



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:45 pm – 5:45 pm**

**Potential Questions regarding Communicating with the Public:**

- How do engineering academies interact with the public?
  - What are the primary communications channels?
  - What are the primary audiences targeted?
- Are there best practices that can be distilled from CAETS member academies?
  - How do you determine which mechanisms are the most effective for a given audience?
  - Do you maintain and analyze specific metrics?
- What might CAETS do to communicate the value of engineering to society, policy-makers, and other stakeholders?
  - What are the “common” messages that should be communicated globally?
  - What means should be used to communicate those messages?
  - Should we build alliances with other engineering organizations in order to gain broader distribution networks?
- What are the next steps for CAETS?



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:34 pm – 5:45 pm**

**Potential Questions regarding Communicating with the Public:**

- How do engineering academies interact with the public?
  - What are the primary communications channels?  
 Besides classical PR activities as media relations, events, online and social media acatech also provides an open dialogue on current controversial topics aiming for stakeholders from science, industry and society. On selected Tuesdays there is an evening discussion (“acatech am Dienstag”) with experts on topics as digitization, Energiewende, nursing robots, autonomic driving, future of work etc. We organize also science cafés all over the country on distinctive topics with regional relevance.  
 There are also publications on science communication and organized science slam competitions. With “acatech Horizonte” we are developing an easy-to-read scientific scheme combining articles, videos and events on a specific topics as blockchain or cyber security to inform decision makers. acatech recommends that scientists who, as communicators, already invest significant resources in terms of funds and time, strive to increase their visibility and maintain credibility in the eyes of generally less specialised but in media terms more strongly represented opinion formers.
  - What are the primary audiences targeted? B2B in science, economy, politics/decision makers and interested/engaged society. There are also workshops for students e.g. drawing science comics.  
 acatech recommends , for the purpose of targeting specific groups, the adoption of a more problem-oriented approach to communication with the general public rather than a technology-oriented approach.
- Are there best practices that can be distilled from CAETS member academies?
  - How do you determine which mechanisms are the most effective for a given audience?  
 The classical mechanism is based on a good publication fostered by public and media relation work. A good example of our work in 2018 is the report “TechnikRadar”, a survey based on phone interviews about motivation, feelings and reactions of selected social groups regarding technologies.  
 Best experiences were made with interactive dialogue-oriented forums. acatech recommends that the positions and value judgements held by individual stakeholders, including those outside the scientific community, be treated with respect throughout all communication processes, and to be given due, serious consideration, without prejudice. in relation to the dialogue between science and society, options need to be investigated for ensuring that information and opinions are gathered and received systematically from the general public by science and industry.
  - Do you maintain and analyze specific metrics? We analyze the media resonance, social media and online benchmarks, downloads and feedbacks of our stakeholders. acatech recommends that science studies be launched to systematically bring together the findings of theoretical research with practical experience.
- What might CAETS do to communicate the value of engineering to society, policy-makers, and other stakeholders?



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:34 pm – 5:45 pm**

- What are the “common” messages that should be communicated globally?  
Reliable science is an indispensable basis for good (political) decisions.  
Science and technologies are indispensable for reaching the Sustainable Development Goals of the United Nations.
- What means should be used to communicate those messages?  
People are not convinced by a loud volume, but by listening and discussing.  
A close orientation of CAETS activities (events, publications and communication) towards the activities of the United Nations would be helpful.
- Should we build alliances with other engineering organizations in order to gain broader distribution networks?  
From a science academy’s view, both sides benefit from a bridge between science and implementation. Possible partners regarding the SDGs are e.g. “Engineers without Borders international”, “United Nations Environment Programme” and the WFP Innovation Accelerator.
- What are the next steps for CAETS? A helpful international activity besides common communication activities could be a conference about the science of science and technology communication and best/effective practice in different countries. One step might be to create a CAETS Committee on that.



