Building Power Engineering Workforce: Challenges and Potential Solutions

NSF-NAE Workshop on Building
A Robust Workforce in
Electric Power Engineering
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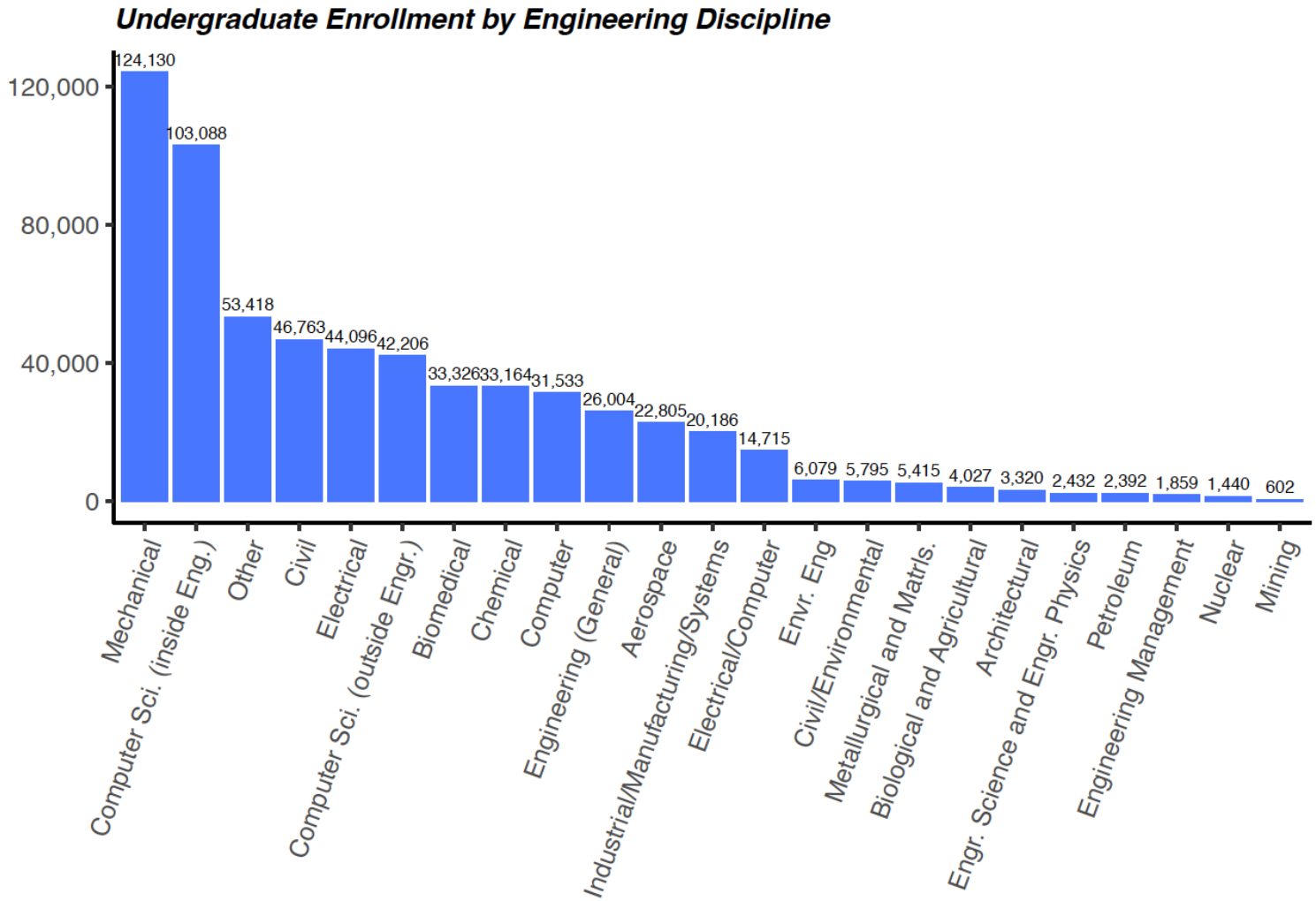
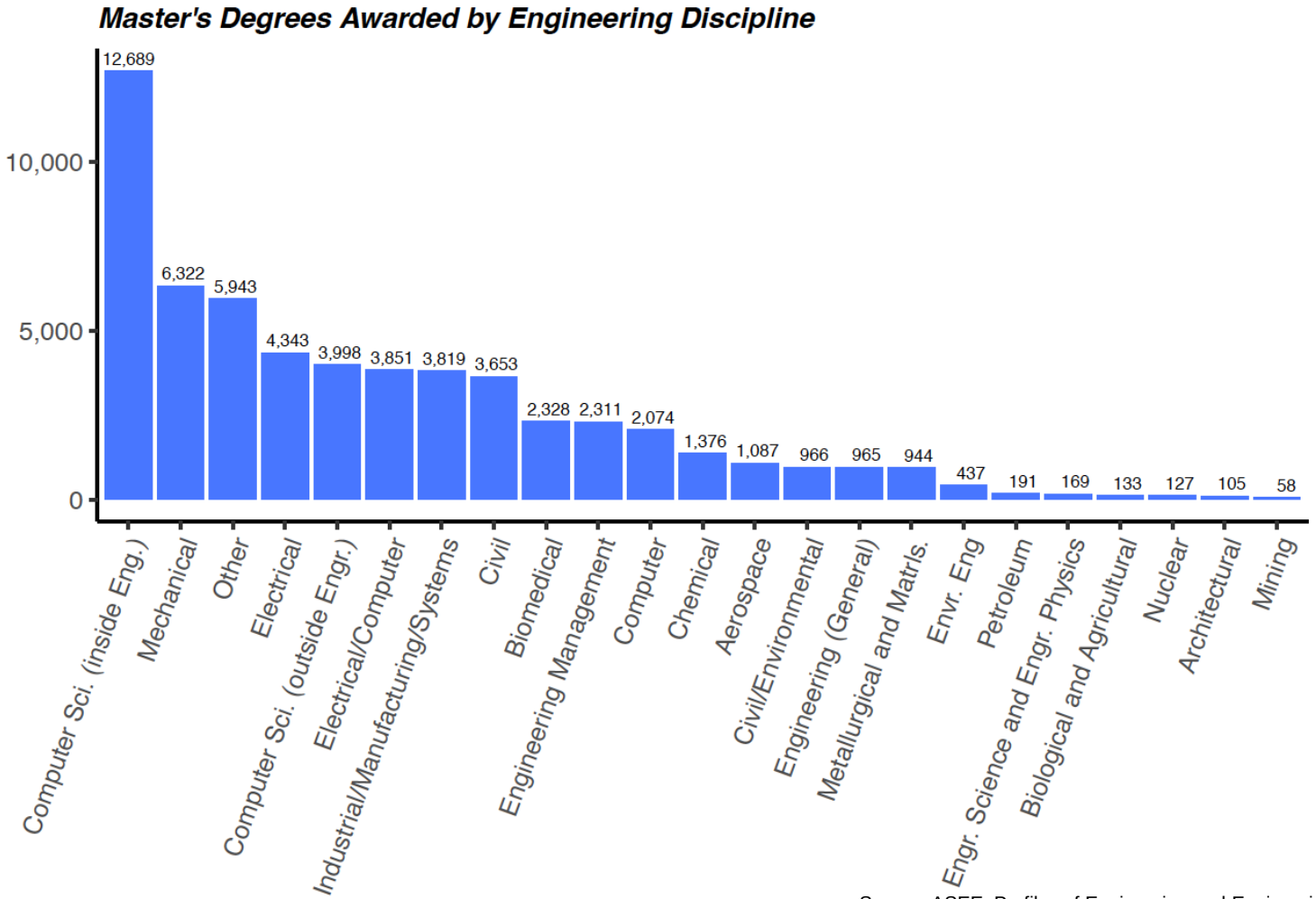


