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Special Lecture

“International Cooperation and Development of the Sustainable Cities of the Future - Focusing on Water/Energy Nexus”

Date: July 6, Tue.

Time: 10:00 – 12:00

Place: 11th Bldg., University of Tokyo

Lecturer: Prof. Vladimir Novotny

(Northeastern University, USA)



<Synopsis>

Cities of the Future (COTF) is an international movement, now under the auspices of the International Water Association, towards a change of paradigm of how urban areas manage comprehensively their waters, stormwater, used water, and solids. It is a response of the professional and lay/stakeholder society to challenges by population increase, global climatic changes, and current and anticipated future shortages of resources, primarily of water. The presentation will briefly describe urban metabolism, COTF framework and greenhouse gas (GHG) emissions and urban water footprints both inside the city and virtual. It will define ecocities (COFFs) and outline the pathways to achieving the sustainability goals. Specifically, two goals of (1) reducing water use by 50% and (2) zero net carbon (GHG), emissions will be discussed and the contribution of the water sector towards the net zero GHG emissions goal. Several case examples of ecocities currently planned or even built will be showcased. The change of water demand from the current high use to a sustainable use cannot be achieved by water conservation only under the current linear energy demanding water/stormwater/used water management. Further reduction of the water demand by desalination and reuse by high degree treatment (e.g., nanofiltration or reverse osmosis) contemplated by high use communities in water short areas requires a significant amount of energy and there is a limit on the maximum percent of water that can be reused in a closed water cycle. Cluster semi-distributed water delivery, reclamation and reuse with heat energy recovery will be described, followed by presenting a proposal for a regional integrated resource recovery facility (IRRF) which reclaims water for ecologic flow, irrigation and nonpotable uses, produces biogas, hydrogen, electric energy, struvite, residual organic solids for soil conditioning and sequester carbon. Synopsis of the current IWA COTF program will be presented.