GIVING A VOICE TO ONTARIANS ON ENERGY EAST

AUGUST 13, 2015

REPORT TO THE MINISTER

Ontario

Ontario Energy Board

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EXECUTIVE SUMMARY

THIS REPORT MARKS THE CONCLUSION OF AN EXTENSIVE CONSULTATION AND ENGAGEMENT WITH THE PEOPLE OF ONTARIO, INCLUDING FIRST NATION AND MÉTIS COMMUNITIES, THAT SOUGHT THEIR VIEWS ON THE ENERGY EAST PIPELINE (ENERGY EAST OR THE PROJECT).

The Energy East Pipeline is a proposal by TransCanada PipeLines Limited (TransCanada) to convert an existing natural gas pipeline and build a new pipeline, both of which would carry crude oil from Alberta to refineries in Québec and a refinery and marine terminal in Saint John, New Brunswick. The Ontario Minister of Energy asked the OEB to undertake this consultation to help inform the government's position when it appears before the National Energy Board hearing on Energy East[1]. The National Energy Board is the federal regulatory agency charged with reviewing TransCanada's application.

[1] Letter from Minister of Energy, Nov. 12, 2013, http://www.ontarioenergyboard.ca/OEB/_Documents/Documents/ltr_Min_Chiarelli_to_OEB_Chair_EnergyEast_20131113.pdf

WHAT THE OEB DID

During the consultation and review, the OEB team travelled to seven towns and cities in northern and eastern Ontario, and had a similar number of meetings with First Nation and Métis communities. The OEB's consultation and review focused on the four potential impacts specified in the Minister's letter[2]:

- the impacts on Ontario natural gas consumers, in particular those in eastern and northern Ontario, in terms of rates, reliability and access to supply;
- the impacts on the natural environment and pipeline safety in Ontario;
- the impacts on local and Aboriginal communities in Ontario; and
- the short- and long-term economic impacts of the Project in Ontario.

After hearing from the public, the OEB added a fifth impact to be studied in the review: the potential impact of Energy East on climate change.

These potential impacts were not the only elements steering the consultation and review. We were also guided by the six principles for assessing pipelines that were set out in the letter from the Minister. These principles include the requirement that pipelines have "the highest available technical standards for public safety and environmental protection"; that they have "world-leading contingency planning and emergency response programs"; and that "proponents and governments must fulfil their duty to consult obligations with Aboriginal communities[3]."

WHAT PARTICIPANTS SAID

Participants at the community meetings routinely expressed concerns about pipeline safety and the effects an oil spill would have on their local rivers, lakes and sources of drinking water. One First Nation elder described water as the "lifeblood of Mother Earth" and framed the issue this way: *"Would you put something in your mother's blood that would poison her? Your mother wouldn't be able to hold you then."* Most participants felt that the provisions ensuring the safety of the Energy East Pipeline need to be strengthened.

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[2] Letter from Minister of Energy, Nov. 12, 2013, http://www.ontarioenergyboard.ca/OEB/_Documents/Documents/ltr_Min_Chiarelli_to_OEB_Chair_EnergyEast_20131113.pdf

[3] Ibid

Even with TransCanada's proposed Eastern Mainline Pipeline (a new pipeline that TransCanada is proposing to transport natural gas from Maple to Cornwall, Ontario), a number of participants were concerned that Energy East would still create a shortage of natural gas in eastern Ontario. This shortfall would increase the price of their natural gas and reduce the anticipated economic benefits from Energy East. First Nation and Métis communities, concerned about their treaty and Aboriginal rights, felt they were being asked to bear all the risks of a pipeline crossing their treaty territories, without receiving any of the benefits.

These concerns though were not unanimous. Some felt that transporting crude oil through a pipeline was safer than transporting it by rail and that the Energy East Pipeline would deliver economic benefits for Ontario, as well as the rest of the country. Others said that governments should focus on the longer term issue of climate change and the need to transition to a carbon-free economy.

A significant theme in the consultation was the communities' desire to remain engaged with TransCanada after the OEB's consultation and the hearings at the National Energy Board. Specifically, communities wished to be involved in the ongoing monitoring of the pipeline.

THE OEB'S ADVICE

Our advice is based on TransCanada's application filed with the National Energy Board on October 30, 2014 and additional technical material filed on January 30, 2015.

Looking at what has been filed as of January 2015, the OEB is concerned with some aspects of Energy East. The following is a brief summary of our advice to the Ontario government. A complete summary of all of our advice on Energy East can be found in section 7 of this report.

IMPACTS ON ONTARIO NATURAL GAS CONSUMERS

Natural gas is a critical fuel for millions of Ontario consumers, heating their homes, operating their businesses and helping to generate their electricity. Energy East will remove pipeline capacity for natural gas by converting one of TransCanada's 42-inch pipelines to carry crude oil. We are concerned that, even with the new natural gas pipeline that TransCanada is proposing to build in eastern Ontario, Energy East will reduce the supply and increase the price of natural gas for consumers in that region. Ontario needs to be assured that the pipeline capacity and the supply of natural gas in eastern Ontario will meet Ontario's medium- and long-term needs and that Ontario natural gas consumers will not subsidize the costs of Energy East.

IMPACTS ON THE NATURAL ENVIRONMENT

The Energy East Pipeline would be near many Ontario waterways. The proposed pipeline crosses or runs beside the Nipigon, Ottawa, Mattawa, Madawaska, Rideau and St. Lawrence rivers. It would also pass by a number of lakes, including Lakes Temagami, Nipissing and Nipigon, Trout Lake and Lake of the Woods. In light of this proximity, the OEB believes that TransCanada needs to assess whether it is appropriate to take a route originally chosen for a natural gas pipeline and use it for the transportation of crude oil. Where the existing pipeline route is too close to environmentally sensitive areas, TransCanada should reroute the pipeline or justify why rerouting is not necessary.

TransCanada should pay particular attention to protecting Nipigon Lake, Trout Lake, the Ottawa River, the Rideau River, the Oxford-Marsh Aquifer, the Nepean Aquifer, and other areas where there is elevated public concern. As for the route near the St. Lawrence River, TransCanada should study an alternative route near the Canadian Pacific (CP) rail line and reroute the pipeline to follow the CP right-of-way.

In addition, TransCanada should work with local and First Nation and Métis communities to identify the "significant water crossings" that will require additional shut-off valves.

IMPACTS ON CLIMATE CHANGE

The National Energy Board has decided to examine the greenhouse gases that are emitted by the construction and operation of Energy East. Ontarians, however, remain concerned about the Project's effect on upstream and downstream greenhouse gas emissions. After people said any assessment of Energy East would not be complete unless it studied the potential impact on climate change, we added climate change to the impacts to be reviewed. The issue of climate change is bigger than any one pipeline project, and the discussion paper we commissioned is a valuable contribution that should be used as part of a broader discussion of the issue.

IMPACTS ON PIPELINE SAFETY

Pipeline safety, and the effects of a spill on local rivers and lakes, were the most important concerns for people living near the proposed route of Energy East. They insisted the pipeline have the highest standards for integrity and emergency response. We believe TransCanada should be using the latest generation of leak detection systems for Energy East, as the impact of an accident on an oil pipeline is far more profound than with a natural gas pipeline. TransCanada also needs to demonstrate that, in the event of a spill, the amount of crude oil that could be released will be as low as reasonably practicable.

The most important threat to the integrity of Energy East is the four sections of the pipeline in northern Ontario that are coated with polyethylene tape. Ontario needs to be assured of the reliability of the in-line inspection tools that TransCanada will use to detect cracks on the four tape-coated sections. TransCanada should conduct a hydrostatic test before the pipeline is put into service carrying oil.

As well, TransCanada must demonstrate its financial ability (and associated guarantees) to cover the response, clean up and remediation costs of a spill, knowing that these costs could easily surpass $1 billion.

IMPACTS ON LOCAL COMMUNITIES

Participants at the OEB's community meetings appreciated our consultation and review. The process raised both the awareness of the Project and the desire for ongoing engagement on the issues of pipeline safety including emergency response.

The OEB believes community engagement needs to be long lasting and treated as an essential part of the life-cycle approach of operating Energy East. So, TransCanada should continue its community engagement effort and be accountable to First Nation, Métis and local communities for its monitoring and emergency response measures.

First responders must be given information about the trajectory of spills at specific sites, along with the type of oil carried by the pipeline. TransCanada should perform emergency drills to demonstrate that it will be able to effectively respond and minimize the damage from spills.

IMPACTS ON ABORIGINAL COMMUNITIES

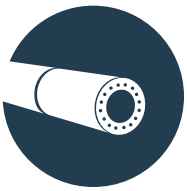
Ontario's First Nation and Métis communities generally believe neither TransCanada nor the National Energy Board have respected their treaty or Aboriginal rights. Ontario therefore needs to encourage the National Energy Board to insist that all Aboriginal and treaty rights are respected at the Energy East hearing, and that the Federal Crown fulfils its duty to consult.

SHORT- AND LONG-TERM ECONOMIC IMPACTS

Pipelines generally produce minimal economic benefits for the communities they flow through. So while almost half of Energy East will run through Ontario, it is expected to produce only modest economic benefits for the province. This will result in an imbalance between the risks of the Project and the expected benefits for Ontarians. Under these circumstances it is even more important that Ontario natural gas consumers face no harm due to Energy East.

A complete summary of all of the OEB's advice on Energy East can be found in section 7 of this report.

1 INTRODUCTION



THE ONTARIO ENERGY BOARD (OEB) CARRIED OUT THIS CONSULTATION AND REVIEW AT THE REQUEST OF THE ONTARIO MINISTER OF ENERGY. THE MINISTER ASKED THE OEB IN NOVEMBER OF 2013[4] TO EXAMINE AND REPORT, FROM AN ONTARIO PERSPECTIVE, ON THE PROPOSED ENERGY EAST PIPELINE (ENERGY EAST OR THE PROJECT).

The people of Ontario are deeply interested in Energy East. The OEB team travelled across the province and met people who were concerned about the Project's potential impacts on their water and their environment, or who were looking forward to the economic opportunities that could flow from Energy East. First Nation and Métis communities also wanted the Project to respect their treaty and Aboriginal rights.

