Workshop on Material Flows and Environmental Impacts associated with Massive Consumption of Natural Resources and Products
November 17, 2006,
EPOCHAL TSUKUBA, Takezono, Tsukuba, Ibaraki, Japan

Hidden material flows by extraction of natural resources

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Abstract

Ore-TMR(Total Materials Requirements) and Ecological Rucksack are the similar concept to express the amount of hidden materials flows by extraction of natural resources from the litho- and eco-sphere. The term of “hidden material flow” was used in the international collaboration of resource flow analysis in 1990’s and defined that the portion of the total material requirement that never enters the economy. While these flows never enters the economy in those days of waste treatment of soils and waters were not completed, the amount of the total material which is mined and treated becomes to give important effect on the economy in these days with environmental considerations. Then we should rename it as “Total Ingest Material from nature” and should refine as the total amount of natural material which is ingested into techno-sphere and need treatment to return to eco-sphere.
In this presentation, the estimation method of ore-TMR and its application to material flow analysis are introduced. In the application to MFA on recycling, TMR consideration clearly shows the effective material flow than conventional weight flow. TMR consideration also gives the information of rare metals’ content in products. This information is available to give guideline of resource productivity. Most important advantage of TMR consideration is to be able to compare any products which include various values of resources with the same resource parameter. Resource parameter should be one of three important parameter of sustainability: 天地人(tian, di, ren : heaven, earth and being) according to ancient Chinese Wise.