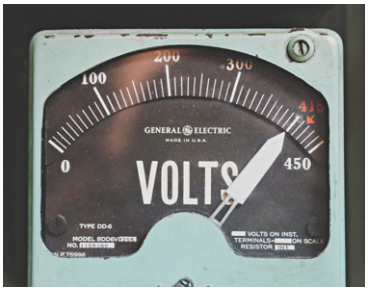
IVEY ENERGY POLICY AND MANAGEMENT CENTRE



2020 ANNUAL REPORT

IVEY Business School
WESTERN UNIVERSITY · CANADA

Energy Policy and Management Centre

DIRECTOR'S MESSAGE

GUY HOLBURN, DIRECTOR | Ivey Energy Policy and Management Centre | Professor of Business, Economics and Public Policy, Ivey Business School

On January 8, 2020, the Ivey Energy Policy and Management Centre hosted an Ivey Idea Forum in Toronto, titled 'Canada's Energy Future: Disruption, Denial and Transition', featuring energy experts from Alberta and Ontario and a sold-out audience. Little did we know how apt the topic would prove to be on the eve of the global COVID-19 pandemic, which has led to a tragic loss of human life and disrupted industries far and wide – including Canada's energy sector. As the world looks ahead with a glimmer of optimism for 2021, the energy sector will play an important role in economic recovery while facing new challenges in adapting to a post-COVID society.

Amidst the upheaval and uncertainty over the last year, I am pleased to share some of the accomplishments of the Ivey Energy Centre which, like many other organizations, quickly pivoted to virtual operations. We discovered many benefits of moving our events online, including larger, broader audiences and quicker implementation. Our first virtual event, an expert panel on the State of the Canadian Oil and Gas Industry, which came weeks after the WTI oil price plummeted to an astonishing negative $37/barrel, was watched by more than 500 participants from coast to coast. And our fourth Annual Workshop on the Economics of Electricity Policy and Markets – themed 'Mega Projects, Distributed Energy and the Modern Grid' – attracted many more registrants and from a wider range of provinces as compared to previous years. I expect that virtual events will continue to be an important means through which the Centre fosters informed, evidence-based public discourse on energy issues even when in-person events become an option again.

The Centre released several new Policy Briefs based on original research by Centre faculty, including: Regulating Induced Emissions from Pipelines; The Economic Impact of Alberta's Crude Oil Curtailment Policy; A Statistical Overview of Canada's Energy Sector; and, The Paris Agreement in 2020: Canada in a Global Context. The Centre also published a major new report, The Investment Climate for Canada's Energy Sector, based on

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an extensive survey of senior energy sector executives in the electricity, gas, oil, and pipeline sectors. A second version of the survey and a new report on 'clean' technology investment are already underway, as the Centre plans to conduct this work annually. The Centre's blog page has also proved popular with postings on a range of topics, from the impact of COVID-19 on electricity demand to modernizing regulatory frameworks and the business of energy transitions.

The Centre continued to host thought leaders in the virtual classroom during 2020, connecting Ivey students with energy sector executives. More than 15 leaders from across the country joined Ivey classes and student club events for thoughtful discussions on a wide variety of topics in the clean tech, electricity, gas, oil and pipeline sectors. We are thankful to all these speakers for kindly sharing their time, experiences and insights with the next generation of business leaders.

The work of the Centre is made possible by the generous support of Ivey alumnus, Ted Kernaghan, HBA '65, and the members of the Ivey Energy Consortium: ATCO, Bruce Power, Hydro One, OMERS, Power Workers' Union, Suncor Energy Foundation, and TC Energy. I am very grateful for their continued support for the Centre's research, educational, and outreach initiatives. I would also like to acknowledge our excellent team of faculty, staff, research assistants, Fellows, Executives-in-Residence, and Advisory Board members for their hard work and dedication this year.