[4] Letter from Minister of Energy, Nov. 12, 2013, http://www.ontarioenergyboard.ca/OEB/_Documents/Documents/ltr_Min_Chiarelli_to_OEB_Chair_EnergyEast_20131113.pdf

The OEB found that people were eager to participate in our review of the proposed Project. They wanted to ensure their government is aware of their concerns, and that these concerns are reflected in our report. They also wanted their involvement with Energy East to continue beyond the submission of this report and include increased access to information about the ongoing operation of the pipeline and the products it will carry.

THE ENERGY EAST PROPOSAL

As illustrated in Figure 1, the Energy East Pipeline is a very significant project. The 4,600-kilometre (km) oil pipeline would carry approximately 1.1 million barrels per day of crude oil from Alberta and Saskatchewan to refineries in Québec and a refinery and marine terminal in Saint John, New Brunswick[5]. TransCanada PipeLines Limited

[5] TransCanada originally proposed to build a second marine terminal at Cacouna, Québec. TransCanada is no longer building the Cacouna terminal and has not said at this time whether another marine terminal will be built at another location.

FIGURE 1: MAP OF ENERGY EAST
Source: TransCanada

(TransCanada) filed its application with the National Energy Board (NEB) for the $11.3 billion[6] project on October 30, 2014.

Nationally, the proposed Energy East Pipeline has two distinct elements:

- the conversion of 3,000 km of existing 42-inch natural gas pipeline to carry crude oil. The converted pipeline would run through Alberta, Saskatchewan, Manitoba and Ontario. The majority of the conversion would occur in Ontario; and
- the construction of 1,500 km of new 42-inch oil pipeline in Alberta, Saskatchewan, Manitoba, Ontario, Québec and New Brunswick[7]. Nearly all of the new pipeline will be located in eastern Ontario, Québec and New Brunswick.

[6] Pg. 9, Energy East Pipeline Project: *Understanding the Economic Benefits for Canada and its Regions,* Conference Board of Canada, October 2014. (The associated Eastern Mainline Pipeline would cost an additional $1.5 billion). On July 31, 2015, TransCanada Corporation said the cost of Energy East would increase due to higher costs and adjustments to the pipeline's route following feedback from governments and local and Aboriginal communities.

[7] These two sections do not account for the entire length of the 4,600 km. pipeline. TransCanada says approximately 100 km of feeder lines are also part of the Project.

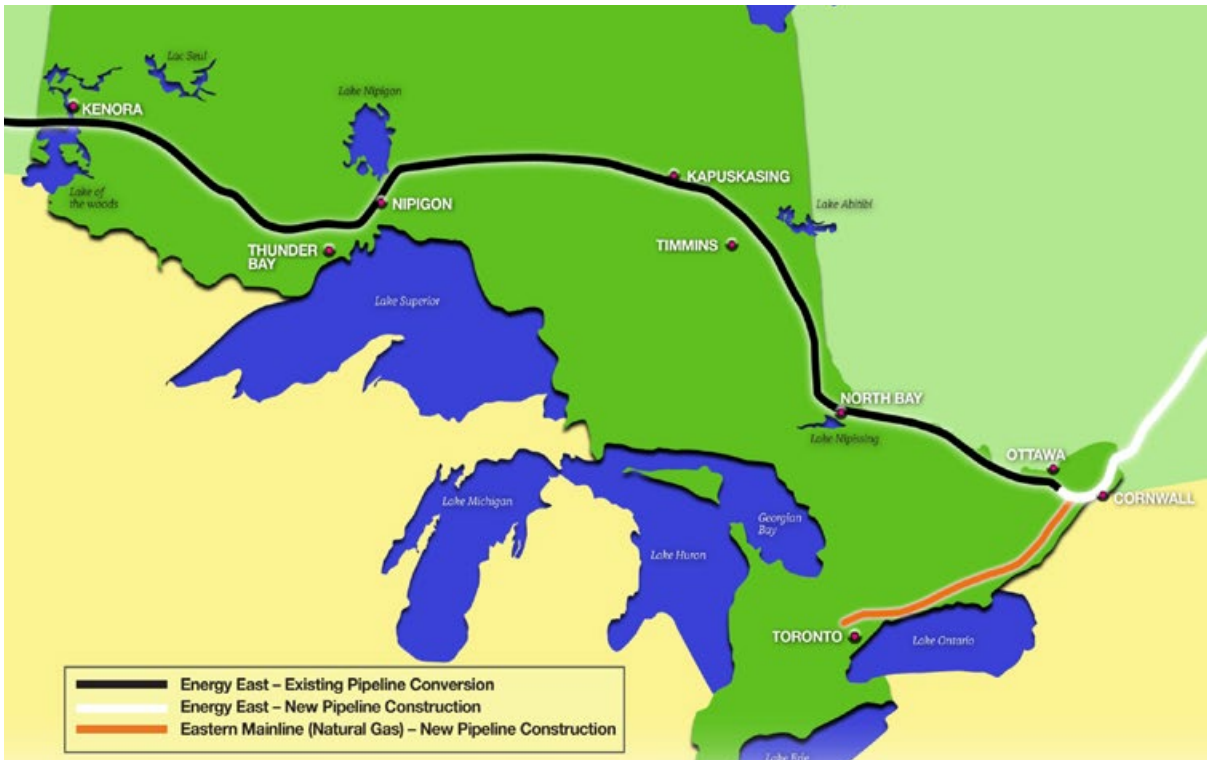


FIGURE 2: ENERGY EAST PIPELINE IN ONTARIO
Source: Ontario Energy Board

As Energy East is an interprovincial undertaking, it falls under federal jurisdiction. This means the NEB and ultimately the Federal Cabinet will determine if the Project can go ahead, and under what conditions. The NEB will hold a public hearing on the engineering, economic, environmental and social aspects of TransCanada's application to determine whether it is in the Canadian public interest.

In Ontario, the Energy East Pipeline has three distinct elements:

- the conversion of approximately 1,900 km of an existing 42-inch natural gas pipeline in TransCanada's Canadian Mainline system to carry crude oil; the converted pipeline would run from the Manitoba border to Iroquois, just west of Cornwall;
- the construction of just over 100 km of new 42-inch oil pipeline from Iroquois, Ontario to the Québec border; and
- the building of 30 new pump stations.

TransCanada is also proposing to build the Eastern Mainline Pipeline (Eastern Mainline), a new 36-inch natural gas pipeline that would run approximately 245 km from Maple to Cornwall, Ontario.

ONTARIO'S ROLE

While the Government of Ontario does not have the power to accept or reject the Project, it does have an interest in the safe operation of pipelines in the province, as well as their environmental and economic impacts. As a result, the Government of Ontario intends to participate as an intervener in the NEB process. The OEB will not participate in the NEB process.

The Government of Ontario has said that it will use six principles[8] to assess proposed pipeline projects:

- pipelines must meet the highest available technical standards for public safety and environmental protection;
- pipelines must have world leading contingency planning and emergency response programs;
- proponents and governments must fulfil their duty to consult obligations with Aboriginal communities;
- local communities must be consulted;
- projects should provide demonstrable economic benefits and opportunities to the people of Ontario, over both the short and long term; and
- economic and environmental risks and responsibilities, including remediation, should be borne exclusively by the pipeline companies, who must also provide financial assurance demonstrating their capability to respond to leaks and spills.

[8] Pg. 76, *Achieving Balance, Ontario's Long-Term Energy Plan,* 2013

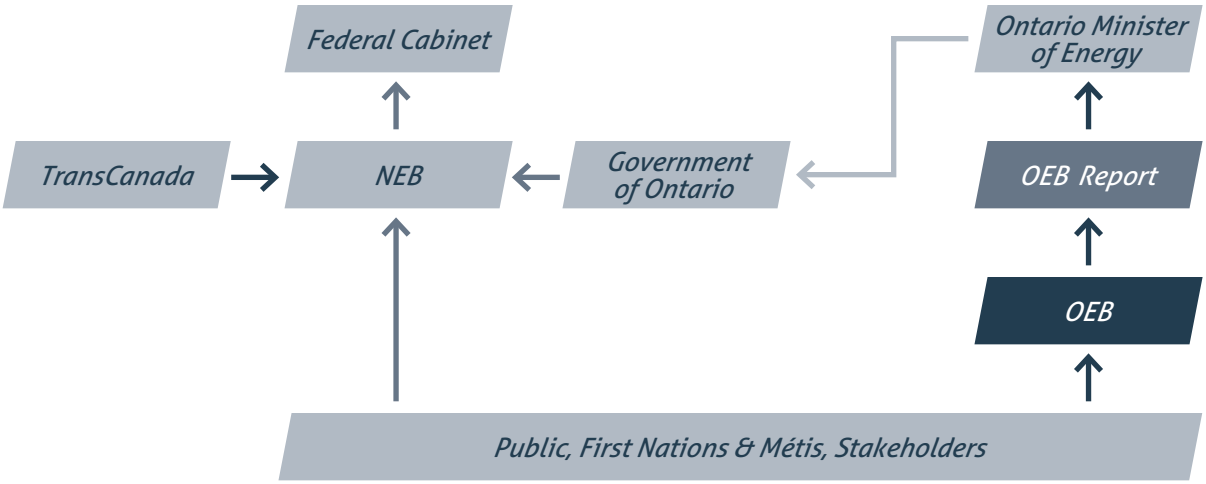


FIGURE 3: OEB'S CONNECTION TO THE NEB PROCESS
Source: Ontario Energy Board

The Ontario Minister of Energy cited these principles in November 2013 when the OEB was asked to examine and report on the Energy East proposal from an Ontario point of view. The Minister said our report would help formulate the government's position when it intervenes in the Energy East hearing at the NEB. Figure 3 illustrates the role our consultation and review will play in the process.

When the Ontario Minister of Energy wrote to the OEB[9], the Minister asked us to consider the implications of the following impacts of the Energy East Pipeline:

- impacts on Ontario natural gas consumers, in particular those in eastern and northern Ontario, in terms of rates, reliability and access to supply;
- impacts in Ontario on the natural environment and pipeline safety;
- impacts in Ontario on local communities and Aboriginal communities; and
- the short- and long-term economic impacts of the Project in Ontario.

