accumulator' is any source of electrical energy generated by direct conversion of chemical energy and consisting of one or more primary battery cells (non-rechargeable) or consisting of one or more secondary battery cells (rechargeable) (Directive 2006/66/EC).

Best available techniques
Best available techniques as defined in Article 2(11) of Directive 96/61/EC (Directive 2008/98/EC).

Broker
Any undertaking arranging the recovery or disposal of waste on behalf of others, including such brokers who do not take physical possession of the waste (Directive 2008/98/EC).

Coherent estimates
A Coherent estimate describe the strength of association between two series of data where the possible dependence between them is not limited to simultaneous values but may include primary, covered and smoothed relationships (Everitt, B.S. 2002; The Cambridge Dictionary of Statistics, CUP. ISBN 0-521-81099-X).

Complementary flows
The term mainly refers to all waste flows that are not reported by the official compliance systems and others to a national level specified according to the ELV, BATT and WEEE Directives. A certain portion of these flows ends up being exported, incinerated or landfilled. The term also includes non-compliant treatment like recycling with other waste streams, for instance with mixed metal scrap. The amount of WEEE and BATT treated this way is very difficult to quantify.

For ELV the complementary flows are referred to as unknown whereabouts of ELV. These are vehicles which are not reported; they are neither registered as part of the European vehicle stock (also called "vehicle fleet" or "vehicle parc"), nor as vehicles exported from the EU (termed extra EU-Export in COMEXT), nor as ELVs (Eurostat). (Mehlhart, G. et.al, (2011).)

Electrical and Electronic Equipment (EEE)

Equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1 000 volts for alternating current and 1 500 volts for direct current (Directive 2012/19/EU).

End-of life Vehicle (ELV)
A vehicle which is waste within the meaning of Article 1(a) of Directive 75/442/EEC (Directive 2000/53/EC). EOL End-of-Life.

Exported
WEEE, BATT or ELV products that are exported as defined by Regulation (EC) No 1013/2006 on shipments of waste.

Eurostat
Eurostat is the statistical office of the European Union. Its task is to provide the European Union with statistics at European level that enable comparisons between countries and regions. Eurostat is actually the only provider of statistics at European level and the data Eurostat issue are harmonised as far as possible (Eurostat, Eurostat - what we do, 2016). Eurostat contains reported data on flows on sold production, imports and exports of BATT and battery-containing items as well as information on separately collected BATT and battery containing items for the EU-28. All data is collected following standard definitions and criteria. This can be used to identify complementary flows.

Gap
The gap is non-accounted or the unknown whereabouts of the end of life vehicles (ELV), waste batteries (BATT) and Waste Electrical and Electronic Equipment (WEEE).

For this report, the WEEE Gap is defined as the difference between the WEEE generated, the WEEE officially reported, and sum of complementary flows as expressed in the following formula:

WEEE Gap= generated- officially reported- sum of complementary flows

Lifespan or Residence Time
The time equipment spends at a household, business or the public sector is called the lifespan or residence time. This timeframe includes the exchange of second hand equipment among households and businesses within the given territory usually being the country borders. This is to be distinguished from the commonly used lifespan that is reflecting first use by the first consumer or business (Baldé et al., 2015; Wang et al., 2013).

Placed on the market
Placing on the market (also commonly referred to as 'put on the market') means the first time a product is sold on the market within the territory of a Member State on a professional basis (Directive 2012/19/EU).

Preparing for re-use
Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing (Directive 2008/98/EC).

Prevention measures taken before a substance, material or product has become waste, that reduce: (a) the quantity of waste, including through the re-use of products or the extension of the life span of products (b) the adverse impacts of the generated waste on the environment and human health; or (c) the content of harmful substances in materials and products (Directive 2008/98/EC).

(Product) Stocks

Material reservoirs (mass) within the system analysed that have the physical unit of kilogrammes and tonnes (per inhabitant or household). For the purpose of the project and the sales-stock-lifespan model, stocks are the total amount of products (EEE, BATT and vehicles) in households, businesses and public sector. This is destined to become waste in the future and is also often referred to as the "urban mine". The stocks can be differentiated between in-use stocks and hibernated stocks (functioning and non-functioning products).

Producer Compliance Scheme
A Producer Compliance Scheme is usually a limited company, through which producers will meet their obligations to register with the appropriate authority and finance the cost of collection, treatment, recovery and environmentally sound disposal.

