

CURRICULUM VITAE (UPDATED Feb. 08, 2025)

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**Senior Scientist (研究员), Professor (教授)**

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**EDUCATION**

2004/08–2010/07 **Ph.D.**, Environmental Science & Engineering, Tsinghua University, Beijing

2006/09–2006/12 Exchange Student, Venice International University, Venice, Italy

2000/09–2004/07 **B.S.**, Environmental Engineering, Tsinghua University, Beijing

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**PROFESSIONAL EXPERIENCE**

2015/08–Present Professor, University of Chinese Academy of Sciences (UCAS)

2015/08–Present Senior Scientist, Ins. of Urban Environment, Chinese Aca. of Sci. (IUE-CAS)

2013/03–2015/07 Associate Research Scientist, Yale University

2010/06–2013/02 Postdoctoral Associate, Yale University

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**RESEARCH INTERESTS**

- 1) **General:** Industrial Ecology, Environmental System Engineering, AI & Sustainability
  - 2) **Specific:** Socio-economic metabolism of materials, especially metals and plastics
    - a) Developing methodology and database for quantifying material use and cycles
    - b) Analyzing patterns, drivers, and future scenarios of materials use and cycles
    - c) Uncovering environmental and other impacts of materials use and cycles
    - d) Exploring policies and measures for sustainable management of materials
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**LANGUAGES**

Chinese Mandarin, Chinese Taiwanese, English

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## JOURNAL SERVICE

### Editor/Associate Editor/Editorial Member

- 1) *Journal of Industrial Ecology*
- 2) *Resources, Conservation, and Recycling*
- 3) *Energy, Ecology, and Environment*
- 4) *Frontiers of Engineering Management*
- 5) *Environmental Research: Infrastructure and Sustainability*
- 6) *Chinese Journal of Environmental Management (In Chinese)*
- 7) *Bulletin of Chinese Academy of Sciences (In Chinese)*

### Guest Editor for Special Issues

- 8) 2024. "Advancing the Circular Economy", A joint special issue across *Environmental Science & Technology* (ES&T), *Environmental Science & Technology Letters* (ES&T Letters), *ACS Sustainable Chemistry & Engineering*, and *ACS Sustainable Resource Management*.
- 9) 2015. "Characterizing Anthropogenic Stocks: Methods and Application", *Resources, Conservation, and Recycling*.
- 10) 2015. "Industrial Ecology in China", *Acta Ecologica Sinica*. (In Chinese)

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## CONFERENCE SERVICE

- 2023** **Chair.** The 1<sup>st</sup> International Conference on Urban Science and Sustainability. IUE-CAS, Xiamen, China. Dec. 15-17.
- 2019** **Co-Chair.** The 10<sup>th</sup> International Conference of the International Society for Industrial Ecology. Tsinghua University, Beijing. July 7-11.
- 2018** **Chair.** Sino-Japan Symposium for Industrial Ecology. CAS. Xiamen, China. Nov 28-Dec 2.
- 2015** **Chair.** Chinese Environmental Scholars Forum. Yale University. May 30-31.
- 2014** **Co-Initiator, Co-Chair.** Chinese Environmental Scholars Forum. Harvard University. Nov. 8-9.
- 2013** Technical Committee Member. The 7<sup>th</sup> International Conference of the International Society for Industrial Ecology. Ulsan, Korea.
- 2012** Organizing Committee Member. The 3<sup>rd</sup> Asia-Pacific Meeting of the International Society for Industrial Ecology. Beijing, China.

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## SCIENTIFIC COMMITTEES AND MEMBERSHIPS

- 2021-Present** **Chair** of the Organizing Committee, Online Lecture Series on Urban Science and Sustainability.
- 2020-Present** **Board Member.** Rare Earth Industry Association.
- 2018-2020** **Board Member.** International Society for Industrial Ecology.