IVEY ENERGY POLICY AND MANAGEMENT CENTRE

BY THE NUMBERS, 2012-2020

$1.8 million
Grants and awards

5,400
Newsletter subscribers

27
Policy Briefs

8,200
Attendees at events

73
Events

$5,500,000
Donations

RESEARCH

The Investment Climate for Canada's Energy Sector

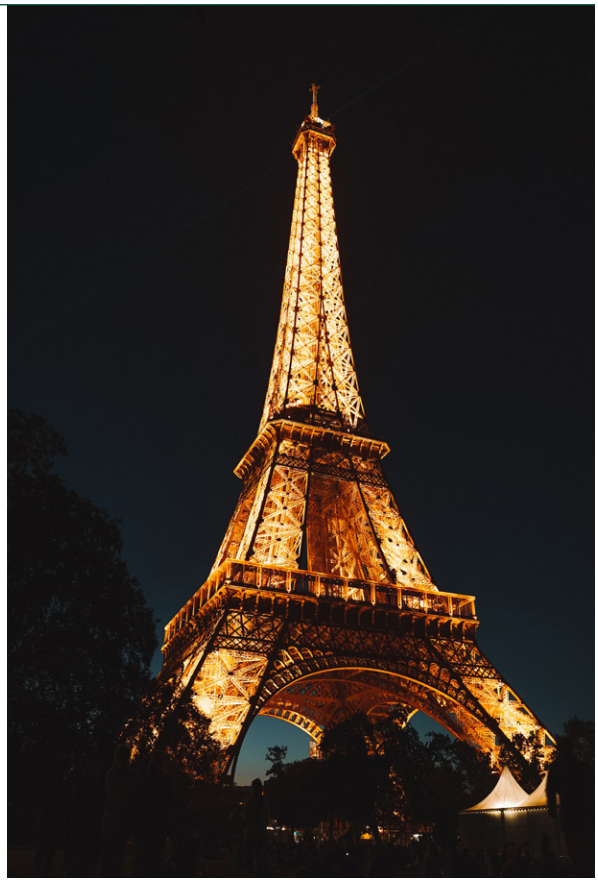
GUY HOLBURN AND BRIAN RIVARD

This report provides an assessment of the investment climate for Canada's electricity, gas, oil, and pipeline industries, based on an extensive survey of senior energy sector executives conducted by the Ivey Energy Policy and Management Centre. The goal of the survey was to better understand what factors drive energy companies' investment decisions and how Canada compares to other countries. Survey responses indicated that investment conditions in each sector compared unfavourably to other countries where executives had foreign experience, particularly the United States, and that conditions had deteriorated in Canada over the last three years while they had improved in the United States. Survey respondents identified several policy areas where reform would improve the investment climate: Making regulatory approval processes more efficient, especially for major infrastructure projects; improving the clarity, stability, predictability and consistency of regulation and policy to reduce the risks of investment in long-lived assets; supporting the development of new pipeline infrastructure to facilitate export access of Canadian oil and gas to world energy markets; enhancing public understanding of the energy industry's role within Canada; and, articulating a strategic approach to energy policy that incorporates economic development, environmental, climate and social goals.

The Paris Agreement in 2020: Canada in a Global Context

RADOSLAV DIMITROV

The 2015 Paris Agreement on Climate Change (PA) is the main international policy agreement that defines the global response to climate change. Its environmental goal is to keep the global temperature rise to "well below 2ºC" and preferably to 1.5 ºC. Policies required to meet these goals include expanding renewable energy, enhancing energy efficiency and decarbonizing transportation, energy systems and energy-intensive industries. Efforts to reach the 1.5 ºC goal are estimated to require global investments of US$1.6 trillion to US$3.8 trillion per year between 2020 and 2050. The 2020 global pandemic of COVID-19 temporarily reduced this cost as it slashed energy consumption and led to a record drop in global emissions in modern history, but the hard work of implementing the PA is still ahead. This Policy Brief examines whether, five years after the Paris Agreement was negotiated, major economies are fulfilling their policy pledges. What are the main climate policy developments and economic trends around the world? How do Canada's policies compare to actions abroad? What is the status of the presumed "global green shift" and what are its implications for Canada?