The Minister asked the OEB to focus on these four impacts when we consulted the public, including local communities, First Nation and Métis communities, and stakeholders. The consultation was to be broad and transparent, and give the public and stakeholders the time and opportunity to make oral and written comments.

[9] http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm

This report is the OEB's response to the Minister's request. Our report shows how the views heard in the consultation informed every aspect of the OEB's work, from our engagement with local and Aboriginal communities to the assessments of our technical advisors and subsequently, our advice to the Minister.

To provide the needed technical assessments, the OEB retained experts to examine the potential impacts cited by the Minister. In light of concerns raised by the public, we also engaged an expert to assess the impact of Energy East on greenhouse gas (GHG) emissions from an Ontario, national and global perspective.

The assessments of the technical advisors are based on TransCanada's application filed on October 30, 2014, and additional technical material filed on January 30, 2015.

2 LISTENING TO ONTARIANS

TO GIVE ONTARIANS AND ABORIGINAL COMMUNITIES THE BEST OPPORTUNITY TO DISCUSS THEIR VIEWS ON ENERGY EAST, THE OEB HELD THE MOST COMPREHENSIVE CONSULTATION AND ENGAGEMENT WE HAVE EVER UNDERTAKEN. DURING THE CONSULTATION, STAFF AT THE OEB AND OUR TECHNICAL ADVISORS VISITED LOCAL AND ABORIGINAL COMMUNITIES IN 2014 AND AGAIN IN 2015, AND HELD A STAKEHOLDER FORUM IN JANUARY 2015.

During the consultation, participants were asked to identify the impacts they felt the OEB should focus on in its report to the Minister. Their responses will be discussed in greater detail later in this report, but they fall into four broad themes.

SAFETY AND THE IMPORTANCE OF WATER

Participants said their number one concern about Energy East was the threat of an oil spill in their local lakes and rivers. Specifically, they voiced concerns that an oil spill would harm their drinking water, the local fish and wildlife habitat, and their ability to use their local lakes and rivers for commerce and recreation. First Nation and Métis peoples also talked about their spiritual connection to water, and their feeling that water is life and a resource they need to protect as part of "Mother Earth."

Water is important because the Energy East Pipeline would span some of Ontario's major watersheds, including the Nelson River, Hudson Bay and the Great Lakes-St. Lawrence River basins. The Project would cross or come close to rivers such as the Ottawa, Mattawa, Madawaska, Mississippi, Rideau, South Nation and St. Lawrence rivers. It would pass by a number of lakes: Temagami, Nipissing, Nipigon, Trout Lake and Lake of the Woods[10].

[10] Pg. 1, Assessment of Impacts on the Natural Environment, DNV GL, March 2015

THE DESIRE FOR PARTICIPATION AND OVERSIGHT

Most participants stated that they want to have more control and oversight of the Project. There were numerous requests that local communities be involved in additional monitoring and oversight of the operations of the pipeline.

Others felt there would not be enough scrutiny of Energy East at the NEB to ensure it is in the public interest. Concerned about the Project's impact on climate change, they pointed out that the NEB, in its hearing process, would not examine the upstream and downstream greenhouse gas emissions associated with Energy East.

CONCERN ABOUT THE PRICE AND SUPPLY OF NATURAL GAS

Natural gas consumers, especially the gas utilities, electricity generators and industrial users, were concerned that Energy East would create a shortfall in pipeline capacity in eastern Ontario, and that this would increase the price of natural gas. They said that the Eastern Mainline Pipeline, which TransCanada proposes as a replacement for the capacity removed from the Canadian Mainline, would not provide enough capacity to meet the present and future needs of consumers in eastern Ontario.

In addition, gas consumers were worried about the costs of Energy East and stated that natural gas consumers should not end up subsidizing the oil shippers who would use Energy East.

THE NEED FOR ECONOMIC BENEFITS

There was complete unanimity that Energy East needs to provide both short- and long-term economic benefits for Ontario. There was less agreement on what exactly those benefits would be. A number of participants felt that there would be little benefit for their communities after the short-term jobs from construction ended. Others said the ongoing operations would mean steady jobs, apprenticeship opportunities, and additional tax revenues for small- and mid-sized communities.

Some participants suggested that a broader vision of economic benefits was necessary, and called for a National Energy Strategy that would help the country transition to low-carbon fuels.

HOW WE LISTENED

To ensure that the OEB heard the views of Ontarians and Aboriginal communities, the OEB established two important principles for its consultation. First, the OEB decided that people would not have to come to Toronto to make their views known; we would instead go out into communities and listen to people along the route of the pipeline. Second, we felt it was important to return to the communities and share the work of our technical advisors, providing participants with an opportunity to ask questions.

So the OEB divided the Energy East Consultation into two parts: Part One would invite people's views on Energy East and Part Two would share with them the preliminary assessments of our technical advisors. These assessments took into consideration people's views from Part One. Stakeholders and the public were invited at the end of Part Two to file written submissions, summing up their views on Energy East.

The consultation process began with a meeting of 26 industrial, environmental and municipal stakeholders, where we advised them of our plans and received their general support for the consultation process.

PART ONE CONSULTATION

At the beginning of Part One, the OEB posted on its Energy East website[11] a discussion guide, toolkit and three backgrounders on pipeline safety, natural environment and gas markets. The OEB then went out and held meetings in seven communities: Kenora, Thunder Bay, Kapuskasing, Timmins, North Bay, Ottawa (Stittsville) and Cornwall[12]. Seven discussion meetings were also held with First Nation and Métis communities.

Close to 2,300 people participated in the Part One meetings, signed up for email alerts or submitted written proposals. The OEB's Energy East website had 24,000 page views, and

[11] http://www.ontarioenergyboard.ca/html/oebenergyeast

[12] p. 4, *Part One Summary, Ontario Energy Board Energy East Consultation,* Swerhun Facilitation

the meetings generated 16 stories in newspapers, and on websites, radio and television. When the Part One consultation was finished, the OEB posted a summary report on our website that included views heard at the community meetings and people's written submissions[13]. The report was independently prepared by the OEB's third-party facilitator, Swerhun Facilitation. We also posted a summary report that included views heard at the First Nation and Métis meetings and written submissions. This report was independently prepared by Counsel Public Affairs.

The views expressed during Part One helped our technical advisors identify the areas they needed to look at when assessing TransCanada's application. At the meetings, participants repeatedly asked about the pipeline's potential impact on climate change and said any assessment of the potential impacts of Energy East must include an analysis of the Project's downstream and upstream greenhouse gas emissions. In response to this concern, and on our own initiative, we commissioned an analysis of the Project's potential impact on climate change.

The OEB engaged the following experts to provide assessments:

ASSESSMENTS	COMPANY
Pipeline Safety	Det Norske Veritas (Canada) Ltd. (DNV GL)
Natural Environment	Det Norske Veritas (Canada) Ltd. (DNV GL)
Economic Impact	Mowat Energy, The Mowat Centre's Energy Research Hub
Large Volume Gas Users	Elenchus Research Associates Inc.
Natural Gas Prices	ICF Consulting Canada
Climate Change	Navius Research Inc.

Their final reports can be found on our website.

[13] www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#summary

PART TWO CONSULTATION

The Part Two meetings began in January of 2015, with a return visit to the seven local and First Nation communities visited in Part One, followed by a meeting with the Métis Nation of Ontario. In the Part Two community meetings, the OEB focused on local impacts and shared the technical advisors' preliminary assessments of TransCanada's application. At the meetings, we distributed handouts and/or provided display boards that summarized the preliminary assessments of our technical advisors on the following subjects:

- Pipeline Safety
- Natural Environment
- Short- and Long-Term Economic Impacts
- Climate Change
- Natural Gas Impacts

In addition, the OEB posted the preliminary assessment of the impact of Energy East on natural gas prices in Ontario on our website on March 6, 2015.

The interest in Energy East was even more pronounced during the Part Two consultation than during Part One. More than 10,700 people participated in the Part Two community and stakeholder meetings, signed up for email alerts or submitted written letters, proposals and position papers. There were an additional 18,450 page views of the OEB's Energy East website, and 66 stories about the meetings were published in local newspapers, and on websites, radio and television.

As we did in Part One, we posted a report[14] on the OEB website that summarizes what we heard during the Part Two meetings, together with the written submissions from individuals and organizations. The report was independently prepared for the OEB by Swerhun Facilitation, the third-party facilitator for the Energy East consultation. A summary report[15] of the discussions with First Nation and Métis communities and their written submissions was also posted on the OEB's website. This report was independently prepared by Counsel Public Affairs.

The OEB held a Stakeholder Forum on January 29 and 30, 2015 in Ottawa so that environmental, industry and municipal representatives could provide the OEB with a broader,

[14] http://www.ontarioenergyboard.ca/html/oebenergyeast/documents/parttwo/SummaryReports/Energy_East_Part_Two_Summary.pdf

[15] http://www.ontarioenergyboard.ca/html/oebenergyeast/documents/parttwo/SummaryReports/Summary_Report_Part_Two_FNM.pdf

province-wide analysis of the potential impacts of Energy East. The sessions were broadcast by the public affairs cable channel, CPAC, and are archived on the channel's website[16].

FIRST NATION AND MÉTIS ENGAGEMENT

The OEB and the Government of Ontario are neither the proponents nor the decision makers for the Project, so the OEB's engagement was never designed to fulfil the legal duty to consult owed by the Crown when it contemplates decisions that may affect Aboriginal or treaty rights (the duty to consult is discussed further in section 5.2). While the OEB's meetings and other outreach efforts represent a thorough engagement with Ontario's First Nations and Métis, they were not meant to serve as a "consultation" for the purposes of fulfilling the duty to consult. The OEB was clear about this throughout our engagement with Aboriginal communities.

During the OEB's meetings with Ontario's First Nation and Métis peoples, many of the concerns that were expressed were similar to those of the general public. As described in further detail later in this report, there were a variety of concerns about pipeline safety and potential environmental impacts, particularly those affecting water.

However, representatives of First Nation and Métis communities also emphasized the importance of respecting their treaty and Aboriginal rights. This includes upholding the Crown's duty to meaningfully consult with First Nation and Métis communities, accommodate their concerns and interests, and respect Aboriginal rights to traditional land use.