- 2015–2016**      **Founding President.** Chinese Society for Industrial Ecology.
- 2015–2017**      **Board Member.** The Sustainable Urban Systems Section of the International Society for Industrial Ecology.
- 2007–2008**      **Poster Competition Chair.** The Student Chapter of the International Society for Industrial Ecology.
- 2006–Present**      Member. International Society for Industrial Ecology.
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## AWARDS

- 2024** Stanford World's Top 2% Scientists
- 2023** Stanford World's Top 2% Scientists
- 2023** **Graedel Prize** for the Best Paper published in the Journal of Industrial Ecology
- 2021** Research Frontier Award, Chinese Society for Industrial Ecology
- 2019** Youth Award, China Society of Natural Resources
- 2018** Youth Award, China Ecological Society
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## INVITED TALKS (SELECTED)

- 2024** Toward Circular Metal-Energy Nexus without Carbon. The 2<sup>nd</sup> Science for Future Conference co-organized by the German National Academy of Sciences Leopoldina and the Chinese Academy of Sciences. Berlin, Oct. 29-30.
- 2024** Material-Energy-Carbon Nexus and Sustainability. Nexus Forum 2024 on Sustainable Exploration of Interdisciplinary Research and Innovation hosted by *NEXUS*. The Hong Kong Polytechnic University, Hongkong, May 9-10.
- 2023** Material flow analysis of plastics in China/Asia: Some preliminary findings. The final dissemination workshop of “C-THRU: carbon clarity in the global petrochemical sector”. Organized by Cambridge University. Singapore, Sept. 6.
- 2023** **Keynote Speech:** 10 Measures for Sustainable Socio-Economic Metabolism. The 11<sup>th</sup> International Conference of the International Society for Industrial Ecology. Leiden University, Netherland, July 3.
- 2020** **Keynote Speech:** Materials Dependence of Urbanization & Implications for Sustainability. International Conference on Resource Sustainability – Sustainable Urbanization in the BRI Era. University of Nottingham Ningbo, Dec. 13-15.
- 2019** **Framing Remarks:** Current Landscape for Sustainable Urbanization Research and Practice in China. A Joint Workshop co-organized by the U.S. National Academies of Sciences, Engineering, Medicine and the Chinese Academy of Sciences. Washington D.C., Dec. 16.
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## PROJECTS (SELECTED)

- 2021-2024 PI.** Consumer Packaging Plastic Waste and Its Environmental Impacts in China: Measurement, Patterns, and Management. NO. 52070178.
- 2021-2023 PI.** Resources and Environmental Impacts of Urbanization and Implications for Sustainable Urban Management. International Cooperation Project of CAS. NO. 132C35KYSB20200004.
- 2020-2024 PI.** Promoting Resource Efficiencies of Metals: Mapping, Measurement, and Management (PRE-4M). NSFC-UNEP Joint Funding. NO. 71961147003.
- 2017-2020 PI.** Structure and evolution of the global material flow networks of critical rare earth elements. National Natural Science Foundation of China. NO.41671523.
- 2016-2020 PI.** Mapping the Reserves of Urban Fe, Al, and Cu Mine in China. Key Research Program of Frontier Sciences, Chinese Academy of Sciences. No. QYZDB-SSW-DQC012.

