ANDREW LEACH, PH.D.

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AFFILIATIONS

| University of Alberta, Faculty of Arts (Economics) and Faculty of Law Professor, with tenure | 2022- |
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| Smart Prosperity, Research Network Member | 2018- |
| CIRANO, Center for Interuniversity Research and Analysis on Organizations Researcher | 2005- |
| PAST AFFILIATIONS | |
| University of Alberta, Alberta School of Business | |
| Professor, with tenure Associate Professor, with tenure Enbridge Professor of Energy Policy Assistant Professor | $\begin{array}{c} 2022 \\ 2011-2022 \\ 2013-2015 \\ 2006-2011 \end{array}$ |
| Centre for Applied Business Research in Energy and the Environment (CABREE), Alberta School of Business Research Centre, Academic Director | 2014-2022 |
| Government of Alberta, Department of Environment and Climate Change Chair, Climate Leadership Panel | 2015 |
| Environment Canada, Strategic Policy Branch Visiting Scholar | 2012-2013 |
| Sustainable Prosperity, Research Network Member | 2008–2017 |
| HEC Montréal , Institute of Applied Economics Assistant Professor (on leave, 2007) | 2003–2007 |
| Queen's University, Economics Department Teaching Fellow | 2002 - 2003 |
| EDUCATION | |
| University of Alberta Master of Laws | 2021 |
| Queen's University Ph.D. (Economics) | 2004 |
| University of Guelph Master of Arts (Economics) | 1999 |
| University of Guelph Bachelor of Science (Environmental Science) | 1998 |

PUBLICATIONS

William Noel, Timothy M. Weis, Qiulin Yu, Andrew Leach and Brian Fleck. (2022) Mapping The Evolution of Canada's Wind Energy Fleet, Renewable & Sustainable Energy Reviews 167(112690), pages 1-10.

Leach, Andrew. (2021) The No More Pipelines Act?, Alberta Law Review 59(1), pages 7-40.

Bankes, Nigel, Andrew Leach and Martin Olszynski. (2021) Supreme Court of Canada Re-writes the National Concern Test and Upholds Federal Greenhouse Gas Legislation. A Comment on the References re Greenhouse Gas Pollution Pricing Act, 2021 SCC 11, Energy Regulation Quarterly 9(2), pages 27-57.

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Leach, Andrew. (2021) Environmental Policy is Economic Policy: Climate Change Policy and the General Trade and Commerce Power, Ottawa Law Review 52(2), pages 97-156.