Source: ASEE, Profiles of Engineering and Engineering Technology, 2021



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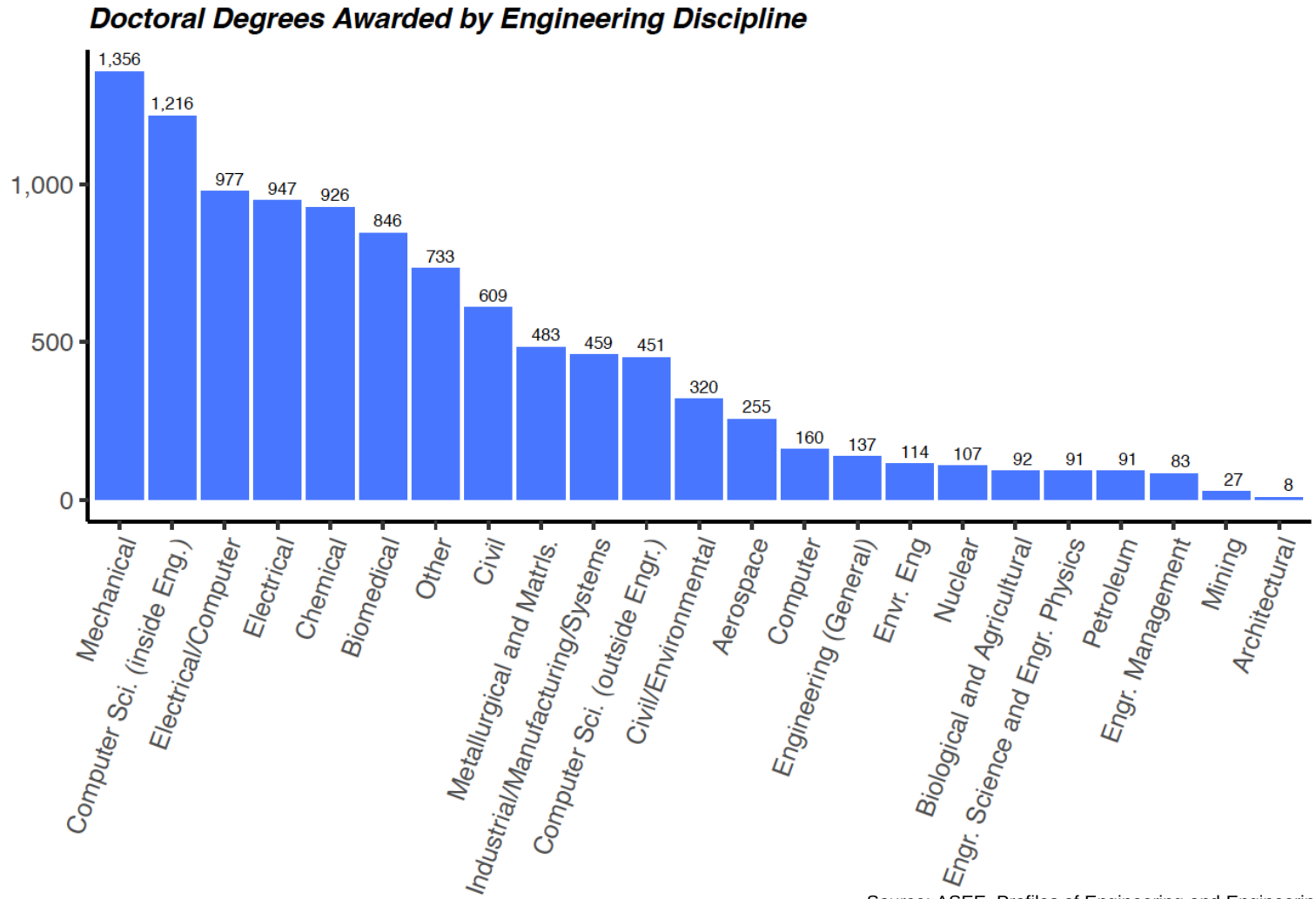
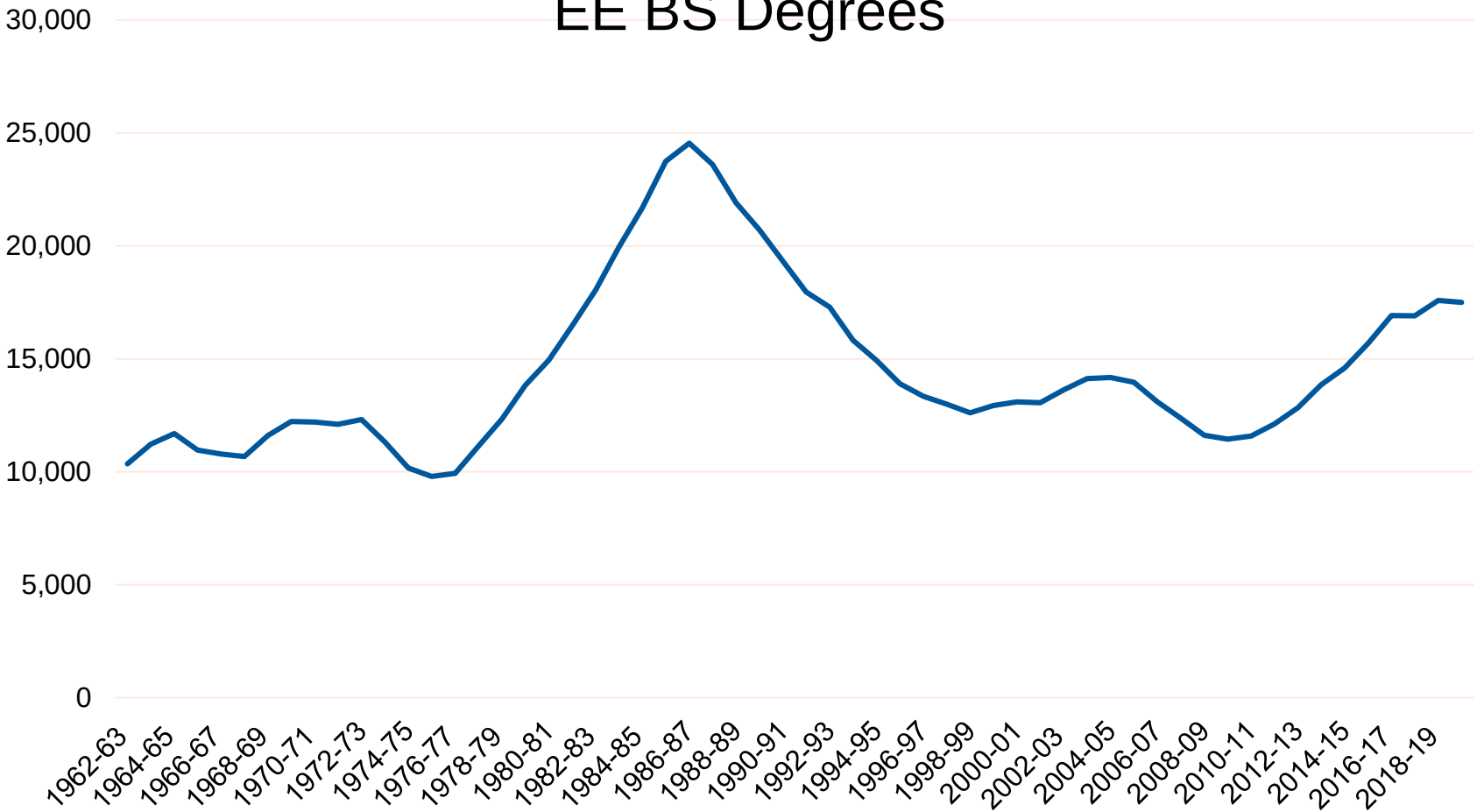


