Engineering and Public Policy is the leading academic department in the world that combines deep technical analysis with modern social science and policy analysis in order to address problems in technology and public policy.
About Engineering and Public Policy

History of the Department
EPP was established as a full academic department in Carnegie Mellon’s College of Engineering in 1976. The undergraduate program was developed prior to that with support from the Alfred P. Sloan Foundation. As of 2013 the department had graduated over 800 double major undergraduates and roughly 240 Ph.D. graduates.

Academic Programs

Undergraduate programs
EPP offers double major undergraduate degrees with all five of Carnegie Mellon’s traditional Engineering Departments and with the undergraduate program in the School of Computer Science (SCS). These degrees are designed to add additional dimensions and skills of students who plan to pursue traditional technical careers. In addition to their regular technical courses, double major students take a range of courses in social analysis and in technology and policy.

All EPP double majors also complete two unique group project courses in which they address a real-world problem in technology and public policy. Between 6 and 8 percent of all engineering undergraduates pursue the double major. The department also offers a minor in technology and policy for students outside of engineering or computer science. Details on the undergraduate programs can be found at www.epp.cmu.edu/undergraduate/index.html.

Graduate programs
The doctoral program in EPP prepares students with backgrounds in science, engineering or mathematics for careers doing research or analysis on problems in technology and public policy. Many students complete an M.S. in EPP on their way to the Ph.D.

Forty percent of the graduates of this program have gone to academic jobs. The remaining sixty percent are distributed fairly evenly among industry, government, and think tanks or consulting firms. Details on the graduate programs can be found at www.epp.cmu.edu/graduate/index.html.

EPP also offers a one-year M.S. program in Engineering and Technology Innovation Management (E&TIM) that provides a technical alternative to an M.B.A. for students with technical backgrounds. Details can be found at www.cit.cmu.edu/etim.

Washington, DC Office
EPP maintains a small office in Washington, DC in the American Association for the Advancement of Science (AAAS) building at 1200 New York Avenue, NW. This office is used to expand interaction between EPP students and faculty, and relevant policy organizations and decision makers in Washington.

Research
Engineering and Public Policy is the leading academic department in the world that combines deep technical analysis with modern social science and policy analysis in order to address problems in technology and public policy.

Research in the department is focused on problems in:
• energy and environmental systems;
• information and communication technology (ICT) policy;
• risk analysis and communication; and
• technology policy and the management of R&D.

Across these four focal areas, EPP faculty and students also study issues in: engineered systems and domestic security, technology and organizations, and technology and economic development (focusing in particular on Brazil, China, India, and Mexico). Researchers in EPP frequently undertake the development of new software tools for the support of policy analysis and research.

EPP’s quantitative interdisciplinary systems approach is unique. Our research is defining the field of interdisciplinary, technically-informed policy analysis. Much of this work is conducted in research centers and groups. The next page provides a few examples. For additional examples and details see www.epp.cmu.edu/research.
Privacy
The Cylab Usable Privacy and Security Laboratory (http://cups.cs.cmu.edu/) performs a wide range of research on developing and implementing usable privacy in computer systems.

Energy Behavior
People make decisions about how, where and when to do things that use energy. Shaping those choices requires both empirical studies in behavioral social science and serious technical analysis.

Big Data Analytics for Policy and Management
Research looks at how large datasets on consumer behavior can be used to support policy making and management in information systems, media, education and energy. Network-centric randomized experiments are used to complement these analyses to learn how consumers use and shape the development of new technologies.

Reduced CO\textsubscript{2} from Fossil Fuels
EPP researchers have built some of the world’s leading engineering-economic models of conventional and advanced coal and gas power plants, including CCS systems that capture and sequester CO\textsubscript{2} (www.iecm-online.com). They have also addressed the economics of decarbonizing the electricity system and developing a regulatory framework for CCS (www.CCSReg.org).

Climate Change and Climate Policy
Much of EPP’s work in this area takes place through the NSF Center for Climate and Energy Decision Making (http://cedmcenter.org). The center has collaborators in leading research groups across the U.S., Canada and in Europe.

The Electricity Industry
Through the Electricity Industry Center (www.cmu.edu/electricity) and the Electric Energy Systems Group (www.eesg.ece.cmu.edu) researchers in EPP are addressing the full range of issues faced in controlling and operating modern electric power systems, including integration of renewables, distributed generation and micro grids, and its control and operation of “smart grids.”

