

## ACS Change Drivers

### ***What is a Change Driver?***

Change Drivers are indicators of fundamental driving forces showing where important change is, or could be, happening that will impact strategic planning over the next 5 to 10 years. They include shifts or trends that can spell change ahead, and they help us think about the future. They are developed from research<sup>1</sup> and Environmental Scanning (EScan) and provide context for grassroots group EScanning.

### ***What is an ACS Change Driver?***

In 2017, the ACS Board Strategic Planning Committee (SPC) worked with Foresight Alliance (FA), an innovative consulting firm, with the goal of making ACS environment scanning and futures forecasting more robust. FA applies foresight, strategy, and research to build organizations' resilience in today's increasingly complex and fast-changing environment. The main drivers for this initiative were concerns about missing trends or themes, especially weak signals, and a desire for improved balance between internal discussions and external input. Phase I of the project included interviews of ACS governance and staff and other research to develop a domain map of areas of significant impact on ACS strategy. In Phase 2, a trends inventory was created, consisting of 60-80 ACS Signals (forecasts, trends, issues, innovations). During Phase 3, eight change drivers particular to the chemistry enterprise were developed that identify where relevant change is taking place as well as the implications for ACS strategy (see Appendix).

In November 2017, a face-to-face meeting of the SPC and a few selected ACS leaders was held to do a deep dive on the content and usage of the eight change drivers and to prepare a preliminary report to the Board. For each change driver the participants identified their perceived level of impact (high or low) in the short-term and long-term on five segments of the Society (Society as a whole, Executive Leadership Team, Board of Directors, Committees/Advisory Boards, and Grassroots units—local sections, technical divisions, regional boards and international chapters).

### ***What are the ACS Change Drivers?***

The three highest perceived impact change drivers include:

- **Conferences and Events Re-imagined** *to adapt the meeting experience to embrace new modes of learning, improved personalization, and more meaningful participant engagement.*
- **Chemistry's Changing Workforce** *to adapt to demographic shifts, diversity increases, and automation.*
- **Globalization of Chemistry** *to adapt to the shifting balance of science including R&D and manufacturing around the globe.*

### ***How Can the ACS Change Drivers Help Us with our Work?***

ACS grassroots units are encouraged to engage in strategic discussions centered on one, two or all three of the high impact change drivers by discussing the following questions with your respective groups:

- How could a particular change driver affect us, for example in terms of new products, services or modes of working?
- With respect to a particular change driver, what could/should/must be done to ensure our future strength and viability?

<sup>1</sup>[Teaching about the Future by Drs. Peter Bishop and Andy Hines](#)

## Appendix: ACS Change Drivers

### Conferences and Events Re-imagined

Conferences and events need to adapt the meeting experience to embrace new modes of learning, improve the personalization of meeting programs, and create new opportunities for meaningful engagement—especially to attract younger members.



### Chemistry's Changing Workforce

The chemistry workforce is facing potentially significant change and disruption as demographics shift, diversity increases, and the continuing rise of automation makes itself felt. At the same time, uncertainty about immigration could spark a new challenge as foreign students return to their home countries or never arrive in the US.

### Globalization of Chemistry

The center of balance of global science is gradually moving from the Atlantic to the Pacific Rim, as Asian science continues to grow in scale and sophistication. Asia is funding a growing portion of the world's R&D driven by economic growth and rising technological aspiration.



### New Models of Information Delivery and Discovery

Digitization of information has swelled the amount of scientific information generated. New digital tools for sharing and searching information continue to change how science is conducted and how information is shared.

### Chemistry's Interdisciplinary Future

Chemistry has been highly successful in its embrace of interdisciplinarity and is developing deeper links in fields like energy, climate change research, agriculture, and advanced materials.



### Automating Chemistry

Advanced analytics and artificial intelligence (AI) systems are increasingly automating lab work, synthesizing research advances, and creating complex computational molecular models—all far more productively than human researchers.

### Greening Chemistry

The chemical industry is positioning itself as innovative and proactive when it comes to environmental issues, by developing non-hazardous or climate-friendly alternatives to conventional chemical ingredients.



### American Petrochemical Resurgence

Hydro-Fracking has helped turn the US back into a global energy superpower and transformed it into a low-cost petrochemicals producer. This has triggered a wave of new investment in chemical-production facilities, with significant new capacity coming online over the next few years