METU Environmental Engineering
Departmental Seminar Spring 2023

ASSESSMENT OF THE WATER-CENTRIC CIRCULAR ECONOMY MODELS IN ECO-INDUSTRIAL PARKS WITH WATER-ENERGY-FOOD-ECOSYSTEM NEXUS APPROACH

The effects of industrial parks on the environment are quite high. Resource use, including energy and water, CO_2 emission, wastes and discharges create pressure on the environment. There are various methods to make this situation more sustainable by exchanging of materials, energy, water and by-products and reducing resource extraction. Circular Economy, recommended by the EU Green Deal, is one such methods. Definition of Circular Economy comprises maintaining resources in use for as long as feasible, extracting maximum value from them, and then recovering, renewing, and reusing of resources. The Circular Economy substitutes the linear take-make-waste economic paradigm with a closed-loop system that reduces waste, pollution, and emissions. Also, there is a strong connection between water, energy, food and ecosystem which is called Water-Energy-Food-Ecosystem Nexus. In the context of Water-Energy-Food-Ecosystem Nexus, the word nexus refers to how these components are intimately interconnected, with actions in one policy area having a shared influence on the others, as well as on the ecosystems. The purpose of this study is to propose and assess various water-centric Circular Economy models and scenarios to move industrial parks away from linearity in water use and turn them into eco-industrial parks, taking into account the concept of a Circular Economy. Reuse, recycle and reduce principles are some of the Circular Economy principles. In this study, by using these principles in water, some Circular Economy models will be developed within or between industries. These water-centric Circular Economy models will be evaluated by integrating the concept of Water-Energy-Food-Ecosystem Nexus and using indicators that will best describe the character of the system. These Key Performance Indicators can be divided into three subgroups: environmental, economic and social. The examples of them can be water use, water productivity, level of water stress, use of primary energy, energy productivity, recycle rates, food waste, food security, social inclusion, gross value added, net revenues from the reduced water abstraction from the waterworks and so on.

Advisor: Doç.Dr. Emre ALP

Date: 22.03.2023

Time: 15:40

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