

Resilient Women: Our Collective Role in Advocating for Each Other and the Future of Environmental Chemistry

Sharon L. Walker

Special Symposium on “Women in Science & Engineering”

A tribute to impactful contributions made to environmental chemistry.

2021 ACS Fall Meeting theme is “Resilience of Chemistry”



Moment of Gratitude and Welcome

- Organizers: Dion Dionysiou, Christie Sayes, Virender Sharma and Charifa Heijase
- Co-presenters: Janet Hering, Katherine McMahon, and Michelle Scherer
- ACS
- Welcome to our community!



Mentoring and Being Mentored

Mentors

Massoud Pirbazari (USC)
Linwood Pendleton (USC)
Meny Elimelech (Yale)
Jon Walz (Yale)
Joe Childers (UCR)
Mark Matsumoto (UCR)

Collaborators and friends...

Grad school friends
GRC foosball and hiking buddies
AEESP, ACS, AICHE
ASEE and ELATES

PhD students

- Gexin Chen
- Berat Haznedaroglu
- Hyunjung Kim
- Amy Gong
- Indranil Chowdhury
- Ian Marcus
- Ryan Honda
- Alicia Taylor
- Jacob Lanphere
- Travis Waller
- Chen Chen
- Drew Story
- Caroline Kim
- Holly Mayton
- Unnati Rao
- Daniel White

Master students

- Olgun Zorlu
- Parham Javadinajjar
- Kelsey Whittaker
- Jessamine Quijano

Post-doctoral advisor:

- Saeed Torkzaban
- Yongsuk Hong
- David Ginsburg
- Nichola Kinsinger
- Avner Ronen

Countless undergrads...



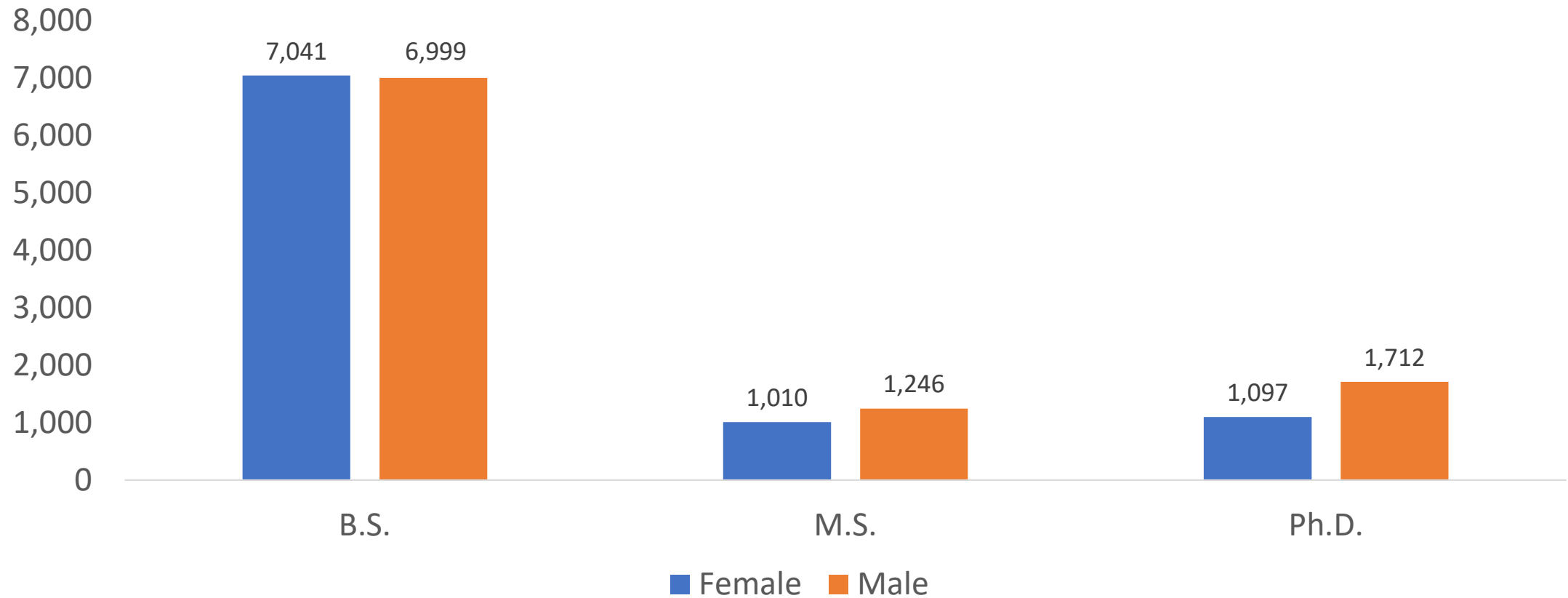
Acknowledging where we are

- 14% of National Academy of Science (NAS, 2017) are women
- In 2021 NAS elected 120 new members last year, 59 women (49%, highest ever)
- 9% of the National Academy of Engineering (NAE), 2020)
- In 2021, NAE elected 128 new members, 27 are women (21%)

Why aren't we further along?!

