The National Academies of Sciences, Engineering, and Medicine (NASEM) announced on July 21, 2022, publication of a new report entitled The Importance of Chemical Research to the U.S. Economy. The National Science
Foundation (NSF), the Department of Energy (DOE), the National Institute of Standards and Technology (NIST), and the American Chemical Society (ACS) asked NASEM to convene a committee to consider strategies to sustain and enhance the economic activity driven by fundamental research investments in the chemical sciences. The chapter on “Sustainability for the Chemical Economy” includes the following general conclusions:

- Implementing a circular economy will require a paradigm shift in the way products are designed, manufactured, and used, and how the waste products are collected and reused. These new processes, and the use of clean energy and new feedstocks to enable these processes, will require novel chemistries, tools, and new fundamental research at every stage of design;

- Transitioning the chemical economy into a new paradigm around sustainable manufacturing, in which environmental sustainability is balanced with the need for products that will improve quality of life, enhance security, and increase U.S. competitiveness, will require substantial investment and innovation from industry, government, and their academic partners to create and implement new chemical processes and practices;

- As fundamental chemical research continues to evolve, the next generation of research directions will prioritize the future of environmental sustainability and new energy technologies. Keeping sustainability principles in mind during every stage of research and development will be critical to accomplishing this goal;

- Chemical research will have the greatest impact addressing energy and environmental sustainability if researchers and practitioners develop and use tools to quantify and mitigate environmental and human health impacts of new discoveries, are aware of the societal implications of their work, and if the research is driven by policies that identify specific environmental sustainability outcomes; and

- As the world moves deeper into its current energy transition, including the switch to electric vehicles, the implementation of clean energy alternatives, and the use of new feedstock sources, coupled with an increasing focus on circularity, decarbonization, computation, measurement, and automation will significantly alter the operations and processes of current industries, creating new opportunities and challenges that will benefit from fundamental chemistry and chemical engineering advances.

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