### PEER-REVIEWED JOURNAL PAPERS (*IN ENGLISH*):

- 1) Ma, F. M.; Wang, H.-M.\*; Tzachor, A.\*; Hidalgo, C. A.; Schandl, H.; Zhang, Y.; Zhang, J. L.; **Chen, W.-Q.\***; Zhao, Y. Z.; Zhu, Y.-G. and Fu, B. J. The disparities and development trajectories of nations in achieving the sustainable development goals. *Nature Communications*. 2025, 16:1107.
- 2) Wang, J. Y.; Chan, F. K. S.\*; Johnson, M. F.\*; Chan, H. K.; Cui, Y. H.\*; Chen, J. W. and **Chen, W.-Q.\*** Material Cycles, Environmental Emissions, and Ecological Risks of Bisphenol A (BPA) in China and Implications for Sustainable Plastic Management. *Environmental Science & Technology*. 2024, 59(3): 1631-1646.
- 3) Liu, B.; Wang, P.\*; Zhou, J.; Gao, Y.; Ma, S. J.; **Chen, W.-Q.**; Li, J. S.\* and Chang, V. W.-C. Refocusing on effectiveness over expansion in urban waste–energy–carbon development in China. *Nature Energy*. 2024, <https://doi.org/10.1038/s41560-024-01683-8>.
- 4) Wang, P.; Wang, Q.-C.\*; Lu, T.; Hao, M. and **Chen, W.-Q.** Sustainable Energy Strategies Enable the Green Transition of China’s Copper Tube Industry. *ACS Sustainable Chemistry & Engineering*. 2024, 12(48): 17600-17612.
- 5) Wang, P.\*; Zang, L.-Y.; Tzachor, A.\* and **Chen, W.-Q.\*** E-waste challenges of generative artificial intelligence. *Nature Computational Science*. 2024, 4: 818–823.
- 6) Li, X. Y.; Zhang, C.\*; Yang, X.; Xia, Z. Q.; Cao, Z.\*; Wang, P.; Wang, H. M.; Wang, T.; Liu, G. and **Chen, W.-Q.** Hybrid multi-stage steel footprinting unveils a more interdependent material foundation of the global economy. *Ecological Economics*. 2025, 227: 108408.
- 7) Cui, D.; Bi, Z.; Wang, Y.; Gu, Y. L.; Wang, H. M.\*; Gao, X. F.\*; Wang, P.; Sun, S. and **Chen, W.-Q.\*** Scenario analysis of waste tires from China’s vehicles future. *Journal of Cleaner Production*. 2024, 478: 143940.
- 8) Yang, J. C.; Duan, L. L.; Peng, S. T.; Heijungs, R.; Geng, X. Y.; Wang, P.; **Chen, W.-Q.\*** and Yang, Y.\* Toward More Realistic Estimates of Product Displacement in Life Cycle Assessment. *Environmental Science & Technology*. 2024, 58(37): 16237 – 16247.
- 9) Jian, X. M.; Liu, Y. P.\*; Ye, Z. L. and **Chen, W.-Q.** Influence of mandatory waste classification on environmental and economic impacts of residual waste treatment in Xiamen, China. *Waste Management & Research*. 2024, <https://doi.org/10.1177/0734242X241265055>.
- 10) Zhao, S.; Wang, P. \*and **Chen, W.-Q.\*** Refining material criticality for global circular, low-carbon and just transition. *Resources, Conservation and Recycling*. 2024, 208: 107708.
- 11) Hou, L. L.\*; Fishman, T.; Wang, R. R.; Tzachor, A.; Wang, H. M.; Wang, P.; **Chen, W.-Q.** and Voet, E. A Comprehensive Accounting of Construction Materials in Belt and Road Initiative Projects. *Environmental*

