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EDUCATION

Massachusetts Institute of Technology
Ph.D. – Engineering Systems Division, February, 2000
Major Field: Technology, Management, and Policy
Diss. title: *Uncertainty and Learning in Sequential Decision-Making: The Case of Climate Policy*
Committee: Professors Henry Jacoby, Gordon Kaufman, and Greg McRae

Massachusetts Institute of Technology
M.S. – Technology and Policy Program, June, 1996

University of Pennsylvania
B.S.E. – Computer Science and Engineering, June, 1988

PROFESSIONAL EXPERIENCE

Associate Department Head and Director of Graduate Program, John and Willie Leone Family Department of Energy and Mineral Engineering, The Pennsylvania State University, July 2019 – present

Professor, John and Willie Leone Family Department of Energy and Mineral Engineering, The Pennsylvania State University, July 2018 – present

Associate Professor, John and Willie Leone Family Department of Energy and Mineral Engineering, The Pennsylvania State University, Jan 2014 – Jun 2018

Associate Professor, Engineering Systems Division, Massachusetts Institute of Technology, July 2013 – Jan 2014

Assistant Professor, Engineering Systems Division, Massachusetts Institute of Technology, July 2008 – June 2013

Visiting Professor, Department of Earth Atmosphere and Planetary Sciences, Massachusetts Institute of Technology, July 2006 – June 2008

Assistant Professor of Public Policy, Department of Public Policy, University of North Carolina at Chapel Hill, July 2001 – June 2006

Post-doctoral Research Associate, MIT Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology, March 2000 – June 2001

Research Assistant, MIT Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology, October 1994 – February 2000

Research Assistant, Energy Laboratory, Massachusetts Institute of Technology, September 1993 - September 1994

Software Engineer, Unisys, Co., Kyoto, Japan, April 1991 - August 1993.

Visiting Research Fellow, Department of Electrical Engineering, Kyoto University, April 1989 - October 1990

Lab Coordinator, LINC Laboratory for Artificial Intelligence, Computer and Information Sciences Department, University of Pennsylvania, June 1988 - March 1989

PUBLICATIONS (Peer-reviewed articles)

Webster, M., Fisher-Vanden, K., Lammers, R.B., Kumar*, V., and Perla, J. (2021). Integrated hydrological, power system and economic modeling of climate impacts on electricity demand and cost. *Nature Energy* (in press). DOI: 10.1038/s41560-021-00958-8.

Zhao*, B., Bukenberger*, J., and **Webster, M.** (2021). Scenario Reduction Methods for Two-Stage Stochastic Generation Expansion under Multi-Scale Uncertainty. *IEEE Transactions on Power Systems* (in press). DOI: 10.1109/TPWRS.2021.3121369.

Varghese*, S., Dalvi*, S., Narula, N., and **Webster, M.** (2021). The Impacts of Distinct Flexibility Enhancements on the Value and Dynamics of Natural Gas Power Plant Operations. *IEEE Transactions on Power Systems* **36** (6): 5803-5813. DOI: 10.1109/TPWRS.2021.3084367.

Sun, S., Valqui Ordonez*, B., **Webster, M.D.**, Liu, J., Kucharik, C.J., and Hertel, T. (2020). Fine-Scale Analysis of the Energy−Land−Water Nexus: Nitrate Leaching Implications of Biomass Cofiring in the Midwestern United States. *Environmental Science & Technology* **54**: 2122−2132. DOI: 10.1021/acs.est.9b07458.

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Morris*, J., Srikrishnan, V., **Webster, M.**, and Reilly, J. (2018). Hedging Strategies: Electricity Investment Decisions under Policy Uncertainty. *Energy Journal* **39** (1) 101-122.

Allen, D.T., Cardoso-Saldaña, F.J., McGaughey, G., McDonald-Buller, E., and **Webster, M.** (2017). Uses for Expanded Production of Natural Gas Liquids: Chemicals or Power? *WIREs Energy Environ 2018,* **7**: e258. DOI: 10.1002/wene.258.

Webster, M., Fisher-Vanden, K., Popp, D., and Santen*, N. (2017). Should We Give Up After Solyndra? Optimal Technology R&D Portfolios under Uncertainty. *Journal of the Association of Environmental and Resource Economics* **4** (S1) (September 2017, Part 2): S123-S151.

Santen*, N.R., **Webster, M.D.,** Popp, D. and Perez-Arriaga, I. (2017). Inter-temporal R&D and capital investment portfolios for the electricity industry's low carbon future. *The Energy Journal* **38** (1) 1-24.

Craig*, M., McDonald-Buller, E. and **Webster, M.** (2016). Technology Adoption under Time Differentiated Market-Based Instruments for Pollution Control. *Energy Economics* **60** (2016) 23–34.

McDonald-Buller, E., Kimura, Y., Craig*, M., McGaughey, G., Allen, D. and **Webster, M.** (2016). Dynamic Management of NO_X and SO_2 Emissions in the Texas and Mid-Atlantic Electric Power Systems and Implications for Air Quality (2016). *Environ. Sci. Technol.* **50** (3) 1611-1619.

Palmintier*, B., and **Webster, M.** (2016). Impact of Operational Flexibility on Generation Planning. *IEEE Transactions on Sustainable Energy*. **7** (2) 672-684.

Jacquillat*, A, Odoni, A.R., and **Webster, M.D.** (2016). Dynamic Control of Runway Configurations and of Arrival and Departure Service Rates at JFK Airport under Stochastic Queue Conditions. *Transportation Science* **51** (1) 155-176.

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de Sisternes*, F.J., **Webster, M.D.,** and Perez-Arriaga, J.I. (2015). The Impact of Bidding Rules on Electricity Markets with Intermittent Renewables. *IEEE Transactions on Power Systems* **30** (3) 1603 - 1613.

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Pacsi, A.P., Alhajeri, N.S., **Webster, M.D.,** Webber, M.E. and Allen, D.T. (2013). Changing the spatial location of electricity generation to increase water availability in areas with drought: a feasibility study and quantification of air quality impacts in Texas. *Environ. Res. Lett*. **8:** 035029.

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Sun*, L., **Webster, M.,** McGaughey, G., McDonald-Buller, E.C., Thompson, T., Prinn, R., Ellerman, A.D. and Allen, D.T. (2012). Flexible NOx Abatement from Power Plants in the Eastern United States. *Environmental Science and Technology* **46** (10) 5607–5615.

Webster, M., Sokolov, A.P., Reilly, J.M., Forest, C.E., Paltsev, S., Schlosser, A., Wang, C., Kicklighter, D., Sarofim, M., Melillo, J., Prinn, R.G., and Jacoby, H.D. (2012). Analysis of Climate Policy Targets under Uncertainty. *Climatic Change* **112** (3): 569-583.

Alhajeri, N.S., Donohoo*, P., Stillwell, A.S., King, C.W., **Webster, M.D.,** Webber, M.E. and Allen, D.T. (2011). Using Market-Based Dispatching with Environmental Price Signals to Reduce Emissions and Water Use at Power Plants in the Texas Grid. *Environmental Research Letters* **6:** 044018.

Webster, M.D., Sue Wing, I., and Jakobavits*, L. (2010). Second-Best Instruments for Near-Term Climate Policy: Intensity Targets vs. the Safety Valve. *Journal of Environmental Economics and Management* **59** (2010) 250–259.

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Sokolov, A.P., Stone, P.H., Forest, C.E., Prinn, R., Sarofim, M.C., **Webster, M.D.,** Paltsev, S., Schlosser, C.A., Kicklighter, D., Dutkiewicz, S., Reilly, J., Wang, C., Felzer, B., and Jacoby, H.D. (2009). Probabilistic Forecast for 21st Century Climate based on Uncertainties in Emissions (without Policy) and Climate Parameters. *Journal of Climate* **22**: 5175-5204.