Risk Analysis and Communication
With psychologists, economists and engineers working together, EPP has long been the source of important innovations in risk analysis and risk communication spanning topics from energy and the environment to homeland security and health (www.hss.cmu.edu/departments/sds/risk).

Energy Efficiency and Energy-Related Behavior
Improving the efficiency with which society uses energy is at least as important as developing new clean sources of energy. Work in EPP covers both technology (LEDs, plug hybrids, etc.) and also consumers’ behaviors and choices.

Managing Technical Innovation and R&D Policy
Research includes studies of how relocating manufacturing overseas affects U.S. innovation, how innovation affects supply chain specialization, how regulation can induce innovation, the determinants of science productivity in developing nations, the history and sociology of technological change, and the management of intellectual property in a global context (www.cmu.edu/SETChange).

Fine Particle Air Pollution
Very fine particles produce health damage from air pollution and have climate impacts. The Center for Atmospheric Particle Studies (http://caps.web.cmu.edu) performs laboratory and field studies to support effective emissions control and improve scientific understanding.

Life Cycle Methods
Tracking the flows of materials and energy through production, use, recycling, and disposal is a valuable strategy to assess the impacts of technologies and systems. Investigators in the Green Design Institute (www.cmu.edu/gdi) have pioneered such methods as EIO-LCA.

Information and Communication Technology Policy
Research in EPP in information and communication technology policy ranges from improving communication for first responders, to cognitive radio, radio spectrum management and the design of a next generation Internet.
Faculty in EPP

Most faculty in EPP have joint appointments with traditional departments. These include:

**CEE** Civil and Environmental Engineering  
**ChemE** Chemical Engineering  
**Chem** Chemistry  
**ECE** Electrical and Computer Engineering  
**Heinz** H. John Heinz III College  
**Hist.** History  
**MechE** Mechanical Engineering  
**MSE** Materials Science and Engineering  
**SCS** School of Computer Science  
**SDS** Social and Decision Sciences  
**Tepper** Tepper School of Business

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**Peter J. Adams**  
Professor, CEE and EPP; Director, Center for Atmospheric Particle Studies. Climatic effects of fine particles, global and regional models of atmospheric chemistry, and air quality in developing countries. Ph.D. California Institute of Technology, 2001.

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**Jay Apt**  
Professor, Tepper and EPP; Director, Electricity Industry Center. Problems of the modern electric power system, industrial strategy. Ph.D. Massachusetts Institute of Technology, 1976.

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**V. S. Arunachalam**  

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**Inês Lima Azevedo**  
Associate Professor, EPP; Co-Director, Center for Climate and Energy Decision Making. Energy and climate decision making and policies. Ph.D. Carnegie Mellon University, 2009.

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**Michel Bézy**  
Distinguished Service Professor, EPP; Associate Director, Carnegie Mellon in Rwanda. Strategic use of digital information, innovation management, ICT for development. Ph.D. Université Catholique de Louvain, Belgium, 1982.

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**Alfred Blumstein**  
University Professor, Heinz and EPP. Methods for public systems analysis, criminology and criminal justice. Ph.D. Cornell University, 1960.

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**Serguey Braguinsky**  
Associate Professor, SDS, Heinz and EPP. Economics of innovation, entrepreneurship and growth, development economics, institutional economics. Ph.D. Keio University, 1997.

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**Travis D. Breaux**  
Assistant Professor, SCS and EPP; Director, Requirements Engineering Laboratory. Software engineering, regulatory compliance, privacy and security. Ph.D. North Carolina State University, 2009.

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**Kathleen M. Carley**  
Elizabeth A. Casman

Jared L. Cohon

Lorrie Faith Cranor
Professor, SCS and EPP; Director, CyLab Usable Privacy and Security Laboratory. Usable privacy and security; Internet policy. D.Sc. Washington University in St. Louis, 1996.

Neil M. Donahue

Pedro M. Ferreira
Assistant Professor, Heinz and EPP. Big data analytics, social networks, IT policy and management. Ph.D. Carnegie Mellon University, 2004.

Paul S. Fischbeck
Professor, SDS and EPP. Bayesian decision theory, geographic information systems, subjective probability assessment, system reliability, military decision making. Ph.D. Stanford University, 1990.

Baruch Fischhoff
University Professor, SDS and EPP. Judgment and decision making including risk perception and management. Ph.D. Hebrew University, 1975.

Eden S. Fisher
Professor of the Practice, EPP; Executive Director, E&TIM. Technology planning, innovation management, design for sustainability. Ph.D. Carnegie Mellon University, 1984.

