

# (Steps Toward) Linking Engineering and Public Administration and Policy at NC State



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Linking Engineering and Public Policy in the MPP/MPA Curriculum and Beyond  
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# Overview

- (Steps Toward) Linking Engineering and Public Administration and Policy at NC State
  - Faculty Clusters
  - Courses and Curriculum
  - Research
- Ripple Effects (and other initiatives)
- Next Steps...

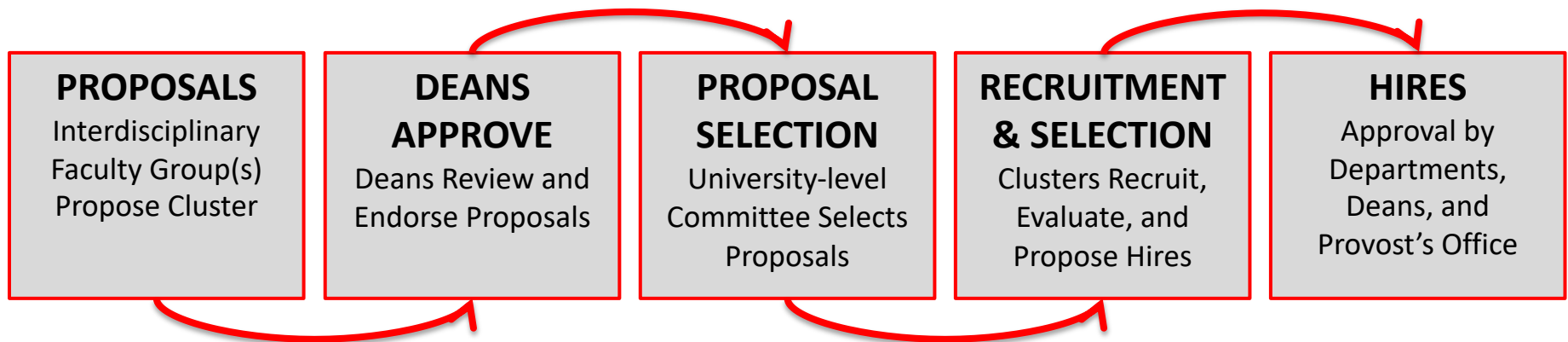
# Chancellor's Faculty Excellence Program

- The [CFEP](#) is NC State's faculty cluster hire initiative designed to:
  - Expand interdisciplinary research opportunities
  - Achieve national eminence in priority areas
  - Increase federal funding
  - Create new academic programs to meet student demand
  - Meet the needs of constituents as a Land Grant institution
  - Attract diverse faculty
- Two waves of cluster hiring (to date)
  - First wave (2012) resulted in 12 clusters
  - Second wave (2015) resulted in 8 more clusters

# Chancellor's Faculty Excellence Program

- A Few Key Features
  - Proposals originate with current faculty
    - Build on strength, interests
    - Intended to increase faculty buy-in
  - Hiring done by interdisciplinary search committees
    - Proposed “tenure homes” departments involved
  - Funding primarily through the provost
  - Policies and processes developed for interdisciplinary faculty review and rewards (annual, post-tenure, P&T)
- (See [\*Creating a Culture of Interdisciplinary Excellence\*](#))

# CFEP Process



# PA Cluster Hires/Participation

- PA has hired faculty members through two clusters
  - [Genetic Engineering and Society](#)
    - PA hire: Jennifer Kuzma, Professor and Co-Director of GES Center
    - 2 other hires (Natural Resources, Applied & Environmental Econ) and 1 previously hired (Entomology and Genetic Engineering)
  - [Sustainable Energy Systems and Policy](#)
    - PA hire: Christopher Galik, Associate Professor
    - 3 other faculty (Civil Engineering, Ag & Resource Economics, and Computer & Electrical Engineering)
- Mixed Motives for PA's Participation
  - Stakeholder needs (faculty, students, employers, society)
  - Strategic (pragmatic?)

