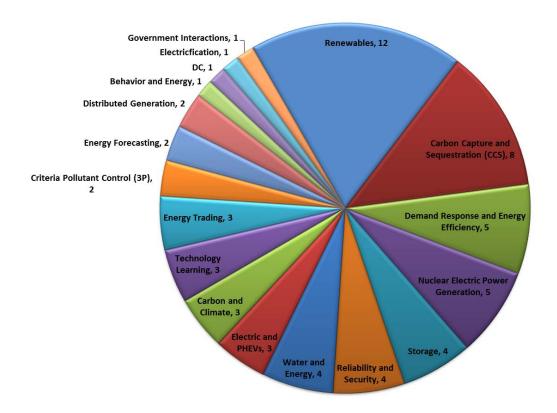


Peer-Reviewed Research Papers in 2016 and 2017

CEIC Papers Published or Submitted in 2016 and 2017 through August



Published Papers:

Abdulla, A., M.J. Ford, M.G. Morgan, and D.G. Victor, "A retrospective analysis of funding and focus in US advanced fission innovation." *Environmental Research Letters*. 2017. 12 (8): 084016.

Baik, S., A.L. Davis, and M.G. Morgan, "Assessing the Cost of Large-scale Power Outages to Residential Customers." *Risk Analysis*. 2017. DOI: 10.1111/risa.12842

Baik, S., M.G. Morgan, and A.L. Davis, "Providing Limited Local Electric Service During a Major Grid Outage: A First Assessment Based on Customer Willingness to Pay." *Risk Analysis*. 2017. DOI: 10.1111/risa.12838

Bandi, M. and J. Apt, Variability of the wind turbine power curve. *Applied Sciences*, 2016. 6: 262.

Ciez, R.E. and J.F. Whitacre, "Comparison between cylindrical and prismatic lithium-ion cell costs using a process based cost model." *Journal of Power Sources*. 2017. 340: 273-281.

Ciez, R.E., and J.F. Whitacre, "The cost of lithium is unlikely to upend the price of Li-ion storage systems" *Journal of Power Sources*. 2016. 320: 310-313.

Ciez, R.E., and J.F. Whitacre, "Comparative techno-economic analysis of hybrid micro-grid systems utilizing different battery types." *Energy Conversion and Management.* 2016. 112: 435-444.

Clack, C. T. M., S.A. Qvist, J. Apt, M. Bazilian, A,R. Brandt, K. Caldeira, S.J. Davis, V. Diakov, M.A. Handschy, P.D. H. Hines, P. Jaramillo, D.M. Kammenm, J.C.S. Long, M.G. Morgan, A. Reed, V. Sivaram, J. Sweeney, G.R. Tynan, D.G. Victor, J.P. Weyant, and J.F. Whitacre, "Evaluation of a proposal for reliable low-cost grid power with 100% wind, water, and solar." *Proceedings of the National Academy of Sciences of the United States of America*, 2017. 114(26): 6722-6727.

Carless, T.S., W.M. Griffin, and P.S. Fischbeck, "The environmental competitiveness of small modular reactors: A life cycle study." *Energy*. 2016. 114: 84-99.

Craig, M.T., P. Jaramillo, H. Zhai, and K. Klima, "The Economic Merits of Flexible Carbon Capture and Sequestration as a Compliance Strategy with the Clean Power Plan." *Environmental Science & Technology*. 2017. 51 (3): 1102-1109.

Dryden, R., M.G. Morgan, A. Bostrom, W. Bruine de Burin, "Public Perceptions of How Long Air Pollution and Carbon Dioxide Remain in the Atmosphere." *Risk Analysis*. 2017. doi:10.1111/risa.12856.

Farquharson, D., P. Jaramillo, G. Schivley, K. Klima, D. Carlson, and C. Samaras. "Beyond global warming potential: a comparative application of climate impact metrics for the life cycle

