

The Department of Engineering and Public Policy

MIT Roundtable

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EPP on about Two Slides

<http://www.epp.cmu.edu>

EPP is a department in the Engineering College.

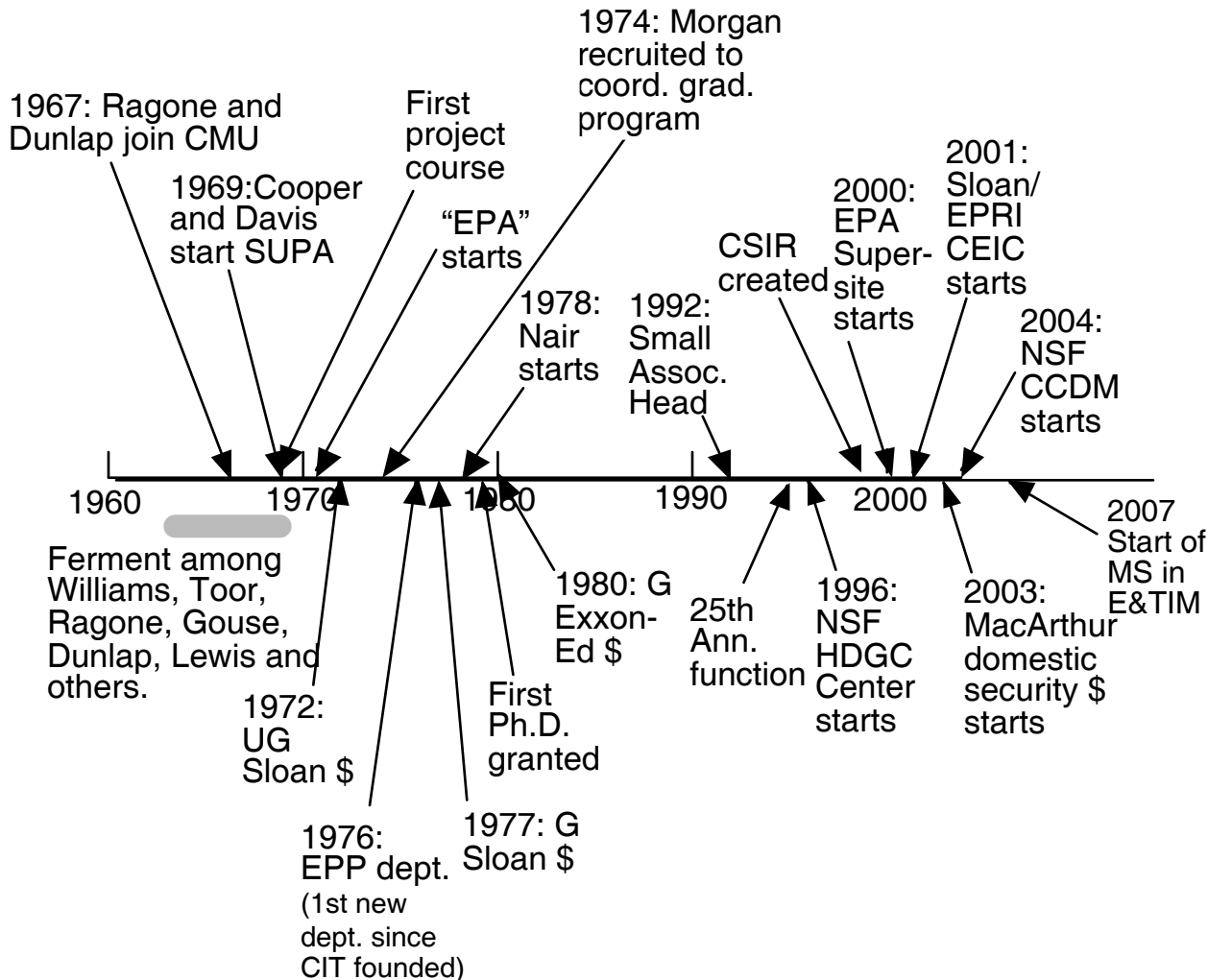
Faculty: Total of ~39 in various categories. Includes true 50:50 joint appointments with all five traditional engineering departments as well as joint appointments with social science units.

Undergraduate double-major degrees with traditional engineering departments (roughly 650 BS graduates to date).