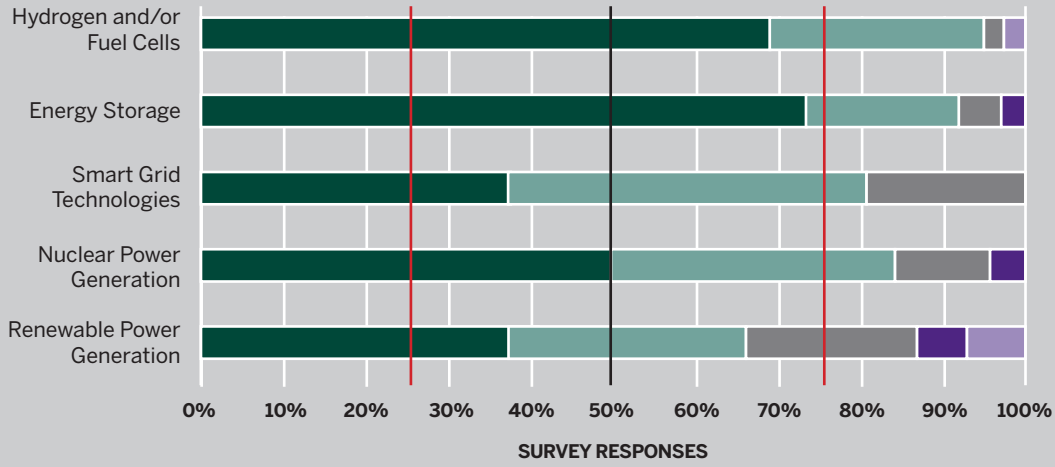


Investment in Canada's Clean Energy Technology Sector

GUY HOLBURN, BRIAN RIVARD, JIYA HAI AND SORENA RAHI

This research examines investment in Canada's clean energy technology sector, based on data from an online survey of senior energy sector executives conducted by the Ivey Energy Centre in late 2020. While there are many start-up cleantech-focused firms, many of Canada's electricity, gas, oil and pipeline companies are also actively involved in one or more cleantech sectors. Nearly 30 per cent of respondents whose companies were involved in electricity, gas, oil or pipelines indicated that cleantech businesses were important to their companies. A majority of responding executives expected that investment in all forms of cleantech would increase over the next three years, notably in hydrogen and fuel cell technologies, energy storage, and nuclear power generation (as depicted in the Figure below).

Predicted change in investment in cleantech in the next three years



The Economic Impact of Alberta's Crude Oil Curtailment Policy

BRANDON SCHAUFELE

In January 2019, the Government of Alberta imposed 'curtailment' limits on crude oil and bitumen that the province's 25 largest operators were permitted to produce – leading to a nine-per-cent reduction in production volumes – in response to a growing and prolonged price differential between the Western Canadian Select price of oil and the West Texas Intermediate benchmark. This policy marked an interventionist shift for a government that historically had avoided interfering in oil markets. Accordingly, the WCS price of oil exiting the province increased from a low of $5.97/bbl in December 2018 to $53.25 in April 2019. This Policy Brief measures the short-run market implications of the curtailment policy, estimating that curtailment increased producer operating income by $658 million per month, while reducing consumer operating income, primarily refineries in the U.S. Midwest, by $763 million per month. Despite the large transfer of wealth from refiners to Albertan upstream producers, the government's initial curtailment rate was smaller than the rate that would have maximized returns to Alberta's heavy oil and bitumen producers.

Regulating Induced Emissions from Pipelines

ADAM FREMETH AND BRANDON SCHAUFELE

Impact assessments for pipelines historically focused on factors such as safety and the prospect of spills, and did not explicitly consider carbon dioxide emissions. This changed with the passage of Bill C-69, the Canadian Energy Regulator Act, which explicitly links energy project approvals to Canada's climate change commitments through a "climate test." However, the Act stops short of prescribing specific regulations for pipeline approvals or for whether induced emissions—upstream emissions from oil and gas production, and downstream emissions from final consumption—should be included. This Policy Brief presents a two-step process for the regulation of induced emissions caused by oil and gas pipelines, whereby regulators first specify a set of principles and then select a set of regulatory instruments that follow from those principles. Reasonable principles include: Minimizing the ex-post economic inefficiencies due to imperfect information, being administratively practical, maintaining consistent treatment across projects, and ensuring the project proponents bear the risk of new infrastructure projects. Three rules for regulating induced emissions from pipelines follow from these principles: Applying a carbon tax, setting the tax at an appropriate level (the global social cost of carbon), and only regulating domestic emissions. Based on these principles and consequent instruments, Canada's existing backstop carbon pricing policy implies that new pipeline projects currently satisfy the climate test.

Energy in Canada: A Statistical Overview

GUY HOLBURN, BRIAN RIVARD, RAMIN ALAHDAD AND JIYA HAI

This Policy Brief provides a statistical overview of the contribution of Canada's energy sector—electricity, gas, oil, and pipelines—to the country's economy. In 2019, the energy sector accounted for approximately 9.5 per cent of Canada's GDP and 1.5 per cent of its labour force. One reason for the sector's economic prominence is Canada's position as one of the world's leading energy-producing and exporting countries. Canada consistently ranks as a top-three exporter of electricity and a world leader in the production of zero greenhouse gas emission electricity, ranked third in hydroelectric production, sixth in nuclear production, and ninth in wind electricity production. It is the fouth largest producer and exporter of crude oil and is historically a top-five producer and exporter of natural gas.

