

# ZHANG SHAOHUI

## CURRICULUM VITAE

Beihang University (BUAA)  
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Date of Birth: 18 October 1984

Citizenship: Chinese

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(IIASA)

<https://scholar.google.nl/citations?user=bLMZE0wAAAAJ&hl=nl> (Google scholar)

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### Research Interests

Energy & resource efficiency, integrated assessment models for GAINS and MESSAGEix, technology assessment, policy development and evaluation.

### Teaching courses

Energy and Resource System Analysis (Master), Energy System model (Master & PhD)

## EDUCATION AND PROFESSIONAL EXPERIENCE

- 2012 —2016 Ph.D. Utrecht University, Netherlands
- 2009 —2012 M.Sc. Zhengzhou University, China

## PROFESSIONAL EXPERIENCE

- 2018- Associate Professor, Beihang University (BUAA), China
- 2018- Guest Research Scholar, International Institute for Applied Systems Analysis (IIASA), Austria
- 2016 —2018 Postdoctoral Research Scholar, International Institute for Applied Systems Analysis (IIASA), Austria
- 2016 —2019 Guest researcher, Copernicus Institute of Sustainable Development, Utrecht University, Netherlands
- 2013 —2013 Research assistant, International Institute for Applied Systems Analysis (IIASA), Austria
- 2009 — 2012 Research assistant, Research Institute of Environmental Sciences, Zhengzhou University, China

## **SUPERVISION (Ph. D. and MS students)**

3. Xu Wang. 2019. Assessing Energy Efficiency Co-Benefits for Air Pollution and Greenhouse Gas Abatement in China's Building Sector. School of Economics and Management, Beihang University, Beijing, China (under the Young Scientists Summer Program (YSSP) of IIASA, Laxenburg, Austria).
2. Boshu Li. 2018. Towards decapacity policy solutions for air quality and public health improvement in the Jing-Jin-Ji region of China, School of Environment, Peking University, Beijing, China (under the Young Scientists Summer Program (YSSP) of IIASA, Laxenburg, Austria).
1. Jiamin Ou. 2018. Demand-driven ground-level ozone pollution in the Guangdong province, South China. University of East Anglia, Norwich, UK (under the Young Scientists Summer Program (YSSP) of IIASA, Laxenburg, Austria) - Mikhalevich Award winner of IIASA.

## **RESEARCH EXPERIENCE**

13. Modelling Air Pollution Control and Environmental Health Perspectives under the Green and Low Carbon Transition of Global Energy System (MAPEHP) (funded by Global Energy Interconnection Group Co., Ltd.) 2021-2021
12. Development of mid-and long-term integrated management strategy for future fine particle air quality improvement in Northeast Asia (funded by National Research Foundation of Korea) 2020/10-2025/03
11. Development of Air Pollutant Emissions Inventory in BTH, China (I) (founded by National Institute of Environmental Research (NIER) of Korea) 2020-2020
10. Developing Market-based Energy Efficiency: Cost-effective assessment of air quality in Hebei, China (funded by World Bank) 2019 – 2020
9. Pollution Management and Environmental Health (PMEH) (funded by World Bank) 2016 – 2023
8. Exploring pathways for co-development and sustainable mitigation in China's steel and cement sectors under 1.5°C Climate target (funded by National Natural Science Foundation of China (NSFC)) 2020 - 2023
7. The development for China Resource and Energy System Model, (funded by Beihang University (BUAA)) 2019 - 2023
6. Smart Energy and Environment development 2030 (SEED 2030), (funded by International Institute for Applied Systems Analysis (IIASA)) 2016 - 2018
5. Relationship between energy efficiency and air quality, (funded by the China Scholarship Council - Utrecht University) 2012 - 2016.
4. Establish energy conservation management system platform in Henan Province, (funded

by Energy Foundation for China) 2010 - 2011.

**3.** Evaluation Index System for the Out-dated Thermal power industry in Henan province, (funded by Energy Foundation for China) 2010 - 2011.

**2.** The industry energy saving potential analysis in Henan Province, (funded by Energy Foundation for China) 2009 -2010.

**1.** The ammonia industry energy saving potential analysis in Henan province, (funded by Energy Foundation for China) 2009 -2010.