Ontario's Aboriginal peoples brought a unique perspective to our engagement. Many felt an intense cultural and historic attachment to the land and water, and a special responsibility to protect those resources — not just for the present but also for future generations.

[16] The CPAC coverage is available at www.cpac.ca/en/digital-archives/?search=energy+east

3 IMPACTS ON ONTARIO NATURAL GAS CONSUMERS IN TERMS OF RATES, RELIABILITY AND ACCESS TO SUPPLY

TRANSCANADA'S CANADIAN MAINLINE (MAINLINE) IS AN EXISTING NATURAL GAS TRANSMISSION SYSTEM THAT CONSISTS OF SEVERAL PARALLEL PIPELINES STRETCHING MORE THAN 14,000 KM FROM THE ALBERTA-SASKATCHEWAN BORDER EAST TO THE QUÉBEC-VERMONT BORDER. THE COMPANY'S ENERGY EAST PROJECT WOULD CONVERT ONE OF THESE PIPELINES FROM CARRYING NATURAL GAS TO CARRYING CRUDE OIL.

The Mainline has three distinct segments. The first segment, the Prairies Line, runs from the Alberta border to the Manitoba-Ontario border. The next two segments, the Northern Ontario Line and the Eastern Ontario Triangle, are the sections that are relevant to this review.

The Northern Ontario Line consists of three (and in some places four) parallel pipelines that run from the Manitoba-Ontario border to North Bay, Ontario. At the City of North Bay, the Mainline splits into what is known as the Eastern Ontario Triangle (as illustrated in Figure 4). One side of the triangle consists of two parallel pipelines that run from North Bay to Maple (near Toronto); the second side consists of two parallel pipelines that run from North Bay to Iroquois near Cornwall (known as the North Bay Shortcut); the bottom of the triangle consists of two or three parallel pipelines that connect Maple[17] to Iroquois.

[17] Near Maple, there are three parallel pipelines

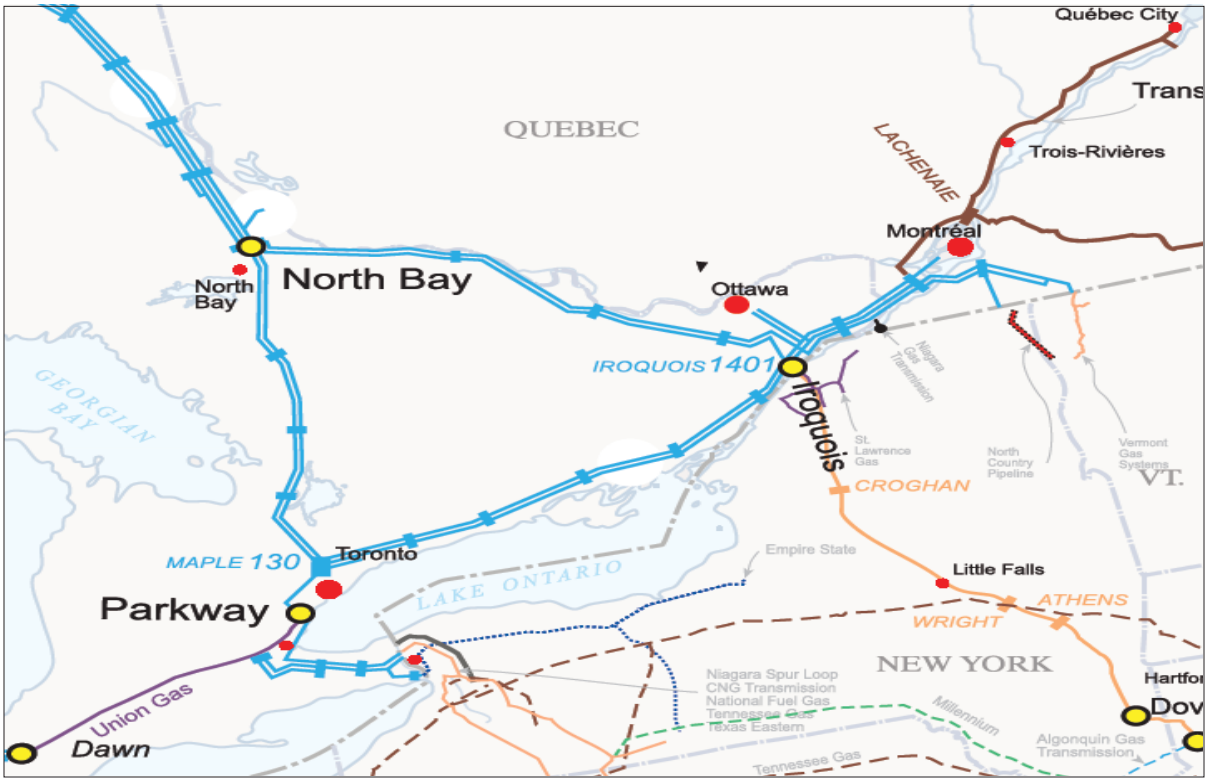


FIGURE 4: EASTERN ONTARIO TRIANGLE
Source: TransCanada via KPMG

Natural gas has traditionally flowed from west to east along the Mainline to Ontario and markets in the northeast of the United States (U.S.). However, the increase in natural gas from the nearby Marcellus and Utica shale fields in the U.S. northeast and the decrease in conventional gas from western Canada has dramatically changed the natural gas landscape. More gas from the shale fields is flowing into Ontario and U.S. northeast and less gas is coming from the west. As a result, the amount of natural gas flowing on TransCanada's Mainline has declined.

Despite this, TransCanada's Mainline is still critical to ensuring Ontario has a reliable supply of natural gas, because western Canada is expected to remain the largest single source of natural gas for the province. A report prepared for the OEB's Natural Gas Market Review estimated that, in 2020, 42% of the province's natural gas would still be

coming from western Canada[18]. Additionally, markets in the U.S. northeast currently use TransCanada's Mainline to get access to western Canadian gas, particularly during the winter. Consequently, the conversion of one of TransCanada's existing 42-inch gas pipelines to carry oil has raised concerns there will not be sufficient pipeline capacity to serve the needs of Ontario and other markets, especially in the area served by the North Bay Shortcut.

3.1 TRANSCANADA'S APPLICATION

In Ontario, TransCanada has proposed to remove some pipeline capacity from gas service in northern Ontario (along the Northern Ontario Line) and eastern Ontario (along the North Bay Shortcut). This will reduce natural gas capacity in northern Ontario by approximately 1470 terajoules per day (TJ/d) and by 1210 TJ/d in eastern Ontario[19].

In its application, TransCanada stated that, in all foreseeable events, there will be enough capacity on the Northern Ontario Line to meet its firm service requirements[20] (i.e. for natural gas shippers who hold firm contracts for pipeline capacity with TransCanada in order to receive an uninterrupted supply of gas during the length of the contracts). Therefore, TransCanada indicated that the Project will not create a shortfall in natural gas pipeline capacity for northern Ontario (i.e. west of North Bay).

However, TransCanada anticipated there will be a shortfall in the natural gas pipeline capacity required to meet forecasted demand[21] in eastern Ontario. This reduction in gas pipeline capacity will be caused by the removal of one of the two pipelines on the North Bay to Iroquois portion of the Mainline (the North Bay Shortcut). The North Bay Shortcut is part of the Eastern Ontario Triangle as previously shown in Figure 4.

As a result, TransCanada is proposing to build the Eastern Mainline Pipeline (Eastern Mainline), a new 36-inch natural gas pipeline that would run approximately 245 km from Maple to Cornwall, Ontario. In order to reduce the costs to consumers who use the new pipeline, TransCanada said it will contribute $500 million towards the cost of its construction. The Eastern Mainline would add 580 TJ/d of capacity, an amount TransCanada originally said would be sufficient to meet the needs of natural gas shippers who have firm

[18] Pg. 37, *2014 Natural Gas Market Review Final Report,* Navigant, December 2014

[19] Impact of Energy East on Ontario Natural Gas Prices by ICF Canada, page 14

[20] Volume 2: Sale and Purchase of Mainline Assets, Section 4, page 1 of 36

[21] Volume 1: Energy East Project and Asset Transfer Applications, Section 1, page 3 of 6.

contracts with the company, as well as future growth. However, TransCanada said more recently in a letter[22] to the NEB on April 2, 2015, that it was reviewing additional requests for pipeline capacity on the Eastern Mainline that could change its forecast.

TransCanada says Energy East will result in lower costs for shipping natural gas. In its application, TransCanada indicated that the combined effect of removing an under-utilized pipeline and the construction of the Eastern Mainline would result in a net benefit to shippers of over $900 million, calculated on a net present value basis, to 2030. Shippers in the Eastern Ontario Triangle would get approximately $500 million of these savings[23]. TransCanada provided no estimate on how much of these savings would flow through to consumers.

3.2 THE VIEWS EXPRESSED[24]

Participants at the community meetings were concerned that, even with the Eastern Mainline, Energy East would create a shortfall in pipeline capacity for natural gas. This shortfall would reduce the supply of natural gas and increase the price for consumers. They indicated that a reliable supply of natural gas is critical to Ontario's energy infrastructure and its industrial competitiveness. They suggested that a reduction in supply and the resulting increase in the price of gas could hurt Ontario's manufacturing sector.

The large volume gas users such as electricity generators, gas utilities and industrial users generally supported TransCanada's assessment that there would be sufficient capacity on the Mainline to meet the needs of gas consumers in northern Ontario. However, these shippers indicated that the remaining capacity along the North Bay Shortcut, combined with the capacity that would be added by the proposed Eastern Mainline, would not be enough to meet current and future needs.

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[22] April 2nd, *Potential Future Amendment of the Application,* TransCanada PipeLines Ltd.

