

▶ AIChE[®] ANNUAL REPORT 2017



AIChE 
The Global Home of Chemical Engineers



June C. Wispelwey
Executive Director



T. Bond Calloway, Jr.
2017 AIChE President

2017 was another successful year for AIChE, as we accomplished our many strategic, financial, innovation and organizational goals. We inaugurated the RAPID Manufacturing Institute, grew our net assets, enhanced process safety education, expanded our meetings, and launched two new membership programs. RAPID — short for Rapid Advancement in Process Intensification Deployment — is a partnership with industry, academia and the Department of Energy (DOE) that leverages DOE's \$70 million contribution over five years to improve efficiencies through process intensification and modularization in energy-intensive sectors, such as chemicals, oil and gas, pulp and paper-making, and other industries.

Some of our highlights from 2017 include:

- ▶ Launching two new programs aimed at increasing membership and enhancing the member experience. One program targets our undergraduate members as they transition to Young Professionals; and a second program, piloted by the Fuels and Petrochemicals and the Food, Pharmaceutical and Bioengineering divisions, provides more technical content to division members.
- ▶ Expanding the reach of AIChE's technical entities through 49 specialty conferences and workshops.
- ▶ Enriching our Undergraduate Process Safety Learning Initiative with six new SACHE® learning modules, six educator workshops, five module translations, and four student boot camps.
- ▶ Recognizing members through our awards programs, and unveiling the inaugural Margaret Hutchinson Rousseau Pioneer Award and our 35 Under 35 Awards for Young Professionals.
- ▶ Expanding the Bioengineering & Translational Medicine journal and introducing a mobile app for Chemical Engineering Progress (CEP).
- ▶ Successfully expanding our Spring and Annual meetings with new programming and more sponsorship and exhibits.
- ▶ Conducting five Chem-E-Car Competitions® outside of the U.S. — teaching students chemical engineering principles, teamwork, and process safety.
- ▶ On-boarding 58 RAPID members, launching four RAPID jump-start projects, selecting another 21 projects for 2018, outlining the body of knowledge for process intensification, and completing roadmaps in all technical focal areas; plus advancing education in these areas.
- ▶ Expanding global conferences and workshops for our Center for Chemical Process Safety (CCPS®) as well as publishing two new CCPS books, a video series on risk, and a mobile app for incident evaluation.
- ▶ Raising \$6.2 million in cumulative funds for our "Doing a World of Good Campaign," with those funds directed toward five transformative priorities.
- ▶ Increasing our presence on social media, including AIChE Engage — our mobile-friendly platform that connects AIChE members with each other and their chemical engineering communities.
- ▶ Adding \$3.6 million to our net assets, achieving a record total of \$27.2 million.

AIChE is grateful for the support of our many dedicated volunteers, members and staff for helping to make 2017 a resounding success, and allowing for the Institute's continued growth. We take our inspiration from you, and are driven to develop a new strategic plan for 2018 that will help us meet our challenges in the future.

