**Annex 2**

**Scoping and developing further end-of-waste (EoW) and by-product (BP) criteria**

**Circular Economy Action Plan 2.0.**

***Written consultation on short-listed streams***

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# **About you**

***This consultation is organised by type of waste. Please complete and/or correct as many fiche templates as relevant. The European Commission welcomes one consolidated reply per Member State or organisation.***

**Name:**

**First name:**

**Name of the Member State or organisation on which behalf you are submitting this input:**

**Contact details (e-mail, telephone number):**

**In which EU Member State(s) is your association/organisation or company based?:**

**What else should we know about your organisation (e.g. that you are an EU umbrella organisation with X members across Y EU countries, representing about Z% of the total market for a specific secondary raw material)?:**

**Fiche Templates for the different candidate end-of-waste or by-product streams**

Instructions for filling out the templates:

* Be **clear**: make sure that units are provided with numbers and indicate what they represent (full EU territory, one Member State, data from a certain association covering X% of the market, etcetera); clearly indicate the reference year (ideally 2019 data should be provided).
* Be **transparent**: when providing numbers or information, indicate the relevant on-line accessible source or send along supporting material such as databases, scientific articles, reports, etcetera
* Be **complete**: an important condition for materials to be ranked as priority material to be considered for EU-wide EoW or by-product criteria development will be that the various criteria have been properly addressed with clear, verifiable and complete data. This particularly relates to geographical coverage. Hence, the data provided should indicate that the case can be made for the EU as a whole, not only for a single region or Member State.
* Be **concise**: although being complete, the provided information should be limited to what is needed in order to be able to make an informed decision on prioritising waste and material streams for the development of EU-wide EoW or by-product criteria . Complete templates should not be more than 2-3 pages. Non-essential information can be provided via internet links or compiled in a supporting document.
* **Correct** where possible: the current set of data and information has been gathered from the studies and stakeholder consultations organised by the Commission in the last few years (see cover letter). Stakeholders are invited to critically review, clarify, correct and update the data. The Commission is not responsible for the correctness of the data and information currently listed in the below fiches.
* Be **timely**: the deadline for returning the completed fiche templates and supporting information to [JRC-END-OF-WASTE@ec.europa.eu](mailto:JRC-END-OF-WASTE@ec.europa.eu) is **Wednesday 6 October 2021**.

1. **Plastics**

**1.1 PET- Polyethylene terephthalate** (plastic bottles (water, soft drinks etc.) food packaging film, strapping, carpets, vehicle tyre cords, fibres)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PET- Polyethylene terephthalate |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** | End-of-waste criteria for poly(ethylene phthalate) (PET) recyclate (single case decision) | | https://www.epa.ie/publications/compliance--enforcement/waste/Final-Decision-EoW-Criteria-for-rPET-Flake---Shabra.pdf |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

**1.2 HDPE- High-density Polyethylene** (milk containers, shampoo bottles, cleaning agents, etc.)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | HDPE- High-density Polyethylene |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.3 PE- Low-density polyethylene** (plastic bags, plastic food wrapping (e.g. fruits, vegetables)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PE- Low-density polyethylene |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.4 PVC- Polyvinyl chloride** (plastic piping, vinyl flooring, cabling insulation, roof sheeting)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PVC- Polyvinyl chloride |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | 740.000 t of PVC recycled in Europe in 2018.  Some 2.5 Mt PVC waste / yr in Europe | | Vinyl Plus annual report 2019  Consultic (2013) |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** | Netherlands. Granulated PVC of 31.01.2018. | | https://www.afvalcirculair.nl/onderwerpen/afval/toetsing-afval/ |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.5 PP- Polypropylene** (Bottle lids, food tubs, furniture, automobile parts etc.)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PP- Polypropylene |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.6 PS- Polystyrene** (plastic cutlery, food take away containers)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PS- Polystyrene |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.7 ABS- Acrylonitrile butadiene styrene** (computers, televisions, kitchen appliances, toys, keyboard keycaps, musical instruments, automobile components(\*\*) 3d printing)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | ABS- Acrylonitrile butadiene styrene |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?:** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.8 PC- Polycarbonates** (electronic applications, Products in construction industry (e.g. for domelights, flat or curved glazing, and sound walls), Compact Discs, DVDs, and Blu-ray Discs, Automotive, aircraft, railway, and security components)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PC- Polycarbonates |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.9 PU- Polyurethane** (Foam, cleaning products, thermal insulation)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | PU- Polyurethane |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

