

YAYUN (BIRDY) CHEN

Department of Agricultural Economics
Texas A&M University
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EDUCATION

Ph.D. in Agricultural Economics , Texas A&M University	2020-2024
M.A., Economics , The University of Texas at Austin	2019
M.A., Economics , National Tsing Hua University	2016
B.A., Economics (with Honors) , Lanzhou University	2013

CURRENT EMPLOYMENT

Associate Research Scientist , Texas A&M University	Oct. 2024- Present
Postdoctoral Research Associate (Promoted) , Texas A&M University <i>Supervisor:</i> Bruce A. McCarl & Chengcheng Fei	Mar. 2024- Oct. 2024
Gas Market Analyst - RBAC Inc.	2019-2020
Organization Excellence Intern - Schindler China	2018
Research Analyst - Anbound Research Center (Think Tank)	2017

RESEARCH INTERESTS

Primary Field: Energy and Environmental Economics, Climate Change Economics, Mathematical Programming, Applied Econometrics

Secondary Field: Life Cycle Assessment, Techno-Economic Analysis, Industrial Organization, Game Theory

PEER-REVIEWED JOURNAL ARTICLE

- [1] Chen, K., P. Zhang, **Y. Chen**, C. Fei, J. Yu, J. Zhou, Y. Liang, W. Li, S. Xiang, S.Y. Dai, and J.S. Yuan. 2024. "Electro-biodiesel empowered by co-design of microorganism and electrocatalysis." *Joule*. <https://doi.org/10.1016/j.joule.2024.10.001>.
- [2] Lin, N., **Y. Chen**, and M.P. Madariaga. 2024. "Route-to-market strategy for low-carbon hydrogen from natural gas in the Permian Basin." *Fuel* 355:129420.

PUBLICATION

IGU (2021), "Global Renewable and Low-Carbon Gas Report 2021 Edition" Global Renewable and Low-Carbon Gas Report.

PAPER UNDER REVIEW

- [1] **Chen, Y**, X. Deng, C. Fei, B.A. McCarl, J. Mjelde, and Y. Xu. 2024. “Regional Oil Production and Economic Impacts Due to Hurricane’s Landfalls in the Gulf Coast Region”, 2024 (Energy Economics, under review)
- [2] **Chen, Y**,X. Deng, C. Fei, B.A. McCarl, and Y. Xu. 2024. “The Economic Impacts of Hurricane Forecast on the U.S. Gulf Coast Petroleum Refineries”, 2024 (Environment and Resource Economics, under review)
- [3] **Chen, Y**, K. Chen, C. Fei, S. Y. Dai, and J. S. Yuan. 2024. “Life Cycle Assessment and Social Benefits of Producing Bioplastics via Integrating Electrochemical CO₂ Conversion and Microbial Fermentation” (ACS Energy & Fuel, submitted)

OTHER WORKING PAPERS

- [1] **Chen, Y**, X. Deng, C. Fei, B.A. McCarl and Y. Xu. 2024. “The Economic Impact of Hurricane Forecast Inaccuracy on Gulf Coast Petroleum Refineries”
- [2] **Chen, Y**, C. Fei, B.A. McCarl, S. Y. Dai, B. Long, and J. S. Yuan. 2024. “Supply Chain and Market Penetration Analysis of Algae-based Low Carbon Products-Biofuels or Animal Meals”
- [3] **Chen, Y**, C.J. Fei, R. Woodward, and J. Rangel. 2024. “The Climate Change Impacts on Honey Bee Loss Rate across the United States”
- [4] **Chen, Y**, C.J. Fei, B.A. McCarl, R.B. Stevens, and E. Price. “Are Road Blockages a Source of Food Insecurity and Poverty in Afghanistan: A Propensity Score Matching Approach”
- [5] **Chen, Y** “The Impacts of Covid-19 on the Air Pollution and Greenhouse Gas Emissions in the United States: A Perspective on Transportation Sector”
- [6] **Chen, Y**, N. Lin, and R. Brooks. 2024. “Forecasting National Level Electricity Mix Based on Planned Installed Capacity: A Machine Learning and Multinomial Logit Modeling Approach”
- [7] Arreola-Vargas, J., B. Xu, **Y. Chen**, C. Fei, Z. Foudeh, C. Hu, C. Granda, S. Y. Dai, and J. S. Yuan. 2023. “Integration of the Carboxylate Platform with Mcl-PHA Fermentation to Enable a Universal Route from Waste to Bioplastics”
- [8] **Chen, Y**, C. Fei, B.A. McCarl, S. Y. Dai, B. Long, and J. S. Yuan. 2024. “Environmental and Economic Assessment of Algae Cultivation to Produce Low Carbon Aviation Fuels and Animal Meals”
- [9] Li, J., J. Arreola-Vargas, C. Hu, Z. Liu, **Y. Chen**, P. Piriayathanasak, R. Shan, Y. Wang, X. Meng, C. Bakker, C. Fei, B.A. McCarl, B. Yang, A.J. Ragauskas, S.Y. Dai, and J.S. Yuan “Upgrading Biorefinery Design with ‘Out-and-Out Utilization of Lignin’ to Boost Waste Valorization for Improving Economic and Environment Performance”