June C. Wispelwey, Executive Director

T. Bond Calloway, Jr., 2017 AIChE President

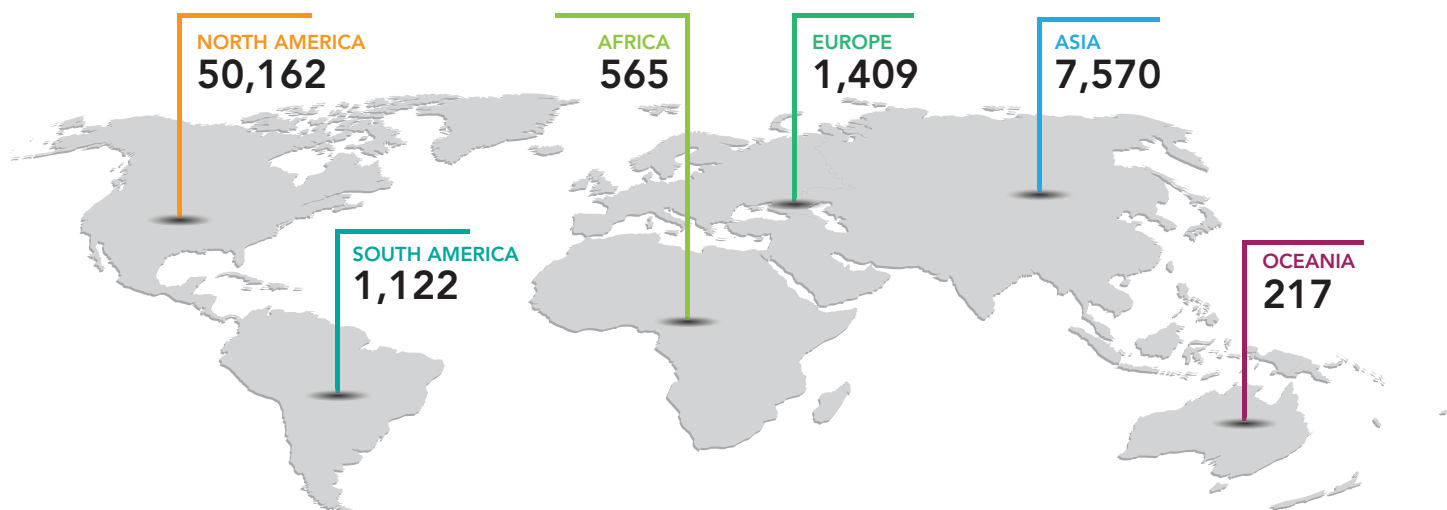
Membership



60,000+
TOTAL MEMBERS



110
COUNTRIES



Professional Membership

AIChE provides membership to graduating seniors with YP1, a program that supports these members as they transition to young professional members.



38,000+
PROFESSIONAL MEMBERS



110
COUNTRIES

Division & Forum Membership

Out of 38,000+ professional members, nearly 9,000 are also members of a technical division or forum. See the full list AIChE.org/divisions-forums.

New in 2017

Launched division pilot program to develop member benefits and engagement for the Fuels and Petrochemicals Division and the Food, Pharmaceutical, and Bioengineering Division.



9,000
MEMBERS OF A TECHNICAL
DIVISION OR FORUM

Local Section Membership

8,500+ professional members are involved in local sections in 44 countries.



8,500+
PROFESSIONAL MEMBERS



44
COUNTRIES

Technical Entities

AIChE's Technical Entities are distinct communities of chemical engineers and other professionals that address such societal grand challenges as health and nutrition, energy, environment and sustainability, water, and safety. These entities keep AIChE at the forefront of new technologies available to chemical engineers. They expand AIChE's reach to engineers and scientists who are working in fields beyond core chemical engineering competencies and who are concentrating on similar challenges. AIChE's Institute for Sustainability (IfS) and Society for Biological Engineering (SBE) were founded nearly 15 years ago, and have subsequently expanded their reach and technical content through workshops, conferences, credentialing, and educational offerings. More recently, additional technical entities such as the Center for Energy Initiatives (CEI), the International Metabolic Engineering Society (IMES), the International Society for Water Solutions (ISWS), the Center for Innovation and Entrepreneurship Excellence (CIEE), and the Regenerative Engineering Society (RE Society) have been created. Also, the Design Institute for Emergency Relief Systems (DIERS) was reorganized to become a technical entity, enabling it to develop an individual membership structure.

AIChE.org/TEs

New in 2017

- Held conferences on Epigenetics and CRISPR Technology.
AIChE.org/SBENewConf



- Acquired the Mammalian Synthetic Biology Workshop



COLLECTIVELY, THE TECHNICAL ENTITIES HAVE NEARLY

50,000

MEMBERSHIPS AMONG THEM



NEARLY

19,000

DISTINCT MEMBERS



FROM NEARLY

100

COUNTRIES



IN 2017, THE TECHNICAL ENTITIES RAISED MORE THAN

\$330k

IN GRANTS TO SUPPORT STUDENT AND YOUNG FACULTY ENGAGEMENT



Student Membership



23,000+
STUDENT MEMBERS



ACROSS
89
COUNTRIES



NEARLY
300
STUDENT CHAPTERS



ACROSS
41
COUNTRIES

AIChE.org/Students

New in 2017



25
NEW INTERNATIONAL
STUDENT CHAPTERS
CREATED IN 2017

IN COUNTRIES INCLUDING:

BANGLADESH, BRAZIL, CANADA, CHINA,
GREECE, INDIA, INDONESIA, IRAQ, MEXICO,
OMAN, TURKEY, AND THE UNITED KINGDOM

Thank you to our ScaleUp program sponsors for helping to enrich the next generation of chemical engineers. AIChE acknowledges the following generous sponsors whose support has made ScaleUp a continued success.

