

Associate Professor (Research) Qingbin Song

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Academic Qualification

Ph.D. in Civil and Environmental Engineering, University of Macau
MSc in School of Environmental and Biological Science, Dalian University of Technology
BSc in Department of Environment Science and Engineering, Hebei University of Science and Technology

Teaching Area

Solid Waste Management and Recycling
Environmental Impact Assessment
Special Topic of Environmental Science and Engineering

Research Area

Whole process management and recycling technology of solid waste (E-waste and Organic waste);
Urban metabolism mechanism of resource and energy
Environmental impact and risk assessment (LCA and MFA method)
Urban GHG emissions and its reduction.
Environmental and energy-saving behavior and willingness analysis

Working Experience

2020.07-	Associate Professor, Department of Environmental Science and Engineering, FIE, MUST
2017.08-	Deputy secretary-general, Circular Economy Branch, Chinese Society of Environmental Science
2016.01-2020.07	Assistant Professor, Macao Environmental Research Institute, MUST
2015.08-2015.12	Project director, Basel Convention Regional Centre for Asia and the Pacific (BCRC China)
2013.05-2015.08	Post doctorate, School of Environment, Tsinghua University

Research Grants

2021.03-2023.03	Research and demonstration on the environmentally sound recycling technology with high economic value of waste mobile phones; FDCT-GDST, PI
2022.06-2023.03	Monitoring of wild pland in Macao; Macau Municipal Affairs Bureau, PI
2020.04-2021.04	The whole process management and risk control mechanism of medical waste under new coronavirus pneumonia epidemic in Macau; FDCT, PI
2020.01-2020.12	Research on the mid- and long term pathway of energy transformation in Guangdong-Hong Kong- Macau Great Bay; Chinese academy of engineering, PI of sub-project 4.

- 2019.10-2022.09 Characterizing the influence mechanism of the use activities and its carbon emissions of urban household e-products in Guangdong-Hong Kong-Macao Natural Science Foundation of Guangdong Province, **PI**
- 2019.09-2021.08 Environmental quality monitoring of walking trail in Taipai House museum; Macau Municipal Affairs Bureau, **PI**
- 2019.05-2022.04 Mechanism research of mechanochemically enhanced leaching of rare earth elements from typical e-waste; FDCT, **PI**
- 2018.12-2021.12 Characterizing the PBDEs composition feature and its emission and migration mechanism of typical e-waste plastics during the recycling process in Macau; FDCT, **PI**
- 2018.06-2019.05 Researches on the quantitative evaluation model and its application of E-waste transboundary movements; Research Grants for Macau University of Science and Technology, **PI**

Representative publications (Complete publication refer to my webpage)

Books/Edited Volumes

1. **Qingbin Song**, Zhishi Wang, Jinhui Li. E-waste Management and Assessment in Macau. LAMBERT Academic Publishing. 2014.
2. 李金惠, 溫宗國, 宋慶彬等. 中國城市礦產開發利用實踐與展望. 中國環境出版社, 2015.
3. Jinhui Li, **Qingbin Song**. “Metal Sustainability from Global E-waste Management” in the book of “Metal Sustainability: Global Challenges, Consequences, and Prospects”. John Wiley & Sons, Ltd, 2016. (Book chapter)
4. **Qingbin Song**, Zhishi Wang. “The Generation and Management Status of Waste Office Equipment” in the book of “E-Waste: Regulations, Management Strategies and Current Issues”. Nova Science Publishers, Inc, 2017. (Book chapter)
5. **Song Q.**, Sun C., Wang Z., Cai K. Book Chapter “Municipal solid waste to electricity development and future trend in China: a special life cycle assessment case study of Macau”. In the book of “Waste to Energy: Multi-Criteria Decision Analysis for Sustainability Assessment and Ranking”. Academic Press, 2020.