GRANTS

Awarded

- [1] "Dynamic and adjustable high production (DahP) switch for long-term stability in continuous fermentation" (DoD Defense Advanced Research Projects Agency (DARPA), My Role: Senior Personnel, 2024-2027, \$381,574 (TAMU share), Phase 0).
- [2] "Climate Change and Global Agriculture" (USDA-Foreign Agricultural Service, My Role: **Co-PI**, 2024-2027, \$2,500,000, My share: 16%).
- [3] "NSF ERC (Engineering Research Center): Carbon Utilization Redesign through Biomanufacturing-Empowered Decarbonization (CURB)" (NSF 2023, J. Yuan, S. Dai, et al. My Role: Senior Personnel/Student Leader, 2024-2029, \$26,000,000).
- [4] "Produce Biologically Derived Limonene from Algae/CO₂ Cultivation System as a Solvent for EOR" (Chevron Technical Center, My role: Senior personnel, 2023-2024, \$449,949)
- [5] "The Impact of English Proficient Reclassification on Long-Term Educational and Earnings Outcomes" (University of Houston Education Research Center Project #055, My Role: **Co-PI**, 2023-2027)
- [6] "Analysis of China's Wind Power Industry Competitive Model – A Case Study of Wind Power Industry of the Hexi Corridor in Gansu" (The National Undergraduate Innovation and Entrepreneurship Training Programs, Lanzhou University, My Role: **PI**, 2012-2013, ¥1,000).
- [7] "Through 'Contact Cards' to Analysis the Parents' Demands of College Students' Quality Education -A Case Study of Lanzhou University" (Undergraduate Innovation and Entrepreneurship Training Programs, Lanzhou University, My Role: **PI**, 2010, ¥8,000).

Under Review

- [8] "Climate Change Impacts on Agricultural Production, Processing and Transportation Facility" (USDA-National Institute of Food and Agriculture-Agriculture and Food Research Initiative (NIFA-AFRI), My Role: **Co-PI**, \$649,999, My share: 18%).
- [9] "What will the increased solar and wind electricity do to agricultural production and markets" (USDA-NIFA-AFRI, My Role: **Co-PI**, \$649,999, My share: 22%).
- [10] "Artificial Intelligence-Empowered Continuous Algae Cultivation for Highly Productive, Carbon-Negative, and Economic Manufacturing of Plastics and Feed" (DOE project, My Role: Senior Personnel, \$1,250,000).
- [11] "Waste-empowered Asphalt Decarbonization" (DOE project, My Role: Senior Personnel, \$496,523 (TAMU share)).
- [12] "Advanced Integrated Biorefinery with High Hydrolysate Processibility, Maximized Emission Mitigation, and Enhanced Economic Feasibility" (DOE project, My Role: Senior Personnel, \$2,000,000).

[13] “Electro-Bio Manufacturing of Platform Chemicals and Polymer Precursors from CO₂” (DOE project, Role: Senior Personnel, \$522,721 (TAMU share)).

[14] “Degradable Single-use Bioplastic Film based on Electrochemical CO₂ Reduction and Fermentation” (DOE project, My Role: Senior Personnel).

Unawarded

[15] “Carbon Negative Manufacturing via Integration of Direct Air Capture and Electrocatalytic CO₂ Reduction with Bioconversion through Efficient Electron Carriers” (DOE project, My Role: Senior Personnel).

[16] “DDRIGs: Simulating Sustainable Fuel Switching and Market Dynamics in Agriculture: A Game-theoretical Approach” (NSF Doctoral Dissertation Research Improvement Grants 2023, \$26,506)

[17] “Economic and Environmental Assessment of Expanding Green Hydrogen in Agricultural Power and Fertilizer Production” (USDA-Southern Sustainable Agriculture Research and Education 2023, \$16,500).

WORKING PROJECTS

[1] Integrated Carbon Capture and Utilization via Rapid Electrification (IC-CURE) (Texas A&M University Targeted Proposal Teams (TPT) initiative, My Role: Senior Personnel, \$500,000).

[2] Continuous Algae-based Carbon Capture and Utilization (CACCU) to Transform Economics and Environmental Impacts (DOE project, My Role: Senior Personnel, \$2,000,000).

[3] Understanding and Controlling Cell-to-Cell Variability for Robust Bioconversion (DOE project, My Role: Senior Personnel, \$215,025(TAMU share)).

[4] Multi-Stream Integrated Biorefinery Enabled by Biorefinery Waste Processing (DOE project, My Role: Senior Personnel, \$2,230,000).

