

Brigid Rowan

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Professional Profile

Brigid Rowan is an energy economist with over 25 years of experience in the areas of energy and regulatory economics (related to conventional, unconventional and renewable energy, and energy efficiency). Ms. Rowan's practice is informed by evidence that deep and rapid decarbonization is required to address the climate emergency. Her work examines economic development and environmental impacts of large energy supply, infrastructure and transportation projects (including pipelines), North American and global oil, gas, coal and electricity markets, as well as regulation of natural gas and electricity.

Since 2011, her practice has focused on fossil fuel supply and transportation (notably Canadian tar sands, shale oil and gas, coal, pipelines and rail). She has co-authored reports and expert testimony on the most controversial oil, gas and coal projects in North America, including crude oil pipelines (Keystone XL, Enbridge Line 9B, Trans Mountain), natural gas pipelines (Williams NESE and PennEast) and energy logistics facilities (Millennium Bulk Terminal (coal), Vancouver Energy Distribution Terminal (crude), Kalama Manufacturing & Marine Export Facility (shale gas/methanol)).

Ms. Rowan has provided consulting services in energy economics and regulation and expert evidence in Quebec, Ontario, Manitoba, British Columbia, Washington, California, Colorado, North Dakota, South Dakota, New York, New Jersey and New England, as well as at the Canadian Energy Regulator (CER) and the US Federal Energy Regulatory Commission (FERC). She has filed testimony in over 25 regulatory proceedings before the *Régie de l'énergie du Québec* (Quebec Energy Board). She has also provided support to counsel in all the Quebec proceedings and litigation support in many others. Brigid's clients include environmental, Indigenous and public interest groups, energy companies, start-ups and governments. She has held leadership positions in start-ups and non-profits, and worked with large corporations in energy marketing, communications and government relations.

Energy Economics and Energy Industry Experience

**2006 – present Senior Energy Economist, The Goodman Group, Ltd.,
Berkeley, California**

Provides expert consulting services related to energy regulation and economics (conventional, unconventional and renewable energy, and energy efficiency). These services include expert reports, testimony, intervenor and litigation support (assistance with deposition, interrogatories, cross-examination, brief/final argument, policy assessment and research).

Specializes in the economic development and environmental impacts of large energy supply, infrastructure and transportation options (including pipelines), North American and global oil, gas, coal and electricity markets, as well as regulation of natural gas and electricity.

Major Projects:

- Since 2006, has co-authored or collaborated in over 30 national, regional, and state/provincial studies on the economic development impacts (notably jobs) and environmental impacts of various energy supply and transportation options in the US and Canada.
- Since 2011, has co-authored 13 expert reports on the economic development impacts and environmental impacts of fossil fuel production and transportation (particularly shale and tar sands crude production, interjurisdictional pipelines, transloading facilities and crude-by-rail projects). These reports include analysis of related markets for energy supply produced and/or transported.
- Prepared a background report in 2019 for **WWF-Canada** on the economics of Grays Bay Road and Port Project in western Nunavut. The purpose of the project is to open up the Kitikmeot Region to mining development by MMG, a majority Chinese state-owned mining company. Grays Bay Road would be the longest all-weather road in Nunavut, bisecting core calving grounds for the endangered Bathurst caribou herd. The report provides an analysis of the environmental costs of the project (with an evaluation of the threats and potential extinction of the Bathurst herd), as well as the employment benefits for Nunavut, particularly for Inuit communities.

In conjunction with the report, led a discussion for WWF-Canada on the strategic use of economic analysis in critiquing large extractive projects and the importance of not ceding economic arguments to industry.

- In-depth participation in the preparation of the [“Expert Report on Millennium Bulk Terminals-Longview/Lighthouse”](#) and the [“Expert Rebuttal Report on](#)

[Millennium Bulk Terminals-Longview/Lighthouse](#)” with Ian Goodman, on behalf of the **Washington State Office of the Attorney General (AGO)** in the matter of *Lighthouse Resources, Inc., et al. v. Jay Inslee, et al.* before the US District Court (West). At maximum throughput of 44 million metric tons of coal per year, the Millennium Bulk Terminals-Longview (proposed by Lighthouse), would be the largest coal export terminal in North America. TGG was retained by the AGO to conduct research and analysis on the burden to the US coal industry if the Millennium Bulk Terminals-Longview were not built.

In light of TGG’s analysis of the Asian demand for the US coal to be exported via the terminal, as well as the employment impact of the terminal, the November 2018 Expert Report concluded that the terminal would not significantly affect the US coal industry, nor US coal exports to Asian markets. After careful review of the other expert reports, TGG concluded in the December 2018 Expert Rebuttal Report that the findings and conclusions of the November 2018 Expert Report remained unchanged. New developments occurring since the filing of the Expert Report, as well as TGG’s review of the reports of the other experts, have further strengthened the opinions and findings in the TGG Expert Report.

- Co-authored the “[Expert Report on the Northeast Supply Enhancement \(NESE\) Project Economic Impact Analysis for New Jersey, New York and Pennsylvania](#)” with Ian Goodman, commissioned by the **Eastern Environmental Law Center (EELC)** concerning the Williams NESE Project. This May 2018 report evaluates the economic impact study (Economic Impacts of the Proposed Northeast Supply Enhancement in New Jersey, Pennsylvania and New York) prepared for the Transcontinental Gas Pipe Line Company, LLC (Transco) by Michael Lahr and Will Irving of Rutgers University.

