



## **What is the urban water-energy-food nexus? An explanation of the concept and case study examples from Europe and China**

Davy Vanham, Bernd Gawlik, and Giovanni Bidoglio

European Commission, Joint Research Centre, Directorate for Sustainable Resources, Ispra (VA), Italy  
(davy.vanham@ec.europa.eu)

In this paper, we give a clarification what the urban water-energy-food (WEF) nexus comprises. In the literature, the WEF nexus is also identified as the WEFE (water-energy-food-ecosystem) nexus or the FEW (food-energy-water) nexus. Although the concept is very high on the scientific and policy agenda, there is amongst scholars not always a clear understanding what this nexus comprises, and how case studies should be handled. Our paper consists of two parts: 1) a clarification of the concept as well as its importance for research and policy making and 2) the demonstration of actual case studies. In the first part, we clarify the concept in a visual way. We discuss how the Sustainable Development Goals (SDGs) and the concept of planetary boundaries relate to the concept. We briefly discuss tools such as footprinting or LCA to assess the nexus for a geographical region, in this case a city. We briefly discuss solutions to solve the nexus for a city, in the framework of global planetary boundaries. In the second part, we show case studies from the recently published Urban Water Atlas of Europe, which includes large European cities like London or Berlin. We also show the case study of Hong Kong.