Journal Papers (*Corresponding author)

1. Cai, K., **Song, Q.***, Yuan, W., Yang, G., Li, J. (2022) Composition changes, releases, and potential exposure risk of PBDEs from typical E-waste plastics. *J Hazard Mater* 424, 127227.
2. Zhao, S., Zhao, D.*, **Song, Q.*** (2022) Comparative lifecycle greenhouse gas emissions and their reduction potential for typical petrochemical enterprises in China. *Journal of Environmental Sciences* 116, 125-138.
3. Cai, K., Sun, C., Wang, H., **Song, Q.***, Wang, C., Wang, P. (2022) The potential challenge for the effective GHG emissions mitigation of urban energy consumption: A case study of Macau. *Environmental Impact Assessment Review* 93, 106717.
4. Zhao, S., Duan, W., Zhao, D., **Song, Q.***. (2022) Identifying the influence factors of residents' low-carbon behavior under the background of “Carbon Neutrality”: An empirical study of Qingdao city, China. *Energy Reports* 8, 6876-6886.
5. Xu, L., Zhong, Y., He, X., Shi, X., **Song, Q.***. (2022) Perception and Behavioural Changes of Residents and Enterprises under the Plastic Bag Restricting Law. *Sustainability* 14, 7792.
6. Long, Y., Li, Z., **Song, Q.***, Cai, K., Tan, Q., Yang, G. (2022) The dynamic stock-flow and driving force analysis of the building metal and non-metal resources at a city scale: An empirical study in Macao. *Circular Economy* 1, 100004.
7. Wang, Z., **Song, Q.***, You, Y., Duan, H., Yuan, W., Li, J. (2021) Identifying the lifecycle ODP and GWP effects of the refrigerants from household air-conditioners in Macau. *Environmental Impact Assessment Review* 90, 106639.

