ENGINEERING RESEARCH CENTERS 2018 END-OF-YEAR SLIDES

i. 19 ERCs Referenced in Slides 1–5

ERC for Integrated Access Networks at the University of Arizona (CIAN)	Future Renewable Electric Energy and Management Systems Center at North Carolina State University (FREEDM)
NSF Nanosystems Engineering Research Center for Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST)	Nanosystems Engineering Research Center for Nanotechnology Enabled Water Treatment Systems at Rice University (NEWT)
Engineering Research Center for Bio-mediated and Bioinspired Geotechnics at Arizona State University (CBBG)	ERC for Precise Advanced Technologies and Health Systems for Underserved Populations at Texas A&M University (PATHS-UP)
ERC for Directed Multiscale Assembly of Cellular Metamaterials with Nanoscale Precision at Boston University (CELL-MET)	ERC for Power Optimization for ElectroThermal Systems at University of Illinois (POETS)
ERC for Innovative and Strategic Transformation of Alkane Resources at Purdue University (CISTAR)	ERC for Quantum Energy and Sustainable Solar Technologies at Arizona State University (QESST)
ERC for Cell Manufacturing Technologies at Georgia Institute of Technology (CMaT)	ERC for Re-inventing the Nation's Urban Water Infrastructure at Stanford University (ReNUWIt)
Center for Biorenewable Chemicals at Iowa State University (IOWA)	Nanosystems Engineering Research Center for Translational Applications of Nanoscale Multiferroic Systems at University of California Los Angeles (TANMS)
ERC for Lighting Enabled Systems & Applications at Rensselaer Polytechnic Institute (LESA)	ERC for Ultra-wide-area Resilient Electric Energy Transmission Networks at University of Tennessee (CURENT)
NSF Nanosystems Engineering Research Center for Nanomanufacturing Systems for Mobile Computing and Mobile Energy Technologies at University of Texas (NASCENT)	Center for Neurotechnology at University of Washington (CNT)
ERC for Revolutionizing Metallic Biomaterials at North Carolina A&T State University (NCAT)	

ii. "Annualized ERCs" on slides 1–5 include the 19 ERCs from the previous slide and the following additional 8 ERCs

Quality of Life Technology Engineering Research Center at Carnegie Mellon University (CMU)	Engineering Research Center for Structured Organic Particulate Systems at Rutgers University (C-SOPS)
ERC for Extreme Ultraviolet Science and Technology at Colorado State University (EUV)	Synthetic Biology ERC at the University of California, Berkeley (SynBERC)
Engineering Research Center for Compact and Efficient Fluid Power at the University of Minnesota – Twin Cities (Minnesota)	ERC for Collaborative Adaptive Sensing of the Atmosphere at the University of Massachusetts (UMass)
ERC on Mid-Infrared Technologies for Health and the Environment at Princeton University (MIRTHE)	ERC for Biomimetic MicroElectronic Systems at the University of Southern California (USC-BMES)

1 | ERC Products of Innovation, FY 1985–2018*

	FY 2018 (19 ERCs)		FY 2013–2017 Annualized		FY 1985–2018 (65 ERCs)
Intellectual Property Transaction	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
Inventions Disclosed	44	2	104	6	2,445
Patent Applications Filed (Provisional and Full)	87	5	112	6	2,100
Patents Awarded	15	1	31	2	851
Licenses Issued	8	< 1	14	1	1,363
Economic Development	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
Spinoff Companies	6	< 1	13	1	223
Spinoff Employees	20	1	76	4	1,414

** Does not include centers from the Earthquake Technology Sector*

2 ERC Influence on Curriculum, FY 1985–2018*

	FY 2018 (19 ERCs)		FY 2013–2017 Annualized		FY 1985–2018 (65 ERCs)
Degrees	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
New Full-Degree Programs Based on ERC Research	1	< 1	3	< 1	54
New Degree Minors Based on ERC Research	0	< 1	1	< 1	31
New Certificate Programs Based on ERC Research	1	< 1	3	< 1	41
Courses	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
New Courses Based on ERC Research	24	1	41	2	1,030
Ongoing Courses With ERC Content	259	14	321	18	3,014
Course Modules Based on ERC Research	31	2	36	2	680
Textbooks	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
New Textbooks Based on ERC Research	6	< 1	6	< 1	179
New Textbook Chapters Based on ERC Research	1	< 1	12	1	100

** Does not include centers from the Earthquake Technology Sector*

3 ERC Information Dissemination, FY 1985–2018*

	FY 2018 (19 ERCs)		FY 2013–2017 Annualized		FY 1985–2018 (65 ERCs)
Peer-Reviewed Publications (Total)	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
Journals**	950	50	968	53	23,312
Conference Proceedings**	510	27	589	32	17,713
Trade Journals	13	1	19	1	633
Coauthored With ERC Students	565	30	666	36	12,130
Education and Outreach	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
Education and Colloquia	839	44	979	54	16,113
Workshops, Short Courses, and Webinars	360	19	357	20	5,184

** Does not include centers from the Earthquake Technology Sector*

*** Includes publications that result from center support, associated projects, and sponsored projects*

Curricular Impact of ERCs, FY 2007–2018*

	FY 2018 (19 ERCs)		FY 2013–2017 Annualized		FY 2007–2018 (39 ERCs)
New and Ongoing Courses, Workshops, Short Courses, Webinars, and Textbooks Based on ERC Research	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
With Engineered-System Focus	362	19	397	22	3,483
With Multidisciplinary Content	342	18	322	17	3,069
Offered at Undergraduate Level	209	11	236	13	2,083
Offered at Graduate Level	314	17	319	17	2,858
Used at More Than One ERC Institution	196	10	71	4	778
Team Taught by Faculty in More Than One Department	159	8	59	3	748

** Does not include centers from the Earthquake Technology Sector*

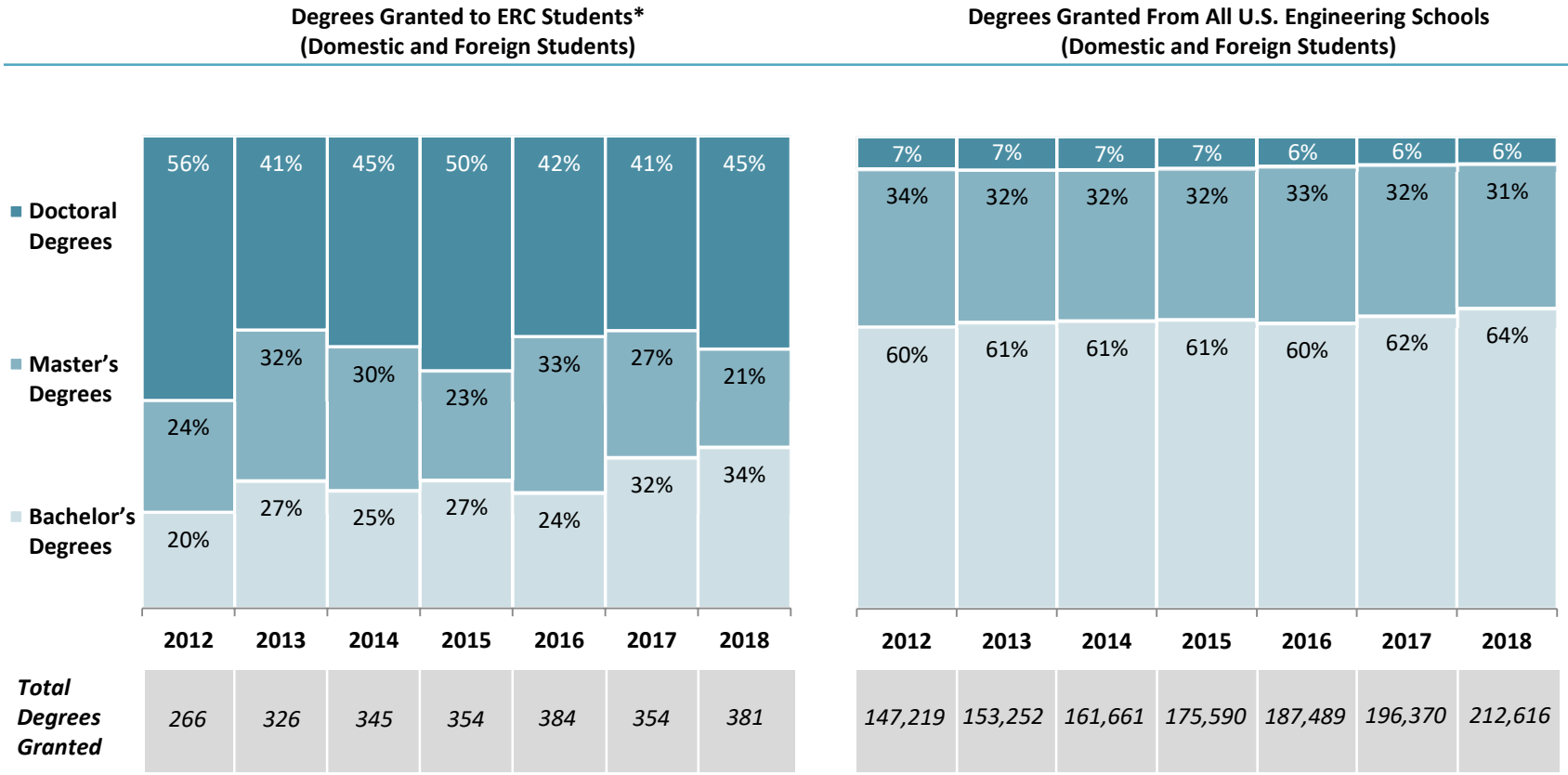
*** Data collection of curricular impacts started in 2007.*

ERC Student Degrees, FY 1985–2018*

	FY 2018 (19 ERCs)		FY 2013–2017 Annualized		FY 1985–2018 (65 ERCs)
Degree Type	***Total***	***Per Center***	***Total***	***Per Center***	***Total***
Bachelor's	130	7	95	5	4,414
Master's	79	4	103	6	4,238
Doctoral	172	9	155	8	4,962
Total	***381***	***20***	***353***	***19***	***13,614***

** Does not include centers from the Earthquake Technology Sector*

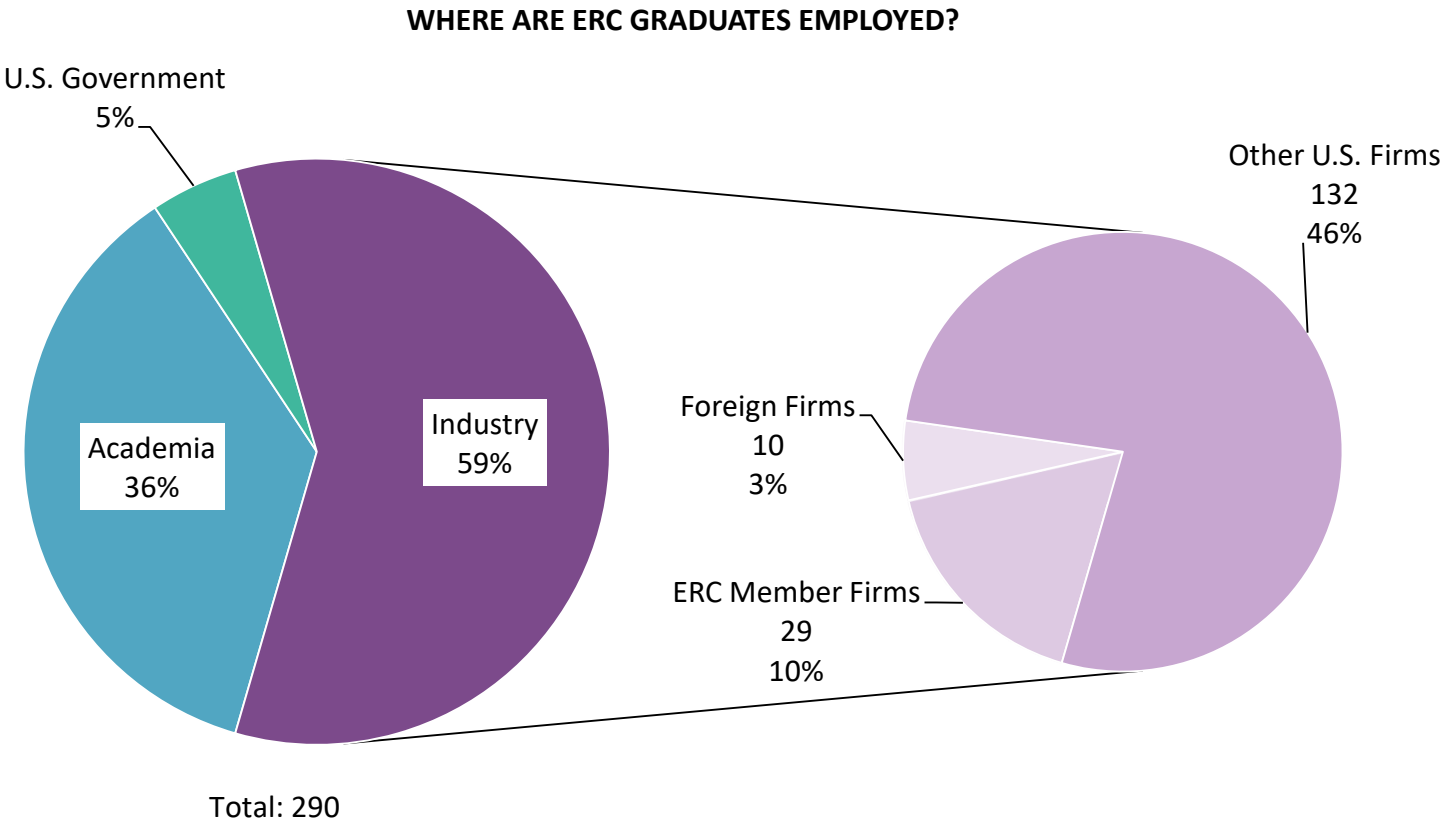
6 Degrees Granted to ERC Students vs. All U.S. Engineering Graduates, FY 2012–2018



** Does not include centers from the Earthquake Technology Sector*

Data Source: American Society for Engineering Education (ASEE) (http://edms.asee.org)

ERC Graduate Employment (19 Centers), FY 2018



8 ERC Research and Education Personnel, by Underrepresented Group and Citizenship Status, FY 2018

Personnel Category	Total	Total U.S. Citizens and Permanent Residents	Women*		Underrepresented Racial Minorities*		Hispanic*		Foreign	
			Number	%	Number	%	Number	%	Number	%
Faculty										
Total	776	636	166	26%	44	7%	55	9%	85	11%
Graduate Students										
Postdocs	233	79	33	42%	6	8%	5	6%	131	56%
Graduate Students	1,577	666	229	34%	59	9%	84	13%	737	47%
Doctoral	1,244	505	178	35%	38	8%	56	11%	613	49%
Master's	336	163	51	31%	21	13%	28	17%	125	37%
Total**	1,809	744	261	35%	65	9%	89	12%	868	48%
Undergraduate Students										
ERC Undergraduate Students (Research Assistants, Non-REU Students)	951	651	299	46%	96	15%	116	18%	67	7%
NSF REU Site Award Students	78	78	40	51%	30	38%	16	21%	0	0%
ERC's Own REU Students	168	158	77	49%	44	28%	43	27%	1	1%
Total**	1,128	820	383	47%	150	18%	159	19%	68	6%
Community College										
Participants in RET Program	4	4	0	0%	1	25%	0	0%	0	0%
K–12 Teachers										
K–12 RET	153	143	75	52%	21	15%	12	8%	0	0%
K–12 Non-RET	92	64	37	58%	13	20%	8	13%	0	0%
Total	245	207	112	54%	34	16%	20	10%	0	0%
Young Scholars										
Total	214	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grand Total***	***4,210***	***2,445***	***950***	***39%***	***300***	***12%***	***331***	***14%***	***1,021***	***26%***

** U.S. citizens and permanent residents only*

*** The sum of the number of personnel for each row may exceed the total because personnel may belong to multiple categories.*

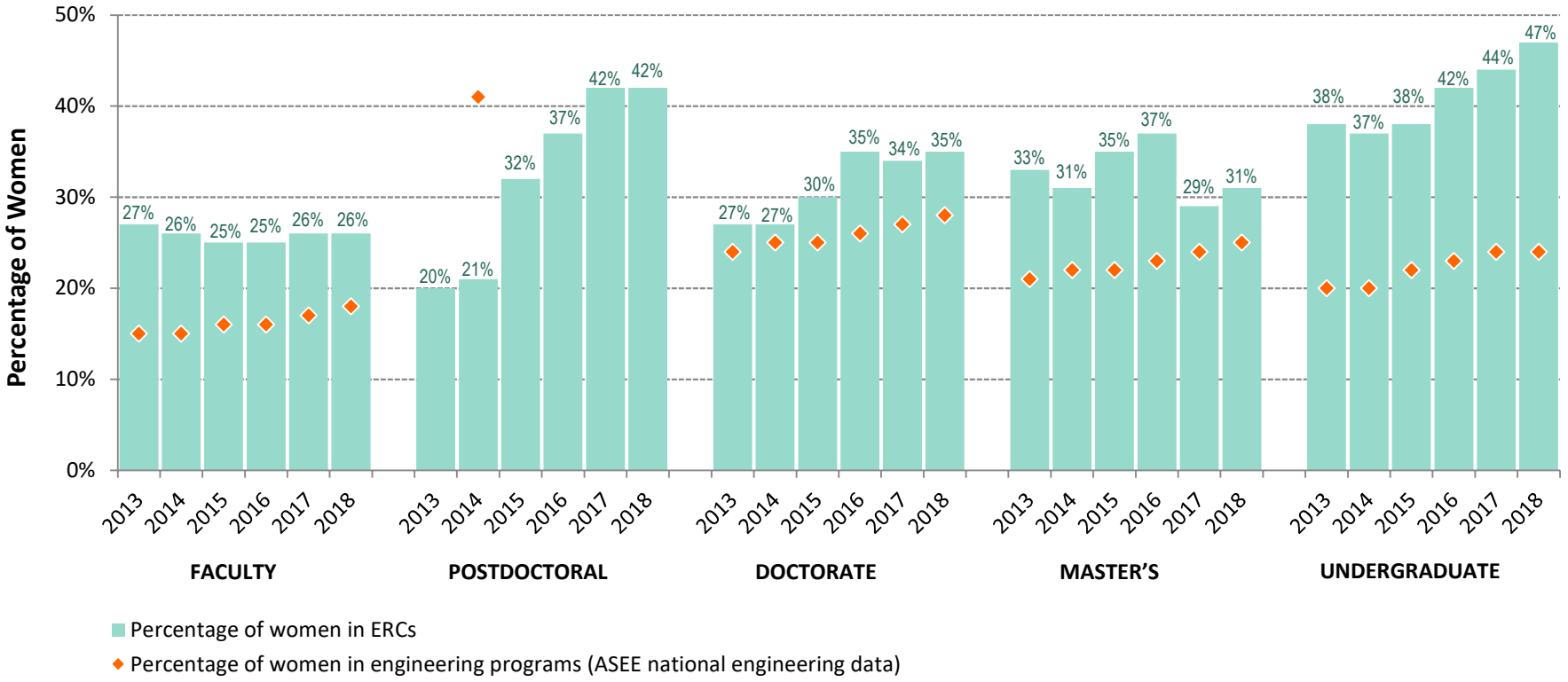
**** Leadership/Administration Directors, Thrust Leaders, and Education Program Leaders are included in the Grand Total. For the Grand Total row, all columns exclude Young Scholars, except the Total column.*

NOTE: *For years in which the center entered demographic data by institution rather than per person, data are not included.*

Participants Impacted by ERC Engineering Education Activities, FY 2018

Outreach Participants	Total
Community College Events	
Faculty Who Attended ERC-Sponsored Educational Outreach Events	73
Students Who Attended ERC-Sponsored Educational Outreach Events	1,287
Total	1,360
K–12 Events	
Pre-college K–12 Teachers	3,933
K–12 Students	58,947
Total	62,880
Grand Total	***64,240***