Webster, M.D. (2009). Uncertainty and the IPCC: An Editorial Comment. *Climatic Change* **92**: 37-40.

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Oppenheimer, M., O'Neill, B.C., and **Webster, M.D.** (2008). Negative Learning and Global Environmental Change. *Climatic Change* **89** (1-2) 155-172.

Nam, J., **Webster, M.D.,** Kimura, Y., Jeffries, H., Vizuette, W., and Allen, D.T. (2008). Reductions in ozone concentrations due to controls on variability in industrial flare emissions in Houston, Texas. *Atmospheric Environment* **42**: 4198-4211.

Scott, J., Sokolov, A., Stone, P., and **Webster, M.** (2008). Relative roles of climate sensitivity and forcing in defining the ocean circulation response to climate change. *Climate Dynamics* **30**: 441–454.

Webster, M.D., Nam, J., Kimura, Y., Jeffries, H., Vizuette, W., and Allen, D.T. (2007). The effect of variability in industrial emissions on ozone formation in Houston, Texas. *Atmospheric Environment* **41** (40) 9580–9593.

Webster, M.D., Scott, J., Sokolov, A., Dutkiewicz, S., and Stone, P. (2007). Estimating Probability Distributions from Complex Models with Bifurcations: The Case of Ocean Circulation Collapse. *Journal of Environmental Systems* **31** (1) 39-59.

Oppenheimer, M., O'Neill, B.C., **Webster, M.D.,** and Agrawala, S. (2007). The Limits of Consensus. *Science* **317** (14 September 2007) 1505-1506.

Webster, M.D., and Cho, C.-H. (2006). Analysis of Variability and Correlation in Long-term Economic Growth Rates. *Energy Economics* **28** (5-6) 653-666.

O'Neill, B., Crutzen, P., Grubler, A., Hà Dương, M., Keller, K., Kolstad, C., Koomey, J., Lange, A., Obersteiner, M., Oppenheimer, M., Pepper, W., Sanderson, W., Schlesinger, M., Treich, N., Ulph, A., **Webster, M.,** and Wilson, C. (2006). Learning and climate change. *Climate Policy* **6**: 585-589. DOI: 10.1080/14693062.2006.9685623.

Webster, M.D. (2003). Communicating Climate Change Uncertainty to Policymakers and the Public. *Climatic Change* **61** (1-2) 1-8.

Webster, M.D., Forest, C., Reilly, J., Babiker, M., Kicklighter, D., Mayer, M., Prinn, R., Sarofim, M., Sokolov, A., Stone, P., and Wang, C. (2003). Uncertainty Analysis of Climate Change and Policy Response. *Climatic Change* **61** (3) 295-320.

Webster, M.D. (2002). The Curious Role of Learning: Should We Wait for More Data? *The Energy Journal* **23** (2) 97-119.

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Forest, C.E., Stone, P.H., Sokolov, A.P., Allen, M.R., and **Webster, M.D.** (2002). Quantifying Uncertainties in Climate System Properties using Recent Climate Observations. *Science* **295** (5552) 113-117.

Reilly, J.M., Stone, P.H., Forest, C.E., **Webster, M.D.,** Jacoby, H.D., and Prinn, R.G. (2001). Uncertainty in Climate Change Assessments. *Science* **293** (5529) 430-433.

Webster, M.D., and Sokolov, A.P. (2000). A Methodology for Quantifying Uncertainty in Climate Projections. *Climatic Change* **46** (4) 417-446.

Mayer, M., Wang, C., **Webster, M.D.,** and Prinn, R. (2000). Linking Local Air Pollution to Global Chemistry and Climate. *Journal of Geophysical Research* **105** (D18) 22,869-22,896.

Valverde, L.J.A., and **Webster, M.D.** (1999). Stabilizing Atmospheric CO_2 Concentrations: Technical, Political, and Economic Dimensions. *Energy Policy* **27** 613-622.

Calbo, J., Pan, W., **Webster, M.D.,** McRae, G.J., and Prinn, R. (1998). Parameterization of urban subgrid scale processes in global atmospheric chemistry models. *Journal of Geophysical Research* **103** (D3) 3437.

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* Indicates first author was advisee.

PAPERS SUBMITTED/IN REVIEW

Valqui*, B., **Webster, M.D**., Sun, S., and Hertel, T. (2021). Technology Adoption in Electricity Markets: Game-Theoretic Framework Approach for Coupling Market Models. *The Energy Journal* (Revise and Resubmit).

Hohl, C., Lo Prete, C., Radhakrishnan, A., and **Webster, M**. (2021). Comparing Two-Settlement and Multi-Settlement Market Designs for Wind Integration into the NPCC Electric Power System. *The Energy Journal* (In Review).

Yen*, S.-H., Varghese*, S., and **Webster, M.D.** (2021). Configuration-Based Unit Commitment for Combined-Cycle Units and the Value of Flexibility. *IEEE Transactions on Power Systems* (In Review).

Webster, M.D., Zhao*, B., Bukenberger*, J., and Blumsack, S. (2021). The Transition to Low-Carbon Electric Power: Portfolios, Flexibility, and Option Value. *Nature Energy* (In Review).

Bukenberger*, J., and **Webster, M.D.** (2021). Stochastic Transmission Planning: Latent Factor Approximation of AC Costs with DC Subproblems. *IEEE Transactions on Power Systems* (In Review).

PAPERS IN PREPARATION

Bukenberger*, J., and **Webster, M.D**. (2021). Multistage Adaptive Transmission Planning with Partitioned Scenario Trees. *INFORMS Journal on Computing* (In Preparation).

Su*, W., Blumsack, S., and **Webster, M.D**. (2021). A Stochastic Optimization Approach to Planning for Wide-Area Failures in Interconnected Natural Gas and Electric Power Transmission. *IEEE Transactions on Power Systems* (In Preparation).

Kumar*, V., Turner, S., Voisin, N., and **Webster, M.D.** (2021). Production Cost Models of Electricity: How Much Flexibility Does Hydroelectric Provide? *Applied Energy* (In Preparation).

Bukenberger*, J., and **Webster, M.D**. (2021). A Partitioning and Bounding Method for Adaptive Transmission Planning. (In Preparation).

CITATIONS SUMMARY

Citation indices	All	Since 2016
Citations	4123	1556
h-index	31	24
i10-index	44	35

Based on Google Scholar, accessed November 28, 2021.

BOOKS

Ellerman, A.D., **Webster, M.D**., Parsons, J., Jacoby, H.D., and McGuinness, M. (2008). *Cap-and-Trade: Contributions to the Design of a U.S. Greenhouse Gas Program*. MIT Center for Energy and Environmental Policy Research, Cambridge, MA, 100pp.

BOOK CHAPTERS

Webster, M.D. (2007). "Boiled Frogs, Hysteresis, and Path-Dependency in Climate Policy Decisions", Chapter 29 in [Schlesinger, M., H. Kheshgi, J. Smith, F. de la Chesnaye, J. Reilly, C. Kolstad, and T. Wilson, eds.] *Human-Induced Climate Change: An Interdisciplinary Assessment*, Cambridge University Press, pp. 355-364.

GOVERNMENT REPORTS

Parson, E., V. Burkett, K. Fisher-Vanden, D. Keith, L. Mearns, H. Pitcher, C. Rosenzweig, **M. Webster** (2007). *Global Change Scenarios: Their Development and Use*. Sub-report 2.1b of Synthesis and Assessment Product 2.1 by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Department of Energy, Office of Biological & Environmental Research, Washington DC., USA, 154pp.

Wilcoxen, P.J., et al. (2017). *SAB Advice on the Use of Economy-Wide Models in Evaluating the Social Costs, Benefits, and Economic Impacts of Air Regulations*. U.S. Environmental Protection Agency, Science Advisory Board. Report. 150pp. Available at: https://sab.epa.gov/ords/sab/f?p=100:12:12973585925323.