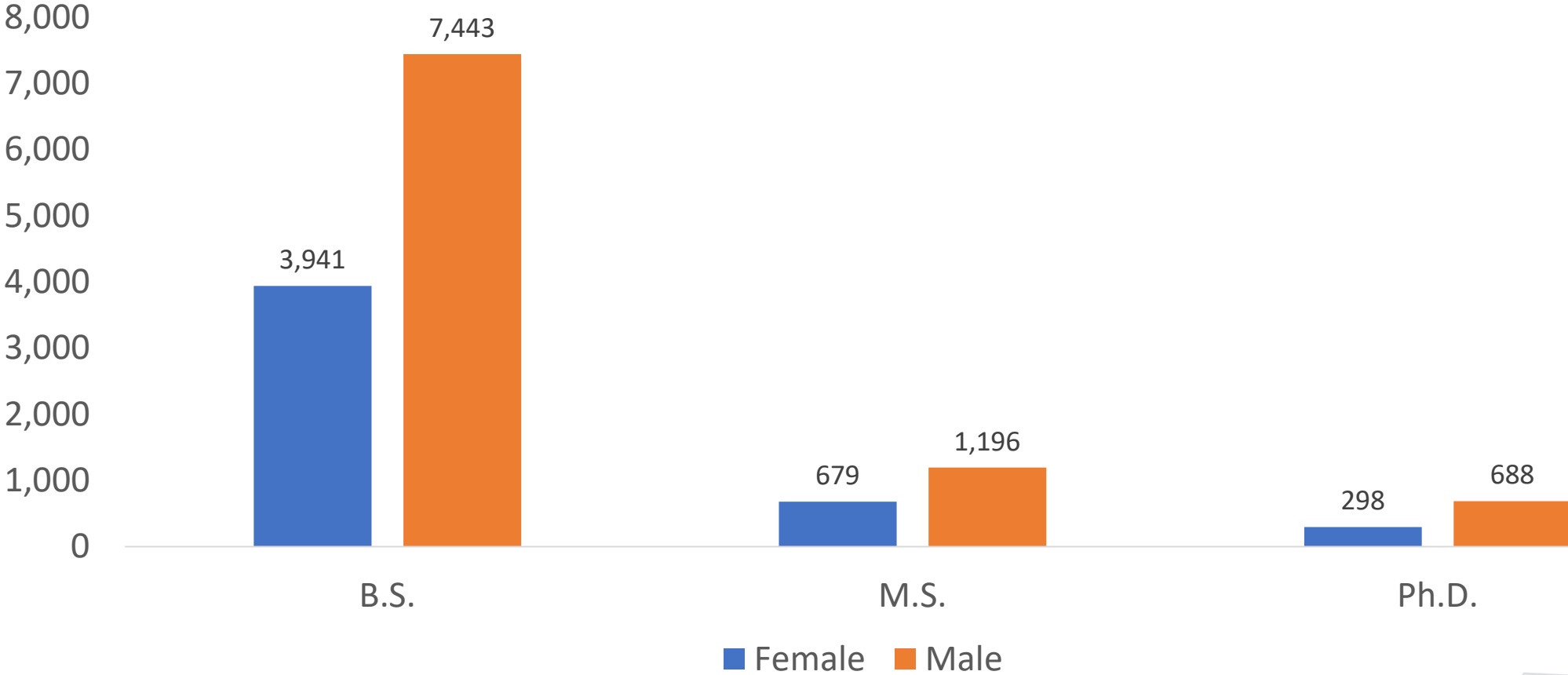


Chemistry degrees conferred 2018



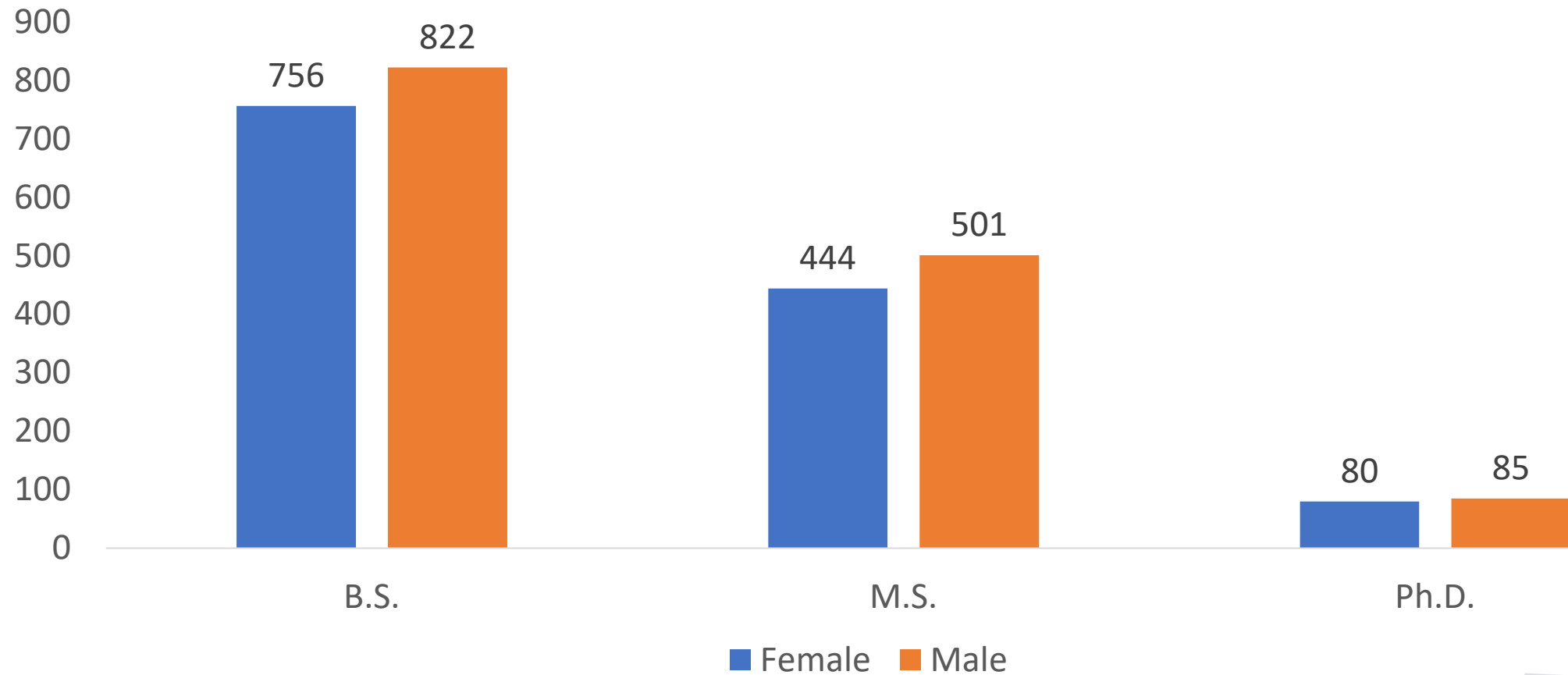
NCES Digest 2019: Table 318.30

Chemical engineering degrees conferred 2018