TGG’s evaluation demonstrates that the Rutgers Analysis substantially overstates the jobs from building the Project. The Rutgers Analysis overstates construction jobs in the tri-state area by 70-80%. Moreover, pipeline operations result in very small expenditures (and employment impacts) and have very little positive effect on the economy. The expert report was submitted at FERC in May 2018 by the EELC on behalf of NY/NJ Baykeeper, Food & Water Watch et al, as part of [Intervenors’ Additional Comments On FERC’s March 2018 Draft Environmental Impact Statement For The Northeast Supply Enhancement Project](#).

- Appointed by **NunatuKavut Community Council (NCC)**, an Inuit community in Labrador, as external advisor for the Independent Expert Advisory Committee (IEAC) on Muskrat Falls in 2017-2018. Muskrat Falls is a large and highly controversial hydroelectric project that has been widely opposed by many Indigenous residents. The mission of the IEAC was to use science and Indigenous Knowledge to recommend measures to protect the health of the Indigenous and local population from the effects of methylmercury related to hydro development at Muskrat Falls.

As the NCC external advisor to the IEAC (2017-2018):

- Assisted NCC leadership in retaining David Lean, a leading international scientific expert on methylmercury to represent the NCC on the IEAC's Independent Expert Committee and worked closely with Dr. Lean and NCC to ensure that Nalcor improve the inadequate monitoring of methylmercury in areas affected by the project (Churchill River to Lake Melville)
- Presented the work of the IEAC to community members at the NCC's March 2018 Annual General Meeting following the peak of the controversy surrounding Muskrat Falls
- Assisted NCC leadership in negotiations with Nalcor, the federal and provincial government, and other affected Indigenous communities; in formulating the NCC's positions for the IEAC; and in drafting the [final recommendations](#) of the IEAC to the Newfoundland government in April 2018.

As NCC's external advisor on the Canadian federal environmental and regulatory reviews (2016-2017):

- Prepared a December 15, 2016 presentation for NCC President, Todd Russell to the Canadian Federal Environmental Assessment Review Expert Panel. Authored "[Written Submission to Federal Environmental Assessment Review Panel](#)" on behalf of NCC (based on the presentation), filed on December 23, 2016. The purpose of the presentation and the written submission was to present NCC's recommendations to the Federal Environmental Assessment Review Panel in the context of the Trudeau government's commitment to improve the federal environmental assessment process and Indigenous consultations.
- Co-authored, coordinated and edited NCC's "[Submissions to the Government of Canada Regarding Environmental and Regulatory Reviews – Discussion Paper](#)," filed on September 15, 2017. This document presented NCC's comments on the update of the federal review of environmental and regulatory processes (pertaining to the Fisheries Act, the Navigation Protection Act, Environmental Assessment Processes and the Modernization of the National Energy Board).

- In-depth participation in the preparation of the Declaration of Ian Goodman regarding a review of the environmental and economic impacts of a proposed methanol production plant at Port of Kalama (the Project) in Washington. The Declaration discusses the failure of the Final Environmental Impact Statement for the Project to adequately consider GHG emissions associated with the Project, as well as a number of other potential environmental and economic impacts. The Declaration of Ian Goodman was filed in August 2017 with a legal brief by **Earthjustice** before the Shorelines Hearings Board for the State of Washington **on behalf of Columbia Riverkeeper, Sierra Club and Center for Biological Diversity**.
- In-depth participation in the preparation of the Declaration of Ian Goodman **on behalf of the Standing Rock Sioux Tribe** concluding that a shutdown of the Dakota Access Pipeline, pending the completion of a new environmental review, (a) would not have the severe disruptive consequences claimed by the pipeline company; (b) would not unduly harm crude producers, refiners, consumers and the US economy; (c) would (at most) result in a relatively limited increase in crude by rail; and (d) would not have significant adverse impacts in regard to risk of accidents/spills. The Declaration of Ian Goodman was filed on August 7, 2017 to support an extensive [legal brief by Earthjustice before the United States District Court for The District Of Columbia](#). This brief is part of [Earthjustice's litigation on behalf of Standing Rock Sioux Tribe on the Dakota Access Pipeline](#).
- Co-authored written [Expert Testimony on the Need for the Vancouver Energy Distribution Terminal \(VEDT\)](#) and a [Technical Appendix on the Market Analysis Underlying the Need for the VEDT](#) with Ian Goodman. The expert report was filed in May 2016 before the State of Washington Energy Facility Site Evaluation Council on behalf of **Earthjustice**. The testimony concludes that the VEDT will do little if anything to supply Washington with energy. Consequently, there is no economic need for this Project to supply the state.

The testimony also shows that the VEDT is likely not in Washington's public interest. TGG's cross-jurisdictional study of the costs and benefits of energy logistics facilities for host jurisdictions consistently concludes the following: the benefits are relatively small; the cost/risks are relatively large; and the economic benefits and costs/risks tend to be unevenly distributed (across stakeholders and regions), with the project proponents getting the majority of the benefits and the hosting jurisdiction bearing the majority of the costs/risks.

- Co-authored the "[Expert Report on the PennEast Pipeline Project Economic Impact Analysis for New Jersey and Pennsylvania](#)" with Ian Goodman, commissioned by the **New Jersey Conservation Foundation**. This

November 2015 report evaluates the economic impact study (PennEast Pipeline Project Economic Impact Analysis) prepared for the PennEast Pipeline Company. The PennEast Analysis claims that the pipeline project to transport Marcellus shale natural gas from Pennsylvania to New Jersey would have considerable economic benefits in both states. Goodman and Rowan demonstrate that the PennEast Analysis significantly overstates the total jobs from designing and building the pipeline by approximately two thirds or more.

