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**Understanding the Societal Challenges Facing Nuclear Power**

*September 1 to 3, 2021*

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The aim of this workshop is to elaborate on the nature and extent of societal challenges facing nuclear energy, and to discuss the lessons that industry, analysts, and policy makers might learn from past experiences in the nuclear industry, from analogous industries, and from rigorous social science.

Watch the livestream here: <https://livestream.com/accounts/7036396/events/9775108>

Submit questions and comments here: <http://nationalacademies.org/deps-webinar>

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*Day 1: September 1, 2021*

- 11:30 AM     **Welcome**  
*Richard Meserve, Covington & Burling LLP and Committee Chair*
- 11:35 AM     **How did we get here? The nuclear industry's record of public engagement**  
*Moderator: Ahmed Abdulla\*, Carleton University*  
– *Thomas R. Wellock, U.S. Nuclear Regulatory Commission*  
– *Spencer R. Weart, American Institute of Physics (retired)*  
– *M.V. Ramana, University of British Columbia*
- 1:00 PM     **Break**
- 1:30 PM     **What do the social and decision sciences tell us about the issues facing nuclear power?**  
*Moderator: Kirsty Gogan\*, LucidCatalyst and TerraPraxis*  
– *Baruch Fischhoff, Carnegie Mellon University*  
– *Nick Pidgeon, Cardiff University*  
– *Seth Tuler, Worcester Polytechnic Institute*
- 3:30 PM     **Adjourn**
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*Day 2: September 2, 2021*

- 11:30 AM     **Welcome**  
*Richard Meserve, Covington & Burling LLP and Committee Chair*
- 11:35 AM     **What does the field of science and technology studies tell us about the issues facing nuclear power?**  
*Moderator: Allison Macfarlane\*, University of British Columbia*

\*Denotes member of Committee on the Laying the Foundation for New and Advanced Nuclear Reactors in the United States

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- *Sheila Jasanoff, Harvard University*
- *Behnam Taebi, TU Delft*
- *Andy Stirling University of Sussex*
- *Pierre-Benoit Joly, French Institute for Research and Innovation in Society*

1:30 PM     **Break**

2:00 PM     **Opposition is not unique to nuclear energy: learning from other industries**

*Moderator: Todd Allen\*, University of Michigan*

- *Sarah Mills, University of Michigan*
- *John Downer, University of Bristol*
- *David Victor, University of California San Diego*

3:30 PM     **Adjourn**

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*Day 3: September 3, 2021*

11:30 AM     **Welcome**

11:35 AM     **What can we learn from nuclear waste siting? Successes and challenges.**

*Moderator: Allison Macfarlane\*, University of British Columbia*

- *Saida Laârouchi Engström, Swedish Nuclear Fuel and Waste Management Company*
- *Arne Kaijser, KTH Royal Institute of Technology*
- *Anne Bergmans, University of Antwerp*

1:30 PM     **Break**

2:00 PM     **Best practices in public engagement and participation from ongoing activities related to nuclear energy.**

*Moderator: Ahmed Abdulla\*, Carleton University*

- *Doug Hunter, UAMPS*
- *Mary Woollen, Ultra Safe Nuclear Corporation*
- *Christi Bell, University of Alaska Business Enterprise Institute*

3:30 PM     **Adjourn**

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**Panelist Biographies**

**Panel 1**

**Thomas R. Wellock, U.S. Nuclear Regulatory Commission**

Thomas Wellock is the Historian of the Nuclear Regulatory Commission (NRC). He earned a Ph.D. in history from the University of California, Berkeley and published two books, *Critical Masses: Opposition to Nuclear Power in California, 1958–78* and *Preserving the Nation: The Conservation and Environmental Movements, 1870-2000*. Previously, he was a professor of history at Central Washington University (1997-2010). He also worked as a systems engineer at the Davis-Besse Nuclear Power Station and as a reactor test engineer for General Dynamics Corporation. He has authored numerous scholarly articles, blogs, and video histories on the NRC and nuclear power.