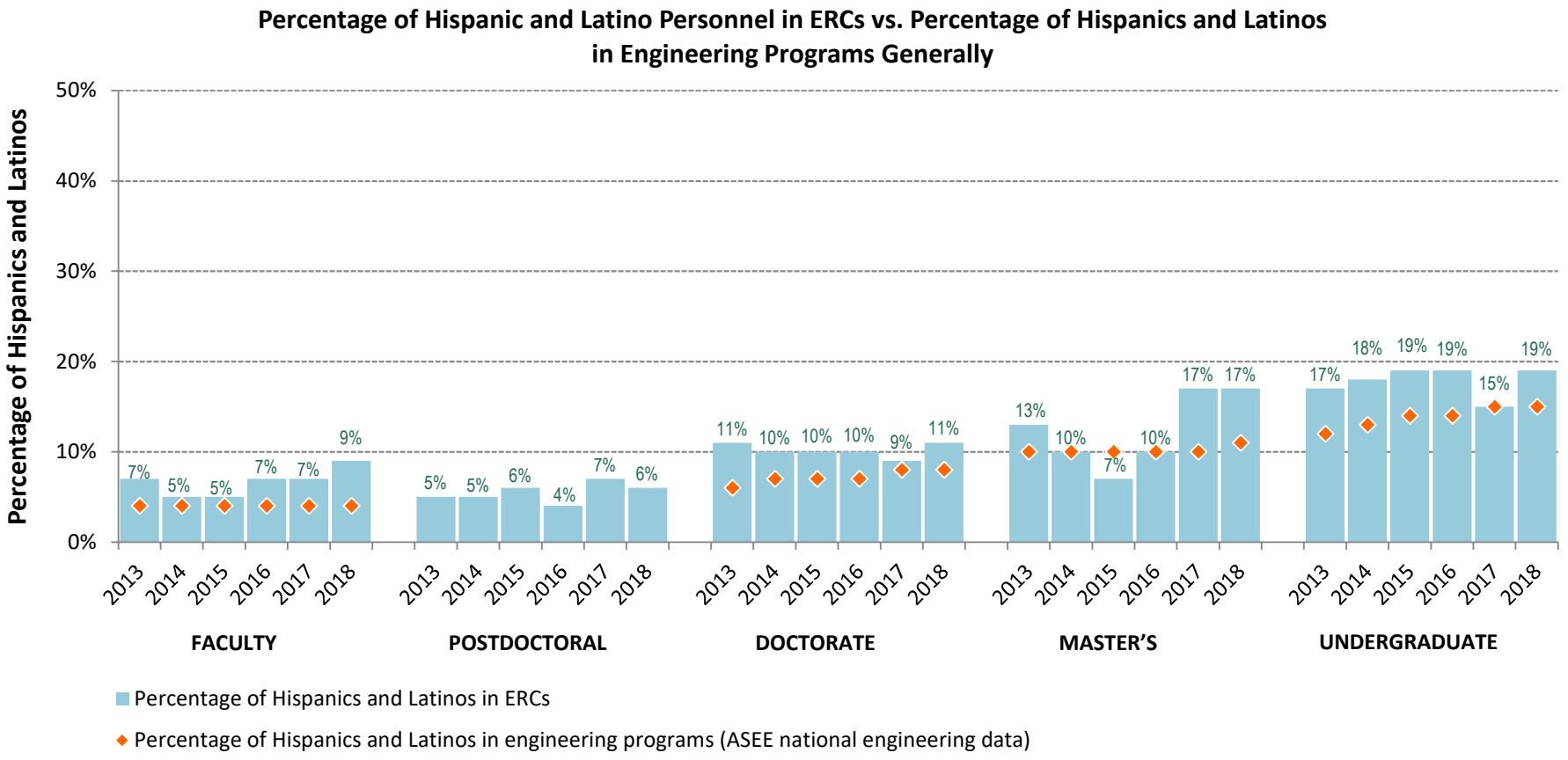
Percentage of Women Personnel in ERCs vs. Percentage of Women in Engineering Programs Generally



NOTES:

- *Data from centers are not included for years in which the center entered demographic data by institution rather than per person.*
- *Both ERC data and national statistics are for U.S. citizens and permanent residents only.*
- *Undergraduates include REU students.*
- *The percentages of women are calculated out of the total number of U.S. citizens and permanent residents, including personnel who did not report gender.*
- *ASEE data were not collected for postdoctoral for 2013 or 2015–2018.*
- *The percentages of personnel who did not report gender are as follows: 2013: 7.66%, 2014: 7.34%, 2015: 8.12%, 2016: 9.74%, 2017: 11.98%, 2018: 10.61%.*

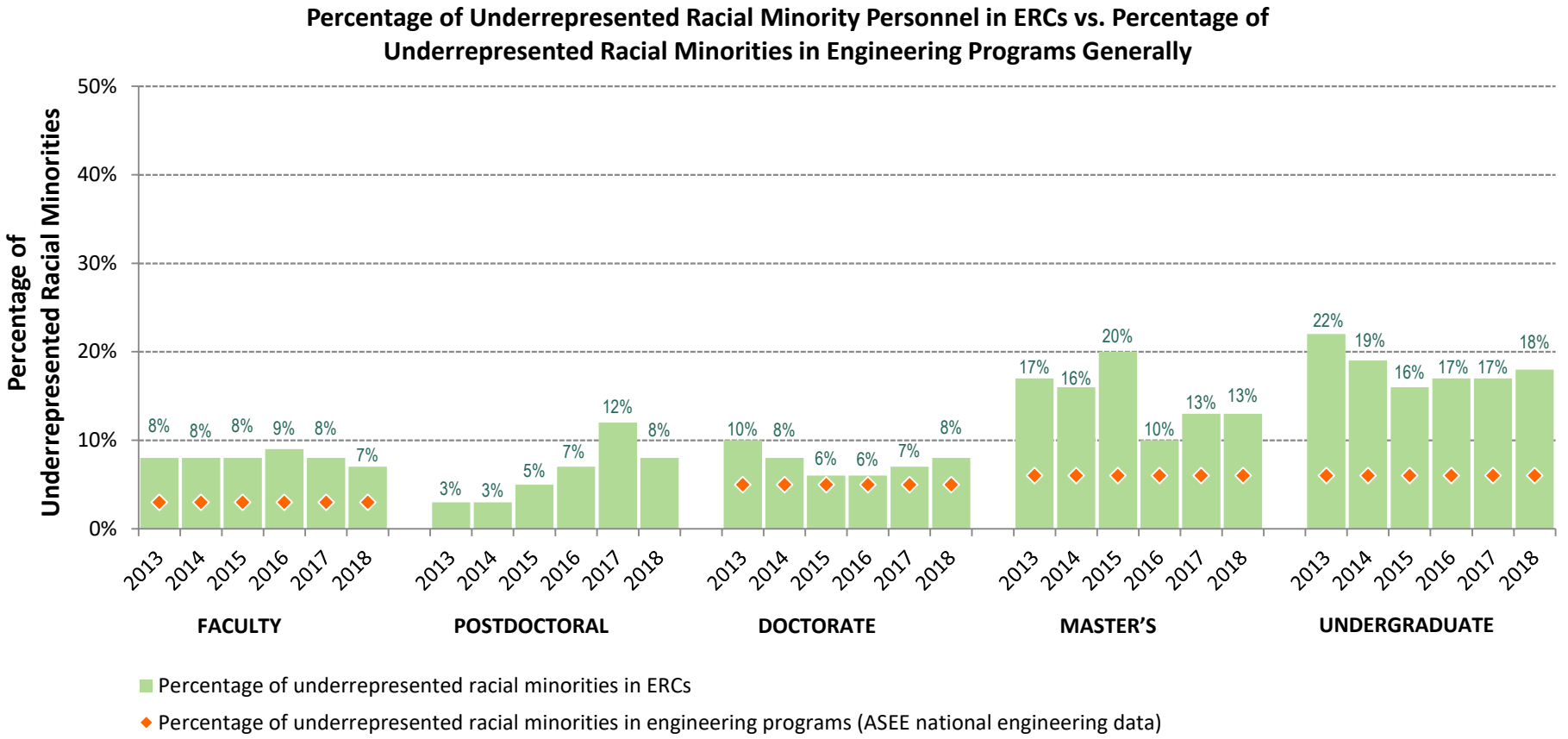
Hispanics and Latinos in ERCs, FY 2013–2018



NOTES:

- *Data from centers are not included for years in which the center entered demographic data by institution rather than per person.*
- *Both ERC data and national statistics are for U.S. citizens and permanent residents only.*
- *Undergraduates include REU students.*
- *The percentages of Hispanics and Latinos are calculated out of the total number of U.S. citizens and permanent residents, including personnel who did not report ethnicity.*
- *ASEE data were not collected for postdoctoral for 2013–2018.*
- *The percentages of personnel who did not report ethnicity are as follows: 2013: 18.22%, 2014: 18.61%, 2015: 17.59%, 2016: 21.07%, 2017: 17.39%, 2018: 15.81%.*

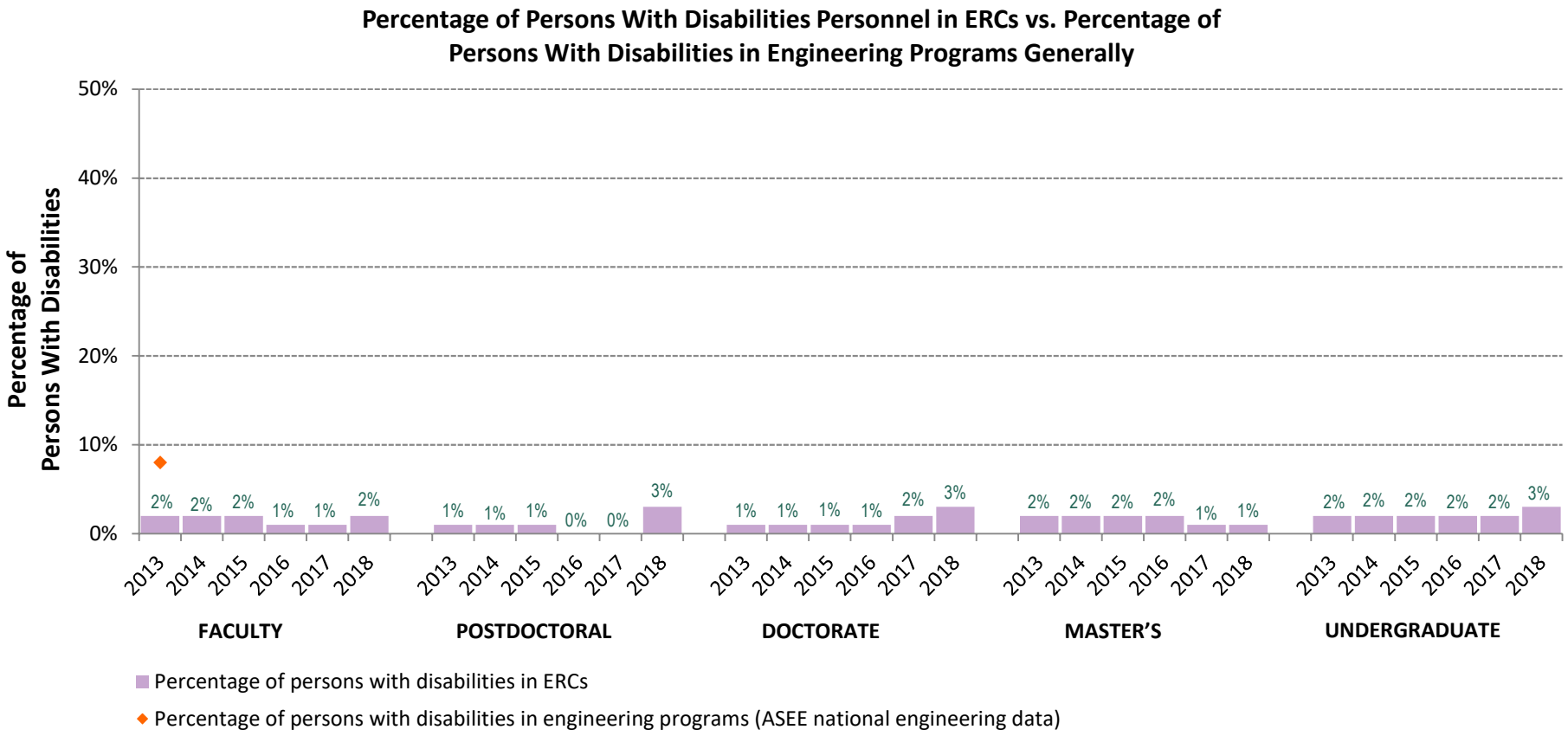
12 Underrepresented Racial Minorities in ERCs, FY 2013–2018



NOTES:

- *Data from centers are not included for years in which the center entered demographic data by institution rather than per person.*
- *Both ERC data and national statistics are for U.S. citizens and permanent residents only.*
- *Undergraduates include REU students.*
- *The percentages of underrepresented racial minorities are calculated out of the total number of U.S. citizens and permanent residents, including personnel who did not report race.*
- *ASEE data were not collected for postdoctoral for 2013–2018.*
- *The percentages of personnel who did not report race are as follows: 2013: 18.89%, 2014: 19.07%, 2015: 19.24%, 2016: 22.30%, 2017: 17.79%, 2018: 16.84%.*

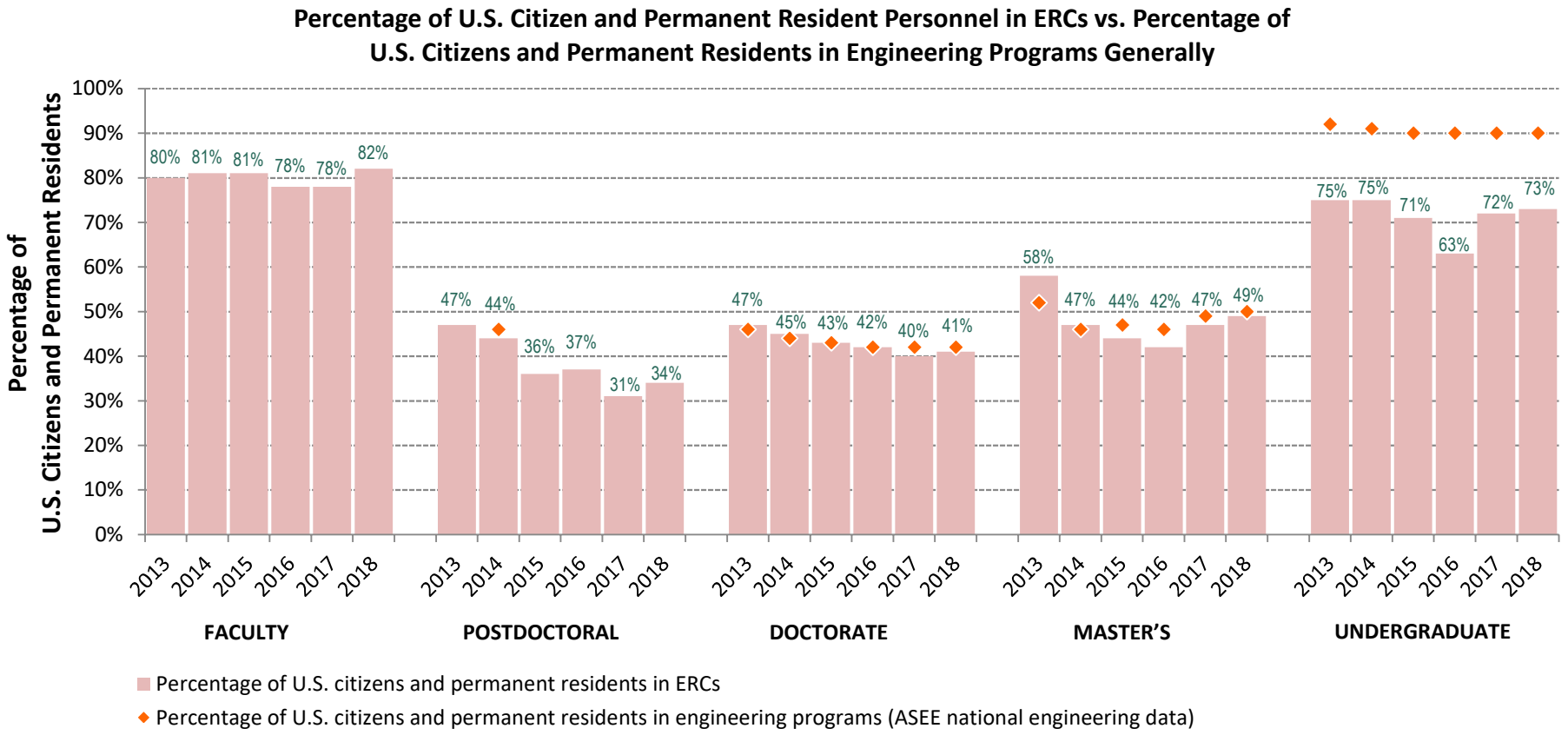
13 Persons With Disabilities in ERCs, FY 2013–2018



NOTES:

- *Data from centers are not included for years in which the center entered demographic data by institution rather than per person.*
- *The percentages of persons with disabilities are calculated out of the total number of U.S. citizens and permanent residents, including personnel who did not report disability status.*
- *Undergraduates include REU students.*
- *The national percentages for persons with disabilities are for all persons, regardless of citizenship. The national percentages for doctoral students with disabilities and master's students with disabilities are from the national percentages for graduate students (master's and doctoral students combined).*
- *ASEE data are available only for faculty for 2013.*
- *The percentages of personnel who did not report disability status are as follows: 2013: 16.15%, 2014: 20.67%, 2015: 21.86%, 2016: 24.00%, 2017: 27.90%, 2018: 20.70%.*

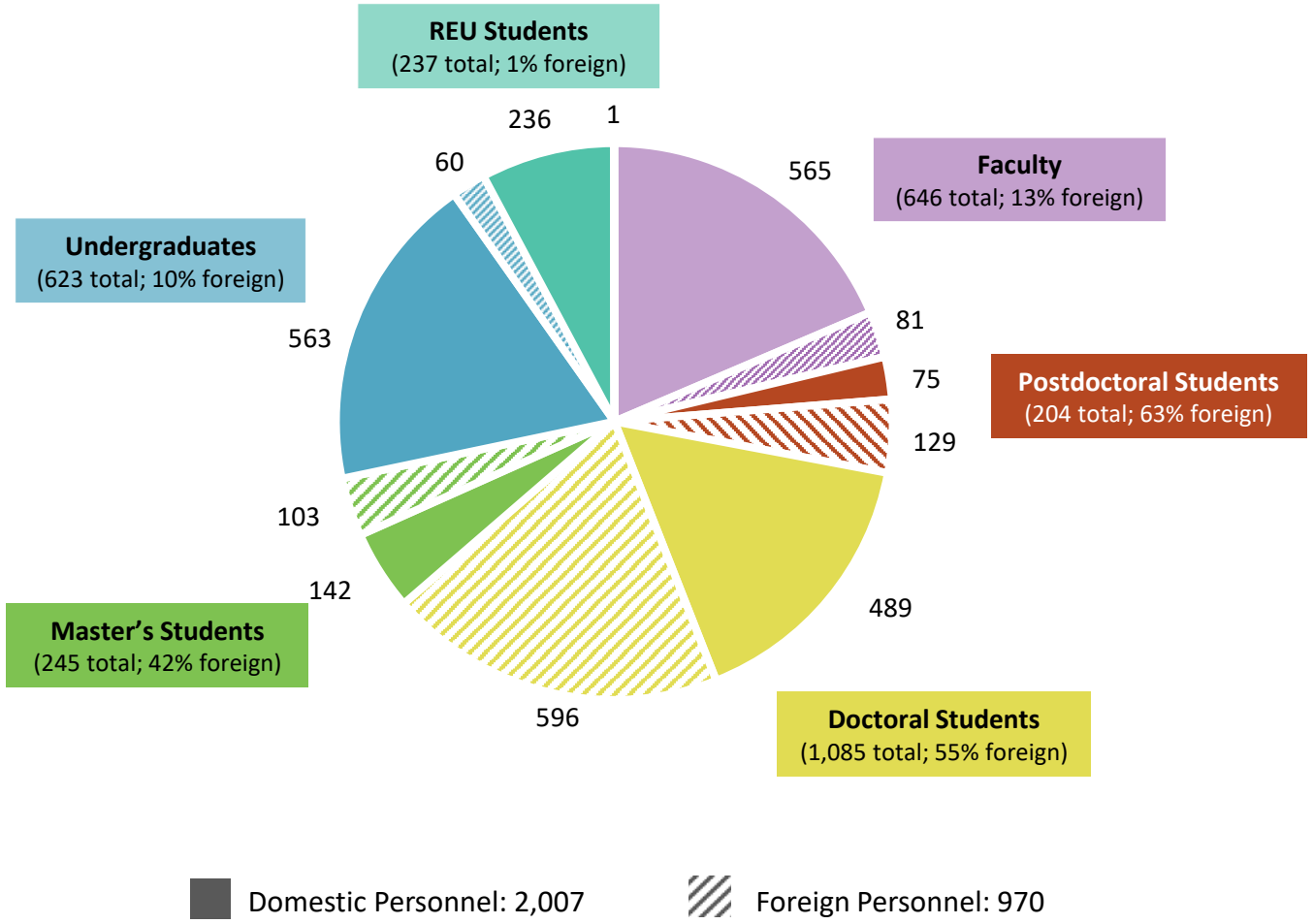
14 U.S. Citizens and Permanent Residents in ERCs, FY 2013–2018



