Accepted Manuscript

Assessing air pollution abatement co-benefits of energy efficiency improvement in cement industry: A city level analysis

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PII: S0959-6526(18)30631-0

DOI: 10.1016/j.jclepro.2018.02.293

Reference: JCLP 12240

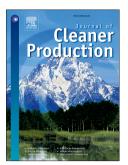
To appear in: Journal of Cleaner Production

- Received Date: 1 November 2017
- Revised Date: 22 February 2018

Accepted Date: 26 February 2018

Please cite this article as: Zhang S, Ren H, Zhou W, Yu Y, Ma T, Chen C, Assessing air pollution abatement co-benefits of energy efficiency improvement in cement industry: A city level analysis, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.02.293.

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6 7	Shaohui Zhang ¹ , Hongtao Ren ² *, Wenji Zhou ¹ , Yadong Yu ² , Tieju Ma ^{1,2} , Chuchu Chen ³
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12	
13	Abstract
14	China is the world's largest cement producer, contributing to 60% of the global total. Jiangsu
15	province takes the lead of cement production among China's provinces, contributing to 8.4%
16	of the national total cement output. In this study, a geo-graphical information system-based
17	energy model is developed to assess the potential of energy savings and associated
18	mitigation of CO ₂ and air pollutant emissions in Jiangsu's cement industry during 2015–2030.
19	Results show that 1) compared to 2015, energy consumption in the baseline scenario will
20	decrease by 54% at the provincial level. Economical energy saving potential for 2030 is
21	around 50 PJ, which equals to 35% of energy use in the baseline in 2030. 2) At the city level,
22	Changzhou, Wuxi, and Xuzhou are top three cities in terms of energy saving potential. 3) The
23	economical CO_2 emission reductions will decrease by 4.4 Mt in 2030, while the emissions of
24	PM and NOx would decline by 30% and 56%, respectively. This study will help policy makers
25	develop integrated policies to support the coordinated development of Jiangsu and can also
26	enhance the effectiveness of the implementation of joint prevention and control of
27	atmospheric pollution to improve regional air quality.
28	
29	Keywords: co-benefits; GIS-based energy model; energy efficiency; cement industry;
30	emission reduction
31	
32 33	Nomenclature
34	Abbreviations
35	ECSC Energy conservation supply curves
36	CSC Conservation Supply Curve
37	GHG Greenhouse gases
38	SO ₂ Sulfur dioxide

39 NOx Nitrogen oxides

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