AIChE.org/ScaleUp



CORNING



New in 2017

Volunteering

Introduced micro-volunteering program to get new members to participate in small ways. More than **200 opportunities** have been successfully completed with another **200** in progress.

AIChE.org/volunteer



Awards



AIChE PRESENTED
MORE THAN

450

AWARDS IN 2017

The most prestigious among these are the two Board of Directors awards and 16 Institute awards — presented at the 2017 Honors Ceremony. See all professional member award winners at AIChE.org/2017Awards

2017 International Travel Grant Awardees



See photos of 2017 student award honorees.
AIChE.org/2017StudentAwardsCeremony

New in 2017 Margaret Hutchinson Rousseau Pioneer Award

Sponsored by 

In 2017, AIChE inaugurated The Margaret Hutchinson Rousseau Pioneer Award for Lifetime Achievement by a Woman Chemical Engineer. This award is given to a woman member of AIChE who has made significant contributions to chemical engineering research or practice over the course of her career — and who has paved the way for women to have a greater impact on the profession.

The award honors the memory of Dr. Margaret Hutchinson Rousseau — the first woman to earn a PhD in chemical engineering from MIT, the first woman member of AIChE, and the first woman to receive AIChE's Founders Award. Rousseau is known for her work at Pfizer, the sponsor of this award.

The inaugural recipient of the Margaret Hutchinson Rousseau Pioneer Award is Dr. Frances Hamilton Arnold, The Dick and Barbara Dickinson Professor of Chemical Engineering, Bioengineering, and Biochemistry at the California Institute of Technology. You can watch Dr. Arnold's video award acceptance at AIChE.org/2017Rousseau.



Dr. Frances Arnold

See photos of all 2017 Institute and Board Award honorees.
AIChE.org/2017HonorsCeremony

35 Under 35

In 2017, AIChE and the Young Professionals Committee recognized 35 outstanding AIChE members under the age of 35 who have made significant contributions to the field of chemical engineering and AIChE.

AIChE.org/35under35-2017

AIChE®

35UNDER35

BIOENGINEERING | CHEMICALS | EDUCATION
ENERGY | INNOVATION | LEADERSHIP | SAFETY



Publications

Journal Highlights

2017 was an excellent year for the five AIChE journals: *AIChE Journal*, *Bioengineering & Translational Medicine*, *Biotechnology Progress*, *Environmental Progress & Sustainable Energy*, and *Process Safety Progress*.



BIOENGINEERING & TRANSLATIONAL MEDICINE'S

▶ **DOWNLOADS UP**
450%
IN 2017 (SECOND YEAR
OF PUBLICATION)

CEP Highlights

Chemical Engineering Progress continued to publish unparalleled technical features, product updates, and columns in 2017. It has also improved on delivery. Offering full HTML pages for both desktop and mobile, CEP increased its website users by **42%** in 2017.

CEP also launched an app in September of 2017 attracting more than 3,000 mobile downloads.

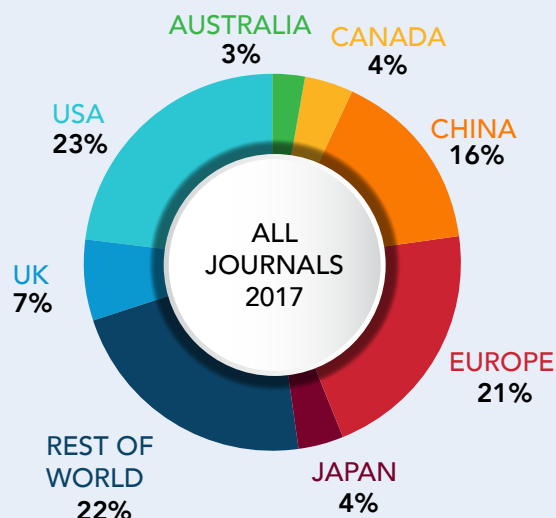
 **42%**
WEBSITE USERS
INCREASE IN 2017



9,751
TOTAL PAGES PUBLISHED



MORE THAN
1.2MM
FULL-TEXT
DOWNLOADS



3,000
MOBILE APP
DOWNLOADS

Events

AIChE's largest conferences continue to attract chemical engineers and related professionals working in industry and academia from across the world.