Recovery
Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations (Directive 2008/98/EC).

Recycling
Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations (Directive 2008/98/EC).

Removal
Manual, mechanical, chemical or metallurgic handling with the result that hazardous substances, mixtures and components are contained in an identifiable stream or are an identifiable part of a stream within the treatment process. A substance, mixture or component is identifiable if it can be monitored to verify environmentally safe treatment (Directive 2012/19/EC).

Reuse
Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived (Directive 2008/98/EC and Directive 2000/53/EC).
Separate collection The collection where a waste stream is kept separately by type and nature so as to facilitate a specific treatment (Directive 2008/98/EC).

Scrap
Scrap consists of recyclable materials left over from product manufacturing and consumption, such as parts of vehicles, building supplies, and surplus materials. Unlike waste, scrap has monetary value, especially recovered metals, and non-metallic materials are also recovered for recycling (Oxford English Dictionary, 2016).

Split-factors
Multipliers that are used to convert a value or number into various values that sum up to the original value.

Treatment
Any activity after the end-of life vehicle [or any other product or good] has been handed over to a facility for [mechanical, chemical, thermal, biological pre-processing, such as] depollution, dismantling, shearing, shredding, [sorting], recovery or preparation for disposal of the shredder wastes, and any other operation carried out for the recovery and/or disposal of the end-of life vehicle and its components (Directive 2000/53/EC). It is not the recovery or disposal operation itself but rather the preparation prior to recovery or disposal (Directive 2008/98/EC).

Vehicle

Any vehicle designated as category M 1 or N 1 defined in Annex IIA to Directive 70/156/EEC, and three wheel motor vehicles but excluding motor tricycles (Directive 92/61/EEC).

Waste
Means any substance or object in the categories set out in Annex I of Directive 2006/12/EC which the holder discards or intends or is required to discard.

Waste battery
Waste battery or accumulator' means any battery or accumulator which is waste within the meaning of Article 1(1)(a) of Directive 2006/12/EC and Directive 2006/66/EC.

Waste Bin
WEEE or waste BATT put in the waste bin and not separately collected for recycling but typically landfilled or incinerated includes household waste and mixed bulky waste.

Waste electrical and electronic equipment (WEEE)
Electrical or electronic equipment which is waste within the meaning of Article 3(1) of Directive 2008/98/EC, including all components, sub-assemblies and consumables which are part of the product at the time of discarding (Directive 2012/19/EU). WEEE is grouped in categories outlined in Annexes I to IV of the WEEE Directive.

Waste flows
Waste flows are the amounts of waste from the point of being waste generated heading via collection to various recycling, recovery, disposal and export (for reuse) destinations.

Waste generation
WEEE Generated in a Member State corresponds to the total weight of discarded products (waste) as a result of consumption within the territory of that Member State in a given reporting year, prior to any activity (collection, preparation for reuse, treatment, recovery (including recycling) or export) after discarding. Waste arising from private, business and industrial sector. Waste generated is not the same as waste collected, since other non-compliant waste flows and processing exist. Moreover, a differentiation between excluding und including major mineral waste is made in Eurostat statistics.

Waste holder
The waste producer or the natural or legal person who is in possession of the waste (Directive 2008/98/EC).

Waste management
The collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker (Directive 2008/98/EC).

Waste producer
Anyone whose activities produce waste (original waste producer) or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste (Directive 2008/98/EC).

WEEE, BATT, ELV collected (and treated)
The WEEE that is collected, reported and regulated by national transposition of the WEEE, Battery or ELV Directive. This includes WEEE, BATT, and ELV that is collected, exported and treated and recorded in national and European statistics.

WEEE, BATT, ELV Generated

The amount WEEE, BATT, ELV discarded after consumption within the member state in a given reporting year, prior to any collection, reuse, treatment or export, as defined in the WEEE, Battery, and ELV Directives. Generally WEEE and BATT generated is calculated using a sales-lifespan approach, according to internationally agreed statistical guidelines (Baldé et al, 2015) using the UNU keys for WEEE (Magalini et al, 2016) and the BATT keys for BATT.

WEEE Officially Collected and Treated
The WEEE that is reported as collected and recycled under the producer compliance regime within the member state and recorded in national and European statistics.

1.3 BATT specific terms

Automotive BATT
Any battery or accumulator used for automotive starter, lighting or ignition power (Directive 2006/66/EC).

