

Parth Vaishnav

7206 Raymond St., Pittsburgh, PA 15218, USA * parthv@cmu.edu * +1 (412) 512 2038 * www.parthv.com

EDUCATION

Carnegie Mellon University, Pittsburgh, PA

PhD in Engineering and Public Policy May 2015

- Dissertation on reducing air pollution from international aviation and ocean shipping
- Committee: Prof. M. Granger Morgan (CMU), Prof. Paul S. Fischbeck (CMU), Prof. James J. Corbett (University of Delaware), Annie Petsonk (Environmental Defense Fund)

University of Cambridge, United Kingdom

MPhil in Technology Policy Jul 2011

- Assessed business models to supply energy to the rural poor; commendation for outstanding performance

National University of Singapore and Eindhoven University of Technology, Netherlands

Master of Technological Design May 2005

National University of Singapore

Bachelor of Engineering (Mechanical), Minor in Bioengineering Jun 2003

APPOINTMENTS

Carnegie Mellon University

Assistant Research Professor, Pittsburgh, PA Sep 2017 – present

Associate Director, Center for Climate and Energy Decision-Making, Pittsburgh, PA Nov 2015 – present

Research Engineer, Pittsburgh, PA Nov 2015 – Sep 2017

Post-doctoral fellow, Pittsburgh, PA Jun 2015 – Oct 2015

Environmental Defense Fund

Aviation Policy Intern, Washington, DC May 2014 – Aug 2014

- Contributed to improving the International Civil Aviation Organization's (ICAO) scheme to cap carbon dioxide emissions from international aviation by estimating and publishing the impact on airlines of ICAO's proposals
- Mentored a graduate recruit, who went on to provide excellent analytical support to the team

Royal Dutch Shell

Strategy & Portfolio Analyst, The Hague, Netherlands Apr 2008 – Sep 2010

- Triggered profitable trading decisions through analysis of long- and short-term evolution of market fundamentals for European natural gas and global liquefied natural gas (LNG)
- Provided key inputs to strategic decisions (e.g., whether to invest in gas transmission pipelines) by producing analyses and briefing materials for senior management, including the CEO of Shell

Deployment Analyst, Singapore Oct 2006 – Mar 2008

- Managed stakeholders across functions and lines of business to improve supply chain planning processes and reduce inventory at Shell Lubricants, Singapore, by 15%

Production Planner, Singapore Aug 2005 – Oct 2006

- Ensured >95% supply reliability to customers at an industrial lubricant oil plant operating at near-full capacity

National University of Singapore

Research Assistant, Singapore May 2004 – Aug 2004

- Co-founded a company to commercialize techniques to facilitate rapid exploration of product forms in the concept generation phase

Undergraduate Internship, Micron Semiconductor, Singapore, Jan 2002 - Jun 2002

- Streamlined a packaging process and improved the facility layout to reduce floor space utilization and set-up costs by 40% each

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JOURNAL PUBLICATIONS

Note: At Carnegie Mellon University, it is standard practice to co-author with students and for students to assume first authorship. Collaboration and multi-authorship are strongly encouraged.

“+” indicates a Ph.D. student

1. Vaishnav, P., Horner, N., Azevedo, I.L., 2017. “Location-specific Costs and Benefits of Residential Solar Photovoltaics” *Environmental Research Letters*, 12, 094015 doi:10.1088/1748-9326/aa815e
2. Morgan, M.G., Vaishnav, P., Dowlatabadi, H., Azevedo, I.L., 2017. “Rethinking the Social Cost of Carbon” *Issues in Science and Technology*, Summer 33(4): 43-50.
3. Bonnín Roca, J.⁺, Fuchs, E.R.H., Vaishnav, P., Morgan, M.G., Mendonça, J., 2017. “When Risks Cannot Be Seen: Regulating Uncertainty in Emerging Technologies” *Research Policy* 46, no. 7 (September 2017): 1215-1233. doi: 10.1016/j.respol.2017.05.010
4. Bonnín Roca, J.⁺, Vaishnav, P., Mendonça, J., Morgan, M.G., 2017. “Getting Past the Hype About 3-D Printing” *MIT Sloan Management Review* 58, 57–62 Available: <http://sloanreview.mit.edu/article/getting-past-the-hype-about-3-d-printing/>
5. Vaishnav, P., 2016. “Design of a Global Market Based Measure · ICAO’s Market Based Mechanism: Keep It Simple.” *Carbon & Climate Law Review* 10, 120–126. Available: <http://cclr.lexxion.eu/article/CCLR/2016/2/9>
6. Bonnín Roca, J.⁺, Vaishnav, P., Fuchs, E.R.H., Morgan, M.G., 2016, “Policy needed for additive manufacturing.” *Nature Materials* 15, 815–818. doi:10.1038/nmat4658
7. Vaishnav, P., Petsonk, A., Avila, R.A.G., Morgan, M.G., Fischbeck, P.S., 2016, “Analysis of a proposed mechanism for carbon-neutral growth in international aviation.” *Transportation Research Part D: Transport and Environment, Special Issue on Climate Change and Transport* 45, 126–138. doi:10.1016/j.trd.2016.02.017
8. Vaishnav, P., Fischbeck, P.S., Morgan, M.G., Corbett, J.J., 2016, “Shore Power for Vessels Calling at U.S. Ports: Benefits and Costs.” *Environmental Science & Technology* 50, no. 3 (February 2, 2016): 1102–10. doi:10.1021/acs.est.5b04860.
9. Vaishnav P., 2014. “Greenhouse gas emissions from international transport.” *Issues in Science and Technology*, Winter 30(2): 25-28. Available: <http://issues.org/30-2/parth/>
10. Vaishnav, P., 2013. “Costs and Benefits of Reducing Fuel Burn and Emissions from Taxiing Aircraft.” *Transportation Research Record: Journal of the Transportation Research Board* 2400 (December): 65–77. doi:10.3141/2400-08.