- Co-authored written expert testimony, entitled "[Changes to the Economic Costs and Benefits of the Keystone XL Pipeline for South Dakota](#)" with Ian Goodman. The testimony filed in April and June 2015 at the South Dakota Public Utilities Commission on behalf of the **Rosebud Sioux Tribe** and withdrawn in July 2015. Based on the conclusions of pipeline safety expert, Richard Kuprewicz, Rowan and Goodman estimate a range of Worst-Case Scenario Costs starting at US\$1 billion and escalating to \$2 billion or more for a very high consequence event. Given the Keystone XL's very small employment and property tax benefits, TGG concludes that, under a range of worst-case scenarios, the costs of the Project will greatly exceed the benefits for South Dakota.
- Co-authored the "[Economic Costs and Benefits of the Trans Mountain Expansion Project \(TMX\) for BC and Metro Vancouver](#)" with Ian Goodman **in collaboration with Simon Fraser University's Centre for Public Policy Research**. The report, released in November 2014 and re-released in February 2015, refutes Kinder Morgan's claims regarding the positive economic development benefits of its controversial pipeline project. Goodman and Rowan show that the benefits of the pipeline are very small and have been significantly overstated by Kinder Morgan, whereas the worst-case costs of a catastrophic spill are very large and have been vastly understated.
- Co-authored the "[Economics of Transporting and Processing Tar Sands Crudes in Quebec](#)" with Ian Goodman **in collaboration with Équiterre and Greenpeace Canada**. The January 2014 report demonstrates that the economic development benefits for Quebec of moving and refining tar sands crudes would be insignificant while the costs and risks are very high.

- Co-authored an "[Analysis of the Potential Costs of Accidents/Spills Related to Crude by Rail](#)" with Ian Goodman on behalf of **Oil Change International (OCI)**. The November 2013 report demonstrates that the economic costs of crude by rail accidents can be very large and concludes that a major crude by rail (CBR) unit train accident/spill could cost \$1 billion or more for a single event. The report was incorporated into [Comments filed by NRDC, Sierra Club and OCI before PHMSA as part of the Advance Notice of Proposed Rulemaking Hazardous Materials: Rail Petitions and Recommendations To Improve the Safety of Railroad Tank Car Transportation, December 5, 2013](#).
- Co-authored expert testimony, entitled "[The Relative Economic Costs and Benefits of Enbridge's Line 9B Reversal and Line 9 Capacity Expansion Project](#)" with Ian Goodman. The expert report was filed in August 2013 at Canada's National Energy Board on behalf of the **Équiterre Coalition**, a coalition of Quebec- and Ontario-based environmental groups. In light of pipeline safety expert, Richard Kuprewicz's high-risk assessment for rupture on the Project, Goodman and Rowan demonstrate that due to Line 9B's extraordinary proximity to people, water and economic activity, the rupture costs of the Project (under a wide variety of pipeline accident/spill possibilities) range from significant to catastrophic. They conclude that the potential economic costs could exceed (and, under a wide range of accident/spill conditions, greatly exceed) the potential economic benefits.
- Co-authored "[Comments on Initial Study/Mitigated Negative Declaration \(IS/MND\) Valero Crude by Rail Project Benicia, California](#)" with Ian Goodman on behalf of **NRDC**. The July 2013 report provides a Market Analysis of a proposed crude by rail project for the Valero Benicia Refinery. Goodman and Rowan conclude that the proposed project could significantly affect crude supply (and thus quality) for the refinery, and recommend that a full Environmental Impact Report be undertaken. The report was included as an attachment to [NRDC's Comments on Notice of Intent to Adopt a Mitigated Negative Declaration for the Valero Crude by Rail Project, filed with the City of Benicia on July 1, 2013](#).
- Co-authored a "[Report evaluating the adequacy of the Keystone XL \(KXL\) Draft Supplemental Environmental Impact Statement \(DSEIS\) Market Analysis](#)" with Ian Goodman, and filed as an attachment to the Comments on KXL DSEIS jointly submitted by the **Sierra Club, NRDC, and 14 other environmental and public interest organizations** in April 2013. Based on their evaluation of the early 2013 market conditions (including emerging crude markets, factors driving tar sands expansion, availability and cost of crude oil transportation, and tar sands breakeven costs), Goodman and Rowan conclude that (i) the US State Department's DSEIS Market Analysis was deeply flawed and not a sound basis for decision-making; and (ii) KXL, and specifically its impact on tar sands logistics costs and crude prices,

would have a significant impact on tar sands expansion under a very broad range of conditions and assumptions.

- Co-authored an [influential and widely publicized](#) study of the Keystone XL pipeline employment impacts (“[Pipe Dreams? Jobs Gained, Jobs Lost by the Construction of Keystone XL](#)”) with Ian Goodman and the **Cornell Global Labor Institute**. The report was released in September 2011 and updated in January 2012. Goodman and Rowan provided the economic analysis to demonstrate that TransCanada Pipelines Ltd had greatly exaggerated the employment impacts of the Keystone XL (KXL) Project. TGG estimated the Project would create no more than 2,500-4,650 temporary direct construction jobs for two years and at the most a handful of permanent jobs (ranging from a low of 20 to a high of 127). TGG’s conclusions in Pipe Dreams were used to demonstrate to the US media and to the Obama Administration that KXL would not be a major job creator for the US, nor would it have any substantial impact on US unemployment.
- Co-authored “Employment Impacts of Air-Pollution Controls at North Dakota Coal Plants” with Ian Goodman. This November 2011 study for **Sierra Club National** estimated the employment impacts of Air-Pollution Controls at North Dakota Coal Plants.
- Collaborated in the preparation of expert testimony on behalf of **The Greenlining Institute** on economic development impacts (focusing on job creation and stimulus) of capital expenditures and rate increases proposed by the Pacific Gas & Electric Company in its 2011 General Rate Case; co-authored an analysis of the Economics of Supplier Diversity with Ian Goodman, as supplementary evidence for the same case.
- Collaborated in the analysis for the Avoided Energy Supply Costs in New England: 2009 Report, prepared for **Avoided-Energy-Supply-Component (AESC) Study Group**, which represents all major electric and gas utilities in New England, as well as efficiency program administrators, state energy offices and regulators. TGG’s contribution to this report was an analysis of the economic development impact of Massachusetts electricity and gas energy efficiency programs.
- Co-authored several national and regional analyses with Ian Goodman in 2007 and 2008 to brief management of **SunPower Corporation** (an international solar electric manufacturer based in California). The focus was on the economic development and environmental benefits of solar manufacturing and reduction of coal use.