# Courses and Curriculum: Genetic Engineering and Society

- **Sample Courses**
  - Science & Technology Policy
  - Governance Systems and Modeling
- **Curriculum/Research Training Programs**
  - [GES minor](#) (available to master's and PhD students)
  - IGERT training program (funding ended)
  - NRT-funded [AgBioFEWS](#) training program
    - (Agricultural Biotechnology In Our Evolving Food, Energy, and Water Systems)
    - PhD Cohort Fellows (first cohort of 10 admitted Fall 2019)

# Courses and Curriculum: Sustainable Energy Systems and Policy

- **Sample Courses (special topics)**
  - Energy Policy
    - Blend of technical, political, and economic
    - Develop alternatives presented to mock Public Utilities Commission
  - Applied Problem Solving: NCSU Climate Action Plan
    - Course project was to update NC State's Climate Action Plan
- **Curriculum/Research Training Programs**
  - Existing (sans PA/policy courses)
    - [Renewable Electric Energy Systems](#)
    - [Renewable Energy Assessment and Development](#)
  - In development (to be housed in PA)
    - Graduate Certificate in Sustainable Energy Policy and Management  
(*working title*)



# Connecting through Courses and Curriculum

- A couple observations from faculty...
  - “... *I make the engineers uncomfortable by forcing them to write memos and op-eds, and then scare the MPAs with some required energy modeling assignments*”—**Christopher Galik**, commenting on his energy policy course.
  - “*Engineers often take a more optimistic view of science and technology and have in-depth knowledge of how technical work is done, whereas social scientists are often more skeptical and tend to focus more on the broader societal obligations while bringing more knowledge about social and policy systems. By the end of my course, both come to see the other’s perspective and appreciate their respective disciplines*”—**Jennifer Kuzma**, describing the benefits of having engineers and PA students in the same class.

# Connecting through Research

- **GES Center** has an extensive portfolio of research, workshops, colloquia, etc. (see [GES publications](#))
  - This cluster benefits from a center
- **Sustainable Energy Systems and Policy** cluster likewise has impressive research portfolio
  - The lack of center (staff, physical space) is a challenge (e.g., no cluster website, social media)
- **Institute for Transportation Research (non cluster)**
  - Jason Coupet, Assistant Professor of PA, using operations and productivity methods to prioritize state DOT projects, location of new schools (Wake County Public Schools)
    - Thinking beyond traditional (cheap land) to include health effects (longer commutes, less after-school activities/sports, health consequences)

# Connecting through Research:

## Energy Storage Options for NC

- Interdisciplinary team from NC State charged with evaluating the potential for energy storage in the state (NC HB 509, 2017)
  - Faculty from agricultural and resource economics, public administration, electrical engineering, civil engineering, and NC Clean Technology Center
- Public Policy Impacts
  - Intended to guide the NC General Assembly as it develops storage-related energy policies
  - [NC Utilities Commission](#) just issued an order opening investigation based upon the report
- NC State Sustainability Innovation/Impact Award  
(See project info at <https://energy.ncsu.edu/storage/>)

# Other Connections

- Consortium for Nonproliferation Enabling Capabilities ([CNEC](#))
  - Funded by a five-year, \$25 million grant from the National Nuclear Security Administration's (NNSA) Office of Defense Nuclear Nonproliferation Research and Development
  - Developing the next generation of leaders with practical experience in technical fields relevant to nuclear nonproliferation.
    - Consortium of seven universities and four national laboratories
  - Graduate Certificate in Nuclear Nonproliferation Science and Policy
    - Blend of course from Nuclear Engineering and Political Science

# Benefits to Connecting

- Clusters have brought additional capacity
  - New electives
  - PA courses, taught from diverse disciplinary perspectives
- Growing recognition of interdisciplinary work's benefits
- Impressive research productivity (the cluster hires are among the most productive faculty)
  - Sponsored research
  - Peer reviewed articles
  - Mentoring graduate student research
- Relevance and Potential as a Viable Partner
  - No small thing on a STEM campus

# Challenges to Connecting

- Clusters
  - Money for new hires and start-up packages
  - Space
    - Exemplified by GES v. Sustainable Energy Systems & Policy
  - Agreements on overhead
  - Faculty reviews and rewards
    - What “counts” (and ensuring it does)
    - Policy v. practice, norming
  - PA program mission
    - Tail wagging the dog?

# Challenges to Connecting

- Courses and Curriculum
  - New/unfamiliar courses and instructors (low enrollments)
  - New courses usually offered as “special topics” (master’s and doctoral)
  - MPA program mission
    - Mission affects recruitment (generalist management), curriculum, faculty hiring, etc.
  - Reluctance (perhaps, deterrence) from science and engineering students’ advisors

# Next Steps...

- Additional opportunities through new clusters?
  - Successful but expensive (unlikely)
  - Adding (or replacing) capacity to existing clusters
- Micro credentials
  - Graduate Certificate in Sustainable Energy Policy and Management (*working title*)
    - To be housed in PA
- Low hanging fruit
  - Better marketing courses (and PA minor)
  - Cross-listing courses (e.g., Civil Engineering/PA 578 Energy & Climate)
    - Challenged by RCM-type funding