AHMED ABDULLA

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CURRENT TITLES

Irwin Jacobs Post-doctoral Fellow *2015 - Present*
School of Global Policy and Strategy
University of California, San Diego

Member, Deep Decarbonization Initiative *2015 - Present*
University of California, San Diego

Adjunct Assistant Professor *2016 - Present*
Engineering and Public Policy
Carnegie Mellon University

EDUCATION

Carnegie Mellon University *2014*
Ph.D. in Engineering & Public Policy

Thesis: Exploring the Deployment Potential of Small Modular Reactors
Committee Members: M. Granger Morgan (chair); Ines Azevedo; Jay Apt; John D. Steinbruner

Princeton University *2009*
B.S.E. in Chemical Engineering
Focus on Entrepreneurship & Management

Thesis: The Electro-chemical Purification of Hydrogen using Polymer Electrolyte Membrane Fuel Cells
Thesis Advisor: Jay B. Benziger

FELLOWSHIPS & AWARDS

Grant from the Alfred P. Sloan Foundation *2017*
Assessing the contribution of light water small modular nuclear reactors to reduce carbon emissions from the U.S. energy system by 2050 (*$125,000*)

UC San Diego Frontiers of Innovation Fellowship *2016*
A radical expansion of global nuclear power: the institutional challenge (*$25,000*)

Grant from the John D. & Catherine T. MacArthur Foundation *2012*
Implications of Small Modular Reactors (SMRs) for Nuclear Security (*$706,000*)

Steinbrenner Robert Dunlap Graduate Research Fellowship *2011*
Awarded by the Steinbrenner Institute at Carnegie Mellon to support studies at the Ph.D. level

Crown Prince's International Scholarship, Bahrain *2009*
Awarded for studies at the Ph.D. level at Carnegie Mellon University

Princeton in Africa Fellowship *2009*
Recipient of fellowship to the research-oriented International Institute of Water and Environmental Engineering in Ouagadougou, Burkina Faso

The ExxonMobil Award for Outstanding Design Project *2009*
Awarded by the Chemical Engineering Department at Princeton
Winning Project: A Proposal for the Sustainable Production of Liquid Hydrocarbon Fuels

The Michelle Goudie '93 Senior Thesis Award *2009*
Awarded by the Chemical Engineering Department at Princeton
Thesis Title: The Electro-chemical Purification of Hydrogen using Polymer Electrolyte Membrane Fuel Cells

Crown Prince's International Scholarship, Bahrain *2005*
Awarded for studies at the B.S.E. level at Princeton University

PUBLICATIONS

Abdulla A, Ford MJ, Morgan MG, Victor DG. A retrospective analysis of funding and focus in U.S. advanced fission innovation. *Environmental Research Letters* **12**(8):084016. *Editor's Featured Article.*

Ford MJ, Abdulla A, Morgan MG, Victor DG (2017) Expert assessments of the state of U.S. advanced fission innovation. *Energy Policy* **108**:194-200.

Ford MJ, Abdulla A, Morgan MG (2017) Evaluating the cost, safety and proliferation risks of small floating nuclear reactors. *Risk Analysis*. doi:10.1111/risa.12756.

Abdulla A (2015) Preserving the nuclear option: Overcoming the institutional challenges facing small modular reactors. A publication of the *International Risk Governance Council*.

Abdulla A, Morgan MG (2015) Nuclear Power for the Developing World. *Issues in Science and Technology*.

Prasad S, Abdulla A, Morgan MG, Azevedo IL (2015) Nonproliferation Improvements and Challenges Presented by Small Modular Reactors. *Prog Nuc Energy* **80**:102-109.

Abdulla A, Azevedo IL, Morgan MG (2013) Expert Assessments of the cost of light water small modular reactors. *Proc Nat Acad Sci USA* **110**(24):9686-9691.

Abdulla AY, Khadka AG, Kas M, Frankenstein W, Carley KM, Carley LR (2012) Nuclear security and Iran: developing a methodology to assess a country's nuclear capacity. *Midwest Political Science Association National Conference (MPSA 2012)*.

Kas M, Khadka AG, Frankenstein W, Abdulla A, Kunkel F, Carley LR, Carley KM (2012) Analyzing scientific networks for nuclear capabilities assessment. *J Am Soc Inf Sci Technol* **63**(7):1294-1312.

Abdulla A, Laney K, Padilla M, Sundaresan S, Benziger JB (2010) Efficiency of hydrogen recovery from reformate with a polymer electrolyte hydrogen pump. *AIChE J* **57**(7):1767-1779.

