

Maxwell Brown

Experience	Colorado School of Mines	
	<i>Assistant Professor</i>	2024–
	<i>Affiliate Faculty</i>	2022–2024
	<i>Adjunct Professor</i>	2019–2022
	National Laboratory of the Rockies	
	<i>University Affiliate</i>	2024–
	<i>Senior Modeler</i>	2022–2024
	<i>Senior Energy Systems Modeler</i>	2020–2022
	<i>Energy Systems Modeler</i>	2017–2020
	<i>Intern</i>	2017
	Payne Institute for Public Policy	2015–2017
	Critical Materials Innovation Hub (CMI)	2013–2017
	Oak Ridge National Laboratory	2012–2017
Education	<i>PhD Mineral and Energy Economics - Colorado School of Mines</i>	2017
	<i>MS Resource Economics and Policy - University of Maine</i>	2012
	<i>BS Economics, Statistics - North Dakota State University</i>	2010
	<i>AS Computer Engineering - North Dakota State College of Science</i>	2006
	<i>Study Abroad - American University in Cairo</i>	2009
Publications	Bistline, J.E.T., et al. 2026. “Impacts of the Inflation Reduction Act and One Big Beautiful Bill Act on the US energy system.” <i>Nature Reviews Clean Technology</i> , 1–12. doi: 10.1038/s44359-026-00168-z .	
	Gagnon, P., and Brown, M. 2026. “Impacts from procuring clean electricity claims under different inventory accounting methods.” <i>Joule</i> , 10, Article 102349. doi: 10.1016/j.joule.2026.102349 .	
	Brown, M., and Seyedrezaei, M. 2026. “Strategic competition in lithium mining and refining: A multi-stage game theoretic model.” <i>Resources Policy</i> , 113, Article 105823. doi: 10.1016/j.resourpol.2025.105823 .	
	Serpe, L., et al. 2025. “The importance of spatial resolution in large-scale, long-term planning models.” <i>Applied Energy</i> , 385, Article 125534. doi: 10.1016/j.apenergy.2025.125534 .	
	Brown, M., et al. 2025. “Distributional impacts of technology pathways for US power sector transformation.” <i>Applied Energy</i> , 388, Article 125500. doi: 10.1016/j.apenergy.2025.125500 .	
	Brown, M., et al. 2025. “No Minerals, No Megawatts: How material costs and availability shape the future of the US power sector.” <i>Resources Policy</i> , 106, Article 105607. doi: 10.1016/j.resourpol.2025.105607 .	
	Becker, J., et al. 2025. “US economy-wide decarbonization: Sectoral and distributional impacts.” <i>Energy and Climate Change</i> , 6, Article 100181. doi: 10.1016/j.egyc.2025.100181 .	