**2004 – present Senior Energy Economist,
Econalysis Consulting Services Inc. /
Elenchus Research Associates Inc.
Montreal, Quebec and Ottawa, Ontario**

- Have provided written evidence and/or testified and/or assisted counsel and coordinated with subject-matter experts in over 30 regulatory proceedings before the *Régie de l'énergie du Québec* (Quebec Energy Board) on behalf of Option consommateurs in energy regulatory proceedings. The cases involved Quebec gas distributors (Gaz Métro (now Énergir) and Gazifère), as well as Hydro-Québec Distribution (the electricity distributor) and Hydro-Québec Transport (the electricity transmission company).
- Offer strategic advice and analytical expertise to public interest intervenors and their counsel in energy regulatory proceedings through the preparation of comments, interrogatories, testimony, cross-examination, and final argument.
- Actively participate in working groups, negotiations and consultations related to energy stakeholder issues in Quebec.
- Hire, coordinate and collaborate with subject-matter experts in various energy regulatory proceedings.
- Managed Econalysis' team of Quebec-based energy analysts from 2005-2007.

Major Projects on behalf of Option consommateurs:

- R-3567-2013: Coordinate and collaborate with subject-matter expert and assist counsel in a multi-phase case starting in 2016. R-3567-2013 includes a cost allocation study, a methodology for determining the profitability of extension projects, and the establishment of a rate structure for Gaz Métro (now Énergir).
- R-3693-2009 Phase 3: Prepared evidence and coordinated expert participation in Gaz Métro's 2013 case with respect to the renewal of its Distribution Incentive Mechanism.
- R-3809-2009 Phases 1 and 2: Prepared evidence and testified in Gaz Métro's 2013 rate case with respect the Supply Plan, a Gas Procurement Incentive Mechanism, operating costs and other rate issues.

- R-3752-2011 Phase 2: Prepared evidence and testified in Gaz Métro's 2012 rate case with respect to the profitable development of the residential market, cost allocation and rate strategy.
- Prepared evidence and testified on a range of regulatory issues (notably energy efficiency programs for lower-income consumers) in 2004-2007 regulatory hearings relating to Hydro-Québec and Gaz Métro.

**2001 – 2004 Principal, Energy and Communications Consultant,
Just Brigid Energy & Communication
Montreal, Quebec**

- Provided comprehensive English communications and website production services with a specialization in energy and the environment.
- Clients included: Quebec Ministry of the Environment, Équiterre, Quebec Centre for Action on Climate Change, Madinina Software.
- Managed the redesign, production and relaunch of a new website for Équiterre, Quebec's largest environmental group (www.equiterre.org) and advised on the web strategy for the Quebec Centre for Action on Climate Change.

**1998 – 1999 Energy Consultant, Econalysis Consulting Services
Toronto, Ontario**

- Assisted in the preparation of expert testimony in English and French and conducted research for public interest intervenors in Quebec, Ontario and Manitoba energy regulatory proceedings.

**1998 Client Manager, Utility & Energy Services Industry
IBM Canada,
Toronto, Ontario**

- Managed IBM client relationships at Canada's largest energy utilities via the direct marketing channel.

**1996 – 1997 Direct Marketing Specialist, Industry Solutions Unit,
IBM Canada
Toronto, Ontario**

- Managed diverse teams (database specialists, graphic designers, copywriters, translators, ad agencies, direct mail houses) to implement Quebec-based B2B direct marketing campaigns for the energy and telecommunications industry, including pioneering web campaigns.

- Successfully implemented five campaigns, three of which generated response rates of 10-35% and respective revenues of over \$2.5 million.

**1995 – 1996 Energy Analyst, The Goodman Group, Ltd.,
Boston, Massachusetts**

- Collaborated in the preparation of expert testimony regarding Hydro-Québec's cycle of electricity surpluses and sales promotion in domestic and export markets on behalf of Commission Staff for a Quebec Government Commission on Hydro-Québec's purchasing policies with respect to independent power producers
- Assisted with the research and writing of various expert reports on energy economics for environmental and indigenous groups.

**1992 – 1993 Energy Analyst, Stephen Graham Associates,
Ottawa, Ontario**

- Prepared a series of documents for policymakers on the economic, political and technical feasibility of various alternative energy options in developing countries.

Senior Management and Management Consulting Experience

**1999 – 2001 Acting CEO and Co-Founder
Sites.com, New York, NY**

- Oversaw operations for this New-York-based search engine/publishing start-up including web content development, book production (circulation 15,000 copies), sales and marketing, human resources, finances, facilities, telecommunications, information technology.
- Developed marketing strategy including branding, advertising, marketing channels and media relations; managed the development of offline and online marketing communications.
- Participated in all aspects of strategy and business plan development.