2017 Spring Meeting & Global Congress on Process Safety

The Spring Meeting is AIChE's key technical conference for practicing chemical engineers. At the 2017 meeting in San Antonio, sessions addressed big data, upstream engineering, gas utilization, refinery processing, clean energy, smart manufacturing, and more.

The Global Congress on Process Safety addresses the critical needs of process safety practitioners more broadly and deeply than any other conference, with tracks devoted to loss prevention, plant safety, process safety management, and global perspectives.

AIChE.org/Spring



MORE THAN
2,400
ATTENDEES



750
PAPERS



TRAVELED FROM
46
COUNTRIES

2017 Annual Meeting

As the premier educational forum for chemical engineers interested in innovation and professional growth, AIChE's 2017 Annual Meeting attracted more than 5,400 attendees to Minneapolis.

2017 program highlights included:

- ▶ **NEW** – Meet the Executives panel on “Innovating for a Sustainable Future” (with executives from Chevron, The Dow Chemical Company, Cargill, BASF, and Owens Corning Insulation)
- ▶ **NEW** – Programming and exhibits in support of AIChE's RAPID Institute — with expanded coverage of process intensification; modular chemical processing; and increased emphasis on Net-Gen Manufacturing — including 3D printing, smart manufacturing, modular manufacturing, and innovation in pharmaceutical manufacturing
- ▶ **NEW** – NH3 Energy+ programming in collaboration with NH3 Fuel Association, emphasizing NH3 in sustainable energy and agriculture
- ▶ **NEW** – Programming on microbiomes and microbial communities; and the thermal deconstruction of biomass
- ▶ Enhanced programming on diversity and inclusion, including a panel on “Starting and Thriving in the Workplace” (with representatives from Chevron, BASF, ExxonMobil, and Oregon State University)

AIChE.org/Annual



MORE THAN
5,400
ATTENDEES



5,900
PAPERS



TRAVELED FROM
56
COUNTRIES



Annual Student Conference

More than 1,500 students traveled from across the globe to Minneapolis for four days of education, career information, social events, and competitions.

AIChE.org/ASC



MORE THAN

1,500

STUDENTS

New in 2017

Students participated in a Q&A with executives from 3M, ExxonMobil, Honeywell Specialty Materials, and Cornell University.

2017 Annual Student Conference Chem-E-Car Competition®

Forty-four teams participated in the 2017 annual competition with more than eleven from outside the U.S. Indonesia's ITS University clinched the top trophy in the Annual Student Conference Chem-E-Car Competition® finals, missing the target by just 2 cm. The target distance was 23.5 m and the required load was 157 ml of water.

See all winners AIChE.org/2017Chem-E-CarWinners

 **44**
TEAMS



▲ Institut Teknologi Sepuluh Nopember, first place for performance

5 Global Chem-E-Car Competitions®

More than 53 student-chapter teams competed in AIChE's signature competition, which is expanding worldwide.

AIChE.org/ChemECar



53
STUDENT
CHAPTERS

- ▶ Bahrain
- ▶ Barcelona
- ▶ Hong Kong, China
- ▶ Medellin
- ▶ Tianjin, China



▲ Students at the 2017 competition in Bahrain

Industry Technology Groups

RAPID

In December 2016, the U.S. Department of Energy established the RAPID Advancement in Process Intensification Deployment (RAPID) Institute, the 10th Manufacturing USA Institute and AIChE's newest industry technology group. Leveraging \$70 million in federal funding and more than \$70 million in cost-share commitments from partners, RAPID is focused on developing breakthrough process-related technologies to boost energy productivity and energy efficiency by 20 percent in five years. Process intensification is any technology development that leads to substantially smaller, cleaner, or more energy efficient processes.



