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URBAN MINING AND LANDFILL MINING

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In recent years, the metaphors of *urban mining* and *landfill mining* have received increasing international recognition. Various authors, particularly in the field of industrial ecology, have pointed out the relevance of anthropogenic material stocks for modern societies. According to them, reclaiming parts of these stocks must involve concepts and activities that go beyond waste recycling as currently practiced. These concepts and activities have been summarized under the term *urban mining*. However, the current use of the term urban mining by some researchers as a fancier *21st-century-substitute* of old-fashioned terms like *waste recycling* has also created some discomfort in the community. Thus, one of the first questions to answer is, to which anthropogenic resources can the term urban mining be applied to, and also which processes or activities (e.g. product design, collection, recycling technologies, …) are to be included within the concept of urban mining? Another question of relevance is the use-status of anthropogenic material stocks. While some of them are actually in use (e.g. most buildings), making a utilization of materials in these stocks unlikely in the foreseeable future, other anthropogenic material stocks are currently out of use by humans. This particularly counts for old landfills, which lead to increasing activities of research groups, but also practitioners, to investigate the potential to extract *secondary raw materials* from these types of *anthropogenic stock resources* by so-called *landfill mining*. Research groups working in this field are very active, and have published a lot on

i) methods for the prospection and exploration of secondary raw materials in landfills on different scales, from individual landfills to all landfills on national level;
ii) technologies to extract different types of secondary raw materials and other resources (land, energy) from landfills;
iii) economic and ecological (LCA) evaluation of landfill mining projects.

These studies have increased the knowledge and understanding of landfill mining as a function in a circular economy, and subsequently also lead to new questions, such as (selection):

i) Which methods of exploration and prospection (document-based vs. drilling vs. geo-physical methods) are required and applicable in which mining step, particularly considering the cost effectiveness of the method?
ii) Which technologies for processing of secondary raw materials from landfill mining are the most suitable and applicable (e.g. waste incineration vs. plasma technology)?
iii) Which items have to be considered in cost-benefit analysis (e.g. positive value of land acquired through reclamation vs. negative value through impairment of resident population and their economic activities during excavation) or ecological impact assessments (assumed length of landfill aftercare without landfill mining)?

These and other issues are to be discussed not only with different stakeholders in society, but also within scientific groups and fields. Good venues therefore are the Sardinia Landfill Symposium and particularly the Bergamo Symposium on Urban Mining, both organized by the IWWG. In order to built-up a platform behind venues like the mentioned ones, it is inevitable to organize and form task groups within the IWWG that particularly deals with the issues of Urban Mining and Landfill Mining. This workshop can thus be seen as the kick-off to form such a task group. Whether it will be

one task group on both, Urban and Landfill Mining, or two task groups on both topics, will be a result of the workshop.

Introductory lectures:

V.S. Rotter, S. Downes, J. Huisman, P. Wäger, D. Cassard (DE)
ProSUM - Prospecting secondary raw materials in the urban mine and mining waste – Data sources and data requirements
A. Winterstetter, D. Laner, H. Recheberger, J. Fellner (AT)
Evaluating and classifying landfill mining in analogy to natural deposits
K. Kuchta (DE)
Mining critical metals in e-waste and incineration slags/ashes