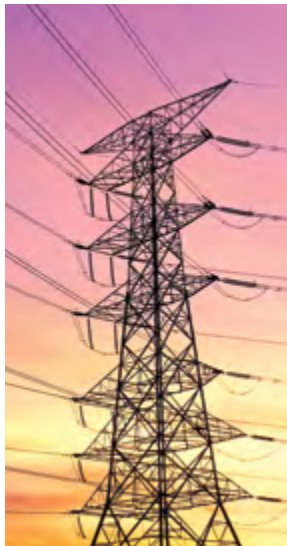


IVEY ENERGY POLICY AND MANAGEMENT CENTRE



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AND STAFF**

DIRECTOR'S MESSAGE



GUY HOLBURN, DIRECTOR | Ivey Energy Policy and Management Centre, Ivey Business School | Professor and Suncor Chair in Energy Policy

During 2018, the Ivey Energy Policy and Management Centre continued to expand its contributions to independent, evidence-based thought leadership on energy sector development in Canada with several new initiatives.

The Centre organized the annual Workshop on the Economics of Electricity Policy and Markets for the first time in Toronto, attracting participants in industry, government, and academia from across Canada and the U.S. The Centre also co-organized the Energy Leaders Roundtable in Alberta, in conjunction with the Council for Clean and Reliable Energy and the University of Calgary's School of Public Policy. This was the first year the event was held in Alberta after a five-year track record of similar roundtable events in Ontario. These forums provide an important opportunity for a range of industry stakeholders to have thoughtful, candid dialogue about the changing policy environments for electricity, gas, oil, and pipelines; their impact on the energy sector; and future paths forward. At a time when Canada's hydrocarbon sector is facing unprecedented challenges, it is more important than ever to bring stakeholders together to find new ways to advance economic, environmental, and societal needs.

In the fall, the Centre launched a new blog, EnergyMatters@Ivey, in which Ivey faculty are providing expert commentary on contemporary industry and policy issues such as regulation and governance. The blog complements the Centre's in-depth Policy Briefs and faculty's academic publications, and is designed to reach a wide-ranging audience with an interest in energy topics.

The Centre is supported generously by a broad range of organizations and individuals. I am especially grateful for the continued support of the Ivey Energy Consortium – ATCO, OMERS, Power Workers' Union, Suncor Energy Foundation, TransCanada Corporation, and Union Gas – as well as two new supporters: Bruce Power joined the Ivey Energy Consortium this year, bringing expertise and leadership in the nuclear power industry; and, Ivey alumnus, Ted Kernaghan, HBA '65, made a significant gift to establish the E. J. Kernaghan Chair in Energy Policy, awarded to Associate Professor Adam Fremeth, HBA '00.

I am most thankful for the trust and confidence of our donors, and for the efforts of the whole Ivey Energy Policy and Management Centre team – faculty and staff, students, executive fellows, and advisory board members – all of whom are integral to the Centre's achievements and contributions.

RESEARCH

SUPPORTING ACADEMIC THOUGHT LEADERSHIP



TED KERNAGHAN, HBA '65, SUPPORTS NEW CHAIR AND RESEARCH FUND IN ENERGY POLICY

TED KERNAGHAN, HBA '65, (LEFT)
AND ADAM FREMETH, HBA '00

Ted Kernaghan, Senior Investment Advisor at Kernaghan & Partners Ltd., sees major energy projects more as a nation-building exercise than merely the development of large-scale infrastructure.

Kernaghan's keen interest in how energy projects are decided, financed, and completed dates back more than 50 years, when he spent five years as an oil analyst. From his analysis, Kernaghan feels Canada needs to do a better job of bringing major energy projects to fruition, in a manner that is equitable to all impacted jurisdictions.

To help Canada avoid future "missed opportunities," Kernaghan gave \$1.5 million to Ivey in late 2017 to establish the E.J. Kernaghan Chair in Energy Policy and the related E.J. Kernaghan Energy Policy Research Fund, both in support of the Ivey Energy Policy and Management Centre.

"In my view, there's an opportunity to make improvements in the way we're behaving," Kernaghan says. "I really think policy, academic research, and communication should be able to play a significant role."