WORKING PAPERS

- “Technology Forgiveness: The Different Institutional Resilience of Polymer and Metal Additive Manufacturing in Portugal” with Jaime Bonnín Roca (University of Cambridge), Granger Morgan (CMU), Erica Fuchs (CMU), Joana Mendonça (University of Lisbon). Available: <https://papers.ssrn.com/abstract=3077276>
- “Disentangling stigma from actuarial risk: the cautionary story of nuclear power,” with Ahmed Abdulla (UCSD), Brian Sergi (CMU), David Victor (UCSD)
- “Discovering heuristics for additive manufacturing,” with Patrick Funk, Erica Fuchs, Alex Davis, Barry Dewitt (all at CMU)
- “Assessing High Voltage Direct Current (HVDC) as an enabling technology for deep decarbonization of the electricity grid,” with Liza Reed, Granger Morgan and Daniel Armanios
- “It’s what you know that just ain’t so: Countering misinformation,” with Alex Davis (CMU) and Tamar Krishnamurti (University of Pittsburgh)
- “Decarbonizing Global Freight Systems with a Focus on Modal Shift,” with Lynn Kaack, Granger Morgan, Inês Azevedo, and Mike Griffin (all at CMU)

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OTHER PUBLICATIONS AND WRITINGS

- Vaishnav, P., 2016. "Plug the Loopholes in ICAO's Plan." *Aviation Week & Space Technology* 178, 66.
- Vaishnav, P., Morgan, M.G., 2016. "Summary of a Workshop on Identifying and Avoiding Potential Dead Ends and Missed Opportunities in Climate Policy." Available: <http://cedmcenter.org/wp-content/uploads/2016/06/Summary-of-Workshop-on-Climate-Policy-Dead-Ends-and-Missed-Opportunities.pdf>
- Bonnín Roca, J., Vaishnav, P., Fuchs, E.R.H., Morgan, M.G., 2015. "Notes on a Workshop on Certification of Metal Additive Manufacturing Systems and Parts for Use in Civil Aviation: Challenges and Opportunities." Available: http://www.parthv.com/wp-content/uploads/2016/02/CMU_Workshop_Summary_FINAL.pdf
- Branstetter, L., Horner, N., Morgan, M.G., Rubin, E., Vaishnav, P., 2015. "Put Kids First, Not Gas Companies." *Pittsburgh Post-Gazette*. July 19, sec. Forum.
Reprinted as:
 - Branstetter, L., Horner, N., Morgan, M.G., Rubin, E., Vaishnav, P., "Put Kids First, Not Gas Companies." *York Dispatch*. July 27, 2015.
- Vaishnav, P., Horner, N., Branstetter, L., 2015. "Pennsylvania Needs and Can Afford a Shale Gas Severance Tax." *Pittsburgh Post-Gazette*, January 18, sec. Forum.
- Vaishnav, P. & Horner, N., 2014. "Apocalypse Not: Severance Taxes and Industry Exit in the Marcellus Shale." *Pennsylvania Budget and Policy Center Briefing Paper* Available: <http://tinyurl.com/n8enbtg>
- Vaishnav, P., 2013. "ICAO Deal to (Eventually) Reduce Greenhouse Gas Emissions from Aviation a Good First Step." *The Energy Collective Blog Post*. Available: <http://tinyurl.com/lw9nkjx>
- Vaishnav, P., 2011. "Innovation for Emerging Markets: Novel Business Models to Supply Energy to the Rural Poor." Dissertation (M.Phil.), University of Cambridge.