**1.10 OTHER- Other plastics (e.g. acrylic, polyactic fibres etc.)** (fiberglass, water cooler bottles)

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Other plastics- Please define which plastic type this should be); add tables if necessary for multiple plastic materials |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

# **A specific textile waste stream, e.g. carpet waste**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Textile waste - Please define which material this should be (e.g. carpet waste); add tables if necessary for multiple textile waste materials |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | 1.6 Mt of carpet waste was estimated to be generated in the EU in 2018 but only a small amount was recycled | | http://changingmarkets.org/wp-content/uploads/2017/04/German-Carpet-Report-ENG.pdf |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5. Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** |  | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |  |

# **Rubber (granulated/powder) from end-of-life tyres**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Rubber |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | In whole 2.99 million tonnes of tyres are processed following End-of-Life derived rubber in EU. The content in weight of the rubber fraction is 1.6 Million tonnes. | |  |
| **Number of identified uses** | Infill for artificial turf pitches, surfaces for play, sport and leisure, moulded objects, new tyres, construction applications, modification of asphalt and bitumen  The recycling of tyres leads to the different types of materials such as: shreds and chips, rubber granules, fine rubber powders, reclaim rubber, rubber matrix with some rubber powders. Hereby recovered materials include metal, textile, fiber, fine powders, shreds and chips, granulates powder and reclaim powder. In whole 2.99 million tonnes of tyres are processed following End-Of-Life derived rubber in EU. The content in weight of the rubber fraction is 1.6 Million tonnes. This rubber fraction is then recovered into to 2 separate ways: material and energy. The Material part includes Civil engineering, public works, backfilling and recycling. The Energy part includes the energy recovery. The other and most significant material applications include synthetic turf, playgrounds, moulded products and micronized rubber powder as a raw material for some high value applications (tyres, plastics, coatings, roofing systems and rubber asphalt). Market outlets of recycled rubber differ among countries, depending on climate conditions, national legislation or local/regional presence of cement plants, but concern the intra-european market. | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** | 684869 volume/weight (unknown units) as waste shipment (volume/weight) of the (potential) secondary raw material within the EU 27 (last 3 years)? | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand | Demand: all MS France 449,500 *(unit unknown)* (UK 444,500) Germany 439,000 Italy 372,500 Poland 268,500 Spain 243,500 Sweden 92,000 Netherlands 91,000 Portugal 84,000 Belgium 80,100 Czech Rep, 75,800 Austria 74,000 Finland 58,700 Romania 50,500 Denmark 49,000 Greece 45,000 Hungary 44,000 Bulgaria 40,800 Ireland 37,500 Slovak Rep, 29,000 Croatia 22,500 Slovenia 20,000 Latvia 12,500 Lithuania 12,500 Cyprus 6,900 Estonia 3,300 Malta 2,300 Luxembourg | |  |
|  |  | |  |
| **7 Existence of relevant product standards** | Quality standards for ELT derived materials at CEN level (TC366 - CEN/TS 17045:2017) are being developed. For rubber granules, a number of different technical standards are available (EN 15330-1 (2013), EN 933-1 (2012), EN 14955 (2005), EN 1097-3 (1998), EN 14836 (2005), DIN 18035-7:2002-06, NF P90- 112, and PAS 107:2012. Other important standards are CEN/TC 366 and CEN TS14243. Different rubber granule market segments have different rubber granule size requirements. Within a specific rubber granule market, each application has its own requirements in terms of particle size and purity  There are several European Technical Committees that work for creating new Standards related either to ELT-derived materials (CEN TC366) and to products that commonly use ELT recycled rubber (e.g. CEN TC 217 for sport and leisure surface | |  |
| **8 Existing national/regional EoW and/or by-product criteria** | For tyre recycling in the EU we are only aware of national EoW criteria for secondary raw materials in Portugal and the UK until Brexit. Harmonized EoW criteria in the EU would be beneficial for the uptake of secondary raw materials from tyre recycling (rubber, steel, textile). In other words, to raise awareness with EoW materials (secondary raw materials) that can substitute primary raw materials without limitation and thus increased demand and incorporation into new products.  As of 2018 the following states had no legal clarity concerning the placement on the market of ELT derived granulates and powders as product or as waste: Germany, Finland, Greece, Spain, Hungary, Romania, Bulgaria, and Belgium. Turkey and Norway can also be mentioned also even if they are not member states. However, in UK, Portugal, Slovakia, Czech Republic, Denmark and Italy ELT derived granulates and powders are placed in the market as Product provided that they meet national EoW criteria France considered granulated and powders as Waste since there is no a specific end-of-waste (EoW) criteria for ELT granulates. Sweden has not drafted EoW criteria proposed yet and considered imported granulates as a product. In the case of Netherlands, only ELT granulates for rubber infill applications had been considered as products if compliant with ISA M37 Rubber infill according to the Letter of Environment Ministry of the Netherlands (2005). Latvia and Estonia have drafted Draft Regulation on technical processings. In 2018, Greek authorities drafted a proposal of EoW regulation (2018), with a very similar content to the Portuguese decree  ELT rubber, Sources: ETRMA 2020, ECHA.  EoW: UK, PT, SK, CZ, DK, IT (Decreto 31 marzo 2020, n. 78.), ES (draft Jan 2021), LV (draft), EE (draft, additive to shale oil), EL (draft), NL (only for infill). DK also seems to have a quality protocol like UK. EL (in prep), , LT (under consideration), NL (granulate for infill), PT (ELT rubber), UK  By-product: FI and NO (case by case permitting of imports).  In IE used as waste. in SE and ES rubber crumb is also apparently sold as waste. | |  |
| **8 Low expected environmental/ human health impact** | An explicit decision from a Competent Authority qualifying a recycled plastic as non-waste creates consumer confidence in the legal status, quality and REACH-compliance of the recycled material. This is key in the uptake of recycled plastics. Currently, it is rather the absence of national EoW criteria which is a barrier to a wider uptake of plastic secondary raw material.  Many regulations, like Declarations of Performance for construction products, or the REACH restriction of chemical substances only apply once the material has ceased to be waste | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **Mineral C&D waste (concrete, bricks) for use as aggregate**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Mineral C&D waste |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | 320 Mt of non-hazardous mineral construction and demolition waste were generated in the EU in 2018. | | Eurostat |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |

|  |  |  |
| --- | --- | --- |
| **5 Exports outside the EU** |  |  |

|  |  |  |
| --- | --- | --- |
| **6 Market success factors** |  |  |
| * 6a Purity |  |  |
| * 6b CRM (where relevant) |  |  |
| * 6c Evidence of demand |  |  |
| **7 Existence of relevant product standards** |  |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  |  |
| **9 Low expected environmental/ human health impact** |  |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  |  |

# **WEEE (specific stream after pre-treatment)**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | WEEE |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | About 1.3 Mt WEEE plastic collected in the EU. About 560.000 t recycled and converted to granulate. Main target WEEE plastics recycled are PE, PP, HIPS and ABS. | | Sofies (2020). https://www.bsef.com/wp-content/uploads/2020/11/Study-on-the-impact-of-Brominated-Flame-Retardants-BFRs-on-WEEE-plastics-recycling-by-Sofies-Nov-2020-1.pdf |
| **2 Number of identified uses** | All recovered metals all have their own markets and the recycled plastics (potentially some 50 % of the plastics used in EEE products) are currently already (at least partly) used new EEE applications. | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** | From collection point to recycler is one waste shipment, From recycler to end-processor a second and there can be various steps in between. So if there are 30 Mio MTs of WEEE over the last 3 years, this results in several times this volume in terms of shipments much of it cross border | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) | Waste Electrical & Electronic Equipment (WEEE) (plastics: a.o. ABS, PS, PE, PP; metals; critical raw materials; other component materials) | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** | Secondary raw materials produced out of WEEE should comply with REACH (and RoHS if applied in EEE) only. Any secondary raw material should promise chemical compliance to REACH and for electronic appliances RoHS and given that compliance the environmental risks of re-introduction of materials from WEEE is non-existent. REACH (RoHS) compliance should be the only criterion for re-introduction of secondary raw materials into the loop. | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **Biological materials (not covered by the Fertilising Products Regulation (EU) 2019/1009)**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Biological materials - Please define which material this should be; add tables if necessary for multiple biological materials |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** |  | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |

|  |  |  |
| --- | --- | --- |
| **5 Exports outside the EU** |  |  |

|  |  |  |
| --- | --- | --- |
| **6 Market success factors** |  |  |
| * 6a Purity |  |  |
| * 6b CRM (where relevant) |  |  |
| * 6c Evidence of demand |  |  |
| **7 Existence of relevant product standards** |  |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  |  |
| **9 Low expected environmental/ human health impact** |  |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  |  |

# **Paper**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Paper |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** | Repulping in paper mills to produce recycled pulp. Recycled pulp is then used mostly on-site to produce recycled paper.  Recovered paper is worldwide used as a secondary raw material for the production of paper and board. In 2019, Europe utilized 48.9 MT recovered paper out of which 11.3Mt recovered fibers were traded within Europe and 8.8 Mt structural surplus was exported to papermills outside Europe | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** | the waste shipment (volume/weight) of the (potential) secondary raw material within the EU 27 (last 3 years): 12000000 (*unit unknown)*  Within the EU, waste shipment regulations regarding Annex VII are often interpreted differently. Additionally, countries like Italy and Spain as well as the German states Bavaria and North Rhine-Westphalia have already enacted national end-of-waste legislation which often leads to interpretation conflicts with other European countries. | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand | The demand in the EU (including UK) + NO + CH was 50,7 million tonnes in 2019. The demand for by-productsis stable and growing in line with the need to secure raw materials that are sourced in Europe coupled with the switch from fossil-based materials to renewable low-carbon alternatives  all MS except for MT | |  |
| **7 Existence of relevant product standards** | There is currently no harmonization of the status for recovered paper as secondary raw material in Europe despite a harmonized quality standard (EN 634). When shipping recovered paper from the Netherlands (=waste) to Bavaria (= end-of-waste) in Germany, the status of the recovered paper changes four times [route through North Rhine-Westphalia (=end of waste) & Hesse (=waste)]. | |  |
| **8 Existing national/regional EoW and/or by-product criteria** | Some countries have introduced EoW status for paper for recycling. Shipments of paper for recycling between countries where this material has different waste/EoW status has led to administrative fines for transporters due to shipping documents (WSR Annex VII)  Within the EU, waste shipment regulations regarding Annex VII are often interpreted differently. Additionally, countries like Italy and Spain as well as the German states Bavaria and North Rhine-Westphalia have already enacted national end-of-waste legislation which often leads to interpretation conflicts with other European countries. | |  |
| **9 Low expected environmental/ human health impact** | Not likely to contain SVHC | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **Ferrous slags**