**1994 – 1995 Director of Communications,
International Children's Institute,
Toronto, Ontario**

- Created and presented several successful proposals to obtain government and foundation funds in excess of \$500,000 for this Canadian NGO, which assists traumatized refugee children.
- Managed the production of communications materials for Institute pilot projects in Toronto and Croatia.

1993 – 1994 **Public Sector Management Consultant, Groupe SECOR,
Ottawa, Ontario**

Major Projects:

Republic of Benin

- Co-produced a study in French on public sector reform in Benin as a member of a team assisting the President of Benin in strengthening government systems to support the political transition to democracy
- Participated in interviews and conducted research on-site with senior government officials and key ministers in Cotonou, Benin.

Marketing Communications for the World Bank

- Developed a marketing package for Groupe SECOR to familiarize World Bank officials with the firm's capabilities and experience.

Government Relations Experience

1988 **IBM Canada,
Public Affairs Specialist
Toronto and Ottawa, Ontario**

- Produced an IBM position paper encouraging high tech initiative in Canada.
- Prepared political briefing material for company executives.

1988 **IBM Europe,
Public Affairs Specialist
Brussels, Belgium**

- Wrote an article on the effects of the 1988 US Trade Bill on American subsidiaries in Europe for *Commerce in Belgium*, a business journal.
- Prepared a report on broadcast advertising in a united Europe and the effects of EU advertising directives on IBM's business.
- Researched the potential effects of the Montreal Protocol on IBM Europe and recommended that IBM Europe not align itself with companies (such as Dow Chemical), who lobbied against the Protocol.

Education

**Master of Arts, International Affairs, International Political Economy
(Environmental Specialization),**

Norman Paterson School of International Affairs,
Carleton University, Ottawa, Ontario, 1996.

Thesis examines how the Cree of Northern Quebec (a Canadian First Nations group) used economic arguments and energy regulation to successfully oppose Hydro-Québec's construction of the Great Whale dam.

Bachelor of Arts, Honours Economics, Computer Science Minor

(Cooperative Education Program),
University of Waterloo, Waterloo, Ontario, 1990.

Other: Financial Literacy Program for Directors and Executives,
Rotman School of Management, University of Toronto, 2007.

Languages: English, French, Spanish, Italian.

Appointments, Achievements and Awards

Greenpeace Canada (2006-2020): Co-Chair (2017-2020); Board member (2006-2015); Treasurer and Chair of the Finance Committee (2008-2015); Chair the Nominations Committee (2012-2015); Member of the Board Search Committee to Recruit Executive Director (2012 and 2019).

Quebec Centre for Action on Climate Change (2004): provided pro-bono web strategy advice and website production oversight.

Équiterre (2003-2004): managed the redesign, production and relaunch of a new website for Équiterre, Québec's largest environmental group (www.equiterre.org).

Humber School for Writers (2002): scholarship for a fiction-writing workshop.

IBM Canada Team Success Award (1997 and 1998) and **IBM Canada Public Affairs Award** (1988): presented for an outstanding contribution to the Public Affairs Department.

Canadian Club at Harvard University (1996): participated in a round table discussion on energy exports with former Quebec Premier, Robert Bourassa.

Ottawa Co-Director, Pollution Probe (1993): co-directed the 1993 Ottawa fund-raising drive for this Ontario-based ENGO.

Ontario Public Interest Research Group (1992): co-organized a panel discussion at the Canadian Parliament Buildings on hydro projects in the Canadian North for Indigenous and federal politicians and members of the public.

Carleton University Grant for Graduate Studies (1991-93): grant requirements included conducting tutorials for undergraduate Economics courses.

University of Waterloo Nordic Ski Team (1988-90): competed at the provincial level.

Competitive Cycling (1986-89): competed at the national and provincial levels.

Publications and Major Reports

Submissions to the Government of Canada Regarding Environmental and Regulatory Reviews – Discussion Paper on behalf of NunatuKavut Community Council, *September 15, 2017* (co-author with S. Kath and D. Simon and in-depth participation of Ian Goodman).

Written Submission to Federal Environmental Assessment Review Panel on behalf of NunatuKavut Community Council to the Canadian Federal Environmental Assessment Review Expert Panel, *December 23, 2016* (with in-depth participation of G. Russell Jr., T. Russell and I. Goodman).

Expert Report on the PennEast Pipeline Project Economic Impact Analysis for New Jersey and Pennsylvania, commissioned by the New Jersey Conservation Foundation, *November 4, 2015* (co-author with Ian Goodman).

Comments on Scoping Supplemental Environmental Impact Statement (SEIS) Rulemaking for Colorado Roadless Coal Exception #46470 to the U.S. Department of Agriculture Forest Service on behalf of the Sierra Club, *May 22, 2015* (co-author with Ian Goodman).

Comments on Draft Environmental Impact Report (DEIR) Analysis of Oil and Gas Well Stimulation Treatments in California on behalf of NRDC, *March 16, 2015* (co-author with Ian Goodman), incorporated as an attachment to Comments filed by Natural Resources Defense Council (NRDC), Center for Biological Diversity (CBD), Sierra Club, Los Angeles Waterkeeper on the Department of Conservation's, through its Division of Oil, Gas and Geothermal Resources (DOGGR), Draft Environmental Impact Report (DEIR) for Well Stimulation in California (the Project) prepared pursuant to the California Environmental Quality Act (CEQA).

Economic Costs and Benefits of the Trans Mountain Expansion Project (TMX) for BC and Metro Vancouver in collaboration with The Centre for Public Policy Research, Simon Fraser University, *November 10, 2014* (co-author with Ian Goodman, re-released *February 4, 2015*).