Professor Adam Fremeth, HBA '00, was appointed to the inaugural E.J. Kernaghan Chair in April 2018, for an initial four-year term. Fremeth is an Associate Professor in the business, economics, and public policy area and joined Ivey full time in 2009. He has contributed to Ivey's impact on energy policy at the federal and provincial levels, which led to Ontario's 2017 "smoothing" of generation costs and the implementation of Ivey recommendations to the National Energy Board Modernization Project.

Fremeth says the gift to support the chair and research fund is an affirmation of the Energy Centre's ability to connect academic research to the challenges of practitioners and policy-makers.

"Seeing a distinguished alumnus come back and recognize that the School continues to take a leading role in the Canadian economy is an important sign for all of us who are working on these types of issues," Fremeth says. "I think we're contributing to the Canadian discussion and helping to elevate the quality of that conversation, either on the academic side or on the more practitioner-oriented work we do with executives and policy-makers. This bodes well for the future of our economy and Ivey's role in it."

NEW FACULTY STRENGTHEN ENERGY CENTRE RESEARCH PORTFOLIO



BRIAN RIVARD

ADJUNCT PROFESSOR AND RESEARCH
DIRECTOR, IVEY ENERGY POLICY AND
MANAGEMENT CENTRE

CURRENT ROLE

Rivard conducts research on energy policy topics, provides oversight, project management, and strategic direction for the Centre's research initiatives, and communicates the Centre's research findings to academics, policy-makers, and business leaders. His goals are to promote the use of evidence-based research in energy policy-making and to create a forum for industry, government, academia, and interested stakeholders to discuss and exchange ideas on energy policy development.

PREVIOUS ROLES

Principal at Charles River Associates, Director of Markets at the Independent Electricity System Operator (IESO), and senior economist with the Canadian Competition Bureau. While at the IESO, Rivard analyzed the impacts of changes to the IESO Market Rules, Market Design, government policies, and other industry initiatives. He also gave expert testimony before the U.S. Federal Energy Regulatory Commission and the Ontario Energy Board.

RESEARCH INTERESTS

Rivard's research focuses on energy market design and regulation. One of his research projects explores approaches to the recovery of capacity-related costs in energy markets and opportunities in Ontario to more efficiently recover such costs in Ontario's Global Adjustment. Another research stream looks at the energy sector investment environment, including a measure of planned investment activity across North America in the near term. It also examines views on what influences investment decisions in North America, particularly in Canada.

FINDINGS

His research on capacity-related costs finds that the current approach for recovery of the Global Adjustment provides an implicit price signal to consumers for peak demand reductions. This signal is far in excess of the incremental cost of new generation capacity or reasonable estimates of the value of loss of load, and therefore might lead to socially inefficient investments. For his research on the investment environment, Rivard aims to produce an annual report that can be used to monitor and present trends in energy sector investment in Canada.

ENERGY CENTRE POLICY BRIEFS

ANALYSIS AND INSIGHT INTO ENERGY ISSUES



A HISTORICAL AND COMPARATIVE PERSPECTIVE ON ONTARIO'S ELECTRICITY RATES

This Policy Brief provides a historical and comparative perspective on the development of Ontario's electricity rates from 1970 to 2015, the modern era of electricity in the province. This includes the addition of commercial-scale nuclear generation, efforts to deregulate and restructure the wholesale power market, as well as recent initiatives to decarbonize generation and reduce consumption.

REGULATING MEGA- PROJECTS: THE CASE OF MUSKRAT FALLS

In May 2011, the government of Newfoundland and Labrador announced that costs associated with the Muskrat Falls project would be exempt from regulatory review and approval by the Board of Commissioners of Public Utilities (PUB). This report examines the purpose and role of regulatory agencies in the electricity sector and assesses the effect of exempting the Muskrat Falls project from PUB oversight.



IMPROVING GOVERNANCE AND STRATEGY IN ONTARIO'S ELECTRICITY SECTOR

This report documents the results from a survey of 384 directors of Local Distribution Companies (LDCs) in Ontario. The survey profiles directors' professional careers and views about organizational financial priorities, diversification, and mergers and acquisitions.

PUBLISHED AND WORKING PAPERS

DEMAND SHOCKS CHANGE THE EXCESS BURDEN OF CARBON TAXES

Brandon Schaufele, January 2019

Movements in international markets have major implications for a wide-range of industries. This paper develops a method to measure competitiveness consequences of carbon taxes given these changes in markets.