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:34 pm – 5:45 pm**

**Background on CAE (Canada) and Input to the Communications Question**

To understand the CAE (Canada)'s comments on this topic, it is important to provide background.

The Canadian Academy of Engineering (CAE) comprises many of the country's most accomplished engineers, who have expressed their dedication **to providing strategic advice on matters of critical importance to Canada related to the application of science and engineering principles**. The Academy is an independent, self-governing and non-profit organization established in 1987 to serve the nation in matters of engineering concern. We have approximately 750 Fellows. 11% are retired. 78% are registered professional engineers. 10% are women. 9% list French as their primary communications language, the rest English. The split between academics, industry and government/other is 58%/39%/13%. We would be interested in learning the similar demographics from other CAETS Academies.

In Canada, as in many other countries, in addition to academies of engineering, there are a number of engineering organizations / bodies (professional associations; advocacy groups; learned engineering societies; student groups; not-for-profit organizations (e.g. Engineers Without Borders)) that communicate with different segments of the populations for a number of reasons (promotion of the profession; recruitment; diversity (gender, race); general education/extension on engineering and engineers; policy making; etc.). Academies of engineering should not attempt to duplicate or to reinforce effective messages coming from other engineering stakeholders. They should rather draw on the expertise and recognition of their members to address key issues that affect individuals and societies and for which engineering contributions are essential: climate change, energy, food, housing, transportation, water.

The CAE receives no financial support from any level of government. Our staff comprises the equivalent of 1.5 FTE. This limitation requires the CAE to focus our communications.

We maintain a website <https://www.cae-acg.ca/> (which is currently receiving a major update) and social media presence through Facebook <https://www.facebook.com/CanadianAcademyOfEngineering/>, Twitter @TheCdnAcadofEng and LinkedIn <https://www.linkedin.com/groups/4520311>. We use Google analytics to measure the reach of our various website pages. Information on recent news about Fellows, nominating new Fellows and scholarship applications are our most popular pages. Our Facebook feed has very few reads each week. However, we have over 800 followers on our Twitter feed. Over 200 Fellows follow our LinkedIn account. We also email monthly newsflashes to all of our Fellows via Mailchimp. We use its analytic tools to measure how many Fellows read each section. <https://www.cae-acg.ca/whats-new-at-the-academy/cae-notes-newsflash/>. Virtually all of our internal and external communication is issued in English and French. We recently surveyed our Fellows and discovered that, of the 20% who responded to the survey, 81% read the monthly newsflash, 27% read the Twitter feed. 14% follow the Facebook page, 49% belong to the Linked group and 99% read the emails we send to the Fellows.

In order to leverage our scarce resources, we have

- i) Focused primarily on informing elected officials and public servants and



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:34 pm – 5:45 pm**

ii) Partnering with larger, respected organizations.

To address i) we have introduced ourselves to Ministers and opposition critics of relevant ministries (Finance, Industry, Science, Transport, Natural Resources) and kept them on our mailing lists. When we have research projects, we include government officials as participants <http://irpp.org/research-studies/making-better-use-of-science-and-technology-in-policy-making/>. We proactively seek nominations of Fellows who are elected officials and public servants. In 2018, 10% of new Fellows were in these categories. We publish op-eds in media outlets most likely to be read by government officials <https://www.hilltimes.com/>. We provide testimony to House of Commons and Senate Committees and follow up with committee members.