Erica R. H. Fuchs
Associate Professor, EPP. International technology & operations management, innovation and industrial policy; optoelectronics, automobiles; China. Ph.D. Massachusetts Institute of Technology, 2006.

W. Michael Griffin
Associate Research Professor, EPP; Executive Director, Center for Climate and Energy Decision Making; Executive Director and Co-Director, Green Design Institute. Impacts of production of chemicals and fuels via fermentation from renewable resources and the biodegradation of materials. Ph.D. University of Rhode Island, 1980.
Chris T. Hendrickson
University Professor, CEE and EPP. Engineering planning and management, including design for the environment, system performance, construction project management, finance and computer applications. Ph.D. Massachusetts Institute of Technology, 1978.

David A. Hounshell
Professor, SDS and EPP. Environmental technology innovation, industrial R&D, region industrialization, history of science, technology, and business. Ph.D. University of Delaware, 1975.

Gabriela Hug
Assistant Professor, ECE and EPP; Co-Director, Electric Energy Systems Group. Control and optimization in electric power systems. Ph.D. Swiss Federal Institute of Technology Zurich, 2008.

Marija D. Ilic
Professor, ECE and EPP; Director, Electric Energy Systems Group. Modeling and control of electric power and other large-scale systems. D.Sc. Washington University in St. Louis, 1980.

Paulina Jaramillo
Assistant Professor, EPP; Executive Director, RenewElec Project. Life-cycle assessment, energy system analysis, renewable energy. Ph.D. Carnegie Mellon University, 2007.

Ramayya Krishnan
Dean, Heinz College; Professor, Heinz and EPP. Risk management, business process design, information security and privacy, social network analysis, consumer behavior, promoting data access. Ph.D. University of Texas at Austin, 1987.

Deanna H. Matthews
Assistant Teaching Professor and Associate Department Head for Undergraduate Affairs, EPP. Life-cycle assessment, green design, K-12 engineering and science education. Ph.D. Carnegie Mellon University, 2001.

H. Scott Matthews

Meagan Mauter
Assistant Professor, ChemE and EPP. Innovation at the water-energy interface, with an emphasis on integrated utilities for energy efficiency, corporate environmental behavior and advanced water treatment processes. Ph.D. Yale University, 2011.

Jeremy J. Michalek
Professor, MechE and EPP; Director, Vehicle Electrification Group; Design Decisions Laboratory. Techno-economic and environmental analysis of systems and policies, energy and green design, vehicle electrification, optimization, choice modeling. Ph.D. University of Michigan, 2005.

M. Granger Morgan
University and Lord Chair Professor, EPP, ECE, Heinz; Founding Head, EPP (1977-2014); Co-Director, Center for Climate and Energy Decision Making and CMU Electricity Industry Center. Technology and public policy, analysis of uncertainty, climate decision making, electric power, risk analysis. Ph.D. University of California, San Diego, 1969.

Spyros N. Pandis
Jon M. Peha
Professor, EPP and ECE. Technology and policy issues of Internet, wireless and telecom networks; spectrum management; privacy; public safety and homeland security; copyrighted content online; technology for developing countries. Ph.D. Stanford University, 1991.

Edward S. Rubin
Professor, EPP and MechE. Integrated energy-environmental-economic modeling and analysis of electric power systems, global climate change mitigation, carbon sequestration, environmental technology innovation. Ph.D. Stanford University, 1969.

Douglas C. Sicker
Head and Professor, EPP; Professor, Computer Science. Network systems, wireless networking, Internet policy, spectrum management, privacy and security. Ph.D. University of Pittsburgh, 2000.

Jeffrey J. Sirola

Marvin A. Sirbu

Mitchell J. Small
Professor, CEE and EPP. Environmental policy, math modeling, water and air quality, statistical analysis, soil and ground water monitoring data, uncertainty analysis. Ph.D. University of Michigan, 1982.

Deborah D. Stine
Professor of the Practice, EPP; Associate Director for Policy Outreach, Wilton E. Scott Institute for Energy Innovation. Science and technology advice for policy makers, policy analysis, program evaluation, energy and environmental policy, innovation policy. Ph.D. American University, 1992.

Subra Suresh

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Jay F. Whitacre
Associate Professor, MSE and EPP. Sustainable energy solutions, with a focus on both materials and policy issues surrounding energy generation and storage technology. Ph.D. University of Michigan, 1999.

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