

## Associate Professor Qingbin Song

Macau University of Science and Technology  
Faculty of Innovation Engineering  
Department of Environmental Science and Engineering  
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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  $\text{CO}_2$  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  $\text{Ce}_{1-x}\text{M}_x\text{NiO}_{3-\lambda}$  (M=Al, 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  $\text{Ag}_2\text{O-TiO}_2$  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>