- Leach, Andrew, Nic Rivers, and Blake Shaffer. (2020) Canadian Electricity Markets during the COVID-19 Pandemic: An Initial Assessment, Canadian Public Policy 46(S2), pages S145-S159.
- Olszynski, Martin, Nigel Bankes, and Andrew Leach. (2020) Case Comment: Reference re Greenhouse Gas Pollution Pricing Act, 2020 ABCA 74, Journal of Environmental Law and Practice 33(2), pages 159-184.
- Leach, Andrew and Eric M. Adams. (2020) Seeing Double: Peace, Order, and Good Government, and the Impact of Federal Greenhouse Emissions Legislation on Provincial Jurisdiction, *Constitutional Forum* 29 (1), pages 1-20.
- Bošković, Branko and Andrew Leach. (2020) Leave it in the ground? Oil sands development under carbon pricing, Canadian Journal of Economics 53(2), pages 526-562.
- Heyes, Anthony, Andrew Leach and Charles F. Mason. (2018) The Economics of the Canadian Oil Sands, Review of Environmental Economics and Policy 12 (2), pages 242-263.
- Leach, Andrew and Trevor Tombe. (2016) Power play: The termination of Alberta's PPAs, SPP Communiqué 8 (11), pages 14 pages.
- Leach, Andrew. (2016) Canada in a Low-Carbon World: Impacts on new and existing resources, Canadian Public Policy 42 (S1), pages S18-S23.
- Leach, Andrew. (2015) Canadian Hydrocarbon Resources in an Era of Manufactured Energy, in Roland Paris and Taylor Owen (eds), The World Won't Wait: Why Canada needs to rethink its international policies, *University of Toronto Press* 2015, pages 240.
- Leach, Andrew and Branko Boskovic. (2014) Carbon cost will not stop oil-sands work, *Nature Letters* 511, pages 534-534.
- Leach, Andrew. (2012) Alberta's Specified Gas Emitters Regulation, Canadian Tax Journal 60(4), pages 881-898.
- Chakravorty, Ujjayant, Andrew Leach, and Michel Moreaux. (2012) Cycles in nonrenewable resource prices with pollution and learning-by-doing, *Journal of Economic Dynamics and Control* 36(10), pages 1448-1461.
- Laurent-Lucchetti, Jeremy and Andrew Leach. (2011) Generational welfare and induced innovation under climate change policy, *Scandinavian Journal of Economics* 113(4), pages 904-936.
- Leach, Andrew, Charles F. Mason and Klaas van't Veld. (2011) Co-optimization of oil production and carbon sequestration, *Resource and Energy Economics* 33, pages 893-912.
- Leach, Andrew, Joseph Doucet and Trevor Nickel. (2011) The effectiveness of Alberta biofuels policy, *Energy Policy* 39(7), pages 4007-4015.
- Chakravorty, Ujjayant, Andrew Leach, and Michel Moreaux. (2011) Would Hotelling Kill the Electric Car?, Journal of Environmental Economics and Management 61(3), pages 281-296.
- Chakravorty, Ujjayant, Shelby Gerking and Andrew Leach. (2010) "State Tax Policy and Oil Production: The Role of the Severance Tax and Credits for Drilling Expenses," *US Energy Tax Policy*, Metcalf, Gilbert (ed), Cambridge University Press, 414 pages..
- Leach, Andrew. (2009) The Welfare Implications of Climate Change Policy, Journal of Environmental Economics and Management 57(2), pages 151-165..
- Bahn, Olivier and Andrew Leach. (2008) The Secondary Benefits of Climate Change Mitigation: An overlapping generations approach, Computational Management Science 5(3), pages 233-257.
- Leach, Andrew. (2007) The Climate Change Learning Curve, Journal of Economic Dynamics and Control 33, pages 1728-1752.
- Clark, C. Robert and Andrew Leach. (2007) The Potential for Electricity Market Restructuring in Quebec, Canadian Public Policy 33(1), pages 1-20.
- Leach, Andrew. (2006) Regulation by Reputation, Computers and Operations Research 33, pages 409-425.

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CURRENT PROJECTS

Sara Hastings-Simon, Andrew Leach, Blake Shaffer and Tim Weis. "Alberta's Renewable Electricity Program: Design, Results, and Lessons Learned," Revisions requested by *Energy Policy*, May 2022.

Andrew Leach. "Canada's Oil Sands in a Carbon-Constrained World," revisions requested by the *Canadian Foreign Policy Journal*, April 2022.

Andrew Leach, and Alain-Desiré Nimubona. "Abatement Technology Search and the Porter Hypothesis." Submitted to the *Journal of Economic Dynamics and Control*, January 2022

Andrew Leach and Blake Shaffer. "Carbon Price Pass-Through in Alberta's Electricity Market," presented at the 2022 Canadian Economics Association Conference.

Andrew Leach and Charles F. Mason. "Nonrenewable resources, reserves, and carbon pricing."

Mark Droessler and Andrew Leach. "Green with envy? Carbon pricing impacts on the economic viability of green and blue hydrogen" Accepted for presentation at the 2022 Global Conference on Environmental Taxation.

Andrew Leach. "I can't believe it's not butter. What we can (and can't) learn about emissions quotas from supply management and the grain trade." Submitted to the *UBC Law Review*, July 2022.

Andrew Leach. "The Constitutional Limits on Federal GHG Emissions Policies."

Kathryn Harrison and Andrew Leach. "Canada's post-COVID Climate Challenge."

