SUBJECT: Expertise of MNP LLP

REFERENCE: NFAT Review: A Review of Manitoba Hydro's Macro Environmental Considerations, 13 January 2014. The Scope Of Work (SOW) undertaken by MNP LLP, as defined by the PUB.

QUESTION:

Please provide elements from each authors' curriculum vitae which demonstrate their purported expertise.

RESPONSE:

Please refer to attachments.

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PROFILE	Craig Sabine joined MNP in 2012 and is a Senior Manger in the Energy & Utilities practice. Craig is an expert in the analysis of Canadian energy projects and in climate change policy and mitigation strategy, as well as in other environmental and sustainability-oriented issues. For over 12 years, Craig has assisted a variety of clients with regulatory efforts and supported the development of public policy at the federal and provincial levels. Prior to MNP, Craig spent 10 years with ICF International, working with a broad set of public and private sector clients on issues related to emissions reduction strategies and emissions trading initiatives, carbon finance, climate change policy and GHG risk. Craig was a member of ICF's verification team who performed verification, assurance and auditing functions for corporate GHG compliance and offsets development, as well as voluntary GHG strategies and carbon footprinting. Craig has participated in developing or verifying over twelve commercial-grade inventories and has completed numerous site visits to industrial and power generation facilities, providing GHG quantification services. Craig's climate practice assignments ranged from large point source emitter quantifications with the TransCanada, Husky, Capital Power and the Canadian Gas Association to carbon footprinting for services-based organizations and public sector entities. In his energy practice, Craig developed much of the Canadian portion of ICF's electricity markets projection model and policy analysis tool, the IPM® and often supported generators, utilities and regulators in strategic planning, economic development, asset and portfolio assessment, due diligence, policy analytics and generation procurement and sale. Craig has evaluated the impacts of emissions reduction policies on the electricity sector, including Environment Canada's Turning the Corner climate change policies and transboundary NO_x and SO_x trading policies. Prior to working at ICF, Craig worked in the International Smog Program of the Transboundary Air Issues Branch, Environment Canada, in Hull Quebec. He conducted preliminary research for the evaluation of effective emissions trading allocation methodologies as well as providing support for other projects and issues pertaining to public policies.
SERVICE LINE	Management Consulting
INDUSTRY FOCUS	Energy & Utilities, Sustainability, Public Sector
OFFICE	Toronto, Ontario

SELECTED ASSIGNMENTS:

INDUSTRY	SERVICE LINE	PROJECT DESCRIPTION
Energy and Utilities	Testimony	**Koskie Minsky Expert Witness Support** – For a law firm representing plaintiffs in a class action case vs. Atlantic Power Corporation, Craig provided expert witness evidence regarding economic and market-based impacts on the financial position of the IPP. Craig's testimony includes evaluation of the Florida and Ontario electricity markets and the impacts of PPA negotiations on Atlantic's share value and ability to service dividends.
Energy and	Audit and	**OPA Process Audit and Re-design** - Craig recently supported the OPA in

Utilities	Compliance	efforts to reconstruct the review and assurance process of regulated price plan claims submitted by Ontario electricity distributors as part of their settlement activities. Craig provided technical expertise on two field audits of the settlement claims and has been managing the development of a compliance and risk-based oriented certification program to replace annual audit.
Energy and Utilities	Regulatory	**ENMAX Affiliates Fair Market Value Review** – Craig managed the third party review of ENMAX's 2011 and 2012 affiliate transactions in support of the firm's current cost of service rate filing. The goal of the assignment was to provide assurance of compliance with the AUC's Affiliates Code of Conduct and to provide opinion on the fair market value of affiliate transactions between ENMAX and for-profit entities. Direct testimony may be required during the AUC hearing.
Energy and Utilities	Internal Controls	**OEB Internal Controls Review** – Craig participated as subject matter expert and reviewer on an assignment to evaluate the design and compliance of internal controls within the OEB's procurement, finance and IT departments. Subsequently the MNP evaluated and recommended on the need for and design of an internal audit function within the organization.
Energy and Utilities	Regulatory	**ENMAX Fibre Optics Business Valuation** – In support of the potential for regulatory hearings associated with the sale of a non-regulated business, Craig managed the development of a valuation of fibre optics assets for a Canadian utility. The assignment developed a full model of equipment, construction, labour and operating costs associated with an urban fibre optic network.
Energy and Utilities	Regulatory	**CustomerFirst Alternative Service Delivery Model** – For a number of Ontario LDCs, Craig is currently leading the development of a shared services collaboration to enhance the cost efficiencies and customer service for ratepayers. The collaborative model is an alternative design toward efficiency from traditional consolidation and merger.
Energy and Utilities	Regulatory	**Distribution Sector Panel** – Craig recently led an MNP team to support a consortium of 4 Ontario LDCs (Greater Sudbury Hydro, North Bay Hydro, Northern Ontario Wires, Chapleau Public Utilities Corp) in the development and presentation of their position on LDC consolidation for the Ministry of Energy and the Panel. The position included analysis of the economic, operational, and community-based implications of various options to drive efficiencies in the sector. The focus of the position paper and presentation addressed the following prinicples: Efficiency and reliability of the systems being maintained; Safety of the systems being maintained; Price impacts to ratepayers; and Capacity of LDCs to carry out their mandate.
Energy and Utilities	Regulatory	**Kinder Morgan General Rate Application** – Currently, Craig is working closely with an internal team of operations, project management and finance experts at a major Canadian pipelines company to prepare the rate base for their 2013 rates application to the National Energy Board. Craig is managing all aspects of development and verification of the rate base and capital project accounts to develop one of three key sections of the GRA cost of service.
Energy and Utilities	Finance and Risk	**Kinder Morgan Pipeline Abandonment Trust Development** – Pursuant to the current land matters consultation policy process currently being carried out by the National Energy Board, Craig is currently working with a team to manage the development of a pipeline abandonment mechanism for a major Canadian pipeline in the form of a trust fund. This project includes project

