**RESUME**

**Basic information**

Full Name: Sheng Yang

Age: 33

Department: School of Energy Science and Engineering

Institution: Central South University

Designation: Associate professor, Master's Degree Supervisor

职务：制冷与人工系 副主任

Mobile Number: +86-16673265666

Email: ceshyang@csu.edu.cn

His research interests are chemical/energy system engineering, including fuel cell mass and heat transfer and system optimization, chemical process simulation and optimization, renewable distributed energy system planning and operation optimization, new thermal cycle system, process industrial process techno-economic analysis and life cycle evaluation. He has presided over 8 vertical research projects including the Science and Technology Innovation Bureau of the Central Military Commission, the National Natural Science Foundation of China, and the Natural Science Foundation of Hunan Province, and 9 horizontal projects including the Shanghai Institute of Space Power, Guangdong Electric Power Design Institute, and Henan Xinlian Chemical Industry Group. He has published more than 70 papers in well-known academic journals at home and abroad. He is also a young member of the Process Simulation and Simulation Committee of the Chinese Chemical Society, a young member of the Information Technology Application Committee of the Chinese Chemical Society, and a director of the Hunan Instrumentation Society.

**Education experience**

2008/09—2012/06, Dalian University of Technology, College of Chemical Engineering, B.S., Chemical Processes

2012/09—2014/06, Dalian University of Technology, College of Chemical Engineering, Master of Chemical Engineering

2014/09—2017/06, South China University of Technology, School of Chemical Engineering, Chemical Engineering, Ph.

**Work Experience**

2018/01—present, Associate Professor, School of Energy Science and Engineering, Central South University

2022/06—present, Associate Department Head, Refrigeration and Artificial Environment, School of Energy Science and Engineering, Central South University

**Representative project in recent years**

1. Science and Technology Innovation Bureau of the Central Military Commission，XXX engineering，XXX research on hydrogen production technology，2022/10-2024/09， Project Chair
2. National Science Fund for Young Scholars（No. 22008265）Thermodynamic mechanism of imidazole-type acidic ILS/LiBr/H2O ternary refrigerant and synthesis of green and efficient refrigeration process，2021/01-2023/12，Project Chair
3. National Science Fund for Young Scholars of Hunan province（No. 2022JJ40574），2023/01-2025/12，Project Chair
4. Open Foundation of Key Laboratory of Low-carbon Transformation Science and Engineering，（No. KLLCCSE07）2019/01-2021/12，Project Chair
5. Central South University innovation-driven project，（No. 2282020cxqd071）2020/01-2022/12，Project Chair
6. Henan Xinlianxin Shenleng Co., LTD，Coal chemical gas resource utilization project，2021/12-2026/12，Project Chair
7. Jiujiang Xinlixin Ring Fertilizer Co., LTD，Energy system analysis and plant capability calibration，2020/10-2021/12，Project Chair
8. Shanghai Institute of Space Power Supply，Research on energy coupling mechanism and efficient matching technology of organic liquid dehydrogenation-fuel cell，2021/10-2022/08，Project Chair
9. Shanghai Research Institute of Chemical Industry，Study on combustion characteristics of high energy liquid fuel in engine，2020/10-2021/12，Project Chair
10. Guangdong Electric Power Design Institute，Preparation of safety assessment report, system access report and feasibility study report of Foshan Hengyi Power Co., LTD. 2X600MW new energy storage frequency modulation project，2020/01-2022/12，Project Chair

**Representative papers in recent years (First /corresponding author)**

**2023**

1. Nan Xie, Zhenyu Xiao, Wei Du, Chengwei Deng, Zhiqiang Liu, **Sheng Yang\***. Thermodynamic and exergoeconomic analysis of a proton exchange membrane fuel cell/absorption chiller CCHP system based on biomass gasification. Energy, 2023, 262: 125595.

2. Aixiang Xu, Lanxiang Yang, Mengjin Xu, Tingting Song, Hong Chen, Li Xiang, Zhiqiang Liu,  **Sheng Yang\***. A cascade lithium bromide absorption refrigeration/dehumidification system for efficient energy recovery: Development, 3E optimization and Life cycle assessment. Journal of Cleaner Production,2023, 383：135286.

3. Lingzhi Yang, Hang Hu, **Sheng Yang\***, Shuai Wang, Feng Chen, Yufeng . Life cycle carbon footprint of electric arc furnace steelmaking processes under different smelting modes in China. Sustainable Materials and Technologies, 2023, 35: 00564.