## **2.1 Iron and steel slag**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Iron and steel slag |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** | It has been claimed that the uses of the ferrous slag are an environmentally valuable alternative to virgin raw materials. | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** | The ferrous slag is shipped between MSs when the distance to be covered by the shipment is below a certain range, i.e. economic viability of the ferrous slag use dependent on transport costs. | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand | Request depends on local market conditions, which vary throughout MS's; ferrous steel slag is widely used in EU in civil engineering works. : Ferrous steel slag is used as follows (data Euroslag 2018): - Road construction: 51.1 % - Cement and concrete: 4.0 % - Hydraulic engineering: 1.0 % - Fertilizer: 3.4 % - Metallurgical use: 9.8 % - Miscellaneous uses: 3.9 % - Deposit and interim storage: 26.8 %  The market of the ferrous slag is composed by different segments (applications). More precisely, the ferrous slag replaces virgin resources in applications such: cement production; natural aggregates; fertilisers (liming); and more in general as construction material in place of natural stones or components for construction products | |  |
| **7 Existence of relevant product standards** | National regulations regarding (the release of) dangerous substances.  There are many European standards that technical regulate the today’s use of slag in the construction and engineering. Most relevant standards for EAF C slags are EN 13043:2002 and EN 13043:2002/AC:2004 (Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas) and EN 13242:2002+A1:2007 (Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction). | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** | Ferrous slags are REACH registered as UVCB  Ferrous steel slags are fit for circular use, as they are registered under REACH as a non-dangerous substance and they fulfill the SQD limit values  The EAF C slag is classified as a by-product in accordance with EU-REACH regulation.  The ferrous slags are REACH registered as UVCB. | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **Copper slags**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Waste / material** | | Copper slags |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** | |
|  | | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | | 3.500.000 t/yr copper final slag generated | | European Copper Institute. |
| **2 Number of identified uses** | | Iron silicate is purposefully produced through copper (Cu) production in terms of process technology, operation and quality | |  |
| **3 Market value of by-product/waste, total €** | |  | |  |
| **4 Intra EU shipments** | | : Shipment between MSs is nearly non-existent due to national differences in interpretations of by-product criteria | |  |
| **5 Exports outside the EU** |  | | |  |
| **6 Market success factors** | |  | |  |
| * 6a Purity | |  | |  |
| * 6b CRM (where relevant) | |  | |  |
| * 6c Evidence of demand | |  | |  |
| **7 Existence of relevant product standards** | |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** | | Different requirements and corresponding certification of resource are adopted in different Member States, which may result in conflicting status and no shipment between Member States (e.g. Belgium and the Netherlands). Finland has a different consideration, as a waste. For other members is a By- Product. | |  |
| **9 Low expected environmental/ human health impact** | | Complies with REACH regulation, safe use is documentary exposure assessment carried out. The substance does need the classification criteria according to CLP regulation. The following identifiers have been used for registration under REACH: “slag, copper smelting” (EC 266-968-3) and a boundary composition defined and applied jointly by the European copper industry. | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** | |  | | |

## **3.1 Iron silicate**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Iron silicate |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** | As engineered mineral, replacing virgin ones in various uses, iron silicate is comparable to natural minerals from quarries. It can serve as sustainable substitute of choice for scarce natural aggregates, and is used in various applications e.g. in the form of substitute for primary building materials, in road construction, hydraulic engineering, cement, concrete & other applications | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** | Iron silicate is considered as by-product in Germany and shipped to several Member states such as BE, DK, FI, LT, NL, Spain, Norway, Sweden, Greece, Luxemburg, UK. Iron silicate is considered as waste in Belgium and Bulgaria, which makes shipment to other Member states difficult.  Shipment between MSs is nearly non-existent due to national differences in interpretations of by-product criteria.  Current transboundary shipment is limited and rather by exceptional case, the largest amounts being used within the specific member states. The main barrier for shipment between Member States is the nonharmonized interpretation of the product status among Member States / local authorities. To promote the EU market, transboundary hurdles need to be overcome. | |  |
| **5 Exports outside the EU** |  | |  |
| **6Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand |  | |  |
| **7 Existence of relevant product standards** | Iron silicate is covered by the EN standard for concrete EN 12620-1 ‘Aggregates for concrete’. | |  |
| **8 Existing national/regional EoW and/or by-product criteria** | Barriers towards increasing the valorisation potential of final slags are the different interpretation of by-product vs. waste status and inconsistent single case decisions, as well as differences in regulations and standards at Member State level for construction materials.  The main barrier for shipment between Member States is the non-harmonized interpretation of the product status among Member States / local authorities. To promote the EU market, transboundary hurdles need to be overcome. | |  |
| **9 Low expected environmental/ human health impact** | Safe use of iron silicate through the whole life cycle is demonstrated by substantial testing and REACH registration (joint submission by EU copper industry , “slag, copper smelting” (EC 266-968-3) )  The safe use of final slags during whole life cycle is demonstrated through REACH. . Final slags as substances are registered under REACH and exposure scenarios guarantee the safe use during manufacturing, service life and end-oflife phase.  The following identifiers have been used for registration under REACH: “slag, copper smelting” (EC 266-968-3) and a boundary composition defined and applied jointly by the European copper industry. | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **Bauxite residue (from alumina production)**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Bauxite residue |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** | 7.000.000 t/yr produced. 200.000 t/yr recycled | |  |
| **2 Number of identified uses** | There are 2 main uses in the cement industry: 1) as a clinker raw meal substitute in ordinary Portland cement (OPC) or 2) as a Supplementary Cementitious Materials (SCM). A recent technology roadmap developed by the International Institute describes such potentials (see “IAI Technology Roadmap for Maximising the use of Bauxite Residue in Cement” ). | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand | 2 MS | |  |
| **7 Existence of relevant product standards** |  | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **9 Low expected environmental/ human health impact** | low SVHC content | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **FGD – flue gas desulphurisation gypsum and plasterboard**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | FGD |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** | Recovered materials are primarily used for the manufacturing of new plasterboard or other gypsum products. In the case of recycled gypsum, this is the prioritised application for the recovered materials. The general split of gypsum consumption in Europe (which aggregates natural, FGD and recycled sources of gypsum) is as follows: Plasterboard and plaster products (77%), cement (17%) and agriculture (6%). The targeted markets are within the EU – and generally local. In total, we estimate that a yearly 18-19 million tonnes of natural gypsum is substituted mainly by FGD gypsum (see "by-product" section of the survey) and to a lesser extent (583,000 t) by recycled gypsum waste. | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |
| **5 Exports outside the EU** |  | |  |
| **6 Market success factors** |  | |  |
| * 6a Purity |  | |  |
| * 6b CRM (where relevant) |  | |  |
| * 6c Evidence of demand | Demand: all MS | |  |
| **7 Existence of relevant product standards** | Together with the European power industry, Eurogypsum has developed quality criteria for FGD gypsum, based on which each company defines its own quality standards. | |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  | |  |
| **8 Low expected environmental/ human health impact** | Low SCHV content | |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | | |

# **Mill scale waste (from steel production) – as by-product**

**INDIVIDUAL WASTE / MATERIAL FICHE TEMPLATE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Waste / material** | Mill scale |  |  |
| **Do you consider this waste or material stream to be relevant for EoW or rather for by-product criteria?** |
|  | **Information/data** | | **Source / origin** |
| **1 Current recovery, recycling and collection rates or generated/ used material amounts** |  | |  |
| **2 Number of identified uses** | Mill scale is a very valuable metallurgical raw material as it contains about 65 to 70% iron and due to its chemical, mineralogical and physical properties. Although precise composition may depend on the type of steel being produced, it can be used for the production of steel, cement or as additives for agglomerates. These applications will significantly contribute to savings of other raw materials like limestone and iron ore, and the associated environmental impacts the extraction of these raw materials may involve (energy consumption, impacts associated to mining processes, etc.). The consideration of mill scale as a byproduct (instead of waste or EoW) will promote its secondary use in the market and will avoid current existing administrative burdens. With the objective of promoting the circularity of several secondary materials, and thus the contribution to the overall circular economy, this option should be boosted. | |  |
| **3 Market value of by-product/waste, total €** |  | |  |
| **4 Intra EU shipments** |  | |  |

|  |  |  |
| --- | --- | --- |
| **5 Exports outside the EU** |  |  |

|  |  |  |
| --- | --- | --- |
| **6 Market success factors** |  |  |
| * 6a Purity |  |  |
| * 6b CRM (where relevant) |  |  |
| * 6c Evidence of demand |  |  |
| **7 Existence of relevant product standards** | The applicable rules / standards for the use of mill scale are diverse, as the applicability restrictions of the mill scale in general (both the consumed in Spain and the shipped to third European countries) depend on the Company standards of the purchasers of the material (which will depend on the final use of the mill 20 scale). Although the standards used by different Member States (MS) are the same (as the technical regulation does not prejudice the categorization of the mill scale, but its performance), different rules exist among different MS and among different final users (they may apply diverse limits such as leaching limits). It shall be considered that the applicability rules will directly affect potential shipment limitations. |  |
| **8 Existing national/regional EoW and/or by-product criteria** |  |  |
| **9 Low expected environmental/ human health impact** | Mills scales are registered by the Spanish steelmaking companies under REACH and are not considered as hazardous under CLP. |  |
| **Other policy considerations (if this material should be considered for by-product criteria, please provide evidence to support the fulfilment of the conditions from Art. 5 §1(a)-(d) of the Waste Framework Directive)** |  | |