SURCHARGES VERSUS REBATES: EVALUATING A MUNICIPAL ELECTRICITY CONSERVATION PROGRAM

Brandon Schaufele, September 2018

Using monthly account level data for more than 27,000 households between 2007 and 2014, this study statistically evaluates the effect of a municipal electricity conservation program on household energy usage.

POLLUTION AND POLITICIAN PRODUCTIVITY: THE EFFECT OF PM ON MPs

Anthony Heyes, Nicholas Rivers and Brandon Schaufele, Land Economics, September 2018

Applying methods of textual analysis to all 119,225 speeches made in the Canadian House of Commons between 2006 and 2011, the authors establish that air pollution reduces the speech quality of Canadian Members of Parliament.

THE IMPACT OF SOCIAL ACTIVISM ON CORPORATE NONMARKET PERFORMANCE: EVIDENCE FROM THE NUCLEAR POWER GENERATION INDUSTRY

Adam Fremeth, Guy L. F. Holburn and Alessandro Piazza, July 2018

This paper studies the impact of activist protests on regulatory agency decisions in the context of the U.S. nuclear power industry. Using data on the geographic locations of anti-nuclear protests from 1970-1995, the authors find that protests correlated with lower regulated financial rates of return for electric utilities with nuclear facilities closer to protest locations.

SIGNALING BY EARLY STAGE STARTUPS: U.S. GOVERNMENT RESEARCH GRANTS AND VENTURE CAPITAL FUNDING

Mazhar Islam, Adam Fremeth, and Alfred Marcus, Journal of Business Venturing, January 2018

This paper studies the value that signals have for startups in an emerging technology industry by examining the impact of government research grants on the recipients' ability to attract subsequent venture capital (VC) funding.

FACULTY RESEARCH GRANTS AND AWARDS

Adam Fremeth

- Fulbright Scholar Award, \$12,500, 2018-2019
- Social Sciences and Humanities Research Council grant, \$132,666, Principal Investigator, 2014-2018

Matt Davison

- NSERC Discovery grant, \$235,000, Principal Investigator, 2015-2019

Horia Hangan

- Infrastructure Operational Fund CFI and ORF, \$3,635,891, Principal Investigator, 2014-2019
- NSERC CRD grant, \$540,000, Principal Investigator, 2015-2018
- NSERC Discovery grant, \$110,000, Collaborator, 2012-2017

Guy Holburn

- Natural Resources Canada grant, \$30,000, Principal Investigator, 2015-2016
- Social Sciences and Humanities Research Council grant, \$62,000, Principal Investigator, 2010-2013
- Hydro One University of Western Ontario Research grant, \$150,000, Principal Investigator, 2010-2012

Brandon Schaufele

- Environment Canada Economics and Policy Research Network, \$500,000, Collaborator, 2012-2017
- Sustainable Prosperity Research grant, \$13,200, Principal Investigator, 2013
- University of Ottawa CUT grant, \$6,863, Principal Investigator, 2012-2013
- Pacific Institute for Climate Science, \$10,000, Co-Principal Investigator, 2012-2014
- CIGI-INET Research grant, \$198,000, Collaborator, 2012-2014

TEACHING

NEW IVEY CASE STUDIES WITH AN ENERGY FOCUS



MEG ENERGY: SURVIVING IN A LOW-OIL-PRICE ENVIRONMENT

ADAM FREMETH, OCTOBER 2018 | In mid-December 2014, the chief executive officer of MEG Energy, a Canadian oil sands company, was about to meet with the company's board of directors to discuss how the company should respond to rapidly changing oil prices. Even with MEG Energy developing technology to extract oil from the oil sands, resulting in lower costs per barrel and a decrease in the carbon intensity of its product, the 45-per-cent drop in the price of oil would challenge MEG's business model and present financial challenges for the company. This was clearly illustrated by the 180-per-cent decline in its share price. The price of oil had fallen to US\$60 per barrel, and just a week earlier, MEG Energy had announced a reduction in its 2014 capital expenditure to \$1.2 billion. Although the company had been successful in adding more barrels to production and finding more ways to market, it was unclear what it needed to do now to survive.