		management, financial and process advisory and collaboration with other service groups including valuation, actuarial, regulatory, finance and asset management (ongoing).
Energy and Utilities	Regulatory	**Enbridge Shared Services Cost Allocation Model** - Recently at MNP, Craig participated on a team who assessed the shared services cost model of one of Ontario's largest natural gas distribution utilities, whose parent company provides shared services support in a number of operational functions. To approve the natural gas rates charged to Ontario consumers, Enbridge Gas Distribution must have its shared services cost allocation approved by the OEB after third party assessment. The analysis included benchmarking the shared costs of several functions to other cost of service and ratemaking submissions of gas and electric utilities.
GHG Assurance and Auditing	Quantification of Greenhouse Gas Attributes of Renewable Energy Credits (RECs)	**EPCOR/Capital Power Renewable Energy Credits Quantification** - Electricity generation from renewable sources is eligible for "Eco-Logo" certification where it is deemed to offset fossil fuel generation. In Alberta, electricity is predominantly generated from coal and natural gas. Craig managed a project to develop a methodology and analysis of the greenhouse gases deemed to be offset from two renewable generators in Alberta for the period of 2003 through 2008. This quantification was used to provide an expert opinion on the actual offsets attributable to the RECs associated with these generators.
GHG Assurance and Auditing	SGER Compliance Reports and Baseline Application Verifications	**Multiple Clients GHG Reporting** - Mr. Sabine supported ICF's verification team conducting over 36 Compliance Reports and Baseline Application Verifications under Alberta's Specified Gas Emitters Regulation ('SGER'). The verifications were undertaken for EnCana, TransCanada Pipelines and Husky Energy for a broad range of facilities including: gas-fired power plants, natural gas pipelines, cogeneration units, natural processing facilities, and SAG-D bitumen recovery operations.
GHG Assurance and Auditing	Verification of F23 Emission Reduction Activities	**Dupont Emissions Reduction Project Verification** - Mr. Sabine was lead of an audit team that performed a verification of the DuPont Louisville Freon plant; to verify HFC-23 emission reductions for 2008, 2009 and 2010. The facilities managers have implemented several programs leading to GHG equivalent reductions of over 1 million tonnes. More recently, a change to the quantification protocol was also reviewed that added a new portion to the amount of HFC-23 reduced through project level reductions. The data sources and data were QA/QC'ed and calculations verified. The focus of this assignment was the issuance of a letter of verification for the emission reductions achieved by way of Dupont's efficiency optimization program and F-23 destruction abater.
GHG Assurance and Auditing	Third Party Verification and Opinion of Greentags	**EPCOR Environmental Attributes** - For one of Alberta's premiere electricity generators and marketers, Craig completed a verification of the methodology and quantification of the environmental attributes associated with renewable generation from Ecologo certified facilities. Opinion letters were drafted for several large commercial customers who have entered into contract with Epcor, for "Greentag" energy to be used voluntarily for a percentage of their load.
GHG Assurance and Auditing	CDM Project Risk Assessment and Valuation	**Natsource GHG Reduction Portfolio Risk** - Craig was engaged by a large asset management and carbon investment firm in valuing a portfolio of CDM projects. Using ICF's proprietary CDM project evaluation tool, KPRISM, Craig is working on a team to adapt the tool to evaluate a portfolio of CDM and JI projects that are part of a carbon hedge fund developed by Natsource. The risk assessment will enable Natsource to analyse their

