Vision on technology for a better world

Subject: Solicitation of Comments on the Draft Guidance for the Application of the United Nations Framework Classification for Resources for Mineral and Anthropogenic Resources in Europe, of March 8th, 2022 (Ref.: 2022/SED/14)

Introduction

VITO is an independent Flemish research organisation in the area of cleantech and sustainable development. Our goal is to accelerate the transition to a sustainable world. Our research unit Sustainable Materials Management provides applied research and policy support in a global and European context, to public authorities and companies. Our activities take place in an inclusive and collaborative environment that relies on an open network of relevant stakeholders on the topics of sustainable materials management, product life cycles and circular economy. We help companies to close loops and develop and evaluate technologies. We support the design and implementation of effective waste management policies and demonstrate that higher-quality products can be made using fewer resources and that waste streams can be better valorised.

Since 2014, VITO coordinates the **European Topic Centre on Circular Economy**, a consortium of European institutions contracted by the European Environment Agency (EEA) to supply thematic expertise and carry out specific tasks identified in the EEA Multi-Annual Work Programme (MAWP). VITO was part of the pan-European Expert Network '**Mining the European Anthroposphere**' (COST Action MINEA) and actively contributed to the development of the new framework for classifying raw materials from secondary sources, such as mine tailings, buildings, infrastructure, consumer goods, and all sources from the material life cycle stages, including production, use and end-of-life. VITO is currently a partner in the consortium for the Horizon Research and Innovation Action '**Future Availability of Secondary Raw Materials**', acronym FutuRaM.

Generic comments

The objectives of the Guidance include the facilitation of Regional European resource management, enabling and supporting coherent and consistent regional resource management policies and associated regulations at European level (p. 4).

In that context, the European sustainability policy includes the new circular economy action plan (CEAP), adopted in March 2020, as one of the main building blocks of the European Green Deal, Europe's new agenda for sustainable growth. In the context of circular economy, a categorization system has been proposed[1] that consists of 14 circular categories, that aim to contribute to increasing resource efficiency and decreasing environmental impacts throughout value chains by applying or enabling one or more of the so-called 9 circular economy 'R' strategies or principles, referred to as the 9 R's, only one of which refers to material recycling. Consequently, these categories include the following:

[1] European Commission, Directorate-General for Research and Innovation, Schempp, C., Hirsch, P., *Categorisation system for the circular economy: a sector-agnostic categorisation system for activities substantially contributing to the circular economy*, Publications Office, 2020, https://data.europa.eu/doi/10.2777/172128

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- *'2.a Reuse, repair, refurbishing, repurposing and remanufacturing of end-of-life or redundant products, movable assets and their components that would otherwise be discarded*
- *2.b Refurbishment and repurposing of end-of-design life or redundant immovable assets (buildings/infrastructure/facilities)*
- *3.a Separate collection and reverse logistics of wastes as well as redundant products, parts and materials enabling circular value retention and recovery strategies*
- *3.b Recovery of materials from waste in preparation for circular value retention and recovery strategies (excluding feedstock covered under 3.c)*
- *3.c Recovery and valorisation of biomass waste and residues as food, feed, nutrients, fertilisers, bio-based materials or chemical feedstock*
- *3.d Reuse/recycling of wastewater'*

The main objective of the circular economy is to increase sustainability by avoiding the extraction of primary resources from nature, by preserving, as long as possible, the functionality of those materials and products that are already in use. At the inevitable point where the functionality is lost, we will preferably use the anthroposphere to obtain the resources required for the restitution of the lost functionalities.

It is therefore our conviction that the classification of anthropogenic resources should explicitly refer to the so-called '**inner circles**'[2] of the circular economy in which the functionality of, preferably, whole products that were (close to being) discarded, is recovered, in priority followed by functional product parts and components, substances and mixes of substances, alloys, composite materials, high grade metals and minerals, and, in particular cases, chemical elements.

Regarding the **waste hierarchy**, we recognize that the hierarchy has been an extremely useful and relevant tool for improving waste management. The hierarchy ranks waste treatment options applicable to waste materials, with the aim to at least recover as much as possible materials from waste. In a circular economy however, this conventional materials perspective is substituted by a products perspective[3]. In a circular economy, the recovery of materials from collected discarded products is the least preferred option, that should be restricted to those circumstances in which product functionality cannot be recovered at a higher level of product structure. This means that for exploiting that part of the urban mine that consists of discarded products, buildings and infrastructure, all different waste treatment options considered in the waste hierarchy will be relevant, as partly anticipated in the section of the Guidelines that refers to the waste hierarchy (p. 29).