DISCUSSION PAPERS / IN PREPARATION (Unpublished)

Webster, M. (2019). Rewarding Flexibility: An Analysis of the Impact of PJM's Proposed Price Formation Reform on the Incentives for Increasing Generator Flexibility. Report (unpublished). Prepared for PJM Interconnection. https://www.eme.psu.edu/sites/www.eme.psu.edu/files/rewarding_flexibility_pjm_final_1.pdf

Blumsack, S., Lo Prete, C., Shanbhag, U., and **Webster M.** (2018). Analysis of State Policy Interactions with Electricity Markets in the Context of Uneconomic Existing Resources: A Critical Assessment of The Literature. Report (unpublished). Prepared for PJM Interconnection. https://nuclearenergy.pasenategop.com/wp-content/uploads/sites/90/2018/10/attachment-bressler.pdf

Popp, D., Santen, N., Fisher-Vanden, K., and **Webster, M.** (2012). Technology Variation vs. R&D Uncertainty: What Matters Most for Energy Patent Success? NBER Working Paper No. 17792, January 2012. URL: http://www.nber.org/papers/w17792.

Pena-Alcaraz, M., **Webster, M.,** and Ramos, A. (2011). An approximate dynamic programming approach for designing train timetables. Working Paper. Available at: http://esd.mit.edu/WPS/2011/esd-wp-2011-11.pdf

Webster, M.D., Santen, N.R., and Parpas, P. (2011). An approximate dynamic programming framework for modeling global climate policy under decision-dependent uncertainty. (Working Paper). Available at: http://esd.mit.edu/WPS/2011/esd-wp-2011-12.pdf.

Webster, M., Sokolov, A.P., Reilly, J.M., Forest, C.E., Paltsev, S., Schlosser, A., Wang, C., Kicklighter, D., Sarofim, M., Melillo, J., Prinn, R.G. and Jacoby, H.D. (2009). Analysis of Climate Policy Targets under Uncertainty. MIT Joint Program Report #180, MIT Joint Program on the Science and Policy of Global Climate Change, Cambridge, MA.

Selin, N., Paltsev, S., Sokolov, A., Wang, C., and **Webster, M**. (2011). Implications of Climate Policies for Future Aerosol: Health and Economic Impacts. Working Paper.

Selin, N.E., Wu, S., Nam, K.-M., Reilly, J.M., Paltsev, S., Prinn, R.G., and **Webster, M.D**. (2009). Global Health and Economic Impacts of Future Ozone Pollution. MIT Joint Program Report #177, MIT Joint Program on the Science and Policy of Global Climate Change, Cambridge, MA.

Webster, M.D., S. Paltsev, J. Parsons, J. Reilly, and H. Jacoby. (2008). Uncertainty in Greenhouse Emissions and Costs of Atmospheric Stabilization. MIT Joint Program Report #165, MIT Joint Program on the Science and Policy of Global Climate Change, Cambridge, MA.

Webster, M.D. and H.D. Jacoby (2008). Carbon Cycle Uncertainty and the Cost of Atmospheric Stabilization. Working Paper.

Webster, M.D., I. Sue Wing , L. Jakobavits, and T. Felgenhauer (2008). Uncertainty in costs and abatement from near-term carbon reduction policies in the U.S. Working Paper.

Webster, M.D., J. Holak, and H.D. Jacoby (2008). Avoiding Foreclosure of Future Climate Options. Working Paper.

Allen, D., C. Murphy, Y. Kimura, W. Vizuete, T. Edgar, H. Jeffries, B.-U. Kim, **M. Webster** and M. Symons (2004). Draft Progress Report, Texas Environmental Research Consortium Project H-13, "Variable Industrial VOC Emissions and their impact on ozone formation in the Houston Galveston Area." April 9, 2004.

Webster, M.D. (1997). *Uncertainty in Future Carbon Emissions: A Preliminary Exploration*. Cambridge, MA, MIT Joint Program on the Science and Policy of Global Change, Report No. 30.

Webster, M.D., Tatang, M.A., and McRae, G.J. (1996). *Application of the probabilistic collocation method for an uncertainty analysis of a simple ocean model*. Cambridge, MA, MIT Joint Program on the Science and Policy of Global Change, Report No. 4.

REFEREED CONFERENCE PROCEEDINGS

Chao, H.P., **Webster, M**., DePillis, M., Giacomoni, A., Oren. S., Wilson, R., Zhao, B. (2021). Stochastic Market Auction Redesigned Trading System (SMARTS). INFORMS Annual Meeting, Los Angeles CA (remote), October 24, 2021.

Frasier, J., and **Webster, M**. (2020). Incentivizing Generator Flexibility Investments: A Stochastic

Analysis of Various Market Designs. CIGRE Annual Meeting (remote). Sept 2, 2020.

Frasier, J., **Webster, M**., and Woodfield, R. (2020). A Holistic Framework for Electricity Market Design: The Benefits of Regulatory and Market Coordination. CIGRE Annual Meeting (remote). Sept 2, 2020.

Bukenberger, J. and **Webster, M**. (2019). Stochastic Transmission Expansion Planning: Approximating the Annual AC Operating Cost with the DC Subproblem. INFORMS Annual Meeting, Seattle WA, October 23, 2019.

Dawar, K., **Webster, M**., and Srinivasan, S. (2019). Well Location Optimization Using Reinforcement Learning. INFORMS Annual Meeting, Seattle WA, October 23, 2019.

Valqui, B., and **Webster, M.** (2019). Effect of Carbon Pricing on the Generation Investment Decisions of a Strategic Investor. INFORMS Annual Meeting, Seattle WA, October 23, 2019.

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Fisher-Vanden, K., Kumar, V., Lammers, R., Perla, J., and **Webster, M.** (2019). Modeling integrated Economic-Power System-Hydrological Impacts: The Drivers and Economic Impacts of Water Shortages on the Western Power Grid. INFORMS Annual Meeting, Seattle WA, October 22, 2019.

Webster, M., Seelhof, M., and Ustun, B. (2013). Multi-stage Stochastic Capacity Expansion under Policy and Market Uncertainty. INFORMS Annual Meeting, Minneapolis, MN. October 6, 2013.

Morris, J., and **Webster, M**. (2013). Energy and Climate Decisions Under Uncertainty: A Computable General Equilibrium Analysis. INFORMS Annual Meeting, Minneapolis, MN. October 6, 2013.

Ustun, B., Parpas, P., and **Webster, M**. (2011). Importance Sampling in Stochastic Programming & Application to Economic Dispatch for Power Systems. INFORMS Annual Meeting, Charlotte, NC. November 15, 2011.

Santen, N., **Webster, M.,** Popp, D., and Fisher-Vanden, K. (2011). An Approximate Dynamic Program for Modeling Low-carbon Energy Research Investments under Uncertainty. INFORMS Annual Meeting, Charlotte, NC. November 15, 2011.

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Donohoo, P., Perez-Arriaga, J., and **Webster, M.** (2011). Integrating Dynamics and Uncertainty for Robust Transmission Planning. INFORMS Annual Meeting, Charlotte, NC. November 15, 2011.

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Prinn, R.G., A. Sokolov, and **M. Webster** (2008). Current and Future Emissions and Concentrations of Trace Gases Impacting the Stratosphere. *Eos Transactions AGU*, 89(53), Fall Meeting Supplement, Abstract A12B-03.

Webster, M. (2004). Prudent Policy or Boiling Frogs: Can Standard Two-Period Decision Models Give False Justification for Delaying Abatement? INFORMS Annual Meeting, Denver, CO. November, 2004.

Webster, M. (2003). Air Quality Regulatory Design and Analysis Support Tools in the Presence of High Temporal Variability: The Case of Houston's CAA SIP. Association for Public Policy and Management, Annual Conference, Washington, DC. Panel Organizer: "Issues in the Design of Cost-Effective Environmental Regulations: Connecting Theory to Application." November 2003.