[23] Volume 2: Sale and Purchase of Mainline Assets, Section 4, page 1 of 36

[24] A more complete look at the views expressed during the consultation and engagement can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

> *THE CURRENT CAPACITY OF THE PIPELINE TRANSCANADA IS PROPOSING TO TRANSFER TO OIL TRANSPORTATION SERVICE IS APPROXIMATELY 1,200 TJ/D. TRANSCANADA'S PROPOSAL WOULD REPLACE ONLY 575 TJ/D OF THIS CAPACITY. THIS WILL NOT PROVIDE SUFFICIENT CAPACITY TO SERVE CURRENT AND FUTURE EASTERN CANADIAN AND U.S. NORTHEAST MARKETS.*
>
> [UNION GAS]

Other large users said the shortfall is especially critical because domestic and export customers use the existing surplus capacity on the North Bay Shortcut to purchase interruptible or other short-term services. They indicated that some of them are unable to make the long-term commitment required for new firm capacity and believe that TransCanada should provide some on-peak interruptible capacity in the final design of the Eastern Mainline.

> *MAINTAINING SOME CAPACITY IN EXCESS OF CURRENT FIRM CONTRACTED OBLIGATIONS WOULD SUPPORT ROBUST MARKETS — BOTH PRIMARY AND SECONDARY.*
>
> [INDUSTRIAL GAS USERS ASSOCIATION]

In addition, some of the large volume gas users wanted to ensure that natural gas consumers do not subsidize TransCanada's oil business. They are concerned that natural gas customers will bear the burden of any cost overruns on the Eastern Mainline, or any reduction in its forecasted benefits. They insisted that a fair price be charged for the pipeline assets being transferred from the existing Mainline system to Energy East.

3.3 WORK OF TECHNICAL ADVISORS

The OEB engaged two firms, Elenchus Research Associates and ICF Consulting Canada, to analyze the potential impact of Energy East on the supply and price of natural gas in Ontario. Elenchus Research Associates (Elenchus) interviewed large volume gas users for their views on the Project. ICF Consulting Canada (ICF) analyzed the effects of Energy East on natural gas prices in Ontario and in particular, the effect that reducing the capacity on the North Bay Shortcut might have on natural gas prices in eastern Ontario. The following is a summary of their work.

ELENCHUS

Elenchus interviewed a number of the province's large volume gas customers (i.e. shippers) and their associated organizations, including the Industrial Gas Users Association, the Association of Power Producers of Ontario, Union Gas Ltd., and Enbridge Gas Distribution Inc. These shippers and their organizations stated that:

- converting the sections of natural gas pipeline west of North Bay does not create a shortfall in pipeline capacity;
- converting the section of the pipeline between North Bay and Iroquois does create a shortfall in pipeline capacity;
- the price of the natural gas assets being transferred to Energy East should be fair to natural gas customers. Natural gas users should not subsidize an oil pipeline;
- Energy East increases the risk of higher tolls on the Mainline;
- reducing the capacity between North Bay and Iroquois will result in:
  - » a higher commodity price for natural gas, and increased price volatility in the Eastern Ontario Triangle
  - » a higher cost of electricity from gas-fired generation in Ontario
- commercial terms to access transportation capacity will be more onerous; and
- since the newest pipeline on the Mainline system in Ontario is being transferred to Energy East, the remaining older lines may be susceptible to future integrity issues resulting in:
  - » a risk of higher operating and maintenance costs
  - » system reliability concerns

ICF CANADA

To estimate the impact of Energy East on natural gas prices in Ontario, ICF looked at the prices at two trading hubs: Dawn and Iroquois-Waddington[25]. Dawn is a major market hub[26] for the delivery of natural gas to Ontario and eastern Canada. Iroquois-Waddington is a small market hub at the eastern end of the Eastern Ontario Triangle that is used to export gas into the U.S. northeast[27].

ICF said[28] there are two reasons why the reduction in pipeline capacity due to Energy East will create a shortfall and increase gas prices in eastern Ontario: the expected growth of gas demand in eastern Ontario; and the continued reliance by New England and New York consumers on western Canadian natural gas shipped through eastern Ontario during winter peak periods. These price increases will primarily occur in the winter months, when gas demand is high. Summer prices will not be affected as much.

If Energy East goes ahead, ICF's analysis estimated that gas prices at Iroquois-Waddington are expected to be an average of 3.5% higher between 2016 and 2035. The gas prices at Iroquois-Waddington would be even higher than that during the winter months of December, January, and February, increasing an average of 12% over the same period. Summer prices at Iroquois-Waddington would largely be unaffected. The effect on Dawn prices is expected to be modest. Figure 5 shows the details of the expected price impacts.

[25] See Figure 5 for the location of Dawn and Iroquois

[26] A market hub is a regional market place with many buyers and sellers

[27] See Figure 6 for current and the expected gas flows

[28] Found in ICF's current Base Case assumptions from its technical report which is posted on the OEB's website

		IROQUOIS-WADDINGTON	DAWN
Annual	Without EE	5.82	5.50
	With EE	6.02	5.51
	Difference	*0.20*	*0.01*
	% Diff.	***3.5%***	***0.2%***
Winter (Dec–Feb)	Without EE	6.57	5.64
	With EE	7.35	5.68
	Difference	*0.78*	*0.04*
	% Diff.	***11.9%***	***0.8%***
Summer (May–Sep)	Without EE	5.38	5.32
	With EE	5.37	5.31
	Difference	*-0.01*	*-0.01*
	% Diff.	***-0.1%***	***-0.2%***
Design Day[29]	Without EE	35.59	35.65
	With EE	39.82	35.93
	Difference	*4.24*	*0.28*
	% Diff.	***11.9%***	***0.8%***

FIGURE 5: AVERAGE GAS PRICE EFFECTS OF ENERGY EAST, 2016–2035 (IN 2014 US$/MMBtu)

Source: ICF Report

In forecasting the price impacts of Energy East, ICF examined both the anticipated gas flows and the anticipated demand for natural gas in Ontario. Specifically, ICF estimated the gas flows in 2030 across both eastern Ontario and the northeast U.S., with and without Energy East. The anticipated gas flows are illustrated in Figure 6. As for Ontario's total demand for natural gas, ICF expected it to grow to 3,560 TJ/d by 2020 and 4,780 TJ/d by 2035.

[29] Design Day refers to the daily demand for natural gas that comes from extremely cold weather conditions. Design day demand is usually determined using the actual demand on the coldest day over a given time interval, such as 20 or 30 years, and the expected growth in demand over time. Gas utilities typically plan their gas supply to meet a design day demand in the winter.

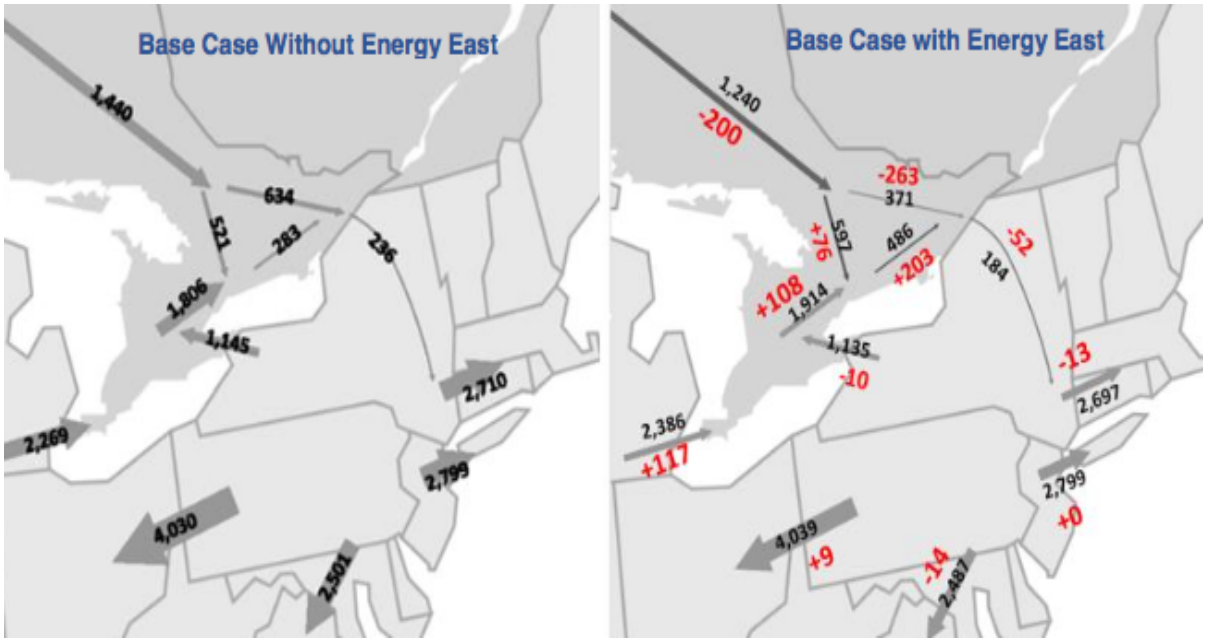

FIGURE 6: AVERAGE ANNUAL GAS FLOWS IN 2030 WITH/WITHOUT ENERGY EAST (MMcfd)

Source: ICF Report

ICF predicted that Energy East will require an increase in the flow of natural gas on the Maple to Iroquois section of the Eastern Ontario Triangle, to compensate for the reduced pipeline capacity between North Bay and Iroquois. This is because the flow of gas south to consumers in New York and New England via Iroquois-Waddington is expected to remain substantial during the winter months. ICF expects continued demand for western Canadian gas by U.S. northeastern consumers in the winter.

ICF also examined the impact of Energy East on the Mainline tolls that would be paid by shippers to transport gas in eastern Ontario. Given the many uncertainties and unknowns on the specifics of the Project, ICF's analysis was less than conclusive. As a result, ICF concluded that the Energy East Pipeline could end up either benefiting or costing Ontario gas shippers, depending on how the Project is implemented and assessed.

ICF said a two-year delay in Energy East, something that has already been announced by TransCanada, might reduce the benefits calculated by TransCanada[30]. A large portion of the savings for shippers is based on avoiding the costs associated with the accelerated depreciation of the Northern Ontario Line. ICF estimated that a two-year delay in the project timelines could mean an approximate $100 million reduction in the savings for shippers that have been predicted by TransCanada[31].

ICF examined what might happen if TransCanada expands the Eastern Mainline Pipeline to fully replace the lost capacity in the Eastern Ontario Triangle. ICF noted that expanding the diameter of the pipeline from 36-inches to 42-inches would increase the cost of the Eastern Mainline, but these costs may be offset by an increase in long-term pipeline revenue, and the elimination of the price increases for natural gas.