- Science & Technology*. 2024, 58(35): 15575 - 15586.
- 12) Ting, M.; Liu, Y. P.\*; Liu, Y. Z. W.; Hao, M. and **Chen, W.-Q.** Towards sustainable building landscapes: a spatially explicit life - cycle analysis of carbon emissions and mitigation strategies. *Landscape Ecology*. 2024, 39: 167.
  - 13) Feng, Y.; Wang, P.\*; Li, W.; Zhang, Q.; **Chen, W.-Q.** and Feng, D. Y.\* Environmental impacts of lithium supply chains from Australia to China. *Environmental Research Letters*. 2024, 19: 094035.
  - 14) Song, L. L.; Huang, Y. Y.; Liu, Y. P.; Li, N. and **Chen, W.-Q.** Mapping manufactured capital in mainland China with harmonized night - time light images between 1992 and 2018. *Journal of Industrial Ecology*. 2024, 28(5): 1103-1116.
  - 15) Huang, G. C.; Song, L. L.\*; Wen, Y. Z. and **Chen, W.-Q.**\* Material metabolism and associated environmental impacts in Pearl River Delta urban agglomeration. *Journal of Industrial Ecology*. 2024, 28(5): 1227 - 1241.
  - 16) Chen, Y. H.; Liu, Y. P.; Slootweg, M.; Hu, M. M.; Tukker, A.; and **Chen, W.-Q.**\* Unlocking rooftop potential for sustainable cities: A systematic review. *Frontiers of Engineering Management*. 2024, <https://doi.org/10.1007/s42524-024-4053-3>.
  - 17) Liu, Y.-F.; Wang, P.; Feng, D.-Y.; Liu, X. J.\*; Han, Z. K.; Dai, T.; Zhang, S.-T. and **Chen, W.-Q.** Illustrating China's journey to balance, circular, and secure potassium cycles in the last three decades. *Resources, Conservation & Recycling*. 2024, 202: 107378
  - 18) Cao, Z. and **Chen, W.-Q.** Circular economy strategies to decarbonize China's bulk material cycles. *Nature Climate Change*. 2023, 13: 1030-1031.
  - 19) Li, X.; Song, L. L.; Liu, Q. C.; Ouyang, X.; Mao, T.; Lu, H. J.; Liu, L. T.; Liu, X. J.; **Chen, W.-Q.**\*; and Liu, G.\* Product, building, and infrastructure material stocks dataset for 337 Chinese cities between 1978 and 2020. *Scientific Data* 2023, 10: 228.
  - 20) Wang, P.; Wang, C. Y.; Li, J. S.; Hubacek, K.; Sun, L. X.; Yang, F.\*; Feng, K. S.\* and **Chen, W.-Q.**\* Incorporating platinum circular economy into China's hydrogen pathways toward carbon neutrality. *PNAS Nexus*. 2024, 3(5): 172.
  - 21) Wang J. Y.; Geng, X. Y.; Peng, W.\*; Yang, J. C.; Yang, Y.; Chan, F. K. S.; Chan, H. K.; Johnson, M. F.; Liu, X. J.; Zhu, Y.-G. and **Chen, W.-Q.**\* Pesticide-related risks embodied in global soybean trade. *Cell Reports Sustainability*. 2024, 1(3): 100055.
  - 22) Wei, J. L. M.; **Chen, W.-Q.**\*; Chen, C. K.; Huang, Y. Y. and Tang, L. B. Evaluating the bulk commodities supply risk from the perspective of physical trade. *Resources Policy*. 2024, 93: 105059.
  - 23) Wang J. Y.; Chan, F. K. S.\*; Johnson, M. F.\*; Chan, H. K.\*; Cui, Y. H.; Chen, J. W.; Zhu, Y.-G. and **Chen, W.-Q.**\* Material flow analysis of chemical additives in plastics: A critical review. *Critical Reviews in Environmental Science & Technology*. 2024, 1-17.
  - 24) Zhao, S.; Wang, P. \*; Wang, Lu and **Chen, W.-Q.**\* Quantifying provincial in-use stocks of rare earth to identify urban mining potentials in the Chinese mainland. *Journal of Cleaner Production*. 2024, 453: 142251.
  - 25) Wang, H. M.; Wang, P.; Zhang, X.; **Chen, W.-Q.**\*; Tzachor, A.\*; Fishman, T.; Schandl, H; Acuto, M.; Yang, Y.; Lu, Y. Y.; Böcher, C.; Ma, F. M.; Zhang, C.; Yue, Q.; Du, T.; Liu, J. G.\* and Zhu, Y.-G. Substantial increase in China's manufactured sand supply since 2010. *Nature Geoscience* 2024, 17: 833-836.
  - 26) Shi, Y.-L.\*; **Chen, W.-Q.**\*; and Zhu, Y.-G.\* Direct, Embedded, and Embodied Trade of Arsenic: 1990-2019. *Environmental Science & Technology*. 2024, 58(27): 12008-12017.
  - 27) Duan, L. L.; Song, L.-L.\*; Wang, W. J.; Jian, X. M.; Heijungs, R.; and **Chen, W.-Q.**\* Urbanization inequality:

- evidence from vehicle ownership in Chinese cities. *Humanities and Social Sciences Communications*. 2024, 11: 703.
- 28) Wang, Q.-C.; Lu, T.; Chen, H.-C.; Wang, L.; Jia, J. P.\* and **Chen, W.-Q.**\* Tracing environmental footprint of copper wire rod manufacturing in China. *Resources, Conservation and Recycling*. 2024, 204: 107503.
- 29) **Chen, W.-Q.**\* Eckelman, M. J.; Sprecher, B.; Chen, W.; and Wang, P.\* Interdependence in rare earth element supply between China and the United States helps stabilize global supply chains. *One Earth*. 2024 7(2): 242-252.
- 30) Wang, P.; Yang, Y.-Y.; Heidrich, O.; Chen, L.-Y.; Chen, L.-H.; Fishman, T. and **Chen, W.-Q.**\* Regional rare-earth element supply and demand balanced with circular economy strategies. *Nature Geoscience*. 2024 17: 94-102.
- 31) Yang, X.; Zhang, C.\*; Li, X. Y.; Cao, Z.\*; Wang, P.; Wang, H. M.; Liu, G.; Xia, Z. Q.; Zhu, D. J. and **Chen, W.-Q.**\* Multinational dynamic steel cycle analysis reveals sequential decoupling between material use and economic growth. *Ecological Economics*. 2024. 217: 108092.
- 32) Dang, M.-Y.; Wang, Q.-C.\*; Qi, J. C.; Liu, G. G.; Li, N. and **Chen, W.-Q.**\* Green Design Evaluation of Electrical and Electronic Equipment Based on Knowledge Graph. *ACS Sustainable Chemistry & Engineering*. 2023 11 (51): 18011-18020.
- 33) Chen, C. K.; Li, N.; Qi, J. C.; Wei, J. L. M., and **Chen, W.-Q.**\* Material Flow Analysis of Dysprosium in the United States. *Environmental Science & Technology*. 2023, 57 (45): 17256-17265.
- 34) Dai, T.; Liu, Y.-F.; Wang, P.; Qiu Y.; Mancheri, N.; Chen W.; Liu, J.-X.; **Chen, W.-Q.**\* Wang, H. M. and Wang, A.-J.\* Unlocking Dysprosium Constraints for China's 1.5 °C Climate Target. *Environmental Science & Technology*. 2023, 57 (38): 14113-14126.
- 35) Zhao, S.; Wang, P.\*; Chen, W.; Wang, L.; Wang, Q.-C.; **Chen, W.-Q.** Supply and demand conflicts of critical heavy rare earth element: Lessons from gadolinium. *Resources, Conservation and Recycling*. 2023, 199: 107254.
- 36) Wang, Y.; Ma, F. M.; Tzachor, A.; Wang, P.; Wang, H. M.\*; Lyu, J.\*; Yue, Q.; Du, T.; **Chen, W.-Q.** and Liang, S. Quantifying Economic Sectoral Iron Commodity Use and Related Vulnerability in China's Supply Chains. *Resources, Conservation and Recycling*. 2023, 198: 107150.
- 37) Zhong, Q. M.; Zhang, Z. H.; Wang, H. M.\*; Zhang, X.; Wang, Y.; Wang, P.; Ma, F. M.; Yue, Q.; Du, T.; **Chen, W.-Q.** and Liang, S. Incorporating Scarcity into Footprints Reveals Diverse Supply Chain Hotspots for Global Fossil Fuel Management. *Applied Energy*. 2023, 349: 121692.
- 38) Song, L.-L.; Ewijk, S.; Masanet, E.; Watari, T.; Meng, F.; Cullen, J. M. Cao, Z. and **Chen, W.-Q.**\* China's bulk material loops can be closed but deep decarbonization requires demand reduction. *Nature Climate Change*. 2023, 13: 1136-1143.
- 39) Wang, R. R.\*; Hertwich, E. G.\*; Fishman, T.; Deetman, S.; Behrens, P.; **Chen, W.-Q.**; De Koning, A.; Xu, M.; Matus, K.; Ward, H.; Tukker, A.; Zimmerman, J. B. The legacy environmental footprints of manufactured capital. *Proceedings of the National Academy of Sciences*. 2023, 120 (24): e2218828120.
- 40) Wang, H. T.; Feng, K. S.; Wang, P.\*; Yang, Y. Y.; Sun, L. X.\*; Yang, F.; **Chen, W.-Q.**; Zhang, Y. Y. and Li, J. S.\* China's Electric Vehicle and Climate Ambitions Jeopardized by Surging Critical Material Prices. *Nature Communications*. 2023, 14: 1246.
- 41) Hu, X. Q.; Sun, B. X.; Wang, C.\*; Lim, M. K.; Wang, P.; Geng, X. Y.; Yao, C. Y. and **Chen, W.-Q.** Impacts of China's Exports Decline in Rare Earth Primary Materials from a Trade Network-Based Perspective. *Resources Policy*. 2023, 81: 103321.
- 42) Hu, X. Q.; Wang, C.\*; Lim, M. K.; **Chen, W.-Q.**; Teng, L. M.; Wang, P.; Wang, H. M.; Zhang, C.; Yao, C. Y. and