PENDING PUBLICATIONS

Abdulla A. Accelerating the adoption and diffusion of low-carbon energy technologies: an investigation of the role of political and economic factors in challenging CCS deployment. In preparation.

Abdulla A, Schell KR. Achieving deep decarbonization in Japan: integrating models of political economy into energy and power system analysis. In preparation.

Abdulla A, Ford MJ, Morgan MG, Victor DG. Improved representation of the economic and institutional limits to deep decarbonization of the electric power sector. In preparation.

Ford MJ, Abdulla A, Morgan MG, Victor DG. Applying Data Envelopment Analysis to assessments of deep decarbonization strategies. In preparation.

Abdulla A, Vaishnav P, Sergi B, Victor DG. Disentangling stigma from actuarial risk: the cautionary story of nuclear power.

RESEARCH HIGHLIGHTS AND COMMENTARIES

Kramer D (2017) DOE's advanced nuclear reactor program deemed ineffective. *Physics Today.*

Brown P (2017) New Generation Nuclear Reactors Unlikely to Deliver on Design. *EcoWatch.*

Analysis highlights failings in US's advanced nuclear program. (2017) *PhysOrg.*

Puko T (2017) The idea of floating nuclear power plants gets a new look. Plants moored offshore could supply electricity to remote areas. *The Wall Street Journal.*

Tynan GR and Abdulla A (2017) California should rethink everything when it comes to climate change. *San Diego Union-Tribune.*

Abdulla A, Vaishnav P (2016) The Myth of Technology Neutral Regulation. *The Energy Collective.*

Prengaman K (2013) Does a new approach to nuclear make economic sense? Small, mass-produced reactors could be the future, but only if they get cheaper. *Ars Technica.*

WORK EXPERIENCE

University of California, San Diego September 2015 - Present
Irwin Jacobs Post-doctoral fellow *San Diego, CA*

· Conducting research on the political economy of deep decarbonization, and trying to determine how to optimize public expenditures where private capital is insufficient or unable to facilitate energy transitions. Projects include assessing the performance of government investments in R&D; comparing government R&D investment strategies across countries; and investigating how people strike bargains when evaluating the risks of clean energy technologies.

Carnegie Mellon University 2014 - 2015
Post-doctoral fellow *Pittsburgh, PA*

· Conducted research on the deployment potential of small modular nuclear reactors. It is difficult to see how we can decarbonize the world's energy system without nuclear power. The purpose of this fellowship was to sketch a potential roadmap in which nuclear power would remain a viable part of our global energy mix. Achieving this safely and securely requires changes in the industry's construction and deployment paradigms, and in the institutional paradigm governing the technology.

Intl. Institute of Water and Environmental Engineering 2009 - 2010
Researcher *Ouagadougou, Burkina Faso*

· Conducted a carbon assessment for the university while employed at its energy department. This involved a full life cycle analysis of the institute's operations. Side projects estimated Burkina Faso's renewable energy resource base, and analyzed the life cycle implications of plastic recycling in the Burkinabe context.

Benziger Fuel Cell Group 2008 - 2009
Researcher *Princeton, NJ*

· Investigated the effects of CO_2 poisoning on fuel cell performance, and whether Polymer Electrolyte Membrane fuel cells can be used on a large scale to purify reformed hydrogen. Research was conducted in the Benziger Fuel Cell Research Group (http://pemfc.princeton.edu).

The Bahrain Petroleum Company B.S.C. Summer 2007
Intern *Sitra, Bahrain*

· Trained with the Technical Services Department which, with JGC Corporation (Japan), was pre-commissioning a USD 700 million Low Sulfur Diesel Production Project and a USD 300 million Refinery Gas Desulfurization Project.

PEDAGOGICAL EXPERIENCE

Policy Analysis and Decision Theory *Under development*
School of Global Policy and Strategy, UC San Diego
This newly developed course is a core requirement of the Master of Public Policy program in the School of Global Policy and Strategy. It begins by emphasizing the importance of evidence-based decision-making in crafting and evaluating public policies. It also introduces students to the frameworks and tools of policy analysis and decision-making theory. In addition to teaching students how these tools operate, the course explicitly highlights the limitations of these tools by emphasizing the importance of robust uncertainty analysis and risk analysis, and the cognitive heuristics that challenge action.