NOTES:

- *Data from centers are not included for years in which the center entered demographic data by institution rather than per person.*
- *Undergraduates include REU students.*
- *The percentages of U.S. citizens and permanent residents are calculated out of the total number of personnel, including personnel who did not report citizenship.*
- *ASEE data are not available faculty for 2013–2018 or for postdoctoral for 2013 or 2015–2018.*
- *The percentages of personnel who did not report citizenship are as follows: 2013: 10.58%, 2014: 11.00%, 2015: 13.49%, 2016: 18.65%, 2017: 14.05%, 2018: 13.09%.*

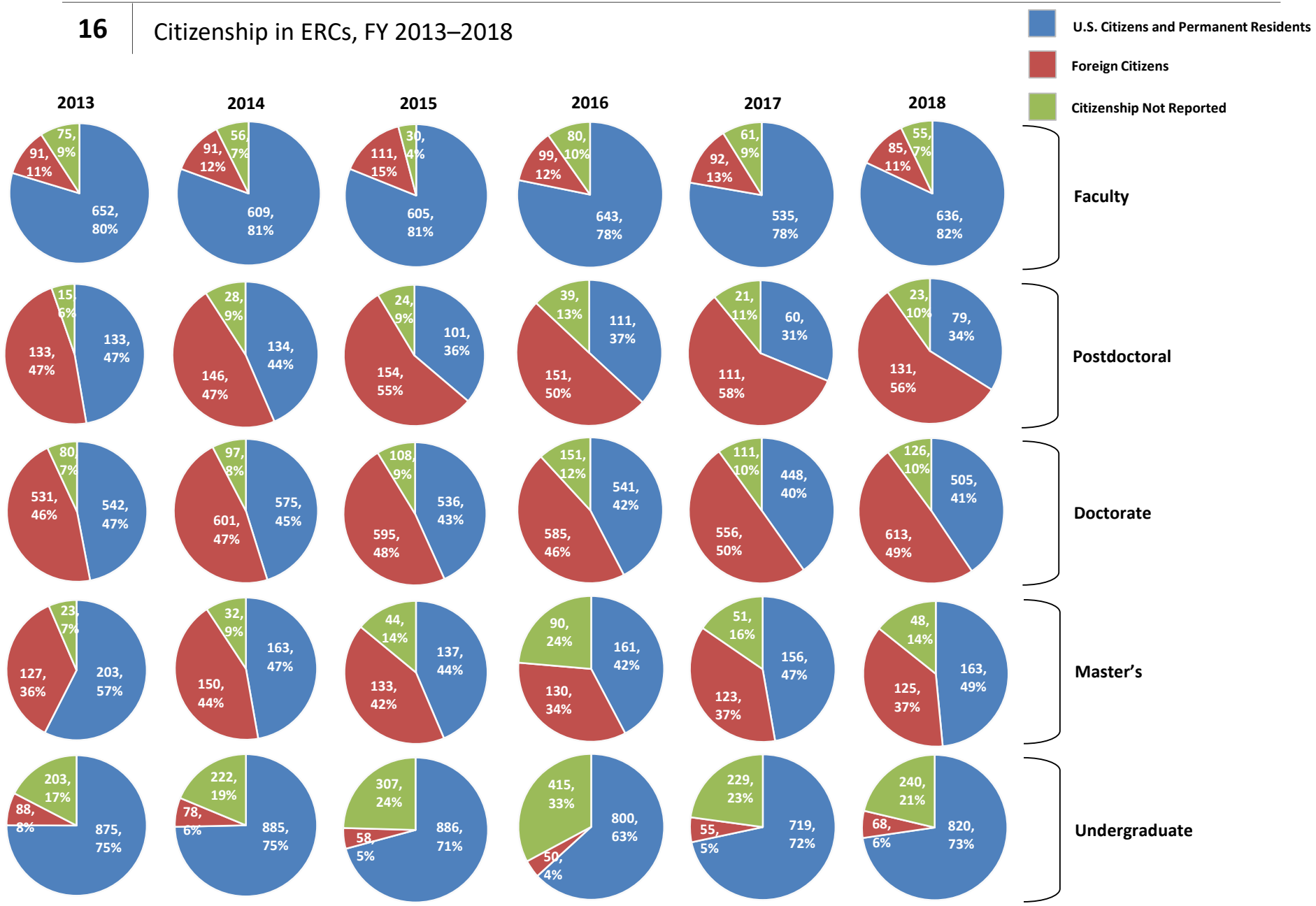
15 Personnel Conducting ERC Research, FY 2018



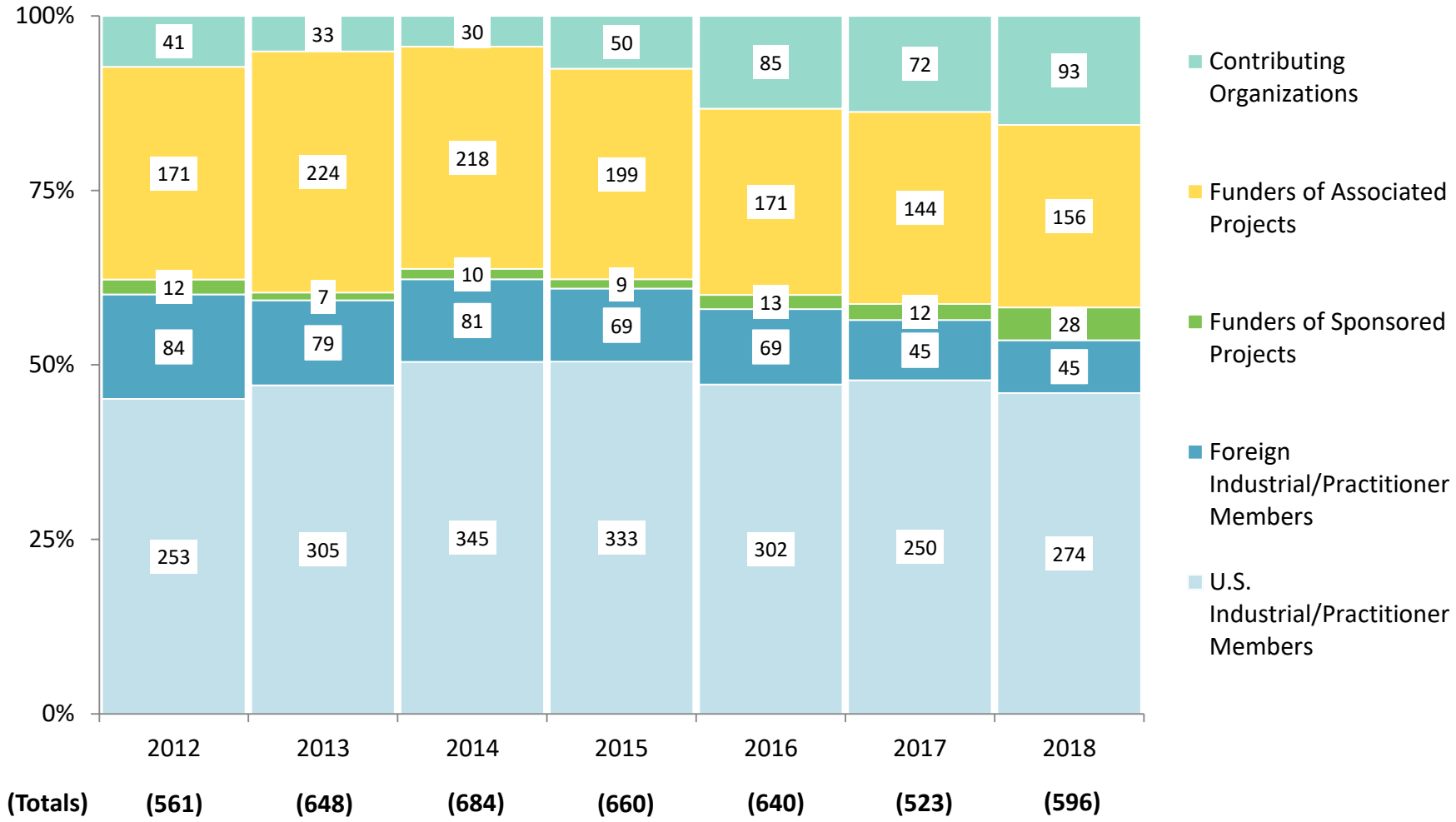
NOTES:

- *The sum of the number of personnel for each category may exceed the total number of personnel because personnel may belong to multiple categories.*
- *Percentage of foreign personnel is calculated out of domestic and foreign personnel, excluding personnel who did not report citizenship.*

Citizenship in ERCs, FY 2013–2018



17 ERC Industrial/Practitioner Members and Supporting Organizations, FY 2012–2018*



** Does not include centers from the Earthquake Technology Sector*

18 ERC Industrial/Practitioner Members and Supporting Organizations, FY 2012–2018*

	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Organization Type							
Contributing Organizations	41	33	30	50	85	72	93
Funders of Associated Projects	171	224	218	199	171	144	156
Funders of Sponsored Projects	12	7	10	9	13	12	28
Foreign Industrial/Practitioner Members	84	79	81	69	69	45	45
U.S. Industrial/Practitioner Members	253	305	345	333	302	250	274
Total Number of Organizations	***561***	***648***	***684***	***660***	***640***	***523***	***596***
Total Number of Centers	***17***	***20***	***20***	***17***	***19***	***16***	***19***
Average Number of Organizations per Center	***33***	***32***	***34***	***39***	***34***	***33***	***31***

** Does not include centers from the Earthquake Technology Sector*

Industrial/Practitioner Member Support by Year, FY 2012–2018*

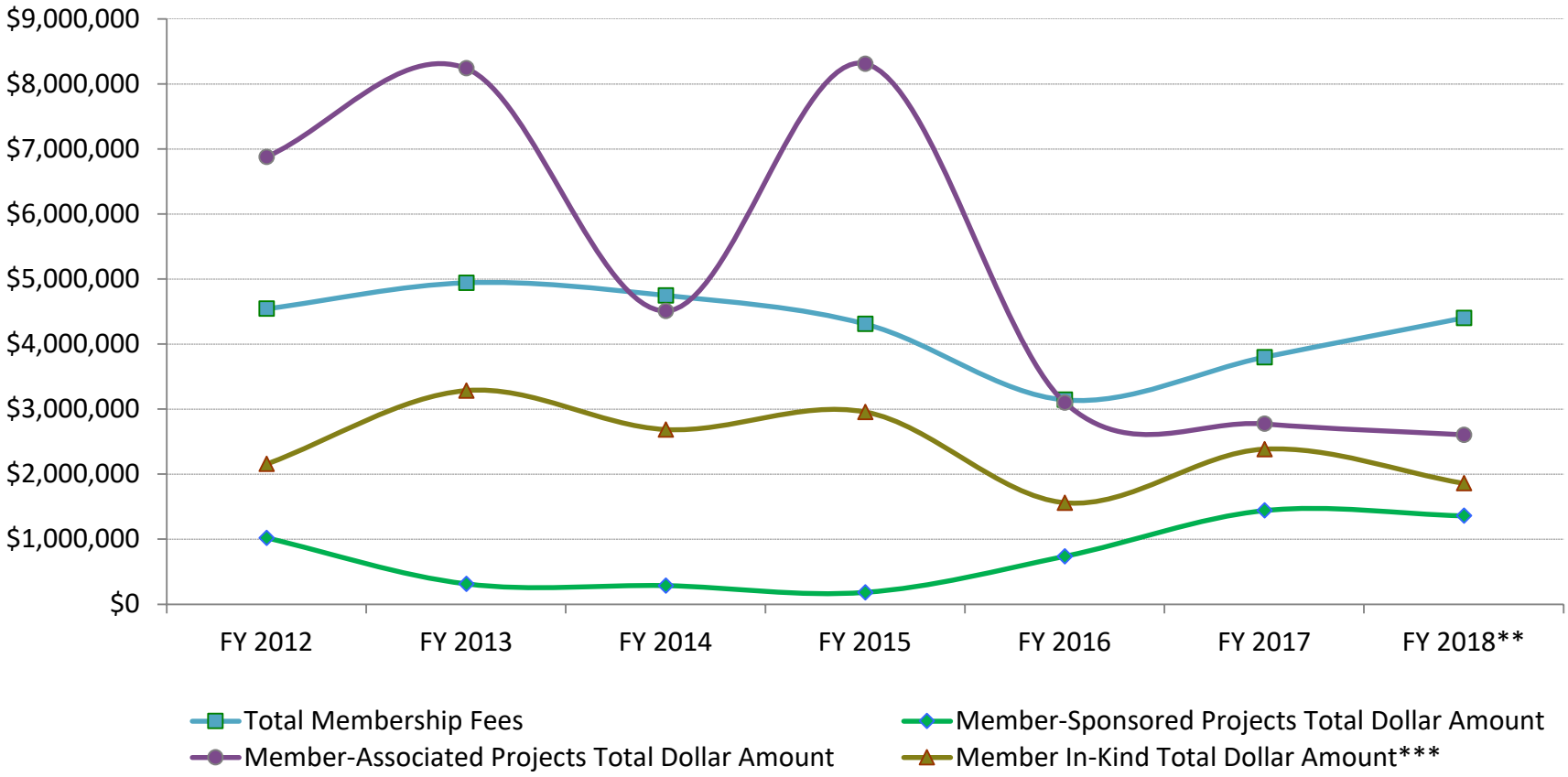
	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018**
Type of Support							
Total Membership Fees	$4,542,049	$4,942,433	$4,747,675	$4,309,666	$3,142,772	$3,796,620	$4,400,305
Member-Sponsored Projects Total Dollar Amount	$1,018,645	$311,757	$285,000	$182,000	$735,122	$1,440,493	$1,359,913
Member-Associated Projects Total Dollar Amount	$6,877,611	$8,239,885	$4,508,750	$8,308,585	$3,099,725	$2,772,841	$2,605,165
Member In-Kind Total Dollar Amount***	$2,155,791	$3,284,191	$2,685,819	$2,954,553	$1,560,677	$2,384,789	$1,858,394
Total Dollar Amount, Industrial/Practitioner Member Support to Centers	***$14,594,096***	***$16,778,266***	***$12,227,244***	***$15,754,804***	***$8,538,296***	***$10,394,743***	***$10,223,777***

** Does not include centers from the Earthquake Technology Sector*

*** Support received by the end of the current reporting year. Includes data for centers that have entered partial data during a no-cost extension (NCE).*

**** Data for this row are from the In-Kind Support reported in the Organizations section.*

20 Industrial/Practitioner Member Support by Year, FY 2012–2018*

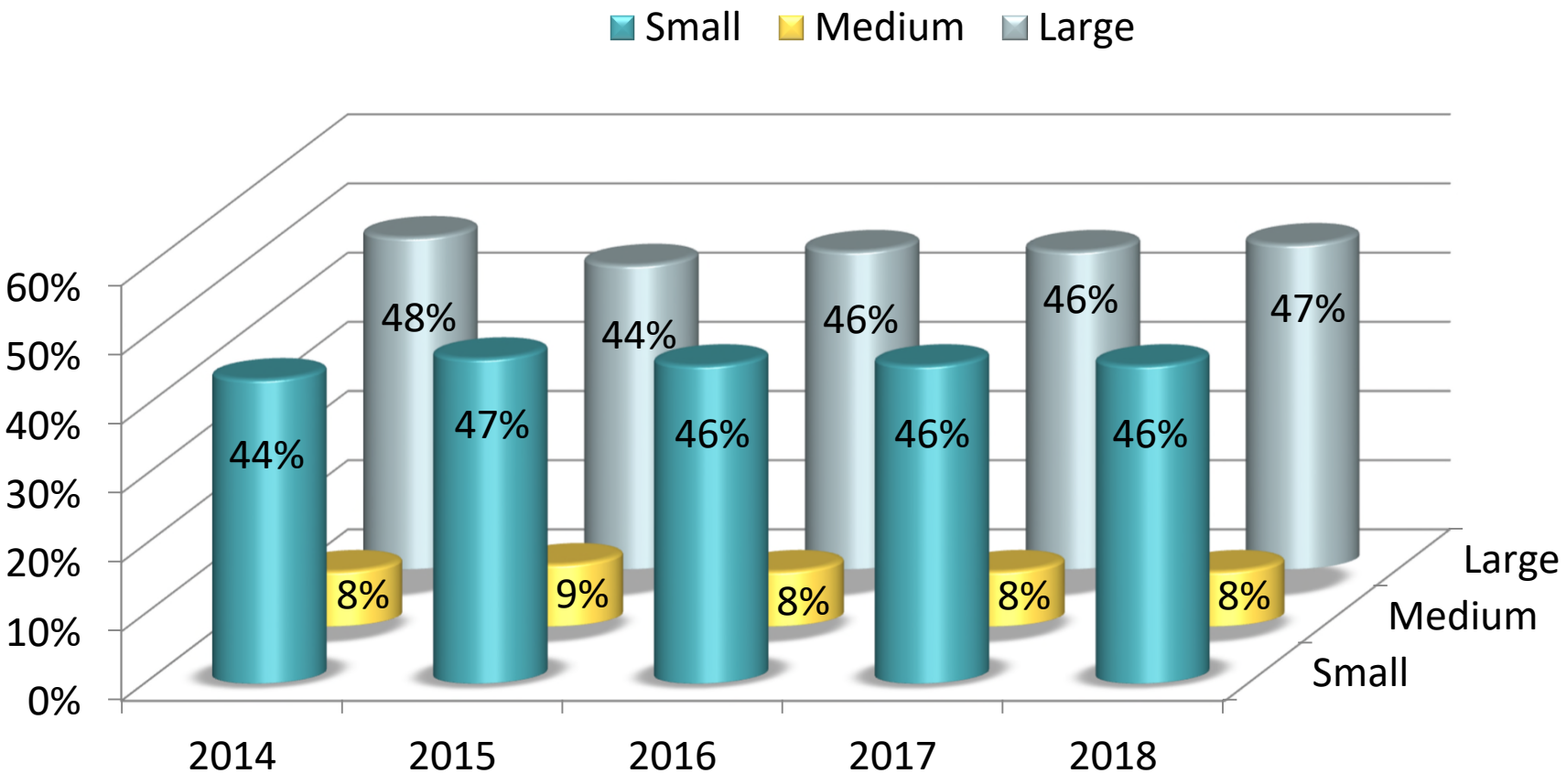


** Does not include centers from the Earthquake Technology Sector*

*** Support received by the end of the current reporting year. Includes data for centers that have entered partial data during a no-cost extension (NCE).*