Webster, M. (2003). Design of Control Strategies in the Presence of High Temporal Variability in Emissions. NARSTO Emissions Inventory Conference, Austin, TX. October 2003.

Webster, M. (2002). Incorporating Path-Dependency into Decision Analytic Methods: An Application to Global Climate Policy. Association for Public Policy and Management, Annual Conference, Dallas, TX. Panel Organizer: "Global Climate Policy Choices under Uncertainty: Adapting the Analysis Tools". November 2002.

INVITED LECTURES

Webster, M. (2020). Quantifying the Value of Flexibility. General Electric 7F Users Group Annual Meeting (remote). June 18, 2020.

Webster, M. (2020). Technology Portfolio Planning for an Uncertain Future: Overview of Decision Concepts. Electric Power Research Institute (EPRI) Webinar: EPRI Program 201-B (remote). August 31, 2020.

Bukenberger, J. and Webster, M. (2020). A Multistage Stochastic Transmission Expansion Algorithm for Wide-Area Planning Under Uncertainty. U.S. Dept of Energy, Office of Electricity (remote). Sept. 24, 2020. (presented to multiple program managers within OE).

Webster, M. (2017). "Challenges to the Electric Power Sector and New Questions." Pacific Northwest National Laboratory, Richland, WA.

Webster, M. (2017). “Challenges to the Electric Power Sector and New Questions.” U.S. Environmental Protection Agency, Clean Air Markets Division, Washington, DC.

Webster, M. (2017). “Dimensionality Reduction and Sampling Strategies for Stochastic Optimization.” Quantitative Developmental Systems Seminar, University Park, PA.

Webster, M. (2017). “Energy Technology R&D under Uncertainty: An Approximate Dynamic Programming Framework Industrial and Manufacturing Engineering Seminar (IE 590), University Park, PA.

Webster, M. (2014). "Dynamic, Flexible Air Quality Management for the Electric Power Generation Sector." EPRI Webinar, Palo Alto, CA

Webster, M. (2013). "The Impact of Bidding Rules on Electricity Markets with Intermittent Renewables." CEEPR Workshop, Berlin, Germany.

Webster, M. (2012). "New Long-Term Planning Tools for Electricity and Coupled Infrastructure." Saudi Aramco Executive Briefing, Cambridge, MA.

Webster, M. (2012). "New Long-Term Planning Tools for Electricity and Coupled Infrastructure." GDF Suez Executive Briefing, Cambridge, MA.

Webster, M. (2012). "Sequential Decision-Making Under Uncertainty with IAM Models Using Approximate Dynamic Programming." Integrated Assessment Modeling Consortium, Utrecht, Netherlands.

Webster, M. (2012). "New Analysis Tools for Long-Term Power Systems Planning." National Renewable Energy Laboratory, Golden, CO.

Webster, M. (2012). "An Approximate Dynamic Programming Framework for Long-Term Energy Planning Models." Instituto de Investigación Tecnológica, Universidad Pontificia Comillas, Madrid, Spain.

Webster, M. (2012). "An Approximate Dynamic Programming Framework for Climate Decision Under R&D Uncertainty." University of Texas, Austin, Operations Research & Industrial Engineering Dept., Austin, TX.

Webster, M. (2012). "An Approximate Dynamic Programming Framework for Climate Decision Under R&D Uncertainty." Carnegie-Mellon University, Engineering and Public Policy Dept., Pittsburgh, PA.

Webster, M. (2012). "An Approximate Dynamic Programming Framework for Global Climate Decision Under Uncertainty." University of Michigan, Dept. of Atmospheric, Oceanic, and Space Sciences, Ann Arbor, MI

Webster, M. (2011). "Methods for Modeling Decisions under Uncertainty for Integrated Assessment Models." U.S. Department of Energy Integrated Climate Change Modeling, PI Meeting, Washington, DC. Joint with Nidhi Santen (graduate student).

Webster, M. (2011). "Uncertainty Analysis of the MIT Integrated Global System Model." Energy Modeling Forum, Snowmass Workshop 2011, Snowmass, CO.

Webster, M. (2010). "R&D Portfolio as a Sequential Decision under Uncertainty." U.S. Department of Energy / Pacific Northwest National Laboratory, R&D Portfolio Analysis Tools and Methodologies, Washington, DC.

Webster, M. (2010). "Air Pollution, Health and Economic Impacts of Global Change Policy and Future Technologies: An Integrated Model Analysis." U.S. Environmental Protection Agency, EPA-STAR Kickoff Meeting, RTP, NC.

Webster, M. (2010). "Collaborative Research: An Improved Climate Policy Model of Endogenous Technical Change Considering Uncertain R&D Returns and Uncertain Climate Response." National Science Foundation, Human and Social Dynamics Conference, Washington DC.

Webster, M. (2010). "Uncertainty and Technology Innovation," Department of Energy Integrated Climate Change Modeling, Science Team Meeting, Washington, DC.

Webster, M. (2010). "EFRI RESIN: Infrastructures, Markets, and Natural Cycles: Managing Electricity, Water and Air Quality in Texas; Transformative Research in Resilient and Sustainable Infrastructures," National Science Foundation, EFRI Grantee Meeting, Washington, DC.

Webster, M. (2009). "The Interface of Infrastructures, Markets, and Natural Cycles: Innovative Modeling and Control Mechanisms for Managing Electricity, Water and Air Quality in Texas," National Science Foundation – Virginia Tech RESIN Workshop, Washington, DC.

Webster, M. (2009). "Considering Risk in Developing a Regulatory Response to Climate Change," New Ideas for Risk Regulation, Society for Risk Analysis & Resources for the Future, Washington, DC.

Webster, M. (2009). "A Cost-Effectiveness Analysis of Alternative Ozone Control Strategies: Flexible Nitrogen Oxide (NOx) Abatement from Power Plants in the Eastern United States," U.S. Environmental Protection Agency, Clean Air Markets Division, Washington, DC.

Webster, M. (2009). Interview, Worldview, Chicago Public Radio.

Webster, M. (2009). "Long-term Greenhouse Gas Stabilization and the Risks of Dangerous Impacts," Society for Risk Analysis, New England Chapter, Boston MA.

Webster, M. (2008). "Cost-Containment: A Primer," Carbon Market Insights Americas 2008, Pew Center on Climate & Point Carbon, Washington, DC.

Webster, M. (2008). "Uncertainty in Emissions, Costs, and Climate Impacts under Stabilization Scenarios," Energy Modeling Forum 22 Uncertainty Workshop, Wesleyan University, Middletown, CT.

Webster, M. (2008). "Sequential Decision under Uncertainty in Integrated Assessment Models, and Implications for Near-Term Mitigation," Victoria University, Victoria, Canada.

Webster, M. (2008). "Challenges in Uncertainty Analysis of Integrated Assessment Models," U.S. Department of Energy / Argonne National Lab Uncertainty Workshop, Chicago, IL.

Webster, M. (2008). "Considering Risk and Uncertainty in Designing Climate Change Policy," Princeton University, Woodrow Wilson School of Public and International Affairs, Princeton, NJ; also at Rice University, James A. Baker III Institute for Public Policy, Houston, TX.

Webster, M. (2008). "Cost-Containment: A Comparison of Instruments," MIT Center for Energy and Environmental Policy Research Workshop: The EU ETS, Perspectives and Lessons, Washington D.C.; also presented at University of North Carolina at Chapel Hill, Department of Public Policy, Chapel Hill, NC, February 2008.

Webster, M. (2008). "Smart Trading for Ozone Reductions in PJM: A Feasibility Study," U.S. Environmental Protection Agency, Clean Air Markets Division, Washington D.C.

Webster, M. (2008). "Considering Risk and Uncertainty in Designing Climate Change Policy." MIT, Technology and Policy Program, Cambridge, MA.