## **REFeree**

### **Review Editor**

Frontiers in Sustainable Cities - Climate Change and Cities

### **Topic Editor**

Atmosphere

### **Regular referee of manuscripts submitted for publication to**

Applied Energy

Atmospheric Environment

Environment International

Energy

Energy Economics

Energy Efficiency

Energy Policy

Energy Strategy Reviews

Geographical Journal

Journal of Cleaner Production

Journal of Renewable Energy

Natural Hazards

Nature Climate change

Nature Sustainability

One Earth

The Energy Journal

## **PUBLICATIONS - Refereed Articles in Journals**

I have an exceptional **multidisciplinary track record in scientific work having authored peer-reviewed articles** in an extensive range of scientific disciplines.

27. Hui Yue, Ernst Worrell, Wina Crijsns-Graus, & **Shaohui Zhang**. (2021). The potential of industrial electricity savings to reduce air pollution from coal-fired power generation in China. *Journal of Cleaner Production*. (2021). <https://doi.org/10.1016/j.jclepro.2021.126978>.
26. Meng Xu, Zhongfeng Qin, **Shaohui Zhang** & Yang Xie. Health and economic benefits of clean air policies in China: A case study for Beijing-Tianjin-Hebei region. *Environmental Pollution*, (2021). <https://doi.org/10.1016/j.envpol.2021.117525>.
25. Meng Xu, Zhongfeng Qin, **Shaohui Zhang\***. Integrated assessment of cleaning air policy in China: a case study for Beijing-Tianjin-Hebei region. *Journal of Cleaner Production* (2021) 296, e126596. <https://doi.org/10.1016/j.jclepro.2021.126596>.
24. Yuli Shan, Jiamin Ou, Daoping Wang, Zhao Zeng, **Shaohui Zhang**, Dabo Guan & Klaus Hubacek. Impacts of COVID-19 and fiscal stimuli on global emissions and the Paris Agreement. *Nature Climate Change* (2020). <https://doi.org/10.1038/s41558-020-00977-5>
23. Meng Xu, Zhongfeng Qin, **Shaohui Zhang\***. Carbon dioxide mitigation co-effect analysis of clean air policies: lessons and perspectives in China's Beijing-Tianjin-Hebei region. *Environmental Research Letters* (2020). <https://doi.org/10.1088/1748-9326/abd215>
22. Jiamin Ou, Zhijiong Huang, Zbigniew Klimont, Guanglin Jia, **Shaohui Zhang**, Cheng Li, Jing Meng, Zhifu Mi, Heran Zheng, Yuli Shan, Peter K. K. Louie, Junyu Zheng & Dabo Guan. Role of export industries on ozone pollution and its precursors in China. *Nature Communications* 2020. <https://doi.org/10.1038/s41467-020-19035-x>
21. Fu Zhao, Ying Fan, **Shaohui Zhang\***. Assessment of efficiency improvement and emission mitigation potentials in China's petroleum refining industry. *Journal of Cleaner Production*. 2021. <https://doi.org/10.1016/j.jclepro.2020.124482>
20. Xu Wang, Pallav Purohit, Lena Höglund-Isaksson, **Shaohui Zhang**, and Hong Fang. Co-benefits of energy-efficient air conditioners in the residential building sector of China. *Environmental Science & Technology*. 2020. <https://doi.org/10.1021/acs.est.0c01629>
19. **Shaohui Zhang**, Yang Xie, Robert Sander, Hui Yue, Yun Shu. Potentials of energy efficiency improvement and energy–emission–health nexus in Jing-Jin-Ji's cement industry. *Journal of Cleaner Production*. 2021. [DOI: 10.1016/j.jclepro.2020.123335](https://doi.org/10.1016/j.jclepro.2020.123335)
18. Boshu Li, Yan Chen, **Shaohui Zhang**, Zheru Wu, Janusz Cofala, Haicheng Dai. Climate and health benefits of phasing out iron & steel production capacity in china: findings from the IMED model. *Climate Change Economics*. 2020. <https://doi.org/10.1142/S2010007820410080>
17. Yang Xie, Xiaorui Liu, Qi Chen, **Shaohui Zhang\***. An integrated assessment for achieving the 2°C target pathway in China by 2030. *Journal of Cleaner Production*. 2020. [DOI: 10.1016/j.jclepro.2020.122238](https://doi.org/10.1016/j.jclepro.2020.122238)
16. Xu Tian, Hancheng Dai, Yong Geng, **Shaohui Zhang**, Yang Xie, Xiaorui Liu, Pantao Lu, Raimund Bleischwitz. Toward the 2-degree target: Evaluating co-benefits of road transportation in China. *Journal of Transport & Health* 15: e100674. 2019. [DOI: 10.1016/j.jth.2019.100674](https://doi.org/10.1016/j.jth.2019.100674).