3.4 OEB'S ADVICE TO MINISTER

Even with the Eastern Mainline, large users and participants living in the local and Aboriginal communities shared a concern about the effect of Energy East: they were worried it would create a shortfall in pipeline capacity leading to a decrease in their gas supply and an increase in their price of natural gas.

In reviewing the Project, ICF expects that there will be sufficient capacity to meet current and future gas demand in northern Ontario (i.e. the Northern Ontario Line between the Ontario-Manitoba Border and North Bay, Ontario). As a result, Energy East is not anticipated to affect the price of natural gas in northern Ontario. The OEB agrees with these findings.

However, ICF finds that there will be insufficient pipeline capacity along the North Bay Shortcut in the Eastern Ontario Triangle. This will reduce the supply of natural gas and is expected to lead to price increases in eastern Ontario. In particular, ICF expects that the Iroquois-Waddington winter gas prices (in December, January and February) will be on average 12% higher between 2016 and 2035 while the impact on Dawn prices will be modest.

The OEB recognizes that there is inherent uncertainty in forecasts that try to estimate what could happen in the future. Despite this, Ontario consumers need to be assured that

[30] April 2, *TransCanada Alters Québec Scope of Energy East Pipeline Project*

[31] Pg. 34, *Impact of Energy East on Ontario Natural Gas Prices*, ICF Consulting Canada, 2015

pipeline capacity and natural gas supply in eastern Ontario will be available to meet its medium- and long-term needs.

The Energy East Pipeline would convert currently under-utilized natural gas pipelines for another use, which would help limit Mainline toll increases. However, as ICF's analysis concludes, the potential benefits depend on how the Project is implemented and assessed. While there may be potential benefits, Energy East has costs and risks that Ontario shippers currently do not have to bear. Shippers have raised concerns about how these costs would be recovered and say natural gas consumers could end up subsidizing Energy East, a cross-subsidy that would benefit oil shippers.

As a result, the OEB offers the following advice:

- TransCanada should update its gas demand, supply and price forecasts to reflect current and projected market conditions and the delays that have been announced in the Project. TransCanada's calculation of the expected Project costs and benefits should also be updated to reflect these delays. This update should also include specific tolling impacts for Ontario customers. Ongoing market monitoring is essential;
- Ontario consumers need to be assured that enough pipeline capacity and natural gas supply will be available to meet Ontario's medium- and long-term needs, particularly in eastern Ontario. TransCanada needs to ensure that transportation capacity requirements are appropriately established; and
- Ontario consumers should not cross-subsidize the Energy East project. Ontario shippers' tolls should match the costs of the services they purchase.

4 IMPACTS ON NATURAL ENVIRONMENT AND PIPELINE SAFETY

ONTARIANS ARE APPREHENSIVE ABOUT THE POSSIBILITY OF AN ENERGY EAST OIL SPILL, ESPECIALLY THE DAMAGE IT COULD CAUSE TO THEIR RIVERS, LAKES AND STREAMS. DURING THE COMMUNITY MEETINGS THEY SAID THAT PROTECTING THE NATURAL ENVIRONMENT AND ENSURING PIPELINE SAFETY ARE ESSENTIAL.

The OEB assessed pipeline safety using a risk-based approach. Risk is not just defined as the likelihood of a failure; it also includes the consequences of the failure. Our technical advisor looked at the sections of the application that are about preventing an accident or a spill, along with the sections on how to minimize the environmental damage and risk to people caused by any failure or spill.

Many participants had longer term concerns about the environmental impact of Energy East. They were worried that the Project would increase greenhouse gas emissions. To assess this potential impact, the OEB engaged Navius Research Inc. (Navius) to analyze the emissions generated as a result of Energy East. Navius looked at both the source of emissions (from extraction to transportation, refining and consumption) and how Energy East is likely to affect emissions in Ontario, Canada, and globally.

4.1 NATURAL ENVIRONMENT

Most of the area to be crossed by Energy East is forested Crown land in northwestern and north central Ontario. With a few exceptions, small communities are dispersed along the Trans-Canada Highway. The population density increases further east, with the land use becoming more agricultural and urban in the Ottawa and St. Lawrence River valleys. The

proposed pipeline crosses or runs beside a number of rivers, including the Nipigon, Ottawa, Mattawa, Madawaska, Rideau and St. Lawrence rivers. The planned route also passes by a number of lakes: Temagami, Nipissing, Nipigon, Trout Lake and Lake of the Woods[32].

4.1.1 TRANSCANADA'S APPLICATION

As part of its application, TransCanada filed an Environmental and Socio-Economic Assessment that outlines the environmental impact of the Project. According to the NEB's Filing Manual[33], an Environmental and Socio-Economic Assessment must describe the general topography of the Project, any physical or environmental features that may affect it, as well as the Project's impact on air, water, and wildlife. It must also recognize there may be other projects in the vicinity and look at both the cumulative impact of a project, and how these impacts are going to be mitigated. An Environmental Protection Plan is generally developed as part of the Environmental and Socio-Economic Assessment to provide mitigation measures that would be implemented during pipeline construction and operations.

TransCanada stated, in its application, that after appropriate mitigation measures are taken, Energy East is not likely to cause significant adverse environmental effects in Ontario. The only exception to this in the application is the Project's potential for cumulative adverse effects on Woodland Caribou at two pump stations (Smooth Rock Falls and Potter) in the Kesagami Range. Woodland Caribou are listed as "threatened" under the federal Species at Risk Act. TransCanada proposes measures to offset habitat loss that are consistent with the federal Woodland Caribou Recovery Program.

While it has not yet done so, TransCanada said it will be filing additional information on a number of other aspects of the Project, including the environmental impacts of the construction camps and work storage sites. Site-specific data on environmental mitigation and updated environmental protection plans will be filed, as will details on valve locations and environmentally sensitive areas (known as Highly Sensitive Receptors) on the existing pipeline route. TransCanada will also model the paths that oil would take if there were an accident anywhere on the existing pipeline. It is not known when this material will be filed with the NEB.

[32] Pg. 1, Assessment of Impacts on the Natural Environment, DNV GL, March 2015

[33] National Energy Board, 2014 Filing Manual, Guide A.2

In its application, TransCanada said that in the event of an oil spill it would provide alternative sources of drinking water.

4.1.2 THE VIEWS EXPRESSED[34]

When people talked about the potential impact of Energy East on the province's natural environment, they were usually talking about water. This was the dominant topic of discussion at the community meetings. In Part One, people voiced generalized concerns about the threats of an oil spill to the province's rivers and lakes. With the release of the preliminary assessment of the Project's overall and local environmental impacts, participants were encouraged in the Part Two community meetings to discuss their local concerns. During Part Two, participants stated that the risks to their local water sources — both water bodies such as Trout Lake and ground water wells — are the most important issue for the OEB to focus on in its report. They also noted that people need fresh water for a variety of reasons and questioned the amount of water that TransCanada would supply in the event of a spill.

> *"WE DON'T BELIEVE SPILLS AND LEAKS CAN BE ENTIRELY PREVENTED AND WE DON'T BELIEVE THAT TRANSCANADA WILL BE ABLE TO PROPERLY CLEAN UP AFTER A SPILL AND RESTORE THE NATURAL ENVIRONMENT*
> [OTTAWA PARTICIPANT]

A lot of the discussion revolved around the definition of a "significant water crossing." While TransCanada promised in its application that there would be additional protection at "significant water crossings" with valves on either side of the river or stream, the company at this time has not consulted with the communities to establish which water crossings it considers to be "significant."

This worried a number of people at the meetings in Kenora, Thunder Bay, Kapuskasing, Timmins and North Bay. There were frequent requests that TransCanada consult with local communities and engage the First Nations and Métis before arriving at its list of "significant water crossings." Several participants felt that all water bodies, whether they are above

[34] A more comprehensive look at all the views expressed during the consultation can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

or below ground should be considered "significant" in terms of protection and mitigation, because even minor water bodies connect to larger watersheds.

> *ALL WATER BODIES SHOULD BE EQUALLY CONSIDERED AND PROTECTED, INCLUDING AQUIFERS, HEADWATERS, SURFACE WATER AND GROUND WATER.*
> [KAPUSKASING PARTICIPANT]

The idea that a diluted bitumen spill poses a more hazardous threat came up at meetings in Kenora, Thunder Bay and North Bay. Participants were afraid that the diluted bitumen is toxic and would sink to the bottom of rivers or lakes, making it difficult to clean up. Some were not comforted by an Environment Canada study[35] that looked at the behaviour of diluted bitumen and confirmed that diluted bitumen would have to be mixed with foreign matter such as silt and soil before it would sink in salt water. Participants thought that the environmental impacts of a diluted bitumen spill in fresh water bodies needed to be specifically studied.

The Council of Canadians commented that the potential transportation of 1.1 million barrels per day of diluted bitumen is an unacceptable risk to Ontario waterways.

[35] *Properties, Composition and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands Transport Canada*, November 2013

> *SINCE ITS [THE COUNCIL'S] PREVIOUS SUBMISSION TO THE OEB, FURTHER EVIDENCE HAS COME FORWARD AFFIRMING DEFICIENCIES IN OUR UNDERSTANDING OF HOW DILUTED BITUMEN REACTS IN WATER, AND THE IMPLICATIONS OF A SPILL. A DRAFT FEDERAL REPORT ON DILUTED BITUMEN, BROUGHT TO THE PUBLIC'S ATTENTION THANKS TO AN ACCESS TO INFORMATION REQUEST, IDENTIFIES A NUMBER OF KNOWLEDGE GAPS ABOUT THE BEHAVIOUR AND EFFECTS OF DILUTED BITUMEN. THESE INCLUDE DILUTED BITUMEN'S TOXICITY AND ITS IMPLICATIONS FOR AQUATIC ENVIRONMENTS.*
> **[COUNCIL OF CANADIANS]**[36]

Others asserted that the transport of crude oil by rail, as an alternative to the Energy East Pipeline would pose an even greater hazard to the natural environment.

4.1.3 WORK OF TECHNICAL ADVISOR

The OEB engaged an independent consultant, DNV GL, to examine the Energy East application and determine whether, as the Minister requested, the plans for the Project met the "highest available technical standards for public safety and environmental protection[37]."