NCES Digest 2019: Table 318.30

Env. engineering degrees conferred 2018

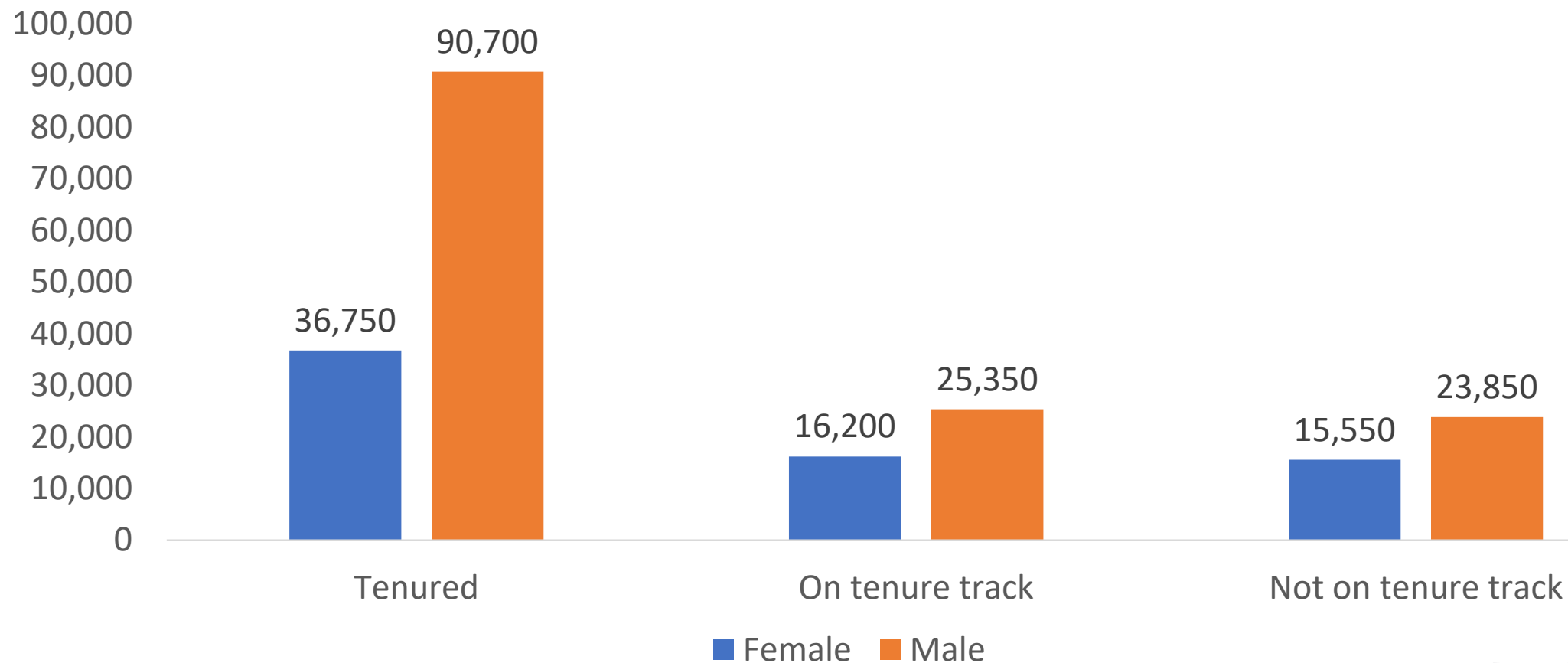


NCES Digest 2019: Table 318.30



STEM faculty

