CALL FOR PAPERS FOR A NEW SPECIAL ISSUE IN THE JOURNAL OF CLEANER PRODUCTION (JCLP)

Urban and Landfill Mining: Emerging Global Perspectives and Approaches

Over time, massive amounts of material resources have been extracted for infrastructure and product development. The resulting accumulation has presented serious environmental challenges such as problems related to disposal and pollution. But these so-called urban stocks could also be important resource reservoirs in the future. In the case of particular metals, for example, stocks in the built environment and in our millions of landfills are already of comparable size to “virgin” reserves.

There are numerous opportunities for replacing traditional mining processes with “urban mining” techniques which emphasize the extraction of obsolete resources situated in buildings, infrastructure and other durable goods. Illustrative examples of potential sources of such resource stocks include old water supply systems, power and transportation networks, buildings and military structures that are out of service without having been brought back into the circular flow of materials.

In Sweden, for example, it has been found that one such hibernating stock, obsolete power cables buried in the ground, contains four times more copper than that which is consumed domestically annually. Urban mining also involves encouraging people to recycle their out-of-date electronic gadgets and other obsolete products. Old electronic devices such as cell phones and computers contain precious metals such as gold, silver, iridium and a range of other valuable materials that can be recaptured for reuse.

Another emerging approach is ‘landfill mining’ which involves the extraction, processing, treatment and/or recycling of materials that have been dumped in informal waste dumps and in structured landfills. The main objectives of such initiatives have thus far been conservation of landfill space, reclamation of land and remediation. A new trend is however, to consider these landfills as “alternative mines for materials and energy resources.” This type of research is still in an emerging phase. Also integration of regional/urban/exurban sustainability plans into the rehabilitation and future multi-functional uses is an asset to consider in regional sustainability initiatives.

In this special issue of the Journal of Cleaner Production (JCLP), contributions are being invited that cast light on these issues, and which, provide an overview of the ‘state-of-the-art’ knowledge and research of urban and landfill mining. What policies must be in place for the facilitation of urban mining? What technologies are needed for ecologically and economically sound recovery of valuable materials? What can be done with currently generated urban wastes so that they are directly incorporated back into the closed materials loops and not place in such landfills in the first place. The editors of this special issue invite comprehensive literature reviews of this entire field as well as theoretical and empirical contributions, which address one or more of the following questions:
- **What are the incentives and drivers for local governments and material’s recovery companies to engage in landfill and/or urban mining?** The economy is an important driver for change of course. What are the roles of changing conditions through increasing prices for virgin materials? How could different stakeholders such as local, regional and national governments, landfill owners, infrastructure managers, individuals and recycling companies develop collaboration? In order to be sustainable, initiatives must also embrace concepts such as ‘Cradle2Cradle,’ sufficiency, and industrial symbiosis. Are there new markets and employment opportunities for the landfill and urban mining activities as well as for the rehabilitation of the mined landfills? Is the need for new peri-urban space providing incentives for landfill mining?

- **What is the potential of landfill and urban mining?** Explorative research shows that there is huge potential for landfill and urban mining. But more detailed regional and commodity studies are needed. How much of the urban material’s stocks are available for recovery in the short and long-term perspective? It is also relevant to know the distribution, quantities, and value of those stocks in the built environment.

- **What state-of-the-art technologies are available for landfill and urban mining?** What improved technologies can be deployed to detect, extract and process material resources located in landfills & in the built environment? What materials can be separated, recovered and refined at what quality levels? Do existing technologies require further modifications, and if so what are the barriers to the essential innovations in such technologies? Also, are network approaches on the basis of industrial symbiosis feasible as private and public owners of landfills will seldom have the equipment and skills for such mining processes? Will traditional mining companies become interested in applying their skills, financial resources and technologies to focus upon these emergent mining opportunities? Will smelter operators become involved in finding new ways of processing urban ores?

- **What are the environmental and human health impacts of landfill and urban mining?** It is obvious that these approaches could contribute to the conservation of natural resources. The large volume of materials that are in landfills or in the built environment could be reused and recycled, and can serve as substitutes for virgin materials. Such activities will however cause a wide range of environmental impacts on the local, regional and global scales. At the same time, landfill mining can solve current and prevent future environmental problems caused by dumps and landfills. What are the net impacts from a systems perspective? Do we need standards for recovery, environmental, worker health and safety aspects for the processes of extraction and use of materials and for the management of the residues that are left after the currently useful materials have been extracted? What human health risks must be addressed in the process of such urban mining and in the rehabilitation phases after such mining has been completed?

- **How can governments facilitate changes in this area?** Legislation can be both a driver and barrier for change. What safety, regulatory and administrative issues must
be addressed? Is the facilitation of the development, testing and wide-spread utilization of high-quality educational and training materials for these topics desirable or essential?

How to submit?

Authors are invited to submit their contribution sending a full article using the EES system (http://ees.elsevier.com/jclepro/) before November 10, 2010.

Prospective authors are invited to discuss their research and possible contribution to the special issue during the Session Industrial Symbiosis, Eco-industrial Parks and Resource Recovery in the joint ERSCP/EMSU conference entitled Knowledge collaboration and learning for sustainable innovation that will be held in Delft, the Netherlands, October 25-29\textsuperscript{th}, 2010.

All papers will be subjected to independent peer review. After the review and revision process is completed, all accepted papers will be published in a special issue of the JOURNAL OF CLEANER PRODUCTION in 2011.

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