		carbon price risk and risk of delivery from a portfolio and project level perspective. The KPRISM tool and other techniques employed by ICF have been developed through many years of project experience in valuing emissions reduction projects and assessing their risks to investors.
GHG Assurance and Auditing	Voluntary Carbon Market Project Risk	**JP Morgan Carbon Assets Risk Evaluation** - In early 2008, Mr. Sabine was the technical lead on developing a risk evaluation tool for a large New York investment banking arm. JP Morgan required expert carbon reduction project risk evaluation, on the likelihood of its portfolio of projects completing approvals, keeping construction deadlines and producing registered emission reductions and becoming optimally transactable. The resulting tool was based on ICF's proprietary KPRISM CDM risk evaluation tool, but was tailored for JP Morgan's portfolio of voluntary market projects. The excel-based tool is also flexible in design to be transferable to other portfolio's adaptable to any number of current carbon registries. Craig helped design and implement the programming, while acting as liaison with the client to incorporate specific inputs. Mr. Sabine also presented the final tool and first short training seminar.
GHG Assurance and Auditing	Verification of N_2O Emissions Reduction Activities	**Invista GHG Reduction Verification** - Craig was a key team member for a verification of 2006 vintage (January through July) emissions reductions created as a result of activities at the Invista Maitland, Ontario Adipic Acid production facility (N2O abatement). The verification audit involved an onsite visit to the facility to review source data and confirm calculations described in the Emission Reduction Protocol and ensure that no emission sources have been omitted in the reporting. Based on the findings ICF issued a letter of opinion on the validity of the credits claimed.
Climate Change	2004 GHG Inventory Report	**Canada Gas Association GHG Quantification** - For a partnership of natural gas companies, ICF was employed to quantify and report on GHG emissions. With the growing concerns of climate change and its causes in Canada, the partnership recognized the need for a detailed and comparable inventory of GHG emissions from Canada's natural gas delivery system. Craig was involved in the QA/QC of company level data and development of the inventory report.
GHG Assurance and Auditing	Verification of F23 Emission Reduction Activities	**Dupont Emissions Reduction Project Verification** - Mr. Sabine was part of an audit team that visited the DuPont Louisville plant to verify HFC-23 emission reductions for 2005, 2006 and 2007. A change to the Protocol was also reviewed that added a new portion to the amount of HFC-23 reduced through project level reductions. The data sources and data were QA/QC'ed and calculations verified. The focus of this assignment was the issuance of a letter of verification for the emission reductions achieved by way of Dupont's efficiency optimization program and F-23 destruction abater.
Climate Change	Modeling and Strategic Advice, National Round Table on the Environment and Economy	**NRTEE Economic Analysis of Canadian Emissions Reduction Strategies** - Mr. Sabine worked with a team on this year long modeling and analysis effort investigating scenarios that Canada might use to achieve reductions in its Green House Gas (GHG) emissions by 50-60% as part of an effort to attain sustainable levels of CO2 emissions worldwide. Craig has worked with project managers to help develop, model and assess the level of success that a variety of policy and structural scenarios might have on Canada's next generation of climate change responses. NRTEE's goal for this program is to identify the strategic directions for energy and climate policy the government must pursue to put the country on a course for a 60 percent reduction in greenhouse gas emissions by 2050 in a manner that will contribute to Canada's economic prosperity and competitiveness. The

		team employed a full-cycle energy, economic-demand and supply model to simulate GHG emissions simultaneously across all economic sectors. This model called Energy 20/20 was used to develop and analyze the reductions that could be achieved using the Soclow Wedge theory.
Climate Change	WECC Transmission Developments: Cost and Benefits Quantification	**TransCanada Emissions Cost and Benefits of Transmission Development** - Craig developed an emissions impacts calculator tool for TransCanada Energy, who was exploring the development of two long distance, high-voltage, direct current transmission lines in the western United States. Mr. Sabine managed a team of consultants who developed the tool and provided a detailed displacement analysis of the western US electricity markets. The Zephyr and Chinook Transmission projects would originate in the western interior (Montana and Wyoming) and take advantage of high quality wind resources to be transported down to the Las Vegas area where the lines would gain access to southern California electricity markets. ICF built up a number of data inputs and a methodological framework to allow users to test various supply scenarios utilizing the lines. These supply scenarios are overlaid in the tool with a number of user defined inputs for the load serving entities who would purchase the western interior supply and serve California customers. The tool estimated the impacts on GHG, NOx and SO2 emissions that the development of these transmission lines might have in California if allowed to contribute to the California RPS standards.
Climate Change	Renewable Energy Credit and GHG Offset Market Analysis	**AltaGas Environmental Markets Potential** - Mr. Sabine led an effort for AltaGas, which explored the market potential for RECs and offsets for a British Columbian-based renewable asset. The study provided a very detailed summarization of the different mechanisms around western Canada and the western United States that could provide a source of revenue for the project for environmental attributes. The work also included a 25 year forward looking forecast of REC prices for the western markets, assuming current and future RPS standards and the likelihood of an aggregate US RPS system. The REC analysis was supplemented with quantification from ICF's carbon markets work to provide AltaGas and their investors with a reasonable outlook for the price of carbon offsets.
Climate Change	Alberta and Saskatchewan Power Sector GHG Emissions Assessment and Offsets Potential	**Bruce Power Carbon Offsetting and Electricity Markets Study** - Bruce Power In November of 2008, Craig finalized an analysis of the Saskatchewan and Alberta power markets. The two phased study implemented IPM® to forecast the power sector response in Alberta and Saskatchewan to various nuclear development scenarios over a 30 year time period. The study quantified the volume of GHG reductions that could be realized given nuclear development, the changing fleet dynamics in Saskatchewan and Alberta, as well as, the impacts on electricity transmission and intertie movement. The study also quantified the compliance cost reductions that could be realized if new nuclear were recognized in a Canadian federal offsets system and the potential revenue creation of the offsets produces.
Climate Change	Quantifying the Greenhouse Gas Emission Reductions Associated with the use of Wind Energy	**CANWEA Electricity Generation GHG Intensity Review** - In early 2008, ICF was commissioned by the Canadian Wind Energy Association to provide third party calculations of the power sector related greenhouse gas emissions intensity in Canada. For each province, ICF estimated power grid related emissions intensities using three separate conceptual frameworks. These included Annual Average-Provincial Intensity, Recently Commissioned Intensity, and Operating Margin Intensity, the latter of which followed internationally recognized protocols from the CDM and World