8. Liang, Y., **Song, Q.***, Wu, N.*, Li, J., Zhong, Y., Zeng, W. (2021) Repercussions of COVID-19 pandemic on solid waste generation and management strategies. *Front Environ Sci Eng* 15, 115.
9. 汪中才, 宋慶彬*, 蔡鎧涵, 李金惠 (2021) 家用空調製冷劑物質流動態演化特徵——以中國澳門特別行政區為例. *資源科學* 43, 556-566.
10. Cai, K., **Song, Q.***, Yuan, W., Ruan, J., Duan, H., Li, Y., Li, J. (2020) Human exposure to PBDEs in e-waste areas: A review. *Environmental Pollution* 267, 115634.
11. 宋慶彬*, 汪中才 (2020) 澳門溫室氣體排放特徵與減排策略研究. *中國人口·資源與環境* 30, 18-26.
12. Zhang, Z., Yuan, W.*, Li, P., **Song, Q.***, Wang, X., Xu, W., Zhu, X., Zhang, Q., Yue, J., Bai, J., Wang, J. (2020) Mechanochemical immobilization of lead contaminated soil by ball milling with the additive of $\text{Ca}(\text{H}_2\text{PO}_4)_2$. *Chemosphere* 247, 125963.
13. Cai, K., **Song, Q.***, Peng, S., Yuan, W., Liang, Y., Li, J. (2020) Uncovering residents' behaviors, attitudes, and WTP for recycling e-waste: a case study of Zhuhai city, China. *Environ Sci Pollut Res* 27, 2386-2399.
14. Jiang, Z., Liao, M., Qi, J., Wang, C.*, Chen, Y., Luo, X., Liang, B., Shu, R., **Song, Q.*** (2020) Enhancing hydrogen production from propane partial oxidation via CO preferential oxidation and CO_2 sorption towards solid oxide fuel cell (SOFC) applications. *Renewable Energy* 156, 303-313.
15. Qi, J., Liao, M., Wang, C.*, Jiang, Z., Chen, Y., Liang, B., **Song, Q.*** (2020) Hydrogen production via catalytic propane partial oxidation over $\text{Ce}_{1-x}\text{M}_x\text{NiO}_{3-\lambda}$ ($\text{M}=\text{Al}, \text{Ti}$ and Ca) towards solid oxide fuel cell (SOFC) applications. *International Journal of Hydrogen Energy* 45, 8941-8954.
16. Yang, Z., Zhong, W., Chen, Y., Wang, C.*, Mo, S., Zhang, J., Shu, R., **Song, Q.*** (2020) Improving Glycerol Photoreforming Hydrogen Production Over $\text{Ag}_2\text{O}-\text{TiO}_2$ Catalysts by Enhanced Colloidal Dispersion Stability. *Front Chem* 8, 342.
17. Zhao, S., **Song, Q.***, Wang, C. (2019) Characterizing the Energy-Saving Behaviors, Attitudes and Awareness of University Students in Macau. *Sustainability* 11, 6341.
18. **Song, Q.***, Zhao, S., Lam, I., Zhu, L., Yuan, W., Wang, C. (2019) Understanding residents and enterprises' perceptions, behaviors, and their willing to pay for resources recycling in Macau. *Waste Management* 95, 129-138.
19. Zhao S., **Song Q.***, Duan H.*, Wen Z., Wang C., 2019. Uncovering the lifecycle GHG emissions and its reduction opportunities from the urban buildings: A case study of Macau. *Resources, Conservation and Recycling*, 147, 214-226.
20. Zhu L., **Song Q.***, Sheng N., Zhou X., 2019. Exploring the determinants of consumers' WTB and WTP for electric motorcycles using CVM method in Macau. *Energy Policy*, 127, 64-72.
21. Meng, W., Yuan, W.*, Wu, Z., Wang, X., Xu, W., Wang, L., **Song, Q.*** (2019). Mechanochemical synthesis of lead sulfide (PbS) nanocrystals from lead oxide. *Powder Technology*, 347, 130-135.
22. **Song, Q.***, Duan, H., Yu, D., Li, J., Wang, C., Zuo, J., 2018. Characterizing the essential materials and energy performance of city buildings: A case study of Macau. *Journal of Cleaner Production* 194, 263-276.
23. **Song, Q.***, Wang, Z., Wu, Y., Li, J., Yu, D., Duan, H.*, Yuan, W., 2018. Could urban electric public bus really reduce the GHG emissions: A case study in Macau? *Journal of Cleaner Production* 172, 2133-2142.
24. **Song, Q.***, Wu, Y., Li, J., Wang, Z., Yu, D., Duan, H.*, 2018. Well-to-wheel GHG emissions and mitigation potential from light-duty vehicles in Macau. *The International Journal of Life Cycle Assessment* 23 (10), 1916-1927.
25. **Song, Q.***, Wang, Z., Li, J., Duan, H.*, Yu, D., Liu, G., 2018. Comparative life cycle GHG emissions from local electricity generation using heavy oil, natural gas, and MSW incineration in Macau. *Renewable and Sustainable Energy Reviews* 81, 2450-2459.
26. Yu D, Duan H*, **Song Q***, Li X, Zhang H, Zhang H, Liu Y, 2018. Characterizing the environmental impact of metals in construction and demolition waste. *Environmental Science and Pollution Research*, 25 (14), 13823-13832.
27. **Song Q.**, Wang Z., Li J., Duan H.*, Yu D., Zeng X.*, 2017. Characterizing the transboundary movements of UEEE/WEEE: Is Macau a regional transfer center? *Journal of Cleaner Production*, 157, 243-253.

