

Xiaojin ZHANG



PROFILE

specialist in sustainability, with 9 years of experience in consulting and research, focused on assessing conventional and renewable energy production and storage technologies through life cycle assessment, techno-economic analysis, potential analysis, multi-criteria decision-making analysis.

LANGUAGES

Chinese: native speaker



English: C1



German: B2 (Telc certified)



EXPERIENCE

Paul Scherrer Institute, Switzerland
Scientist, energy technology assessment

Jan 2014 - Present

Scope:

Technology assessment of energy generation and storage technologies using life cycle assessment, techno-economic and potential analysis, investigating technology performance such as life cycle greenhouse gas emissions, levelized cost of electricity, current and future cost developments, technology potentials, etc. Funding acquisition, project management and coordination. Student supervision and lecturing (courses: “CCS and the industry of carbon-based resources”, “renewable energy technologies” and “nuclear energy system”) at ETH Zurich.

Projects:

- Amsterdam Bilbao Citizen Driven Smart Cities (ATELIE) (2019 - 2024)
- Swiss Competence Center for Energy Research, Electricity and Heat Storage (Hae), Commission for Technology and Innovation (2014 - 2020) [Link Phase I](#), [Link Phase II](#)
- Swiss Competence Center for Energy Research, Supply of Electricity (SoE), Commission for Technology and Innovation (2014 - 2020) [Link Phase I](#), [Link Phase II](#)
- Energy System Integration (ESI) Platform, Paul Scherrer Institute (2016 - present) [Link](#)
- Enabling a Low-carbon Economy via Hydrogen and CO₂ Capture & Storage (ELEGANCY) (2017-2020) [Link](#)
- Update on cost and potential of Solar Photovoltaics in Switzerland, Swiss Federal Office of Energy (2018-2019)
- Cost, Environmental and Technology Potential Assessment of Swiss Electricity Supply Technologies until 2050- Solar Photovoltaics, Swiss Federal Office of Energy (2015-2017) [Link](#)
- Life Cycle Assessment of Swiss Nuclear Power, Swissnuclear (2015-2017) [Link](#)

Accomplishments:

- Assessment of stationary heat and electricity storage technologies including pumped hydro storage, li-ion batteries, lead-acid battery, vanadium redox flow battery, advanced compressed air energy storage, power-to-gas, sensible and latent heat storage considering various applications and systems scales
- Technology monitoring of current and future development of solar photovoltaics in Switzerland, exploring its technology potential, economic performance, and environmental impacts
- Evaluation of the role of Power-to-Gas in mobility, as an alternative gas production technology, and as energy storage technology considering its different system variations
- Update of the environmental impacts of nuclear power production in Switzerland considering latest and future fuel supply chain, waste management and plant decommissioning

SOFTWARE

- MS Office
(Excel, PPT, Word, Access, Visio, Onenote)
- System Dynamics Modeling (PowerSim)
- Decision Making Analysis (Criterion Decision Plus)
- Life Cycle Assessment (SimaPro, Brightway)
- Building Simulation (eQuest)

Python, R

Autocad, ArcGIS

TRAININGS & SEMINARS

- Energy Data Hackdays (Brugg, 2019) [Link](#)
- Mentoring program for women with leadership ambition at (PSI, 2018-2019) [Link](#)
- CDM Smith Project Management Training (2013, Singapore)
- Singapore BCA Green Mark Manager course, for green building and low energy design (2010, Singapore) [Link](#)

INTERESTS

- Swimming
- Hiking
- Music
- Art

VONLUNTEER

Visiting Service, Regionales Pflegezentrum Baden (2017- present)

CDM Smith, Singapore

Consultant, urban systems analysis

May 2010 - Dec 2013

CDM Smith is a global consulting firm specialized in water, energy, transportation and infrastructures. Singapore office is an innovation hub that provides integrated solutions for sustainable urban planning by applying advanced urban systems modelling.

Scope:

Analytical model development and application by applying database- and GIS-based simulation tool that compares different combinations of technologies in urban planning, specialized in: Energy Supply and Demand Management, Smart Grid and Renewable Energy, Building Energy Simulation, Greenhouse Gas Accounting and Mitigation, Planning Level Financial Analysis of Technologies (capital/O&M cost estimate, savings in utility cost, investment prioritization, net present value, benefit cost ratio, internal rate of return, payback analysis, scenario analysis, etc.)