		Resources Institute. The study relied on real, historical and empirical data to calculate existing and historical sector GHG intensity. Where datasets were unavailable, proxy information was developed to simulate the likely power generating operations. Data was accumulated over a two month period from a survey of all provincial utilities, system operators, energy utilities boards and national level statistical databases. The results provided CANWEA with reasonable estimations of the emissions intensity associated with operating provincial power grids and how wind can play a role in reducing those emissions intensities on a displacement basis.
Climate Change	Scenario Analysis: Air Emissions Under the Canadian Regulatory Framework	**CEA Air Emissions Futures** - Mr. Sabine led a team employed by the CEA and its members, including all major generating utilities across Canada, to aggregate and analyze electricity sector futures outlooks. While managing the project and facilitating sessions aimed at developing an analysis and approach to lobby the federal government, Craig was challenged to address a broad range of sensitivities affecting different power companies across the country. The project was taken on to develop a comprehensive database of current and forecasted electric generating fleet operations and inform the development of alternative approaches to regulating the sector in terms of GHGs and air pollutants. The analysis assessed the changes in compliance flexibility, fuel switching, new and emerging technology development and credit purchasing across a broad range of regulatory scenarios. The analysis investigated the opportunities and barriers for capital stock turnover, culminating in a lower emitting national power sector and the relevant and realistic timeframes in which this may be feasible.
Climate Change	National Clean Energy and Transmission Development, GHG and CAC Displacement	**TransCanada Environmental Cost/Benefits of National Transmission** - Craig led the development of a GHG and CAC emissions displacement analysis tool incorporating significant power project developments across Canada, with extensive east-west transmission upgrading. The excel-based tool provided the client with a flexible spreadsheet analysis, based on several user-defined inputs. The tool could be used to create scenarios with results providing ultimate GHG and CAC displacements, based on the power projects analyzed and the set of input assumptions applied to these projects. Craig also presented this tool to client and other industry stakeholders at a one day planning and strategy session of the national grid effort.
Climate Change	Assessing the Impact of Climate Change	**CIBC Carbon Pricing Risk Analysis** - For a major lending institution, this project focused on the financial exposure to climate change risk that may be seen by Canada's Large Final emitters. ICF was tasked to develop and apply a methodology that would translate companies' current business practices into emissions intensities to compare against possible government targets. Mr. Sabine was involved in research, data development and QA/QC. Craig was involved in developing a methodology to calculate and project emissions intensities and production values which was a key portion to accurately assess risk to policy developments. The team also worked to forecast carbon market pricing, calculating possible emission reduction potential, and built the framework for the model.
Energy Markets	Generating Plant and Emission Control Technology Cost Model	**Environment Canada Generation Technology Costing Model** - Mr. Sabine managed the development of a costing model for Environment Canada to support their policy modeling efforts in the electricity generation sector. The costing model relies on standard industry approaches to capital cost and operations and maintenance cost estimations, while building on financial, market and other parametric assumptions to analyse macroeconomic impacts on the current and future costs of power plants and

		emissions reduction equipment in Canada. The tool will be used to set the basis for capital and lifetime costs of power plant options, which can be fed into simulation and optimization models supporting policy and market analysis.
Energy Markets	California Market and Policy Assessment of CAISO	**Capital Power California Market Assessment** - Mr. Sabine led an analytic assignment completed for Capital Power identifying and reviewing the key drivers in the California power markets. The analysis aimed to evaluate the attractiveness of the California market for investment in acquisition opportunities or greenfield projects, based on the current market and price direction, market rules, air emissions, climate and water policies and overall robustness of the energy markets in the western United States. The project culminated in a market price forecast and policy risk evaluation report.
Energy Markets	PJM Renewables Queue Process Risk	**SolarRay LLC PJM Connection Due Diligence** - For an investment firm specializing in deploying capital for large-scale solar energy projects, Mr. Sabine completed due diligence on the interconnection process and project status within the PJM interconnection queue. Craig's ICF team reviewed five potential solar projects between 10 MW and 20 MW to determine the risks associated with PJM and distribution utility review procedures, as well as the technical connection risks associated with each project's physical connection requirements and location.
Energy Markets	2010 North American Natural Gas Markets Supply Review	**OEB Natural Gas Markets Assessment** - For the OEB, Craig and a team of gas markets experts developed a review and forecast of the changing natural gas market in North America and its impacts on the Ontario market. In light of recent advancements in unconventional supply and technology, several new supply regions are growing in importance, changing the nature of gas prices and gas transmission around the continent. Several important factors were found to be affecting Ontario market participants.
Energy Markets	Conservation Potential and Market Capability Assessment for System Constrained Area	**OPA Conservation Market Assessment** - For the OPA, Craig managed an extensive study of the West GTA market's capacity and capability to deliver conservation measures, including energy efficiency, demand response and fuel switching in the residential, commercial and industrial sectors. The analysis included an estimation of the technical, economic and achievable potential for conservation and energy efficiency over a 10 year timeframe, under a set of incentive scenarios. Market capability was also assessed with several barriers to uptake of conservation measures being identified. Mr. Sabine managed an ICF team made up of Ontario market experts and building-technology experts to produce a report and set of implementation recommendations that could be used by the OPA and relevant local distribution companies in their design and implementation of conservation programs and incentives.
Energy Markets	Canadian Wind Energy Target 2020	**CANWEA Wind Energy Target Setting** - Mr. Sabine headed up an effort to support CANWEA's new target setting process. The study involved surveying the best available provincial-level electricity demand data and planned power plant new-build information to assess what the future of Canada's electricity supply-demand balance might be. Assumptions on the amount of projected wind uptake were layered over each province's supply-demand outlook to determine a reasonable wind target for the industry. Niche markets and cost competitiveness of different generating technologies were also explored during the process. An accompanying phase investigated in detail, the impacts of different scenarios of economic and policy conditions on cost competitiveness of wind versus other generating technologies.