Canadian Energy Sector Global Rankings

Natural Resource	2015	2016	2017	2018	2019
Hydroelectric Electricity Production	2nd	2nd	2nd	3rd	3rd
Crude Oil Production	4th	4th	4th	4th	4th
Natural Gas Production	5th	4th	4th	4th	5th
Electricity Generation	6th	6th	6th	6th	6th
Nuclear Electricity Production	6th	6th	6th	6th	6th
Natural Gas Exports	4th	4th	5th	5th	7th
Crude Oil Refinery Output	11th	11th	10th	11th	9th
Wind Electricity Production	7th	8th	8th	8th	9th
Renewable Electricity Production	10th	10th	10th	10th	11th
Crude Oil Refining Capacity	11th	11th	11th	11th	11th
Crude Oil Exports	5th	6th	5th	4th	na
Electricity Exports	2nd	1st	1st	3rd	na

PUBLISHED PAPERS

The Impact of Political Directors on Corporate Strategy for Government-Owned Utilities: Evidence from Ontario's Electricity Distribution Sector

ADAM FREMETH AND GUY HOLBURN, *ENERGY POLICY*, 2020

This paper studies governance of state-owned utilities by examining the implications of oversight by independent versus 'political' directors for corporate strategy. While policy think-tanks often recommend that governments appoint independent professional directors to boards of state-owned corporations, governments sometimes select politicians who bring a politically-oriented perspective to their oversight duties. To examine the potential strategic consequences, we draw on a novel survey of 384 directors of municipally owned local electricity distribution companies in Canada, of which about a third were elected municipal councillors and the remaining were independent business professionals. The survey solicited individual director views about strategic priorities, including mergers and acquisitions, business diversification, and corporate financing options. Our statistical analysis of the survey response data finds that political directors, after controlling for prior executive experience and organizational context, were more risk-tolerant on average than independent directors, as evidenced by a greater willingness to diversify into unregulated business activities and to acquire equity stakes in other utilities; but at the same time, they prioritized enhanced dividend payments to the municipal government over re-investment in the corporation, a potential constraint on future business growth.

Lessons from a Utility-Sponsored Revenue Neutral Electricity Conservation Program

BRANDON SCHAUFELE, *ENERGY POLICY*, FORTHCOMING

Using monthly account level data for over 27,000 households between 2007 and 2014, this study evaluates a revenue neutral municipal electricity conservation program. Rebates for the purchase of energy efficient appliances were financed via a small surcharge on high consuming households. The results demonstrate that the program mainly transferred money between residents with almost no effect on electricity consumption. Using variation in the timing of the rebate cheques, none of the energy efficiency incentives yielded a statistically or economically meaningful reduction in electricity consumption compared with a counterfactual where no rebate was offered. Using a bunching estimator and exploiting changes in behavior around the high consumption threshold, a small reduction in electricity consumption is attributable to the surcharge, suggesting that prices are better than subsidies at reducing electricity consumption. Overall, the change in behavior attributable to the electricity conservation program is small, supporting recent evidence that many energy efficiency programs underperform in real-world settings.

RECENT FACULTY RESEARCH GRANTS AND AWARDS

Adam Fremeth, HBA '00	■ Social Sciences and Humanities Research Council Explore grant, Principal Investigator, 2020-2021 ■ Fulbright Scholar Award, 2018-2019 ■ Social Sciences and Humanities Research Council grant, Principal Investigator, 2014-2018
Guy Holburn	■ Erskine Fellowship, University of Canterbury, New Zealand, 2018 ■ Ontario Ministry of Energy grant, Principal Investigator, 2017-2018 ■ Natural Resources Canada grant, Principal Investigator, 2015-2016
Brandon Schaufele	■ Social Sciences and Humanities Research Council Explore grant, Principal Investigator, 2020-2021 ■ Ivey Bridge Award, 2018

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BLOGS & PODCASTS

The Centre published nine blogs and two podcasts in 2020. Brian Rivard hosted podcasts on the impact of the COVID-19 pandemic on electricity wholesale markets with Leonard Kula, Independent Electricity System Operator in Ontario, and with Dennis Frehlich, Alberta Electric System Operator.

Blog: The Business of Energy Transitions

In this blog post, Francis Coulombe, HBA '21, shared key takeaways from Peter Tertzakian's presentation to the Ivey HBA cohort on the business of energy transitions and lessons learned from Thomas Edison.