- assessment of coal and natural gas based electricity." *Journal of Industrial Ecology*. 2017. 21 (4): 857-873.
- Fisher, M.J. and J. Apt, "Emissions and Economics of Behind-the Meter Electricity Storage". *Environmental Science & Technology*, 2017. 51(3): 1094-1101.
- Fisher, M.J., F. Sowell, and J. Apt, "The economics of commercial demand response for spinning reserve." *Energy Systems*, 2017. DOI: 10.1007/s12667-017-0236-x.
- Ford, M.J., A. Abdulla, M. G. Morgan, and D. G. Victor, "Expert assessments of the state of U.S. advanced fission innovation." *Energy Policy*, 2017 18: 194-200.
- Ford, M.J., A. Abdulla, and M. G. Morgan, "Evaluating the Cost, Safety, and Proliferation Risks of Small Floating Nuclear Reactors." *Risk Analysis*. 2017. DOI: 10.1111/risa.12756
- Gingerich, D.B., X. Sun, A.P. Behrer, I.M.L. Azevedo, and M. Mauter, "Spatially resolved airwater emissions tradeoffs improve regulatory impact analyses for electricity generation." *Proceedings of the National Academy of Sciences of the United States*. 2017. 114 (8): 1862-1867.
- Glasgo, B., C.T. Hendrickson, and I.M.L. Azevedo, "Assessing the value of information in residential building simulation: Comparing simulated and actual building loads at the circuit level." *Applied Energy*. 2017. 203: 348-363.
- Glasgo, B., C.T. Hendrickson, and I.M.L. Azevedo, "Using advanced metering infrastructure to characterize residential energy use." *The Electricity Journal*. 2017. 30 (3): 64-70.
- Glasgo, B., I.M.L. Azevedo, and C.T. Hendrickson, "How much electricity can we save by using direct current circuits in homes?" *Applied Energy*. 2016. 180: 66-75.
- Hagerman, S.; Jaramillo, P.; Morgan, M. G. "Is rooftop solar PV at socket parity without subsidies?" *Energy Policy*. 2016. 89, 84–94.
- Handschy, M.A., S. Rose and J. Apt, "Is It Always Windy Somewhere? Occurrence of Low-Wind-Power Events over Large Areas". *Renewable Energy*, 2017. 101: 1124-1130.
- Herzog, H.J., Rubin, E.S. and Rochelle, G.T. "Comment on 'Reassessing the Efficiency Penalty from Carbon Capture in Coal-Fired Power Plants." *Environmental Science & Technology*. 2016. 50 (11): 6112–6113.
- Heuberger, C.F., E.S. Rubin, I. Staffell, N. Shah, and N. MacDowell, "Power capacity expansion planning considering endogenous technology cost learning." *Applied Energy*. 2017. 204: 831-845.
- Horner, N. C. and I.M.L. Azevedo, "Power usage effectiveness in data centers: overloaded and underachieving." *The Electricity Journal*. 2016. 29 (4), 61-69.

- Horner, N.C., A. Shehabi, and I.M.L. Azevedo, "Indirect energy effects of information and communication technology." *Environmental Research Letters*. 2016. 11 (10): 103001.
- Hu, B. and H. Zhai, "The cost of carbon capture and storage for coal-fired power plants in China." *International Journal of Greenhouse Gas Control*. 2017. 65: 23-31.
- Jaramillo, P. and N.Z. Muller, "Air pollution emissions and damages from energy production in the US: 2002–2011." *Energy Policy*. 2016. 90: 202-211.
- Kaack, L.H., J. Apt, M.G. Morgan, and P. McSharry, Empirical Prediction Intervals Improve Energy Forecasting. Proceedings of the National Academy of Sciences of the United States of America, 2017. 114(33): 8752-8757.
- Kang, K. "Policy influence and private returns from lobbying in the energy sector." *The Review of Economic Studies*. 2016. 83 (1): 269-305.
- Keen, J.F. and J. Apt, Are high penetrations of commercial cogeneration good for society? Environmental Research Letters, 2016. 11: 124014.
- Lam, L.T., L. Bransetter, and I.M.L. Azevedo. "China's wind industry: Leading in deployment, lagging in innovation." *Energy Policy*. 2017. 106: 588-599.
- Lam, L.T., L. Bransetter, and I.M.L. Azevedo. "China's wind electricity and cost of carbon mitigation are more expensive than anticipated." *Environmental Research Letters* 2016. 11 (8): 084015.
- Lamy, J, W. Bruine de Bruin, I.M.L. Azevedo, and M.G. Morgan. "Valuing NIMBY for new wind projects in coastal communities using a conjoint-based choice survey." *The Electricity Journal*. (In Press).
- Lamy, J.V., Jaramillo, P. Azevedo, I.L., and Wiser, R. "Should we build wind farms close to load or invest in transmission to access better wind resources in remote areas? A case study in the MISO region." *Energy Policy*. 2016. 96, 341-350.
- Loew, A., P. Jaramillo, and H. Zhai. "Marginal costs of water savings from cooling system retrofits: a case study for Texas power plants." *Environmental Research Letters*. 2016. 11 (10): 104004.
- Lueken, R., Apt, J., and Sowell, F. "Robust Resource Adequacy Planning in the Face of Coal Retirements." *Energy Policy*. 2016. 88, 371-288.
- Lueken, R., Klima, K., Griffin, W. M., and Apt, J. "The Climate and Health Effects of a USA Switch from Coal to Gas Electricity Generation." *Energy.* 2016. 109, 1160-1166.