Energy Markets	Analysis of Intensity Based and Cap & Trade GHG Regulation in Canada	**Canadian Hydropower Association GHG Policy Analysis** - While with ICF Mr. Sabine directed a study for the CHA designed to assess the impacts of different GHG regulation frameworks on the Canadian power sector and the role that hydro developers and operators could play. Mr. Sabine managed the modelling effort using the IPM® to assess hydro's potential role in meeting GHG reduction targets or becoming part of a Canadian system of GHG offsets. The study forecasted carbon price, sector compliance costs and energy prices.
Energy Markets	Regional Market Assessments	**Bruce Power Ontario Market Study** - In early 2007, Craig collaborated with Bruce Power, a nuclear power developer and operator in Ontario. The work focused on using IPM® to develop power market analyses and assessments of potential, future environmental markets. Under prospective regulatory regimes it was valuable to perform scenario analysis and emissions profiling in the Ontario and New Brunswick generating sectors, to allow Bruce Power to develop solid business and environmental strategies. In a regional context, Quebec plays a vital role to both of these markets and was analyzed to incorporate the most accurate representation and interaction possible. The modeling was designed to support the emissions and costs benefits of new large-scale nuclear development in two key Canadian power markets. Changes to capacity mix, dispatch, emissions patterns and interregional transmission were analyzed. The work identified the potential return new nuclear projects might receive, assuming participation in greenhouse gas and air pollutant markets.
Energy Markets	Clean Energy Standard Offer	**OPA Supply Standard Offer Development** - For the Ontario electricity system long-term planning, supply and conservation authority, Craig used modeling and analysis tools to determine the expected operating environment for small (less than 10 MW) gas generators if provided entry into the market given a standard offer program. Craig developed a methodology to assess optimal operating schedules for peak shaving, given the generators would operate four hours or sixteen hours daily. This also included the development of an energy demand and peak demand forecast incorporating planned DSM initiatives over a 25 year period. Craig also helped in developing a detailed hourly power market assessment using two different modeling tools. The forecasts included marginal energy and capacity prices and expected generator electricity rates given a specified uptake of the program across the ten Ontario zonal markets. The team also forecasted natural gas rates for each of the Ontario zones and provided expected operating margins given the different optimal operating schedules analysed.
Energy Markets	Third Party Power Market Assessment	**AMPCO Coal Phase Out Air Emissions Analysis** - ICF performed an assessment of the impacts of the Ontario Government's impending coal phase out plan in a number of different scenarios for an association of major wholesale electricity consumers. Mr. Sabine led an effort drawing on ICF's modeling tools to provide a provocative analysis that looked at the impacts of coal plant retirements on energy prices, investment costs and emissions markets. Craig analyzed several capacity replacement and expansion plans in a sensitivity type analysis on Ontario market dynamics. Mr. Sabine also completed follow-up work for AMPCO. This employment assessed the degree to which imported energy in the analyzed scenarios changed regional emissions patterns and included a research effort on international GHG markets and mercury tracking. All results were presented a Toronto Board of Trade breakfast speech.
Energy	National	**Environment Canada Electricity Sector Policy Modelling** - ICF was

Markets	Implementation of IPM Electric Sector Modeling	employed to follow-up work on an original Canada modeling project from 2003 that was directed at building a national model of the electricity sector that could be seamlessly docked with the US EPA's federal power sector model. After its success ICF will now move forward to update and refine the Canada model implementing structural, and policy changes of the past year. Craig is involved with the upkeep of the generating unit database, and with implementing the changes to the 2006 model. Operating costs, environmental policies, new developments that have been built or approved and other power sector trends are some of the rigorous updates that will be performed to provide Environment Canada with a comprehensive tool to assess policy development.
Energy Markets	Canada-Wide Electricity Sector Modelling	**CEA Electricity Sector Analysis** - ICF is employing a nation-wide electricity sector model on behalf of the CEA to support their negotiations with the federal government. The model will be based on both publicly researched data as well as incorporate utility specific data, thus providing meaningful detailed outputs. Mr. Sabine provided support for both the research and modelling effort in a collaborative effort with Canadian and U.S. colleagues.
Energy Markets	Identifying Carbon Impact and Cost Effective Generation for Regional Hydrogen Production	**NRCAN The Hydrogen Economy** - Acquired and analyzed a wide variety of data on the Canadian Electric Power Sector to determine the capacity of the power generation sector to support a hydrogen economy in transportation. Craig was part of the IPM team that modelled nine Canadian provinces to aid in this three-phase project to determine the impacts of increased demand on power sector emissions output.
Energy Markets	Analysis of Electricity Dispatch in Canada	**Envrionment Canada PERRL Program Development** - The Pilot Emissions Removals, Reductions and Learnings (PERRL) Initiative, allows the Government of Canada to purchase GHG removals through specified projects. For renewables, ICF analysed the dispatch order of power generation in provinces to estimate the emissions that would be displaced through renewable generation. Mr. Sabine was on the team that modelled the Canadian provinces and subsequently formulated the results for the client. He assisted in preparing the model, running and de-bugging the model as well as analysing the results.
Other Energy and Environment	Water Regulatory Review and Barriers Analysis	**Capital Power Water Regulatory and Policy Analysis** - Mr. Sabine managed the development of a full U.S. regulatory review focusing on policies, regulations, standards and permitting processes that are considered in power plant siting, project development and investment decisions. For CPC, interest was placed on several southwest and northeast U.S. markets where investment and expansion opportunities exist. The ICF reviewed riparian and prior appropriation water use law, the Clean Water Act, Secure Water Act and new OTC cooling intake regulations to understand how project development and M&A may be impacted or significantly hurdled by existing and new water policy requirements. Significant focus was placed on allocation and transfer rights.
Other Energy and Environment	Mercury Re-release Potential in Canada	**Environment Canada Mercury Sources in the Electricity Sector** - Craig managed the development of an analytic options paper describing the fate of mercury from the fuel source through combustion and control in coal-fired generating stations; to estimate its potential for re-release into the environment from power plant release points besides the stack emissions. The analysis developed a unique quantification methodology to estimate the potential for release in Canada under a baseline scenario and other policy