Projects:

- Punggol Eco-town Masterplan, Housing Development Board of Singapore (2010-2013) [Link](#)
- Bukit Timah/Geylang/Kallang Drainage Masterplan, Public Utility Board of Singapore (2012-2013)
- Macquarie University Campus Energy System Planning (2012-2013)

Accomplishments:

- Led the model development team consisting of engineers, GIS specialists, software user interface developers on the development of the urban system model including energy- and transportation- sector, financial analytical layer and greenhouse gas accounting layer from framework conceptualization to full implementation [Link to Model Demo](#)
- Coordinated with government agencies and institutions in Singapore and Australia on model application in eco- developments
- Advised clients on technology decision making through quantitative analysis on key performance indicators (KPI) in different alternatives that efficiently improves the sustainability performance of the master plan
- Recognized for excellence in data collection, management, documentation and advanced in data analysis
- Delivered the progress status report to clients, funding organizations, and executive management team within the firm

Sichuan Environmental Protection Agency, China

Intern, environmental impact assessment

Mar 2009 - May 2009

Provincial government department in charge of the environmental regulations

Environmental impact assessor that analyzes data from sites, conducting inspections, identifying potentially adverse effects and recommending preventative measures to conform to environmental regulation

Sichuan Jincheng Construction Machinery, China

Intern, business and interpreting

Dec 2007 - Feb 2008

Subsidiary of China Huashi Corporation that focussing on tower crane manufacturing with a world market coverage.

English interpreter that helps the interpretation and document translation of company's business in Dubai; contract negotiation, and facilitated trade up to 1.8 million USD

EDUCATION

Msc., Environmental Science and Engineering

Nanyang Technological University & Stanford University, Singapore & USA

Full scholarship, Singapore Stanford Partnership

Special Merit Award in Green Wave Environmental Care Project, Tertiary Level, Singapore, 2010

Jun 2009 - Jul 2010

PUBLICATIONS

Zhang, X., Witte, J. Bauer, C., Schildhauer, T. (2019) Power-to-Gas with biomass as CO₂ source, to be published

Zhang, X., Bauer, C. (2019) Potential of solar photovoltaics and its levelized cost in Switzerland, Swiss Federal Office of Energy, under review (report under review, parallel journal publication)

Zhang, X., Wang, H., Treyer, K. (2019) Life cycle assessment compendium - Life cycle inventory analysis, Chapter 4: Development of unit process datasets, Springer (under review)

Schmidt, T.S., Beuse, M., Zhang, X. Steffen, B., Schneider, S., Pena-Bello, A., Bauer, C., Parra, D. (2019) Additional Emissions and Cost from Storing Electricity in Stationary Battery Systems, Environmental Science & Technology, 53(7), 3379-3390, <https://doi.org/10.1021/acs.est.8b05313>

Terlouw, T., Bauer, C., Zhang, X., Alskaf, T. (2019) Towards the determination of metal criticality in home-based battery systems using a life cycle assessment approach, Journal of Cleaner Production, Vol. 221, pp. 667-677, <https://doi.org/10.1016/j.jclepro.2019.02.250> (corresponding author)

Zhang, X., Bauer, C. (2017). Potentials, costs and environmental assessment of electricity generation technologies - Photovoltaics, Swiss Federal Office of Energy, http://www.bfe.admin.ch/themen/00526/index.html?lang=de&dossier_id=05238

Zhang, X., Bauer, C. (2017). Life Cycle Assessment of Nuclear Power in Switzerland, https://www.psi.ch/sites/default/files/2019-05/PSI_LCA-Nuclear_CH_Final-Formatted.pdf

Abdon, A., Zhang, X., Parra, D., Patel, K., Bauer, C., Worlitschek, J. (2017). Techno-economic and environmental assessment of stationary electricity storage technologies for different time scales, Energy, Vol. 139, pp. 1173-1187, <https://doi.org/10.1016/j.energy.2017.07.097> (first co-author)

Parra, D., Zhang, X., Bauer, C. and Patel, M. K. (2017). An integrated techno-economic and life cycle environmental assessment of power-to-gas systems, Applied Energy, Vol. 193, pp. 440-454, <https://doi.org/10.1016/j.apenergy.2017.02.063> (first co-author)

Parra, D., Swierczynski, M., Stroe, D. I., Norman, S. A., Abdon, A., Worlitschek, J., O'Doherty, T., Rodrigues, L., Gillot, M., Zhang, X., Bauer, C. and Patel, M.K. (2017). An interdisciplinary review of energy storage for communities: Challenges and perspectives, Renewable and Sustainable Energy Reviews, Vol. 79, pp. 730-749, <https://doi.org/10.1016/j.rser.2017.05.003>

Zhang, X., Bauer, C., Mutel, C. and Volkart, K. (2017). Life Cycle Assessment of Power-to-Gas: Approaches, system variations and their environmental implications, Applied Energy, Vol. 190, pp. 326-338, <https://doi.org/10.1016/j.apenergy.2016.12.098>

Zhang, X., Cannan, A., Lemaster, K. (2012). Estimating Greenhouse Gas Emissions in Urban Planning Using a Multi-Urban Sector Tool, IWA World Congress on Water, Climate and Energy Proceedings, Dublin

Myers, D., Grace, P., LopezCalva, E., Zhang, X., (2012). District-Scale Water Management Impacts on Infrastructure, Energy, Pollution, and Greenhouse Gas Emissions, Singapore International Water Week 2012 Proceedings, Singapore

Cannan, A., Zhang, X., (2010). Integrated Urban Systems: New Tools to Support Sustainable Water Resource Management, Singapore International Water Week 2011 Proceedings, Singapore

Liu, G., Zhang, X., Wang, H., (2008). Research on Energy Depletion Potential in China, China Life Cycle Management Conference Proceedings