**Spencer R. Weart, American Institute of Physics (retired)**

Spencer R. Weart, received a B.A. in Physics at Cornell University in 1963 and a Ph.D. in Physics and Astrophysics at the University of Colorado, Boulder, in 1968. He then worked for three years at CalTech as a Fellow of the Mt. Wilson and Palomar Observatories, publishing papers in leading scientific journals. In 1971 Dr. Weart changed his field, enrolling as a graduate student in the History Department of the University of California, Berkeley. From 1974 to early 2009 he served as Director of the Center for History of Physics, American Institute of Physics, the oldest institution dedicated to preserving and making known the history of a scientific discipline. Dr. Weart has written two children's science books and wrote or co-edited seven other books. His most recent books are *The Discovery of Global Warming* (Harvard University Press, 2nd ed., 2008) and *The Rise of Nuclear Fear* (Harvard University Press, 2012). Dr. Weart has taught history of science courses at the Johns Hopkins University, the New School-Lang College, and Princeton University. He has served as Treasurer and Council member of the History of Science Society.

**M.V. Ramana, University of British Columbia**

M. V. Ramana is Professor and Simons Chair in Disarmament, Global and Human Security at the School of Public Policy and Global Affairs (SPPGA), University of British Columbia. He is also Director of the Liu Institute for Global Issues and the Acting Director (2020-2021) of the Centre for India and South Asia Research (CISAR) in the Institute of Asian Research. His research interests are in the broad areas of international security and energy supply, with a particular focus on topics related to nuclear energy and fissile materials that can be used to make nuclear weapons. He combines technical skills and interdisciplinary methods to address policy relevant questions related to security and energy issues. He is the author of *The Power of Promise: Examining Nuclear Energy in India*.

**Panel 2**

**Baruch Fischhoff, Carnegie Mellon University**

Baruch Fischhoff, Ph.D., is the Howard Heinz University Professor in the Department Engineering and Public Policy and Institute for Politics and Strategy at Carnegie Mellon University. A graduate of the Detroit Public Schools, he holds a BS in mathematics and psychology from Wayne State University and an MA and PhD in psychology from the Hebrew

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University of Jerusalem. He is a member of the National Academy of Sciences and of the National Academy of Medicine. He is past President of the Society for Judgment and Decision Making and of the Society for Risk Analysis. He is a Fellow of the American Psychological Association (APA), the Association for Psychological Science, the Society of Experimental Psychologists, and the Society for Risk Analysis. He has co-authored or edited myriad titles, including: *Acceptable Risk* (1981), *Elicitation of Preferences* (2000), *Risk Communication: A Mental Models Approach* (2002), *Intelligence Analysis: Behavioral and Social Science Foundations* (2011), *Risk: A Very Short Introduction* (2011), *Communicating Risks and Benefits: An Evidence-Based Guide* (2011), *Judgment and Decision Making* (2011), *Risk Analysis and Human Behavior* (2011), and *The Science of Science Communication I* (2013), *II* (2014), and *III* (2019).

**Nick Pidgeon, Cardiff University**

Nick is Director of the Understanding Risk Research Group within the School of Psychology at Cardiff University and Professor of Environmental Risk. His research looks at public attitudes, risk perception and public engagement with environmental risks, emerging technologies (GM, nanotechnologies, climate engineering), climate change, and energy systems. He is a Fellow of the Society for Risk Analysis and was awarded an Honorary Fellowship of the British Science Association in 2011 and an MBE in the 2014 Queen's Birthday Honours for services to climate change awareness and energy security policy. Nick chaired the 2006 Cross-Party Parliamentary inquiry whose report 'Is a Cross-Party Consensus on Climate Change Possible – or Desirable?' recommended the setting up of the UK Climate Change Committee. He is a co-investigator in the UK Energy Research Centre, and has held numerous science advisory roles in UK government departments over the past 25 years. He was one of the first social scientists to empirically investigate societal attitudes towards climate engineering in the UK (using both surveys and deliberative workshops) as part of the Integrated Assessment of Geoengineering (IAGP) Project.

**Seth Tuler, Worcester Polytechnic Institute**

Seth has been part of the Interdisciplinary and Global Studies Division since 2002, as teacher, advisor, and co-director of project centers. He is currently the co-Director of the Boston Project Center. A desire to link research and practice has been a central part of Seth's work since receiving his PhD in Environmental Science and Policy from Clark University in 1996. Seth's research interests have been concerned with risk governance, public participation, long-term stewardship of contaminated sites, and developing tools to characterize human impacts and vulnerabilities to risk events. He has conducted research, largely with colleagues at the Social and Environmental Research Institute, in a wide range of policy arenas, most recently focused on climate change adaptation planning, clean-up of sites in the US nuclear weapons complex, and nuclear waste management. A thread throughout his work has been to empower communities to participate more effectively in the management of risk.