- Ghadimi, P. Critical Systemic Risk Sources in Global Lithium-Ion Battery Supply Networks: Static and Dynamic Network Perspectives. *Renewable and Sustainable Energy Reviews*. 2023, 173: 113083.
- 43) Wang, Y.; Wang, H. M.; Wang, P.; Zhang, X.; Zhang, Z. H.; Zhong, Q. M.; Ma, F. M.; Yue, Q.; **Chen, W.-Q.**; Du, T. and Liang, S. Cascading Impacts of Global Metal Mining on Climate Change and Human Health Caused by COVID-19 Pandemic. *Resources, Conservation and Recycling*. 2023, 190: 106800.
- 44) Tang, L. B.; Wang, P.; Ma, Z. J.; Pauliuk, S.; **Chen, W.-Q.\***; Dai, T.\*; and Lin, Z. P. Exploring the global trade networks of the tungsten supply chain: Insights into the physical and monetary mismatch among countries. *Journal of Industrial Ecology*. 2022, 1-13.
- 45) **Chen, W.-Q.**; Hauschild, M. Z.; Huang, B.-J.\*; Kara, S.; Sutherland, J. W.; Umeda, Y. Life cycle engineering and sustainable manufacturing for net-zero targets and environmental sustainability. *Resources, Conservation & Recycling*. 2022, 186: 106480.
- 46) Wang, P.; **Chen, W.-Q.\***; Cui, X. Q.; Li, J. S.; Li, W.; Wang, C. Y.; Cai, W. J.\* and Geng, X. Y.\* Critical mineral constraints in global renewable scenarios under 1.5° C target. *Environmental Research Letters*. 2022, 17: 12.
- 47) Wang, Y.; Guo, J.; Yue, Q.; **Chen, W.-Q.**; Du, T. and Wang, H. M.\* Total CO<sup>2</sup> emissions associated with buildings in 266 Chinese cities: characteristics and influencing factors. *Resources, Conservation and Recycling*. 2023, 188: 106692.
- 48) Sun, N. N.; Wang, P.\*; Jian, X. M.; Hao, M.; Yan, X. Y. and **Chen, W.-Q.** Material Flow analysis of plastics from provincial household appliances in China: 1978–2016. *Waste Management*. 2022, 153: 156-166.
- 49) Lu, X. H.; Chan, F. K. S.\*; Li, N.\*; Chen, C. K.; **Chen, W.-Q.\***; Chan, H. K. Improving urban flood resilience via GDELT GKG analyses in China’s Sponge Cities. *Scientific Reports*. 2022, 12: 20317.
