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„UNITED NATIONS FRAMEWORK CLASSIFICATION FOR FOSSIL ENERGY AND MINERAL RESERVES AND RESOURCES 2009" – HOW DO ANTHROPOGENIC RESOURCES FIT IN?

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The question to be answered in this study is how anthropogenic resources can be fit into the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009), a classification system, which had originally been created for geogenic resources. Operating under ECOSOC Decision 2004/233, the UNECE's global work on the UNFC is carried out by the Expert Group on Resource Classification. UNFC-2009 is designed to address the needs of four groups of stakeholders: analysts of international energy and mineral resources, governments, the industry and the financial community to provide the information necessary to allocate capital appropriately.

After drafting an initial operative evaluation procedure aiming at classifying recovered materials from an old landfill under UNFC-2009, it became evident, that specific quantifiable criteria need to be defined in accordance with the axes and classes of UNFC-2009. Hereby it is essential to understand the role of modifying factors, i. e. relevant aspects to turn a specific material deposit into a "resource" (reasonable prospects for economic extraction in the foreseeable future) or a "reserve" (current economic extraction possible). Modifying factors include various aspects such as technical developments, e. g. in separation technology, market prices, laws and regulations and ecological and social considerations. Those factors differ for the evaluation of anthropogenic resources compared to geogenic resources or have at least different priorities. To obtain a comprehensive overview of potentially extractable anthropogenic resource inventories, the heterogeneous nature of anthropogenic resources, i. e. mining various specific materials from different sources, must be thoroughly analyzed. Modifying factors vary, for instance, along the lines of "stocks" vs. "flows". A literature review identifies the main drivers and obstacles, when recovering resources from old landfills, as an example for mining anthropogenic stocks, and resources from waste electrical and electronic equipment (WEEE), as an

example for mining anthropogenic flows. To refine the preliminary evaluation procedure under UNFC-2009 suitable criteria for quantifying the contribution of individual modifying factors to the different UNFC-2009 axes “knowledge on composition”, “socioeconomic viability” and “project / technical feasibility” are defined.

Creating a meaningful basis for comparing anthropogenic resources with geogenic mineral resources will facilitate decision-making for political and private business stakeholders and so promote the use of anthropogenic resources. The systematic integration of anthropogenic resources into UNFC-2009 will also improve the estimates of global total resources stocks and their extractable fractions by considering various boundary conditions, allowing for consistent comparisons between countries’ total geogenic and diverse anthropogenic inventories.