Webster, M. (2006). "Climate-Gate: What will we know and when will we know it?" University of Michigan, Ann Arbor, MI; also at Dartmouth College, Hanover, NH, February 2007.

Webster, M. (2006). "Uncertainty in Integrated Assessments," IIASA Conference on Learning and Climate Change, International Institute for Applied Systems Analysis, Vienna, Austria.

Webster, M. (2005). "Uncertainty in Integrated Assessments**,"** Watson Institute Conference on Frontiers of Environmental Change Research, Brown University, Providence, RI.

Webster, M. (2005). "Constructing Probabilistically-Based Emissions Scenarios," IPCC expert meeting on Emission Scenarios, Washington, DC.

Webster, M. (2004). "To Probabilize or Not to Probabilize…" National Academy of Sciences, Climate Research Committee, Washington, DC.

Webster, M. (2004). "Multi-Period Decision-Making and the "Boiled Frog" Dilemma," Energy Modeling Forum, Snowmass Conference on Climate Change Impacts Assessment, Snowmass, CO.

Webster, M. (2004). "Describing Scientific Uncertainties in Climate Change to Support Analysis of Risk and of Options: Coupling Models Across Disciplines". *IPCC Workshop on Describing Uncertainties in Climate Change to Support Analysis of Risk and of Options*, IPCC Working Group I Technical Support Unit, Boulder, CO.

Webster, M. (2004). "Uncertainty for Climate Policy: Coupling Models Across Disciplines," Aspen Global Change Institute, Conference on Climate Scenarios and Projections: The Known, the Unknown, and the Unknowable as Applied to California, Aspen, CO.

Webster, M. (2003). "The Right Tool for the Wrong Job? Path-Dependency and Climate Change Policy," Science, Technology, and Environmental Policy Seminar, Woodrow Wilson School of Public Affairs, Princeton University, Princeton, NJ.

Webster, M. (2003). "Scenarios and Uncertainty Analysis of Future Emissions and Climate Change." MIT Global Change Forum XXI, October 9, 2003.

Webster, M. (2003). "Analysis of Variability and Correlation in Economic Growth Rates: 1950-2000 Data for Subsequent Uncertainty Analyses," Energy Modeling Forum, Snowmass Conference on Climate Change Impacts Assessment, Snowmass, CO.

Webster, M. (2003). "Incorporating Path-Dependency into Decision Analytic Methods: An Application to Global Climate Policy," Duke Workshop on Reconstructing Climate Policy, Duke University, Durham, NC.

Webster, M. (2003). "Uncertainty Analysis of Climate Change and Policy Response." EGS-AGU Joint Assembly, Venice, Italy.

Webster, M. (2003). "An Analysis of Uncertainty in Future Greenhouse Gas Emissions," Intergovernmental Panel on Climate Change Expert Meeting on Guidance for Further Development of the SRES Scenarios, Amsterdam, The Netherlands.

Webster, M. (2002). "Uncertainty in Future Greenhouse Gas Prices: Methods and Models for Industry Project Evaluation," International Association for Energy Economists, Vancouver, Canada.

Webster, M. (2002). "The Curious Role of Learning in Climate Policy," Energy Modeling Forum, Snowmass Conference on Climate Change Impacts Assessment, Snowmass, CO.

Webster, M. (2002). "Quantifying Uncertainty in Climate Assessments: Progress, Challenges, and Next Steps," National Center for Atmospheric Research, US Workshop on Climate Projections, Uncertainty, and Scenarios for Impacts Assessment, Boulder, CO.

FUNDED RESEARCH

SUMMARY: Total Funding 2001-2021: $55.8M; Direct (own) Funding: $6.9M.

Project Title: Understanding Multistressor and Multiscale Drivers of Feedbacks, Cascading Failures, and Risk Management Pathways within Complex MSD Systems.
Award: DE-SC0022141.
PI: Karen Fisher-Vanden (PSU)
Sponsor: U.S. Department of Energy, Office of Science
Period of Performance: Sept. 2021 – Aug. 2026
Total Budget: $18M
Role: Co-PI, responsible for several tasks involving the development of power systems models and coupling to other system components.

Project Title: Stochastic Market Auction Redesigned Trading System (SMARTS)
Award: DE-AR0001281
PI: Dr. Hung-po Chao (ETA)
Sponsor: U.S. Dept of Energy / ARPA-E (Subaward from Energy Trading Analytics)
Period of Performance: Dec 2020 – Sept 2023
Total Budget (to PSU): $600,000 (direct) / $750,000 (total)
Role: co-PI / PSU subaward PI

Project Title: Valuation of Flexibility in Electric Power Systems
PI: Mort Webster
Sponsor: General Electric
Period of Performance: Aug 2018 – July 2020
Total Budget: $200,000
Role: Lead/Sole PI

Project Title: A Multi-Model, Multi-Scale Research Program in Stressors, Responses, and Coupled Dynamics at the Energy-Water-Land Nexus and for Concentrated, Interdependent Infrastructures: Toward Next Generation Capabilities in Integrated Impacts, Adaptation, and Vulnerability (I-IAV) Modeling and a Community of Practice
PI: Karen Fisher-Vanden (PSU) and PI: John Weyant (Stanford)
Sponsor: U.S. Department of Energy, Office of Science
Period of Performance: Sept. 2016 – Aug. 2021
Total Budget: $9M
Role: Co-PI.

Project Title: Analysis of State Policy Interactions with Electricity Markets in the Context of Uneconomic Existing Resources
PI: Mort Webster (Co-PIs: Blumsack, Lo Prete, Shanbhag)
Sponsor: PJM Interconnection
Period of Performance: June 2018 – Sept 2018
Total Budget: $75,000
Role: Lead PI

Project Title: Load-Following and Flexibility Needs Analysis
PI: Mort Webster (Co-PIs: Blumsack, Lo Prete, Shanbhag)
Sponsor: PJM Interconnection
Period of Performance: January 2017 – Sept 2017
Total Budget: $50,000
Role: Lead PI.

Project Title: A Multistage Stochastic Transmission Expansion Algorithm for Wide-Area Planning under Uncertainty
PI: Mort Webster
Sponsor: U.S. Department of Energy, Office of Electricity
Period of Performance: October 2017 – Sept 2020
Total Budget: $170,000
Role: Lead PI.

Project Title: Efficient and Scalable Methods for Multi-Stage Transmission Expansion under Uncertainty
PI: Mort Webster (co-PI: Shanbhag, U.)
Sponsor: U.S. National Science Foundation, Energy, Power, Control & Networks
Period of Performance: Sept. 2017 – Aug. 2020
Total Budget: $300,000
Role: Lead PI

Project Title: Research in Integrated Assessment Inter-Model Development, Testing, and Diagnostics
PI: Fisher-Vanden, K
Sponsor: U.S. Department of Energy, Office of Science #DE-SC0005171-001
Period of Performance: Jan. 2014 – Dec. 2020
Total Budget: $3M (300,000 direct)
Role: co-PI

Project Title: What are Sustainable Climate-Risk Management Strategies?
PI: Keller, K
Sponsor: U.S. National Science Foundation, Sustainable Research Network
Period of Performance: Jan. 2012 – Dec. 2016
Total Budget: $12M ($500,000 direct)
Role: co-PI

Project Title: Analysis of Dynamic, Flexible NOx and SO2 Abatement from Power Plants in the Eastern U.S. and Texas
PI: Allen, D.
Sponsor: EPA-STAR
Period of Performance: Sept. 2012 – Aug. 2015
Total Budget: $500,000 ($200,000 direct)
Role: co-PI, MIT site PI

Project Title: Decision making under coupled multi-timescale uncertainty
PI: Webster, M.
Sponsor: National Science Foundation, Energy, Power, Adaptive Systems
Period of Performance: Sept. 2011 – Aug. 2014
Total Budget: $330,000
Role: Lead PI