Four wheels, a steering mechanism, and a propulsion system: Peter Tertzakian's definition of a car. On October 14th, Peter Tertzakian, Executive-in-Residence with the Ivey Energy Policy and Management Centre, gave a thought-provoking presentation on energy transitions to Ivey undergraduate students. He started by leading students through the narrative of propulsion systems over the last century. By analyzing vehicles' propulsion systems, we get an excellent representation of the energy business at the time. Over the past 100 years, gasoline and diesel-powered vehicles have clearly prevailed, but there were some serious attempts at changing this paradigm: from a tiny steam auto engine in the 1960s to a fully electric vehicle prototype in the 1970s. So, why is it only 50 years later that electric vehicles are gaining traction? What is now enabling the propulsion system paradigm to shift? The electric vehicle prototype from the 1970s had comparable performance and specs to Tesla's current offerings; what has changed? Tertzakian set out to explain the founding business principles that differentiate successful energy transitions from failures. He used the business case of the electrification of lighting, championed by Thomas Edison, to illustrate these principles.

Think in Complete Systems

Edison understood that an incandescent bulb on its own would be useless if homes were not connected to a source of electricity. He was not simply selling a lightbulb – he had to revamp an entire system. Edison had to generate electricity on a large scale, build a network to distribute power to homes, and only then could he transition lighting from gas-powered lighting to electric. Discovering the lightbulb (though he was not the first to do so), made him a great inventor. Affecting change on the entire system to enable to wide-spread adoption of the lightbulb made him a great innovator.

Follow the Money

The first area to receive electric lighting was a wealthy neighborhood in Manhattan, where Wall Street lies. This was no coincidence: it was Edison's business acumen at work. The high-end market was willing to pay for the "new," and as they bought, Edison's Illuminating Company could learn and fine-tune their processes. Gaining experience, the company realized cost efficiencies that then allowed Edison to offer affordable electricity to mass markets, completing the transition to electric lighting.

Leverage Current Infrastructure

Bringing electric wires into homes was a daunting task for Edison. Instead of attempting to start from scratch, Edison had the idea to repurpose the current infrastructure: gas pipes. Instead of burrowing wires through walls to electrify homes, he fed wires through existing gas piping, added sockets, mounted lightbulbs, and voila: electric illumination. Hijacking the existing pipe system dramatically reduced their workload, enabled faster deployment of technology, and made the conversion from gas to electric less intrusive for homeowners: a win-win.

Challenge the Incumbent

People can be averse to change, and it often takes a significant push to convince consumers to ditch their current habits. Edison discredited gas lighting by covering and publishing reports of gas-related incidents in newspapers. From house fires, deaths, and explosions, Edison publicized it all to discredit the existing system. Highlighting and publishing the problems that customers were experiencing facilitated the adoption of his alternative: electric lighting.

Tertzakian applied these fundamental principles to today's budding energy transition towards a low-carbon economy. Despite being centuries old, the business principles still apply, and players who follow them are more likely to be successful than those who do not. Tesla, for one, has created significant waves towards the electrification of vehicles by employing these principles. Once again, it will take innovative thinking, not simply inventive thinking, for our world to transition to a new energy system; one that will lead to a more sustainable future.

OUTREACH

2020
OCT 6-28

FOURTH ANNUAL WORKSHOP ON THE ECONOMICS OF ELECTRICITY POLICY AND MARKETS

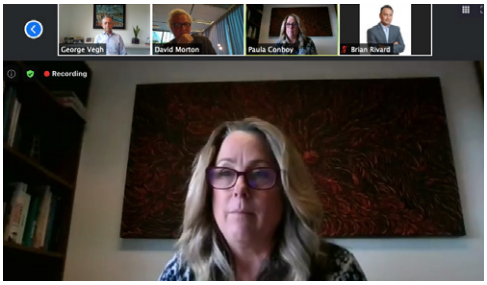
The Energy Centre hosted its Fourth Annual Electricity Workshop in an online format for the first time. Speakers and attendees explored the theme "Mega Projects, Distributed Energy, and the Modern Grid" during four weekly webinars.

IS THERE A FUTURE FOR MEGA ENERGY PROJECTS?