Graduate program is primarily a research-oriented Ph.D. with a focus on problems in which the technical details really matter

New MS in Engineering & Technology Innovation Management (ETIM)

EPP Timeline



- 33-year history
- Integrated with the social sciences since the beginning
- Strong research centers focus work
- Granger Morgan has been Head for 30+ years

Research

Four major areas:

Energy and environment

Risk analysis and communication

Information and communication technology policy

Management of technical innovation and R&D policy

In the context of these four areas, we also work on issues in technology and development (China, India, Mexico and Brazil) and on issues in domestic security.

Roughly a dozen large collaborative group efforts including:

- Climate Decision-making Center.
- Electricity Industry Center.
- Green Design Institute.
- Study and Improvement of Regulation.
- Strategy, Entrepreneurship & Technological Change.
- CyLab.

A full list is available under the research section of the department's web site (www.epp.cmu.edu)

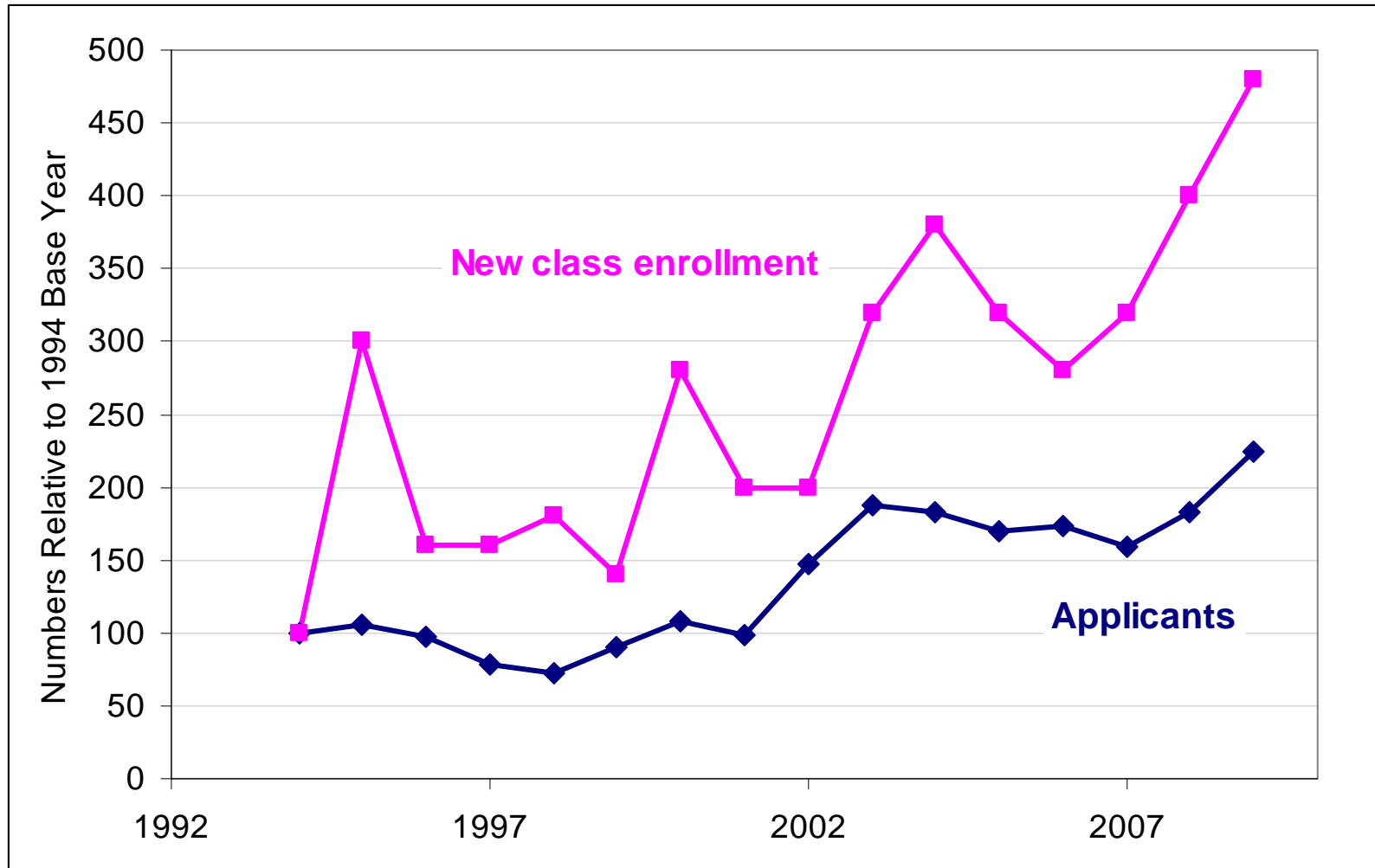
First Set of Questions

- What is the demand from students for degrees in engineering systems at your institution?
- How has it changed over the past 5-10 years?