- 50) Hao, M.; Tang, L. B.; Wang, P.\*; Wang, H. M.; Wang, Q.-C.; Dai, T.\* and **Chen, W.-Q.** Mapping China’s copper cycle from 1950–2015: Role of international trade and secondary resources. *Resources, Conservation and Recycling*. 2022, 188: 106700.
- 51) Mao, T.; Liu, Y. P.\*; **Chen, W.-Q.**; Li, N.; Dong, N.; and Shi, Y. Quantifying spatiotemporal dynamics of urban building and material metabolism by combining a random forest model and GIS-based material flow analysis. *Frontiers in Earth Science*. 2022, 10: 944865.
- 52) Ma, F. M.; Wang, H. M.\*; Schandl, H.; Fishman, T.; Tan, X. T.; Li, Y.; Shi, L.; Wang, P. and **Chen, W.-Q.** Exploring the relationship between economic complexity and resource efficiency. *Resources, Conservation and Recycling*. 2022, 186: 106530.
- 53) Chen, C. K.; Jiang, Z. H.; Li, N.\*; Wang, H. M.; Wang, P.; Zhang, Z.; Zhang, C.; Ma, F. M.; Huang, Y. Y.; Lu, X. H.; Wei, J.L.M.; Qi, J.C. and **Chen, W.-Q.** \*Advancing UN Comtrade for Physical Trade Flow Analysis: Review of Data Quality Issues and Solutions. *Resources, Conservation and Recycling* 2022, 186, 106526.
- 54) Zhang, Z. H.; Jiang, Z. H.; Chen, C. K.; Zhang, X.; Wang, H. M.\*; Li, N.; Wang, P.; Zhang, C.; Ma, F. M.; Huang, Y. Y.; Qi, J. C. and **Chen, W.-Q.\*** Advancing UN Comtrade for Physical Trade Flow Analysis: Addressing the Issue of Missing Values. *Resources, Conservation and Recycling* 2022, 186, 106525.
- 55) Jiang, Z. H.; Chen, C. K.; Li, N.\*; Wang, H. M.; Wang, P.; Zhang, C.; Ma, F. M.; Zhang, Z.; Huang, Y. Y.; Qi, J. C. and **Chen, W.-Q.\*** Advancing UN Comtrade for Physical Trade Flow Analysis: Addressing the Issue of Outliers. *Resources, Conservation and Recycling* 2022, 186, 106524.
- 56) **Chen, W.-Q.\***; Wang, H. M.; Li, N. and Wang, P. Advancing UN Comtrade for Physical Trade Flow Analysis. *Resources, Conservation and Recycling*. 2022, 186:106520.
- 57) Zhang, T. T.; Zhang, P. F.; Peng, K.; Feng, K. S.; Fang, P.; **Chen, W.-Q.**; Zhang, N.; Wang, P.\* and Li, J. S.\* Allocating Environmental Costs of China’s Rare Earth Production to Global Consumption. *Science of The*