- AJ Goulding, London Economics
- Guy Holburn, Ivey Business School
- John Mikkelsen, TC Energy
- Kevin Dawson, Alberta Electric System Operator (moderator)

ARE DECENTRALIZED ENERGY RESOURCES THE FUTURE OF ELECTRICITY

- David Brown, University of Alberta
- Paul Grod, Rodan Energy
- Patrick Lo, Independent Electricity System Operator
- Nicole LeBlanc, Alberta Electric System Operator (moderator)



MODERNIZING REGULATORY AND INSTITUTIONAL FRAMEWORKS

- Paula Conboy, Sussex Strategy Group (Pictured at left)
- David Morton, British Columbia Utilities Commission
- George Vegh, McCarthy Tetrault
- Adam Fremeth, Ivey Business School (moderator)

FUTURE DEVELOPMENTS IN ELECTRICITY MARKET DESIGN AND ORGANIZATION

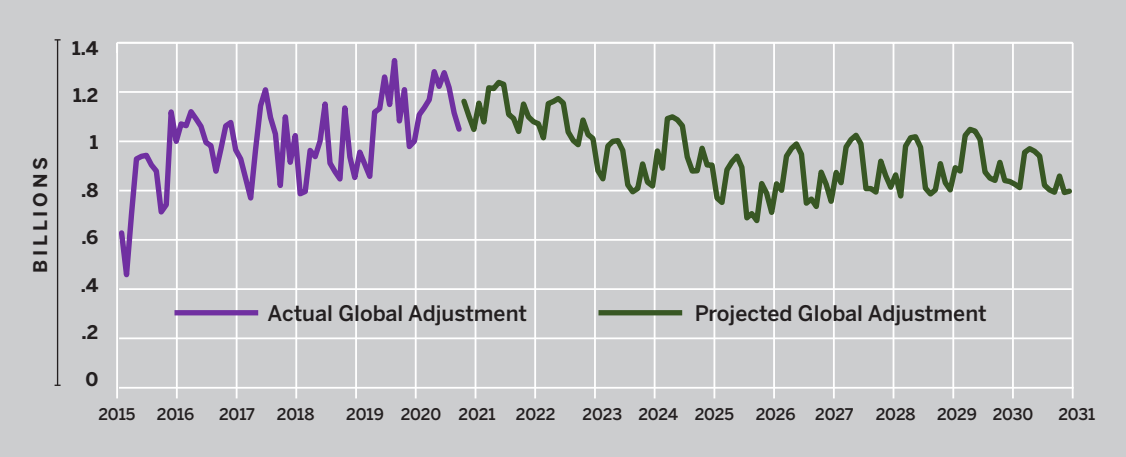
- William Hogan, Harvard University (Pictured at left)
- Kathleen Spees, The Brattle Group
- Brandon Schaufele, Ivey Business School (moderator)

2020
AUGUST 6

ELECTRICITY PRICING: TACKLING ONTARIO'S GLOBAL ADJUSTMENT

Brian Rivard was an invited panelist, along with Ben Dachis of the C.D. Howe Institute, on a webinar organized by the Ontario Energy Association. The discussion centred on the Global Adjustment, which is one of the most important, controversial, and least understood elements of electricity costs in Ontario. Modeling work by Brian Rivard and Guy Holburn suggests that the Global Adjustment may decrease over the next three years.

Actual and Projected Monthly Average Global Adjustment Cost, 2015-2031



2020
MAY 14

THE STATE OF THE CANADIAN OIL AND GAS INDUSTRY

The Ivey Energy Centre partnered with Canadian Club of Toronto to host a webinar discussion on the state of the oil and gas industry in Canada with expert panelists Martha Hall Findlay (Suncor), Gordon Lambert (former Alberta Energy Regulator), and Samantha Stuart (TC Energy) in a conversation moderated by Professor Guy Holburn.