Benjamin Thibault, Tim Weis, and Andrew Leach. "Alberta's quiet but resilient electricity transition" Accepted for publication in Mark S. Winfield, Sustainable Energy Transitions in Canada; Challenges and Opportunities, UBC Press, Spring 2022

Andrew Leach. "Academic Engagement within Canada's Climate Policy Network" in Janis Sarra and Fenner Stewart eds., Reflections on Connecting Canada's Climate Policy Network, Canada Climate Law Initiative, 2022.

SELECTED PROFESSIONAL AND ADVISORY ACTIVITY

Leach, Andrew. "Expert witness report on emissions implications of the Dakota Access pipeline" in progress

Leach, Andrew. "Expert witness reports on the Rigel oil sands project" Fort McKay First Nation, 2020-21.

Leach, Andrew and Angela Adams, Stephanie Cairns, Linda Coady and Gordon Lambert. "Climate Leadership Panel, Report to the Minister" Alberta Environment and Climate Change, 2015.

Leach, Andrew. "Royalty Review Scoping Document" Alberta Energy, 2015.

Leach, Andrew. "Emerging oilsands technology and prospects for GHG emissions reductions" Environment Canada, 2012.

Leach, Andrew. "An evaluation of 'A Climate Change Plan for the Purposes of the Kyoto Protocol Implementation Act (Bill C-288)" National Roundtable on the Environment and the Economy (annually, 2007-2011).

Leach, Andrew. "GHG Emissions Policies for Alberta: Current strengths and weaknesses, key future threats, and a proposed policy solution for the Province of Alberta" Alberta Environment, July, 2009.

Leach, Andrew and Dave Sawyer. "An evaluation of the modeling and information transmittal process used for the development of Alberta's 2008 Climate Change Strategy" Office of the Auditor General of Alberta, July, 2008.

Leach, Andrew. "Policy Options for Carbon Capture and Storage" Alberta CCS Development Council, 2008.

Leach, Andrew and C. Robert Clark. "The determinants of demand for natural gas: a review of the literature" Gaz Métropolitain, July, 2006.

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MAJOR GRANTS

Social Sciences and Humanities Research Council Connection Grant 611-2021-0218, \$24,454 (co-investigator. Grant holder is Blake Shaffer, University of Calgary), 2022.

Canada First Excellence Research Fund: One of ten principal researchers for the Future of Energy Systems Institute grant, University of Alberta, \$75,000,000 over 7 years, 2016.

Social Sciences and Humanities Research Council Insight Development Grant 430-2014-0275, \$58,630 over 2 years, 2014.

Sustainable Prosperity Project grant with Branko Boskovic, \$8000, 2014.

Social Sciences and Humanities Research Council Insight Development Grant 430-2012-0079, \$45,612 over 2 years, 2012.

Social Sciences and Humanities Research Council Collaborator, Alberta Climate Dialogue (ABCD), Community-University Research Alliances, \$1 million over 6 years, 2010.

Social Sciences and Humanities Research Council Standard Research Grant, Grant Number 410-2009-1044, \$18600 over 3 years, 2009.

Social Sciences and Humanities Research Council Sustainable Prosperity Network Grant, \$1.8 million over 7 years, 2008.

Fonds québecois de la recherche sur la société et la culture (FQRSC) Team Grant, \$332 200 over 4 years, with G. Dionne, R. Gagné, P. Lanoie, P. François, and B. Dostie, 2005.

SERVICE AND PUBLIC ENGAGEMENT

House of Commons Standing Committee Testimony:

Natural Resources (RNNR), 44th Parl, 1st Sess, Feb. 28, 2022.

Environment and Sustainable Development (ENVI), 42nd Parl, 1st Sess, Jan. 28, 2019.

Finance (FINA), 42nd Parliament, 1st Session, May 7, 2018.

Transport, Infrastructure and Communities (TRAN), 42nd Parl, 1st Sess, Oct. 31, 2017.

Finance (FINA), 41st Parl, 2nd Sess, Mar. 10, 2015.

Senate Standing Committee Testimony:

Transport and Communications, 42nd Parl, 1st Sess, Apr. 30, 2019.

Energy, the Environment and Natural Resources, 42nd Parl, 1st Sess, May 10, 2016.