**** Data for this line are from the In-Kind Support reported in the Organizations section.*

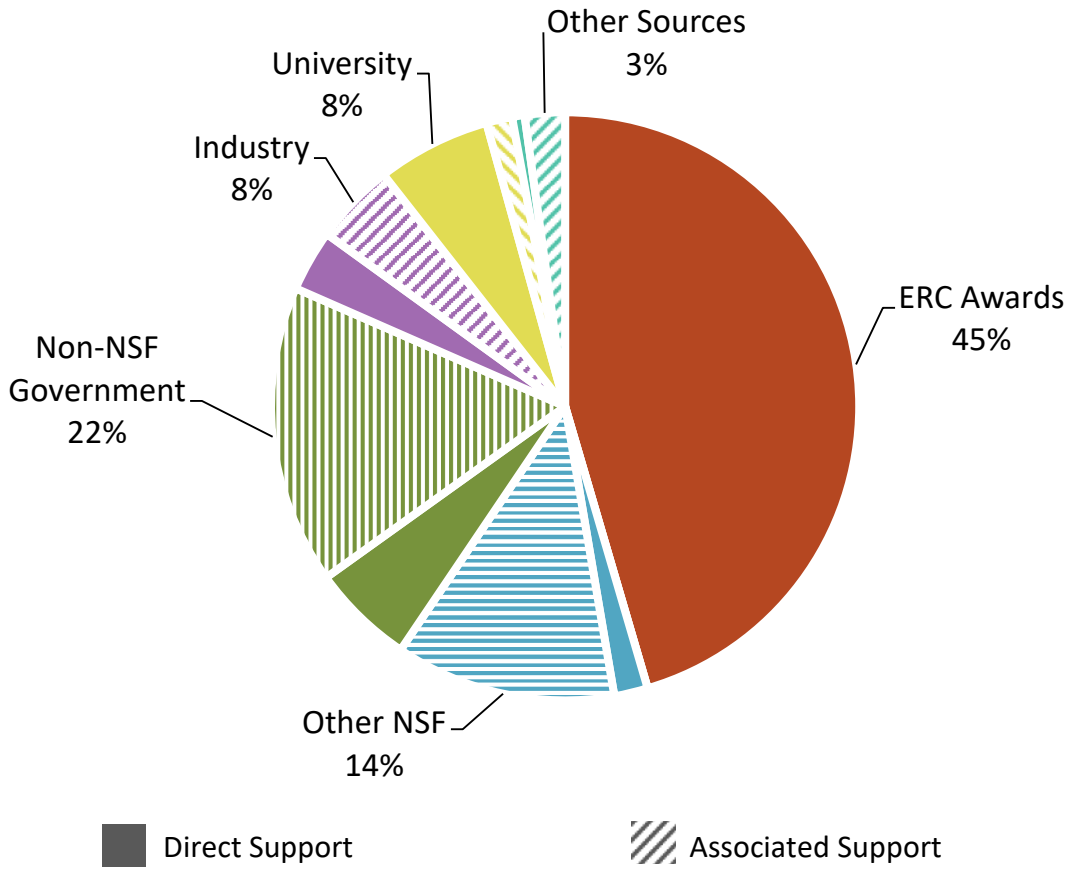
Distribution of Industrial/Practitioner Members by Industry Size, FY 2014–2018



NOTES:

- *The total number of firms is as follows: 2014: 364, 2015: 342, 2016: 323, 2017: 250, 2018: 276.*
- *Industry sizes are as follows: Small = <500 employees, Medium = 500–1,000 employees, Large = >1,000 employees.*

Total ERC New Cash Support, FY 2018 (19 ERCs)

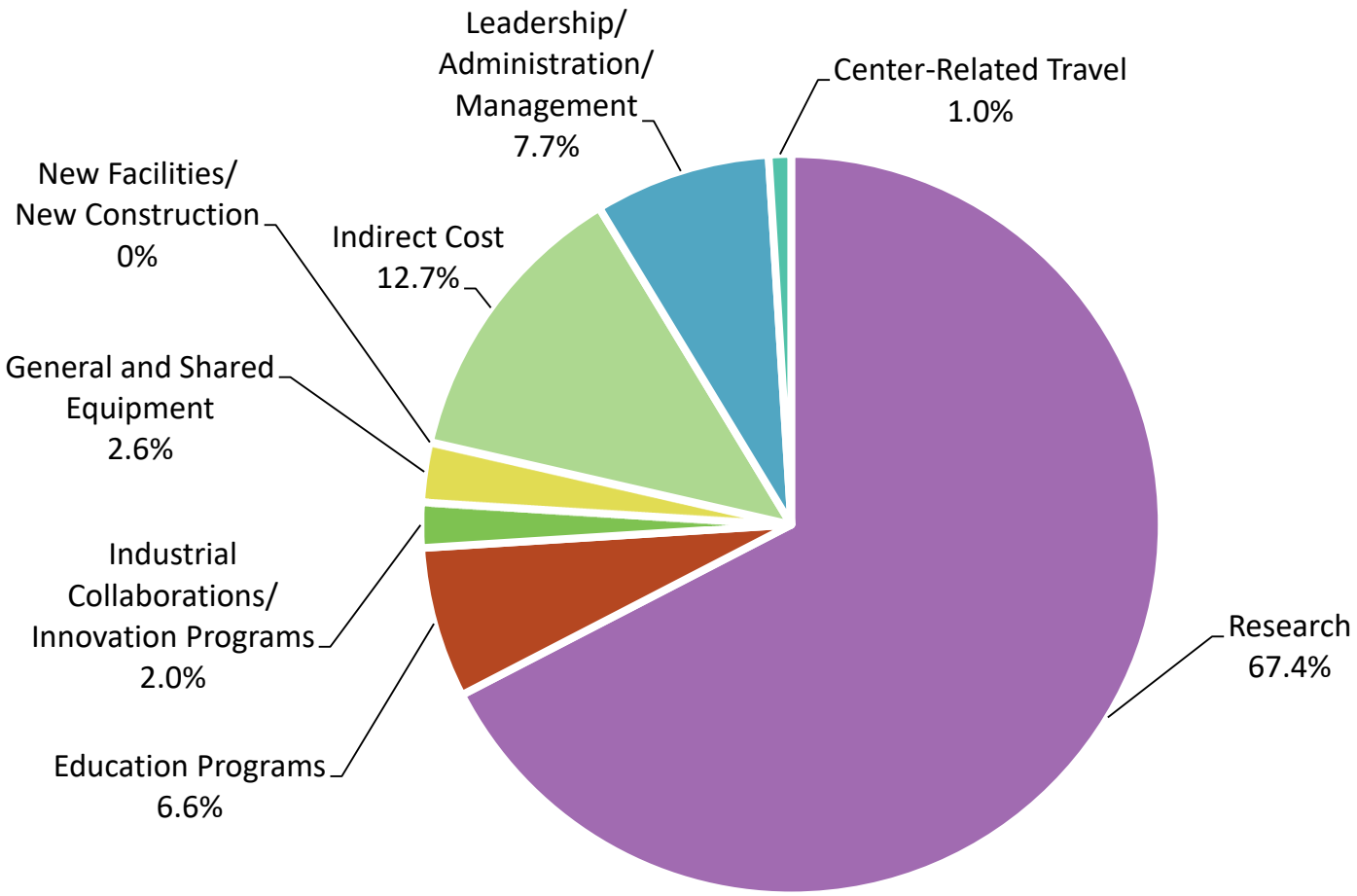


Total value of support: $168 million

NOTES:

- *Percentages shown are Direct Support and Associated Support combined.*
- *Non-NSF Government includes U.S. Government (not NSF), State government, local government, foreign government, and quasi-government research organizations.*
- *Other Sources includes medical facilities, nonprofit organizations, private foundations, venture capitalists, and other sources.*

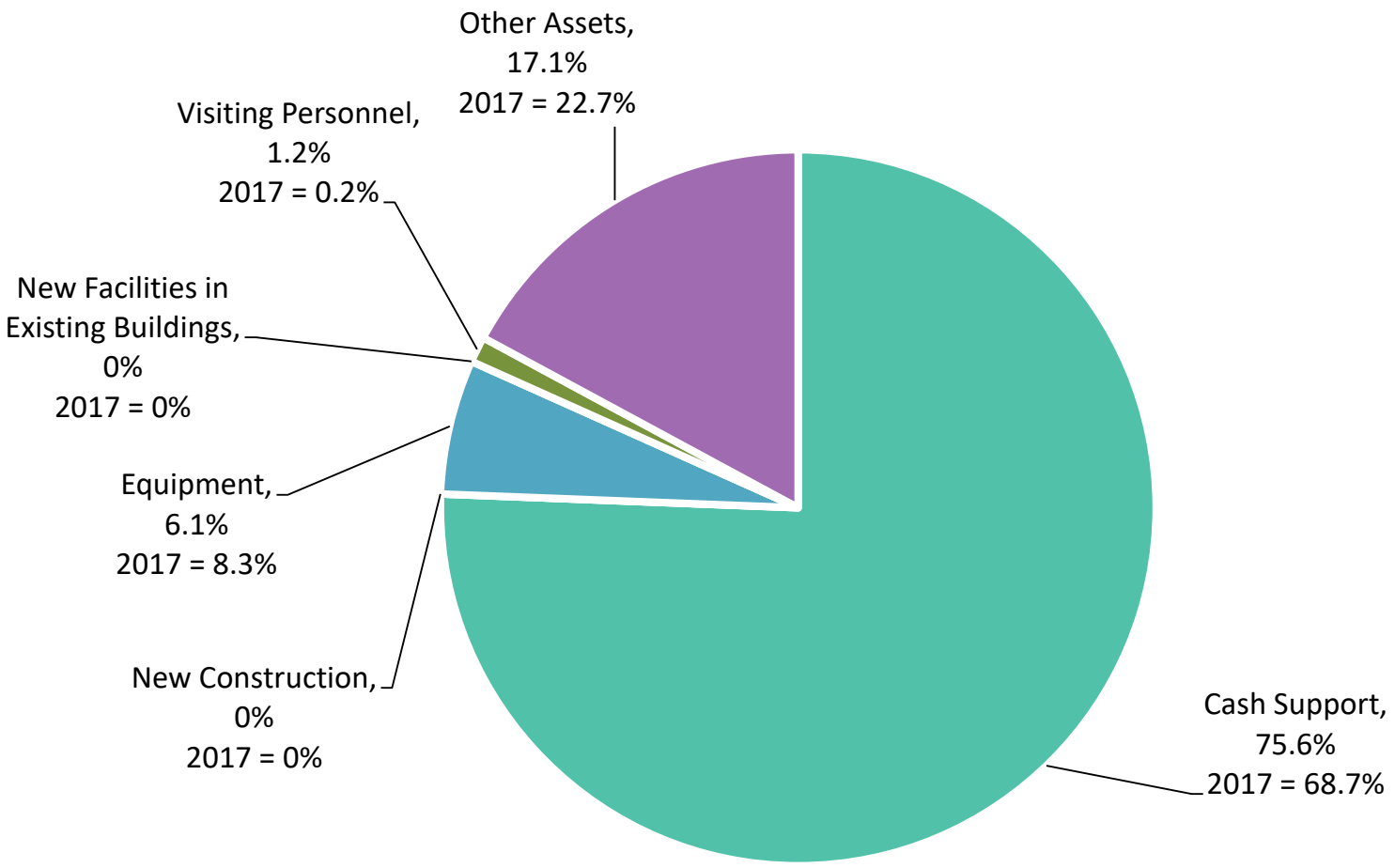
Functional Budgets of ERCs in the Aggregate, FY 2018*



Direct Support total: $165,557,702

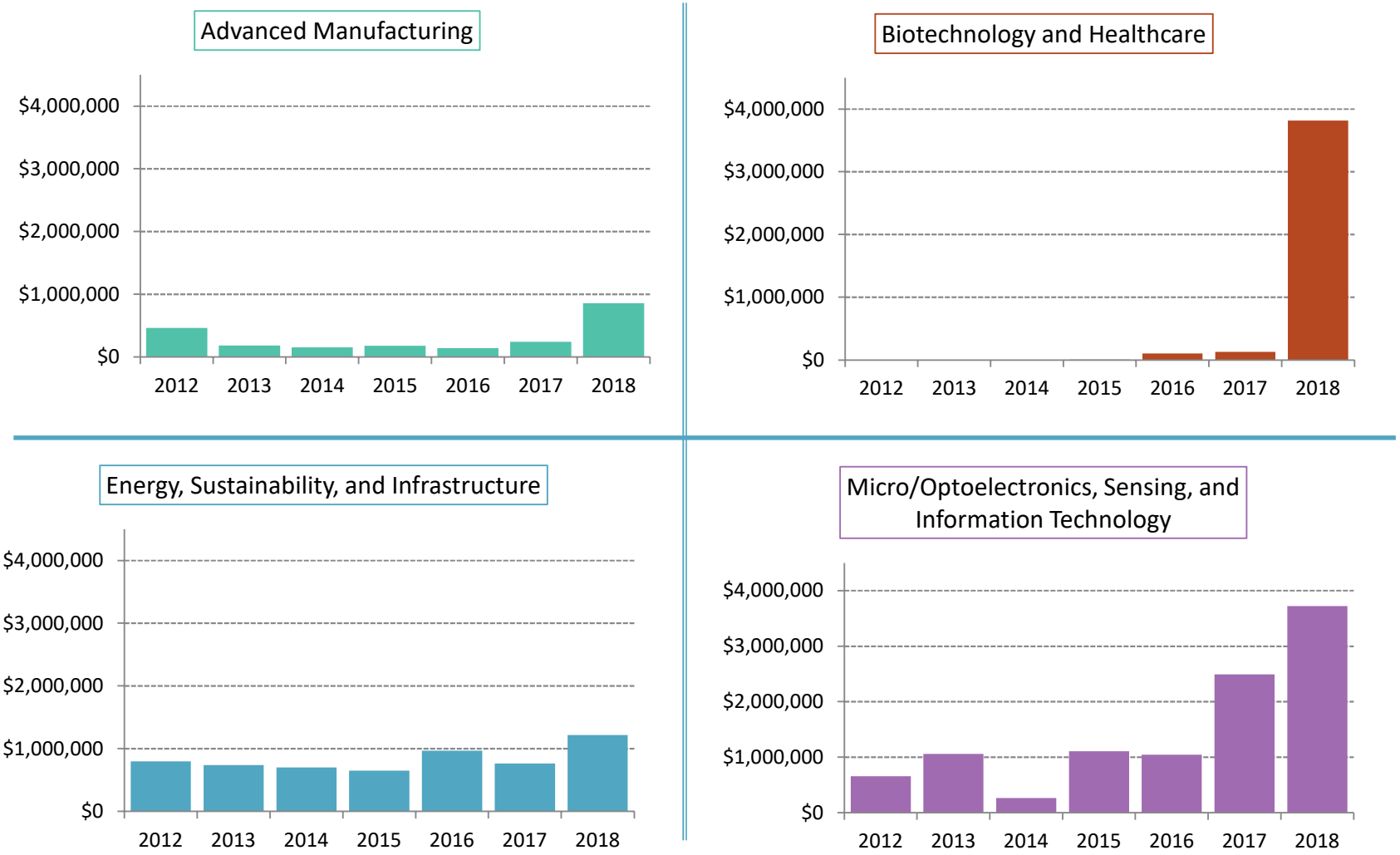
** Includes in-kind support but not residuals*