Battery recycling efficiency
The recycling efficiency of a recycling process means the ratio obtained by dividing the mass of output fractions accounting for recycling by the mass of the waste BATT and accumulators input fraction expressed as a percentage (Regulation (EU) No 493/2012).

Battery recycling process
Any reprocessing operation as referred to in Article 3(8) of Directive 2006/66/EC which is carried out on waste lead-acid, nickel-cadmium and other BATT and accumulators and results in the production of output fractions as defined in point 5 of this Article. The recycling process does not include sorting and/or preparation for recycling/disposal and may be carried out in a single facility or in several facilities (Regulation (EU) No 493/2012).

Industrial BATT
Any battery or accumulator designed for exclusively industrial or professional uses or used in any type of electric vehicle and also include BATT and accumulators used in electrical vehicles, such as electric cars, wheelchairs, bicycles, airport vehicles and automatic transport vehicle (Directive 2006/66/EC).

Input fraction
The mass of collected waste BATT and accumulators entering the recycling process as defined in Annex I (Regulation (EU) No 493/2012).

Output fraction
The mass of materials that are produced from the input fraction as a result of the recycling process, as defined in Annex I without undergoing further treatment, that have ceased to be waste or that will be used for their original purpose or for other purposes, but excluding energy recovery (Regulation (EU) No 493/2012).

Preparation for recycling
Treatment of waste BATT and/or accumulators prior to any recycling process, which shall, inter alia, include storage, handling, dismantling of battery packs or separation of fractions that are not part of the battery or accumulator itself (Regulation (EU) No 493/2012).

Registration bodies
National authorities or with national producer responsibility organisations authorised by Member States where the registration of producers of BATT and accumulators shall take place (Directive 2006/66/EC and 2013/56/EU).

1.4 ELV specific terms

Automotive shredder residue (ASR)
Residues from ELV treatment after de-pollution, dismantling and shredding of the hulk, with or without mechanical post-shredder metal separation (Vermeulen et al., 2011).

Certificate of Destruction
A Certificate of Destruction (CoD) is a document issued to a registered Authorised Treatment Facility (ATF). Legally, all cars recycled by an ATF must be issued with a CoD.

COMEXT
Statistical database on trade of goods managed by Eurostat

De-pollution
Removal or treatment of components listed in ANNEX I of Directive 2000/53/EC, such as BATT, liquefied gas tanks; removal or neutralization of potential explosive components (e.g. air bags), removal and separate collection and storage of fuel, motor oil, transmission oil, gearbox oil, hydraulic oil, cooling liquids, antifreeze, brake; fluids, air-conditioning system fluids and any other fluid contained in the end-of-life vehicle, unless they are necessary for the re-use of the parts concerned; removal, as far as feasible, of all components identified as containing mercury (Directive 2000/53/EC).

Dismantling
Treatment operations in order to promote recycling as listed in ANNEX I of Directive 2000/53/EC, including removal of catalysts, removal of metal components containing copper, aluminium, and magnesium if these metals are not segregated in the shredding processes, removal of tyres and large plastic components (bumpers, dashboard, fluid containers, etc.), if these materials are not segregated in the shredding process in such a way that they can be effectively recycled as materials, and removal of glass. 16

Economic operators
Producers, distributors, collectors, motor vehicle insurance companies, dismantlers, shredders, recoverees, recyclers and other treatment operators of end-of-life vehicles, including their components and materials (Directive 2000/53/EC).

ELV Guidance
Guidance How to report on end-of-life vehicles according to Commission Decision 2005/293/EC describes the scope of the ELV directive and provides guidance to compile a quality report covering the ELV rates for reuse/recovery and reuse/recycling.

Export/ Import of used vehicles
A vehicle running in a foreign country with registration plates from the country of origin is not considered as exported unless it is re-registered in the country of destination. Most MS apply the rule that all residents must register their vehicles in the country of their main residence.

Extra-EU trade
Refers to transactions with all countries outside of the EU: the rest of the world except for the EU.

Fleet of motor vehicles
A total number of vehicles on the roads. The 27 European Union (EU-27) member countries had a fleet of over 256 million in 2008, and passenger cars accounted for 87% of the union's fleet. The five largest markets, Germany (17.7%), Italy (15.4%), France (13.3%), the UK (12.5%), and Spain (9.5%), accounted for 68% of the region's total registered fleet in 2008. The EU-27 member countries had in 2009 an estimated ownership rate of 473 passenger cars per 1000 people.