[2] European Environment Agency, Gillabel, J., Manshoven, S., Hoogeveen, Y., et al., *Paving the way for a circular economy: insights on status and potentials*, Publications Office, 2019, https://data.europa.eu/doi/10.2800/383390

[3] European Environment Agency, Gillabel, J., De Schoenmakere, M., *Circular by design : products in the circular economy*, Publications Office, 2017, https://data.europa.eu/doi/10.2800/860754

Comments on the text of the Guidelines

Number	Page	Text	Comments/questions
1	29	Anthropogenic Material The physical matter without any attribution from a social, environmental, economic, legislative, perspective, and without a specification of the aggregate state (solid, liquid, gaseous).	Can you explain the relevance of including this reference to the aggregate state?
2	29	Anthropogenic materials include, for instance, mineral materials, sewage sludge, biomass, and off-gas.	We suggest to explicitly add reference to discarded products instead of referring to materials only (see 'Generic comments'): *Anthropogenic materials include discarded products, buildings and infrastructure, discarded product and infrastructure parts and components, as well as substances and mixes of substances, alloys, composite materials, metals and minerals, and chemical elements, that can be recovered from any of a product's life cycle stages, including mining, harvesting, production, use and end-of-life treatment*.

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3	15	Mineral and anthropogenic specifications applicable to E axis Categories	We suggest adding a reference to the Taxonomy Regulation in force, that establishes the basis for the EU taxonomy by setting out 4 overarching conditions that an economic activity has to meet in order to qualify as environmentally sustainable. Moreover, within the framework of the Taxonomy Regulation, the Technical Expert Group (TEG) on sustainable finance was asked *'to develop recommendations for technical screening criteria for economic activities that can make a substantial contribution to climate change mitigation and adaptation, while avoiding significant harm to the four other environmental objectives (sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention control, and protection and restoration of biodiversity and ecosystems).'*
4	36	Anthropogenic Material Process A process is defined as the transformation, transport, or storage of materials. Depending on the location of the process, a process is further defined as Anthropogenic Material Process or Environmental Material Process.	The proposed distinction based on the location of the process seems ambiguous and probably unnecessary. Can be added why/how the process definition would be location depending?
5	36	In waste management, for example, transformation and storage takes place in terms of "reuse" "recycling recovery" (preferred) and "disposal.	Resource extraction from the anthroposphere often implies combining different treatment levels as presented in the waste material hierarchy (see 'Generic comments'). E.g., the process of recycling always will inevitably lead to sorting and recycling residues that can be used for energy recovery or that have to be disposed of. Reusable functional components can be obtained from e-waste dismantling, while the rest of the device is further processed to recover composite materials, non-ferrous metal alloys and recycling residues with high calorific value. Therefore, with regard to the discarded appliance, the process cannot be unambiguously categorized as 'recycling', 'reuse' or 'disposal'.

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6	27	Mining Methods There are numerous conventional and unconventional mining methods, which could be utilized to exploit mineral resources. Each has its pros and cons depending on situation-specific characteristics like deposit type, ore morphology, mineralization style, mineralization depth, rock mechanics, safety, geopolitical factors, infrastructure, economics etc.	We suggest considering an analogue and equivalent section under the 'UNFC for Europe Anthropogenic Resources Guidelines' chapter, as to solve the issue raised in our comment #5. Different recovery techniques from mining and production wastes could be listed, as well as the main categories of waste collection, sorting, recycling, and energy recovery technologies. Recent literature is available that establishes conceptual analogies between geological and anthropogenic mining[4].

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[4] Mueller SR, Wäger PA, Widmer R, Williams ID. A geological reconnaissance of electrical and electronic waste as a source for rare earth metals. Waste Management (New York, N.Y.). 2015 Nov; 45:226-234. DOI: 10.1016/j.wasman.2015.03.038. PMID: 25957937; Lederer, J., Šyc, M., Simon , F., Quina, M. J., Hyks, J., Huber, F., Funari, V., Fellner, J., Braga, R., Bontempi, E., Bogush, A., & Blasenbauer, D. (2020). What waste management can learn from the traditional mining sector: towards an integrated assessment and reporting of anthropogenic resources. Waste Management, 113, 154-156. https://doi.org/10.1016/j.wasman.2020.05.054