4. **Sheng Yang**, Songqing Peng, Zhenyu Xiao, Zhiqiang Liu, Chengwei Deng, Wei Du, Nan Xie. Energetic and exergetic analysis of a biomass-fueled CCHP system integrated with proton exchange membrane fuel cell. International Journal of Hydrogen Energy, 2023, In press, https://doi.org/10.1016/j.ijhydene.2022.12.259.

5. Aixiang Xu,Yizhang Wang,Tingting Song,Nan Xie,Zhiqiang Liu,**Sheng Yang\***. Thermodynamic analyses of an innovative system combined dehumidification, cooling and heating driven by solar energy. Energy Conversion and Management, 2023, 279,116757..

6. Tian Zhou, Jiayu Liu, Jingyuan Liu, Jingzheng Ren, Shijie Ding, **Sheng Yang\***. 4E analysis and multi-objective optimization of a cascade LiBr/H2O refrigeration and Organic Rankine cycle integrated system for power generation. Applied Thermal Engineering, 2023, 225,120142.

7. Peizhe Cui,Yaru Zhou,Tingting Song,Zaifeng Xu,Jifu Zhang,Yangyang Liu,Yinglong Wang,Huaqing Qi,Lei Han,**Sheng Yang\***.Thermodynamic and economic analysis of ammonia synthesis process integrating liquified natural gas cold energy with carbon capture and storage.ACS Sustainable Chemistry Engineering, 2023, 11, 7, 3052-3064.

8.Jifu Zhang , Peizhe Cui, **Sheng Yang\*** , Yaru Zhou , Wei Du , Yinglong Wang, Chengwei Deng \* , Shuai Wang .Thermodynamic analysis of SOFC–CCHP system based on municipal sludge plasma gasification with carbon capture. Applied Energy, 2023,336,120822.

**2022**

1. **Sheng Yang**, Lu Zhang, Dongran Song. Conceptural design, optimization and thermodynamic analysis of CO2 capture process based on Rectisol. Energy, [2](https://doi.org/10.1016/j.energy.2021.122566)022,244:122566.

2.Changrong Liu, Hanqing Wang, Zhiyong Wang, Zhiqiang Liu, Yifang Tang, **Sheng Yang\***.Research on life cycle low carbon optimization method of multi-energy complementary distributed energy system: A review. Journal of Cleaner Production,2022, 366: 130380.

3.周天，赵叶静，刘志强，李国选，崔培哲，**杨声\***. 生物质制氢与煤制氢过程的技术经济分析与生命周期评价.中南大学学报（自然科学版）,2022.53(7): 2733-2745.

4.Changrong Liu, Yifang Tang, Hanqing Wang, Zhiqiang Liu,**Sheng Yang\***. Life cycle performance of a distributed energy system in comparison with a conventional energy system for building central heating and cooling in China. Journal of Central South University,2022,29: 2357-2376.

5.Longquan Li, Zhiqiang Liu, Chengwei Deng, Nan Xie, Jingzheng Ren, Yi Sun, Zhenyu Xiao, Kun Lei,**Sheng Yang\***.Thermodynamic and exergoeconomic analyses of a vehicular fuel cell power system with waste heat recovery for carbin heating and reactants preheating. Energy, 2022, 247: 123465.

6. Tian Zhou, Jiayu Liu, Jingzheng Ren, **Sheng Yang\***. Conceptual design, modelling  and optimization of an integrated system by combining Organic Rankine Cycle and absorption refrigeration cycle for efficient energy recovery. Journal of the Taiwan Institute of Chemical Engineers, 2022, 133:104276.

7.  Tian Zhou, Jiayu Liu, Jingzheng Ren, **Sheng Yang\***. Comprehensive Assessment of a Coupled LiBr/H2O Absorption Refrigeration/ORC System for Low-Grade Residual Heat Recovery Based on Advanced Exergy and Exergoeconomic Analysis.  ACS Sustainable Chemistry Engineering, 2022,10(18):5825-5837.

8.**杨声**，肖振宇，刘志强，邓呈维，杜玮，孙毅.质子交换膜燃料电池堆流量分配特性的参数分析.中南大学学报（自然科学版）,2022, 12(53):4627-4636.

9. 张陆，**杨声\***. 低温甲醇洗碳捕集改进与优化. 化工进展，2022，41(11):6167-6175.