Hulk
Car body after de-pollution and dismantling.

Intra-EU trade
Refers to transactions occurring within the EU.

POLK
Polk is now part of IHS Automotive. With the addition of Polk, IHS Automotive provides expertise and predictive insight across the entire automotive value chain from product inception-across design and production-to the sales and marketing efforts used to maximize potential in the marketplace. No other source provides a more complete picture of the automotive industry. For more information about IHS Automotive, please visit www.ihs.com/automotive.

Producer
A vehicle manufacturer or the professional importer of a vehicle into a Member State (Directive 2000/53/EC).

Registration/ de-registration/ re-registration
These terms are not applied in the same manner across the EU and within different domains (e.g. vehicle registration according to Article 3(1) of Directive 1999/37/EC and ELV treatment according to Article 5(3) of Directive 2000/53/EC). Definitions for the purpose of this project:

- *Registration* should be understood as the administrative authorisation for the entry into service in road traffic of a vehicle, involving the identification of the latter and the issuing to it of a serial number, to be known as the registration number. Registration is applied for the first registration of a vehicle;
- *Re-registration* is applied for two cases:
    - when a vehicle is temporarily de-registered (see below) and registered again in the same country;
    - when a vehicle is transferred to another country and re-registered in this new country.
- *De-registration* should be understood as a 'cancellation of a registration', which means the cancellation of a Member State's authorisation for a vehicle to be used in road traffic.
- *Temporary de-registration* means that a vehicle is temporarily (for certain limited time) either fully or in limited manner not permitted to be used in road traffic. 'Temporary de-registration' is typically applied by dealers when they keep used vehicles on private ground (in this case vehicles may obtain special dealer plates) but also can be applied by private person in order to avoid paying tax for a vehicle when the vehicle is not in use
- *Permanent cancellation of registration* occurs when a vehicle has been treated as an ELV. A Certificate of Destruction (CoD) is a condition for de-registration of the ELV. *Final de-registration* is used as a synonym term.

Shredder
Any device used for tearing into pieces or fragmenting end-of life vehicles, including for the purpose of obtaining directly reusable metal scrap (Directive 2000/53/EC).

Treatment
Any activity after the end-of life vehicle has been handed over to a facility for depollution, dismantling, shearing, shredding, recovery or preparation for disposal of the shredder wastes, and any other operation carried out for the recovery and/or disposal of the end-of life vehicle and its components;

Unknown whereabouts of ELV
The complementary flows are referred to as unknown whereabouts of ELV. These are vehicles which are not reported; they are neither registered as part of the European vehicle stock (also called "vehicle fleet" or "vehicle parc"), nor as vehicles exported from the EU (termed extra EU-Export in COMEXT), nor as ELVs (Eurostat). (Mehlhart, et.al, 2011).

Used Car
A used car, a pre-owned vehicle, or a secondhand car, is a vehicle that has previously had one or more retail owners. Used cars are sold through a variety of outlets, including franchise and independent car dealers, rental car companies, leasing offices, auctions, and private party sales.

Vehicle registration certificate
An official document providing proof of registration of a motor vehicle. It is used primarily by governments as a means of ensuring that all road vehicles are on the national vehicle register, but is also used as a form of law enforcement and to facilitate change of ownership when buying and selling a vehicle. In the European Economic Area vehicle registration certificates are govern by the European directive 1999/37/EC.The data on numbers of registered vehicles in Europe are available from official sources, i.e. Eurostat

Vehicle deregistration
Cancelling your vehicle's registration removes the vehicle from the Motor Vehicle Register, which means the vehicle owner can no longer lawfully use the vehicle on the roads. Vehicle deregistration may occur only at the request of the vehicle's registered person or an insurance company.

Vehicle park
European vehicle stock or vehicle fleet

1.5 WEEE specific terms

Clearing House
A central agency for the collection, classification, and distribution especially of information. Clearing houses may be of public or private nature. In the context of this report, their aim is to coordinate the activities of Compliance Schemes (for BATT and WEEEs) at national level.

Collection
The gathering of waste, including the preliminary sorting and preliminary storage of waste for the purposes of transport to a waste treatment facility (Directive 2008/98/EC).