Report on the Economics of Transporting and Processing Tar Sands Crudes in Quebec in collaboration with Équiterre and Greenpeace Canada, *January 2014* (co-author with Ian Goodman).

Analysis of the Potential Costs of Accidents/Spills Related to Crude by Rail, *November 8, 2013* (co-author with Ian Goodman) on behalf of Oil Change International (OCI), incorporated as Attachment 3 to Comments filed by NRDC, Sierra Club and OCI before The Pipeline and Hazardous Materials Safety Administration, U.S. Department Of Transportation as part of the Advance Notice

of Proposed Rulemaking Hazardous Materials: Rail Petitions and Recommendations To Improve the Safety of Railroad Tank Car Transportation, *December 5, 2013*.

Comments on Initial Study/Mitigated Negative Declaration (IS/MND) Valero Crude by Rail Project, Use Permit Application 12PLN-00063, Benicia, California, *July 1, 2013* (co-author with Ian Goodman) on behalf of NRDC, included as an attachment to NRDC's Comments on Notice of Intent to Adopt a Mitigated Negative Declaration for the Valero Crude by Rail Project, filed with the City of Benicia Community Development Department on *July 1, 2013*.

Report evaluating the adequacy of the Keystone XL (KXL) Draft Supplemental Environmental Impact Statement (DSEIS) Market Analysis, *April 22, 2013* (co-author with Ian Goodman), filed as an attachment to the Comments on KXL DSEIS jointly submitted by the Sierra Club, NRDC, and 14 other environmental and public interest organizations.

Pipe Dreams? Jobs Gained, Jobs Lost by the Construction of Keystone XL, *September 28, 2011* (co-author with Ian Goodman, TGG, and L. Skinner and S. Sweeney, Cornell Global Labor Institute; *revised January 18, 2012*).

Employment Impacts of Air-Pollution Controls at North Dakota Coal Plants, prepared for Sierra Club, *November 21, 2011* (co-author with Ian Goodman).

The Economics of Supplier Diversity Examining Areas of Potential Interest for GLI with respect to GRC 2011 and Potential Amendments to GO 156, prepared for The Greenlining Institute, *August 6, 2010* (co-author with Ian Goodman).

Avoided Energy Supply Costs in New England: 2009 Report, prepared for Avoided-Energy-Supply-Component (AESC) Study Group, *August 21, 2009* (co-authors I. Goodman, R. Hornby, P. Chernick, et al and in-depth participation of B. Rowan; *revised October 23, 2009*).

Expert Testimony and Formal Energy Analyst Submissions

Information is presented in the following order: jurisdiction and docket number; title of case; client; date testimony filed; and subject matter covered.

- 1. United States District Court Western District of Washington at Tacoma (Case No. 3:18-cv-05005-RJB); Lighthouse Resources, Inc., et al. v. Jay Inslee, et al.; Washington State Office of the Attorney General (Defendant); November 14, 2018 (Expert Report of I. Goodman with in-depth participation of B. Rowan); December 14, 2018 (Expert Rebuttal Report of I. Goodman with in-depth participation of B. Rowan).**

Conducted research and analysis on the burden to the US coal industry if the Millennium Bulk Terminals-Longview (the largest proposed coal export terminal in North America) were not built. In light of TGG's analysis of the Asian demand for the US coal to be exported via the terminal, as well as the employment impact of the terminal, concluded in the TGG Expert Report that the terminal would not significantly affect the US coal industry, nor US coal exports to Asian markets. Concluded in the TGG Expert Rebuttal Report that the findings and conclusions of the TGG Expert Report remained unchanged. New developments occurring since the filing of the Expert Report, as well as TGG's review of the reports of the other experts, have further strengthened the opinions and findings in the TGG Expert Report.

- 2. United States Federal Environmental Regulatory Commission (Docket CP17-101-000); on behalf of NY/NJ Baykeeper, Food & Water Watch, Central Jersey Safe Energy Coalition, and Princeton Manors Homeowners Association; May 14, 2018 (co-author with I. Goodman); submitted by the Eastern Environmental Law Center (EELC) as part of Intervenors' Additional Comments On FERC's March 2018 Draft Environmental Impact Statement For The Northeast Supply Enhancement Project.**

Evaluated the economic impact study (Economic Impacts of the Proposed Northeast Supply Enhancement in New Jersey, Pennsylvania and New York) prepared for the Transcontinental Gas Pipe Line Company, LLC (Transco) by Michael Lahr and Will Irving of Rutgers University. Concluded that the Rutgers Analysis substantially overstates the jobs from building the Project. The Rutgers Analysis overstates construction jobs in the tri-state area by 70-80%. Moreover, pipeline operations result in very small expenditures (and employment impacts) and have very little positive effect on the economy.

3. **Shorelines Hearings Board for the State of Washington (SHB No. 17-010c); Columbia Riverkeeper, Sierra Club and Center for Biological Diversity (Petitioners); August 21, 2017 (Declaration of I. Goodman with in-depth participation of B. Rowan); in support of Brief filed by Earthjustice on behalf of Petitioners.**

Reviewed the environmental and economic impacts of a proposed methanol production and marine export facility in an industrial park owned by the Port of Kalama (the Project). Discussed the failure of the Final Environmental Impact Statement for the Project to adequately consider GHG emissions associated with the Project, as well as a number of other potential environmental and economic impacts.