General Trends

- We have been ramping up in size but are now at about steady state
 - Total enrollment of about 75 full-time Ph.D. students in Fall 2009
- We graduated 16 doctorates May 2009
 - There do not seem to be problems finding good jobs.
- Of the ~180 doctorates that have graduated from EPP to date
 - 40% have gone to academic jobs
 - 20% each have gone to think tanks & consulting firms, the private sector, and government

Trends in Applicants and Entering Ph.D. Cohort



Second Set of Questions

- How is your unit seen as fitting into Engineering or Social Science or Management?
- How much faculty interaction is there with those schools or departments?
- How do your students fit in?

Department Integration & Interaction

- We have four 50:50 joint appointments between EPP and the Department of Social and Decision Sciences (SDS)
 - Baruch Fischhoff, David Hounshell, Paul Fischbeck, & Wandi Bruine de Bruin
- We have affiliated faculty from the Tepper School of Business, the history department, and the Heinz College
 - For example: Lester Lave, Joel Tarr, & Al Blumstein
- Most of our research is collaborative, and there is heavy interaction with SDS and Tepper
 - 75% of Ph.D. committees have faculty with social science positions
 - 35% have been chaired/co-chaired by faculty with social science positions
- Social science faculty with EPP appointments vote on all departmental matters, sign tenure documents, and serve regularly on CIT college-review committees.

Third Set of Questions

- What are the critical intellectual issues that your unit is addressing?
- Do you see the intellectual agenda over the next five years looking different from the last five years?
- Which issues are growing in terms of faculty/student interest?
- In terms of funding? Any mismatches?