- Bistline, J.E.T., et al. 2025. “Impacts of EPA’s finalized power plant greenhouse gas standards.” *Science*, 387(6730), 140–143. doi: [10.1126/science.adt5665](https://doi.org/10.1126/science.adt5665).
- Goforth, T., et al. 2024. “Exploring equality and sustainability trade-offs of energy transition outcomes in the United States in 2050.” *Applied Energy*, 367, Article 123376. doi: [10.1016/j.apenergy.2024.123376](https://doi.org/10.1016/j.apenergy.2024.123376).
- Brown, P.R., et al. 2024. “System-cost-minimizing deployment of PV-wind hybrids in low-carbon U.S. power systems.” *Applied Energy*, 365, Article 123151. doi: [10.1016/j.apenergy.2024.123151](https://doi.org/10.1016/j.apenergy.2024.123151).
- Brown, M., et al. 2024. “Tax Credits for Clean Electricity: The distributional impacts of supply-push policies in the power sector.” *Journal of the Association of Environmental and Resource Economists*, 11(S1), S199–S229. doi: [10.1086/730923](https://doi.org/10.1086/730923).
- Brown, M., et al. 2024. “Representing carbon dioxide transport and storage network investments within power system planning models.” *Energies*, 17(15), Article 3780. doi: [10.3390/en17153780](https://doi.org/10.3390/en17153780).
- Chanpiwat, P., Gabriel, S.A., and Brown, M. 2024. “Multi-stage modeling with recourse decisions for solving stochastic complementarity problems with an application in energy.” *IEEE Transactions on Power Systems*, 39(3), 4935–4948. doi: [10.1109/TPWRS.2023.3328963](https://doi.org/10.1109/TPWRS.2023.3328963).
- Bistline, J.E.T., et al. 2024. “Power sector impacts of the Inflation Reduction Act of 2022.” *Environmental Research Letters*, 19(1), Article 014013. doi: [10.1088/1748-9326/ad0d3b](https://doi.org/10.1088/1748-9326/ad0d3b).
- Bistline, J.E.T., et al. 2023. “Emissions and energy impacts of the Inflation Reduction Act.” *Science*, 380(6652), 1324–1327. doi: [10.1126/science.adg3781](https://doi.org/10.1126/science.adg3781).
- Balistreri, E.J., and Brown, M. 2023. “Calibrating constant elasticity of substitution technologies to bottom-up cost estimates.” *Journal of Global Economic Analysis*, 8(1), 55–76. doi: [10.21642/JGEA.080103AF](https://doi.org/10.21642/JGEA.080103AF).
- Greivel, G., et al. 2023. “Improving mathematical exposition of an industrial-scale linear program.” *INFORMS Transactions on Education*, 24(2), 119–135. doi: [10.1287/ited.2023.0283](https://doi.org/10.1287/ited.2023.0283).
- Marcy, C., et al. 2022. “Comparison of temporal resolution selection approaches in energy systems models.” *Energy*, 251, Article 123969. doi: [10.1016/j.energy.2022.123969](https://doi.org/10.1016/j.energy.2022.123969).
- Anwar, M.B., et al. 2022. “Modeling investment decisions from heterogeneous firms under imperfect information and risk in wholesale electricity markets.” *Applied Energy*, 306(Part A), Article 117908. doi: [10.1016/j.apenergy.2021.117908](https://doi.org/10.1016/j.apenergy.2021.117908).
- Mignone, B.K., et al. 2022. “Relative cost-effectiveness of electricity and transportation policies as a means to reduce CO₂ emissions in the United States: A multi-model assessment.” *Economics of Energy & Environmental Policy*, 11(1). doi: [10.5547/2160-5890.11.1.bmig](https://doi.org/10.5547/2160-5890.11.1.bmig).
- Cohen, S.M., et al. 2021. “How structural differences influence cross-model consistency: An electric sector case study.” *Renewable and Sustainable Energy Reviews*,

144, Article 111009. doi: [10.1016/j.rser.2021.111009](https://doi.org/10.1016/j.rser.2021.111009).

Sarmiento, L., et al. 2021. “Mexico and U.S. power systems under variations in natural gas prices.” *Energy Policy*, 156, Article 112378. doi: [10.1016/j.enpol.2021.112378](https://doi.org/10.1016/j.enpol.2021.112378).

Brown, M., et al. 2021. “North American energy system responses to natural gas price shocks.” *Energy Policy*, 149, Article 112046. doi: [10.1016/j.enpol.2020.112046](https://doi.org/10.1016/j.enpol.2020.112046).

Avraam, C., et al. 2021. “North American natural gas market and infrastructure developments under different mechanisms of renewable policy coordination.” *Energy Policy*, 148(Part B), Article 111855. doi: [10.1016/j.enpol.2020.111855](https://doi.org/10.1016/j.enpol.2020.111855).

Giarola, S., et al. 2021. “The role of energy storage in the uptake of renewable energy: A model comparison approach.” *Energy Policy*, 151, Article 112159. doi: [10.1016/j.enpol.2021.112159](https://doi.org/10.1016/j.enpol.2021.112159).

Bistline, J.E.T., et al. 2020. “Electric sector impacts of renewable policy coordination: A multi-model study of the North American energy system.” *Energy Policy*, 145, Article 111707. doi: [10.1016/j.enpol.2020.111707](https://doi.org/10.1016/j.enpol.2020.111707).

Siddiqui, S., et al. 2020. “Integrated North American energy markets under different futures of cross-border energy infrastructure.” *Energy Policy*, 144, Article 111658. doi: [10.1016/j.enpol.2020.111658](https://doi.org/10.1016/j.enpol.2020.111658).

Iyer, G.C., et al. 2019. “Improving consistency among models of overlapping scope in multi-sector studies: The case of electricity capacity expansion scenarios.” *Renewable and Sustainable Energy Reviews*, 116, Article 109416. doi: [10.1016/j.rser.2019.109416](https://doi.org/10.1016/j.rser.2019.109416).