Industrial/Practitioner New Support to 19 ERCs, FY 2018



Total value of support: $7.6 million

Non-NSF Government Support by ERC Technology Sector, FY 2012–2018*,**,***

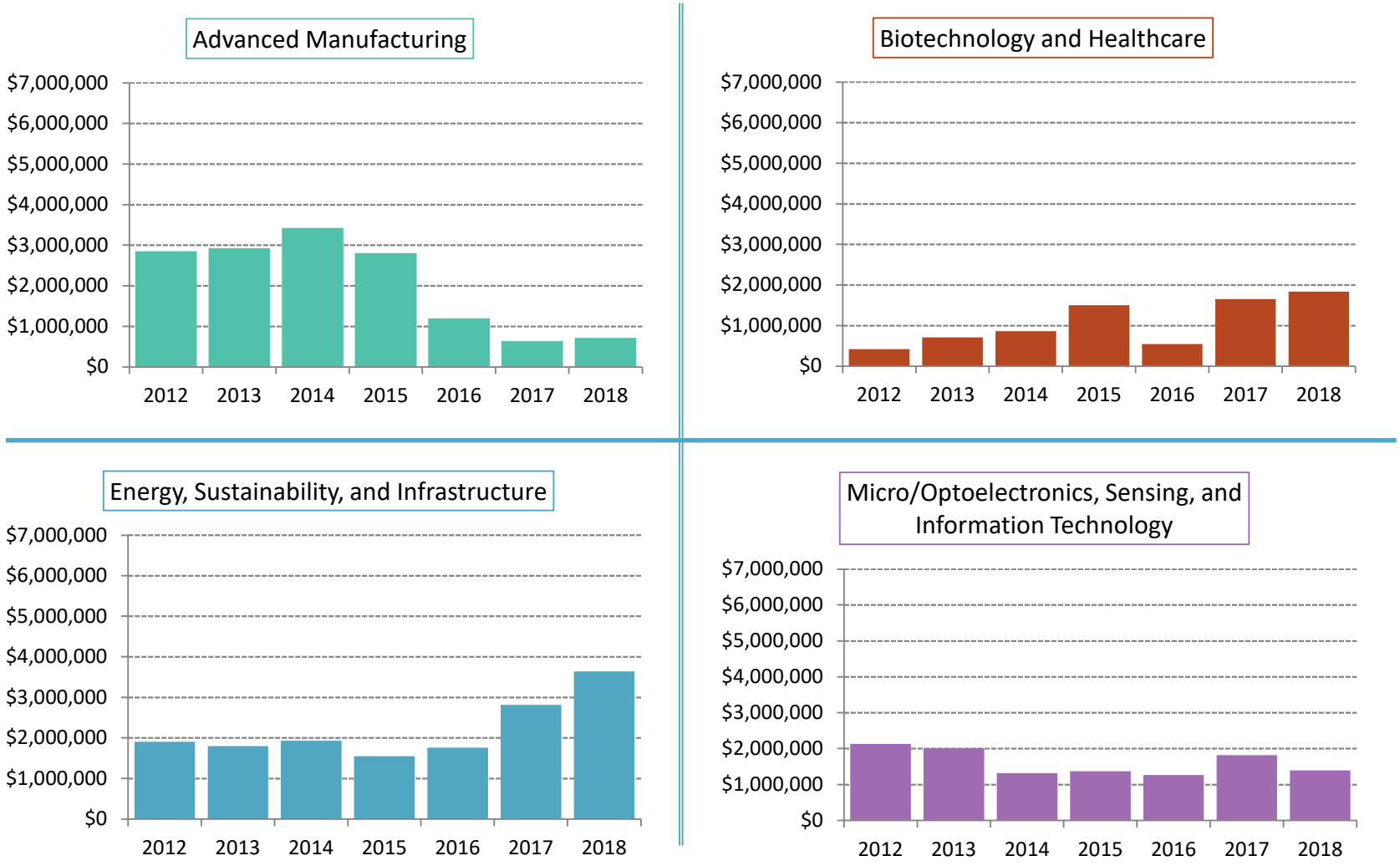


** Does not include centers from the Earthquake Technology Sector*

*** Support includes Unrestricted Cash, Restricted Cash, and In-Kind Support.*

**** Includes data for centers that have entered partial data during a no-cost extension (NCE)*

Industry Support by ERC Technology Sector, FY 2012–2018 *,**,***

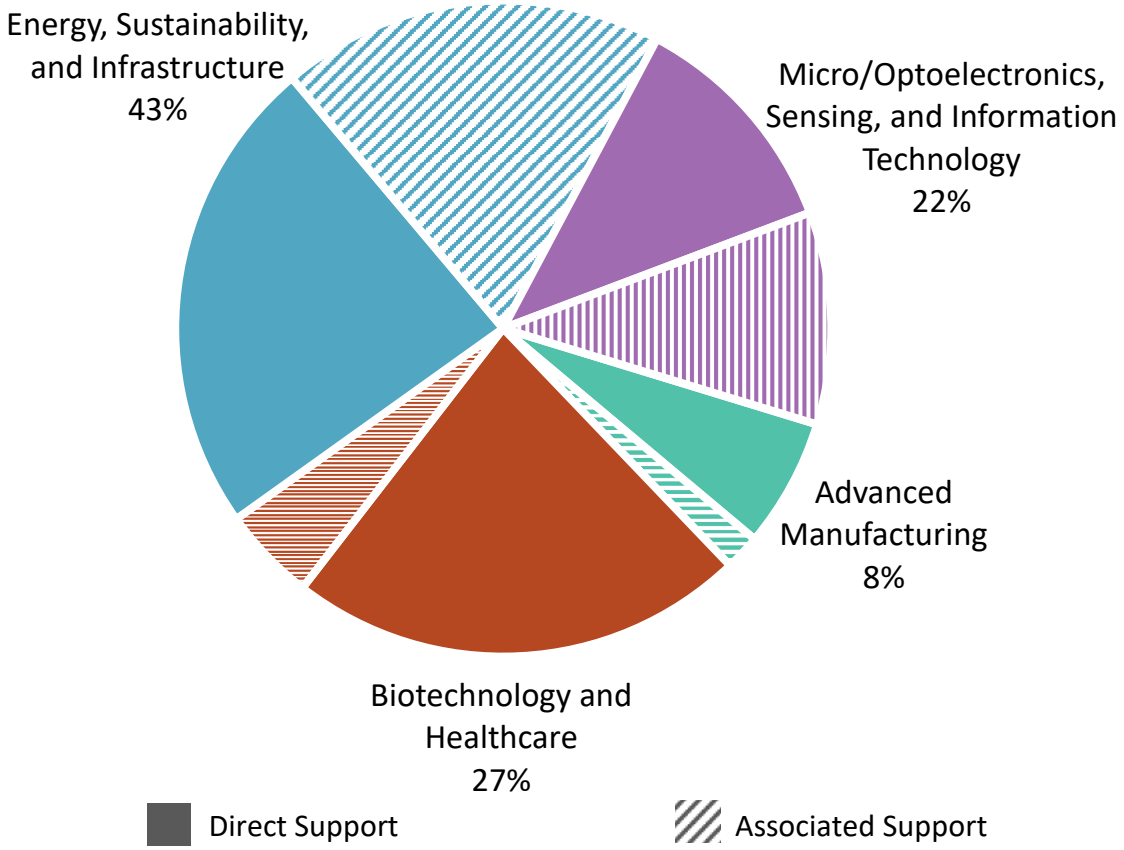


** Does not include centers from the Earthquake Technology Sector*

*** Support includes Unrestricted Cash, Restricted Cash, and In-Kind Support.*

**** Includes data for centers that have entered partial data during a no-cost extension (NCE)*

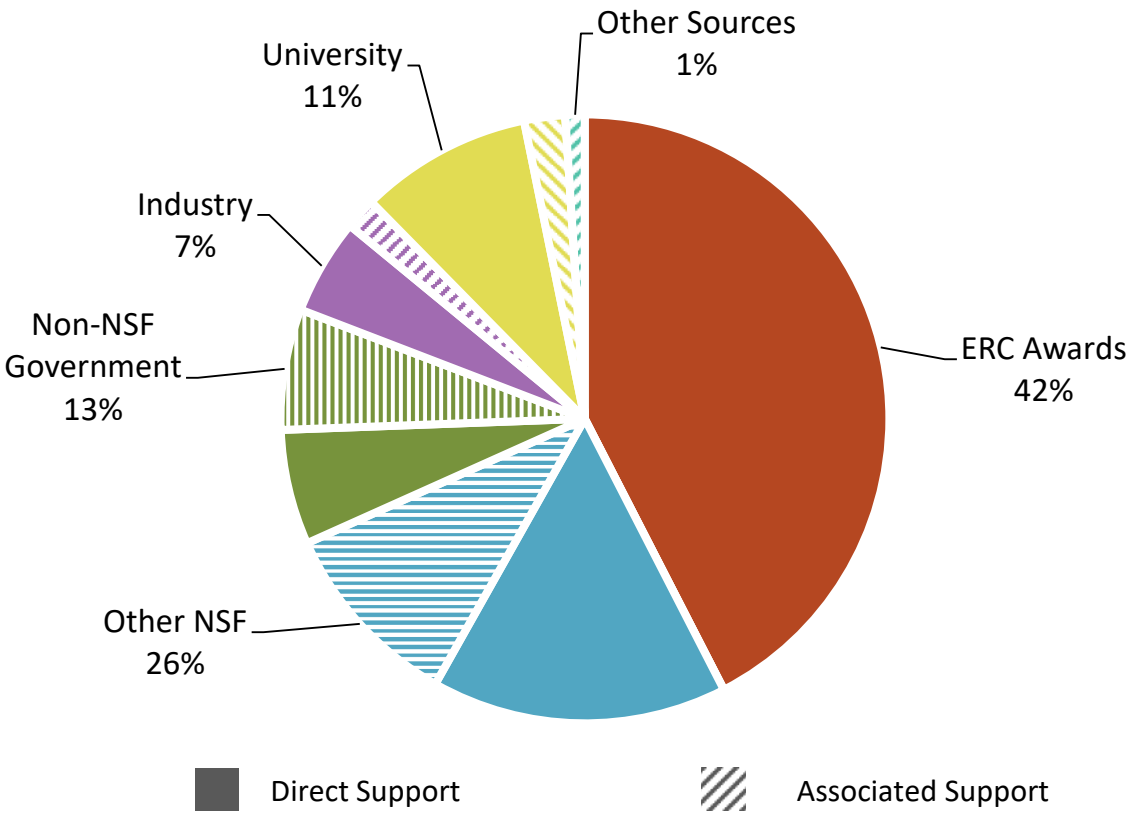
FY 2018 Sources of Support to 19 ERCs, by Technology Sector



Total value of support: $172.3 million

NOTE: *Sources of Support include Unrestricted Cash, Restricted Cash, In-Kind, and Associated Projects. Residuals are not included.*

FY 2018 Support to ERCs in Advanced Manufacturing Sector: 2 Centers (IOWA, NASCENT)

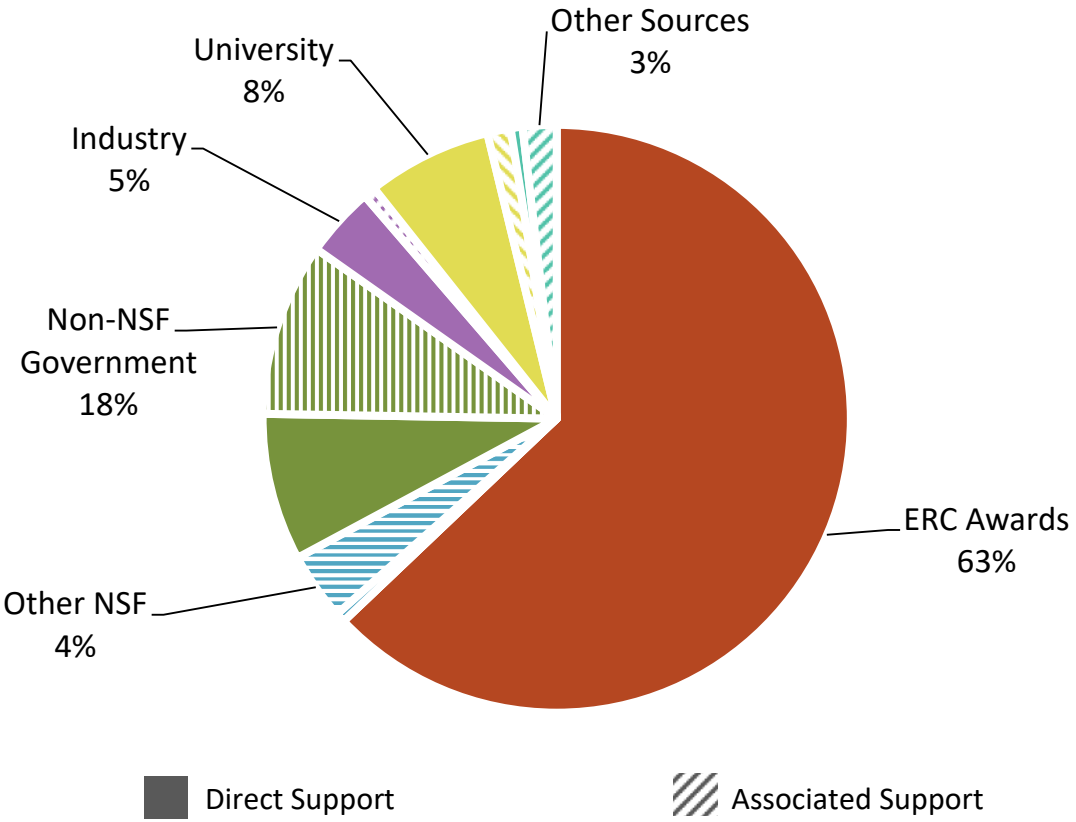


Total value of support: $14.0 million

NOTES:

- *Sources of Support include Unrestricted Cash, Restricted Cash, In-Kind, and Associated Projects. Residuals are not included.*
- *Non-NSF Government includes U.S. Government (not NSF), State government, local government, foreign government, and quasi-government research organizations.*
- *Other Sources includes medical facilities, nonprofit organizations, private foundations, venture capitalists, and other sources.*

FY 2018 Support to ERCs in Biotechnology and Healthcare Sector: 6 Centers (ASSIST, CELL-MET, CMaT, NCAT, PATHS-UP, CNT)

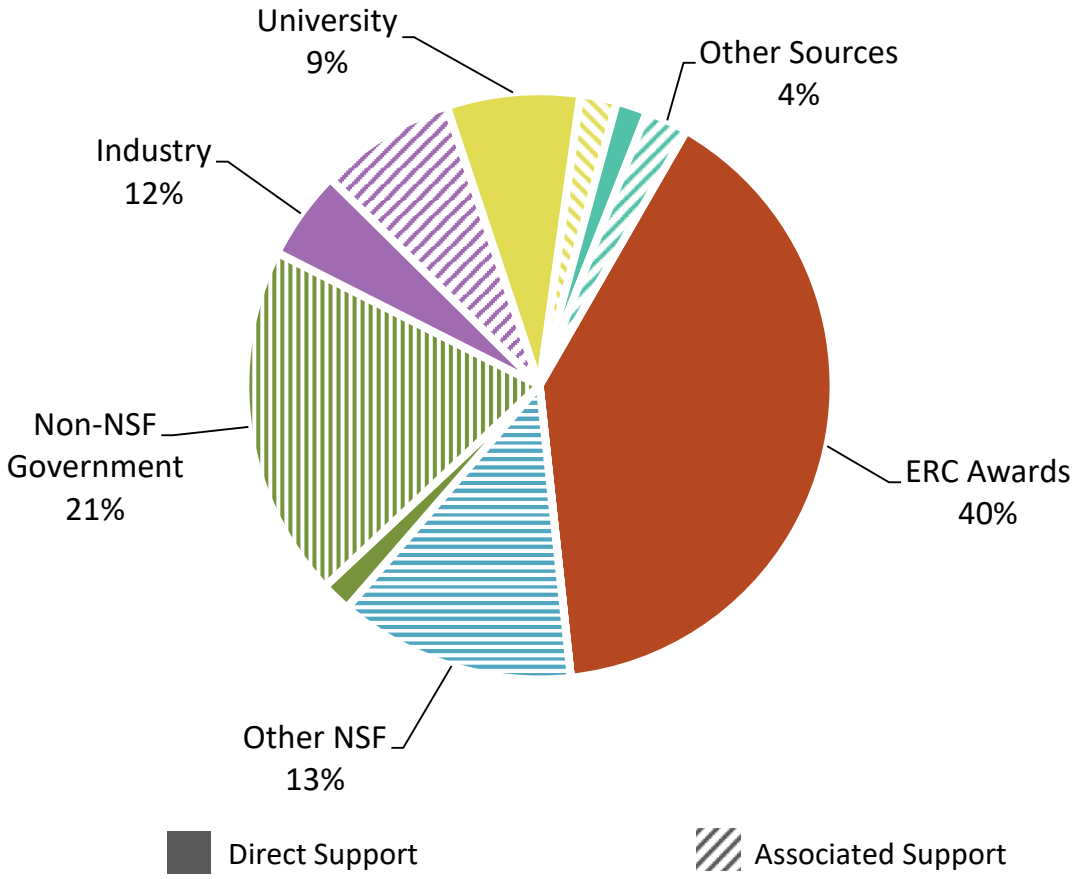


Total value of support: $47.0 million

NOTES:

- *Sources of Support include Unrestricted Cash, Restricted Cash, In-Kind, and Associated Projects. Residuals are not included.*
- *Non-NSF Government includes U.S. Government (not NSF), State government, local government, foreign government, and quasi-government research organizations.*
- *Other Sources includes medical facilities, nonprofit organizations, private foundations, venture capitalists, and other sources.*

30 FY 2018 Support to ERCs in Energy, Sustainability, and Infrastructure Sector: 7 Centers (CBBG, CISTAR, FREEDM, NEWT, QESST, ReNUWIt, CURENT)

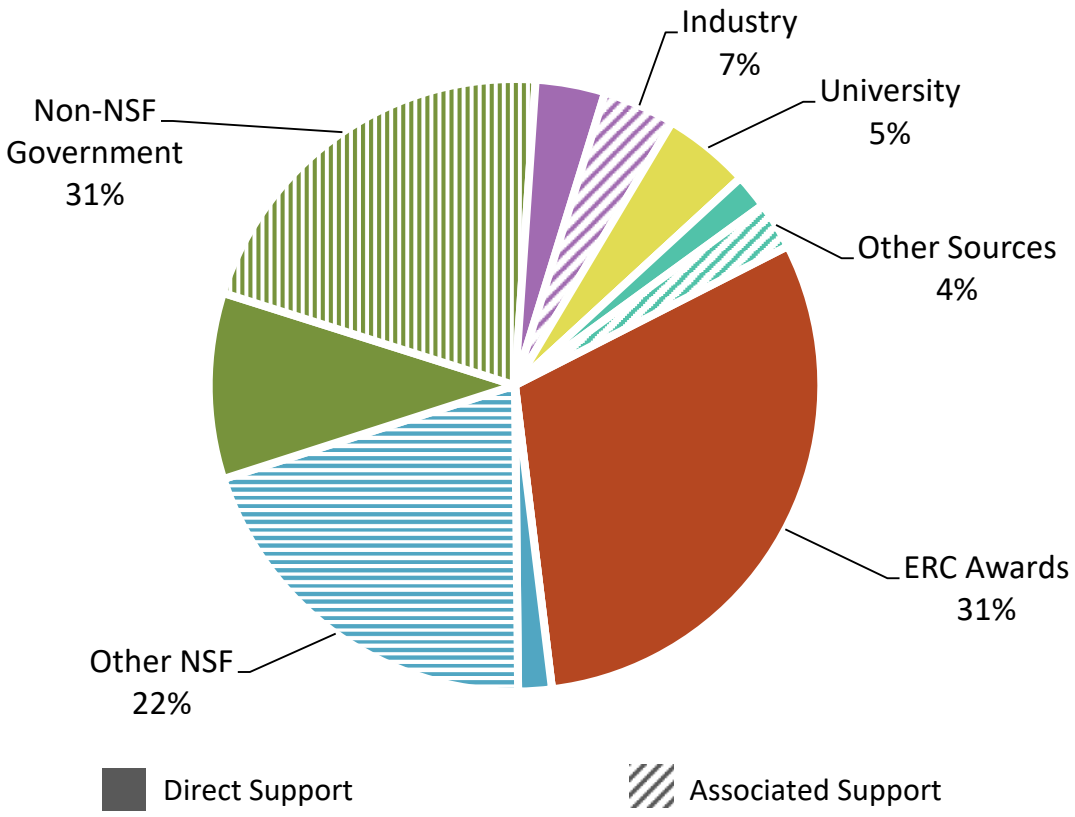


Total value of support: $73.5 million

NOTES:

- *Sources of Support include Unrestricted Cash, Restricted Cash, In-Kind, and Associated Projects. Residuals are not included.*
- *Non-NSF Government includes U.S. Government (not NSF), State government, local government, foreign government, and quasi-government research organizations.*
- *Other Sources includes medical facilities, nonprofit organizations, private foundations, venture capitalists, and other sources.*

31 FY 2018 Support to ERCs in Micro/Optoelectronics, Sensing, and Information Technology Sector: 4 Centers (CIAN, LESA, POETS, TANMS)

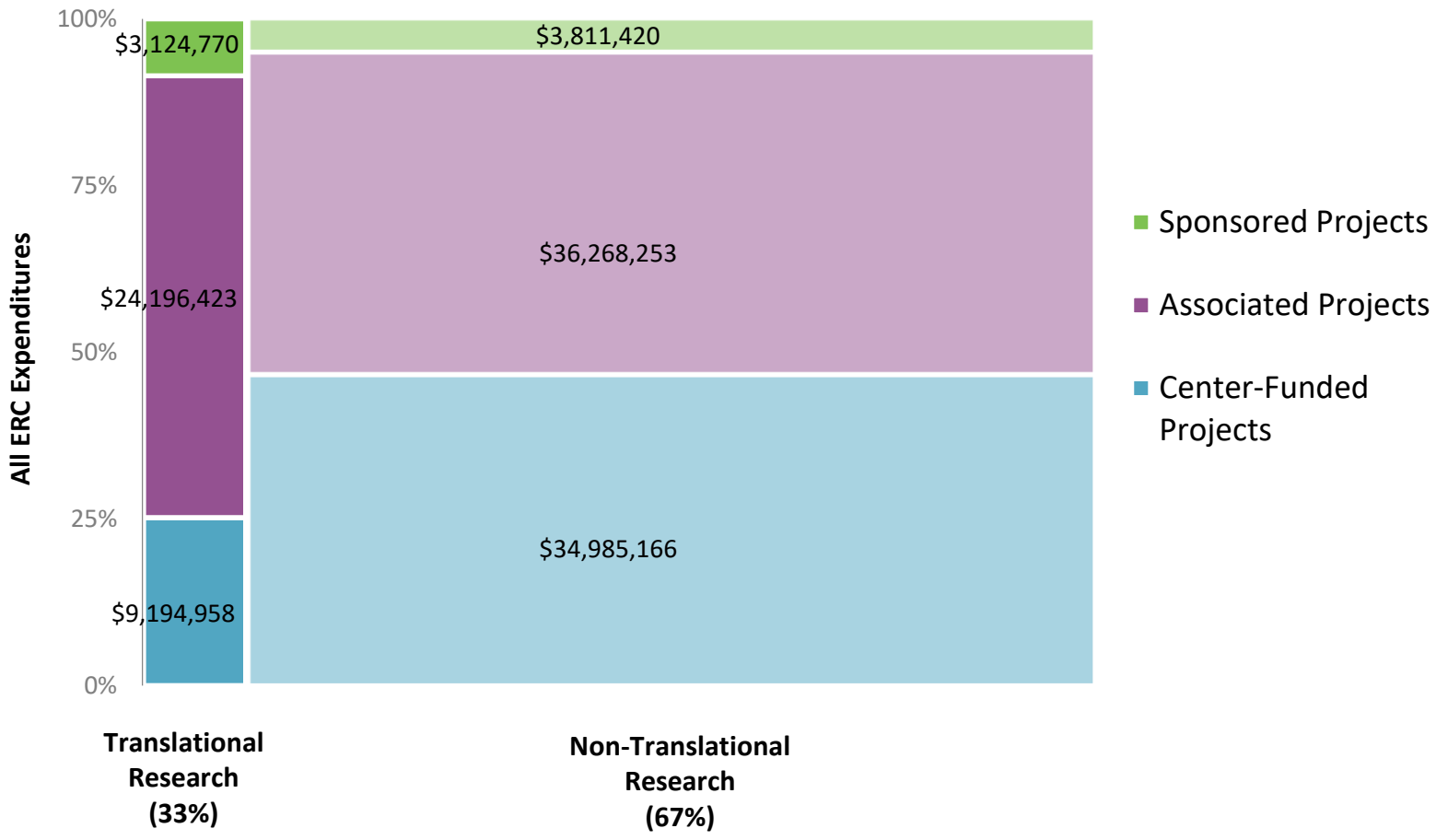


Total value of support: $37.8 million

NOTES:

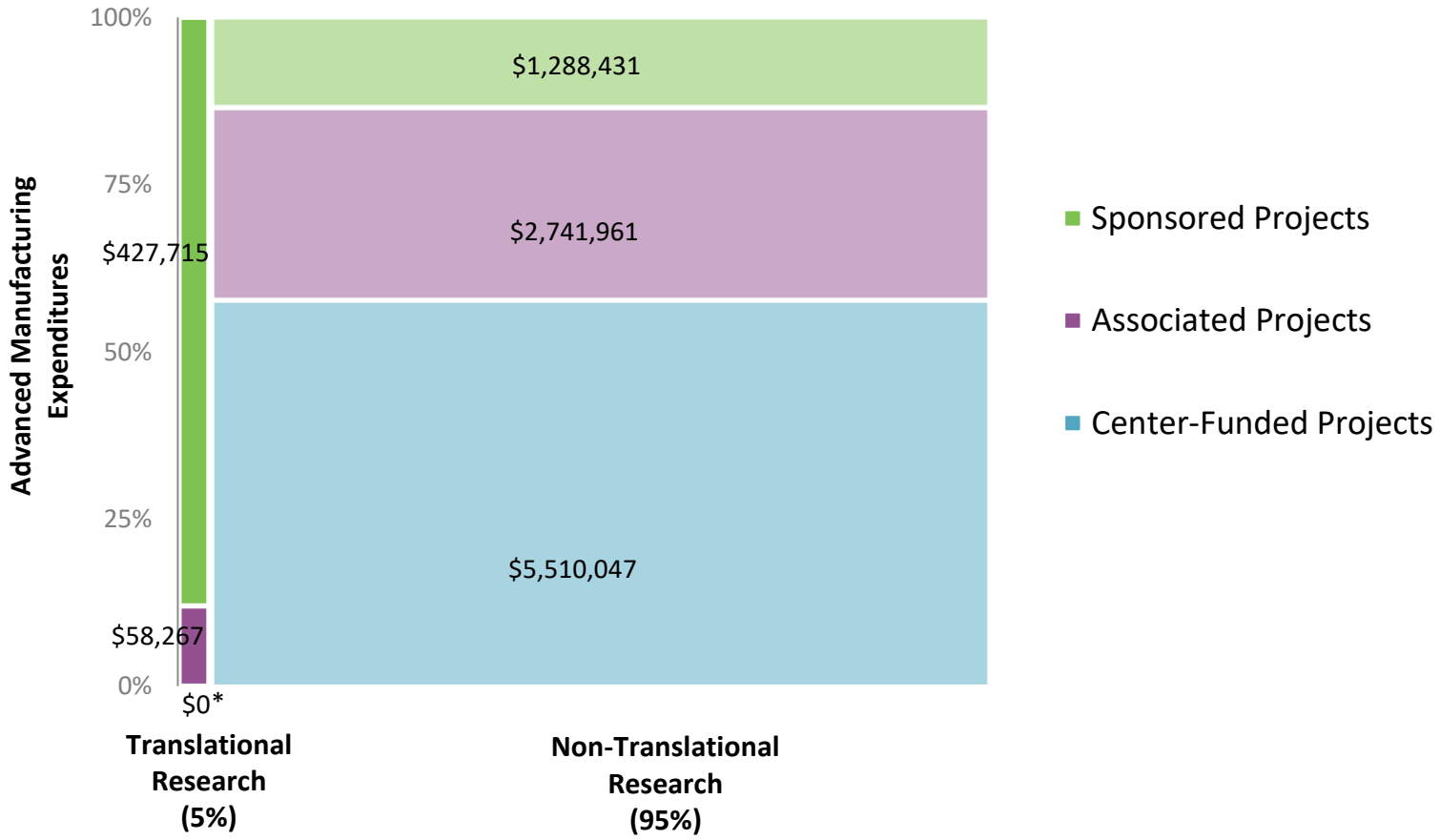
- *Sources of Support include Unrestricted Cash, Restricted Cash, In-Kind, and Associated Projects. Residuals are not included.*
- *Non-NSF Government includes U.S. Government (not NSF), State government, local government, foreign government, and quasi-government research organizations.*
- *Other Sources includes medical facilities, nonprofit organizations, private foundations, venture capitalists, and other sources.*

FY 2018 Expenditures by Type of Research: All ERCs



Total value of support: $112 million

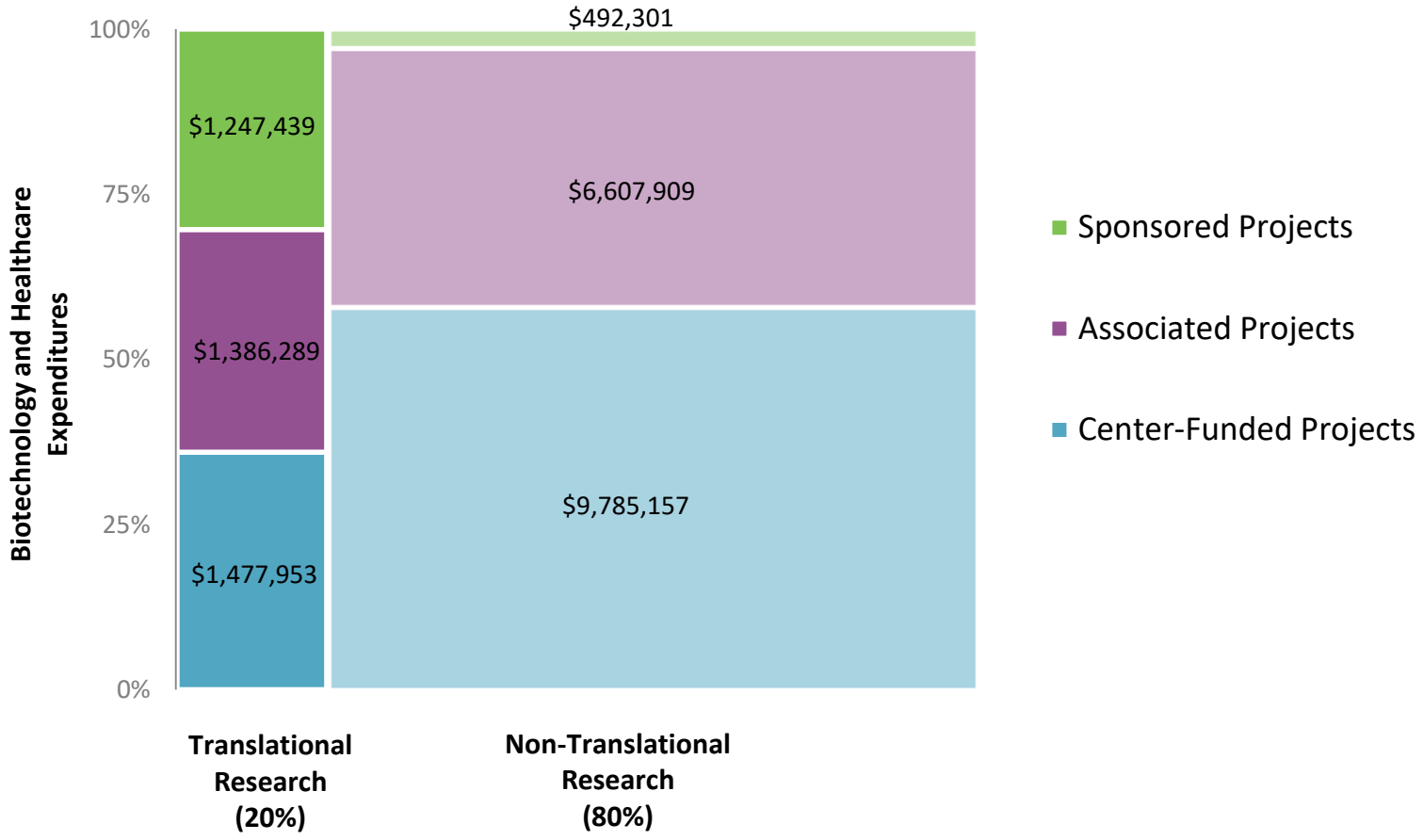
FY 2018 Expenditures by Type of Research: Advanced Manufacturing



Total value of support: $10 million

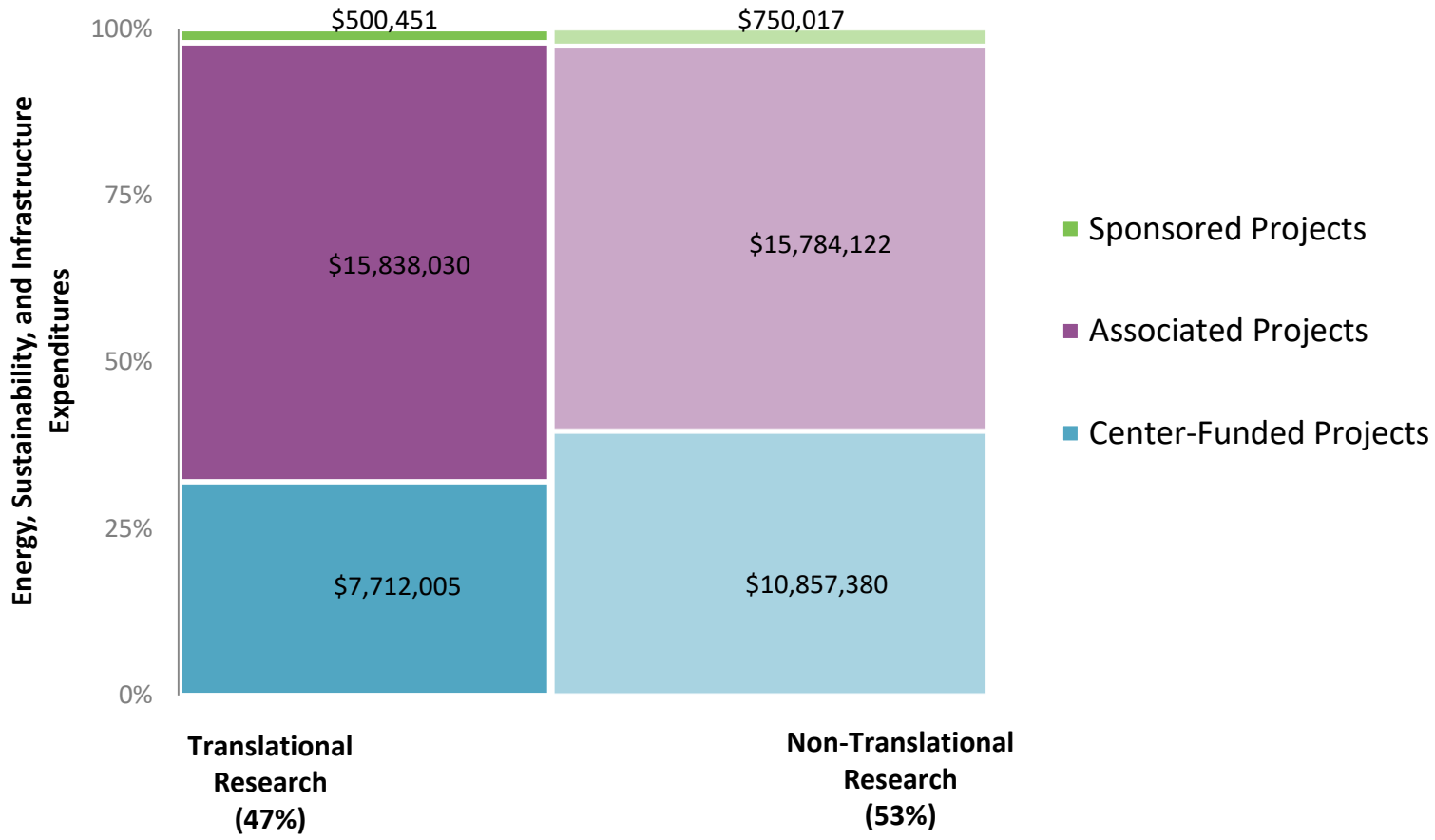
** $0 corresponds to Center-Funded Projects expenditures for Translational Research. Area is not visible due to the small relative size.*

FY 2018 Expenditures by Type of Research: Biotechnology and Healthcare



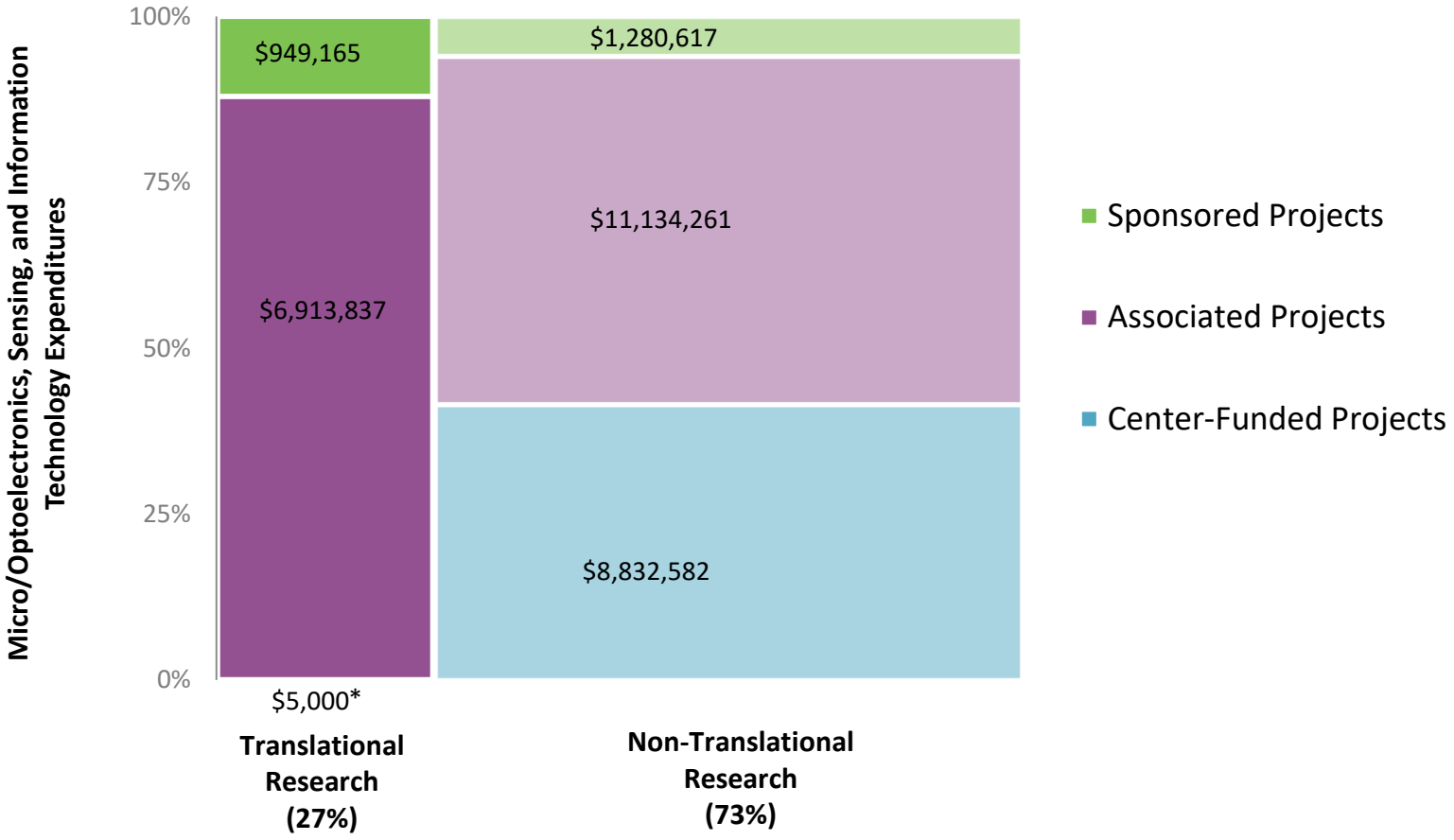
Total value of support: $21 million

FY 2018 Expenditures by Type of Research: Energy, Sustainability, and Infrastructure



Total value of support: $51 million

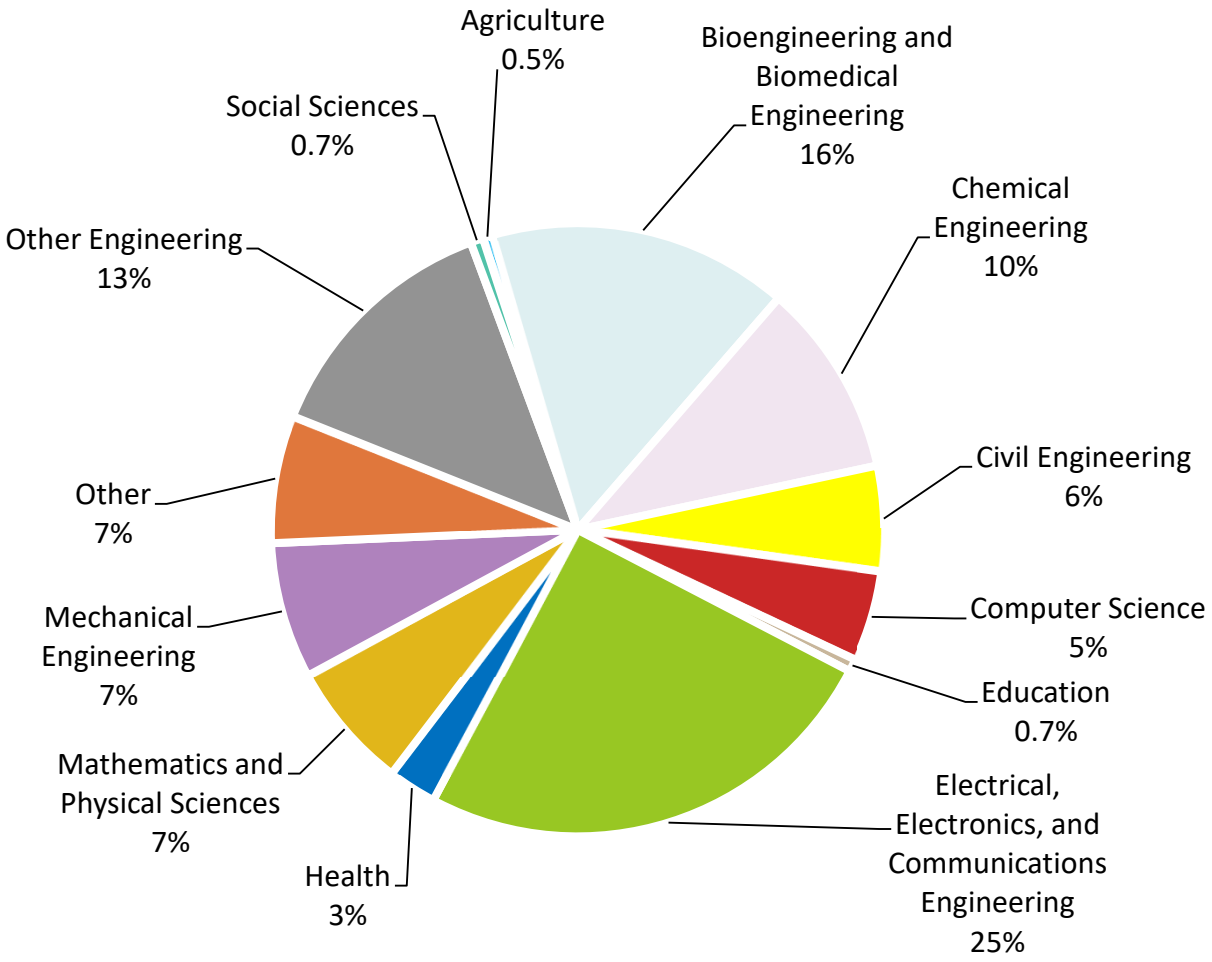
FY 2018 Expenditures by Type of Research: Micro/Optoelectronics, Sensing, and Information Technology