DNV GL observed that it could not make this determination, as TransCanada has yet to file all of the information required for its Environmental and Socio-Economic Assessment. The application is not finalized and the NEB has not ruled on the application's completeness. TransCanada has indicated it will file additional material at a later date.

DNV GL noted that there is no evidence in the application that TransCanada has considered whether it is appropriate to take a route chosen for a natural gas pipeline and use it for carrying crude oil. TransCanada listed 10 criteria for route selection for new pipelines[38], but these criteria do not distinguish between the routing for a natural gas pipeline and for one

[36] Council of Canadians Written Submissions, Part Two of OEB Energy East Consultation

[37] Letter from Minister of Energy, Nov. 12, 2013, http://www.ontarioenergyboard.ca/OEB/_Documents/Documents/ltr_Min_Chiarelli_to_OEB_Chair_EnergyEast_20131113.pdf

[38] Pg. 4-4, *ESA, Energy East Pipeline Project,* Energy East Pipeline Ltd.

carrying crude oil. As the NEB's Joint Review Panel noted in its decision on the Northern Gateway Project, *"The Panel is of the view that pipeline routing is key to avoiding pipeline spills, or lessening potential effects in the event of a spill*[39]." The appropriateness of the general route is Issue No. 9 on the NEB's Issues List for Energy East.

In its assessment, DNV GL raised the issue of rerouting the portion of the new pipeline planned next to the St. Lawrence River near Akwesasne. DNV GL suggested that the new pipeline could be constructed next to the Canadian Pacific (CP) rail line, some 13 to 17 km inland from the St. Lawrence River.

DNV GL also indicated that no evidence has been filed about the hundreds of water bodies that will be crossed or are in close proximity to the pipeline. The information related to the natural environment surrounding the converted section of the pipeline in Ontario is narrowly limited to the area around the 30 pump stations and access roads, the trenchless crossings of the Madawaska and Rideau rivers, and the pipeline's operations and maintenance.

When assessing the impact of oil spills in its application, TransCanada chose 11 "Sites of Interest" across Canada, and used them as surrogates for modelling the likelihood and effects of an oil spill. DNV GL concluded that the intermittent mapping of oil spill trajectories and the use of a small sample of locations as surrogates do not meet "the highest available standards" for environmental protection.

DNV GL also observed that TransCanada has presented little evidence that it has taken into account the impact of an oil spill on the downstream use of surface water. The only municipal water intake that was mapped was for the City of North Bay. Many other communities, including Ottawa, Cornwall and Akwesasne, have water intakes that are downstream from the pipeline. Information is also missing on the springs and surface water intakes for 95% of the route.

DNV GL noted as well that TransCanada's application did not contain enough information on the fish and wildlife that could be affected by the pipeline. TransCanada has committed to compensate for the potential loss of habitat for the Woodland Caribou near two pump stations; a commitment that DNV GL said constitutes the highest level of environmental protection.

[39] Pg. 144, *Enbridge NGP Joint Review Panel,* National Energy Board, 2013

The newly constructed pipeline however, would also affect 30 wetland areas that are breeding grounds for the western chorus frog, a species that is listed as "threatened" under the federal Species at Risk Act. Wetlands make up 18% of the land crossed by the newly constructed section of Energy East, yet DNV GL found no indication that wetlands were avoided in planning the new route, something that is inconsistent with the NEB Filing Manual.

These wetlands are not the only environmentally sensitive areas crossed by Energy East. The proposed pipeline crosses a total of eight provincial parks, four conservation reserves and four conservation areas. Three of the provincial parks are included in the Project Development Area of the pump stations, river crossings or access roads. A conservation reserve and area also overlap the Project Development Area. While TransCanada commits in its application to filing site-specific environmental protection information, there is no detailed information on the impacts and the mitigation plans for parks, conservation reserves and areas, wetlands or other environmentally sensitive areas.

4.1.4 OEB'S ADVICE TO MINISTER

Ontarians' number one concern about Energy East is the potential damage an oil spill could cause to the province's lakes, rivers and streams. In its application, TransCanada says the Energy East Pipeline would have no significant adverse environmental impact in Ontario, except for woodland caribou.

The OEB believes more work needs to be done. In particular, TransCanada needs to assess whether it is appropriate to take a route chosen for a natural gas pipeline and use it for the transmission of crude oil. We note that the effects of an oil spill on Ontario's wildlife and water would be far more profound than the impacts associated from the failure of a natural gas pipeline.

So, the OEB offers the following advice:

Ensure Community Input

- TransCanada should work with local communities and Ontario's First Nations and Métis to develop a list of all the environmentally sensitive areas, also known as Highly Sensitive Receptors;
- TransCanada should overlay the Highly Sensitive Receptors with the comprehensive mapping of spill trajectories it has promised to develop for the entire length of the pipeline; and
- TransCanada should use the map of the spill trajectories near Highly Sensitive Receptors and consult with local communities and Ontario's First Nations and Métis on the designation of "significant water crossings." TransCanada should pay special attention to Nipigon Lake, Trout Lake, the Ottawa River, the Rideau River, the Oxford-Marsh Aquifer, the Nepean Aquifer, and other areas where there is elevated public concern.

Consider Alternative Routes

- Where the existing pipeline route may be too close to Highly Sensitive Receptors, TransCanada should reroute the pipeline or justify why rerouting is not necessary, listing the specific mitigation measures that will be applied to protect the environmentally sensitive areas;
- TransCanada should study the alternative railway route near the CP rail line for the new pipeline it proposes to build close to the St. Lawrence River. The 10 criteria listed in its Environmental and Socio-Economic Assessment should be used to evaluate the alternative railway route against the currently planned route, as well as its proximity to the St. Lawrence River; and
- TransCanada should reroute the pipeline to follow the railway route or justify why rerouting is not necessary, including a listing of the specific mitigation measures that will be used to protect the Highly Sensitive Receptors.

4.1.5 CLIMATE CHANGE

The issue of climate change played an important role in the OEB's consultation and review of Energy East. We added it to the list of potential impacts to be reviewed after many people said during the Part One meetings that any examination of Energy East would not be complete without an analysis of the Project's effect on upstream and downstream emissions of greenhouse gases. They said this was particularly important because the NEB said in its Issues List[40] for Energy East that it would only look at the emissions directly caused by the construction and operation of the pipeline.

We responded to what we heard from the public and, on our own initiative, engaged a technical expert, Navius Research Inc. (Navius), to conduct a comprehensive analysis of the greenhouse gas emissions associated with the Project. Navius' analysis focused on all sources of greenhouse gas emissions that could be attributed to the Project: from the upstream activities associated with the development of the oils sands to the downstream and end use activities associated with the consumption of refined petroleum products.

4.1.5.1 TransCanada's Application

In its application, TransCanada followed the direction of the NEB[41] and estimated the greenhouse gases that would be emitted during construction and operation of Energy East. TransCanada said the construction of Energy East would add about 1,000 kt of CO_2 to the environment. These emissions would occur during 2018–2019[42] and amount to about 0.06% of Canada's annual emissions. The emissions from construction and conversion of the pipeline in Ontario would amount to 142 kt CO_2 annually, or 0.09% of Ontario's emissions in 2012. As for the emissions generated by the operation of Energy East, TransCanada stated they would amount to about 500 kt of CO_2 annually, or 0.07% of Canada's current GHG emissions. The 270 kt of CO_2 that would be emitted every year by the operation of the pipeline in Ontario would come from the eight pump stations using natural gas.

A greenhouse gas management plan is included in TransCanada's application.

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[40] *TransCanada Energy East Pipeline Project — List of Issues,* National Energy Board, January 2015

[41] *TransCanada Energy East Pipeline Project — List of Issues,* National Energy Board, January 2015

[42] On April 2nd, TransCanada announced a two-year delay in the completion of Energy East.

4.1.5.2 The Views Expressed[43]

During the community meetings, climate change was a frequently mentioned environmental impact. Many participants were unhappy that the NEB was not going to consider the greenhouse gas emission that would be produced upstream and downstream of the Energy East Pipeline.

> *WE WOULD LIKE TO SEE THE NATIONAL ENERGY BOARD PUT CLIMATE CHANGE BACK ON THE TABLE. INSTEAD OF EXPANDING FOSSIL FUELS WE SHOULD BE LOOKING INTO RENEWABLE SOURCES OF ENERGY.*
>
> [OTTAWA PARTICIPANT]

A number of participants at the Ottawa community meeting said that, from a climate change perspective, Canada could not afford to have an expansion of oil sands production. These people felt it was not enough to try to mitigate the potential impacts of Energy East; the pipeline had to be stopped. A number of them questioned the results of the analysis carried out by Navius.

Participants at the community meetings in Kenora, Thunder Bay, Kapuskasing and Ottawa, said that governments should be moving away from the extraction and transportation of oil, and focus instead on developing sources of renewable energy.

> *INVESTMENTS IN ALTERNATIVE ENERGY SOURCES ARE FAR MORE PRODUCTIVE THAN INVESTMENTS IN OIL. EVEN IF THE PIPELINE COULD BE DEMONSTRATED AS SAFE, OUR SOCIETY STILL NEEDS TO GET SERIOUS ABOUT REDUCING AND PREVENTING FURTHER CLIMATE CHANGE.*
>
> [THUNDER BAY PARTICIPANT]

[43] A more comprehensive look at all the views expressed during the consultation can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

This was seen to be part of a National Energy Strategy, which was often mentioned as a desirable goal of federal and provincial governments.

4.1.5.3 Work of Technical Advisor

On behalf of the OEB, Navius has produced the most comprehensive Canadian analysis[44] of how Energy East is likely to affect provincial, national and global greenhouse gas emissions. Navius considered the emissions from the entire "life cycle" of a barrel of oil, from production, transportation and refining to consumption.

Results of Modelling

Navius framed its results by looking at the entire trip taken by a barrel of oil: from the "well-to-tank" stage, which includes the emissions associated with the extraction, refining and transportation of crude oil; to the "tank-to-wheels" stage, which ends the moment a consumer burns the gasoline or other petroleum product. It also examined where the emissions are expected to take place: where the oil is produced, where the oil is transported, and ultimately where it is consumed. This allowed Navius to assess not only the size of the increase in emissions, but also where those emissions are expected to take place. Navius looked at impacts in the year 2035, the year the pipeline is expected to be fully utilized. Finally, it examined different scenarios including the effect that other pipelines might have on greenhouse gas emissions from Energy East.