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See accompanying:

- [Denver Post article from former Colorado Governor Bill Ritter](#)
- [UN-Sponsored YouTube video](#)

Hodson, E.L., et al. 2018. “U.S. energy sector impacts of technology innovation, fuel price, and electric sector CO₂ policy: Results from the EMF 32 model intercomparison study.” *Energy Economics*, 73, 352–370. doi: [10.1016/j.eneco.2018.03.027](https://doi.org/10.1016/j.eneco.2018.03.027).

Brown, M., and Eggert, R. 2018. “Simulating producer responses to selected Chinese rare earth policies.” *Resources Policy*, 55, 31–48. doi: [10.1016/j.resourpol.2017.10.013](https://doi.org/10.1016/j.resourpol.2017.10.013).

Imholte, D.D., et al. 2018. “An assessment of U.S. rare earth availability for supporting U.S. wind energy growth targets.” *Energy Policy*, 113, 294–305. doi: [10.1016/j.enpol.2017.11.001](https://doi.org/10.1016/j.enpol.2017.11.001).

Uría-Martínez, R., Leiby, P.N., and Brown, M.L. 2018. “Cost of oil and biomass supply shocks under different biofuel supply chain configurations.” *Transportation Research Record: Journal of the Transportation Research Board*, 2672(24), 28–52. doi: [10.1177/0361198118756876](https://doi.org/10.1177/0361198118756876).

Rubin, J., Leiby, P.N., and Brown, M.L. 2014. “Regional credit trading: Economic and greenhouse gas impacts of a national low carbon fuel standard.” *Transportation Research Record: Journal of the Transportation Research Board*, 2454(1), 28–35. doi: [10.3141/2454-04](https://doi.org/10.3141/2454-04).

Brown, M. 2013. “Catching the PHEVer: Simulating electric vehicle diffusion with an agent-based mixed logit model of vehicle choice.” *Journal of Artificial Societies and Social Simulation*, 16(2), Article 5. doi: [10.18564/jasss.2127](https://doi.org/10.18564/jasss.2127).

**Peer-reviewed
NREL technical
reports**

Gagnon, P et al. 2024 Standard Scenarios Report: A U.S. Electricity Sector Outlook. NREL/TP-6A40-92256. <https://www.nrel.gov/docs/fy25osti/92256.pdf>

Gagnon, P et al. 2023 Standard Scenarios Report: A U.S. Electricity Sector Outlook. NREL/TP-6A40-84327. <https://www.nrel.gov/docs/fy23osti/84327.pdf>

Ericson, S. et al. 2023. Applications of Measuring and Valuing Resilience in Energy Systems. NREL/TP-5R00-83841. <https://www.nrel.gov/docs/fy23osti/83841.pdf>

Steinberg, D, et al. 2023. Evaluating the impacts of the Inflation Reduction Act and the Bipartisan Infrastructure Law on the US power system. <https://www.nrel.gov/docs/fy23osti/85242.pdf>.

Denholm, P et al. 2022. Examining Supply-Side Options to Achieve 100% Clean Electricity by 2035. NREL/TP-6A40-81644. <https://www.nrel.gov/docs/fy22osti/81644.pdf>

Gagnon, P et al. 2022 Standard Scenarios Report: A U.S. Electricity Sector Outlook. NREL/TP-6A40-84327. <https://www.nrel.gov/docs/fy23osti/84327.pdf>

Cole, W et al. 2021 Standard Scenarios Report: A U.S. Electricity Sector Outlook. NREL/TP-6A40-84327. <https://www.nrel.gov/docs/fy22osti/80641.pdf>

Brown, M. et al. 2020. Regional Energy Deployment System (ReEDS) Model Documentation: Version 2019. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-74111. <https://www.nrel.gov/docs/fy20osti/74111.pdf>.

Cox, J., Brown, M., Hughes, C. 2020. Nuclear Energy With Flexible Operation, High VRE, and Emission-Constrained Scenarios. *Book chapter 8 in Flexible Nuclear Energy for Clean Energy Systems*. TP-6A50-77088, September 2020. Available at: <https://www.nrel.gov/docs/fy20osti/77088.pdf>

Johnson et al. 2015. High-Octane Mid-Level Ethanol Blend Market Assessment. NREL Technical Report, NREL/TP-5400-63698, December 2015.

