



Recent Peer-Reviewed Research Papers

42 Published Papers:

Abdulla, A. and Morgan, M.G. "Nuclear Power for the Developing World," *Issues in Science and Technology*, 55-61, Winter, 2015.

Apt, J. "Recent results on the integration of renewable electric power into the US grid." *Materials Research Society Energy and Sustainability - A Review Journal*. 2015. 2: E6.

Babu, S.K., Mohamed, A.I., Whitacre, J.F. and Litster, S. "Multiple imaging mode X-ray computed tomography for distinguishing active and inactive phases in lithium-ion battery cathodes." *Journal of Power Sources*. 2015. 283: 314-319.

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

de Faria, F. A. M.; Jaramillo, P.; Sawakuchi, H. O.; Richey, J. E.; Barros, N. "Estimating greenhouse gas emissions from future Amazonian hydroelectric reservoirs." *Environmental Research Letters*. 2015. 124019.

Hagerman, S.; Jaramillo, P.; Morgan, M. G. "Is rooftop solar PV at socket parity without subsidies?." *Energy Policy*. 2016, 89, 84-94.

- 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.
- Hines, P., Dowds, J., Ryan, T., Buchanan, W., Kirby, E., and Apt, J. “A Review of Large-Scale Wind Integration Studies.” *Renewable and Sustainable Energy Reviews*. 2015. 49, 768-794.
- Hittinger, E.S. and Azevedo, I.L. “Bulk energy storage increases United States electricity system emissions.” *Environmental Science & Technology*. 2015. 49 (5), 3203-3210.
- Hittinger, E.S., Wiley, T., Kluza, J., and Whitacre, J.F. “Evaluating the value of batteries in microgrid electricity systems using an improved Energy Systems Model” *Energy Conversion and Management*. 2015. 89: 458-472.
- Horner, N. and Azevedo, I.L. “Power usage effectiveness in data centers: overloaded and underachieving.” *The Electricity Journal*. 2016. 29 (4), 61-69.
- Khalilpour, R., Mumford, K., Zhai, H., Abbas, A., Stevens, G. and Rubin, E.S. “Membrane-based carbon capture from flue gas: a review.” *Journal of Cleaner Production*. 2015. 103: 286-300.
- Klima, K., and Apt, J. “Geographic Smoothing of Solar PV: Results from Gujarat.” *Environmental Research Letters*. 2015. 10: 104001.
- Klima, K. and Morgan, M.G. “Ice storm frequencies in a warmer climate.” *Climatic Change*. 2015. 133 (2): 209-222.
- 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.
- 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.
- Mohamed, A.I., Sansone, N.J., Kuei, B., Washburn, N.R., and Whitacre, J.F. “Using Polypyrrole Coating to Improve Cycling Stability of NaTi₂(PO₄)₃ as an Aqueous Na-Ion Anode”. *Journal of the Electrochemical Society*. 2015. 162 (10): A2201-A2207.

Oates, D. L.; Jaramillo, P. "State cooperation under the EPA's proposed clean power plan." *The Electricity Journal*, 2015; 28 (3): 26-40.

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.

Prasad, S. Abdulla, A., Morgan, M.G., and Azevedo, I.L. "Nonproliferation improvements and challenges presented by small modular reactors." *Progress in Nuclear Energy*. 2015. 80, 102-109.

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.

Rose, S., and Apt, J. "What Can Reanalysis Data Tell Us About Wind Power?" *Renewable Energy*. 2015. 83, 963-969.

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

Rubin, E. S.; Azevedo, I. M. L.; Jaramillo, P.; Yeh, S. "A review of learning rates for electricity supply technologies." *Energy Policy*, 2015; 86: 198-218.

Rubin, E.S., Davison, J.E. and Herzog, H.J. "The cost of CO₂ capture and storage." *International Journal of Greenhouse Gas Control*. 2015. 40:378-400.

Sakti, A., Michalek, J.J., Fuchs, E.R.H., and Whitacre, J.F. "A techno-economic analysis and optimization of Li-ion batteries for light-duty passenger vehicle electrification" *Journal of Power Sources*. 2015. 273: 966-980.