Dealer
Any undertaking which acts in the role of principal to purchase and subsequently sell waste, including such dealers who do not take physical possession of the waste (Directive 2008/98/EC).

Disposal
Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations (Directive 2008/98/EC).

Distributor
Any natural or legal person in the supply chain, who makes EEE available on the market. This definition does not prevent a distributor from being, at the same time, a producer within the meaning of point (f) (Directive 2012/19/EU).

Harvesting or Scavenging
Removal of valuable components, only considering reuse or material value in e.g. compressors from temperature exchange equipment, hard disks, memory and other small IT components. Harvesting implies pre-treatment in a regulated environment. Scavenging implies theft from whole units in storage.

Mono flows of WEEE (pure WEEE flow)
A mono-flow contains devices which are financially attractive to the market. Mono-flows of WEEE are scrap metals flows that (almost) exclusively contain WEEE products (Wielenga et al., 2011).

Non-treatment
The term non-compliant does not necessarily imply substandard treatment, but rather refers to these quantities not being declared to national/ EU levels. Other terms commonly used are complementary treatment or unreported treatment.

Registered (reported) Flows/Collection
The quantities of WEEE reported to national registers and Eurostat WEEE database are called registered flows (Wielenga et al., 2011).

Unreported flow
The unreported flows are declared to regional authorities under different reporting regimes.

WEEE in mixed metal scrap (WEEE in light iron fraction, pre-shredder material)
Mixed flows (pre-shedder material) can contain metals from all possible sources ad these mostly contains limited percentage of WEEE (Wielenga et al., 2011).

WEEE from private households
WEEE which comes from private households and WEEE which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Waste from EEE likely to be used by both private households and users other than private households shall in any event be considered to be WEEE from private households (Directive 2012/19/EC).

1.6 Mining wastes and minerals terms
Mining waste and minerals terms are those used commonly within the Geological Survey community, as defined in the Minerals4EU project and as defined within the INSPIRE Directive framework. See also the US Geological Survey (USGS) 2011.

CGI
Commission for the Management and Application of Geoscience Information

Geologic Materials
The rocks and sediments that make up the land where we live. The characteristics of geologic materials reflect the processes that form them and the environments in which they form. Geologists divide these materials into three basic rock types.

IFCD
INSPIRE Feature Concept Dictionary

Industrial Minerals and Rocks
Minerals which are neither metallic nor used as fuels, but which are mined and processed for their economic use. A broader definition describes an industrial mineral as any rock, mineral, or naturally occurring substance of economic value, exclusive of metallic ores and mineral fuels, and gemstones. In essence, they are the raw materials used in many industrial, agricultural and construction products.

Material

[1] http://geomaps.wr.usgs.gov/sfgeo/geologic/stories/geologic_materials.html

The term material is used ambiguously in geological science and in engineering science. Materials in natural systems are distinctly different from engineered materials. The term ‘Materials’ as used here refers to ‘engineered materials’ that are composed, manufactured and processed to achieve intended properties.

A Metal (Metallic) Ore

A type of rock (mineral raw material) from which metal can be extracted at a profit.
Metals may be present in ores in the native form (such as native copper), or as noble metals (not usually forming compounds, such as gold), but more commonly they occur combined as oxides, sulphides, sulphates, silicates, etc. The generic wording 'metals' covers 'true' metals (see Periodic Table of Elements https://en.wikipedia.org/wiki/Periodic_table) but also includes semi-metallic substances or metalloids such as As and Ge which are often intimately associated with metals.

Mineral Raw Material

A natural inorganic or organic substance, such as a metallic ore, industrial mineral, construction material or energy fuel, but excluding water.

Open Geospatial Consortium:

The Open Geospatial Consortium (OGC) is an international not for profit organisation committed to making quality open standards for the global geospatial community. These standards are made through a consensus process and are freely available for anyone to use to improve sharing of the world's geospatial data.

Ore

Any naturally occurring (raw) material from which a mineral or aggregate can be extracted at a profit. The term 'ore' originally applied only to metallic minerals but now includes such non-metallic substances as sulphur, calcium fluoride (fluorite), and barium sulphate (barite). Ore is always mixed with unwanted rocks and minerals, known collectively as gangue. The ore and the gangue are mined together and then separated. The desired element (often a metal which is usually contained in chemical combination with some other element in addition to various impurities) is then extracted from the ore. It may be still further refined (purified) or alloyed with other metals.