**Panel 3**

**Sheila Jasanoff, Harvard University**

Sheila Jasanoff is Pforzheimer Professor of Science and Technology Studies at the Harvard Kennedy School. A pioneer in the social sciences, she explores the role of science and technology in the law, politics, and policy of modern democracies. Her books include *The Fifth*

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Branch, *Science at the Bar*, *Designs on Nature*, *The Ethics of Invention*, and *Can Science Make Sense of Life?* She founded and directs the STS Program at Harvard; previously, she was founding chair of the STS Department at Cornell. She has held distinguished visiting appointments at leading universities in Europe, Asia, Australia, and the US. Jasanoff served on the AAAS Board of Directors and as President of the Society for Social Studies of Science. She is an elected member of the American Academy of Arts and Sciences and the American Philosophical Society, foreign member of the British Academy and the Royal Danish Academy, and member of the Council on Foreign Relations. She holds AB, JD, and PhD degrees from Harvard, and honorary doctorates from the Universities of Twente and Liège.

**Behnam Taebi, TU Delft**

Behnam Taebi is Professor of Energy & Climate Ethics and Scientific Director of the Safety & Security Institute at Delft University of Technology. Taebi studied Material Science and Engineering (2006) and received his Ph.D. in Philosophy of Technology (2010). He was further affiliated with Belfer Center for Science and International Affairs at Harvard University (2014-2020). Taebi is the co-Editor-in-Chief of *Science and Engineering Ethics*, and co-editor a volume on *The Ethics of Nuclear Energy*, published with Cambridge University Press (2015) and the author of a monograph on *Ethics and Engineering*, forthcoming with Cambridge University Press (2021). He is also a member of The Young Academy of the Royal Netherlands Academy of Arts and Sciences (in Dutch: DJA-KNAW) and a member of the OECD Expert Group on ‘Transdisciplinary Research for Addressing Global Challenges’. His research interests are in energy ethics, nuclear ethics, responsible innovation and engineering ethics.

**Andrew Stirling University of Sussex**

Andy Stirling is Professor of Science and Technology Policy at the Science Policy Research Unit at the University of Sussex, where he co-directs the 'STEPS Centre'. He has a background in the natural sciences, a master's degree in archaeology and social anthropology (Edinburgh) and a D.Phil. in science and technology policy (Sussex). Formerly a board member of Greenpeace International, Stirling has worked in collaboration with a diverse range of organisations. His research interests include technological risk, innovation policy, scientific uncertainty and public involvement in decision-making, and he has been involved in developing some participatory appraisal methods. Working on issues of power, uncertainty and diversity in science and technology, he has served on a number of UK and EU governmental advisory committees, including the UK Government's Advisory Committee on Toxic Substances and GM Science Review Panel as well as the European Commission's Expert Group on Science and Governance.

**Pierre-Benoit Joly, French Institute for Research and Innovation in Society**

Pierre-Benoit Joly, economist and sociologist, is Director of research at the National Institute of Agronomic Research (INRA) in France. He holds a degree in agronomy (1982), a PhD in economics (1987) and the “Habilitation à diriger les recherches” (1995). He is the Director of the IFRIS (French Institute for Studies of Research and Innovation in Society) and of Labex (Laboratory of Excellence) SITES. Since 1996, his research activities are focused on the governance of collective risks, socio-technical controversies, the use of scientific advice in public decision making and the forms of public participation in scientific activities. He was Member of the expert group “Science and Governance” at the European Commission, he is

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Member of the Council of European Association for the Study of Science and Technology (EASST) and of the French Comité de Prévention et de Précaution and he chairs the Scientific Council of the Programme on GMOs at the French Ministry for Ecology. He has published about one hundred articles (of which more than 50 in refereed journals), three books and he has coordinated five special issues of social sciences journals. He lectures at Ecole des Hautes Etudes en Sciences Sociales (EHESS) and at Sciences Po Paris.