58

MEMBER
ORGANIZATIONS

2017 IMPACT



25

RESEARCH PROJECTS
TO-DATE



73

SUBMISSIONS



\$30MM

PRIVATE-PUBLIC
INVESTMENTS

POTENTIAL IMPACT



500,000

JOB'S CREATED*



1900

PEOPLE TRAINED



1100

TBTU ENERGY
SAVED*

*Potential future impact of process intensification on U.S. process industries

- ▶ Out of 73 submissions, launched four jump-start projects; another 21 projects planned for 2018
- ▶ Completed roadmaps in all technical focal areas and education
- ▶ Outlined the body of knowledge for process intensification
- ▶ Held congressional briefing on Capitol Hill: Strengthening Manufacturing's Heartland—Through Innovation, Standards, Readiness and Supply

AIChE.org/RAPID

DIPPR

DIPPR® or The Design Institute for Physical Properties (DIPPR) is the world's best source of critically evaluated thermo-physical and environmental property data. The DIPPR® 801 database contains recommendations for 34 constant properties and 15 temperature-dependent properties for more than 2,200 compounds.



An AIChE Technology Alliance



46

CORPORATE MEMBERS



80

LICENSEES OF THE THE DIPPR®
801 DATABASE SOFTWARE
OUT OF 119 TOTAL

CCPS

CCPS® is a not-for-profit, corporate membership organization within AIChE that identifies and addresses process safety needs for a variety of facilities involved with handling, storing, using or processing, and transporting hazardous materials. CCPS member companies, working in project subcommittees, define and develop useful, time-tested guidelines that have practical applications within industry.

CCPS educates employees of member companies through its events, courses, books, tools, online resources, and publications.

AIChE.org/CCPS



2017 Milestones:

2,800
PEOPLE ATTENDED



MORE THAN

17

GLOBAL CONFERENCES &
REGIONAL MEETINGS



- ▶ SAN ANTONIO, TEXAS
(GLOBAL CONGRESS ON
PROCESS SAFETY)
- ▶ ARGENTINA

- ▶ AUSTRALIA
- ▶ BAHRAIN
- ▶ BRAZIL
- ▶ CANADA

- ▶ CHINA
- ▶ COLOMBIA
- ▶ FRANCE
- ▶ GERMANY

- ▶ JAPAN
- ▶ MALAYSIA
- ▶ PRAGUE
- ▶ SPAIN

- ▶ The **CCPS Process Safety Beacon**, a resource aimed at delivering critical process safety information to plant operators, celebrated **16 years** of continuous publication with **192 issues** available in nearly **40 languages**.
AIChE.org/Beacon
- ▶ Launch of mobile application for CCPS Process Safety Incident Evaluation (PSIE) Tool
- ▶ Produced and published a video series for educating STEM students about safety through a United Engineering Foundation (UEF) grant.
AIChE.org/ccps/uef-risk-not-chance
- ▶ Developed **six new** interactive SChE (Safety & Chemical Engineering Education) modules and **translated five modules** into Mandarin and Spanish.
AIChE.org/SChE
- ▶ Advanced process safety education with the Undergraduate Process Safety Learning Initiative in collaboration with the AIChE Foundation.
AIChE.org/UPSIL
- ▶ New Books and Translations: **Guidelines for Pressure Relief and Effluent Handling Systems**, 2nd Edition, **Guidelines for Combustible Dust Hazard Analysis**. Translated **Chemical Process Safety, Fundamentals with Applications**, 3rd Edition into Mandarin.



Foundation

The Doing a World of Good campaign, the most ambitious and impactful campaign in AIChE's history, is engaging thousands of chemical engineers to advance the profession and address societal needs.

In its third year, thanks to individual and corporate supporters, the campaign has raised \$6.2mm of its \$15mm goal.