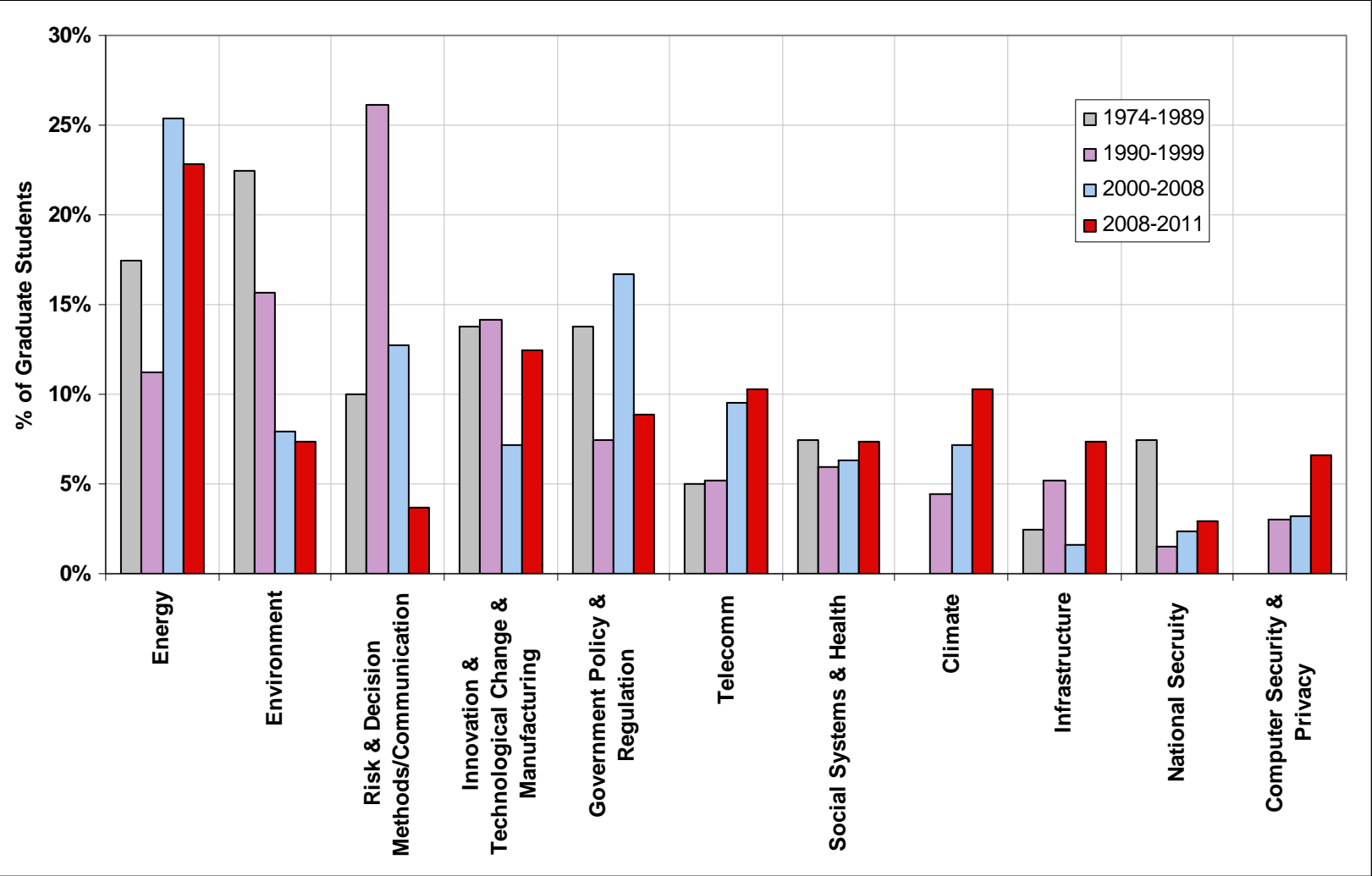
Research Philosophy

- We make progress on theory and methods by addressing real-world problems that stretch and challenge traditional methods and tools
 - Policy analysis (the evaluation, ordering, and structuring of incomplete knowledge for informed decision making)
 - Policy-focused research (the identification and development of techniques and procedures to improve policy analysis)
- Examples
 - Advanced methods for assessing, representing, and integrating uncertainty
 - Communicating risk, engineering, and policy information
 - Dramatically improved methods for LCA
 - Integrated modeling of complex engineering and social systems

May 2009 Ph.D. Dissertations

- **Attari:** Decreasing energy demand: Interventions for individual behavior change
- **Barrett:** Domestic security dimensions of chemical manufacturing & transport
- **Chan:** Coal energy & environment
- **Grieshop:** Sources & atmospheric transformations of semivolatile organic aerosols
- **Hamilton:** University technology transfer
- **Hill:** Social network approaches to decision making regarding science, technology, engineering & mathematics (STEM) careers
- **Hussain:** Effectiveness of technological interventions for education & information services in rural South Asia
- **Azevedo:** Energy and climate: Policy, economics & regulation
- **Logue:** Concentrations, sources & risks of air toxics
- **Newcomer:** Limiting the financial risks of electricity generation capital investments under carbon constraints
- **Newton:** Policy & design choices for privacy & surveillance technologies
- **Ryker:** Mixtures of chemicals in drinking water
- **Samaras:** A life-cycle approach to technology, infrastructure & climate policy decision making: transitions to plug-in hybrids & low carbon electricity
- **Spees:** Meeting electric peak on demand side: Wholesale & retail market impacts
- **Thompson:** Drinking water distribution system security
- **Wagstrom:** Communities in open-source software

Trends in Graduate Student Research



Long-term Outlook

- Entrepreneurially faculty
- Shift from general environmental problems to climate issues
 - Large NSF centers
- Increase in issues related to energy because of CEIC, our very successful electricity center
- Increasing research activities
 - Computer security and privacy & telecommunications
- Steady research activity in innovation & technological change & government/regulatory policy
- New nanotechnology center
 - Integrating materials, environment, health, & risk modeling

Fourth Set of Questions

- What are the critical institutional issues that your unit is dealing with?

Problems

- Generic problems
 - Funding for graduate students
 - Space issues: Increases in the Ph.D. program requires additional graduate student space
- Unique problems
 - Location: Because the program includes both undergraduate & graduate students and multiple disciplines around the campus, finding a central location is critical and difficult
 - Recruiting faculty: Either strong, focused research but little to no policy or the reverse