Energy, the Environment and Natural Resources, 41st Parl, 1st Sess, Nov. 30, 2011.

Selected Invited Speaking Engagements (5 years, * denotes virtual/hybrid event): 2022:

Invited presentation, Canadian Economics Association Annual Meetings, Ottawa, ON.*

Invited seminar, University of British Columbia (Okanagan), Kelowna, BC.*

Invited presentation, University of Texas (Austin) LBJ School of Public Administration.*

2021:

Keynote panelist, GCET21: Twenty-First Global Conference on Environmental Taxation.*

Invited speaker, Coalition of Finance Ministers for Climate Action, Stockholm, Sweden,*

Keynote speaker, APEGGA, Fort McMurray, AB.*

Luncheon keynote, Canadian Association of Business Economists (CABE), Toronto, ON.*

Moderator, Canadian Association of Members of Public Utility Tribunals (CAMPUT) Conference.*

Invited speaker, Edmonton Airports Board of Directors and Executive Team, Edmonton, AB.*

Invited speaker, Canada School of the Public Service, Ottawa, ON.*

Invited speaker, Federal Deputy Ministers' Environment and Climate Change Committee, Ottawa, ON.* Luncheon keynote, CPA Edmonton Chapter, Edmonton, AB.*

2020:

Invited presentation, Alberta Electric System Operator, Calgary, AB.*

Invited presentation, Athabasca Chipewyan First Nation (ACFN), Fort McMurray, AB.*

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Luncheon keynote, Economic Society of Northern Alberta (ESNA), Edmonton, AB.*

Invited presentation, Privy Council Office, Ottawa, ON.*

Invited panelist, Carbon pricing workshop, NYU Wagner Graduate School of Public Service, New York, NY.*

Luncheon keynote, Canadian Bar Association, Environment Division, Edmonton, AB.

Invited speaker, Federal Cabinet Retreat, Winnipeg, MB.

Invited seminar, Rural Economics and Environmental Sociology, University of Alberta, Edmonton, AB.

2019:

Keynote speaker, International Symposium on Sustainable Systems and Technology (ISSST). Portland, OR.

Invited speaker, Economics of Environmental Policy Workshop, University of Ottawa, Ottawa, ON.

Invited panelist, Alberta Investment Management Corporation (AIMCO) Annual Investor's Forum

Invited speaker, Federal Deputy Ministers' Environment and Climate Change Committee, Ottawa, ON.

2018:

Keynote speaker, Economic Society of Northern Alberta (ESNA): Outlook 2019 Conference, Edmonton, AB.

Invited speaker, Asia-Pacific Energy Research Centre Annual Conference, Tokyo, Japan.

Invited panelist, World Congress of Environment and Resource Economists, Gothenburg, Sweden.

Invited seminar, Waterloo Resource and Environmental Economics Workshop, Waterloo, ON.

Invited speaker, Ivey Annual Workshop on the Economics of Electricity Policy and Markets, Toronto, ON.

Invited panelist, Carleton University Centre for European Studies workshop, Ottawa, ON.

Invited speaker, Canadian Bar Association, Natural Resources Section, Calgary Chapter.

Invited speaker, Canadian Bar Association, Environment Section, Edmonton Chapter.

2017:

Keynote speaker, Canada 150 Lecture Series, Statistics Canada, Ottawa, Canada.

Luncheon keynote, Canadian Bar Association, Energy and Resources Law Section, Edmonton Chapter.

Invited speaker, Credit Suisse Client Workshop, Toronto, ON.

Keynote speaker, University of Alberta President's Alumni Reception, Vancouver, BC.

Invited speaker, Enbridge Board of Directors. Calgary, AB.

Invited speaker, Berkshire Hathaway Energy Canada, Calgary, AB.

Keynote speaker, University of Alberta Alumni Reception, Lethbridge, AB.

Invited seminar, Vancouver School of Economics, University of British Columbia, Vancouver BC.

Public lecture, University of British Columbia, Vancouver, BC.

Invited panelist, Atlantic Economic Association, Antogonish, NS.