ProMine AC database structure

The structure stores all the information related to Anthropogenic Concentrations of mining wastes and smelting residues.

Aggregates

Any of several hard, inert materials, such as sand, gravel, slag, or crushed stone, used for mixing with a cementing or bituminous material to form concrete, mortar, or plaster; or used alone, as in railroad ballast or graded fill (Neuendorf, Mehl, & Jackson, 2011).

Ballast

Gravel, broken stone, expanded slag or similar material used as a foundation for roads, esp. that laid in the roadbed of a railroad to provide a firm bed for the ties, distribute the load, and hold the track in line, as well as to facilitate drainage (Neuendorf, Mehl, & Jackson, 2011).

Back fill

Earth or other material used to replace material removed temporarily during construction or permanently during mining, such as stones and gravel used to fill pipeline trenches or placed behind structures such as bridge abutments, or waste rock used to support the roof after removal of ore from a stope. The process of refilling an excavation, a mine opening, or the space around a foundation (Neuendorf, Mehl, & Jackson, 2011).

Cobbing
The separation, generally with a hand-held hammer, of worthless minerals from desired minerals in a mining operation, e.g. quartz from feldspar (Neuendorf, Mehl, & Jackson, 2011).

Concentrate
Enriched ore material collected after a removal of waste in a mill or concentrator. The rejected waste material is known as tailings (Neuendorf, Mehl, & Jackson, 2011).

Concentrator / dressing plant
An industrial facility where mineral processing takes place.

Extractive industry
All establishments and undertakings engaged in surface or underground extraction of mineral resources for commercial purposes, including extraction by drilling boreholes, or treatment of the extracted material (Directive 2006/21/EC).

Gangue
The valueless rock or mineral aggregates in an ore; that part of an ore that is not economically desirable but cannot be avoided in mining. It is separated from the ore minerals during concentration (Neuendorf, Mehl, & Jackson, 2011).

Marginal ore
Ore which, at current market value of products from its excavation and processing, just repays the cost of its treatment (Science Dictionary, 2016).

Mineral processing
Treating crude ores and mineral products in order to separate the valuable minerals from the waste rock, or gangue (Encyclopedia Britannica, 2016).

Mine
(a) An underground excavation for the extraction of mineral deposits, in contrast to surficial excavations such as quarries. The term is also applied to various types of open-pit workings.
(b) The area or property of a mineral deposit that is being excavated; a mining claim (Neuendorf, Mehl, & Jackson, 2011).

Mining
The process of extracting metallic or non-metallic mineral deposits from the Earth. The term may also include preliminary treatment, e.g. cleaning or sizing (Neuendorf, Mehl, & Jackson, 2011).

Mining waste (MIN)
Waste from extraction and processing of mineral resources. It involves materials that must be removed to gain access to the mineral resource, such as topsoil, overburden and waste rock, as well as tailings remaining after minerals have been largely extracted from the ore (European Commission, Mining Waste, 2016).

Ore
The naturally occurring material from which a mineral or minerals of economic value can be extracted at a reasonable profit (Neuendorf, Mehl, & Jackson, 2011).

Overburden
Barren rock material, either loose or consolidated, overlying a mineral deposit, which must be removed prior to mining (Neuendorf, Mehl, & Jackson, 2011).

Recovery
The percentage of valuable constituent derived from an ore, a measure of mining or extraction efficiency (Neuendorf, Mehl, & Jackson, 2011).

Run-of-mine
Ore in its natural, unprocessed state; pertaining to ore just as it is mined (Neuendorf, Mehl, & Jackson, 2011).

Slag
A by-product of the fusion of ores, metals, flux, and fuel that contains noneconomic constituents of the furnace charge (Neuendorf, Mehl, & Jackson, 2011).

Sorting
Processes that operate on particulate material to concentrate a desired component and separate it from waste material.

Tailings
The waste solids or slurries that remain after the treatment of minerals by separation processes (e.g. crushing, grinding, size-sorting, flotation and other physico-chemical techniques) to remove the valuable minerals from the less valuable rock (Directive 2006/21/EC).

Tailings dam
An earth-fill embankment dam used to store by-products of mining operations after separating the valuable fraction from the uneconomic fraction of an ore (Wikipedia, 2016).

Waste
Any solid or liquid generated by human activity that has little or no economic value, usually the result of the manufacture, mining, or processing of a material to produce an economic product (Neuendorf, Mehl, & Jackson, 2011).