Project Title: Methods for Decision under Technological Change Uncertainty and Risk Assessment for Integrated Assessment of Climate Change
PI: Webster, M.
Sponsor: U.S. Department of Energy, Early Career Award
Period of Performance: March 2010 – Feb. 2014
Total Budget: $750,000
Role: Lead PI

Project Title: Air Pollution, Health and Economic Impacts of Global Change Policy and Future Technologies: An Integrated Model Analysis
PI: Selin, N.
Sponsor: U.S. Environmental Protection Agency, EPA-STAR
Period of Performance: Sept. 2009 – Aug. 2012
Total Budget: $600,000 ($200,000 direct)
Role: co-PI

Project Title: The Interface of Infrastructures, Markets, and Natural Cycles—Innovative modeling and control mechanisms for managing electricity, water and air quality in Texas
PI: Allen, D.
Sponsor: U.S. National Science Foundation, Emerging Frontiers in Research and Innovation (EFRI)
Period of Performance: Sept. 2008 – Aug. 2013
Total Budget: $4M ($800,000 direct)
Role: co-PI, MIT site PI

Project Title: Collaborative Research: An improved model of endogenous technical change considering uncertain R&D returns and uncertain climate response
PI: Webster, M. (co-PIs: Fisher-Vanden, K., Popp, D.)
Sponsor: National Science Foundation, Human and Social Dynamics
Period of Performance: July 2008 – June 2011
Total Budget: $750,000
Role: Lead PI

Project Title: Uncertainty in Carbon Prices and the Role of REDD
PI: Webster, M.
Sponsor: Environmental Defense
Period of Performance: June 2008 – May 2009
Total Budget: $50,000
Role: Lead PI

Project Title: Smart Trading
PI: Webster, M. (co-PIs: Ellerman, D., Allen, D.)
Sponsor: US Environmental Protection Agency, Clean Air Markets Division
Period of Performance: June 2008 – May 2009
Total Budget: $75,000
Role: Lead PI

Project Title: Scenario Analysis of Carbon Capture and Sequestration in the Western Electric Grid
PI: Herzog, H.
Sponsor: WESTCARB (partnership between State of California and U.S. Department of Energy)
Period of Performance: June 2007 – May 2008
Total Budget: $300,000 ($200,000 direct)
Role: co-PI

Project Title: Design of Multi-Gas Emissions Scenarios for Climate Change Assessment
PI: Webster, M.
Sponsor: US Environmental Protection Agency, Office of Atmospheric Programs
Period of Performance: Oct. 2005 – Sept. 2006
Total Budget: $25,000
Role: Lead PI

Project Title: Time-differentiated NOx Emissions Control, Ozone Forecasting, and Value of Information: The Development of an Integrated Analysis Framework
PI: Ellerman, D.
Sponsor: National Oceanographic and Atmospheric Administration
Period of Performance: Oct. 2005 – Sept. 2007
Total Budget: $150,000 ($100,000 direct)
Role: co-PI

Project Title: Methods for Developing Emissions Scenarios for Integrated Assessment Models
PI: Webster, M.
Sponsor: Integrated Assessment of Climate Change, Office of Science, U.S. Department of Energy
Period of Performance: Oct. 2004 – Sept. 2007
Total Budget: $300,000
Role: Lead PI

Project Title: Inventories of HR VOC Emissions & Impact of Emission Magnitude & Variability on Ozone Formation in H/G Area
PI: Jeffries, H.
Sponsor: Houston Advanced Research Center
Period of Performance: Aug. 2003 – July 2005.
Total Budget: $145,000 ($50,000 direct)
Role: co-I

Project Title: Integrated Assessment of Climate Change
PI: Webster, M.
Sponsor: Office of Science, U.S. Department of Energy
Period of Performance: Oct. 2002 – Sept. 2004.
Total Budget: $127,000
Role: Lead PI

HONORS AND AWARDS

John T. Ryan Jr. Faculty Fellowship, July 2018.

G. Montgomery and Marion Mitchell Award for Innovative Teaching, July 2017.

U.S. Department of Energy Early Career Award, January, 2010.

Tanner Award for Excellence in Undergraduate Teaching, Univ. of North Carolina, Feb. 2006.

Most Outstanding Faculty Award, Public Policy Majors Union, May, 2003.

Martin Fellowship, Massachusetts Institute of Technology, 1996-1997

Monbusho Scholarship, Japanese Ministry of Education, April 1989 – October 1990

TEACHING RECORD

Pennsylvania State University

Spring 2021:	EGEE 451	Energy Systems Analysis
	EME 501	Design Under Uncertainty in Energy and Mineral Systems
Fall 2020:	EGEE 451	Energy Systems Analysis
Spring 2020:	EME 597	Computational Methods for Electric Power Systems Analysis
Fall 2019:	EGEE 451	Energy Systems Analysis
	EME 501	Design Under Uncertainty in Energy and Mineral Systems
Spring 2019:	EME 597	Computational Methods for Electric Power Systems Analysis
Fall 2018:	EGEE 451	Energy Systems Analysis
	EME 501	Design Under Uncertainty in Energy and Mineral Systems
Spring 2018:	EME 597	Computational Methods for Electric Power Systems Analysis
Fall 2017:	EGEE 451	Energy Systems Analysis
	EME 500	Energy and Mineral Project Investment Evaluation
Spring 2017:	EBF 483	Electricity Markets
Fall 2016:	EGEE 451	Energy Systems Analysis
	EME 500	Energy and Mineral Project Investment Evaluation
Spring 2016:	EBF 472	Quantitative Analysis in Earth Sciences
	EGEE 597A	Computational Methods for Electric Power Systems Analysis
Fall 2015:	EGEE 451	Energy Systems Analysis
	EME 500	Energy and Mineral Project Investment Evaluation

Spring 2015: EBF 483 Electricity Markets
ENNEC 597A Computational Methods for Stochastic Simulation and Optimization
Fall 2014: EGEE 451 Energy Systems Analysis
Spring 2014: EBF 472 Quantitative Analysis in Earth Sciences

PSU Teaching Evaluations:

Semester	Course	Credit	Enrolled	Instructor Rating	Course Rating
Spring 2020	EME 597	3	8	[6.75]	[7.0]
Fall 2020	EGEE 451	3	6	[7]	[7]
Spring 2019	EME 597	3	4	7.0	7.0
Fall 2019	EGEE 451	3	69	6.63	6.89
	EME 500	3	18	6.5	7.0
Spring 2018	EME 597	3	7	6.67	6.67
Fall 2018	EGEE 451	3	80	6.43	6.72
	EME 500	3	33	7.0	6.91
Fall 2017	EGEE 451	3	128	6.1	6.37
	EME 500	3	17	6.47	6.73
Spring 2017	EBF 483	3	116	6.70	6.92
Fall 2016	EGEE 451	3	86	6.45	6.73
	EME 500	3	29	6.69	6.77
Spring 2016	EBF 472	3	118	6.31	6.76
	EGEE 597A	3	20	6.67	6.92
Fall 2015	EGEE 451	3	59	6.06	6.77
	EME 500	3	24	6.57	6.78
Spring 2015	EBF 483	3	84	6.63	6.95
	ENNEC 597A	3	19	6.33	6.80
Fall 2014	EGEE 451	3	90	6.18	6.85
Spring 2014	EBF 472	3	90	5.87	6.54

PSU course evaluations are rated on a scale of 1 (lowest) to 7 (highest).

Massachusetts Institute of Technology (2008 – 2013)

Average Course Evaluations:
Evaluation of Instructor 6.4 (max 7.0)
Evaluation of Course 6.1 (max 7.0)

Fall, 2013: ESD.862 – Modeling Risk, Decisions, and Dynamics (Graduate).
ESD.710 – Risk and Decision Analysis (Graduate).
Spring, 2013: ESD.865 – Modeling Electric Power Systems (Graduate).
Fall, 2012: <Parental/Family Leave>
Spring, 2012: <Research Leave>
Fall, 2011: ESD.862 – Modeling Risk, Decisions, and Dynamics (Graduate).