IRGN 490: Energy Policy in Japan *Spring 2016 & 2017*
School of Global Policy and Strategy, UC San Diego
In this course, we analyze the energy policy of Japan from the 1940s onwards, and explore how energy policy choices have precipitated seminal events in Japan's modern history. After studying the tools of policy analysis, which we employ throughout the course, we explore the factors that make Japan's energy situation both unique and precarious among industrialized nations. We analyze the role of each of the major sources of energy that Japan utilizes, including coal, oil, natural gas, nuclear power, and renewables. For each of these, we anchor on one seminal development, using it as a case study, before comparing Japan's energy policy with that of other major economies. We see how, internally, even in a technocratic economy like Japan, there is interplay of institutional interests, public opinion, and unintended consequences that ultimately determines outcomes. We apply what we learn in an end-of-term project where students play the role of senior counselors or policy analysts whose goal is to articulate a sensible energy policy for Japan's future.

Assessing Risk and Making Informed Decisions *Summer 2013*
Strathmore Business School, Strathmore University, Nairobi, Kenya
This course introduced students to the concepts of risk assessment, risk management, and risk communication. It brought students up to speed on the relevant literature, and demonstrated the tools used in the field. Moreover, it systematically explored other decision-making concepts, like benefit-cost analysis and decision analysis. The course project required students to apply the tools in investigating a case study of their choice. This course was developed and taught in conjunction with Dr. Raul Figueroa for business students at Strathmore University's Business School in Nairobi, Kenya.

98-209: Weapons of Mass Destruction, War, and a Warming World *Spring 2013*
Carnegie Mellon University
Students in this course explored both the policy frameworks and the tools used by modelers in international security studies, including dynamic network analysis and agent-based modeling. The course was co-developed and co-taught with Dr. William Frankenstein, a colleague in the Department of Engineering and Public Policy.

19-701: Introduction to the Theory and Practice of Policy Analysis *Fall 2012*
Department of Engineering and Public Policy, Carnegie Mellon University
As a teaching assistant, I led preceptorial classes, occasionally filled in for Professor M. Granger Morgan, and graded student assignments and examinations. 19-701 is a core course in the Department of Engineering and Public Policy at Carnegie Mellon University. Its syllabus covers the philosophy and

history of science, utility theory, decision theory, and organizational theory. It gives students both theoretical and practical grounding in the tools of public policy and the social and decision sciences.

SUCCEED Student Program *2011-2013*
Department of Engineering and Public Policy, Carnegie Mellon University
Developed class material and delivered lectures to local high school students on "nuclear power" and "international perspectives on climate change mitigation". SUCCEED continues to be sponsored by the *Center on Climate and Energy Decision Making (CEDM)* at Carnegie Mellon University.

INVITED TALKS (NOT INCLUDING CONFERENCES)

Deep Decarbonization Initiative Seminar, UC San Diego *May 2017*
Frontiers of Innovation Scholars Program Symposium, UC San Diego *October 2016*
Center for Energy Research, UC San Diego *May 2016*
Japan Forum for Innovation and Technology, UC San Diego *May 2016*
Center for Climate and Energy Decision Making, Carnegie Mellon University *May 2016*
Science Policy Fellows Roundtable, UC San Diego *November 2015*
Carnegie Electricity Industry Center, Carnegie Mellon University *October 2014*
Carnegie Electricity Industry Center, Carnegie Mellon University *October 2013*
Nuclear Power Council, Electric Power Research Institute *May 2013*
Program on Science and Global Security, Princeton University *May 2013*
Center for Climate and Energy Decision Making, Carnegie Mellon University *May 2013*
Advanced Nuclear Technology Workshop, Electric Power Research Institute *December 2012*
Carnegie Electricity Industry Center, Carnegie Mellon University *October 2012*
Center for Climate and Energy Decision Making, Carnegie Mellon University *May 2012*
Center for Climate and Energy Decision Making, Carnegie Mellon University *May 2011*

ORGANIZATIONS

American Institute of Chemical Engineers (AIChE) *2006 - Present*
Senior Member

ASME *2006 - Present*
Professional Member

United States Association for Energy Economics (USAEE) *2012 - Present*
Member

Society for Risk Analysis (SRA) *2012 - Present*
Member

American Association for the Advancement of Science (AAAS) *2012 - Present*
Member

PEER-REVIEWER

Risk Analysis
Energy Policy

PH.D. STUDENTS

Michael Ford *May 2017*
CAPT (Ret), USN
Thesis Committee co-chair
Department of Engineering and Public Policy, Carnegie Mellon University

LANGUAGES

English (Fluent; Native)
Arabic (Fluent; Native)
French (Elementary)