Waste facility
Any area designated for the accumulation or deposit of extractive waste, whether in a solid or liquid state or in solution or suspension, for the following time-periods (Directive 2006/21/EC).

Waste rock
Rock that must be broken and disposed of in order to gain access to and excavate the ore; valueless rock that must be removed or set aside in mining (Neuendorf, Mehl, & Jackson, 2011).

1.7 Composition

Component
Uniquely identifiable part or subunit of products. Components are usually mechanically removable in one piece and are considered indivisible for a particular function or use. A component can consist of other components e.g. a printed circuit board may contain a capacitor which is also a component. Some products may contain other products as components, for instance, a car has a battery. Other terms include subsystem, part, cluster of parts, or assembly.

Component Group Type
The ComponentGroupType aggregates all components included on a 'ComponentList' to a higher level of component groups. The aggregation is based on characteristics, application purposes, and composition.

Component List
A comprehensive list of components contained with products.

Composite Material

A composite material or composite is a material made from two or more distinct constituent materials with significantly different physical or chemical properties that, when combined, produce a material with characteristics different from the individual components, adapted from Wikipedia, 2015).

Engineered Materials
Refined and processed raw materials to achieve specific functions and specifications e.g. alloys.

Homogeneous material
One material of uniform composition throughout or a material, consisting of a combination of materials, that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes" (Council Directive EC 2011, RoHS Art. 3 (20)).

HREE
Heavy Rare Earth Elements: Y, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

LREE
Light Rare Earth Elements: (Sc[2]), La, Ce, Pr, Nd, Pm and Sm.

Material Group Type
Defines the main categories in which materials are clustered into lists.

Material Type
The specification of the above mentioned material groups into material types.

Material List
The list of constituent materials within the material types.

Substances
Any (chemical) element or compound composed of uniform units (Brunner and Rechberger, 2004). All substances are characterised by a unique and identical constitution and are thus homogeneous.

2 Waste legislation and reporting requirements

The framework for data gathering and reporting was set with the waste framework directive 2008/98/EC referring to the regulation that define basic rules of data structuring.

Directive 2008/98/EC
Waste framework directive. It provides a general framework of waste management requirements and sets the basic waste management definitions for the EU. It lays down general rules for waste prevention, re-use, recycling, recovery, and disposal as well as e.g. lists disposal (D, ANNEX I) and recovery (R, ANNEX II) operations.

Commission Regulations 2150/2002 and 849/2010
Commission Regulation 2150/2002 on waste statistics and Commission Regulation 849/2010 amending 2150/2002 establish a framework to produce Community statistics on waste generation (according to ANNEX I of 2150/2002), recovery, and disposal (according to ANNEX II of 2150/2002), complying with the mainly substance-oriented statistical nomenclature in ANNEX

[2] Not included in EC, 2014

III of 2150/2002. Additionally, the Commission has to put up a table of equivalence between the latter nomenclature and the list of waste (Commission Decision 2000/532/EC).

2.1 BATT legislation

Directive 2006/66/EC is laying down the legislative basis concerning waste batteries on EU level since main aspects, such as minimum treatment requirement, collection as well as recycling rates (refined in Regulation (EU) No 493/2012, and reporting procedures are defined. Limitations of material usage is regulated in Directive 2013/56/EU.

Directive 2006/66/EC
on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Also known as 'Battery Directive' that define prohibitions, rules and requirements concerning production, POM and at the end of a batteries life. The overarching objective (Article 7) is, inter alia, to reduce the environmental impact of batteries by ensuring separate collection, reducing disposal and increasing the recycling of batteries and accumulators.
Within this context, the battery directive requires an annual reporting of the MS bodies to the EC containing at least the following content: battery mass collected, collection rate, and recycling efficiency. However, this is only obliged for portable batteries!

Directive 2013/56/EU
Directive on batteries and accumulators and waste batteries and accumulators as regards the placing on the market of portable batteries and accumulators containing cadmium intended for use in cordless power tools, and of button cells with low mercury content, and repealing Commission Decision 2009/603/EC. This Directive amends paragraphs of Directive 2006/66/EC.