4. **United States District Court for The District Of Columbia (Case No. 1:16-cv-1534-JEB); Standing Rock Sioux Tribe, joined by Cheyenne River Sioux Tribe (Plaintiffs); August 7, 2017 (Declaration of I. Goodman with in-depth participation of B. Rowan); Technical Appendix; August 7, 2017 (Declaration of I. Goodman with in-depth participation of B. Rowan); in support of Brief filed by Earthjustice on behalf of Plaintiffs.**

Reviewed the Brief and Declarations filed by Dakota Access, LLC, regarding remedy in this litigation. Concluded that a shutdown of the Dakota Access Pipeline (DAPL), pending the completion of a new environmental review, (a) would not have the severe disruptive consequences claimed by the pipeline company; (b) would not unduly harm crude producers, refiners, consumers and the US economy; (c) would (at most) result in a relatively limited increase in crude by rail; and (d) would not have significant adverse impacts in regard to risk of accidents/spills. In fact, for the Plaintiffs' reservations, DAPL would have a much higher proximity and much greater risk than does crude by rail. In terms of the risk of worst-case accidents and spills, the Declaration concluded that there is no clear reason to assume that DAPL is less risky than crude by rail.

5. **State of Washington Energy Facility Site Evaluation Council (Case No. 15-001); Application No. 2013-01 Tesoro Savage LLC Vancouver Energy Distribution Terminal; Earthjustice; May 13, 2016 (Direct Testimony of I. Goodman with in-depth participation of B. Rowan); Technical Appendix: Market Analysis; May 13, 2016 (co-author with I. Goodman).**

Evaluation of the economic need for Washington State of the Vancouver Energy Distribution Terminal (VEDT). Demonstrated that the VEDT will do little if anything to supply Washington with energy. Consequently, concluded that there is no economic need for this Project to supply Washington. Analysis of whether the Project is in the public interest of Washington State. TGG's cross-jurisdictional study of the costs and benefits of energy logistics facilities for host jurisdictions consistently

concludes the following: the benefits are relatively small; the cost/risks are relatively large; and the economic benefits and costs/risks tend to be unevenly distributed (across stakeholders and regions), with the project proponents getting the majority of the benefits and the hosting jurisdiction bearing the majority of the costs/risks. Recommendation that the Project be rejected based on the conclusion that it is highly likely that the VEDT is not in the public interest of Washington.

- 6. United States Federal Environmental Regulatory Commission (Docket No. CP15-558-000); on behalf of New Jersey Conservation Foundation; November 6, 2015 (co-author with I. Goodman); submitted by New Jersey Conservation Foundation as part of its comments October 29, 2015 regarding the PennEast Pipeline Application and resubmitted by the same party on September 8, 2016.** Evaluation of the economic impact study (PennEast Pipeline Project Economic Impact Analysis) prepared for the PennEast Pipeline Company. Refuted the PennEast Analysis claims that the pipeline project to transport Marcellus shale natural gas from Pennsylvania to New Jersey would have considerable economic benefits in both states. Demonstrated that the PennEast Analysis significantly overstated the total jobs from designing and building the pipeline by approximately two thirds or more.
- 7. Canadian National Energy Board Hearing Order OH-001-2014; Application for Trans Mountain Expansion Project; North Shore No Pipeline Expansion (NSNOPE); July 21, 2015 (joint testimony with I. Goodman).** Estimated the economic benefits of the proposed Trans Mountain Expansion Project (TMX) for BC and Metro Vancouver and compares these benefits to a range of potential costs of bad to worst-case scenarios. Provided guidance as to whether TMX is in the public and economic interest of BC and Metro Vancouver. Refuted Kinder Morgan's claims regarding the positive economic development benefits of its controversial pipeline project. Demonstrated that the benefits of the pipeline are very small and have been significantly overstated by Kinder Morgan (the proponent), whereas the worst-case costs of a catastrophic spill are very large and have been vastly understated.
- 8. South Dakota Public Utilities Commission (Docket HP14-001); Petition of TransCanada Keystone Pipeline, LP (Keystone) for Order Accepting Certification of Permit Issued in Docket HP09-001 to Construct the Keystone XL Pipeline; The Rosebud Sioux Tribe; April 24, 2015; Rebuttal Testimony June 26, 2015 (joint testimony with I. Goodman). Testimony withdrawn July 17, 2015.** Analysis of the changes to the economic costs and benefits of the Keystone XL Pipeline for South Dakota. Based on the conclusions of pipeline safety expert, Richard Kuprewicz, evaluation of a range of Worst-

Case Scenario Costs starting at US\$1 billion and escalating to \$2 billion or more for a very high consequence event. Given the Keystone XL's very small employment and property tax benefits, concluded that, under a range of worst-case scenarios, the costs of the Project will greatly exceed the benefits for South Dakota.

9. **Assemblée Nationale du Québec Commission de l'agriculture des pêcheries, de l'énergie de des ressources naturelles (Quebec Parliamentary Commission); Parliamentary Hearings to study the acceptability for Quebec of Enbridge Pipelines Inc. proposed project to reverse the flow of Line 9B between North Westover and Montreal; Équiterre; December 3, 2013 (joint testimony with S. Guilbeault and S. Ribaux).**

Provided [oral testimony](#) before the Quebec Parliament on the acceptability for Quebec of Enbridge Pipelines Inc. Line 9B Reversal and Line 9 Capacity Expansion Project Proposal before the Canadian National Energy Board (Hearing Order OH-002-2013). Answered parliamentarians' technical questions on the need for hydrostatic testing at an appropriate pressure and identified the key threats to pipeline safety. Explained to the Commission why international pipeline safety expert Richard Kuprewicz had assessed the risk of rupture on Line 9B at 90% in the years following the reversal.