15. Bowen Yi, **Shaohui Zhang\***, Wang Ya. Estimating Air Pollution and Health Loss Embodied in Electricity Transfers: An Inter-Provincial Analysis in China. *Science of the Total Environment*: e134705. DOI: [10.1016/j.scitotenv.2019.134705](https://doi.org/10.1016/j.scitotenv.2019.134705)
14. Wina Crijns-Graus, Hui Yue, **Shaohui Zhang**, Katerina Kermeli, Ernst Worrell. Energy Efficiency Improvement Opportunities in the Global Industrial Sector. *Encyclopedia of Renewable and Sustainable Materials*, Elsevier 1-12: 2019. doi:[10.1016/B978-0-12-803581-8.10906-3](https://doi.org/10.1016/B978-0-12-803581-8.10906-3)
13. **Shaohui Zhang**, Bowen Yi, Ernst Worrell, Fabian Wagner, Wina Crijns-Graus, Pallav Purohit, Yoshihide Wada, Olli Varis. Integrated assessment of resource-energy-environment nexus in China's iron and steel industry. *Journal of Cleaner Production* 232: 235-249. DOI:[10.1016/j.jclepro.2019.05.392](https://doi.org/10.1016/j.jclepro.2019.05.392).
12. Rui Huang, **Shaohui Zhang\***, Changxin Liu. Comparing Urban and Rural Household CO2 Emissions—Case from China's Four Megacities: Beijing, Tianjin, Shanghai, and Chongqing. *Energies* 2018, 11(5), 1257 [doi.org/10.3390/en11051257](https://doi.org/10.3390/en11051257)
11. Jun Liu, **Shaohui Zhang\***, Fabian Wagner. Exploring the driving forces of energy consumption and environmental pollution in China's cement industry at the provincial level. *Journal of Cleaner Production* 184 (2018) 274-285 [doi.org/10.1016/j.jclepro.2018.02.277](https://doi.org/10.1016/j.jclepro.2018.02.277)
10. **Shaohui Zhang**, Hongtao Ren, Wenji Zhou, Yadong Yu, Chuchu Chen. Realizing co-benefits of energy efficiency and air pollution reduction in the cement industry: a case study of Jiangsu province at city level. *Journal of Cleaner Production* 185 (2018) 761-771 [doi.org/10.1016/j.jclepro.2018.02.293](https://doi.org/10.1016/j.jclepro.2018.02.293)
9. **Shaohui Zhang**, Ernst Worrell, Wina Crijns-Graus, Maarten Krol, Marco de Bruine, Guangpo Geng, Fabian Wagner, Janusz Cofala. Modeling energy efficiency to improve air quality and health effects of China's cement industry. *Applied Energy* 184 (2016) 574–593 [doi.org/10.1016/j.apenergy.2016.10.030](https://doi.org/10.1016/j.apenergy.2016.10.030)
8. **Shaohui Zhang**, Ernst Worrell, Wina Crijns-Graus. Synergy of Air Pollutants and Greenhouse Gas Emissions of Chinese Industries: a critical assessment of energy models. *Energy* 93 (2015) 2436-2450 [doi.org/10.1016/j.energy.2015.10.088](https://doi.org/10.1016/j.energy.2015.10.088)
7. **Shaohui Zhang**, Ernst Worrell, Wina Crijns-Graus. Mapping and modeling multiple benefits of energy efficiency and emission mitigation in China's cement industry at the provincial level. *Applied Energy* 155 (2015) 35-58 [doi:10.1016/j.apenergy.2015.05.104](https://doi.org/10.1016/j.apenergy.2015.05.104)
6. **Shaohui Zhang**, Ernst Worrell, Wina Crijns-Graus. Evaluating co-benefits of energy efficiency and air pollution abatement in China's cement industry. *Applied Energy* 147 (2015) 192-213 [doi:10.1016/j.apenergy.2015.02.081](https://doi.org/10.1016/j.apenergy.2015.02.081)
5. **Shaohui Zhang**, Ernst Worrell, Wina Crijns-Graus, Fabian Wagner, Janusz Cofala. Co-benefits of energy efficiency improvement and air pollution abatement in the Chinese iron and steel industry. *Energy* 78 (2014) 333-345 [doi:10.1016/j.energy.2014.10.018](https://doi.org/10.1016/j.energy.2014.10.018)
4. **Shaohui Zhang**, Shanshan Wang, Ruiqin Zhang. Analysis on the potential of greenhouse gas emission reduction in Henan's electricity sector, *Energy and Environment Research [J]*, 2012, Vol. 2, No. 1, 195-204 [doi.org/10.5539/eer.v2n1p195](https://doi.org/10.5539/eer.v2n1p195)
3. **Shaohui Zhang**, Changsen Zhang, Xiaoge Hou, Rui Lu, Ruiqin Zhang. Evaluation of industry energy efficiency policies and programs in Henan province, *Chinese Journal of Population Resources and Environment [J]*, 2011, Vol. 21, No.12, 36-39 (in Chinese)