Total value of support: $23 million

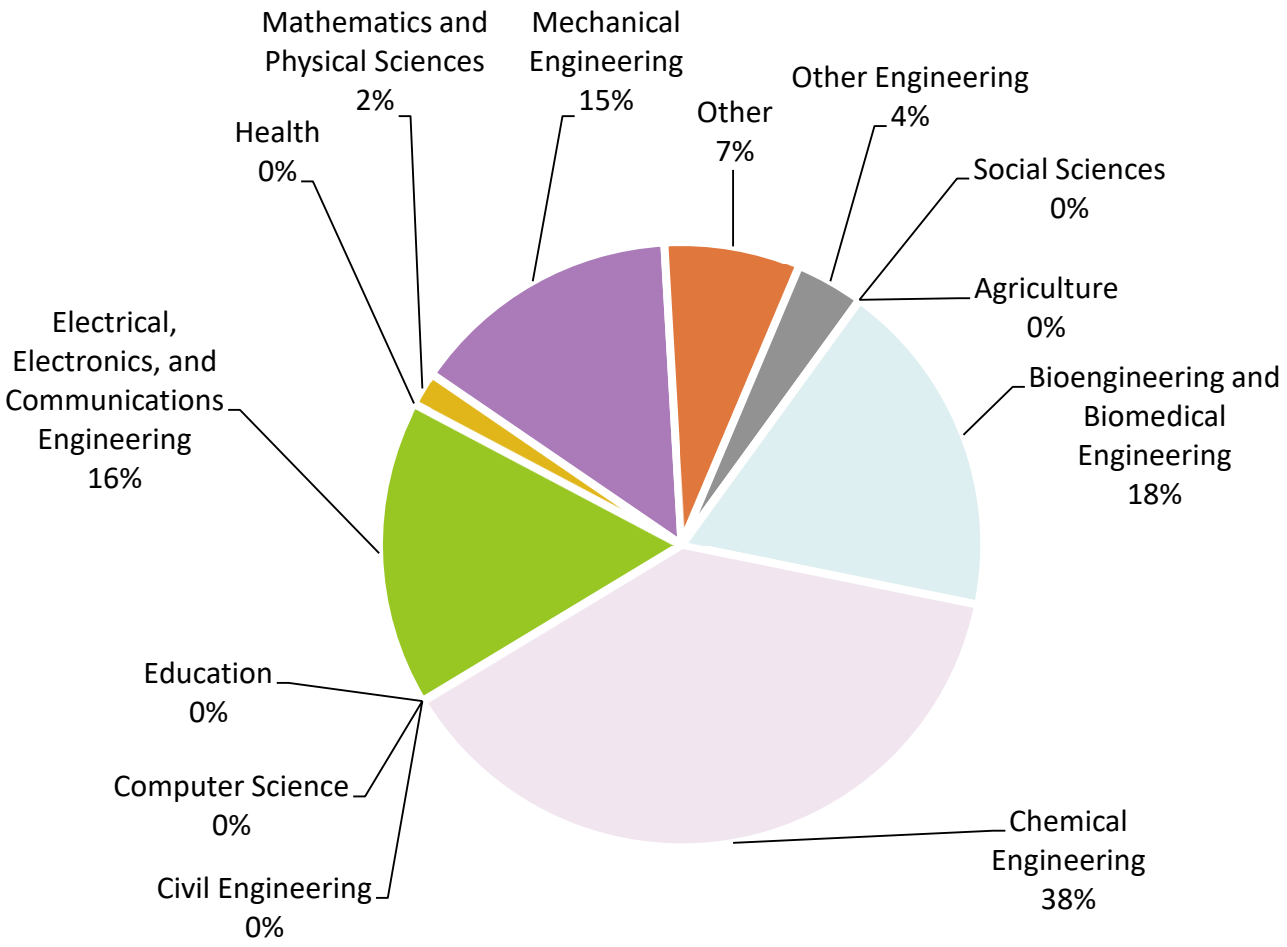
** $5,000 corresponds to Center-Funded Projects expenditures for Translational Research. Area is not visible due to the small relative size.*

All ERC Disciplines, FY 2018



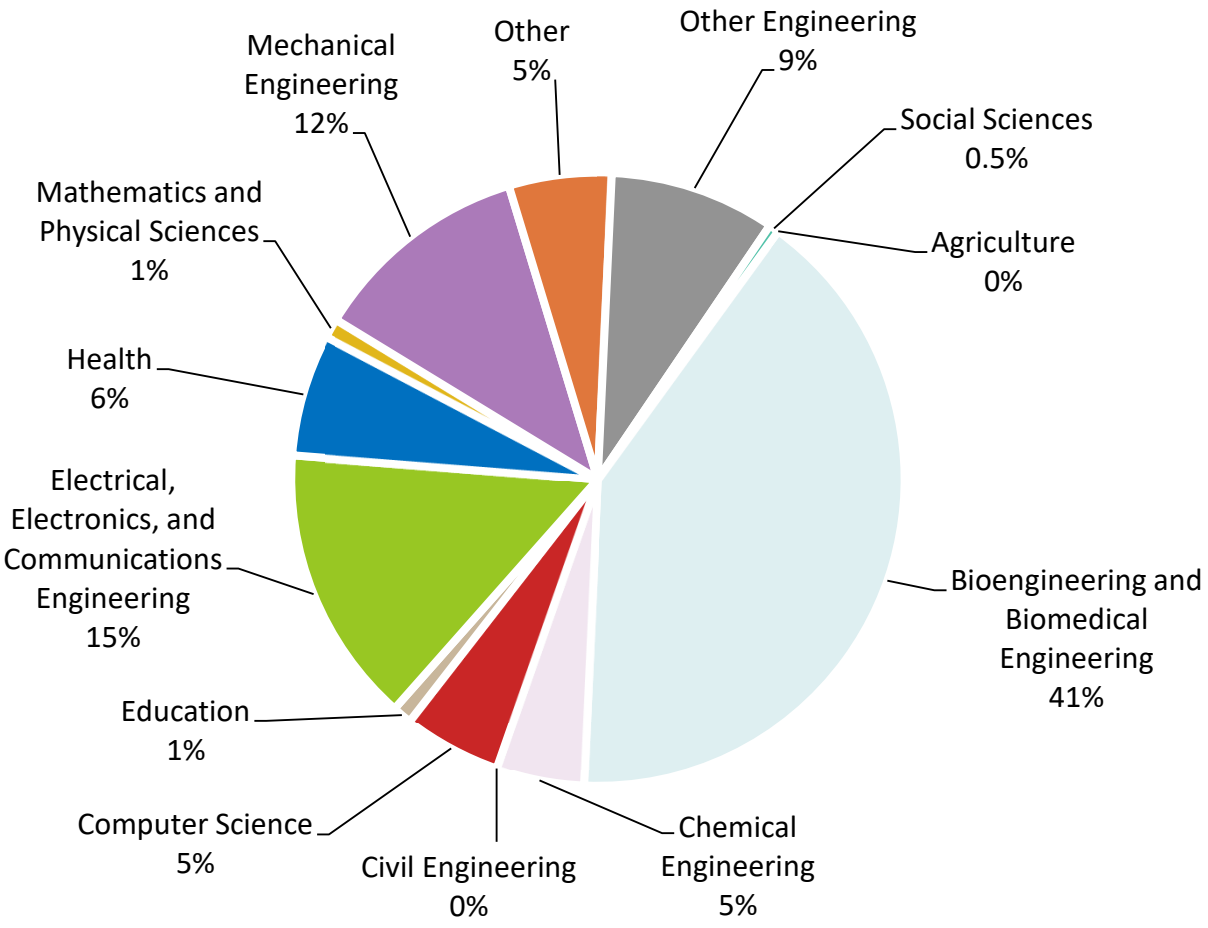
Total number of Project Investigators (PIs): 607

Disciplines by Technology Sector: Advanced Manufacturing, FY 2018



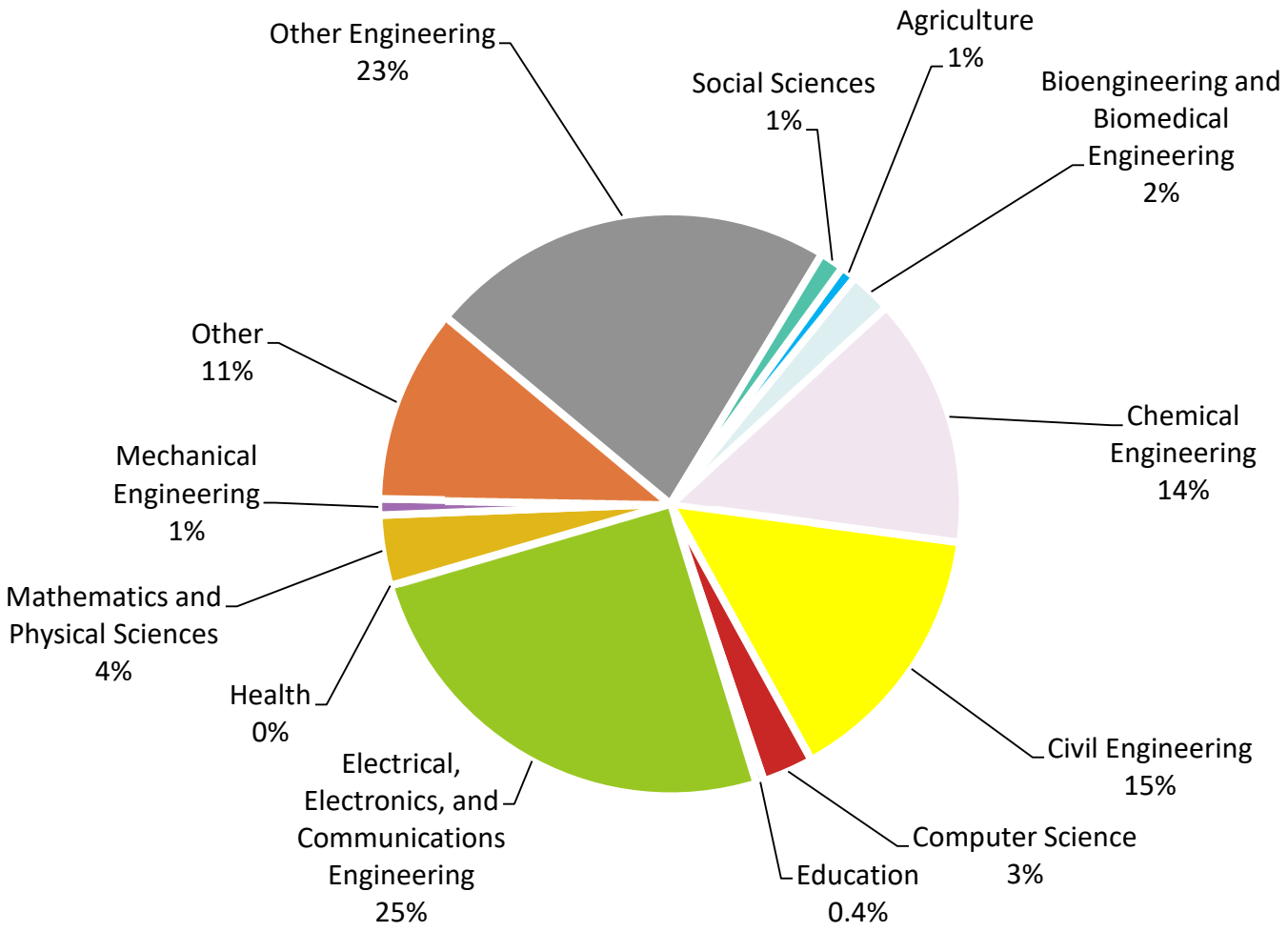
Total number of Project Investigators (PIs): 55

Disciplines by Technology Sector: Biotechnology and Healthcare, FY 2018



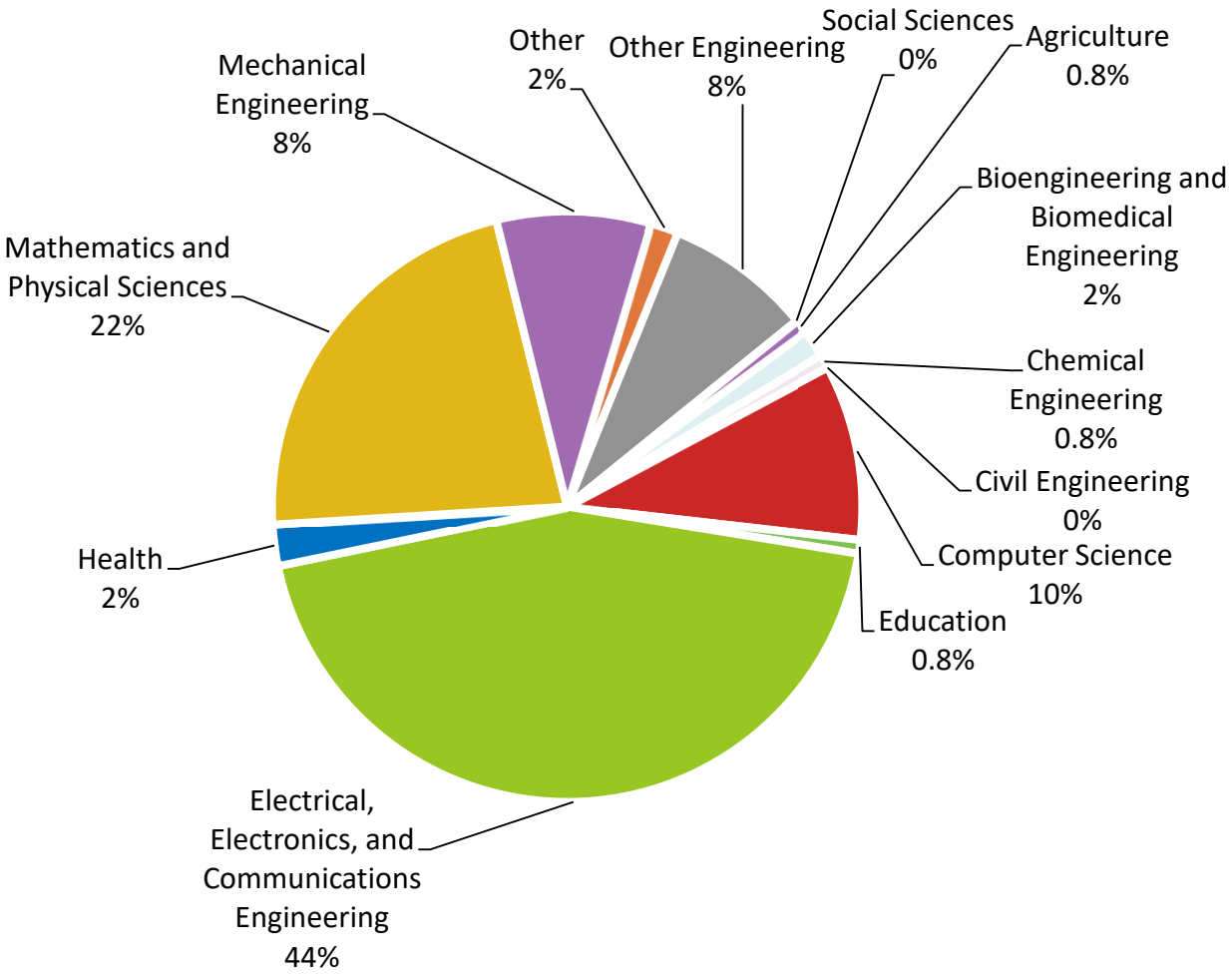
Total number of Project Investigators (PIs): 194

Disciplines by Technology Sector: Energy, Sustainability, and Infrastructure, FY 2018



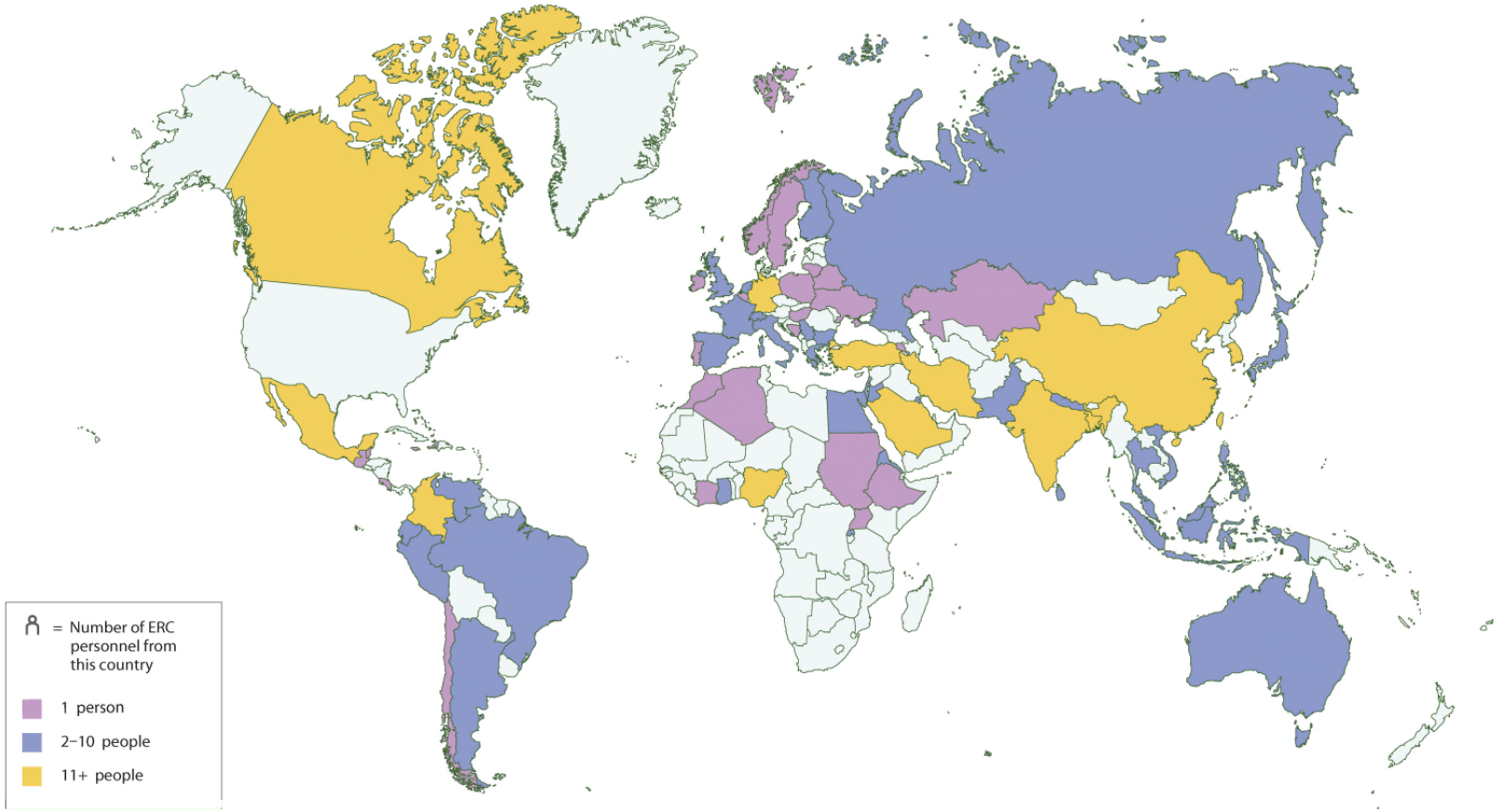
Total number of Project Investigators (PIs): 226

Disciplines by Technology Sector: Micro/Optoelectronics, Sensing, and Information Technology, FY 2018



Total number of Project Investigators (PIs): 132

Country of Citizenship of ERC Foreign Personnel, FY 2018



1 person		
African Countries, Other	Chile	Lithuania
	Costa Rica	Mauritius
	Cote d'Ivoire	Morocco
Algeria	Ethiopia	Norway
Armenia	Guatemala	Poland
Belarus	Haiti	Portugal
Belgium	Hungary	Sudan
Belize	Ireland	Sweden
Bosnia and Herzegovina	Jamaica	Uganda
	Kazakhstan	Ukraine