<http://www.ourcommons.ca/Committees/en/RNNR/StudyActivity?studyActivityId=9966108>

We are members of two larger organizations, the Council of Canadian Academies ([www.scienceadvice.ca](http://www.scienceadvice.ca)) and the Partnership Group for Science and Engineering ([www.pagse.org](http://www.pagse.org)). The former receives federal government funding to perform assessments for various ministries and our Fellows participate when their expertise is useful. PAGSE provides a written brief to the annual Federal Budget consultation. They also mount regular “Bacon & Eggheads” sessions on Parliament Hill where researchers provide parliamentarians with overviews of current science and engineering topics <http://pagse.org/en/breakfasts.htm>

We have had success in the past with partnering with larger Social Science think tanks, as they have staff to handle report product, event planning and communications. We can provide them with the engineering skills that their researchers do not have. We have collaborated with the Institute for Research in Public Policy (<http://irpp.org/>) on a series of workshops on how engineers could best inform public policy. We worked with the Conference Board of Canada ([www.conferenceboard.ca](http://www.conferenceboard.ca)) on the effects on the economy on implementing carbon pricing and other GHG reduction measures. <https://www.conferenceboard.ca/e-library/abstract.aspx?did=8945>

**Potential Questions regarding Communicating with the Public:**

- How do engineering academies interact with the public?
  - What are the primary communications channels?
  - What are the primary audiences targeted?
- Are there best practices that can be distilled from CAETS member academies?
  - How do you determine which mechanisms are the most effective for a given audience?
  - Do you maintain and analyze specific metrics?
- What might CAETS do to communicate the value of engineering to society, policy-makers, and other stakeholders?
  - What are the “common” messages that should be communicated globally?
  - What means should be used to communicate those messages?
  - Should we build alliances with other engineering organizations in order to gain broader distribution networks?



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:45 pm – 5:45 pm**

## US National Academy of Engineering (Background Information)

### Raising Public Awareness of Engineering (2002)

Download Free PDF: <https://www.nae.edu/77919.aspx>

Description: The public has little awareness or appreciation of engineering as the source of technology. The engineering community spends mightily to try to improve public awareness, but an NAE-commissioned survey of activities intended to raise public awareness found little coordination among them and few measures of success. This report provides the results of this survey, explains why it was needed, and recommends how the engineering community can work successfully to communicate the importance of engineering to society.

#### Key Messages Identified:

##### For Students –

- An engineering education is valuable as the basis for a variety of careers.
- Engineering offers challenges, excitement, opportunities, and satisfaction.
- Engineering is worthwhile, challenging, fun, and within reach.
- An engineering career provides flexibility that allows for family life choices and helping people.
- It's not as complicated as you think. Anyone can understand the principles of engineering.
- Engineering is a collection of diverse fields that need people with diverse talents, experiences, creativity, and entrepreneurial spirit.
- Math (and science and technology) literacy will open doors in your future.
- Math is the alphabet of science and engineering.
- The excitement of engineering is that engineers create "something that has not been" for the good of humanity.
- Engineering includes a variety of fields of study and occupations.
- Math is challenging. Competition is not limited to sports.
- Engineers are not what people expect.
- Engineering is a springboard to many career opportunities.

##### For Parents, Teachers, and Guidance Counselors –

- Students must take the tough courses if they want to enter a college of engineering.
- Engineering features low unemployment, and engineers are creative and human.
- If you like math, you'll love engineering.
- If you like solving problems, wait till you hear what engineers can do.
- Engineering offers a lifetime of interesting work.

##### For the Engineering Community (for internal use by trade associations and professional societies and for recruiting at the college level) –

- Engineering is a core competency necessary to solve the complex technical and environmental challenges facing our customers and stakeholders.
- Engineering is a lion's profession.
- Engineering provides innovative solutions to societal problems.
- Engineers make use of both old and new knowledge to solve practical problems.



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:45 pm – 5:45 pm**

- Engineering plays an influential role in the burgeoning fields of bioethics, national security, and others. Engineering is a profession for leaders.

For Policy Makers and Opinion Leaders –

- Engineers are responsible for the high standard of living in the United States.
- Engineering builds societies. Engineering advances economies.
- Engineering is integral to society's progress and a country's ability to produce wealth.
- The United States can't expect to continue to solve its problems by importing technical talent from developing countries.
- Engineers are technology-literate citizens.
- Global competitiveness demands that many of the best and brightest students enroll in engineering.
- If engineering enrollments continue to decline, our nation will face a severe competitive and economic crisis.