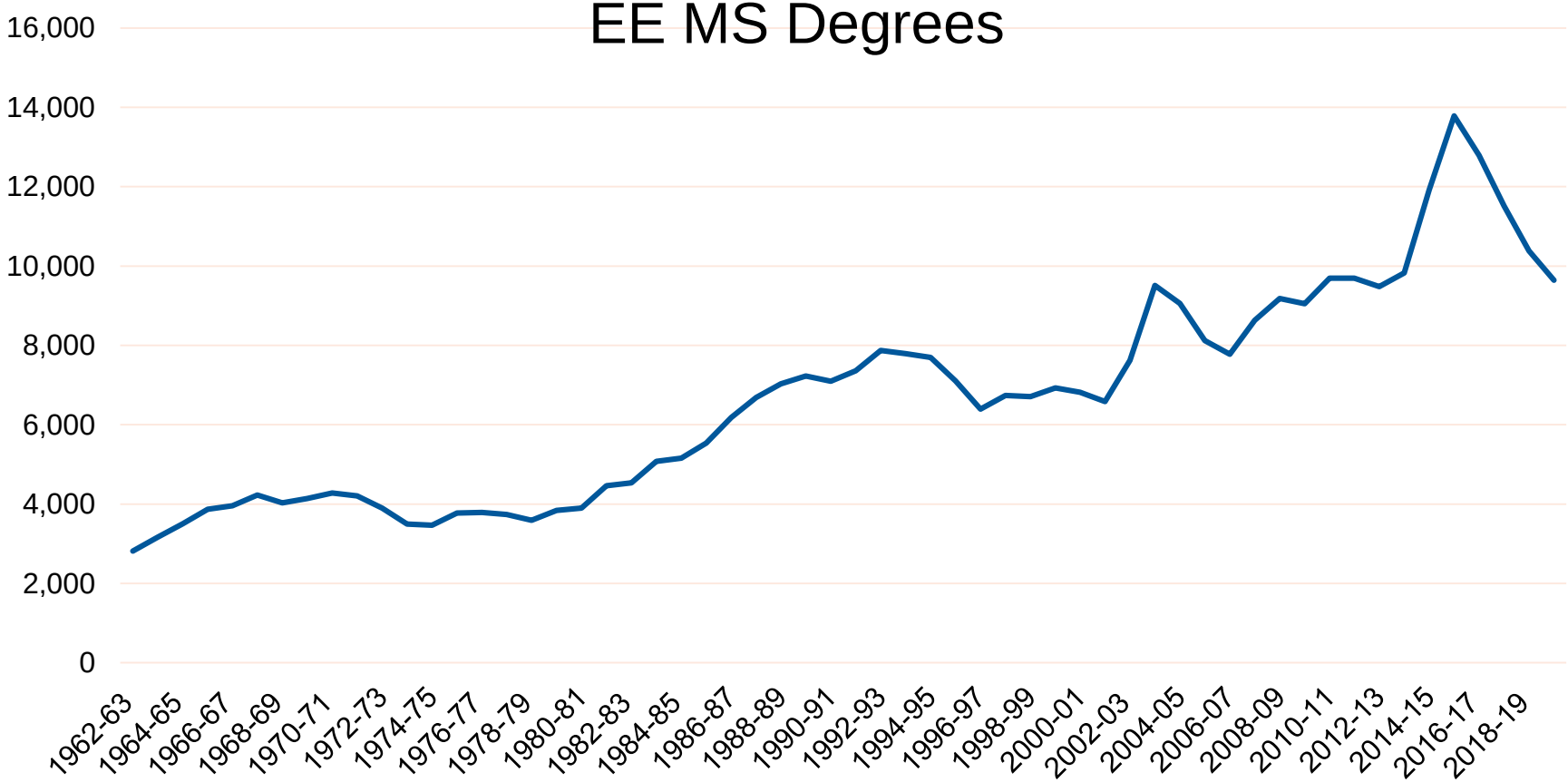
Source: ASEE, Profiles of Engineering and Engineering Technology, 2021