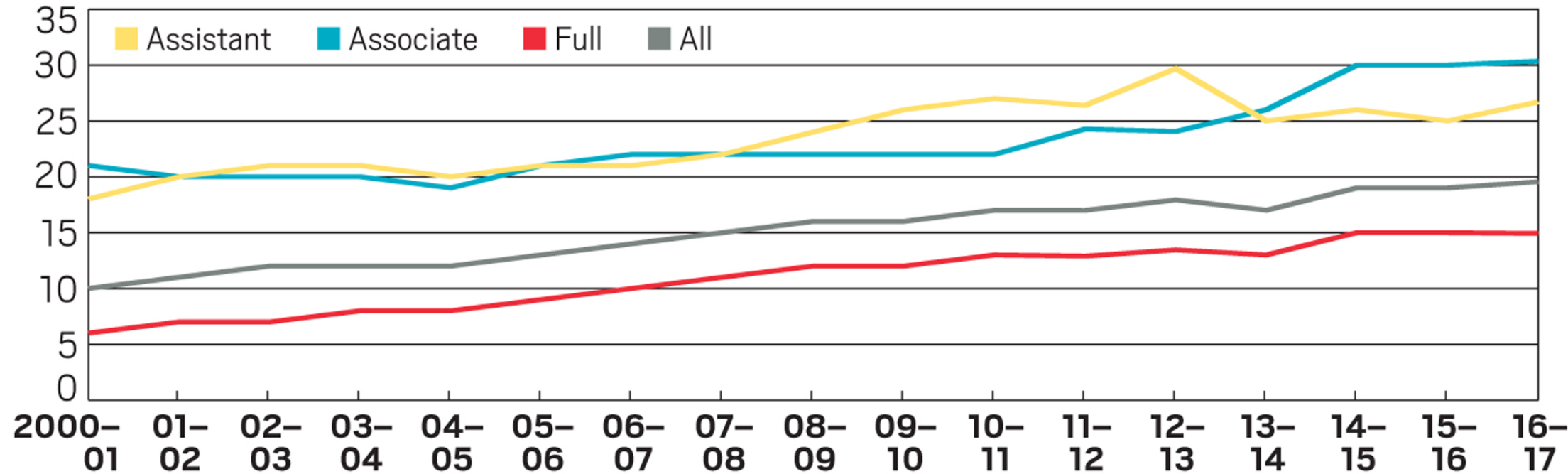
2019



NCES Digest 2020: Table 9-29

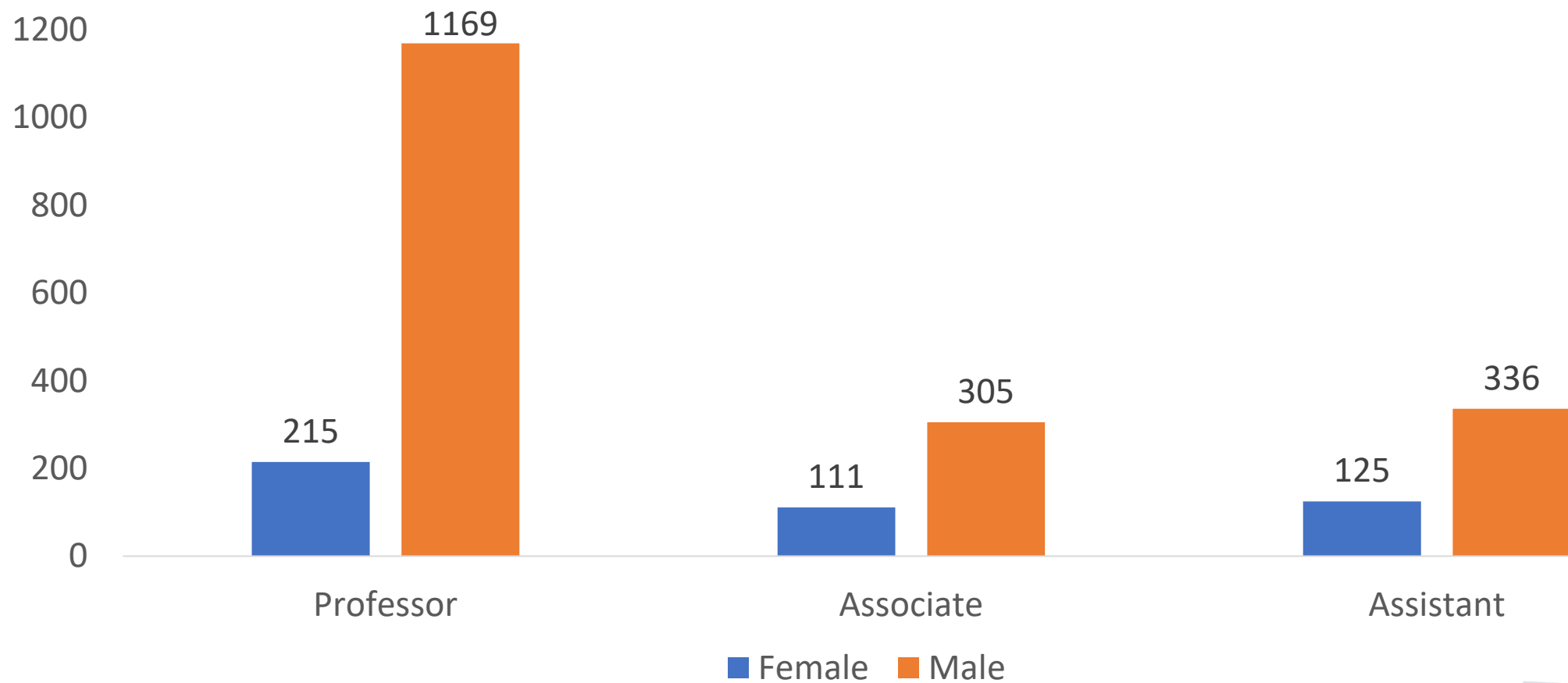
Chemistry faculty over time

Women chemistry professors, %



