

Joe Hittinger, Ph.D., Senior Associate

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, March 2024 – Present.

- Manages projects and proposals focused on resource planning issues, electricity markets, energy efficiency, clean energy technologies, legacy fossil fuel power plants, and industrial decarbonization
- Conducts electricity system modeling activities using industry-standard production cost and capacity expansion software
- Creates and utilizes spreadsheet-based tools and other analytical platforms to analyze energy technologies, programs, and portfolios
- Assesses utility company modeling approaches, scenario definitions, input assumptions and related parameterization

Sublime Systems Inc., Somerville, MA. *Research Scientist*, October 2022 – March 2024.

- Contributed to commercialization of a breakthrough electrochemical process for producing decarbonized cement from renewable electricity, with the goal of addressing 8% of the world's carbon emissions
- Designed and built novel chemical reactor prototypes for upcycling industrial waste by-products into sustainable cement
- Oversaw research and development efforts on a large federal research grant including experimental design, data collection & analysis, budget oversight, and quarterly presentations to federal representatives
- Developed techno-economic models in support of scaling the process from lab- and pilot-scale to a commercially-sized cement plant
- Automated data analyses by creating Python workflows in Jupyter Notebooks utilized by the Research & Development team
- Collaborated on technical writing of IP documents and multi-million dollar grants from the U.S. Dept. of Energy
- Interviewed, hired, onboarded, and mentored junior scientists on the Research & Development team

Tulane University – Shantz Energy Materials Laboratory, New Orleans, LA. *Graduate Research Fellow*, August 2017 – September 2022; *Laboratory Manager & Technician*, May 2020 – September 2022.

Graduate Research Fellow:

- Designed and implemented experiments relating to recycling of waste plastics into sustainable fuels and chemicals

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- Developed low-temperature process for converting polyethylene waste into hydrocarbon fuels
 - Designed, synthesized, and characterized zeolite catalysts with precision-tuned morphological features for various catalytic applications
 - Performed life cycle assessments of next-generation photovoltaic systems with emphasis on carbon footprints
 - Studied nucleation and growth kinetics of perovskite nanocrystals for thin-film solar panels
 - Developed MATLAB code for modeling crystal structure data and analyzing x-ray diffraction data

Laboratory Manager & Technician:

- Trained graduate students and visiting scientists in advanced materials synthesis and characterization techniques
- Maintained and repaired analytical instruments with emphasis on gas chromatography and x-ray diffraction
- Managed laboratory safety including hazardous chemical regulation and disposal

Tulane University – Chemical Engineering Department, New Orleans, LA. *Teaching Assistant*, August 2017 – May 2018.

- Assisted professors of chemical engineering in teaching the following undergraduate courses: Advanced Thermodynamics, Fluid Mechanics, and Chemical Reactor Design
- Held weekly office hours and led recitation study periods for junior and senior undergraduate chemical engineering students
- Awarded “Teaching Assistant of the Year” in 2018 by combined vote of students, peers, and professors

Vanderbilt University – Bardhan Nanophotonics Laboratory, Nashville, TN. *Research Assistant*, January 2014 – May 2017.

- Developed synthesis and characterization methods for gold nanoparticles with immunotherapy applications

University of Washington – Molecular Engineering & Sciences Institute, Seattle, WA. *Research Intern*, June 2015 – August 2015.

- Interned with the National Science Foundation’s Nanotechnology Network and developed lab skills for nanoparticle synthesis

EDUCATION

Tulane University, New Orleans, LA

Doctor of Philosophy in Chemical & Biomolecular Engineering, 2022

Vanderbilt University, Nashville, TN

Bachelor of Engineering in Chemical & Biomolecular Engineering with minors in Chemistry and Nanotechnology, 2017

PUBLICATIONS

Knight, P., S. Chavin, J. Hittinger, A. Zeng, C. Resor. 2025. *Modernizing Pennsylvania's Clean Energy Policies: An analysis of the proposed PRESS and PACER policies*. Synapse Energy Economics for Pennsylvania Department of Environmental Protection.

Yuang, C., M. Whited, T. Nguyen, S. Schadler, R. Anderson, W. Dejeanlouis, C. Palmer, C. Mattioda, A. Glaser Schoff, S. Koester, J. Hittinger, P. Eash-Gates. 2024. *Utility Engagement Playbook for Industrial Customers: Addressing Power Sector Barriers to Electrification*. Synapse Energy Economics and World Wildlife Fund for Renewable Thermal Collaborative.

Hittinger, J., D. Shantz. 2022. *Systematic Study of Low Temperature Cracking of Low-Density Polyethylene with ZSM-5*. Microporous and Mesoporous Materials, Volume 343. ISSN 1387-1811.

Webb, J., Y. Ou, S. Faley, E. Paul, J. Hittinger, C. Cutright, E. Lin, L. Bellan, R. Bardhan. 2017. *Theranostic Gold Nanoantennas for Simultaneous Multiplexed Raman Imaging of Immunomarkers and Photothermal Therapy*. American Chemical Society Omega, 2, 7, 3583-3594.

Resume updated January 2025