Initiatives for Consideration (Not prioritized and all should include developing measures of effectiveness)

- **Internet Information:** Create a web-based "clearinghouse" for information about engineering outreach accessible not just to the engineering community, but to teachers, parents, students, media, etc.
- **Media Education Programs:** These would include interaction with reporters at high-level fora, one-on-one meetings with influential media, and small group presentations for regional newspapers.
- **Movie and TV Show Development:** These should be geared toward children.
- **Advertising and Public Service Announcements:** A targeted ad campaign could be developed, but needs to be cost effective and should be unified through consistent messages, taglines, and logos. The campaign should generate awareness through focus on basic social issues: standard of living, global competitiveness, economic growth, and national security.
- **Public Lecture Series and Exhibits:** Encourage lecture series and exhibits on engineering topics (perhaps in conjunction with engineering schools) on topics ranging from "hot" practice areas to new engineering developments to large projects in local areas, directed to a generally educated audience who are not engineers, and using engaging speakers.
- **Grassroots Outreach:** Harness and build on the interest and enthusiasm of current outreach activities across the engineering community. Support these efforts by developing common messages, sharing experiences through a web-based clearinghouse, and providing guidance on objectives, execution, and measurement of effectiveness. Unify the efforts through consistent messages and increase efforts to bring activities to more schools and communities on a continuous basis throughout the year.
- **Competitions:** Appeal to the competitive spirit of young people to generate interest in engineering. Use existing local, regional and national competitions to generate more visibility and create more opportunities for greater interaction between students and engineers. Work to expand participation within the engineering community including industry, societies, national labs, and academia



**CAETS Discussion Group: Communicating with the Public**  
**Monday, 10 September 2018**  
**3:45 pm – 5:45 pm**

**Communicating Science and Engineering Data in the Information Age (2011)**

Download Free PDF: <https://www.nae.edu/53384.aspx>

Description: The National Center for Science and Engineering Statistics (NCSES) of the National Science Foundation (NSF) communicates its science and engineering (S&E) information to data users in a very fluid environment that is undergoing modernization at a pace at which data producer dissemination practices, protocols, and technologies, on one hand, and user demands and capabilities, on the other, are changing faster than the agency has been able to accommodate. NCSES asked the Committee on National Statistics and the Computer Science and Telecommunications Board of the National Research Council to form a panel to review the NCSES communication and dissemination program that is concerned with the collection and distribution of information on science and engineering and to recommend future directions for the program.

Communicating Science and Engineering Data in the Information Age includes recommendations to improve NCSES's dissemination program and improve data user engagement. This report includes recommendations such as NCSES's transition to a dissemination framework that emphasizes database management rather than data presentation, and that NCSES analyze the results of its initial online consumer survey and refine it over time. The implementation of the report's recommendations should be undertaken within an overall framework that accords priority to the basic quality of the data and the fundamentals of dissemination, then to significant enhancements that are achievable in the short term, while laying the groundwork for other long-term improvements.

**EngineerGirl**

<https://www.engineergirl.org>

The EngineerGirl website is designed to bring national attention to the exciting opportunities that engineering represents for girls and women. Why girls and women? Because despite an increase in female participation in many traditionally male-dominated professions such as medicine and law, women remain grossly under-represented in engineering. Engineering and engineers are central to the process of innovation, and innovation drives economic growth. Diversity of thought is crucial to creativity, and by leaving women out of the process of innovation we lose a key component of diversity and stifle innovation. We want the creative problem-solvers of tomorrow to fully represent the world's population, because they will be the ones to ensure our health, happiness, and safety in years to come.