Working papers

Avraam, C, et al. The role of long-run response of heterogeneous residential consumers in national resource planning and energy affordability. Revise and re-submit: *Energy Economics*.

Brown, M, and Guajardo, I. Strategic Supply, Recycling, and Substitution in Rare Earth Markets. Under review: *Resources Policy*.

Syedrezai, M, and Brown, M. Market Structure and the Propagation of Supply Chain Disruptions in Concentrated Commodity Markets. Under review: *Resources Policy*.

Brown, M and Steinberg, D. Money to Burn: Incentive Design for Carbon Capture in the US Power Sector. Available here: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6305498. Accepted for presentation at USAEE.

Gagnon, P, and Brown, M. Effectiveness of spatiotemporal accounting for clean electricity claims in the presence of elastic voluntary demand.

Mignone et al. Assessing additionality of clean energy procurement mechanisms.

Basoco, D, and Brown, M. Variational Quantum Optimization for CVaR-Constrained Portfolio Construction.

**Advisory
committee
participation and
previous mentees
(*: Advisee)**

Mary Bingham-Chee* (Mines ORwE, expected graduation Spring '27)
Yongchen Wu (Mines ORwE, expected graduation Spring '27)
Mirali Seyedrezai* (Mines MEE, expected graduation Spring '28)
Kaili Diamond (Mines MEE)
Daniel Yoeono (Mines MEE, expected graduation Spring '28)
Kristina Pitman* (Mines, now NLR)
Sangita Gayatri Kannan (Mines, now ANL)
Kemalcan Aydogdu (Mines Mining Engineering)
Abu Shahadat Md Ibrahim (Mines, now CO PUC)
Teagan Goforth (Carnegie Mellon, now ABT Associates)
Pattanun Chanpiwat (UMD, now Chulachomklao Royal Military Academy)
Jethro Ssengonzi (NCSU Climate Leaders Program)
Merve Olmez-Turan (Mines, now NLR)
Jesse Cruce (NLR through Whole Employee Initiative)
Saroj Khanal (NLR, now PhD student at Johns Hopkins)
Sayeh Shojaeinia (Mines, now at USGS)
Shivani Mathur (Mines, now at CO PUC)

Courses taught

EBGN310: Environmental and Resource Economics
EBGN509: Mathematical Economics
EBGN645: Computational Economics

Independent Studies:

Modeling of quantum economic systems (Spring '26; with David Basoco, Mines QE)
Modeling of electricity systems (Spring '26; with Austin Pucket, Mines MEE)
Modeling resource markets (Spring '26; with Mirali Seyedrezai, Mines MEE)
Modeling for economics research (multiple)

**Journal reviews
since Jan 2024**

Applied Energy, Economic Modeling, Energy, Energy and Climate Change, Energy Conversion and Management, Energy Economics, Energy Policy, Energy Reports, Energy Research & Social Science, Energy Strategy Reviews, Environmental Research Letters, Environmental Science and Technology, Journal of Cleaner Production, Journal of Environmental Economics and Management, Nature Energy, Resources Policy, Transportation Research Part D, Transportation Research Part E, Utilities Policy

Honors, awards

Outstanding Assistant Professor (Mines ESP: 2026)
MEE Excellence in Teaching award (Mines: 2025)
Director's Choice Award: Outstanding Paper (NREL: 2024)
Contributor to Biennial Transparency Report (United Nations: 2024)
President's Award (NREL: 2023)
Postdocs and Graduate Students Group Outstanding Mentor (NREL: 2023)

Outstanding Mentor to NREL Postdocs and Interns (NREL: 2020, 2021, & 2022)
R&D 100 Award, Software Category (2020)
Honorarium for development of ReEDS-USREP Linkage (MIT: 2019)
Most Outstanding Student in the REP Program (UMaine: 2012)
Research Assistantship through the Energy Foundation (UMaine: 2010–2012)
“Near-fluent” in Modern Standard Arabic (US ALDLN: 2009)
Clay Hector Scholarship (NDSU: 2009–2010)
Vernon E. Wendlant Scholarship (NDSU: 2008–2009)
Henry & Em Eggert Scholarship (NDSU: 2006–2008)