EE BS Degrees



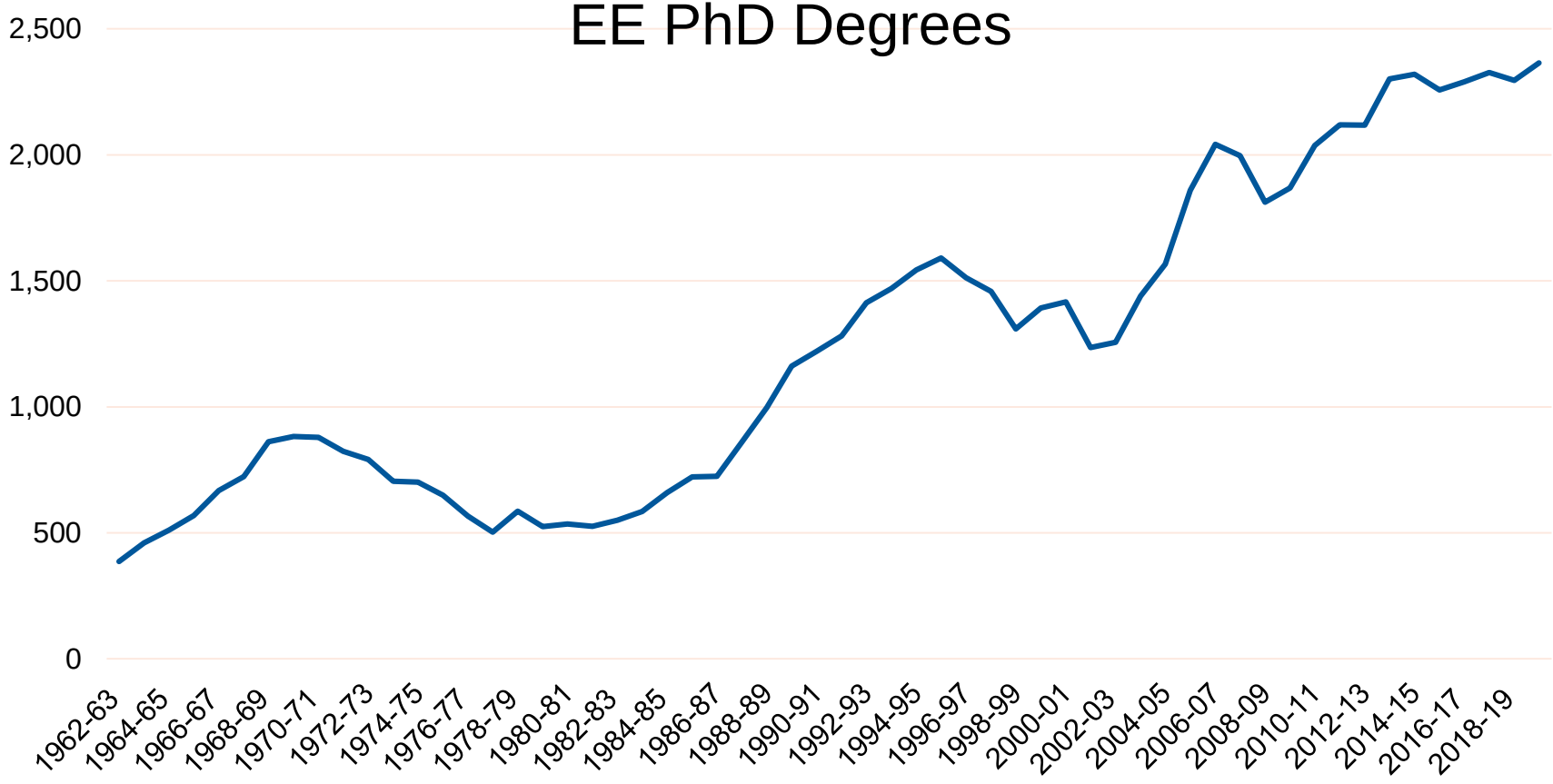
Source: Dept of Education, IPEDS Database

EE MS Degrees



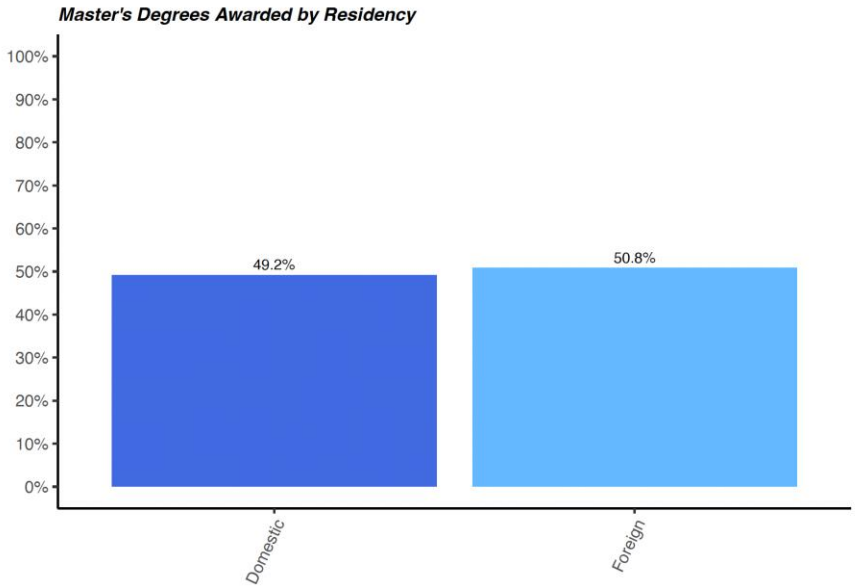
Source: Dept of Education, IPEDS Database