	ESD.710 – Risk and Decision Analysis (Graduate).
Spring, 2011:	ESD.128 – Science, Economics, and Policy of Climate Change (Graduate).
Fall, 2010:	ESD.865 – Modeling Electric Power Systems (Graduate).
	ESD.710 – Risk and Decision Analysis (Graduate).
Spring, 2010:	ESD.862 – Modeling Risk, Decisions, and Dynamics (Graduate).
Fall, 2009:	<Parental/Family Leave>
Spring, 2009:	ESD.862 – Modeling Risk, Decisions, and Dynamics (Graduate).
Fall, 2008:	ESD.934 – Energy and Environmental Systems (Graduate).

University of North Carolina Chapel Hill (2001 – 2006)

Average Course Evaluations:

Evaluation of Instructor	4.7 (max 5.0)
Evaluation of Course	4.3 (max 5.0)

Spring, 2006:	PLCY 298 – Quantitative Modeling Methods for Risk and Decision in Env. Policy (Graduate).
Fall, 2005:	PLCY 71 – Introduction to Public Policy Analysis (Undergraduate).
	PLCY 231 – Theories and Methods for Analyzing Decision in Public Policy and Ethics (Graduate).
Spring, 2005:	PLCY 183 – Policy Analysis for Global Climate Change (Undergraduate).
	PLCY 231 – Theories and Methods for Analyzing Decision in Public Policy and Ethics (Graduate).
Fall, 2004:	PLCY 71 Sec. A – Introduction to Public Policy Analysis (Undergraduate).
	PLCY 71 Sec. B – Introduction to Public Policy Analysis (Undergraduate).
Spring 2004:	PLCY 71 – Introduction to Public Policy Analysis (Undergraduate).
	PLCY 231 – Theories and Methods for Analyzing Decision in Public Policy and Ethics (Graduate).
Fall, 2003:	<Research and Study Leave>.
Spring, 2003:	PLCY 71 – Introduction to Public Policy (Undergraduate).
	PLCY 298 – Quantitative Modeling Methods for Risk and Decision in Env. Policy (Graduate).
Fall, 2002:	PLCY 231 – Theories and Methods for Analyzing Decision in Public Policy and Ethics (Graduate).
	PLCY 198 (183) – Policy Analysis for Global Climate Change (Undergraduate).
Spring, 2002:	PLCY 71 – Introduction to Public Policy Analysis (Undergraduate).
Fall, 2001:	PLCY 175 – Quantitative Analysis in Public Policy (Undergraduate).
	PLCY 231 – Theories and Methods for Analyzing Decision in Public Policy and Ethics (Graduate).

Graduate Theses Supervised:

Doctoral Dissertations (Ph.D.):

Kumar, Vijay. Long Term Planning under Uncertainty: Models and Algorithms. Industrial and Manufacturing Engineering. Pennsylvania State University. September 2021.

Bukenberger, Jesse. Latent Factor Approximating Models for Stochastic Optimization: Applications to Power System Planning. Industrial and Manufacturing Engineering. Pennsylvania State University. May 2021.

Leung, Tommy. Coupled Natural Gas and Electric Power Systems. Engineering Systems Division. Massachusetts Institute of Technology. May 2015.

Pena-Alcaraz, Maria Teresa. Analysis of Capacity Pricing and Allocation Mechanisms in Shared Railway Systems. Engineering Systems Division. Massachusetts Institute of Technology. May 2015.

Jacquillat, Alex. Integrated Allocation and Utilization of Airport Capacity to Mitigate Air Traffic Congestion. Engineering Systems Division. Massachusetts Institute of Technology. May 2015.

Octaviano, Claudia. The Value of Electricity Storage under Large-Scale Penetration of Renewable Energy: A Hybrid Modeling Approach. Engineering Systems Division. Massachusetts Institute of Technology. May 2015.

Ramberg, David. General Equilibrium Impacts of New Energy Technologies on Sectoral Energy Usage. Engineering Systems Division. Massachusetts Institute of Technology. May 2015.

De Sisternes, Fernando. Risk Implications of the Deployment of Renewables for Investments in Electricity Generation. Engineering Systems Division. Massachusetts Institute of Technology. May 2014.

Morris, Jennifer. Electricity Generation and Emissions Reduction Decisions under Uncertainty: A General Equilibrium Analysis. Engineering Systems Division. Massachusetts Institute of Technology. August, 2013.

Donohoo, Pearl, Design of Wide-Area Electric Transmission Networks under Uncertainty: Methods for Dimensionality Reduction. Engineering Systems Division. Massachusetts Institute of Technology. February, 2014.

Santen, Nidhi. Technology Investment Decisions Under Uncertainty: A New Modeling Framework for The Electric Power Sector. Engineering Systems Division. Massachusetts Institute of Technology. September, 2013.

Palmintier, Bryan. Incorporating Operational Flexibility into Electric Generation Planning: Impacts and Methods for System Design and Policy Analysis with Significant Renewables and Carbon Constraints. Engineering Systems Division. Massachusetts Institute of Technology. October 2012.

Jordan, Rhonda. Dynamic Programming of Electric Sector Development in a Developing Country Context. Engineering Systems Division. Massachusetts Institute of Technology. October 2012.

Karplus, Valerie. Incorporation of engineering models of automotive technologies into an economic general equilibrium model. Engineering Systems Division. Massachusetts Institute of Technology. February 2011.

Felgenhauer, Tyler. Prevention and Protection: The Simultaneous Implementation of Climate Change Mitigation and Adaptation Policy Responses. Department of Public Policy. University of North Carolina, Chapel Hill. November 2010.

Masters Theses (S.M.):

Yen, Hsien-Shao, Energy and Mineral Engineering, Penn State, "Configuration-Based Unit Commitment and the Value of Flexibility", M.S., Dec 2020.

Valqui, Brayam, Energy and Mineral Engineering, Penn State, "Adoption of Biomass Co-Firing of Coal Generation Units: A Nash Equilibrium Approach", M.S., Completed: June 2018.

Dalvi, Sourabh, Industrial and Manufacturing Engineering, Penn State, "Valuing Flexibility in Electricity Markets using Dynamic Programming", M.S., Completed: November 2018.

Alizadeh, Mohammadmahdi. Optimizing Job Assignments in Holy Family Academy Using a Goal Programming Model. Industrial and Manufacturing Engineering. Pennsylvania State University. December, 2016.

Dupuis, Alexia. Comparing Costs and Generation Mix Alternatives for the Application of the Clean Power Plan in the PJM Electricity Market: Application of Unit Commitment. Energy and Mineral Engineering. Pennsylvania State University. May, 2016.

Stines, Zachary. Reducing the Impact of the Power Sector on Ozone Pollution: An Evaluation of Spatial and Temporal Differentiated Prices for Nitrogen Oxide Emissions. Energy and Mineral Engineering. Pennsylvania State University. May, 2016.

You, Fan. Unit Commitment Problems: A Comparison of Algorithms and Heuristics. Industrial and Manufacturing Engineering. Pennsylvania State University. May, 2015.

Guo, Yuecheng. Unit Commitment with Electrochemical Storage: An Investigation of Dynamic Programming Schemes. Industrial and Manufacturing Engineering. Pennsylvania State University. May, 2015.

Craig, Michael. Reducing the Contribution of the Power Sector to Ground-Level Ozone Pollution: An Assessment of Time-Differentiated Pricing of Nitrogen Oxide Emissions. Technology and Policy Program. Massachusetts Institute of Technology. June, 2014.

Levy, Tal. Unexpected Consequences of Demand Response: Implications for Energy and Capacity Price Level and Volatility. Technology and Policy Program. Massachusetts Institute of Technology. June, 2014.