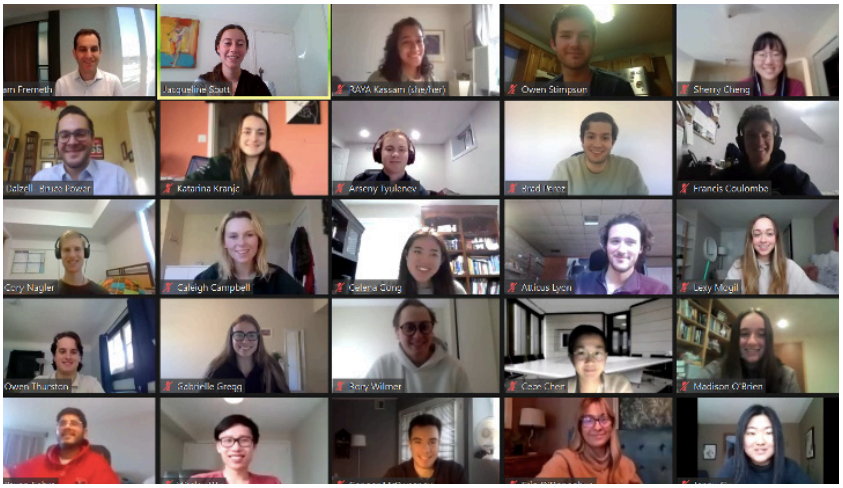
2020
JANUARY 8

CANADA'S ENERGY FUTURE: DISRUPTION, DENIAL AND TRANSITION

The global energy sector is undergoing a period of transformation as new technologies and innovations in the production and consumption of energy challenge the status quo. At the same time, governments are seeking new policies to reduce greenhouse gas (GHG) emissions and mitigate climate impacts. Yet demand for energy in all forms continues to increase globally since economic growth is tightly coupled with energy usage. What do these pressures mean for the future of the energy sector in Canada, an energy superpower with an abundance of natural resources, which have been an engine of economic development?

The Ivey Energy Centre hosted an Ivey Idea Forum in Toronto with a keynote presentation, titled 'Disruption, Denial, and Transition', delivered by Peter Tertzakian, Deputy Director, ARC Energy Research Institute. The presentation was followed by an interactive panel discussion with Lisa DeMarco, Senior Partner, DeMarco Allan LLP, and Michael Kelly, Executive Vice President and General Counsel, OMERS. Professor Guy Holburn served as moderator.

EDUCATION



2020
DECEMBER 8

NUCLEAR POWER AND HEALTHCARE

Pat Dalzell, Head of Corporate Affairs at Bruce Power, spoke to Ivey HBA students about Bruce Power's development of medical isotopes for the healthcare sector in their power reactors.

2020
NOVEMBER 17

LEADING THROUGH THE ENERGY TRANSITION

David Cornhill, MBA '80, Chairman of the Board of AltaGas Ltd, and Alec Clark, HBA '84, Head of Global Energy at TD Securities Limited, discussed leadership challenges during the pandemic while also moving the gas industry through an energy transition in a webinar with Ivey MBA students.

2020
NOVEMBER 11

FIRST NATIONS AND ENERGY IN CANADA

Matt Jamieson, CEO of Six Nations of the Grand River Development Corporation, spoke with Ivey HBA students about Indigenous partnerships in energy projects. He discussed the development of solar and wind power projects in Ontario, partnering with utilities, and future investment plans in energy generation and storage projects.

THE FUTURE OF ENERGY SECURITY IN CANADA

2020
OCTOBER 5

The Ivey MBA Energy & Resources Club hosted an expert panel discussion on energy reliability, independence and economic development with Rod Maxwell, Stonebridge Equity Partners; Alexander Palkovsky, HBA '15, Euro Lithium; and Attilio Braga, HBA '06, TD Securities Global Energy.

2020
AUGUST 18

WOMEN IN MANAGEMENT: JAY GREWAL, PRESIDENT AND CEO OF MANITOBA HYDRO

The Ivey MBA Energy & Resources Club partnered with Ivey's Women in Management Club to host a candid conversation with Jay Grewal, MBA '85, President and CEO of Manitoba Hydro, to discuss her career in the utility, mining, professional services, and financial services sectors. Grewal is the first female President and CEO in Manitoba Hydro's history.

2020
MAY 19

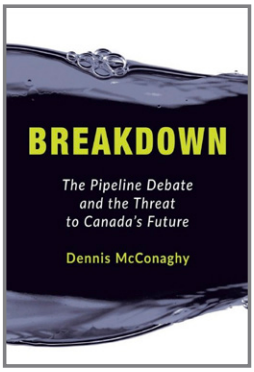
FINDING OPPORTUNITIES DURING CRISIS

Mark Poweska, President and CEO of Hydro One Limited, shared the challenges and successes of managing both consumer and corporate interests through COVID-19, and what an unexpected new normal could look like. Poweska spoke to students as part of the Iey MBA Teachable Moments Virtual Speaker Series.

2020
APRIL 26

THE ENERGY MARKET IN ALBERTA AND BEYOND

Dennis McConaghy, former Executive Vice-President of Corporate Development at TransCanada Corporation (now TC Energy), spoke in a virtual session, organized by the Ivey MBA Energy & Resources Club, focused on the current status of Alberta's energy markets, the economic and social impacts of COVID-19, and the opportunities and risk in sustainable investing. McConaghy drew on personal insights from his time at TransCanada and discussed his new book, *Breakdown: The Pipeline Debate and the Threat to Canada's Future* (Dundurn, 2019), which won the Donner Prize in 2020.



