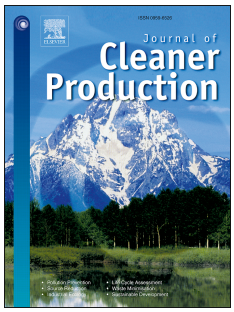
# Accepted Manuscript




Carbon Footprint Accounting in Support of City Water Supply Infrastructure Siting Decision Making: A Case Study in Ningbo, China

L. Wu, X.Q. Mao, A. Zeng

PII: S0959-6526(15)00064-5

DOI: 10.1016/j.jclepro.2015.01.060

Reference: JCLP 5137

To appear in: *Journal of Cleaner Production*

Received Date: 24 March 2014

Revised Date: 30 July 2014

Accepted Date: 11 January 2015

Please cite this article as: Wu L, Mao XQ, Zeng A, Carbon Footprint Accounting in Support of City Water Supply Infrastructure Siting Decision Making: A Case Study in Ningbo, China, *Journal of Cleaner Production* (2015), doi: 10.1016/j.jclepro.2015.01.060.

# Carbon Footprint Accounting in Support of City Water Supply Infrastructure Siting Decision Making: A Case Study in Ningbo, China

L. Wu, X.Q. Mao*, A. Zeng

School of Environment, Beijing Normal University, No. 19 Xinjiekouwai street, Beijing 100875, P. R. China

**Abstract** Consideration of the impact of climate change has penetrated urban infrastructure planning worldwide, and the water sector is no exception. This paper provides an approach to incorporate a low-carbon consideration and climate externalities into an environmental economic analysis for an urban water treatment work planning with a case study from Ningbo, China. The discounted incremental costs are calculated with carbon footprint accounting. The analysis confirms that the inclusion of GHG emission costs as a component in the techno-economic criteria affects the priority ranking for the siting options, and may lead to an entirely different decision on the siting of the water supply facility. However, these criteria should be cross-examined with a sensitivity test during the decision making process, with the discounting rate and carbon pricing level being the main sensitivity factors. This study suggests that the benchmark discount rate for the water supply infrastructure average incremental economic cost accounting should be decreased from 6% to 4.5-4.0%.

**Keywords:** life cycle analysis; carbon footprint accounting; water treatment work siting; life cycle cost

* Corresponding author. Tel.: +86 10 58807812; fax: +86 10 58807812.
E-mail address: maoxq@bnu.edu.cn (X. Q. Mao).