10. **Canadian National Energy Board Hearing Order OH-002-2013; Enbridge Pipelines Inc. Line 9B Reversal and Line 9 Capacity Expansion Project Application; Équiterre (Coalition); August 8, 2013 (joint testimony with I. Goodman).**

Analysis of relative economic costs and benefits of Enbridge's Line 9B Reversal and Line 9 Capacity Expansion Project. Evaluation of the Project, which would transport a mix of tar sands dilbit, Bakken, and conventional WCSB crudes through Ontario and Quebec, crossing major waterways and Canada's most populous urban areas, (including Toronto and Montreal). Recommendation that the Enbridge Project be rejected, based on (i) the results of this relative economic cost-benefit analysis, demonstrating that the potential economic costs could exceed (and, under a range of malfunction/accident conditions, greatly exceed) the potential economic benefits; (ii) the highly uneven allocation of costs and benefits among the stakeholders, and across regions; and (iii) the conclusion of international pipeline safety expert, Richard Kuprewicz, that there is a high risk of pipeline rupture in the early years following Project implementation due to a combination of cracking and corrosion.

11. **Régie de l'énergie du Québec (Quebec Energy Board) File R-3693-2009 Phase 3; Société en commandite Gaz Métro (SCGM or Gaz Métro) Application for the Renewal of the Incentive Mechanism**

for the Improvement of the Performance of Gaz Métro; Option consommateurs; April 9, 2013 (joint comments with J.F. Wilson).

Analysis of various scenarios outlined by the Régie de l'énergie du Québec regarding a proposed Incentive Mechanism for Gaz Métro's distribution rates from the perspective of regulatory efficiency, equity between the distributor and customers, and equity among rate classes.

- 12. Régie de l'énergie du Québec (Quebec Energy Board) File R-3809-2009 Phase 2; Société en commandite Gaz Métro (SCGM or Gaz Métro) Application for the Approval of the Supply Plan and the Modification of the Conditions of Service and Tariff as of October 1st, 2012; Option consommateurs; March 20, 2013; Oral testimony April 30, 2013.**

Evaluation of the reasonableness of SCGM's Operating Costs (including 2013 increase in salaries and wages relative to the years under SCGM's Incentive Mechanism; total operating costs for 2013 relative to the years under SCGM's Incentive Mechanism; benchmarking of total operating costs for 2013 based on a comparison with three other Canadian gas distributors; and pension costs and a valuation of the pension plan and deficit). Review of the 2013 Revenue Forecast (including customer and volume forecast methodology for D1, an analysis of the historic forecasts). Evaluation of affiliate transactions (including recovery of costs from affiliates: Valener and ANR; use of standard labour rates; allocation of common costs). Analysis and recommendations regarding the following: an Interim Sharing Mechanism for underearnings and overearnings for 2013; a method to hold regulated customers harmless in the transfer of the debt from the Unregulated Activities to the Regulated Activities; and the application of a uniform rate increase in D1 and related concerns regarding SCGM's Rate Vision and Rate Strategy.

- 13. Régie de l'énergie du Québec (Quebec Energy Board) File R-3809-2009 Phase 1; Société en commandite Gaz Métro (SCGM or Gaz Métro) Application for the Approval of the Supply Plan and the Modification of the Conditions of Service and Tariff as of October 1st, 2012; Option consommateurs; October 1, 2012 (Phase 1a) and December 7, 2012 (Phase 1b); Oral testimony November 6, 2012 (Phase 1a) and March 12, 2013 (Phase 1b).**

Analysis and recommendations regarding the general acceptability of the overall Supply Plan in light of Option consommateur's interest in balancing security of supply with cost minimization; the multipoint supply proposal and the strategy for displacement of the supply structure from Empress to Dawn; and proposed rate modifications relative to interruptions (Phase 1a). Evaluation and recommendations concerning SCGM's proposed Gas Procurement Incentive Mechanism (GPIM), a "Performance Indicator for the Optimization of Supply Tools" (Phase 1b).

- 14. Régie de l'énergie du Québec (Quebec Energy Board) File R-3752-2011 Phase 2; Société en commandite Gaz Métro (SCGM or Gaz Métro) Application for the Modification of Rates and Service Conditions for the 2011/2012 Rate Year; Option consommateurs; July 8, 2011 (Revised September 9, 2011); Oral testimony September 9, 2011.**

Analysis of: (i) the profitable development of the residential market; (ii) cost allocation, the links between the costs and the rates; and SCGM's long-term vision for the rate strategy; (iii) the 2011/2012 rate strategy (including correction of the cross-subsidization of residential consumers).

- 15. California Public Utilities Commission Application No. 09-12-020; Pacific Gas & Electric Company General Rate Case 2011; The Greenlining Institute; May 19, 2010 (Direct Testimony of I. Goodman with in-depth participation of B. Rowan); Rebuttal Testimony June 4, 2010 (Direct Testimony of I. Goodman with in-depth participation of B. Rowan).**

Analysis of economic development impacts (focusing on job creation and stimulus) of PG&E's proposed capital expenditures and associated rate increases. Consideration of the impacts of these expenditures and rate increases on customers and communities. Recommendation that PG&E increase its supplier diversity activities in order to offset adverse impacts on customers and communities while addressing equity concerns. Analysis of PG&E's Customer Retention and Economic Development (Load Attraction and Retention) activities. Analysis of the direct testimony of other intervenors with respect to economic development impacts of the proposed capital expenditures and quantification of these impacts in the Rebuttal Testimony.

Note: This list includes only formal submissions and expert testimony at major cases since 2010. A complete list of all testimony and formal submissions since 2004 is available upon request.