10. Mengxiao Yu, Xiaobin Liu, Zhiqiang Liu, **Sheng Yang\***. Energy, exergy, economic and environmental (4E) analysis of a novel power/refrigeration cascade system to recover low-grade waste heat at 90-150 ℃.  Journal of Cleaner Production,2022,363: 132353.

11. Peizhe Cui, Zaifeng Xu, Dong Yao, Huaqing Qi, Zhaoyou Zhu, Yinglong Wang, Xin Li, Zhiqiang Liu,**Sheng Yang\***.Life cycle water footprint and carbon footprint analysis of municipal sludge plasma gasification process. Energy, 2022,261, 125280.

12. Xiaobin Liu, Mengxiao Yu, Zhiqiang Liu,  **Sheng Yang\***. Exergy analysis and advanced energy analysis of novel power/refrigerastion cascade system for recovering low grade waste heat at 90-150 ℃. ACS Sustainable Chemistry Engineering, 2022,10, 9184-9193.

13. Tian Zhou, Jingyuan Liu, Jingzheng Ren, **Sheng Yang\***. Thermodynamic analysis and optimization of a multi-stage Rankine cycle power system combining with hydrate energy storage for liquefied natural gas cold energy utilization. Journal of energy storage, 2022, 56: 105974.

14. Wenlong Xiao, Binggui Huang, Xu Ma, Zhengming Yi\*, He'an Luo, **Sheng Yang\***. Analysis and opitimization of a novel coupling process for industrial cresol separation. Industrial & Engineering Chemistry Research, 2022,61, 17342-17350.

**2021**

1. Aixiang Xu, Mengjin Xu, Nan Xie, Jiawei Liang, Keman Zeng, Guangxiao Kou, Zhiqiang Liu, **Sheng Yang**\*. Performance of a cascade lithium bromide absorption refrigeration/dehumidification process driven by low-grade waste heat for hot summer and cold winter area in China, Energy Conversion and Management, 2021, 228:113664.

2. Zhiqiang Liu, Yifang Tang, Huairong Zhou, **Sheng Yang**\*. Life cycle performance of a distributed energy system in comparison with a conventional energy system for district heating and cooling in China, Journal of Cleaner Production, 2021, 288:125663.

3. Peizhe Cui, Dong Yao, Zhaoyuan Ma, Yuanyuan Shen, Xingyi Liu, Kexu Li, Zhaoyou Zhu, Zhiqiang Liu, Jun Gao, Yinglong Wang, **Sheng Yang**\*. Life cycle water footprint comparison of biomass-to-hydrogen and coal-to-hydrogen processes, Science of the Total Environment, 2021, 773:145056.

4. Longquan Li, Zhiqiang Liu, Chengwei Deng, Jingzheng Ren, Feng Ji, Yi Sun, Zhenyu Xiao, **Sheng Yang**\*. Conventional and advanced exergy analyses of a vehicular proton exchange membrane fuel cell power system, Energy, 2021, 222: 119939.

5. Qinghe Li, Zhiqiang Liu, Yi Sun, **Sheng Yang**\*, Chengwei Deng\*. A review on temperature control of proton exchange membrane fuel cells, Processes, 2021, 9（2）, 235.

6. Huairong Zhou, Wenliang Meng, Dongliang Wang, Guixian Li\*, Hongwei Li, Zhiqiang Liu, **Sheng Yang**\*. A novel coal chemical looping gasification scheme for synthetic natural gas with low energy consumption for CO2 capture: modeling, parameters optimiaztion, and performance analysis, Energy, 2021, 225: 120249.

7. **Sheng Yang**, Lu Zhang, Nan Xie, Zhaohui Gu, Zhiqiang Liu\*.Thermodynamic analysis of a semi-lean solution process for energy saving via Rectisol wash process, Energy, 2021, 226: 120402.

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9. Huaqing Qi, Peizhe Cui, Zhiqiang Liu, Zaifeng Xu, Dong Yao, Yinglong Wang, Zhaoyou Zhu\*, **Sheng Yang**\*. Conceptual design and comprehensive analysis for novel municipal sludge gasification-based hydrogen production via plasma gasifier, Energy Conversion and Management,2021,2021:114635.

10. Peizhi Yang, Mingxuan Yuan, Zhiqiang Liu, Nan Xie, Yongjian Liu, **Sheng Yang**\*. Multi- objective optimization and life cycle assessment of a cascade system integrating LiBr/H2O absorption refrigeration with transcritical CO2 power cycle,Energy Conversion and Management, 2021, 244,114453.