CAP-AND-TRADE IN ONTARIO

ADAM FREMETH AND PATRICK SHULIST, PHD '16

SEPTEMBER 2018 | In January 2017, Ontario launched its cap-and-trade program in an effort to curb greenhouse gas (GHG) emissions. Ontario took a progressive position on combatting climate change that included shutting down coal-burning power plants, investing heavily in renewable power, and setting aggressive emissions-reduction targets across all sectors. Its targets included reducing 1990 emissions levels by 15 per cent by 2020, 37 per cent by 2030, and 80 per cent by 2050. Its efforts allowed the province to meet its 2014 target of six per cent below 1990 levels. These targets complemented Ontario's commitment to the United Nation's 2015 Paris Agreement. Firms that annually emitted more than 10,000 tonnes but fewer than 25,000 had the option of entering the market on a voluntary basis. The expected downstream impact to the average Ontario household would be an increase of about C\$150 per year in home-heating and car-fuel costs. However, cost increases would be felt less directly through the rest of the economy. Four particular companies in Ontario had decisions to make regarding how the province's cap-and-trade program would affect their operations.



ALBERTA ENERGY, TECHNOLOGY AND INNOVATION



NOVEMBER 6, 2018

Gord Lambert, Former Executive Adviser, Sustainability and Innovation at Suncor Energy, delivered a presentation to MBA students on the topic of, "Alberta Energy, Technology and Innovation: The journey to achieve resilience and sustainability in the 21st century."



CARBON PRICING AND THE CAP-AND-TRADE PROGRAM



OCTOBER 16, 2018

Richard Laszlo, President of Laszlo Energy Services, spoke to 240 Ivey HBA students about carbon pricing and cap-and-trade programs in Canada and globally, and their impact on carbon emissions and economic performance.



COMMUNITY-BASED AND PEER-TO-PEER ELECTRICITY MARKETS



OCTOBER 12, 2018

Pierre Pinson, Professor at the Technical University of Denmark, presented his research during a conference at Ivey, describing the mathematical framework for community-based and peer-to-peer electricity markets, as well as the opportunities and challenges related to implementation.



THE PROSPECTS FOR ENERGY STORAGE



NOVEMBER 29, 2017

Alexander McIsaac, HBA '11, Director of Business Development at NRStor, and Matthew Sachs, Chief Operating Officer at Peak Power, participated in a discussion with Ivey students about innovation, entrepreneurship, and technological disruption in the energy storage sector.



ENERGY CONSERVATION IN ONTARIO



NOVEMBER 20, 2017

Peter Love, Former Chief Conservation Officer for the Ontario Power Authority and Board Member of Energy Efficiency Alberta, spoke to Ivey students about improving energy conservation programs and societal awareness of energy usage.

IVEY ENERGY POLICY AND MANAGEMENT CENTRE

BY THE NUMBERS, 2012-2018

\$2.8 million

Donations

19

Student internships granted

56

Events

20

Student scholarships awarded

3,600

Newsletter subscribers

\$1.4 MILLION

Grants and awards

5,400


Event attendees

35 Media mentions

OUTREACH



ANNUAL WORKSHOP ON THE ECONOMICS OF ELECTRICITY POLICY AND MARKETS

 October 18, 2018

Alberta and Ontario are in the midst of a fundamental redesign of their electricity markets. The redesign of these markets is happening at a time when the electricity system is experiencing considerable transformation, driven by increased investment in renewable energy and demand response resources, a shift towards more distributed energy resources, innovation in electric storage technology and added intelligence throughout the electric power system. In October, the Ivey Energy Policy and Management Centre organized its second annual workshop on electricity markets, attracting 60 academic, industry, and government experts from across Canada and the U.S. Panel discussions focused on how electricity markets and pricing mechanisms can be designed for the future electricity system, to promote a transparent, efficient, and openly competitive market place. Tim O'Neill, Chair of the Independent Electricity System Operator in Ontario, and Professor James Bushnell, University of California, Davis, gave keynote addresses.