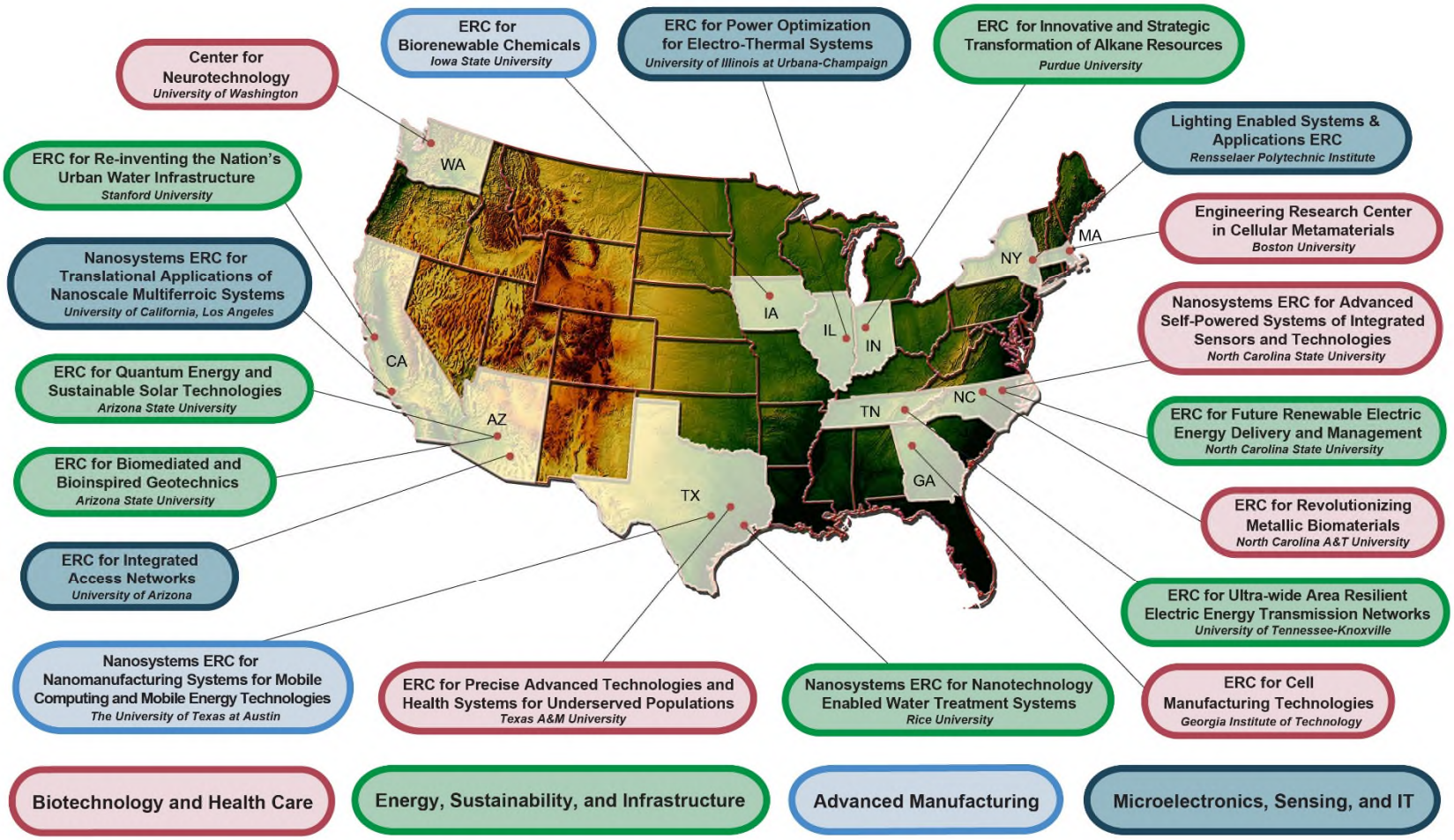
2–10 people			
Argentina (2)	Ghana (3)	Lebanon (4)	Serbia (7)
Australia (4)	Greece (9)	Malaysia (2)	Singapore (5)
Barbados (2)	Hong Kong (2)	Nepal (6)	Spain (8)
Brazil (10)	Indonesia (4)	Netherlands (2)	Sri Lanka (7)
Bulgaria (3)	Israel (4)	Pakistan (3)	Switzerland (5)
Ecuador (2)	Italy (9)	Peru (5)	Thailand (3)
Egypt (7)	Japan (7)	Philippines (3)	United Kingdom (5)
Eritrea (2)	Jordan (2)	Russia (4)	Venezuela (2)
Finland (2)	Kuwait (3)	Rwanda (2)	Vietnam (9)
France (10)			

11+ people	
Bangladesh (35)	Mexico (22)
Canada (11)	Nigeria (11)
China (399)	Saudi Arabia (12)
Colombia (12)	South Korea (55)
Germany (21)	Taiwan (14)
India (219)	Turkey (15)
Iran (50)	

Country Not Reported	28*

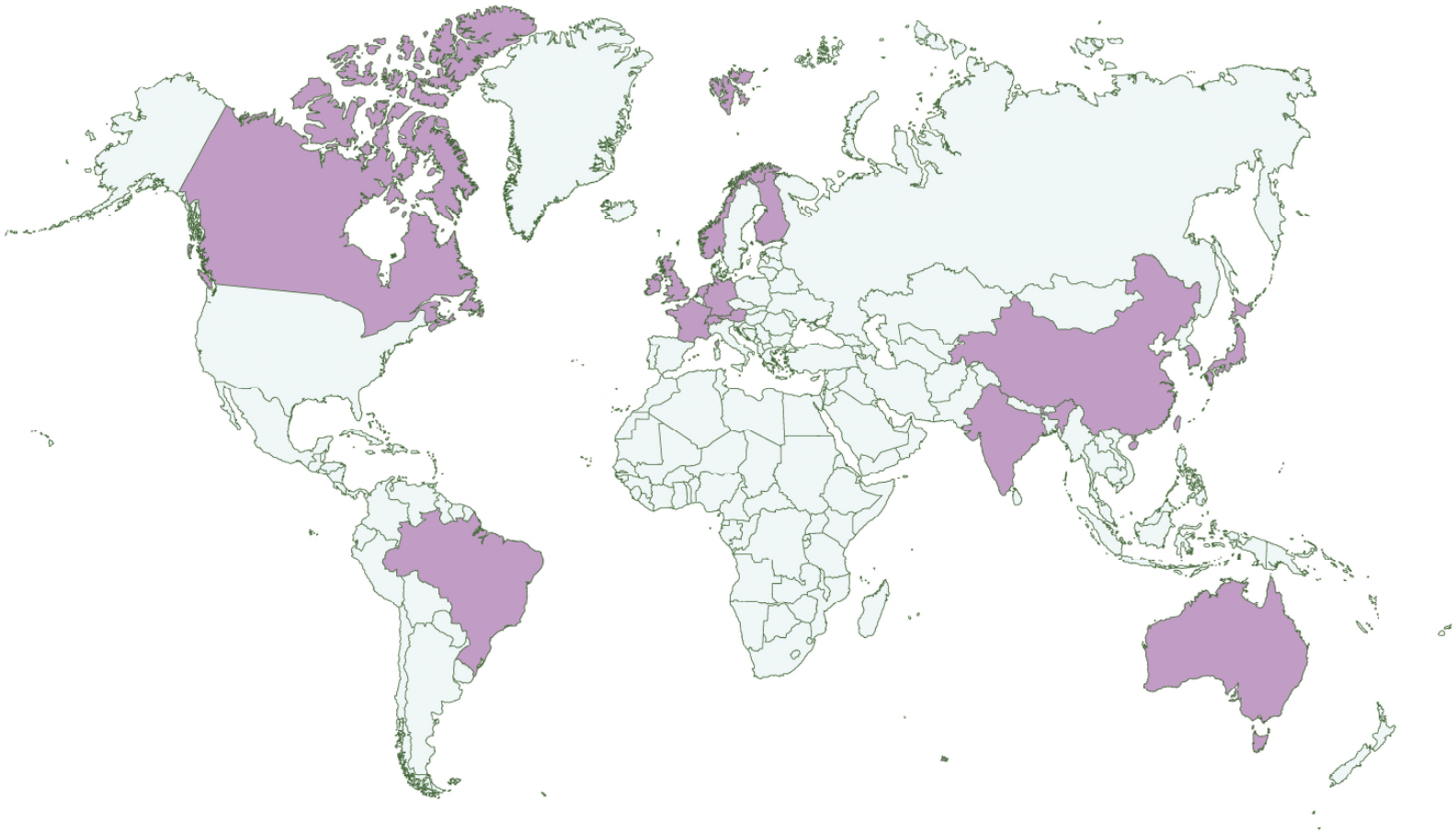
* Number of ERC personnel who are foreign and did not provide a country name

Locations of the Active ERCs, FY 2018



Note: All centers are multi-university partnerships; university shown is lead institution.

Locations of Foreign Participating Organizations, FY 2018



Countries with 1–20 collaborations

Australia	(2)	France	(8)	Norway	(1)
Austria	(1)	Germany	(9)	Singapore	(1)
Brazil	(1)	India	(1)	South Korea	(7)
Canada	(2)	Ireland	(2)	Switzerland	(3)
China	(5)	Japan	(10)	Taiwan	(1)
Finland	(2)	Netherlands	(4)	United Kingdom	(9)

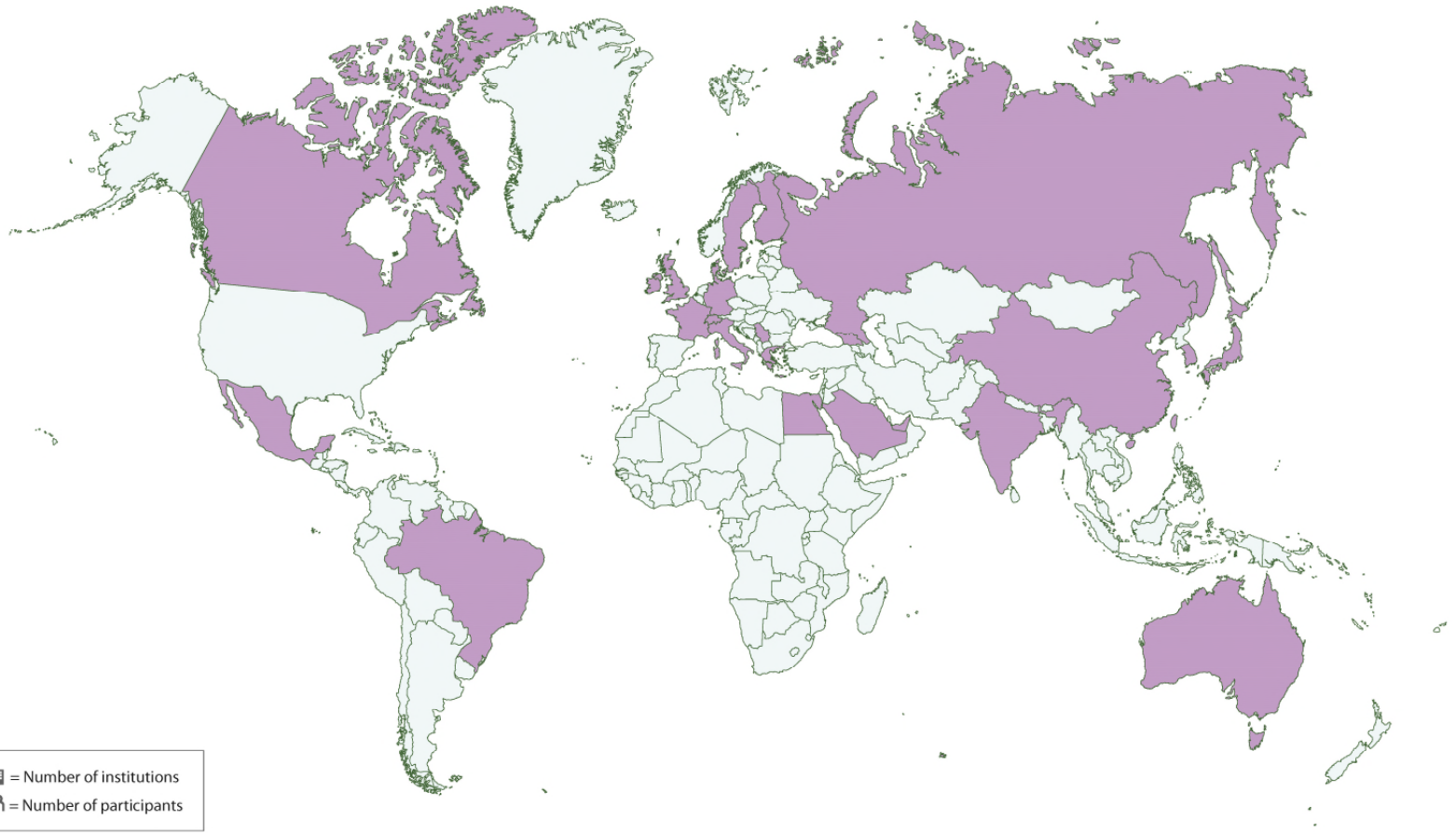
Countries with 21–40 collaborations

No countries reported

Countries with 41+ collaborations

No countries reported

Locations of Foreign Participating Institutions, FY 2018



Australia	1	2
Brazil	3	1
Canada	5	5
China	27	32
Denmark	1	0
Egypt	1	1
Finland	1	2
France	1	0

Georgia	2	0
Germany	11	15
Greece	1	0
Hong Kong	1	1
India	2	1
Ireland	4	6
Italy	3	3
Japan	4	2

Mexico	1	0
Russia	1	1
Saudi Arabia	1	0
Serbia	1	1
South American Countries, Other	1	0
South Korea	2	1
Sweden	2	1

Switzerland	3	6
Taiwan	1	1
United Arab Emirates	1	0
United Kingdom	6	2

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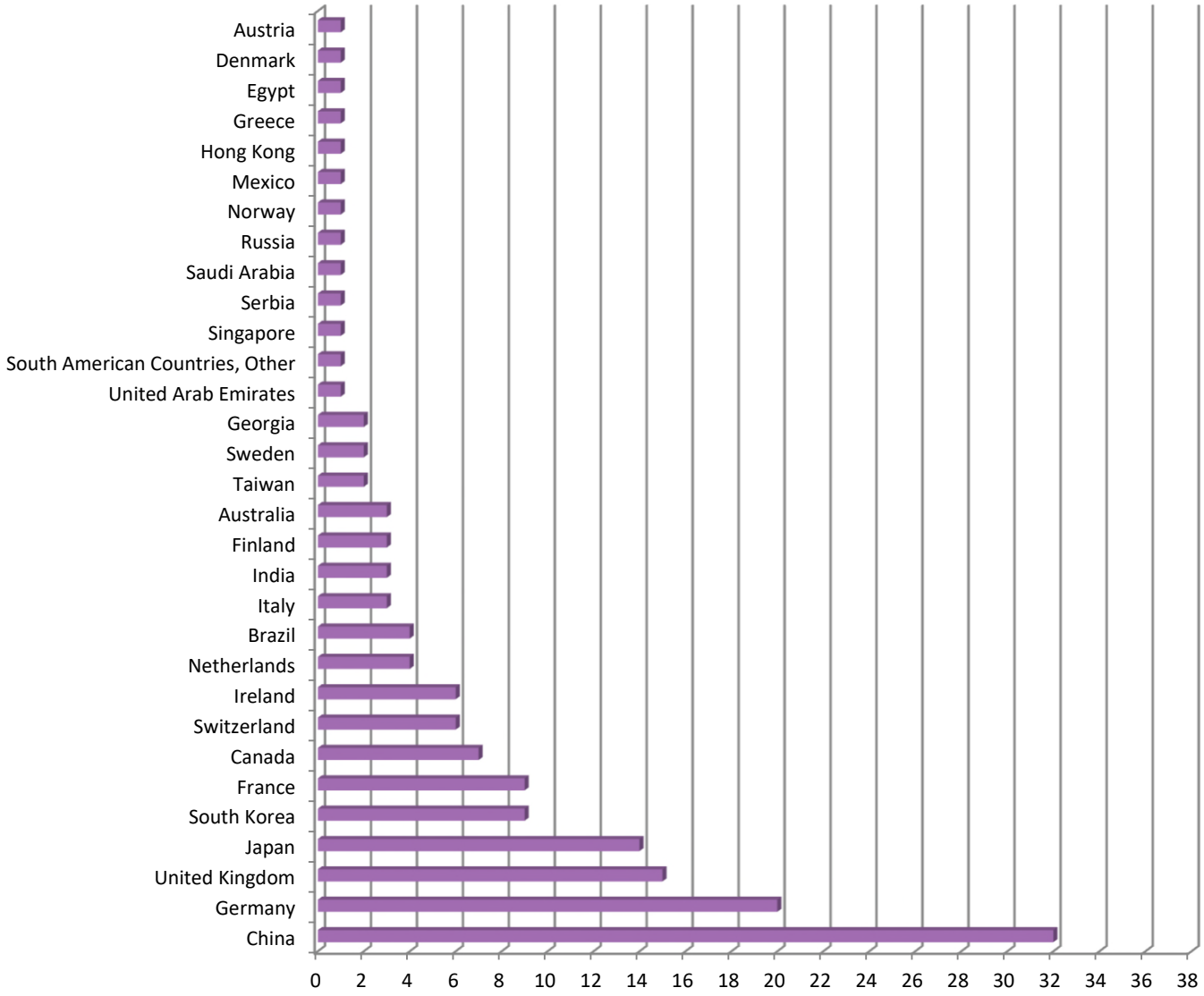
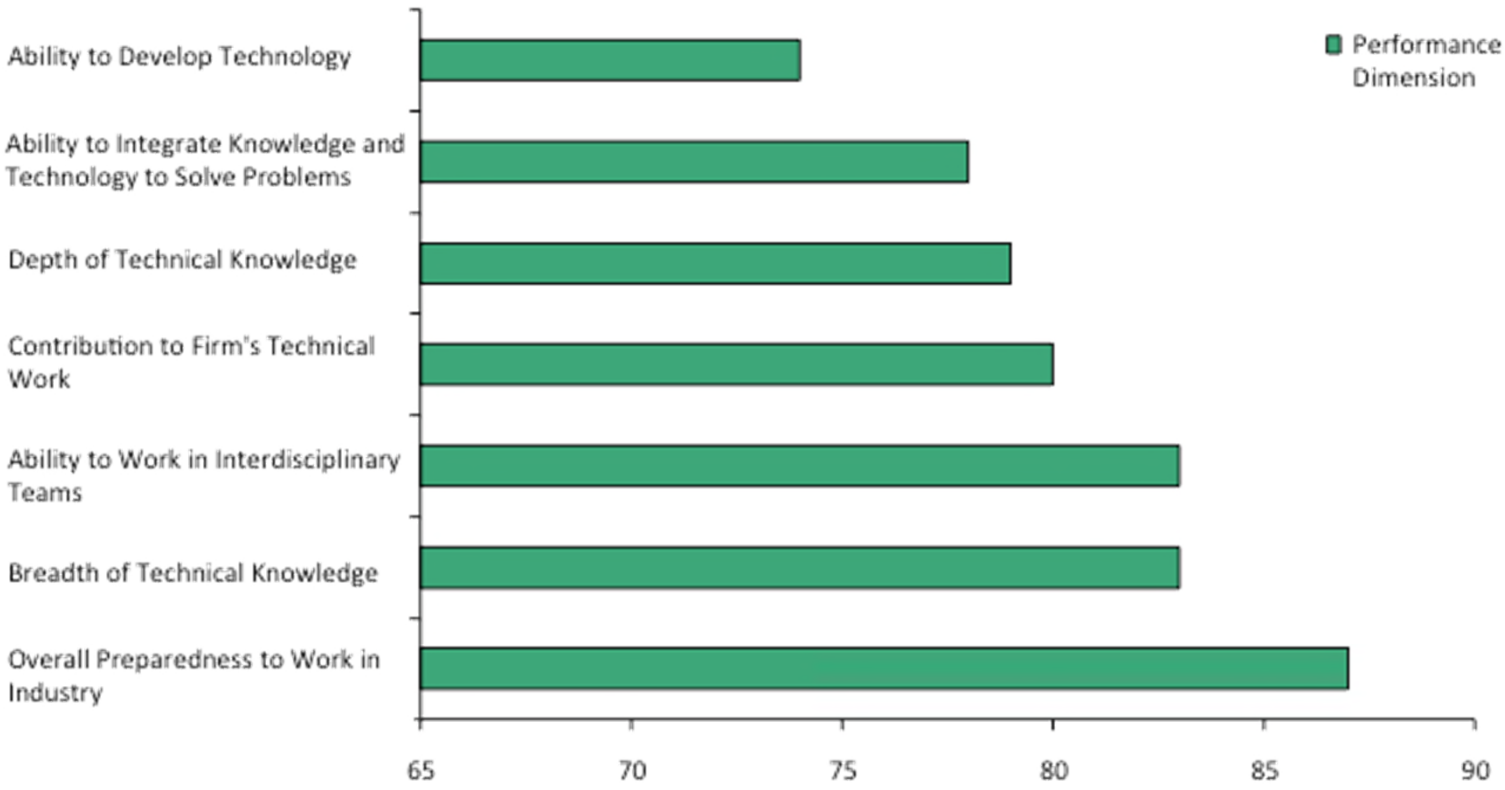
Number of Institutions and Organizations With Financial Headquarters Abroad Collaborating With ERCs, by Country of Origin, FY 2018*,**



** Displays counts of Industrial/Practitioner members, Funders of Associated Projects, Funders of Sponsored Projects, Contributing Organizations, Collaborating Institutions, Non-ERC Institutions Providing REU Students, and Foreign Partner Institutions*

*** Community college and Pre-college institutions are excluded.*

Comparisons by Member Firms of the Performance of ERC Hires vs. Non-ERC Hires*



* Percentage of industrial supervisors rating the former ERC students/graduates hired by their firms as "Better Than" or "Much Better Than" equivalent hires without ERC experience