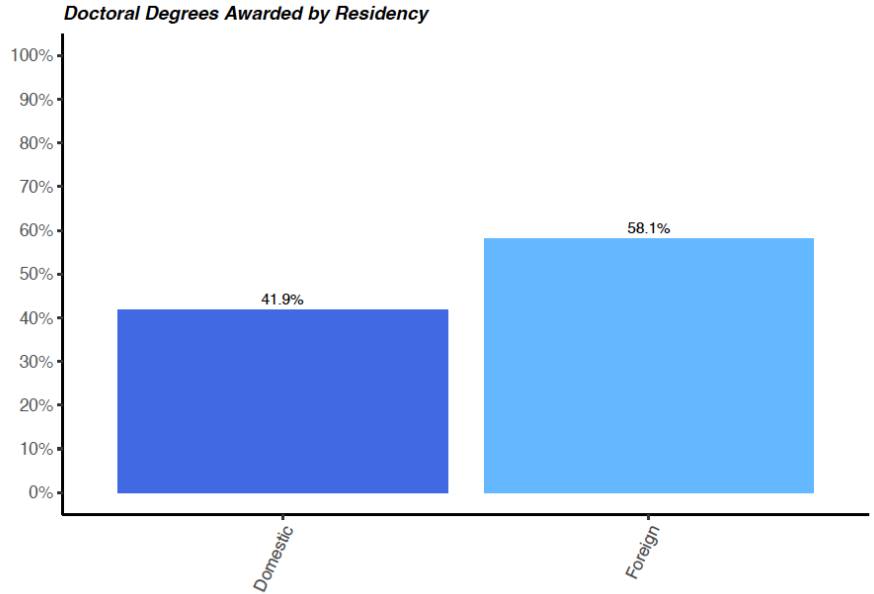
EE PhD Degrees



Source: Dept of Education, IPEDS Database

Engineering Graduate Students





ECE PhD Students (2021):
Total: 17,570 Foreign: 12,252
~70%

Source: NSF NCSES

Source: ASEE, Profiles of Engineering and Engineering Technology, 2021

Challenge: Power Engineering Programs in ECE Departments face Competition

Many universities reduced or eliminated power systems programs in the 80's

ECE students attracted to:

- Machine learning, Artificial Intelligence (ML/AI)
- Communications and networking
- Semiconductors (CHIPS Act)
- Robotics, controls

Challenge: Possible Lack of Awareness of Role of Power Systems in Energy and Climate

- Strong interest in climate change mitigation, adaptation, and resilience
- Role of fossil free energy systems for climate change mitigation, adaptation, and resilience
- Electrification with renewable (and nuclear) power as the most important step in fossil free energy, transportation, HVAC, manufacturing, …

How well do ECE students know this story?

Potential Opportunity : Promote Power Engineering for Energy/Climate

- Promote power systems engineering as crucial to climate change mitigation, adaptation and resilience and attract motivated students into the field
- Target audiences: K-12, undergraduates, general public
- Online as well as in-person programming

Potential Opportunity : Collaborative Educational Partnerships

- Robust, innovative, multi-institution collaborative partnerships to develop successful educations programs.

- Possible Partners:

❖ Research universities
❖ 4-year teaching institutions
❖ Engineering technology programs
❖ Community colleges
❖ Industry
❖ Government

Potential Opportunity: Industry Career Pathways

- It will be crucial for industry to showcase exciting and fulfilling career pathways for power engineers
- Presentations and presence at universities and other partner organizations
- Worker retraining
- Industry internships

Comments

Ideas

Questions?

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