- Total Environment*. 2022, 831: 154934.
- 58) Jian, X. M.; Wang, P.\*; Sun, N. N.; Xu, W.; Liu, L. X.\*; Ma, Y. C. and **Chen, W.-Q.** Material Flow Analysis of China's Five Commodity Plastics Urges Radical Waste Infrastructure Improvement. *Environmental Research: Infrastructure and Sustainability*. 2022, 2 (2): 025002.
  - 59) Wang, Q.-C.; **Chen, W.-Q.\***; Wang, P.; and Dai, T.\* Illustrating the supply chain of dysprosium in China through material flow analysis. *Resources, Conservation & Recycling*. 2022, 184: 106417.
  - 60) Chen, C. K.; Qi, J. C.; Li, N.\*; Ji, T. T.; Wang, H. M.; Huang, Y. Y.; Guo, J.; Lu, X. H.; Han, R. R.; Wei, J. L. M. And **Chen, W.-Q.\***China economy-wide material flow account database from 1990 to 2020. *Scientific Data*. 2022, 9: 502.
  - 61) Wang, H.M.; Wang, X.; Zhang, X.; Liu, G. X.; **Chen, W.-Q.**; Chen, S. F.; Du, T. and Shi, L. \* coupling between material footprint and economic growth in the “Belt and Road” countries. *Journal of Cleaner Production*. 2022, 359: 132110.
  - 62) Nunes, L. M.; Li, G.; **Chen, W.-Q.**; Meharg, A. A.; O'Connor, P. and Zhu, Y.-G. Embedded Health Risk from Arsenic in Globally Traded Rice. *Environmental Science & Technology*. 2022, 56 (10): 6415–6425
  - 63) Wang, P.; Zhao, S.; Dai, T.\*; Peng, K.; Zhang, Q.\*; Li, J. S. and **Chen, W.-Q.\*** Regional disparities in steel production and restrictions to progress on global decarbonization: A cross-national analysis. *Renewable and Sustainable Energy Reviews*, 2022, 161: 112367.
  - 64) Liu, Y. P.; Li, J. J.; **Chen, W.-Q.\***; Song, L. L.; and Dai, S. Q. Quantifying Urban Mass Gain and Loss by a GIS-based Material Stocks and Flows Analysis. *Journal of Industrial Ecology*, 2022, 26:1051-1060.
  - 65) Wang, P.; Wang, H. M.; **Chen, W.-Q.\*** and Pauliuk, S. Carbon Neutrality Needs a Circular Metal-Energy Nexus. *Fundamental Research* 2022, 2 (3): 392-395
  - 66) Sun, Y.; Liu, S.; Wang, P.\*; Jian, X.-M.; Liao, X.-W. and **Chen, W.-Q.\*** China's roadmap to plastic waste management and associated economic costs. *Journal of Environmental Management*, 2022, 309: 114686.
  - 67) Li, F.-Q.; Wang, P.\*; Chen, W.; **Chen, W.-Q.**; Wen, B.-J.; and Dai, T\*. Exploring recycling potential of rare, scarce, and scattered metals: Present status and future directions. *Sustainable Production and Consumption*, 2022, 30: 988–1000.
  - 68) Wang, C.; Feng, K. S.; Liu, X.\*; Wang, P.\*; **Chen, W.-Q.** and Li, J. S.\* Looming challenge of photovoltaic waste under China's solar ambition: A spatial-temporal assessment. *Applied Energy*, 2021, 118186.
  - 69) Lobo, J.\*; Alberti, M.; Allen-Dumas, M.; Bettencourt, L. M. A.; Beukes, A.; Bojórquez Tapia, L. A.; **Chen, W.-Q.**; Dodge, A.; Neal, Z.; Perreira, A.; Pfeiffer, D.; Revi, A.; Roberts, D.; Rozenblat, C.; Shutters, S.; Smith, M. E.; Stokes, E.; Strumsky, D.; Wu, J. A Convergence Research Perspective on Graduate Education for Sustainable Urban Systems Science. *npj Urban Sustainability*. 2021, 1, 39.
  - 70) Song, L.-L.; Han, J.; Li, N.\*; Huang, Y.-Y.; Hao, M.; Dai, M. and **Chen, W.-Q.** China material stocks and flows account for 1978–2018. *Scientific Data*. 2022, 8: 303.
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