CONFERENCE PRESENTATIONS WITH PEER-REVIEWED ABSTRACTS

- Vaishnav, P. (Speaker), Abdulla, A., Sergi, B., Victor, D., "Disentangling stigma from actuarial risk: the cautionary story of nuclear power" *Society of Risk Analysis (SRA) 2017 Annual Meeting* (Arlington, VA, 10-14 Dec. 2017).
- Vaishnav, P. (Speaker), Abdulla, A., Sergi, B., Victor, D., "Disentangling stigma from actuarial risk: the cautionary story of nuclear power" *35th United States Association for Energy Economics (USAEE) North American Conference* (Houston, TX, 12-15 Nov. 2017).
- Vaishnav, P., Abdulla, A., "[POSTER] Public perceptions of clean energy technologies" *Society of Risk Analysis (SRA) 2016 Annual Meeting* (San Diego, CA, 11-15 Dec. 2016).
- Vaishnav, P. (Speaker), Horner, N.C., Azevedo, I.L., "Benefit cost and distributional effects analysis for solar PV in the United States" *Society of Risk Analysis (SRA) 2016 Annual Meeting* (San Diego, CA, 11-15 Dec. 2016).
- Vaishnav, P. (Speaker), Horner, N.C., Azevedo, I.L., "Benefit Cost and Distributional Effects Analysis for Solar PV In The United States" *INFORMS Annual Meeting* (Nashville, TN, 13-16 Nov. 2016).
- Vaishnav, P. (Speaker), Horner, N.C., Azevedo, I.L., "Location, Location, Location: County-Level Costs and Benefits of Residential Solar Photovoltaics" *34th United States Association for Energy Economics (USAEE) North American Conference* (Tulsa, OK, 23-26 Oct. 2016).
- Bonnín Roca, J., Vaishnav, P. (Speaker), Fuchs, E.R.H., Morgan, M.G., 2015. "How can policymakers help immature technologies cross the 'valley of death'? The case of metallic additive manufacturing for aviation" *4S Annual Meeting* (Denver, CO, 11-14 Nov.)
- Vaishnav, P. (Speaker), 2015. "Analysis of ICAO's Market-based Mechanism: Strawman v1.1." *Technology, Management & Policy (TMP) Graduate Consortium* (Pittsburgh, PA, 21-23 Jun.)

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- Horner N. (Speaker), Vaishnav P., Tisa P. (Speaker), 2014. “Grid Access in Remote Alaska: Evaluating Costs and Benefits.” *33rd United States Association for Energy Economics (USAEE) North American Conference* (New York, NY, 15-18 Jun. 2014).
- Hoss F. (Speaker), Vaishnav P. (Speaker), 2013. “What guides spending on risk mitigation: Perceptions or statistics?” *Society of Risk Analysis (SRA) 2013 Annual Meeting* (Baltimore, MD, 9-11 Dec. 2013).
- Horner N. (Speaker), Vaishnav P. (Speaker), 2013. “Mitigating Electric Vehicle Impacts on Grid Infrastructure Requirements.” *32nd United States Association for Energy Economics (USAEE) North American Conference* (Anchorage, AK, 28-31 Aug. 2013).
- Horner N. (Speaker), Vaishnav P. (Speaker), 2012. “Assessment of Pennsylvania Natural Gas Price Support Program Candidates.” *31st United States Association for Energy Economics (USAEE) North American Conference* (Austin, TX, 5 Nov. 2012).
- Vaishnav, P. (Speaker), 2012. “Low-hanging fruit? The costs and benefits of reducing fuel burn and emissions from taxiing aircraft.” In *12th AIAA Aviation Technology, Integration, and Operations (ATIO) Conference*. Indianapolis, IN: AIAA. Available at: <http://arc.aiaa.org/doi/abs/10.2514/6.2012-5510>.
- Vaishnav P. (Speaker), 2011. “Innovating for Emerging Markets - The Case of Rural Electrification.” *Technology Management and Policy Graduate Consortium* (University Park, PA, 26-28 Jun. 2011)