The site was launched in 2001 with input from a specially selected [Girls Advisory Board](#)—bright, energetic girls from all over the United States and Canada. In 2012 a new Girls Advisory Board was instituted in order to re-design the site for a modern audience. The ongoing work of EngineerGirl is overseen by the [EngineerGirl Steering Committee](#) with the generous support of [our sponsors](#).

The website is a service of the National Academy of Engineering (NAE) and grew out of the work of the NAE Committee on the Diversity of the Engineering Workforce.

**Engineering Innovation Podcast and Radio Series**

The NAE works with the Washington, D.C. region's only all-news radio station— WTOP Radio— and the nation's only all-news radio station for federal employees— WFED 1500 AM— to provide weekly features highlighting engineering innovations and stories that add technical context to issues in the news.





## **RAEng Responses**

### **Potential Questions regarding Communicating with the Public:**

#### **1. How do engineering academies interact with the public?**

The type of communication depends heavily on the audience and the goal of the communication. The Royal Academy of Engineering employs a variety of communication methods with the below giving an example of likely channels:

- General Public
  - Social Media (Twitter, LinkedIn, Facebook)
  - News Media (through press releases)
  - Academy Website
  - Printed materials at public events
  - Public Lectures
- Universities/Faculty
  - Email
  - Posters
  - Flyers (printed and digital)
  - Printed Media (reports)
- Young people
  - Social Media
  - Website
  - YouTube

The Academy's international programmes have enabled us to reach out to the public in new ways and illustrate the role that engineering plays in international development and in societal progression more broadly. Through a focus on international development and the SDGs we have been able to engage with a more diverse audience and to communicate the benefits engineering brings to society, particularly to a non-engineering audience. Perhaps this case study can act as a blueprint for communicating the benefit of engineering; it is an example of how we must illustrate the tangible, real-world impact that engineering can have and ensure we do not talk about engineering in a vacuum.

#### **2. Are there best practices that can be distilled from CAETS member academies?**

- **How do you determine which mechanisms are the most effective for a given audience?**

Three of the most important steps in determining effective means of communications are: to consider who the audience; what they are likely to take from the engagement; and the intended purpose of the interaction. For example, communication strategies may be tailored depending on who the intended audience are; for instance, social media advertising can be tailored to target specific geographic regions to ensure that the opportunities on offer are reaching those who they are intended for.

We have found social media an increasingly effective tool for amplifying conversation, particularly among the younger people we engage with (under 45). Live tweeting at events by Academy staff, Academy accounts, and event participants has enabled conversations to be followed by those who are



## CAETS Discussion Group: Communicating with the Public Monday, 10 September 2018 3:35 pm – 5:45 pm

not in the room and sets a platform for wider engagement. Many Academy events incorporate a social media toolkit into the event materials, providing guidance and direction on how to engage with Academy social media, and contribute to the conversation.

Another aspect worthy of consideration is how wide reaching we want the particular communication to be. Broader, high level announcements often follow more traditional means such as press releases and posting on the website. Such communications are often more content heavy and require more time for an audience to engage with. In cases such as these, social media can be used as a directional, support tool to signal potential users in the direction of the website or news article.

Key questions to ask include; Will the intended audience use the medium of communication being used? Who are we trying to reach? How do we want them to engage with us and why?

- **Do you maintain and analyse specific metrics?**

The Academy monitors digital analytics such as website activity and social media engagement and this is fed back into communications strategies to assess their impact. This is normally on a project by project basis.

### **3. What might CAETS do to communicate the value of engineering to society, policy-makers, and other stakeholders?**

- **What are the “common” messages that should be communicated globally?**

Engineering matters. It underpins our daily lives, drives economic growth, plays a critical role in addressing major societal challenges and helps ensure our readiness for the future, from providing a sustainable supply of food, water and clean energy, to advancing healthcare, and keeping us safe and secure.

Engineering should be at the heart of policy-making, ensuring that an engineering voice is present at the very start of any policy discussions

Engineers must take a leading role in working across disciplines to tackle the Global Grand Challenges and the Sustainable Development Goals.