		scenarios assuming mandatory mercury capture rates. The study will be used by the federal government as they develop and expand mercury policy in the country.
Other Energy and Environment	Environmental	**TransCanada Analysis of Mercury Control technologies for Alberta Coal Plants** - In Spring 2009 Craig was engaged to perform a literature review of technical testing documents for mercury removal at coal-fired plants in the US and Canada with the intention of identifying likely causes for lower than expected mercury removal at tested Alberta coal power plants. Mr. Sabine studied testing documents for client's site and compared with the benchmarking analysis created through technical research of mercury control testing documents at other North American sites. The end-product was to help the client develop a mercury removal strategy in response to provincial emissions regulation.
Other Energy and Environment	Environmental	**Environment Canada Liquefied Natural Gas Sector: Technology and Environmental Impacts** - Craig and team of natural gas market experts authored a technology paper for Environment Canada to support their understanding of the LNG value chain, infrastructure and potential environmental impacts of growth in the LNG market in Canada. The paper outlined the technologies and operations at liquefaction, transport, gasification and other LNG facilities and each of their studied environmental impacts and emissions releases.
Other Public Sector and Environment	Environmental	**Environment Canada and Niagara Escarpment Commission Forest Monitoring** – Craig executed in situ biodiversity monitoring of protected forest lands along the Niagara Escarpment, including species identification, inventorying and health assessment.
Other Public Sector and Environment	Environmental	**Environment Canada Emissions Policy Development** - While working at Environment Canada, Craig developed the first frameworks for allocating baseline emissions to electricity generation facilities based on historic performance and grandfathering. The effort was to support development of cross-border air pollutants trading policy.
Other Public Sector and Environment	Environmental	**Lower Trent Conservation Waterfront Restoration Project** – Craig designed a restoration ecology plan to support development of restored natural habitat along sections of the Lower Trent River in Trenton Ontario. Working closely with the conservation authority, Craig and his team designed the methodology and implementation for the project.

EDUCATION & TRAINING	• 2011 M.B.A. Executive Program, Queens School of Business, Kingston Ontario. • 2004 B.E.S. Environment and Resource Studies. Minor, Biology University of Waterloo. Ontario • 2006 Environmental Auditing, Schulich School of Business and Jaques Whitford
PUBLICATIONS	• Sabine, Craig. "The 21st Century Electricity Grid: The Right Time to Catch Up". Whitepaper. September 2009. • Sabine, C., Gilmore, A., Gibbons, W. and V. Young. 2002. "Environmental Education & the Ontario Elementary School Curriculum". Interactions: The Journal of the Ontario Society of Environmental Education. Spring 2002, Vol 14: 3.

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PROFILE	Sarah Keyes has over 4 years of diverse work experience in a variety of industries, including mining, oil & gas and manufacturing. Prior to joining MNP, Sarah worked for over 2 years at PricewaterhouseCoopers in Toronto in the mining practice working toward her CPA designation. Sarah has been actively involved in the sustainability space for over 5 years. In 2009, Sarah created and authored a sustainable business column for the McGill Management newspaper, the Bull & Bear. In 2010, Sarah took an elective course in Strategies for Sustainability, which was a research-oriented course covering a variety of disciplines. Also in 2010, Sarah performed an independent study on Environmental Accounting & Sustainability Reporting, which was heavily research focused. Upon receiving her CPA designation in 2013, she joined as a Consultant in the Energy & Utilities team at MNP. Sarah has worked on a number of projects for various clients within the Energy & Utilities niche since joining, including Sudbury Hydro, ENMAX Power Corp. and Oakville Hydro. Sarah is actively working toward her Greenhouse Gas Verifier (GHG-V) designation. In 2013, she completed a 3-day training course on ISO 14064-3 (Greenhouse Gas Verifications), which included passing a comprehensive final exam.
SERVICE LINE	Consulting
INDUSTRY FOCUS	Energy & Utilities
OFFICE	Toronto, Ontario

SELECTED ASSIGNMENTS:

COMPANY	SERVICE TYPE	DESCRIPTION
MNP LLP	Energy & Utilities Consulting	**Suncor Energy Sustainable Supply Chain Industry Scan** MNP was engaged by Suncor Energy to perform a comprehensive industry scan across the mining & metals and oil & gas industries to identify sustainable supply chain best practices and provide recommendations for Suncor's supply chain management. Sarah's role was to perform in-depth research on over ten companies, assist in the development of the maturity model and write the final deliverable. The final report submitted to Suncor included the company research performed, best practices and trends identified, metrics for measuring success and outcomes of initiatives, a 5 year implementation plan and the maturity model, which provides a visual overview of the companies relative to one another in terms of supply chain sustainability.
MNP LLP	Energy & Utilities Consulting	**Koskie Minsky LLP Due Diligence Review** MNP was engaged by Koskie Minsky LLP (Toronto-based law firm) as an independent expert consultant for a large class action lawsuit against a publicly-traded independent power producer. Sarah's role on the team was to perform in-depth analytical research; benchmark disclosure practices and trends in financial results against comparative companies; perform a full review of the corporation's disclosure and reporting practices; and perform extensive research on analyst reports. Sarah contributed heavily in writing the final independent expert report, which was used by Koskie Minsky LLP as evidence in the class action lawsuit against the corporation.