LEADERSHIP IN WORKSHOPS AND RESEARCH MEETINGS

- 2017: Co-organizer, with Lynn Kaack and Prof. Granger Morgan, Workshop on Strategies and Opportunities for Decarbonizing the World’s Freight System, supported by the Centre for Climate and Energy Decision-Making at Carnegie Mellon University, Pittsburgh, PA
- 2016: Co-organizer, with Prof. Granger Morgan, Workshop on Identifying and Avoiding Potential Dead Ends and Missed Opportunities in Climate Policy, supported by the Centre for Climate and Energy Decision-Making in Washington, DC

STUDENTS ADVISED

Current PhD students

- Patrick Funk (co-advised with EPP Prof. Erica Fuchs and Prof. Alex Davis), “Discovering the heuristics of additive manufacturing,” Fall 2016 — Present
- Jihoon Shin (co-advised with EPP Prof. Granger Morgan, Dr. Ana Barros (University of Porto), Dr. Miguel Amaral (University of Lisbon)), “Exploring opportunities for Portugal to join the supply chain for outfitting aircraft cabin interiors (ACI),” Fall 2016 — Present
- Elizabeth Reed (co-advised with EPP Prof. Granger Morgan and Prof. Daniel Armanios), “Assessing High Voltage Direct Current (HVDC) as an enabling technology for deep decarbonization of the electricity grid” Fall 2016 — Present

Graduated PhD students

- Jaime Bonnín Roca (co-advised with EPP Prof. Erica Fuchs, Prof. Granger Morgan, and Dr. Joana Mendonça (University of Lisbon)), “Leaders and followers: challenges and opportunities in the adoption of metal additive manufacturing technologies,” Fall 2017. Jaime is in the process of accepting a postdoctoral research position at the Institute for Manufacturing at the University of Cambridge.

Master’s students

- Adilla Mutia Fatimah, “Electrification of heating in the United States,” Fall 2017
- Srijana Rai (with EPP PhD student Lynn Kaack), “Decarbonizing Global Freight Systems with a Focus on Modal Shift,” Fall 2017

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- Courtney Thier, Yichen Wei, Tania Lopez, "Updating a tool to analyze the cost and environmental impacts of user-defined electricity portfolios for Pennsylvania," Fall 2015

Undergraduates

- Olamitundun Oladipo (with EPP Prof. Alex Davis and Prof. Tamar Krishnamurti (University of Pittsburgh)), "It's what you know that just ain't so: Countering misinformation," Fall 2017
- Krishna Dave (with EPP PhD student Jaime Bonnin Roca), "Willingness to pay for reduced lead times in aviation supply chains," Fall 2017
- Cheyenne Shankle, "Identifying proposed new technologies to improve commercial aircraft fuel efficiency," Spring 2016

PhD THESIS COMMITTEE SERVICE

- Kerim Dickson (Civil & Environmental Engineering, CMU, with Prof. David Dzombak, Prof. Jared Cohon, and Prof. Constantine Samaras), "Interbasin Transfers in the United States: Present and Future," Fall 2016 —

PhD QUALIFIER COMMITTEE SERVICE

- Woo Suk Chun (Civil & Environmental Engineering, CMU), Fall 2017
- Tania Lopez (Civil & Environmental Engineering, CMU), Fall 2017
- Jiaan Wang (Civil & Environmental Engineering, CMU), Fall 2017
- Yunchuan Lai (Civil & Environmental Engineering, CMU), Fall 2017
- Miranda Gorman (Civil & Environmental Engineering, CMU), Fall 2016

EDUCATIONAL CONTRIBUTIONS

Courses taught as instructor

- *Climate Change Science and Adaptation*: This course consists of four parts. The first part provides a primer for those who are curious about the physical mechanisms by which climate is determined, and by which climate change occurs. The treatment of these mechanisms is not overly quantitative, and no prior knowledge of meteorology or atmospheric science is assumed. The second part describes the projected consequences of climate change; and those that are already occurring. This part also familiarizes students with how societies might adapt to these changes. The third part explores (and critiques) some of the tools that decision-makers use to quantify and compare the damages caused by these consequences. The final part of the course discusses some of the technologies that could be deployed to stave off dangerous climate change.

Faculty course evaluation:

(2017, n = 17) 4.5/5 for overall course quality and 4.5/5 for quality of teaching

(2016, n = 20) 4.5/5 for overall course quality and 4.6/5 for quality of teaching

Guest lectures

- *Understanding Electricity Mix Trade-offs* in a graduate course on Environmental Politics & Policy by Prof. Deborah Stine in Spring 2017 and Fall 2017
- *Climate Change: Problems and Solutions* in a graduate course on Energy Conversion and Supply by Prof. Yoosuf Picard in Fall 2016

Service as teaching assistant at Carnegie Mellon University

- *Introduction to the Theory and Practice of Policy Analysis* (Fall 2014), taught by Prof. Granger Morgan and Prof. Inês Azevedo. Responsibilities included assessment and providing written feedback on assignments and exams, helping design exams, and holding three hour-long recitation sessions.