**Panel 4**

**David Victor, University of California San Diego**

David Victor is a professor of innovation and public policy at the School of Global Policy and Strategy at UC San Diego. He is the Center for Global Transformation Endowed Chair in Innovation and Public Policy. Victor is also the Co-director of the campus-wide Deep Decarbonization Initiative, which focuses on real world strategies for bringing the world to nearly zero emissions of warming gases. Victor is also an adjunct professor in Climate, Atmospheric Science & Physical Oceanography at the Scripps Institution of Oceanography. Prior to joining the faculty at UC San Diego, Victor was a professor at Stanford Law School where he taught energy and environmental law. His research focuses on regulated industries and how regulation affects the operation of major energy markets. Much of his research is at the intersection of climate change science and policy. Victor authored "Global Warming Gridlock," which explains why the world hasn't made much diplomatic progress on the problem of climate change while also exploring new strategies that would be more effective. Victor has been tapped by Southern California Edison to lead the company's Community Engagement Panel for decommissioning of the San Onofre Nuclear Power Plant. According to utility officials, he was chosen to lead the panel because he has the vision, leadership and experience to bring together a diverse group of concerned people. Victor, in 2016, was appointed to Co-Chair, The Brookings Institution, Initiative on Energy and Climate. He is a member of the World Economic Forum's Global Future Council on Energy, where his work focuses on the role of natural gas as a transition fuel to deep decarbonization as well as a member of the Council on Foreign Relations. In 2020, Victor was elected to the American Academy of Arts and Sciences, one of the oldest and most esteemed honorary societies in the nation.

**John Downer, University of Bristol**

John Downer is a senior lecturer in risk and resilience in the School of Sociology, Politics and International Studies at the University of Bristol. He has broad interests in the nexus between science, risk and governance. His work focuses on issues relating to the nature of expert authority, and the role of experts in debates about environmental and technological risk. He works closely with the Science and Technology Studies (STS), and the Sociology of Knowledge literatures in this regard. In previous work, John has looked at engineering debates about testing, safety and regulation in the civil aviation and nuclear spheres. His current research focuses on the risks of complex technological infrastructures (particularly nuclear power), and on the technopolitics of environmental debates (particularly radiological pollution).

**Sarah Mills, University of Michigan**

Sarah joined Center for Local, State, and Urban Policy (CLOSUP) in September 2013 as a policy analyst, and transitioned to a postdoctoral fellowship in January 2015, then to senior project

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manager in February 2018. In this role, she manages CLOSUP's Energy and Environmental Policy Initiative (EPI), including the National Surveys on Energy and the Environment (NSEE) and the new Energy and Environmental Policy Research Group, expanding the reach of UM's research related to renewable energy policy. Sarah's own research considers how energy development impacts rural communities, and in turn how state and local policies facilitate or hinder renewable energy development. Sarah received her doctorate in Urban and Regional Planning at the University of Michigan, where her dissertation looked at the impact that wind energy projects have on farming communities. She has a master's in engineering for sustainable development from the University of Cambridge, and a bachelor's degree in mechanical engineering from Villanova University. Sarah also serves on the City of Ann Arbor Planning Commission.

**Panel 5**

**Saida Laârouchi Engström, Swedish Nuclear Fuel and Waste Management Company**

Saida Laârouchi Engström is Vice President for Strategy and Programmes at SKB, the Swedish Nuclear Fuel and Waste Management Company. She started her career in The Swedish Nuclear Inspectorate as a safety inspector of nuclear installations in Sweden, and went on to lead the feasibility studies to select a site for a final repository for spent fuel in Sweden. Nuclear power companies in Sweden jointly established SKB in the 1970s. SKB's assignment is to manage and dispose of all radioactive waste from Swedish nuclear power plants in such a way as to secure maximum safety for human beings and the environment. SKB manages a system of facilities used to handle all waste from Swedish nuclear power plants. These facilities include a central interim storage facility for spent nuclear fuel (Clab) near Oskarshamn, and a final repository for short-lived radioactive waste (SFR) in Forsmark.

**Arne Kaijser, KTH Royal Institute of Technology**

Arne Kaijser is professor of History of Technology at KTH. His main research interests concern the historical development of infrastructural systems. He has studied different kind of systems (energy systems, transportation systems, communication systems and water systems) in Sweden, the Nordic Countries and Europe, and he is particularly interested in the interaction of infrastructural systems and societies. He has been President of the Society for History of Technology (SHOT), 2009-2010. He has been an active participant in the Tensions of Europe network and was Project leader for an ESF funded project on European Critical Infrastructures. Kaijser's interest in the history of nuclear energy stems from the 1970s, when he worked as a civil servant (he has an M.Sc. in engineering physics) at the Swedish Energy Agency and in parallel served as expert for the anti-nuclear movement.

