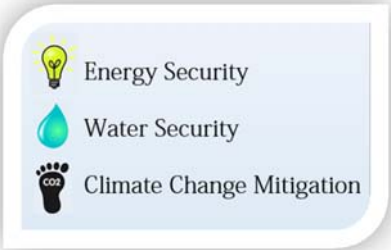
UNDERSTANDING AND QUANTIFYING THE WATER-ENERGY-CARBON NEXUS FOR LOW CARBON DEVELOPMENT IN ASIAN CITIES

WATER-ENERGY-CARBON INTERRELATIONS



Water-energy linkage has not been a priority agenda and it is being planned and managed as separate entities. As water and energy resources are becoming limited, water footprints in energy sectors and energy footprints in water sectors are increasingly being a concern in development and planning process. Hence, it underscore the need to comprehensively and quantitatively understand this interrelationship in a coherent way. The overall goal of understanding this nexus is to optimize the energy and water use for maximum benefit and sustainable growth while reducing Green House Gases (GHGs) emissions. **Cities are significant arena to study this nexus because of several reasons including, high population density, complex agglomeration of infrastructures, economy, industries, technologies and its overall dynamics.** This nexus directly influences three key contemporary policy objectives, namely, climate change mitigation, energy security, and water security.

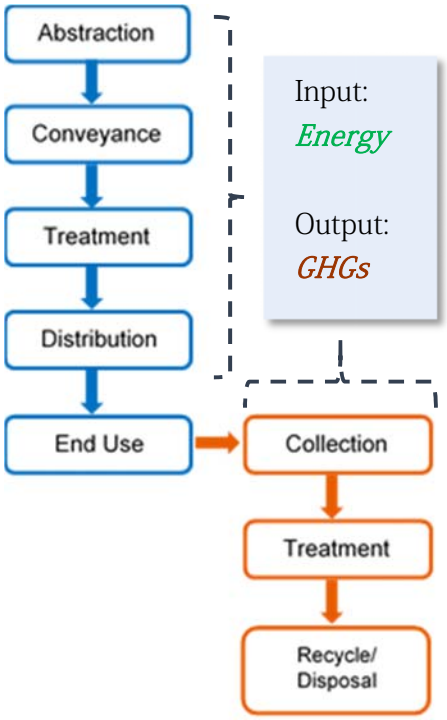
"WEC Nexus" PROJECT

This is a regional research being carried out in an interdisciplinary and comparative fashion in four Asian cities: Tokyo, Bangkok, Delhi and Kathmandu. The research activities will integrate three key dimensions: water, energy and carbon. It is being carried out in policy relevant manner for the benefit of a number of Asian cities in understanding and devising low-carbon urban development.

The major research activities are:

- Comparative case-studies of Asian cities to characterize the nature of water-energy-carbon nexus.
- Quantification of the nexus in order to show the extent of the direct and indirect importance and to illustrate the potentials of the nexus to the low carbon development in cities.
- Gauze the extent and relevancy of addressing the barrier and opportunities for optimizing the water-energy-carbon nexus.

PROJECT FRAMEWORK



Elements of Urban Water System

In context of four Asian cities, energy infrastructures are located outside their boundaries transporting energy into the cities, while all the urban water/waste water utilities are within their boundaries. Therefore, energy for water is more significant for this research than water for energy. **The water infrastructures rely on energy throughout its value chain, source abstraction, conveyance, treatment, distribution, wastewater collection, treatment and recycle/disposal. Typically fossil fuels are the primary sources of energy which produce considerable amount of carbon dioxide and other Green House Gases (GHGs) in the atmosphere.**

The case studies follow the common methodology capturing similarities and differences of issues in four cities. The framework aims to apprehend linkages, key indicators, drivers and implications of water, energy and carbon in every elements of the urban water cycle.

SPONSOR & COLLABORATION

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