Seelhof, Michael. Long Term Infrastructure Investments under Uncertainty in the Electric Power Sector Using Approximate Dynamic Programming Techniques. System Design and Management Program. Massachusetts Institute of Technology. June, 2014.

Eide, Jan. Rethinking CCS - Strategies for Technology Development in Times of Uncertainty. Technology and Policy Program. Massachusetts Institute of Technology. June, 2013.

Ustun, Berk. The Markov Chain Monte Carlo Approach to Importance Sampling in Stochastic Programming. Computation for Design and Optimization Program. Massachusetts Institute of Technology. June, 2012.

Chiyangwa, Diana. Strategic investment in power generation under uncertainty: Electric Reliability Council of Texas. Technology and Policy Program. Massachusetts Institute of Technology. June 2010.

Ereira, Eleanor. Assessing early investments in low carbon technologies under uncertainty: the case of Carbon Capture and Storage. Technology and Policy Program. Massachusetts Institute of Technology. June 2010.

Shu, Gary. Economics and policies for carbon capture and sequestration in the western United States: a marginal cost analysis of potential power plant deployment. Technology and Policy Program. Massachusetts Institute of Technology. June 2010.

Kim, Jieun. Carbon Offsets as a Cost Containment Instrument: A Case Study of Reducing Emissions from Deforestation and Forest Degradation. Technology and Policy Program. Massachusetts Institute of Technology. June 2010.

Jacobovits, Lisa. A Comparison of Cost-Containment Instruments for US Carbon Reduction Policies. Technology and Policy Program. Massachusetts Institute of Technology. June, 2008.

Kim, Jong-Ryool. The Analysis of Cost-Effectiveness of Voluntary Agreements Compared to Emission Trading in Korea. Environmental Science and Engineering. University of North Carolina, Chapel Hill. April, 2003.

Jordan, Elizabeth. Juvenile Justice Programs – What's The Point? Calculating Recidivism Rates. Masters in Public Administration. University of North Carolina, Chapel Hill. April, 2002.

Undergraduate Honors Theses:

Bablak, Robert. "Reassessing Crude Oil Purchases Based on Shutdown Risk ". Finance, Smeel College of Business with Honors, Schreyer's Honors College, Spring 2016.

Humenik, Dylan." Impact Of Increased Market Penetration of Electric Vehicles on The PJM Regional Electric Grid." Energy Engineering, EMS, Schreyer's Honors College, Fall, 2016.

Courtney Enlow, BA/honors, UNC Chapel Hill Public Policy, "Voluntary Participation by Developing Countries in Global Climate Change Accords" April, 2006.

Kevin Feltes, BA/honors, UNC Chapel Hill Public Policy, "The Federal Ethanol Subsidy in a Changing Fuel Market" April, 2005.

Charles Anderson, BA/honors, UNC Chapel Hill Public Policy, "North Carolina Clean Smokestacks, A Critical Case Study on the Process of State-Level Environmental Policy Making," April, 2005.

Charles J McCall, BA/honors, UNC Chapel Hill Intl Stud / CEP, "Roads Diverged: Should the United States pursue a non-cooperative alternative to Kyoto?" December, 2003.

Anna Stimmel, BA/honors, UNC Chapel Hill Public Policy, "Hidden in the Polls: An Alternative to the Death Penalty," April, 2003.

CURRENT PLACEMENT OF FORMER ADVISEES

Name	Degree/Role Advised	Year Completed	Current Employer	Current Title
Kumar, Vijay	Ph.D.	2021	Proctor & Gamble	Operations Engineer
Bukenberger, Jesse	Ph.D.	2021	Penn State	Postdoctoral Research Associate
Pena-Alcaraz, Maria Teresa	Ph.D.	2015	McKinsey & Company	Associate Partner
Jacquillat, Alex	Ph.D.	2015	MIT Sloan School of Management	Assistant Professor of Operations Research and Statistics
Octaviano, Claudia	Ph.D.	2015	Instituto Nacional de Ecología y Cambio Climático	General Coordinator for Climate Change and Low-Carbon Development
De Sisternes, Fernando	Ph.D.	2014	The World Bank	Senior Energy Specialist, Green Hydrogen Lead
Morris, Jennifer	Ph.D.	2014	Massachusetts Institute of Technology	Research Scientist, Joint Program on the Science and Policy of Global Change
Donohoo-Vallett, Pearl	Ph.D.	2014	Pepco Holdings	Key Manager - Strategy
Santen, Nidhi	Ph.D.	2013	EPRI	Senior Consultant
Palmintier, Bryan	Ph.D.	2012	National Renewable Energy Laboratory	Principal Research Engineer & Group Manager: NREL's Grid-connected Energy system Modeling Group
Jordan-Antoine, Rhonda	Ph.D.	2012	The World Bank	Senior Energy Specialist
Karplus, Valerie	Ph.D.	2011	Carnegie Mellon University	Associate Professor, Engineering and Public Policy Department
Felgenhauer, Tyler	Ph.D.	2010	Duke University	Director of Climate Research, The Duke Center on Risk
Zhao, Bining	Postdoc	2022	ABB	Engineer
Fertig, Emily	Postdoc	2015	Google	Research Software Engineer
Parpas, Panos	Postdoc	2011	Imperial College London	Reader (equivalent to Associate Professor in U.S)
Yang, Yingxia	Postdoc	2011	BrightNight	Director of Commercial Strategy
Yen, Hsien-Shao	M.S.	2021	Taiwan Research Institute, Taipei, Taiwan	Assistant Researcher
Dalvi, Sourabh	M.S.	2019	National Renewable Energy Laboratory	Research Engineer

Dupuis, Alexia	M.S.	2016	Charles River Associates	Associate Principal
Stines, Zachary	M.S.	2016	New York Independent System Operator	Manager, Energy Market Design
Craig, Michael	M.S.	2014	University of Michigan- School for Environment and Sustainability	Assistant Professor of Energy Systems
Levy, Tal	M.S.	2014	Appian Way Energy Partners	Senior Trader and Principal
Seelhof, Michael	M.S.	2014	Seelhof Consulting LLC	President and Founder
Eide, Jan	M.S.	2013	HitecVision	Partner
Ustun, Berk	M.S.	2012	University of California, San Diego	Assistant Professor
Chiyangwa, Diana	M.S.	2010	8minute Solar Energy	Energy Markets Manager
Shu, Gary	M.S.	2010	US Agency for International Development	Foreign Service Officer

PROFESSIONAL SERVICE

EDITORIAL

Associate Editor of Energy Economics: 2005-2008

REFEREE FOR JOURNALS

Atmospheric Environment
Climatic Change
Energy Economics
Energy Journal
Environmental and Resource Economics
IEEE Transactions on Power Systems
IEEE Transactions on Sustainable Energy
IEEE Transactions on Smart Grid
Geophysical Research Letters
Global Environmental Change
Journal of the Association of Environmental and Resource Economists
Journal of Climate
Journal of Environmental Economics and Management
Management Science
Science

PROFESSIONAL AFFILIATIONS

- Institute for Operations Research and Management Sciences (INFORMS)
- IEEE
- Association for Public Policy Analysis and Management (APPAM)
- American Geophysical Union (AGU)
- Association of Environmental and Resource Economists (AERE)
- Society for Risk Analysis (SRA)
- International Association for Energy Economics (IAEE)

PROFESSIONAL PARTICIPATION

Organized multiple panel sessions for INFORMS annual meetings, organized panel sessions for APPAM, have participated in numerous conferences and workshops, including IAEE, INFORMS, and IEEE meetings, Energy Modeling Forum (EMF) Snowmass meetings, IPCC meetings, and NCAR workshops. NSF Review Panels for DRMS and EPCN (multiple years). DOE Review Panels for Office of Science. EPA Science Advisory Board.