Diversity within the engineering profession must be nurtured and encouraged.

Engineering itself is a diverse profession, with many routes into it, and within it.

- **What means should be used to communicate those messages?**

This should be addressed on a case-by-case basis, where the target audience and the purpose of the communication is at the heart of any strategy.

- **Should we build alliances with other engineering organizations in order to gain broader distribution networks?**

Partnerships can be very beneficial in allowing a more diverse exchange of ideas and opinions, and in helping achieve objectives. However, our main concern with forming partnerships with other organisations is that we must always be asking ourselves whether this is going to increase our impact as



## CAETS Discussion Group: Communicating with the Public Monday, 10 September 2018 3:35 pm – 5:45 pm

a network. Do the other organization bring with them expertise, resources, or networks that we don't have?

#### 4. What are the next steps for CAETS?

It is the Academy's belief that communications are context dependent. As such, CAETS should begin by identifying the messages it wishes to convey and to whom, before moving on to how.

### **Royal Academy of Engineering Background Information**

#### **Communications Campaigns**

##### This Is Engineering

- *This is Engineering is a new multi-year campaign led by the Royal Academy of Engineering in partnership with eleven major engineering organisations to change the perception of engineering among young people aged 13-18.*
- *This is Engineering* challenges those misconceptions, by presenting a positive image of modern engineering. Through real young engineers it illustrates how engineering is behind many of the things they are already interested in – sport, fashion and tech for example – and that they can follow what they love into engineering, and in doing so help shape the future.
- The first year of the campaign will challenge young people (13-18) to reconsider what engineering really looks like with bold advertising on social media platforms. Supporting PR will encourage parents and teachers to talk about engineering in positive ways with young people, and also communicate the skills and diversity challenge to policy makers and business leaders.
- *This is Engineering is a key partner in HM Government's Year of Engineering, which was launched on 15 January 2018. Together the two campaigns will help inspire the next generation of engineers, raising public awareness about engineering's variety, appeal and impact.*
- At the heart of *This is Engineering* are five 40-second videos, each of which profiles a young engineer who is doing something remarkable. Watch Pavlina, Chris, Vinita, Charles and Daniella and be inspired by the power and potential of engineering!
- <http://www.thisisengineering.org.uk/>

#### **Publications & Reports**

##### Ingenia!

- *Ingenia!* is a stimulating and informative quarterly magazine that publishes articles across the whole range of engineering disciplines. It is aimed at everyone with an interest in engineering, whether working in business and industry, government,



## CAETS Discussion Group: Communicating with the Public

Monday, 10 September 2018

3:35 pm – 5:45 pm

academia or the financial community. Complex or technical engineering issues are made accessible, and will interest engineering enthusiasts of all ages.

- *Ingenia!* has a circulation of around 11,000, and is sent free of charge to anyone who wishes to receive it, including Academy Fellows, engineers, students and teachers. More than 3,600 schools, colleges and university technical colleges receive copies.
- <http://www.ingenia.org.uk/>

### Designing Inclusion into Engineering Education

(<https://www.raeng.org.uk/publications/reports/designing-inclusion-into-engineering-education>)

- A fresh, practical look at how diversity impacts on engineering and strategies for change
- Educators have a fundamental role to play in addressing the skills gap in engineering, but making the profession more welcoming to everyone is challenging. This report sets out a framework to build an inclusive higher education environment in engineering and technology. Based on work at UCL from 2011 to 2016, which culminated in a symposium, it also includes contributions from experts across the world and is supported by the Royal Academy of Engineering.
- This report also builds on a recent study by the Academy (2017) that focuses on creating cultures where engineers thrive. The aim is to work towards an inclusive graduate engineer who understands that they are not working in a monoculture and not producing products or solutions for a homogenous customer  
(<https://www.raeng.org.uk/publications/reports/creating-cultures-where-all-engineers-thrive>)