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- *Introduction to Engineering and Public Policy* (Spring 2014), taught by Prof. Marvin Sirbu. Designed and held weekly recitation sessions for a group of 20 students to reinforce and clarify concepts taught in class, as well as weekly office hours. Assisted in the design and assessment of examinations and assignments.

Educational outreach

- *Summer Centre for Climate and Energy Decision-making (SUCCEED)*: I lead a group of PhD students to organize a five-day summer workshop to teach high school students about issues relating to energy and the environment. This is followed by a two-day workshop for high school teachers covering the same topic. I teach in the workshop for teachers.

Professional training

- *Trainer for new supply chain planning processes and tools*: Provided 50 hours of classroom training in demand planning, production planning, and supply network planning processes and an enterprise resource planning tool to implement the new processes. Training recipients included plant operators, planners, and supply chain managers.

GRANTS

- Funding from the Manufacturing Futures Initiative at Carnegie Mellon University. Role: co-PI, with Prof. Erica Fuchs (PI) and Prof. Alex Davis (co-PI). "Identifying Product Opportunities: Expert heuristics in scientific decision-making." Sep 2017 - Aug 2018. **\$107,091**
- Funding from ProSEED / Crosswalk Seed Grants at Carnegie Mellon University. Role: PI, with Prof. Inês Azevedo (co-PI). "Equipment purchase grant to support Experiential learning for high-school students participating in SUCCEED (SUMmer Center or Climate Energy and Environmental Decision-making)" Fall 2015. **\$2,500.**
- Funding Airport Co-operative Research Program (ACRP) Graduate Research Award on public-sector aviation issues from Transportation Research Board of the National Academy of Sciences. Role: PI. "Low-Hanging Fruit? The Costs and Benefits of Reducing Fuel Burn and Emissions from Taxiing Aircraft." **\$10,000.**

INVITED TALKS

- "Is the sky the limit: can we decarbonize civil aviation?" invited speaker for the Deep Decarbonization Initiative (D2I), Laboratory on International Law & Regulation (ILAR), University of California San Diego, Nov 29, 2017.

AWARDS

- 2013: Third prize (team) at the US Association of Energy Economics' (USAEE) Case Competition at the USAEE's 32nd North American Conference, Anchorage, AK
- 2012: Second prize (team) at USAEE's Case Competition at the 31st North American Conference, Austin, TX
- 2011: Letter of commendation for outstanding performance in the MPhil by the University of Cambridge
- 2011: Hughes Hall Scholarship covering tuition fees associated with pursuing a PhD at the University of Cambridge. Each year, only one student at Hughes Hall is offered this award.
- 2009: Vice President's award from Shell Energy Europe (SEE) for work on modeling the impact of the 2009 recession in Europe on natural gas demand. The awards were presented to up to three people each quarter, from SEE's staff of about 500.
- 2008: Vice President's award from SEE for work on the identification of potential bottlenecks in Europe's gas transmission pipeline system
- 1999: SIA-NOL Scholarship, covering all expenses for undergraduate studies at the National university of Singapore, by the Government of Singapore. About 1% of applicants were successful

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- 1997: National Talent Search Scholarship by the Government of India. Less than 1% of applicants were successful

PROFESSIONAL ACTIVITIES

- Ad-hoc reviewer for *Environmental Research Letters*, and *Transportation Research Part C: Emerging Technologies*
- Chair, USAEE Case Competition. Leading a team to write the case, liaise with sponsors, publicize the competition to ensure wide participation, and to organize judging of entries (2016 onwards)
- Co-wrote, with Prof. Eric Hittinger of the Rochester Institute of Technology, the problem for the US Association of Energy Economists (USAEE) Case Competition (2015)

PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Science (AAAS), United States Association of Energy Economics (USAEE), Society of Risk Analysis (SRA)

LANGUAGES

- English — native proficiency
- German — intermediate proficiency
- Hindi — intermediate proficiency
- Gujarati — intermediate proficiency
- Marathi — basic proficiency

PERSONAL INFORMATION

Date of birth: June 11, 1981; Sex: Male; Citizenship: India, US Lawful Permanent Resident (Green Card)