2. Rui Lu, Xiaoge Hou, **Shaohui Zhang**, Luyun Zhang, Ruiqin Zhang. Study on the Evaluation Index System for the Out-dated Power Plants and Empirical Research, energy conservation[J], 2011,(10),32-39 (in Chinese)

1. **Shaohui Zhang**, Ruiqin Zhang, Changsen Zhang, Xiaoge Hou, Rui Lu. Energy saving and emission reduction potential analysis of the industry in Henan province. Innovation and technology [J]. 2010, Vol.5, 20-21 (in Chinese)

## **Publications – Conference Proceedings & Speech (Refereed & Non-Refereed)**

16. Shaohui Zhang (2021). Explores pathways for climate change mitigation and air pollution abatement in China. 1<sup>st</sup> workshop on Carbon Natural in China. Shijiazhuang, China.

15. **Shaohui Zhang** (2020). GAINS-based assessment for co-control climate change and air pollution. Integrating air pollution and climate change planning in cities. Chengdu, China.

14. **Shaohui Zhang** (2019). Cost-benefits assessment for Chinese air quality policy: a case study for Hebei, China. 14th workshop on Chinese urban air quality management. Chengdu, China

13. **Shaohui Zhang** (2019). Modeling future energy and emission pathway of China's cement and steel industry and the related synergies. Energy transition – exploring the policy-systems-technology nexus. Qingdao, China

12. **Shaohui Zhang** (2019). Scenario modeling for emission pathway and the related synergies in China's steel and cement sectors. The 10th annual conference on energy economic and management, Shanghai, China

11. **Shaohui Zhang** (2019). Scenarios of long-term energy -resource nexus in Chinese steel and cement sectors. The 25th International Sustainable Development Research Society Conference. Nanjing, China

10. **Shaohui Zhang** (2019). Toward solutions for deep decarbonization in steel industry and the associated resource-energy-environment nexus. International Symposium for Global Climate Integrated Assessment Model. Beijing, China.

9. **Shaohui Zhang** (2019). Evaluating energy-water nexus in Chinese iron and steel industry. The 8th International Conference on Water Resources and Environment Research. Nanjing, China.

8. **Shaohui Zhang** (2018). Measuring energy efficiency co-benefits of climate mitigation and air pollution abatement. 2018 joint international conference on ABaCAS and CMAS-Asia-Pacific, Beijing, China

7. **Shaohui Zhang** (2018). Modeling energy efficiency of steel industry in Integrated Assessment Model (IAM): a case study for MESSAGE. The 41st International Association for Energy Economics (IAEE) international conference. Groningen, the Netherlands.

6. **Shaohui Zhang** (2016). Realizing co-benefits of energy efficiency in the Chinese industry. The 4th National Conference on Low Carbon Development Management, Beijing, China.

5. **Shaohui Zhang**, Ernst Worrell, Wina Crijns-Graus, Maarten Krol, Marco de Bruine, Guangpo Geng, Fabian Wagner, Thomas Röckmann, Janusz Cofala. (2015). The contribution of energy efficiency measures to air quality and related health effects in China's cement

industry. The Systems Analysis 2015 conference, Laxenburg, IIASA, Austria.

**4. Shaohui Zhang**, Ernst Worrell, Wina Crijs-Graus (2015). Co-benefits of energy efficiency for air quality and health effects in China's cement industry. The 14th Annual CMAS Conference, Chapel Hill, NC, US.

**3. Shaohui Zhang**, Ernst Worrell, Wina Crijs-Graus (2015). Mapping and modeling multiple benefits of energy efficiency and emission mitigation in China's cement industry at the provincial level. The international scientific conference "Our Common Future under Climate Change" (CFCC15\*), Paris, France.