MNP LLP	Energy & Utilities Consulting	**Consensus Accord** MNP was engaged by a consortium of 40 LDCs (led by Sudbury Hydro) to prepare a response to the Ontario Distribution Sector Panel Review Report: *Ontario's Distribution Sector – Putting the Customer First*. Sarah's role on the team was to perform in-depth analytical research of the sector; prepare multiple financial analyses using the LDC financial statements from the Ontario Energy Board (OEB) website; perform a full cost-benefit analysis of consolidating the Ontario distribution sector; develop a qualitative case for the value of the local utility; use of research and historical benchmarking to develop a case for voluntary consolidation rather than mandatory consolidation; and prepare ultimate recommendations for the 40 utilities and the overall sector. The final deliverable was the Consensus Accord Paper (written and released publicly) on behalf of 40 local distribution companies, which is a response and critique to the Ontario Distribution Sector Panel Review Report.
MNP LLP	Energy & Utilities Consulting	**Oakville Hydro Energy Services Inc. (OHESI) Renewable Energy Projects Offer to Purchase** MNP was engaged by Oakville Hydro Energy Services Inc. (OHESI) to assist in the acquisition of 2 renewable energy (hydro) projects from Horizon Utilities. Sarah's role on this project involved preparing financial models for both hydro projects (included forecasted cash flows, KPIs, capital plan, balance sheet, income statement for 40 years duration of the hydro projects); assist in the structure and wording of the indicative offer presented to the seller; and a full assessment of the seller's forecasts for 2 hydro projects. The financial models resulted in an M&A transaction for a combined value over $37M.
MNP LLP	Energy & Utilities Consulting	**ENMAX Power Corp. (EPC) Underground Residential Distribution (URD) Fair Market Value Assessment** MNP was engaged by EPC to perform a FMV assessment study for single phase multis and single family detached homes (100 amp and 200 amp) URD services in Calgary. Sarah led this project from start to finish and performed all supporting analyses behind the final report. Sarah's analyses included significant regulatory research of the URD-related Alberta Utilities Commission (AUC) regulatory applications and decisions; peer utility cost research; developing a cost build-up for a typical URD lot; and assessing alignment of FMV rates and cost build-ups with AUC regulatory requirements for affiliate transactions. The final deliverable was a comprehensive report outlining the fair market value assessment ranges for single phase multis and single family detached homes URD services in Calgary, Alberta for inclusion in the regulatory rate application to the AUC.

EDUCATION AND PROFESSIONAL DESIGNATIONS	• Bachelor of Commerce, Major in Accounting (Distinction), McGill University (2010) • Chartered Professional Accountant, Chartered Accountant (CPA,CA) with the Chartered Professional Accountants of Ontario (2013)
SUSTAINABILITY QUALIFICATIONS AND EXPERIENCE	• Certified Sustainability Professional (CSP) with the Canadian Professional Sustainability Institute (2011) • ISO 14064-3 *Greenhouse Gas Verifier* Training with CSA Group (2013) • Environmental Accounting Independent Study (McGill Coursework – 2010) • Strategies for Sustainability (McGill Coursework – 2010) • Author of Sustainable Business column in Bull & Bear Newspaper (McGill – 2009/10)

Colleen Elliott
Senior Consultant
Colleen.Elliott@mnp.ca

PROFILE	Colleen Elliott is a Senior Consultant in MNP's Public Sector consulting practice. Colleen spent 7 years working for the Ontario Government for various ministries including the Ministry of the Environment. During that time she led an evaluation of the effectiveness of the organization's inspection programs, which required her to understand a number of environmental laws in order to comment on the efficacy of efforts to enforce the regulations. Prior to this, Colleen was a Policy Research Analyst for the Ontario Chamber of Commerce, developing policy resolutions and position papers on various policy areas including education, health, transportation, energy, and finance. Through her public policy background and practical government experience, Colleen has developed strong research and analysis skills, particularly with regulatory and legislative filings.
SERVICE LINE	Management Consulting – Public Sector Practice
OFFICE	Toronto, ON

SELECTED ASSIGNMENTS:

INDUSTRY	SERVICE TYPE	DESCRIPTION
Government Relations	Policy Analysis	**Ontario Chamber of Commerce** Researched and developed several policy resolutions on issues affecting Ontario's business community as part of the annual OCC Advocacy Plan. Managed the administration of six policy committees and assisted planning events. Provided research and analysis to support the following energy-related policy positions: • Long-term Planning: Affordable, Reliable and Abundant Energy Supply • Diversified Energy Supply Mix • Nuclear Options for Supply of Electrical Power
Public Sector: Ontario Government	Program Evaluation	**Inspection Programs Evaluation – Ministry of the Environment** Conducted an independent evaluation of 20 inspection programs for the Ministry of the Environment's Operations Division. Developed a report on findings and common framework to improve enforcement efforts which included performance measures, monitoring and standardized practices.