AIChE.org/Giving
DoingaWorldofGood.org

INDIVIDUAL SUPPORTERS
SINCE CAMPAIGN LAUNCH: **5,589**

AIChE
The Global Home of Chemical Engineers

DOING
A WORLD
OF GOOD

CAMPAIGN GIVING

\$6.2MM
TOTAL FUNDS RAISED*

\$1MM
IN DONATIONS**
BY AIChE FELLOWS

AMOUNT

\$15MM

\$12MM

\$9MM

\$6MM

\$3MM



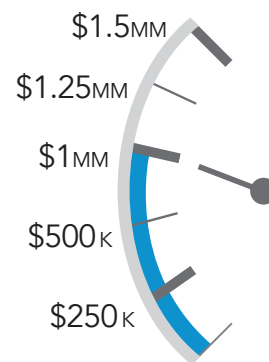
\$1.5MM

\$1.25MM

\$1MM

\$500k

\$250k



*Does not include funds raised from all foundation activities

**Refers to overall foundation donations, including the campaign

IMPACT

SAFETY & ETHICAL PRACTICE

374

UNIVERSITIES PARTICIPATING
IN UNDERGRADUATE PROCESS SAFETY
LEARNING INITIATIVE CURRICULUM

+25%

INCREASE IN SAFETY CERTIFICATES
COMPLETED BY STUDENTS

295

NEW FACULTY MEMBERS
EDUCATED ON PROCESS SAFETY

ATTRACTING & RETAINING THE BEST & THE BRIGHTEST

+50%

DIVERSITY & INCLUSION
SESSIONS SINCE 2016

40+

COUNTRIES INCLUDED IN
STUDENT GLOBAL ENGAGEMENT

RESEARCH & INNOVATION

58

MEMBER COMPANIES
SECURED FOR RAPID INSTITUTE

EDUCATION & CAREER DEVELOPMENT

35 UNDER **35**

NEXT GENERATION LEADERS
RECOGNIZED FOR EXCELLENCE

42

GRANTS AWARDED TO UNDER-
REPRESENTED STUDENTS IN 2017

CHANGING PERCEPTIONS

26k

LIVES IMPACTED THROUGH
OUR PARTNERSHIP WITH
ENGINEERS WITHOUT BORDERS

FOUNDERS' CIRCLE

BENEFACTORS
\$750,000 AND UP



UNDERWRITERS
\$500,000 TO \$749,999



PATRONS
\$250,000 TO \$499,999



2017 AIChE ANNUAL GALA

The 2017 AIChE gala raised approximately \$450,000 to support programs that strengthen pre-college STEM education and foster a diverse and inclusive engineering profession. The event celebrated leaders of LyondellBasell, Bechtel, and Dow for inspiring future leaders.

AIChE.org/Gala2017



▲ L to R: Bob Patel of LyondellBasell, Jim Fitterling of Dow, and Jack Futcher of Bechtel.

Education

AIChE Academy brings a full array of education and training resources to chemical engineers and their companies. In 2017, AIChE Academy delivered more than 580 education products, including courses, webinars, conference presentations and more from AIChE and its entities.

Students can search by topic, availability of continuing education units (CEUs) and professional development hours (PDHs), delivery method, skill level, and location.

In 2017, AIChE trained more than 1,500 attendees* in face-to-face training sessions at companies.

AIChE.org/Academy



580
EDUCATION PRODUCTS



50,000+
ATTENDEES OF
EDUCATIONAL EVENTS*

*in some cases, attendees may repeat a course.

AIChE's Reach

AIChE made an impact on media throughout the world via its own communication channels as well as others. AIChE had a total of 3,515 editorial mentions and 6,593 mentions on social media in 2017 (1,190 on Facebook and 5,137 on Twitter).



3515

TOTAL EDITORIAL
MENTIONS IN 2017



6593

TOTAL SOCIAL
MENTIONS IN 2017

WEB STATS



2017

1,787,749 USERS

2016

1,641,719 USERS

- ▶ **8%** growth in website visitors from previous year. More than **20%** growth over five years.
- ▶ **AIChE.org** attracts site visitors from Australia, Brazil, Canada, India, China, Japan, Malaysia, South Korea, the UK, and more.

AIChE Engage

Engage connects AIChE members with each other and their chemical engineering communities. It serves as the Institute's directory, discussion/communication platform, and volunteer hub.

Discussion Central is the pulse of AIChE's online activity with technical and professional development discussions happening daily. Student Central provides a discussion space for undergraduate students, and Engage is also the home for many private or subject-specific communities.