**Anne Bergmans, University of Antwerp**

Anne is lecturer and senior research fellow at UA's Faculty of Social Sciences and at the Faculty of Law. She holds a PhD in Social Sciences and Master Degree in International Politics and Maritime Economics. Anne's professional interests are mainly situated in the field of science and technology studies, with particular attention to the interaction between science, society and policy. As lecturer, she acts as scientific coordinator of a master in safety studies, and teaches in courses on environment and urbanization, environmental sociology, sociology of risk and emergency planning and response. A good part of her research is focused on public and

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stakeholder engagement in radioactive waste management. In that respect, Anne has been involved in the partnership programme ONDRAF/NIRAS launched in 1998 to site a LILW-repository in Belgium. She coordinated the CARL project (2005-2008), an international social science research project on the effects of stakeholder engagement on decision-making in radioactive waste management, and acted as supervisor and coordinator of the InSOTEC project, funded under the 7th Framework Program (EURATOM; 2012-2014). This project focused on boundary work between the social and the technical in R&D and planning for geological disposal. Anne was furthermore involved in the MoDeRn project (Monitoring Developments for safe Repository operation and staged closure), a four year collaborative project, also funded under the 7th Framework Program (EURATOM; 2009-2012), where she coordinated the social sciences work, which addressed possibilities for early stakeholder engagement in defining monitoring strategies. She is currently involved in its successor project, MoDeRn2020 (EURATOM – H2020; 2014-2018).

**Panel 6**

**Doug Hunter, UAMPS**

Mr. Douglas Hunter is the Chief Executive Officer and General Manager of Utah Associated Municipal Power Systems (“UAMPS”). Mr. Hunter joined UAMPS in December of 1983 and is a 35 year veteran of the electric utility industry. Prior to his appointment as General Manager in 1995, he served as Assistant General Manager and Manager of Municipal Resources of UAMPS. Mr. Hunter holds a Master of Business Administration degree from Utah State University and a Bachelor of Science degree in Biochemistry from the University of California, Davis. He currently serves as the past Chair on the American Public Power Association’s (APPA) Executive Committee and has served on the APPA Board of Directors.

**Mary J. Woollen, Ultra Safe Nuclear Corporation**

Mary Woollen is the Director of Stakeholder Engagement at Ultra Safe Nuclear Corporation, as well as Stakeholder Engagement Specialist with Deep Isolation. She was formerly with the Blue Ribbon Commission on America’s Nuclear Future, as Government and Community Liaison and worked to develop a consent-based approach to siting nuclear waste facilities. She has been a consultant for Lawrence Livermore National Laboratory, DOE’s Integrated Waste Management Program, and as an external engagement policy advisor to the chairman of the NRC. Previously, she was executive director of Keep Yellowstone Nuclear Free. She has a B.A. in sociology/anthropology from Denison College, and a Master of Social Work in medical social work from University of Utah.

**Christi Bell, University of Alaska Business Enterprise Institute**

Christi Bell, currently the Associate Vice Chancellor and Executive Director of the Business Enterprise Institute (BEI), has served in leadership roles at the University of Alaska Anchorage (UAA) for more than 15 years. BEI encompasses the University’s suite of business and economic development programs including the Applied Environmental Research Center which brings new revenues to the University and jobs to Alaska. Bell has extensive experience with the overall UA budgeting processes and shared governance and has strong working relationships with faculty, staff, and leadership across UAA and the UA’s campuses. Bell is regularly called upon by state and federal stakeholders to consult and provide testimony on matters impacting



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Alaska and the University system. With this experience as a backdrop, Bell's focus is on providing leadership, vision, and strategic direction towards ensuring students, faculty, and staff have opportunities to engage with and benefit from relationships with public and private sector entities. Bell holds a CEcD (Certificate in Economic Development) from the International Economic Development Council as well as a Master of Business Administration and a Master of Science in Resource Management, both from the University of Alaska Fairbanks.