Public Sector: Ontario Government	Strategic Planning	**Strategic Plan, Health Professions Regulatory Policy and Programs Branch, Ministry of Health and Long-term Care** Led a working group composed of staff and management from the through the strategic planning process. Included conducting a stakeholder survey on the current state, environment scan and facilitation of a workshop to develop components of the strategic plan. Final deliverable included survey results, environmental scan, workshop results and final strategy map.
Public Sector: Ontario Government	Organizational Review	**Organizational and Strategy Review, Ministry of Energy** Colleen performed a review to assess how well the Ministry of Energy's organizational structure, resource allocation and functions supported and aligned with the ministry's key priorities at the request of the Deputy Minister. She conducted interviews with the Executive team members and reviewed the strategic plan, results-based plan, organizational structure and human capital plan. She also designed and facilitated a strategy review session with the Deputy Minister and Assistant Deputy Ministers to review the strategic plan, identify and prioritize key initiatives, clarify accountability and determine how to best align available resources to support delivery of key priorities. Colleen provided advice on the approach for planning and implementing organizational changes in a preliminary report which outlined the findings from the review and strategy review session. She then assisted with the development of a Request for Services to obtain vendor to implement the findings.
Public Sector: Ontario Government	Business Process Re-engineering	**Bankruptcy and Insolvency Business Process review, Collections Branch, Ministry of Revenue** Provided advice, training and ongoing support to the team as they undertook a review of the bankruptcy and insolvency business processes following the redesign of their organization.
Public Sector: Ontario Government	Service Efficiency Review	**Efficiency Review, ServiceOntario Retail Offices Branch** Co-led a review of Health Card Services (in-person, mail and online) for which included mapping current state processes, subject matter expert consultations and workshops to develop and evaluate opportunities. Identified several service improvement opportunities, which cumulatively amounted to $2M in cost avoidance. This project also included a comparative analysis of the cost per transaction for health card services at publicly-run versus privately-run ServiceOntario offices. Colleen also later did this for driver and vehicle services as well.

EDUCATION AND PROFESSIONAL DESIGNATIONS	• Bachelor of Arts (Honours), Political Science and Sociology, McMaster University • Lean for Service Training, American Society for Quality • Lean Six Sigma Green Belt

Matthew Corbeth

Profile

Matthew Corbeth is an Analyst in the Advisory group within the Energy and Utilities team. Matthew joined the firm in December 2013 after spending a collective 3 years with Great West Life Realty Advisors (GWLRA). During his time at GWLRA he formed an integral part of the asset management team, focusing primarily on financial analysis including: building and maintaining cash flow and valuation models utilizing a discounted cash flow analysis approach; net-present value analysis; cash-flow modeling utilizing appropriate assumptions and critical thinking. Additional responsibilities were rooted in keeping current with market trends, the preparation of business plans, budgets, market reports and research papers. Matthew has a Double Major (Honors) in Environmental Sustainability and Political Science from Dalhousie University. A degree which focused on understanding and addressing complex global challenges—like water and energy security, climate change, environmental degradation and increasing urbanization.

Education and Certifications

BA Honors Major in Environmental Sustainability & Political Science. Dalhousie University, 2011.

Sustainability Thesis

Over the course of a year, designed, researched, and wrote a thesis that explored the sustainable construction industry and how it interacts with regulatory policies in Ontario.

Credit Union Atlantic - CSR & Sustainability Report

Sustainability Advisory

Worked under Dalhousie University's College of Sustainability for one year - to develop an understanding of the ecological footprint of the Credit Union Atlantic (CUA). This project included: creating an emissions inventory and environmental baseline; develop recommendations for ongoing data management and reporting; prioritize areas for reduction; set reduction targets and develop recommendations to reduce emissions. The scope of CUA's business was divided and analyzed based on the following four areas; the physical plan; transportation; day-to-day operations and policies and planning.

Professional Experience

Financial Modeling for Acquisitions and Dispositions

Active in the underwriting and successful acquisition of several large commercial assets. Daily application of highly developed skills in financial analysis – used for building a business case around potential investment opportunities, lease transactions and capital projects.

(Most Recent) OPB Portfolio Acquisition – GWLRA's recent acquisition of the OPB portfolio which consisted of over 2 million square feet of prime industrial real estate.

(Most Recent) Dixie Disposition – Development of asset hold/sell analysis at the request of GWLRA's client.

Matthew Corbeth
Took a lead role in underwriting and due diligence process for the sale of 3 commercial assets.
Strategic Planning for Annual Budgets and Business Plans
Spearheaded the preparation of annual budgets, interim forecasts, and business plans, in collaboration with various internal groups. This process was critical to GWL's ability to manage capital, forecast returns and plan accordingly. Matthew was responsible for 10 million square feet of assets, divided between four separate funds. Additionally, played a key role in writing GWLRA's semi-annual asset reviews, which are then presented to the company's largest client.
Polycor - Strategic 5 Year Plan
Strategic Analysis Provided advisory services to facilitate and support development of Polycor's five year strategic plan through a three-phased approach. Phase One being the development of an overview of the current state and external context of Polycor. The deliverable for Phase One was a strategy briefing paper that described the current situation and potential opportunities and was used to inform strategic planning working sessions and development of the overall plan. Phase Two was leading the development and completion of a five year strategic plan. Phase Three is underway and will encompass planning for implementation.
Sudbury Hydro - Business Process Improvement / System Integration Project
Business Improvement Project The Business Process Improvement project is anticipated to have a 3 year span. The overarching goal of this on-going project is to enhance financial performance, regulatory compliance, employee work/life balance and customer satisfaction. Additional benefits to employee safety and system reliability have also been considered to be in the scope of the project.