ANNUAL CCRE ENERGY LEADERS ROUNDTABLE, ALBERTA

 November 13-14, 2018

The Ivey Energy Policy and Management Centre helped organize the first Energy Leaders Roundtable in Kananaskis, Alberta, in partnership with the Council for Clean and Reliable Energy and the University of Calgary. Fifty energy sector leaders from industry, Indigenous communities, government, and academia attended the two-day event, featuring panel discussions on public perceptions on energy, policy, and regulatory challenges; interprovincial electricity and the national grid; developing energy infrastructure in the public interest; meeting Canada's climate change commitments; and politics and the energy sector. Keynote addresses were given by Deborah Yedlin, Chancellor, University of Calgary, and Greg Lyle, President, Innovative Research Group.



IVEY CANADIAN BUSINESS FRONTIERS CONFERENCE

 November 9, 2018

This conference convened Canada's top leaders across energy, finance, health, and government sectors to discuss the impact of technology disruption on Canadians. Energy sector speakers included Annette Verschuren, Chair and CEO of NRStor, James Scongack, EMBA '17, Executive Vice President at Bruce Power, and Jon Mitchell, General Manager at Suncor Energy. More than 150 participants attended the event, which was a collaboration between Ivey's Energy Policy and Management Centre, Centre for Health Innovation, Centre for Building Sustainable Value, and the Scotiabank Digital Banking Lab. The Honourable Elizabeth Dowdeswell gave a keynote address.



ANNUAL CCRE ENERGY LEADERS ROUNDTABLE, ONTARIO



April 11-13, 2018

The Ivey Energy Policy and Management Centre partnered with the Council for Clean and Reliable Energy to support the 6th Annual Energy Leaders Roundtable, in Orangeville, Ontario, attended by 50 invited Canadian energy leaders. A keynote was given by Matt Jamieson, President and CEO of the Six Nations of the Grand River Development Corporation. Aaron Engen, Managing Director and Co-head of the Power and Energy Infrastructure Group at BMO Capital Markets, also presented.



KEEPING CANADA'S ENERGY SECTOR GLOBALLY COMPETITIVE



December 12, 2017

The Ivey Energy Policy and Management Centre hosted an Idea Forum in Toronto, with expert panellists: John McManus, Senior Advisor for OMERS Infrastructure; Steve Baker, President of Union Gas, and Aaron Engen, Managing Director and Co-head of the Power & Energy Infrastructure Group at BMO Capital Markets. Discussion focused on the need to improve Canada's competitiveness in global markets for investment capital in energy development projects. The event was moderated by Martha Hall Findlay, President and CEO of the Canada West Foundation, and attended by more than 60 guests.

INTRODUCING

**ENERGY
MATTERS
@IVEY**

ENERGYMATTERS BLOG

Our new blog offers an independent and fact-based economic perspective on current energy policy matters, helping to broaden public awareness of new energy issues.

ENERGYMATTERS PODCAST

For our inaugural podcast, we asked Professor James Bushnell: If electricity markets are so great, why are we always messing with them? Bushnell is Professor at University of California, Davis, and a member of the California ISO Market Surveillance Committee. He delivered a keynote at our Annual Electricity Workshop in October.

FACULTY AND STAFF

GUY HOLBURN

DIRECTOR

Guy Holburn is the Suncor Chair in Energy Policy and Professor of Business, Economics, and Public Policy at the Ivey Business School. His areas of expertise are in strategy and regulation in the energy and utilities sectors. He is a Director of London Hydro and a member of the Council for Clean and Reliable Energy. Holburn received his MA and PhD from the University of California, Berkeley, and his BA Hons. (First Class) from Cambridge University. Prior to his academic career, he worked as a management consultant for Bain and Company in the U.K. and South Africa.

BRIAN RIVARD

RESEARCH DIRECTOR

Brian Rivard is an Adjunct Professor and Research Director for the Ivey Energy Policy and Management Centre at the Ivey Business School. His area of expertise and study is electricity market design and regulation. Rivard has experience as an energy consultant, most recently as a Principal at Charles River Associates. He also worked for the Independent Electricity System Operator (IESO) as Director of Markets. For almost 15 years at IESO, he helped support the development of market-based approaches to managing Ontario's electricity system needs. In addition, Rivard spent six years as a senior economist with the Canadian Competition Bureau. He received his MA and PhD in Economics from Western University.