Invited speaker, Edmonton Chamber of Commerce, Environment Committee

Luncheon keynote, Bennett Jones private event, Calgary, AB.

Luncheon keynote, Ottawa Economics Association, Ottawa, ON

Invited speaker, First Energy Capital Annual Investor Conference, Toronto, ON.

Opinion writing and knowledge mobilization:

I've contributed more than 200 opinion pieces on energy and environmental policy in major outlets including the CBC (aleach.ca/opinion/cbc_archive), the Globe and Mail (aleach.ca/opinion/globe_archive), and Maclean's (aleach.ca/opinion/macleans_archive), along with infrequent contributions to other outlets such as Alberta Oil Magazine, Policy Options and The National Post. I have also written several pieces recently in the University of Calgary's ABLawg, a peer-reviewed law blog. I wrote frequently for my personal blog (aleach.ca/opinion/blog) for many years, but do so less frequently now. I maintain a data projects page (aleach.ca/project) as well as a GitHub repository (github.com/leachandrew) through which research code and general interest data visualization resources are available. All linked sources are accessible via my website at aleach.ca.

Academic Service:

In the past five years, I have served as a referee for Journal of Environmental Economics and Management, the Journal of Economic Dynamics and Control, the Canadian Journal of Economics, Canadian Public Policy, SPP Communiqué, the Energy Journal, the Journal of the Association of Environmental and Resource Economists (JAERE), Macroeconomic Dynamics, Joule, Environmental and Resource Economics, Energy Policy, Resource and Energy Economics, and The International Review of Environmental and Resource Economics. I have previously served on the Editorial Council for the Journal of Environmental Economics and Management (2012-2015).

I currently serve on the jury for the 2022 Social Science and Humanities Research Council of Canada (SSHRC) Impact Awards, and on the External Advisory Committee for Statistics Canada's Canadian Centre for Energy

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Information. I have previously served on the selection committee for SSHRC Insight Development Grants.

I have served as an external examiner for doctoral thesis defences at HEC Montréal, the University of Calgary, the University of Toronto, the University of British Columbia, Queen's University, and the University of Ottawa. At the University of Alberta, I have served on many thesis examination committees in the Departments of Economics, Rural Economics and Environmental Sociology, and in the Faculty of Engineering. I have supervised or co-supervised two Ph.D. students in the Department of Economics (James Lin and Samuel F. Gamtessa), and currently co-supervise a Ph.D. candidate (Gloria Duran-Castillo) in the Department of Mechanical Engineering. I have also supervised Master's students in Mechanical Engineering and Economics. The Alberta School of Business, my primary employer, does not have thesis-based graduate programs in my research area.

At the University of Alberta, I am the Academic Director (senior leader) for the Center for Applied Business Research in Energy and the Environment (CABREE) as well as serving on the Energy Systems Curriculum Committee. I have previously served on the School of Business Undergraduate Studies Policy Committee (USPC), on multiple recruiting committees in the School of Business and the Department of Economics, and on the Future Energy Systems Institute Advisory Board.

CABREE has hosted an annual (pre-COVID) energy practitioners' conference since 2016, and I have twice organized the Canadian Resource and Environmental Economics study group meetings. Over the past 5 years, I have evaluated submissions for three AERE summer meetings, the 2019 IEEE Canadian Conference on Electrical & Computer Engineering (CCECE), the 2019 International Association for Energy Economics (IAEE) meetings in Montreal, and the World Congress of Environmental and Resource Economists (WCERE).

I am currently a member of the American Economics Association, the Association of Environment and Resource Economists (AERE), the Canadian Economics Association (CEA), and the Economic Society of Northern Alberta (ESNA). I previously served as both a Board Member and President of ESNA, as well as on the Environment Committee for the Edmonton Chamber of Commerce.

Community Service:

I serve as a Board Member and Vice-Chair for the REACH Edmonton Council for Safer Communities (2019-present) and as a Board Member and Treasurer for Edmonton's Juventus Cycling Club (2021-present). I have previously service as a Board Member for the River Valley Alliance (2017-2019) and as a Director for the Edmonton Girls' Hockey Association.