**2. Shaohui Zhang**, Ernst Worrell, Wina Crijs-Graus (2015). Cutting air pollution by improving energy efficiency of China's cement industry. The Seventh International Conference on Sustainability in Energy and Buildings, Lisbon, Portugal.

**1. Shaohui Zhang**, Ernst Worrell, Wina Crijs-Graus (2014). Integrated assessment of co-benefits between energy efficiency improvement and emission mitigation in Chinese iron and steel industry. Proceedings of ECEEE Industrial Summer Study on Energy Efficiency Arnhem, the Netherlands.

### **Campus or Departmental Talks**

1. Integrated Assessment for Resource, Energy, and Environment. Beijing Institute Technology, 8 May 2021, Beijing, China
2. GAINS overview and application. Zhejiang University, 28 December 2020, Hangzhou, China
3. The development of energy system model and policy assessment in China, Beijing Normal University, 11 November 2019, Beijing, China
4. Scenario modeling for future energy pathway and the related synergies in China, Charles University, 12 August 2019, Prague, the Czech Republic
5. Modeling resource material-energy-water-air pollution nexus of iron and steel industry by MESSAGEix, Utrecht University, 6 February 2018, Utrecht, Netherlands
6. Synergies of material, energy and water in Chinese steel industry, Peking University, 27 December 2017, Beijing, China
7. Realizing co-benefits of energy efficiency and air pollution reduction in cement industry, East China University of Science and Technology, 9 August 2017, Shanghai, China
8. Modeling the synergies between energy efficiency and air quality in the manufacturing sectors, Utrecht University, 21 March 2017, Utrecht, Netherlands
9. Assessing co-benefits of energy efficiency in the Chinese industry, Institute of Policy and Management (IPM) of Chinese Academy of Sciences (CAS), 4 August 2016, Beijing, China
10. Modeling energy efficiency co-benefits for air quality in China's cement industry, Jiangsu University, 19 September 2016, Zhenjiang, China

## **Publications – Technical and Scientific Reports (select)**

2. Wenjia Cai\*, Chi Zhang\*, Hoi Ping Suen\*, Siqi Ai, Yuqi Bai, Junzhe Bao, Bin Chen, Liangliang Cheng, Xueqin Cui, Hancheng Dai, Qian Di, Wenxuan Dong, Deijing Dou, Weicheng Fan, Xing Fan, Tong Gao, Yang Geng, Dabo Guan, Yafei Guo, Yixin Hu, Junyi Hua, Cunrui Huang, Hong Huang, Jianbin Huang, Tingting Jiang, Kedi Jiao, Gregor Kiesewetter, Zbigniew Klimont, Pete Lampard, Chuanxi Li, Qiwei Li, Ruiqi Li, Tiantian Li, Borong Lin, Hualiang Lin, Huan Liu, Qiyong Liu, Xiaobo Liu, Yufu Liu, Zhao Liu, Zhidong Liu, Zhu Liu, Shuhan Lou, Chenxi Lu, Yong Luo, Wei Ma, Alice McGushin, Yanlin Niu, Chao Ren, Zehao Ren, Zengliang Ruan, Wolfgang Schöpp, Jing Su, Ying Tu, Jie Wang, Qiong Wang, Yaqi Wang, Yu Wang, Nick Watts, Congxi Xiao, Yang Xie, Hui Xiong, Mingfang Xu, Bing Xu, Lei Xu, Jun Yang, Lianping Yang, Le Yu, Yujuan Yue, **Shaohui Zhang**, Zhongchen Zhang, Jiyao Zhao, Liang Zhao, Mengzhen Zhao, Zhe Zhao, Jingbo Zhou, Peng Gong. The 2020 China report of the Lancet Countdown on health and climate change. *The Lancet-public health*. 2020. [https://doi.org/10.1016/S2468-2667\(20\)30256-5](https://doi.org/10.1016/S2468-2667(20)30256-5)
1. **Shaohui Zhang**, Markus Amann, Jens Borken-Kleefeld, Janusz Cofala, Adriana Gomez-Sanabria, Zbigniew Klimont, Gregor Kiesewetter, Wolfgang Schoepp, Fabian Wagner, Wilfried Winiwarter, Bowen Yi, Yang Xie, Meng Xu, Honghua Wang, Yajing Lu. Developing a Cost-Effective Comprehensive Plan for Air Quality Control in Hebei Province. 2019.