2020
MARCH 13

IVEY STUDENT ESSAY COMPETITION: CANADA'S ENERGY PAST, PRESENT, AND FUTURE

Two Ivey HBA students, Maya Chambers and Francis Coulombe, both HBA '21, won first and second prizes in the inaugural student essay competition on the theme of 'Canada's Energy Past, Present and Future', jointly sponsored with Peter Tertzakian's Energyphile project.

An excerpt from *Rainbows in the Falls* by Maya Chambers

"In summer 1916, Alberta was the place to be. Only two years earlier, the Calgary Petroleum Products Company struck oil for the first time in Turner Valley. The next day, hordes of people rushed. It wasn't just the possibility of wealth that magnetized the public. A new form of energy promised to accelerate the long societal burn towards modernity. The Ford Model T was recently invented, the Einstein equations were just published, jazz music began to break through, Picasso and Duchamp revolutionized art, and oil made the wheels turn. It felt like the spark that lit everything up. Sure, energy is an industry with massive economic opportunity, but it's also always been the lifeblood of a modern society. Energy touches everything and is exempt from nothing."

An excerpt from *Tomorrow's Fuel* by Francis Coulombe

"It was incredible. They gave my dad and me a tour of the plant, dumbing down the science of it for us to understand. They were capturing CO2 from the atmosphere and transforming it into ready-to-use fuel, while using renewable energy to power their plant. The chemistry and science went over our heads, but its application was clear. This could offset the carbon footprint of transportation without requiring a system overhaul. Fuel pumps didn't need to be replaced by charging stations. Vehicle's current engines could accept the fuel. It was a perfect substitute.
We knew the demo would work. They had fired up the Model T with their fuel a few days ago, to prepare for today's high stakes. They had our car up on a riser with a banner flapping in the wind right above it. The banner read "Yesterday's Car Powered by Tomorrow's Fuel" in big bold font."

FACULTY AND STAFF

GUY HOLBURN | DIRECTOR

Guy Holburn is Director of the Ivey Energy Policy and Management Centre and Professor of Business, Economics and Public Policy at Ivey Business School. His research and teaching focuses on regulation, governance and strategy issues in the energy and utilities sectors. He has published widely in top peer-reviewed academic journals, and authored more than a dozen reports on provincial and federal energy policies. Dr. Holburn has served as a consultant and advisor to governments and companies in Canada and the U.S., and as an expert witness on regulation and corporate strategy issues. He holds a Ph.D. and M.A. from the University of California, Berkeley, and a B.A. Hons. (First Class) from Cambridge University. He is a member of the Council for Clean and Reliable Energy and a Director of London Hydro.

BRIAN RIVARD | RESEARCH DIRECTOR

Brian Rivard is an Adjunct Professor and Director of Research 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. Brian 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, Brian 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 policymaking.

BRANDON SCHAUFELE | IVEY ENERGY CONSORTIUM FELLOW

Brandon Schaufele has been an Ivey Energy Consortium Fellow since 2015. He is an Associate Professor in Business, Economics and Public Policy at the Ivey Business School. Previously, 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.

LAURA MCLEOD | CENTRE COORDINATOR

Laura McLeod coordinates 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 Coordinator for the Pierre L. Morrissette Institute for Entrepreneurship. She holds a BA from Queen's University and a Postgraduate Diploma from Humber College.

FELLOWS AND EXECUTIVES-IN-RESIDENCE

MATT DAVISON
RESEARCH FELLOW

Matt Davison is Dean, Faculty of Science, at Western University and Professor of Applied Mathematics and Statistical & Actuarial Sciences.

RADOSLAV DIMITROV
RESEARCH FELLOW

Radoslav Dimitrov is Associate Professor of International Relations at Western University, and the former Co-Chair of the European Union Task Force on Political Communication and chief political strategist on the European Union Presidency Team in climate policy.

CHRIS GUILLON
EXECUTIVE FELLOW

Chris Guillon is the Co-Founder and Vice President, Finance of StormFisher, a North American biogas power company.

HORIA HANGAN
RESEARCH FELLOW

Horia Hangan is Professor in the Faculty of Engineering at Western University and the founding Director of the Wind Engineering, Energy and Environment (WindEEE) Research Institute.

DAVID HAY
EXECUTIVE FELLOW

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