11. Dongran Song, Songyue Zheng, **Sheng Yang**\*, Jian Yang, Mi Dong, Mei Su, Young Hoon Joo. Annual Energy Production Estimation for Variable-speed Wind Turbine at High-altitude Site. Journal of Modern Power Systems and Clean Energy,2021,9(3):684-687.

12.Changrong Liu, Hanqing Wang, Zhiqiang Liu, Zhiyong Wang, **Sheng Yang**\*.  Research on Bi-level Collaborative Optimization Method for Planning and Operation of Multi-energy Complementary System; Energies, 2021,1471943.

13. Aixiang Xu, Mengjin Xu, Nan Xie, Yawen Xiong, Junze Huang, Yingjie Cai, Zhiqiang Liu, **Sheng Yang**\*. Thermodynamic Analysis of a Hybrid System Coupled Cooling, Heating and Liquid Dehumidification Powered by Geothermal Energy. Energies, 2021, 14, 6084.

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1. Guoxuan Li, Peizhe Cui, Yinglong Wang, Zhiqiang Liu, Zhaoyou Zhu, **Sheng Yang**\*. Life cycle energy consumption and GHG emissions of biomass-to-hydrogen process in comparison with coal-to-hydrogen process, Energy, 2020, 191: 116588.

2. Zhiqiang Liu, Nan Xie, **Sheng Yang**\*. Thermodynamic and parametric analysis of a coupled LiBr/H2O absorption chiller/Kalina cycle for cascade utilization of low-grade waste heat. Energy Conversion and Management, 2020, 205: 112370.

3. Yinglong Wang, Yigang Liu, Xiaobin Liu, Wanxiang Zhang, Peizhe Cui, Mengxiao Yu, Zhiqiang Liu, Zhaoyou Zhu, **Sheng Yang**\*. Advanced energy and exergoeconomic analyses of a cascade absorption heat transformer for the recovery of low grade waste heat. Energy Conversion and Management, 2020, 205:112392.

4. Nan Xie, Zhiqiang Liu\*, **Sheng Yang**\*, Chenghua Tan. Energy efficiency analysis of postcombustion hydrate-based CO2 capture with Tetrahydrofuran and Tetra-n-butylammonium Bromide. Industrial & Engineering Chemistry Research, 2020, 59: 802-813.

5. **Sheng Yang**, Zhenyu Xiao, Chengwei Deng, Zhiqiang Liu, Huairong Zhou, Jingzheng Ren, Tian Zhou\*. Techno-economic analysis of coal-to-liquid process with different gasifier alternatives. Journal of Cleaner Production, 2020, 253: 120006.

6. Nan Xie, Zhiqiang Liu, Zhengyi Luo, Jingzheng Ren, Chengwei Deng, **Sheng Yang**\*. Multi-objective optimization and life cycle assessment of an integrated system combining LiBr/H2O absorption chiller and Kalina cycle. Energy Conversion and Management, 2020, 225:113448.

**2019**

1. Peizhe Cui, Mengxiao Yu, Zhiqiang Liu, Zhaoyou Zhu, **Sheng Yang**\*. Energy, exergy, and economic (3E) analyses and multi-objective optimization of a cascade absorption refrigeration system for low-grade waste heat recovery. Energy Conversion and Management, 2019, 184: 249-261.

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3. Dongran Song, Junbo Liu, Jian Yang, Mei Su, **Sheng Yang**\*, Xuebing Yang, Young Hoon Joo. Multi-objective energy-cost design optimization for the variable-speed wind turbine at high-altitude sites. Energy Conversion and Management, 2019, 196: 513-524.

4. Yinglong Wang, Guoxuan Li, Zhiqiang Liu, Peizhe Cui, Zhaoyou Zhu, **Sheng Yang**\*. Techno-economic analysis of biomass-to-hydrogen process in comparison with coal-to-hydrogen process. Energy, 2019,185: 1063-1075.

5. Mengxiao Yu, Peizhe Cui, Yinglong Wang, Zhiqiang Liu, Zhaoyou Zhu, **Sheng Yang**\*. Advanced exergy and exergoeconomic analysis of cascade absorption refrigeration system driven by low-grade waste heat. ACS Sustainable Chemistry Engineering, 2019, 7: 16843-16857.