Mantripragada, H.C. and Rubin, E.S. "Performance Model for Evaluating Chemical Looping Combustion (CLC) Processes for CO2 Capture at Gas-Fired Power Plants." *Energy & Fuels*. 2016. 30 (3): 2257-2267.

Mersky, A.C., F. Sprei, C. Samaras, and Z.S. Qian, "Effectiveness of incentives on electric vehicle adoption in Norway." *Transportation Research Part D: Transport and Environment*. 2016. 46: 56-68.

Nadarajah, S., F. Margot, and N. Secomandi, "Comparison of least squares Monte Carlo methods with applications to energy real options." *European Journal of Operations Research*. 2017. 256 (1): 196-204.

Ou, Y., Zhai, H. and Rubin, E.S. "Life cycle water use of coal-and natural-gas-fired power plants with and without carbon capture and storage." *International Journal of Greenhouse Gas Control.* 2016. 44: 249-261.

Peña, I., I.M.L. Azevedo, and L.A.F.M. Ferreira, "Lessons from wind policy in Portugal." *Energy Policy*. 2017. 103: 193-202.

Rahmani, M.; Jaramillo, P.; Hug, G. "Implications of environmental regulation and coal plant retirements in systems with large scale penetration of wind power." *Energy Policy*. 2016. 95, 196–210.

Roth, M.B. and P. Jaramillo. "Going nuclear for climate mitigation: An analysis of the cost effectiveness of preserving existing US nuclear power plants as a carbon avoidance strategy." *Energy.* 2017. 131: 67-77.

Rose, S., and Apt, J. "Quantifying Sources of Uncertainty in Reanalysis Derived Wind Speed." *Renewable Energy*. 2016. 94, 157-165.

Roussanaly, S., R. Anantharaman, K. Lindqvist, H. Zhai, E.S. Rubin, "Membrane Properties Required for Post-combustion CO2 Capture at Coal-fired Power Plants." *Journal of Membrane Science*. 2016. 511: 250-264.

Sakti, A., I.M.L. Azevedo, E.R.H. Fuchs, J.J. Michalek, K.G. Gallagher, and J.F. Whitacre, "Consistency and robustness of forecasting for emerging technologies: The case of Li-ion batteries for electric vehicles." *Energy Policy*. 2017. 106: 415-426.

Schweizer, V.J., Morgan, M.G., "Bounding US electricity demand in 2050." *Technological Forecasting and Social Change*. 2016. 105:215-223.

Secomandi, N. "A tutorial on portfolio-based control algorithms for merchant energy trading operations." *Journal of Commodity Markets*. 2016. 4 (1): 1-13.