Source: Open Chemistry Collaborative in Diversity Equity (OXIDE) surveys, 2019

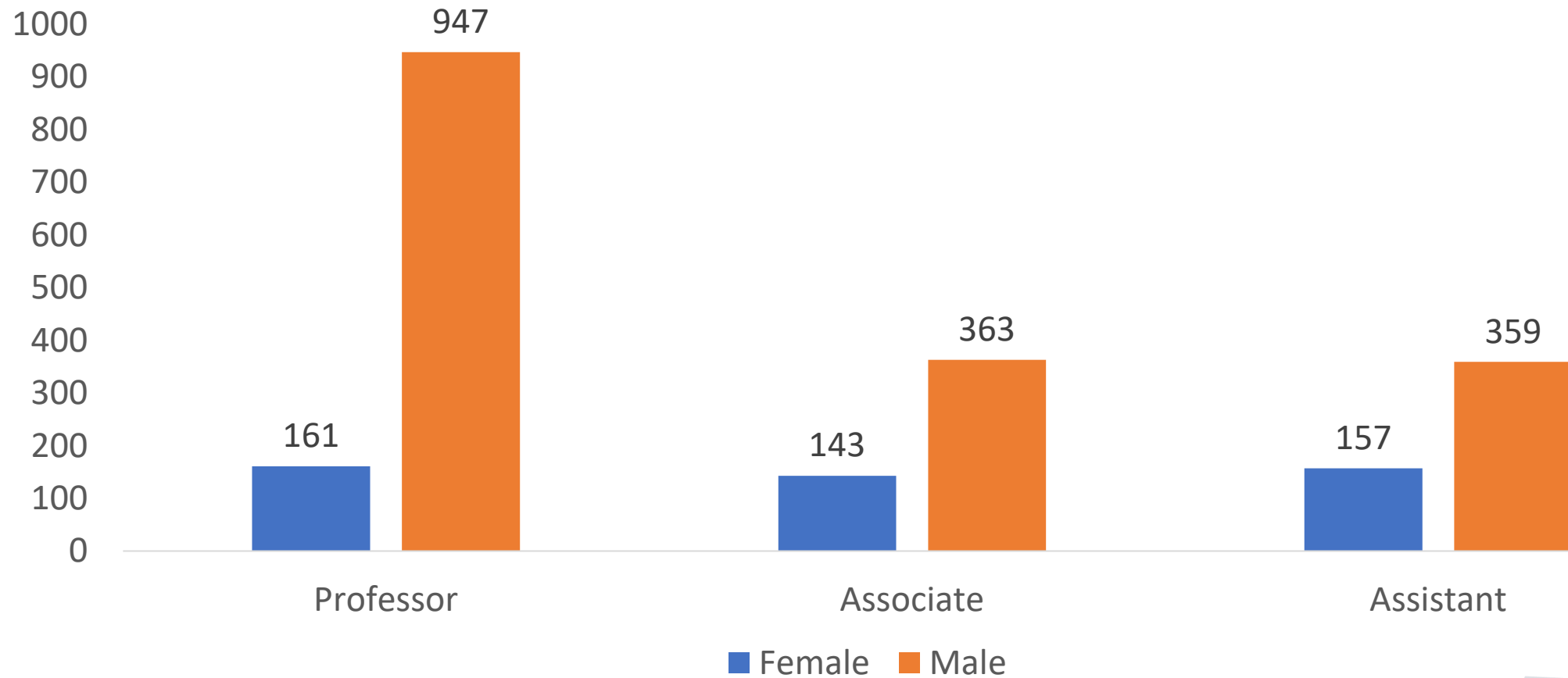
Chemistry faculty 2017



Source: Open Chemistry Collaborative in Diversity Equity (OXIDE) surveys, 2019