Regulation (EU) No 493/2012
Rules regarding the calculation of recycling efficiencies of the recycling processes of waste batteries and accumulators.
This regulation refers to Directive 2006/66/EC and lays down general rules of the calculation of recycling efficiencies. Recyclers are obliged to report, inter alia, the recycling efficiency, input fraction, and output fraction and process design. The recycling efficiency "shall cover all individual steps of recycling and all corresponding output fractions". The composition of input and output fractions shall itemize elemental or component/compound level.

2.2 ELV legislation

Legislation on end-of-life vehicles has the aim to prevent and diminish negative environmental consequences caused by ELV, define producer responsibility, and establish rules and regulations for a better recyclability and recycling of vehicles. In addition to this, legislation on vehicles sets a classification system for types of vehicles, some of which are covered by European and MS directives and laws on end-of-life vehicles.

Directive 2000/53/EC
Directive 2000/53/EC on end-of life vehicles (known as "ELV Directive") defines a legislative framework to minimise the impact of ELV on the environment, to harmonise requirements for collection and treatment, and to set reuse/recycling and reuse/recovery targets for end-of-life vehicles.

Commission Decision 2005/293/EC
Commission Decision 2005/293/EC lays down detailed rules on the monitoring of the reuse/recovery and reuse/recycling targets set out in Directive 2000/53/EC on end-of-life vehicles and the minimum data required for reporting.

Directive 2005/64/EC

Directive 2005/64/EC on the type-approval of motor vehicles with regard to their reusability, recyclability and recoverability and amending Council Directive 70/156/EEC applies to vehicles belonging to the categories M1 and N1, which are defined in Directive 70/156/EEC, ANNEX II, and to new or reused components of M1 and N1 vehicles. It establishes rules and provisions to make sure vehicles and vehicle components maintain the required safety standards when being reused.

ELV Guidance

Guidance How to report on end-of-life vehicles according to Commission Decision 2005/293/EC describes the scope of the ELV directive and provides guidance to compile a quality report covering the ELV rates for reuse/recovery and reuse/recycling.

2.3 WEEE legislation

Legislation concerning WEEE on Member state level is directly linked to the WEEE Directive which is completed by compositional specifications and Commission Decisions 2004/249/EC and 2005/369/EC which lay down a questionnaire for the implementation report that Member States have to submit to the EC.

Directive 2012/19/EU

on waste electrical and electronic equipment (WEEE); known as 'WEEE Directive'. The WEEE Directive sets minimum requirements for the first treatment facilities. Moreover, it defines collection categories according to which data have to be reported.

Directive 2011/65/EU

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
OJ L 174 of 1 July 2011 (Roh's Directive).

Commission Decision 2005/369/EC

Commission Decision of 3 May 2005 laying down rules for monitoring compliance of Member States and establishing data formats for the purposes of Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (notified under document number C(2005) 1355).

Commission Decision 2004/249/EC

Commission Decision of 11 March 2004 concerning a questionnaire for Member States reports on the implementation of Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) (notified under document number C(2004) 714).

2.4 MIN legislation

The EU legislation that deals with mining waste (waste from the extractive industry) mainly deals with security (i.e. dam security) and health aspects (pollution of air, soil and water) of the waste. There is no legislation (yet!) similar to those dealing with WEEE, ELV etc., concerning reusability, recyclability and recoverability. Nevertheless, code lists (lexicon tables) derived from the Mining waste Directive (2006/21/EC) will be used in the data model developed for the ProSUM project.

Directive 2006/21/EC

Directive on the management of waste from extractive industries. The directive introduces measures for safe management of waste resulting from the extraction, treatment and storage of mineral resources and the working of quarries.

Decision 2009/335/EC
Technical guidelines for the establishment of the financial guarantee in accordance with Directive 2006/21/EC concerning the management of waste from extractive industries.

Decision 2009/337/EC
Definition of the criteria for the classification of waste facilities in accordance with Annex III of Directive 2006/21/EC concerning the management of waste from extractive industries.

Decision 2009/358/EC
On the harmonization, the regular transmission of the information and the questionnaire referred to in Articles 22(1)(a) and 18 of Directive 2006/21/EC on the management of waste from extractive industries.

Decision 2009/359/EC
Completing the definition of inert waste in implementation of Article 22(1)(f) of Directive 2006/21/EC concerning the management of waste from extractive industries.

Decision 2009/360/EC
Completing the technical requirements for waste characterization laid down by Directive 2006/21/EC of the European Parliament and of the Council on the management of waste from extractive industries.

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