- Talati, S., H. Zhai, and M.G. Morgan, "Viability of Carbon Capture and Sequestration Retrofits for Existing Coal-Fired Power Plants under an Emission Trading Scheme." *Environmental Science & Technology*. 2016. 50 (23): 12567–12574.
- Talati, S., H. Zhai, G.P. Kyle, M.G. Morgan, P. Patel, and L. Liu, "Consumptive Water Use from Electricity Generation in the Southwest under Alternative Climate, Technology, and Policy Futures." *Environmental Science & Technology*. 2016 50 (22): 12095-12104.
- Vaishnav, P., N. Horner, and I.M.L. Azevedo, "Where have the benefits of rooftop solar photovoltaic generation exceeded the cost?" *Environmental Research Letters*. 2017. 12: 094015.
- Vaishnav, P., Fischbeck, P.S., Morgan, M.G., and Corbett, J.J. "Shore Power for Vessels Calling at U.S. Ports: Benefits and Costs." *Environmental Science & Technology*. 2016. 50 (3), 1102-1110.
- Weis, A.; Jaramillo, P.; Michalek, J. "Consequential life cycle air emissions externalities for plug-in electric vehicles in the PJM interconnection." *Environmental Research Letters*. 2016, 11 (2), 024009.
- Wong-Parodi, G., Krishnamurti, T., Davis, A., Schwartz, D, and Fischhoff, B. "A decision science approach for integrating social science in climate and energy solutions." *Nature Climate Change*. 2016. 6: 563-569.
- Yuksel, T., Tamayao, M.A.M., Hendrickson, C., Azevedo, I.M.L. and Michalek, J.J. "Effect of regional grid mix, driving patterns and climate on the comparative carbon footprint of gasoline and plug-in electric vehicles in the United States." *Environmental Research Letters*. 2016. 11 (4), 044007.
- Zhai, H. and E.S. Rubin, "Technical and Economic Assessments of Ionic Liquids for Pre-Combustion CO2 Capture at IGCC Power Plants." *Energy Procedia*. 2017. 114: 2166-2172.
- Zhai, H. and E.S. Rubin, "A Techno-Economic Assessment of Hybrid Cooling Systems for Coaland Natural-Gas-Fired Power Plants with and without Carbon Capture and Storage." *Environmental Science & Technology*. 2016. 50 (7): 4127-4134.
- Zhou, H., A. Scheller-Wolf, N. Secomandi, and S. Smith, "Electricity trading and negative prices: storage vs. disposal." *Management Science*. 2016. 62 (3): 880-898.

Papers recently submitted for peer review:

- Fisher, M., J. Whitacre, and J. Apt, "A Simple Metric for Predicting Revenue from Electric Peak-Shaving and Optimal Battery Sizing." *Energy Technology*.
- Klima, K., J. Apt, M. Bandi, P. Happy, C. Loutan, and R. Young, "Geographic smoothing of solar photovoltaic electric power production in the western USA." *Renewable Energy*.

Klima, K., H. Sridhar, V. Dash, M.D. Bharadwaj, P. Kumar, and J. Apt, "Are Local Weather Data Required to Predict Annual Solar PV Plant Performance in India?" *ASME Journal of Solar Energy Engineering*.

Murphy, S., J. Apt, J. Moura, and F. Sowell, "Resource adequacy risks to the bulk power system in North America." *Applied Energy*.

Ph.D. Dissertations Completed in 2016 and 2017

Todd Ryan, Case-studies in the economics of ancillary services of power systems in support of high wind penetrations. 2016.

Nathaniel Horner, Powering the information age: Metrics, social cost optimization strategies, and indirect effects related to data center energy use. 2016.

Julian Lamy, Optimal locations for siting wind energy projects: Technical challenges, economics, and public preferences. 2016

Hameed Safiullah, Enabling the future grid: An analysis of operational and flexibility issues in the Indian power system. 2016.

Kristen Schell, Computational models for renewable energy target achievement and policy analysis. 2016.

Len Necefer, Development of a decision aid for energy resource management for the Navajo Nation incorporating environmental cultural values. 2016.

Leslie Abrahams, Quantitative modeling under uncertainty to inform effective energy and environmental practices. 2016.

Felipe Faria, Hydropower development in the Brazilian Amazon. 2016.

Shelly Hagerman, Economics of behind-the-meter solar PV and energy storage. 2016.

Shuchi Talati, The future of low carbon electric power generation: An assessment of economic viability & water impacts under climate change and mitigation policies. 2016.

Long Lam, Innovation in China's renewable energy industry. 2017.

Chin Yen Tee, Market design for the future electricity grid: Modeling tools and investment case studies. 2017.

Nathaniel Williams, Microgrid utilities for rural electrifications in East Africa: Challenges and opportunities. 2017.

Michael Ford, Studies in nuclear power: Low risk and low carbon. 2017.

Michael Fisher, Integrating demand-side resources into the electric grid: Economic and environmental considerations. 2017.

Reports in 2016 and 2017

Hari Mantripragada, Haibo Zhai, Edward S. Rubin, John Kitchin, Wenqin You, and Karen Kietzke, "Systems Analysis of Advanced Power Plant Carbon Capture Technologies,", Report to the Global Climane and Energy Program, 65pp., 2016.

Arman Shehabi, Sarah Smith, Dale Sartor, Richard Brown, Magnus Herrlin, Jonathan Koomey, Eric Masanet, Nathaniel Horner, Inês Azevedo, William Lintner, "United States data center energy usage report" 66pp, 2016.