ADAM FREMETH, HBA '00

E.J. KERNAGHAN PROFESSOR IN ENERGY POLICY

Adam Fremeth is the E.J. Kernaghan Professor in Energy Policy and Associate Professor of Business, Economics, and Public Policy at the Ivey Business School. He completed his doctorate at the Carlson School of Management at the University of Minnesota. He holds an HBA from Ivey and an MA in International Affairs from Carleton University. His research focuses on the intersection of firm strategy and public policy-making.

BRANDON SCHAUFELE

IVEY ENERGY CONSORTIUM FELLOW

Brandon Schaufele was awarded a three-year Ivey Energy Consortium Fellowship in 2015. He is Assistant Professor in Business, Economics and Public Policy at the Ivey Business School. Prior to his arrival in 2014, Schaufele was an Assistant Professor in the Department of Economics at the University of Ottawa, as well as the Research Director of the University of Ottawa's Institute of the Environment. Schaufele's research focuses on the links between firms, governments, and civil society with special emphasis on energy and environmental policy.

MATT DAVISON

RESEARCH FELLOW

Matt Davison is Dean, Faculty of Science, at Western University and Professor of Applied Mathematics and Statistical & Actuarial Sciences. Davison holds the Canada Research Chair in Quantitative Finance and leads the nationwide Modelling Trading and Risk in the Market project for the MITACS Network of Centres of Excellence. Much of his research is on energy markets and finance, and lies at the intersection of industrial mathematics, operational research, and engineering.

RICHARD DICERNI

RESEARCH FELLOW

Richard Dicerni is an Adjunct Research Professor at the Ivey Business School. He began a career with the federal government in 1969 and has held a number of executive positions in the federal and provincial public service, including Deputy Minister of Industry Canada from 2006 to 2012 and Deputy Minister of Alberta Executive Council from 2014 to 2016.

HORIA HANGAN

RESEARCH FELLOW

Horia Hangan is a Professor in the Faculty of Engineering at Western University and the founding Director of the Wind Engineering, Energy and Environment (WindEEE) Research Institute. His research focuses on the simulation and impact of high-intensity winds, wind energy, and wind environmental impacts.

DENNIS MCCONAGHY

VISITING FELLOW

Dennis McConaghy is the former Executive Vice-President of Corporate Development at TransCanada. Previously, he was Executive Vice-President of Pipeline Strategy and Development. He joined TransCanada in 1998, and has held senior positions in Corporate Strategy & Development, Midstream/ Divestments, and Business Development. He has more than 25 years of experience in oil and gas. In 2014, he was appointed Visiting Fellow for both the Ivey Energy Policy and Management Centre and Ivey's Lawrence National Centre for Policy and Management.

LAURA MCLEOD

CENTRE CO-ORDINATOR

Laura McLeod co-ordinates operations and outreach for the Ivey Energy Policy and Management Centre. She first joined the Ivey Business School in 2010 and was previously the Program Co-ordinator for the Pierre L. Morrissette Institute for Entrepreneurship. She holds a BA from Queen's University and a Postgraduate Diploma from Humber College.

RAJIV VARMA

RESEARCH FELLOW

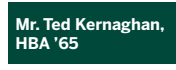
Rajiv K. Varma is an Associate Professor and Hydro One Chair in Power Systems Engineering in the Electrical and Computer Engineering Department at Western University. Varma is the project lead in a recently awarded \$6-million research grant from Ontario Centre of Excellence for a photovoltaic solar power integration.



ADVISORY BOARD

ERIC AXFORD	Executive Vice-President and Chief Sustainability Officer, Suncor Energy
STEVE BAKER	President, Union Gas Limited
PAUL BOOTHE	Managing Director for the Trillium Network for Advanced Manufacturing; Former Director, Lawrence National Centre for Policy and Management, Ivey Business School
JAN CARR	Strategic Adviser, Gowlings WLG; Former CEO, Ontario Power Authority
RICHARD DICERNI	Former Deputy Minister of Alberta Executive Council
MEL HYATT	President, Power Workers' Union
GUY HOLBURN	Director, Ivey Energy Policy and Management Centre, Ivey Business School
JOHN MCMANUS	Senior Advisor, OMERS Infrastructure
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The Ivey Energy Policy and Management Centre is grateful for support from a wide range of individuals and organizations.



Ivey Energy Policy and Management Centre

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