[5] “Market Implications of Changes in Climate, Land Coverage, and Annual Colony Mortality for U.S. Commercial Beekeeping Operations” (Project Apis m. – National Honey Board 2020-2022, My Role: Senior Personnel, \$29,406).

TEACHING EXPERIENCE

Instructor and Teaching Assistant, Energy Institute, Texas A&M University & King Abdullah Petroleum Studies and Research Center (KAPSARC), Riyadh, Saudi Arabia

- Energy, Policy and Environment (Nov. 13-15. 2023)

Lab Instructor, Texas A&M University

- AGECE 641: Applied Mathematical Programming (Ph.D. level course) (Spring 2023)

Teaching Assistant, Texas A&M University

- AGECE 344: Agricultural and Food Law (Fall 2020 (online), Spring 2021 (online), Fall 2021)

- AGECE 350: Natural Resource and Environmental Economics (Fall 2020 (online), Spring 2021 (online))
- AGECE 621: Econometrics for Agribusiness (Master level course) (Fall 2021)

Teaching Assistant, National Tsing Hua University

- Global Economy (EMBA) (Fall 2015)

Tutoring courses: Financial Statistics (IMBA, NTHU), Game Theory (Undergraduate, UT Austin), Statistics (Undergraduate, UT Austin)

SELECTED PRESENTATIONS

- [1] **Chen, Y.**, N. Lin, and R. Brooks. “Forecasting National Level Electricity Mix Based on Planned Installed Capacity: A Machine Learning and Multinomial Logit Modeling Approach”, USAEE, Nov. 2024, Baton Rouge.
- [2] **Chen, Y.**, N. Lin, R. Brooks “Bridging Data and Decisions: Empirical Regression Meets Interface-Based Modeling for Net-Zero Energy Transitions”, USAEE, Nov. 2023, Chicago.
- [3] **Chen, Y.** “The impacts of Covid-19 on the air pollution and Greenhouse Gas emissions in the United States: a perspective on transportation sector”, USAEE, Oct. 2022, Houston.
- [4] **Chen, Y.** “Is Hydrogen a Promising Low-Carbon Future in The Agricultural Sector?” (Poster), USAEE, Oct. 2022, Houston.
- [5] **Chen, Y.** “The Economic Impact of Gulf Coast Hurricanes on the Oil Industry Disruptions across Regions in the U.S.”, 2022 Texas A&M Conference on Energy, College Station
- [6] **Chen, Y.**, N. Lin “The Impacts of Hydrogen Storage Market Growth on Houston Hydrogen Hub-Industrial Sector”, GEOGULF2021, Oct. 2021, Austin.
- [7] **Chen, Y.**, N. Lin “How to Replicate the H2-Vision Project in the Netherlands to Elsewhere in the World?”, IAEE (virtual), Jun. 2021, Paris, France.
- [8] **Chen, Y.**, N. Lin “Natural Gas and Modelling”, Nov. 2019, Department of Economics, The University of Texas at Austin, Austin
- [9] **Chen, Y.**, N. Lin “Building a Demand Model for G2M2: Highlights and Lessons Learned”, RBAC Inc. 2019 User Conference, Austin

AWARDS AND HONORS

UUS Association for Energy Economics, Young Professional Best Paper Award, Finalist	2024
Department Scholarship, Department of Agricultural Economics, TAMU	2024
Travel Scholarship (AAEA), Department of Agricultural Economics, TAMU	2022
GSA Travel Grant, Department of Agricultural Economics, TAMU	2021
Graduate Merit-based Tuition Scholarship, Department of Economics, UT Austin	2018-2019
Mainland Students Full Scholarship, NTHU, Taiwan	2013-2016

Lanzhou University Outstanding Undergraduate Honor	2013
Lanzhou University Outstanding Student Scholarship	2010-2012
Lanzhou University Outstanding Leadership Honor	2010-2011

PROFESSIONAL SERVICE

Peer Reviewer

Climatic Change (3), Algal Research (6), Journal of Cleaner Production (1), Environmental Research: Ecology (1), Environmental Research Letters (1)

Event Organizer

Co-organizer of Neuroeconomics Workshop, National Tsing Hua University	2015-2016
Assistant of Brown Bag Seminar, National Tsing Hua University	2014-2015

SKILLS

Programming Languages: R, GAMS, Mathematica, Python, MATLAB

Data Management and Analysis: SQL, Git, ACCESS, Stata, EViews, Excel (VBA)

Data Visualization: Python, Excel (VBA), Microsoft Visio, Power BI

Document Preparation: LaTeX

Other professional software: openLCA

Languages: English, Mandarin and Wu

AFFILIATION

United States Association for Energy Economics (USAEE), International Association for Energy Economics (IAEE), American Economic Association (AEA), Agricultural & Applied Economic Association (AAEA), Economic History Association (EH)