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

Tamayao, M.A.M., Michalek, J.J., Hendrickson, C., and Azevedo, I.M.L. "Regional variability and uncertainty of electric vehicle life cycle CO₂ emissions across the United States." *Environmental Science & Technology*. 2015. 49 (14), 8844-8855.

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.

Van Den Broek, M., Berghout, N. and Rubin, E.S. "The potential of renewables versus natural gas with CO₂ capture and storage for power generation under CO₂ constraints." *Renewable and Sustainable Energy Reviews*. 2015. 49: 1296-1322.

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.

Weis, A.; Michalek, J. J.; Jaramillo, P.; Lueken, R. “Emissions and cost implications of controlled electric vehicle charging in the U.S. PJM Interconnection.” *Environmental Science and Technology*, 2015; 49 (9): 5813-5819.

Williams, N.; Jaramillo, P.; Taneja, J.; Ustun, T. S. “Enabling private sector investment in microgrid-based rural electrification in developing countries: a review.” *Renewable and Sustainable Energy Reviews*. 2015; 52: 1268-1281.

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.

Wu, W., Shanbhag, S., Wise, A., Chang, J., Rutt, A. and Whitacre, J.F. “High performance TiP2O7 based intercalation negative electrode for aqueous lithium-ion batteries via a facile synthetic route.” *Journal of The Electrochemical Society*. 2015. 162 (9): A1921-A1926.

Wu, W., Shanbhag, S., Chang, J., Rutt, A. and Whitacre, J.F. “Relating Electrolyte Concentration to Performance and Stability for NaTi₂ (PO₄)₃/Na_{0.44}MnO₂ Aqueous Sodium-Ion Batteries.” *Journal of The Electrochemical Society*. 2015. 162 (6): A803-A808.

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., Ou, Y. and Rubin, E.S. “Opportunities for decarbonizing existing US coal-fired power plants via CO₂ capture, utilization and storage.” *Environmental Science & Technology*. 2015. 49 (13): 7571-7579.

Zhai, H. and Rubin, E.S. “Water Impacts of a Low-Carbon Electric Power Future: Assessment Methodology and Status.” *Current Sustainable/Renewable Energy Reports*. 2015. 2 (1): 1-9.

10 Papers Submitted for Peer Review:

Apt, J., Rose, S., and Handschy, M. A. “Is It Always Windy Somewhere? Occurrence of Low-Wind-Power Events over Large Areas.” *Renewable Energy*.

Baik, S. Davis, A., and Morgan, M.G., “Assessing the Cost of Large-scale Power Outages to Residential Customers.” *Risk Analysis*.

Baik, S., Morgan, M.G., and Davis, A. “The Benefits and Costs of Providing Low-Amperage Service in the Event of Blackouts.” *Risk Analysis*.

Bandi, M., and Apt, J. “Variability of the wind turbine power curve.” *Applied Sciences*.

Clack, C.T.M., Qvist, S.A., Apt, J., Davis, S.J., Diakov, V., Handschy, M., Hines, P., Jaramillo, P., Kammen, D.M., Morgan, M. G., Whitacre, J., Sweeney, J., Victor, D.G., Tynan, G.R., Long, J.C.S., Sivaram, V., Brandt, A., Weyant, J.P., and Caldeira, K. “Evaluation of the Jacobson et al. energy system modeling studies.” *Proceedings of the National Academy of Sciences*.

Fisher, M. J., Apt, J., and Sowell, F. “The Economics of Commercial Demand Response for Spinning Reserve.” *Energy Systems*.

Fisher, M.J. and Apt, J., Emissions and Economics of Behind-the Meter Electricity Storage. *Environmental Science & Technology*.

Ford, M., Abdulla, A. and Morgan, M.G., “Evaluating the cost, safety and proliferation risk of small floating nuclear reactors,” *Risk Analysis*.

Keen, J.F. and Apt, J., Are high penetrations of commercial cogeneration good for society? *Environmental Research Letters*.

Lam, L., Lima De Azevedo, I. M., and Branstetter, L. “Not all patents are created equal: wind innovation in China.” *Proceedings of the National Academy of Sciences*.

Reports

Abdulla, A., Preserving the Nuclear Option: Overcoming the institutional challenges facing small modular reactors, Report by the International Risk Governance Council, 42pp, 2015