28. **Song Q.***, Li J., Duan H., Yu D., Wang Z.*, 2017. Towards to sustainable energy-efficient city: A case study of Macau. *Renewable and Sustainable Energy Reviews*, 75, 504-514.
29. Yu, D., Duan, H.*, **Song, Q.***, Liu, Y., Li, Y., Li, J., Shen, W., Luo, J., Wang, J., 2017. Characterization of brominated flame retardants from e-waste components in China. *Waste Management*, 68, 498-507.
30. Yu, D., **Song, Q.***, Wang, Z., Li, J., Duan, H.*, Wang, J., Wang, C., Wang, X., 2017. Quantifying the potential export flows of used electronic products in Macau: a case study of PCs. *Environmental science and pollution research international* 24, 28197-28204.
31. Mao, R., Duan, H*, Dong, D., Zuo, J., **Song, Q.***, Liu, G., Hu, M., Zhu, J., Dong, B., 2017. Quantification of carbon footprint of urban roads via life cycle assessment: Case study of a megacity- Shenzhen, China. *Journal of Cleaner Production*, 166, 40-48.
32. **Song, Q.**, Wang, Z., Li, J., 2016. Exploring residents' attitudes and willingness to pay for solid waste management in Macau. *Environmental Science and Pollution Research*, 23, 16456-16462.
33. **Song Q.**, Li J., Liu L., et al, 2016. Measuring the generation and management status of waste office equipment in China: a case study of waste printers. *Journal of Cleaner Production*, 112, 4461-4468.
34. 宋慶彬, 張宇平, 繆友萍, & 李金惠. (2016). “互聯網+ 資源回收” 模式助推中國資源回收革命. *環境污染與防*.
35. **Song Q.**, Li J, 2015. Greenhouse gas emissions from the usage of typical e-products by households: a case study of China. *Climatic Change*, 132 (4), 615-629.
36. **Song Q.**, Zeng, X., Li J., et al., 2015. Environmental risk assessment of CRT and PCBs workshops in a mobile e-waste recycling plant. *Environmental Science and Pollution Research*, 22(16), 12366-12373.
37. **Song Q.**, Li J., 2015. A review on human health consequences of heavy metals exposure to e-waste in China. *Environmental Pollution*, 196, 450-461.
38. **Song, Q.**, Li, J., Zeng, X., 2015. Minimizing the increasing solid waste through zero waste strategy. *Journal of Cleaner Production* 104, 199-210.
39. 宋慶彬, 李金惠, 董慶銀, 劉麗麗, 2015. 我國廢舊硒鼓墨盒回收與處理現狀研究[J]. *環境工程*, 2015, 33(7): 113-117.
40. **Song, Q.**, Li, J., 2014. Environmental effects of heavy metals derived from the e-waste recycling activities in China: A systematic review. *Waste management*, 35, 2587-2594.
41. **Song Q.**, Li J., 2014. A systematic review of the human body burden of e-waste exposure in China. *Environment International*. 68, 82-93.
42. **Song, Q.**, Wang, Z., Li, J., 2013. Environmental performance of municipal solid waste strategies based on LCA method: a case study of Macau. *Journal of Cleaner Production* 57, 92-100.
43. **Song, Q.**, Wang, Z., Li, J., Zeng, X., 2013. The life cycle assessment of an e-waste treatment enterprise in China. *Journal of Material Cycles and Waste Management* 15, 469-475.
44. **Song, Q.**, Wang, Z., Li, J., 2013. Sustainability evaluation of e-waste treatment based on emergy analysis and the LCA method: A case study of a trial project in Macau. *Ecological Indicators* 30, 138-147.
45. **Song, Q.**, Wang, Z., Li, J., Yuan, W., 2012. Life cycle assessment of desktop PC in Macau. *The International Journal of Life Cycle Assessment*, 3(18): 553-566.
46. **Song, Q.**, Wang, Z., Li, J., Zeng, X., 2012. Life cycle assessment of TV sets in China: A case study of the impacts of CRT monitors. *Waste management*, 32(10):1926-1936.
47. **Song, Q.**, Wang, Z., Li, J., 2012. Residents' behaviors, attitudes, and willingness to pay for recycling e-waste in Macau. *Journal of Environmental Management*, 106, 8-16.
48. **Song, Q.**, Wang, Z., Li, J., Duan, H., 2012. Sustainability evaluation of an e-waste treatment enterprise based on emergy analysis in China. *Ecological Engineering*, 42, 223-231.
49. 宋慶彬, 李愛民, 鞠茂偉, 劉卓, 2010. 厨餘和污泥不同混合比 3(31), 127-131.

50. 宋慶彬,李愛民,鞠茂偉,劉卓,2008.厨余和污泥聯合發酵不同預處理產氫特性研究[J].可再生能源 6, 62-

Professional Certification and Awards

- ✧ 2018 BOC Research Excellence Award, Macau University of Science and Technology
- ✧ 2020 BOC Research Excellence Award, Macau University of Science and Technology
- ✧ Excellent papers; International Conference on Waste Management and Technology (ICWMT), 2016;2019; and 2021
- ✧ The World's Top 2% Scientists 2020, Stanford University

Journal Editorship

Editor Board Member of Circular Economy

Reviewer for Resources, Conservation and Recycling; Journal of Cleaner Production; Waste Management; Science of the Total Environment; Energy; Environmental Impact Assessment Review, etc

Personal Website

<https://scholar.must.edu.mo/scholar/101097>