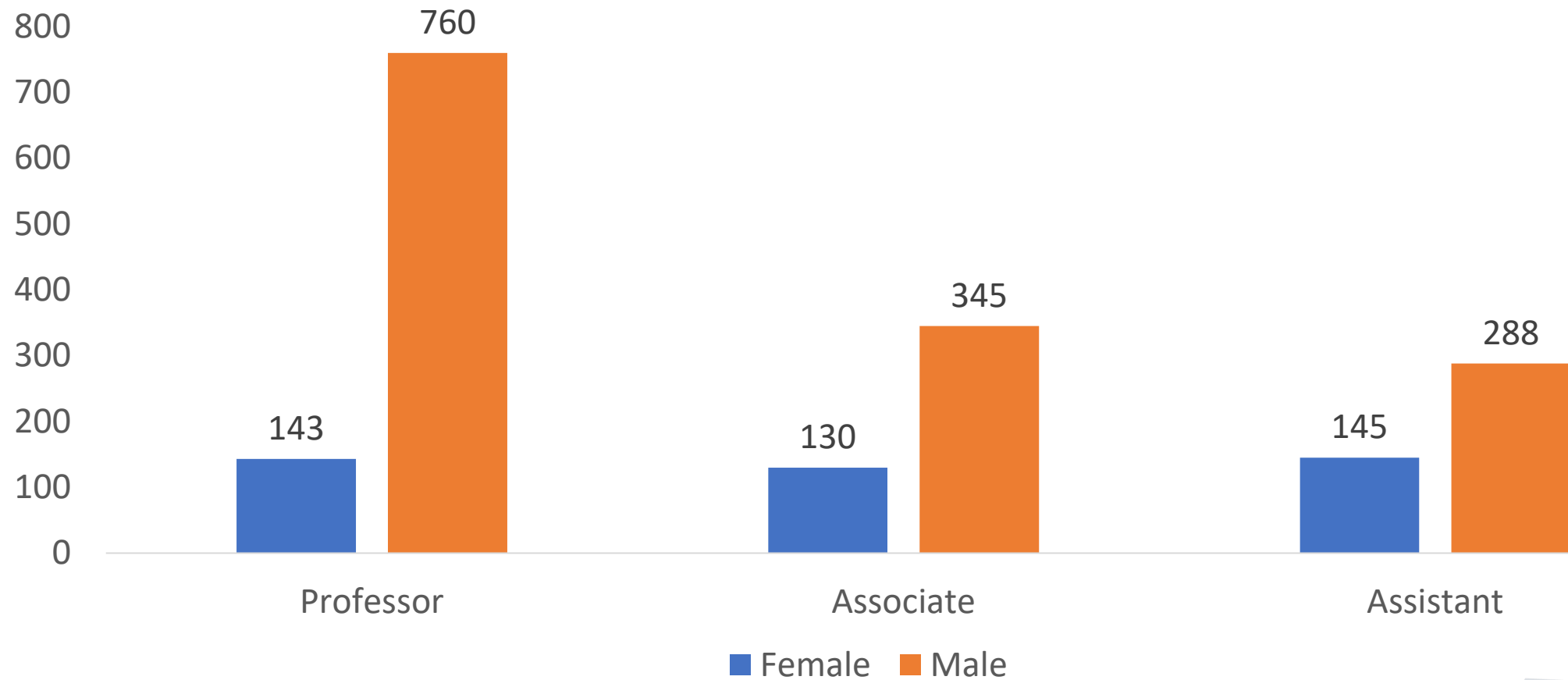
Chemical engineering faculty

2020



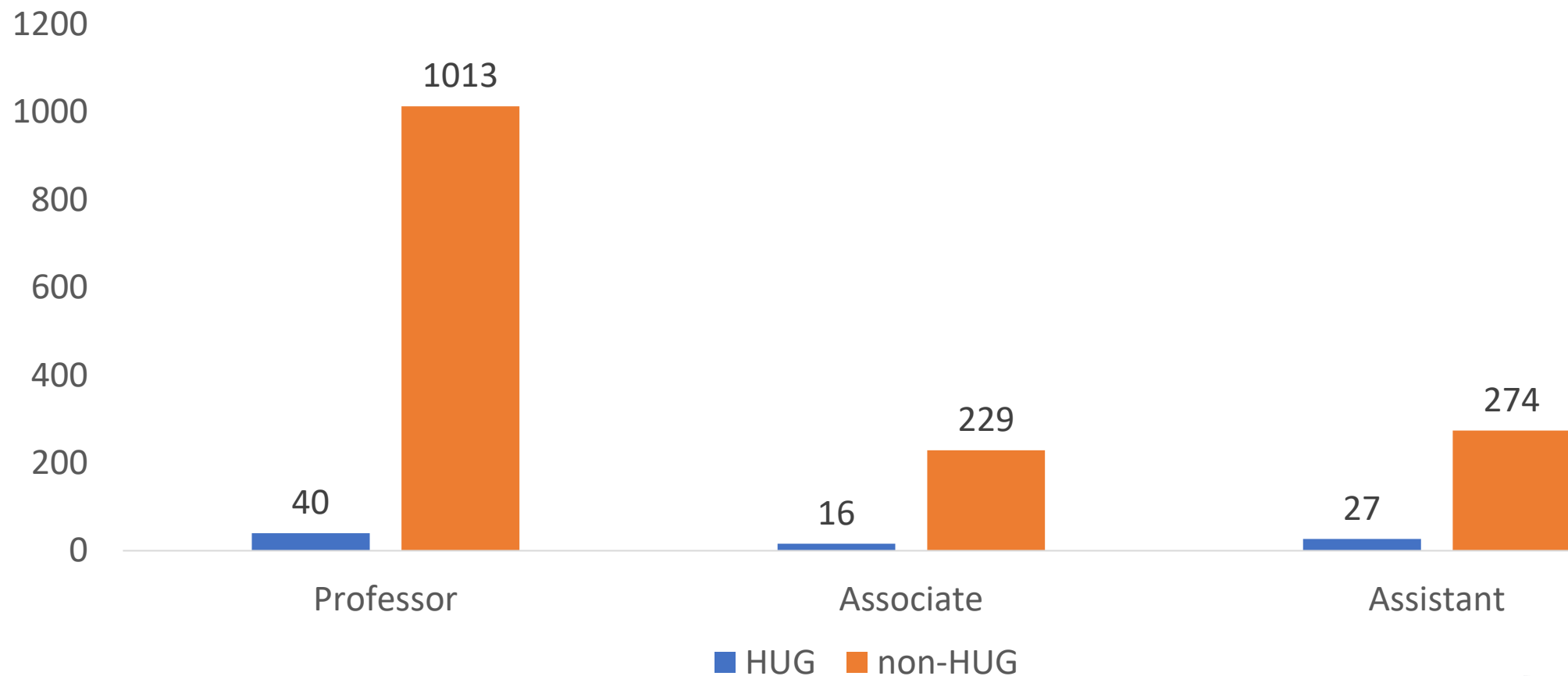
Source: ASEE Institutional Research + Analytics 2021