[AIChE.org/Engage](https://www.aiche.org/engage)



2017 DISCUSSION CENTRAL STATS



29k

SUBSCRIBED



1.9k

TOTAL PUBLIC
MESSAGES



8.3

REPLIES PER
MESSAGE



233

TOTAL THREADS



1.1k

UNIQUE
CONTRIBUTORS

Find AIChE daily on
Twitter, Facebook,
LinkedIn, and YouTube.



TWITTER @CHENECTED

10.8k
FOLLOWERS



LINKEDIN

16.4k
FOLLOWERS



FACEBOOK

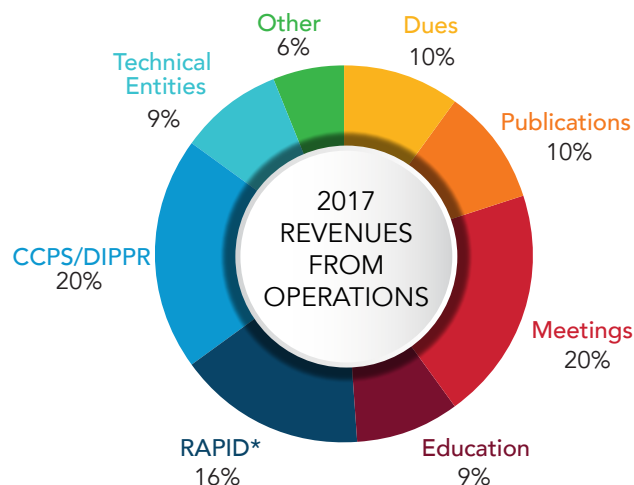
19.4k
PAGE LIKES



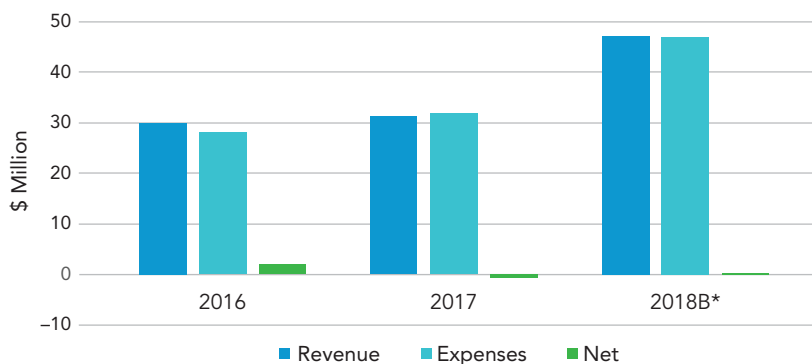
YOUTUBE

6.4k
SUBSCRIBERS

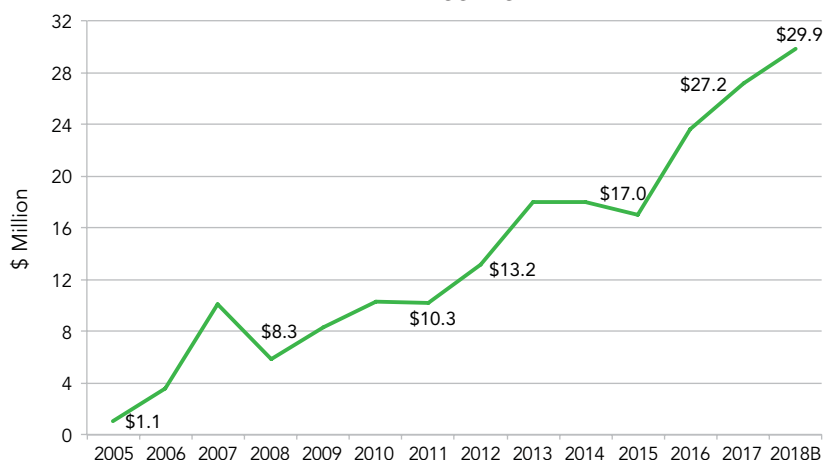
Financial



AICHe OPERATIONS



NET ASSETS



*Due to accelerated growth of the new RAPID Manufacturing Institute.
Financials reflect pre-audit numbers.



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AICHE 
The Global Home of Chemical Engineers