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Tar-containing reclaimed asphalt–environmental assessments for two treatment scenarios (incineration versus recycling)

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Life Cycle Assessment analysis was carried out in order to evaluate quantitatively the environmental burdens related to two possible treatment scenarios for tar-containing reclaimed asphalt pavements. About 4500 tons of this hazardous waste material was obtained during the reconstruction of the runway at Ljubljana Airport. According to the first scenario, this material could be transported to a suitable incineration plant where the hazardous compounds would be decomposed. According to the second scenario, it could be treated as a recycled aggregate, and used for the production of lean concrete for different civil engineering applications, in which case 40 wt. % of the natural aggregates would be replaced by reclaimed asphalt. The hazardous Polycyclic Aromatic Hydrocarbons would be immobilised in the concrete. The results of LCA analysis showed that the incineration scenario has an especially significant impact on energy consumption, as well as on Abiotic Depletion Potential and Global Warming Potential. The reason for this can be found in the energy needs at the incineration plant for the maintenance of high combustion temperatures, since the net generation of energy is low during the incineration of low calorific reclaimed asphalt. In the case of the recycling scenario, the results of the study showed only a slight burden or even a benefit for all of the studied environmental indicators. This is a direct consequence of the reduced extraction and production of natural aggregate.

Biography

Janez Turk has completed his PhD in year 2010 at University of Nova Gorica (Slovenia). He worked on different fields of environmental sciences. From the year 2012, he is employed at Slovenian National Building and Civil Engineering Institute, where he made a specialization for Life Cycle Assessment (LCA). One of his main interests is LCA studies with regard to recycling of construction and industrial wastes and management alternatives of different waste materials.

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