Environmental engineering faculty 2020



Source: ASEE Institutional Research + Analytics 2021

Chemistry faculty 2017

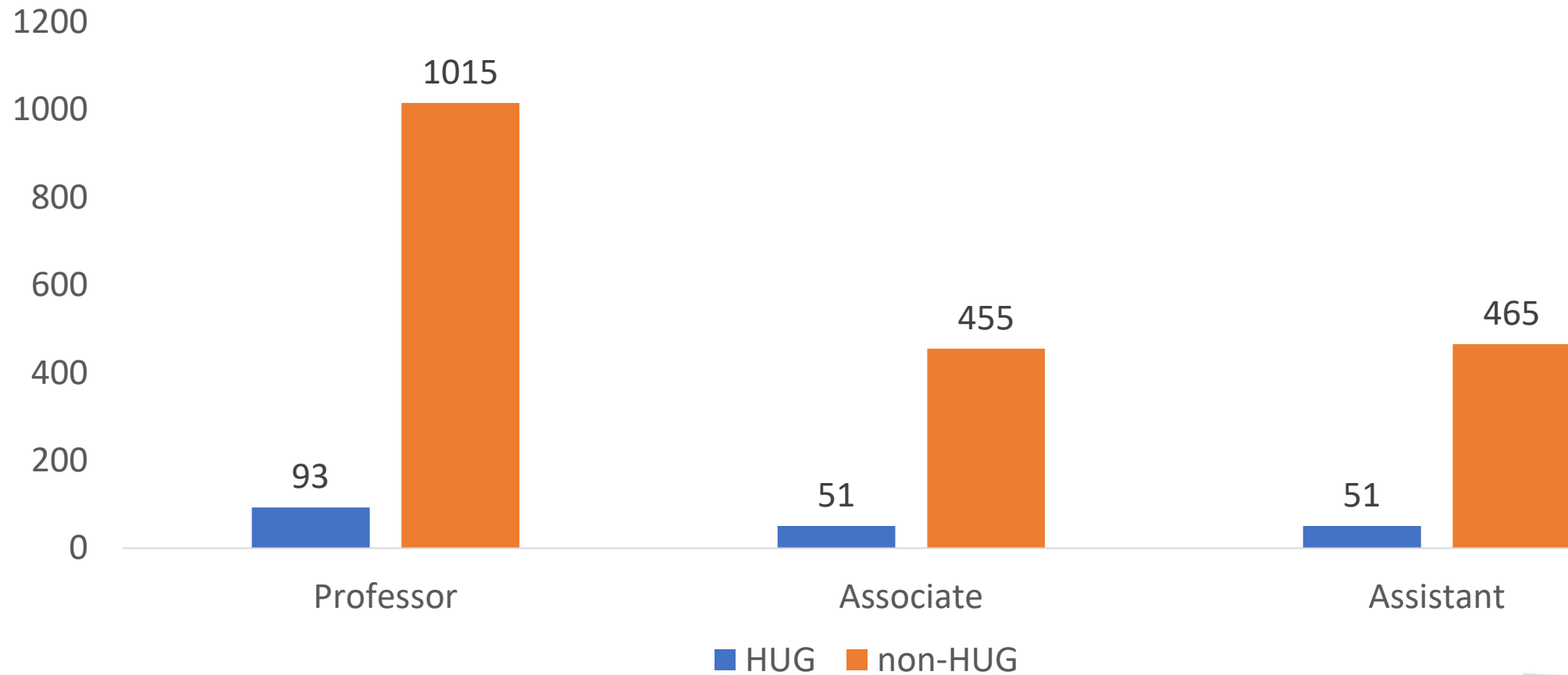


HUG – Historically Underrepresented Groups

Source: Open Chemistry Collaborative in Diversity Equity (OXIDE) surveys, 2019

Chemical engineering faculty

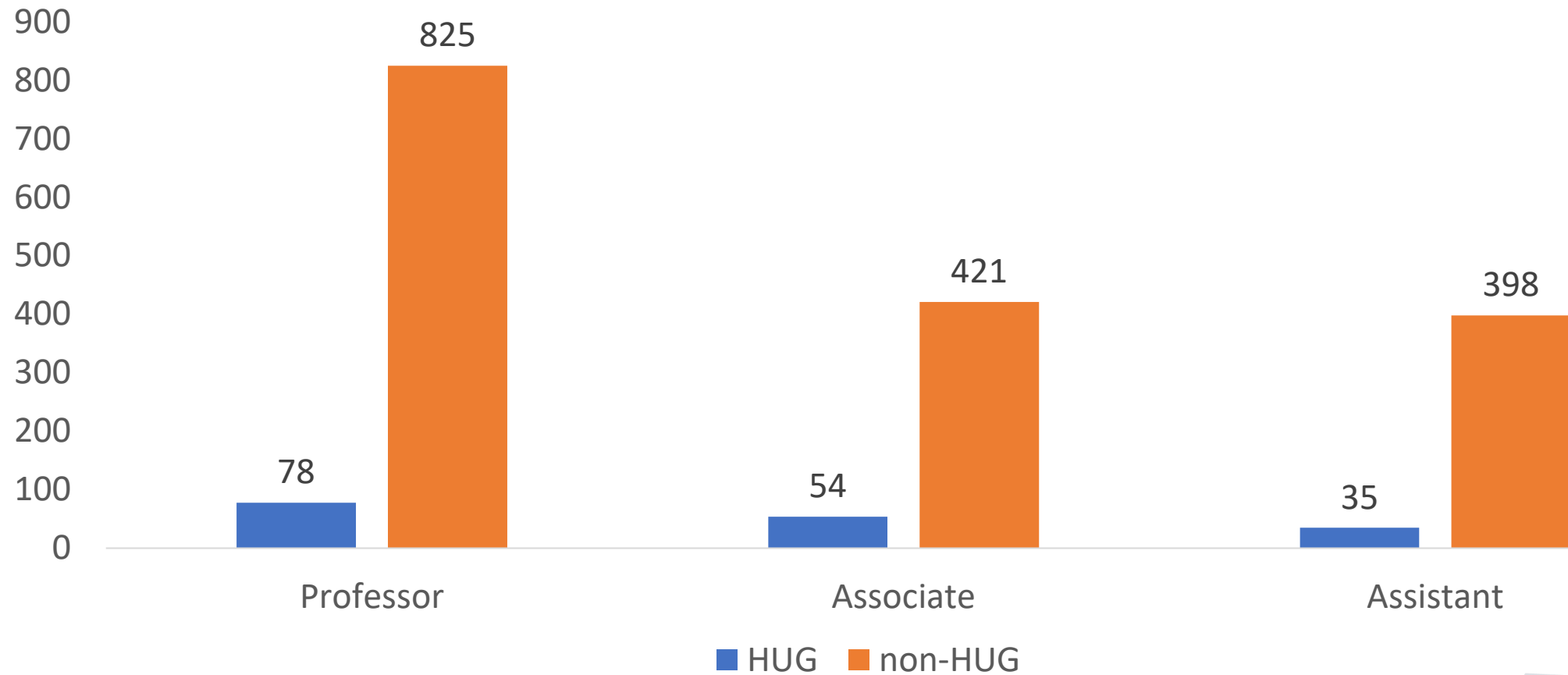
2020



Source: ASEE Institutional Research + Analytics 2021

Env. engineering faculty

2020



Source: ASEE Institutional Research + Analytics 2021

Acknowledging where we are

National Academies Press —

- Master degree increase in chemistry by 35% between 2000 and 2015 (823-1109)
 - 30.5% increase for men (up to 14k)
- Master degree increase in engineering by 129% between 2000 and 2015 (5342-12282)
 - 91% increase for men (up to 37k)
- PhD degree increase in chemistry by 82% between 2000 and 2015 (664-1206)
 - 19% increase for men (up to 1.7k)
- PhD degree increase in engineering by 190% between 2000 and 2015 (835-2426)
 - 75% increase for men (up to 8k)

Acknowledging COVID

- In our Universities
 - Setback in the growth of representation of women in STEMM fields
 - Institutional response exacerbated gender-based inequalities
- In our professional circles
 - Decreased time to network and engage in collaborations because of non-work tasks
 - Women, who may already feel isolated in their field, had that effect amplified by the pandemic

Source: National Academies – Impact of COVID-19 on the Careers of Women in Academic Sciences, Engineering, and Medicine (2021 report)

Acknowledging COVID

- In our personal lives
 - Exacerbating work/life inequalities, leading to loss of early career female academics
 - Exacerbated mental health conditions, which occur more frequently among women
- In our Departments
 - Lay-offs and furloughs disproportionately affect women, due to tending to be in non-tenured positions

Source: National Academies – Impact of COVID-19 on the Careers of Women in Academic Sciences, Engineering, and Medicine (2021 report)

Acknowledging COVID

- In our labs
 - Decreased productivity for women, less journal articles written by women since start of pandemic
 - Note: 4.9% less on all topics, 44.5% less first author and 15.4% less overall than would be anticipated on COVID based topics
 - Reduced research productivity compared to men due to switching to online learning, and caregiving responsibilities

Source: National Academies – Impact of COVID-19 on the Careers of Women in Academic Sciences, Engineering, and Medicine (2021 report)

Moving Forward

- Lean on our Professional Societies
 - American Society of Engineering Education (ASEE)'s Diversity Recognition Program (begun in 2018)
 - Women Chemists Committee of ACS – newsletter, books, advocacy
- Building on our strengths – Collaboration
 - See National Academies report from 2021 that speaks to global cooperation and partnership as the way to strengthen our leadership in STEM internationally
 - Future of federal research funding mandates collaboration and convergence



Moving Forward

- Nicholas Donofrio – “Strengthen Innovation and Inclusion by Bringing Opportunity to Talent” (2020) Bridges 50th Anniversary
 - Student recruitment
 - Faculty hiring
- Demand Institutional support
 - NSF ADVANCE program
 - COACHE - Instruments to investigate tenure equity since 2008 (<https://coache.gse.harvard.edu/history-mission>)
 - Become the leader – ELATES, ACE, <https://drexel.edu/provost/initiatives/elates/>

Resilience Thru Community

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- David Ginsburg
- Nichola Kinsinger
- Avner Ronen

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It is through this rich and powerful community of colleagues, mentors, students, and friends that we can be resilient...