The main findings from Navius are that emissions at the Ontario level are very modest. The main source of greenhouse gas emissions is the energy used to transport the oil through the province. Almost all of these emissions are from the eight proposed pump stations that will consume natural gas. Navius estimated the emissions are between 0.2 and 0.6 million tonnes (Mt) of carbon dioxide (CO_2), less than 0.5% of Ontario emissions.

As for the impact of Energy East on the Canadian greenhouse gas emissions, Navius illustrated in Figure 7 that the pipeline would increase emissions in 2035 by between 0.2 and 11 Mt of CO_2, an increase of between 0.03% and 1.6% in the current levels of greenhouse gas emissions[45]. This increase is due to increased activity in the oil sands, and increased deliveries of bitumen to refineries in Québec and New Brunswick. When bitumen

[44] *Discussion Paper: Greenhouse Gas Emissions Resulting from the Energy East Pipeline,* Navius Research, Feb. 2015

[45] Pg. iv, *Discussion Paper: Greenhouse Gas Emissions Resulting from the Energy East Pipeline,* Navius Research, Feb. 2015

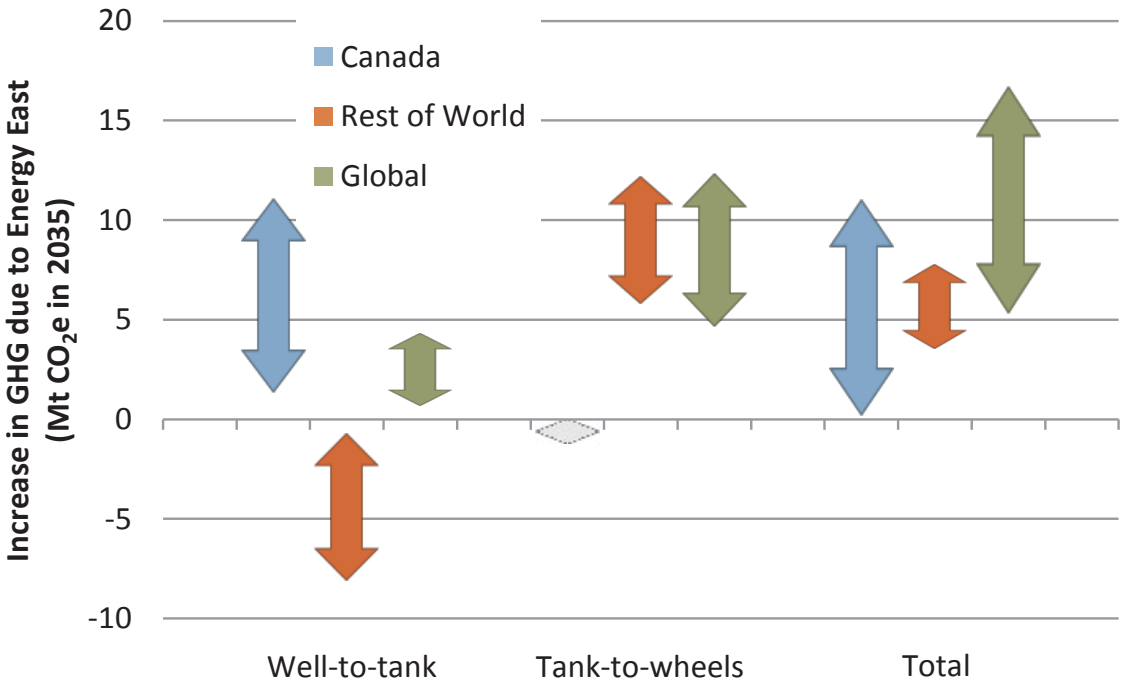

FIGURE 7: LOCATION OF EMISSIONS DUE TO ENERGY EAST IN 2035
Source: Navius

from the oil sands is refined, it produces more greenhouse gas emissions than other grades of crude oil.

The impacts of emissions are larger outside of Canada. Navius projected that Energy East will likely increase annual greenhouse gas emissions outside of Canada between 3.6 and 7.8 Mt. by 2035, an increase of 0.01% in global emissions.

Navius said the increased production due to Energy East is likely to lower the global price of crude oil slightly, and that this will increase both the global consumption of refined petroleum products and global greenhouse gas emissions. But any increase in Canadian oil production due to Energy East would also likely provoke a decline in higher-cost production in other jurisdictions[46].

[46] Pg. vi, *Discussion Paper: Greenhouse Gas Emissions Resulting from the Energy East Pipeline,* Navius Research, Feb. 2015

Other Research

The Navius discussion paper is not the only study that has examined Energy East's impact on climate change. In 2014, the Pembina Institute (Pembina) projected that Energy East would increase annual emissions in Canada by between 30 and 32 Mt CO_2[47], an increase of about 4.5% in this country's 2012 emission levels[48].

This projection is based on Pembina's assumption that, because of rail's much higher cost, rail transport is not an economically feasible alternative to pipelines. So, Pembina argued, a barrel of additional pipeline capacity will increase oil sands production by the same amount. However, experience in Alberta and other jurisdictions indicate that rail is a feasible, if more expensive, alternative. The additional cost of shipping by rail is partially offset by savings from the reduced requirements for diluent, enhanced economies of scale, and the ability to ship oil to multiple markets (all the major North American trading hubs can be reached by rail).

The Navius discussion paper asserted that it is feasible to expand rail capacity to accommodate increased oil sands production. It noted that the transport of oil by rail has grown significantly across North America in recent years. Approximately 200 thousand barrels per day were shipped by rail in western Canada in 2013[49]. In North Dakota which also has limited pipeline capacity, oil exports by rail increased by 800 thousand barrels a day between 2010 and 2014[50]. The Canadian Association of Petroleum Producers estimates that rail loading capacity will increase from 185 thousand barrels per day in 2014 to 350 thousand barrels per day in 2017[51].

The Navius analysis assumed that rail is a viable but a more expensive alternative to pipelines. Navius expects that Energy East will increase oil sands production because of the lower transportation costs. Since some of the oil sands production is to be transported by rail, Navius found the impact of the Project on oil sands production to be much more modest that estimated by Pembina, working out to less than 10% of the pipeline's capacity.

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47 Pg. 2, *Climate Implications of the Proposed Energy East Pipeline,* Pembina Institute, 2014

48 Pg. iv, *Discussion Paper: Greenhouse Gas Emissions Resulting from the Energy East Pipeline,* Navius Research, Feb. 2015

49 *Crude Oil Forecast, Markets and Transportation,* Canadian Association of Petroleum Producers, 2014.

50 U.S. Movements of Crude Oil by Rail, Energy Information Administration, 2015

51 *Crude Oil Forecast, Markets and Transportation,* Canadian Association of Petroleum Producers, 2015.

4.1.5.4 Written Submissions on Navius' Analysis

Pembina, Environmental Defense, and Council of Canadians all commented on the Navius discussion paper. Pembina stated that it did not agree with Navius' assumption that rail transportation would be economic; instead it suggested that a heavy reliance on rail would reduce profits to oil sands companies by more than the Navius analysis. Given expected market conditions over the next decade, Pembina is sceptical that the majority of the industry would be profitable enough to afford Navius' level of reliance on rail over the next decade[52].

> *"GHG IMPACT OF ENERGY EAST WOULD EQUAL THE ANNUAL EMISSIONS OF ADDING OVER 7 MILLION CARS TO CANADA'S ROADS — APPROXIMATELY EQUAL TO THE TOTAL NUMBER OF CARS CURRENTLY ON THE ROAD IN THE PROVINCE OF ONTARIO. THE VOLUME OF NEW OIL SANDS [SIC] PRODUCTION ASSOCIATED WITH THE ENERGY EAST PIPELINE'S CAPACITY WOULD REPRESENT A 34 TO 39 PER CENT INCREASE FROM CURRENT (2012) OIL SANDS PRODUCTION LEVELS[53].*
>
> [PEMBINA]

Environmental Defense supported Pembina's conclusion and suggested that Navius made several errors in the assumptions used in its modeling scenarios, resulting in an inaccurate conclusion[54]. The Council of Canadians wanted the OEB to consider Pembina's report on the climate implications of the Energy East pipeline[55].

4.1.5.5 OEB's Advice to the Minister

During the consultation, climate change was one of the key issues mentioned by people when they discussed the impact of Energy East. They also believed any assessment of the potential impacts of Energy East would be incomplete without an examination of the Project's impact on climate change.

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[52] Pembina Institute, Submission on Final Technical Reports, pages 9 and 10

[53] Ibid

[54] Environmental Defense, Final Comments OEB Energy East Consultation, page 1

[55] Council of Canadians Written Submission, Part Two of OEB Energy East Consultations

We are pleased to add to the discussion with the release of *"Discussion Paper: Greenhouse Gas emissions resulting from the Energy East Pipeline Project."* While there is uncertainty in any projection, the discussion paper from Navius is the most comprehensive Canadian analysis to date on the relationship between pipeline projects and climate change.

The issue of climate change, however, is bigger than any one pipeline project or any one province. We believe the Navius discussion paper is a valuable contribution that should be used in the broader discussion of climate change.

4.2 PIPELINE SAFETY

Since it falls under the jurisdiction of the NEB, Energy East must comply with the requirements of the NEB Act and the NEB's Onshore Pipeline Regulations (NEB OPR). The NEB OPR says Energy East also has to meet the requirements of the Canadian Standards Association (CSA) Z662, the national standard developed by Canadian Standards Association for oil and gas pipelines. Both the NEB OPR and CSA Z662 set the rules for the safe design, construction, operation, testing and maintenance of pipelines. CSA Z662 also includes recommended annexes that go further than these requirements, but these annexes are not mandatory.

4.2.1 TRANSCANADA'S APPLICATION

TransCanada said its primary focus in designing, building and operating the Energy East Pipeline will be to manage, mitigate and reduce risks to public safety and the environment. It said the Project will be designed, constructed and operated in accordance with the NEB OPR and CSA Z662.

In its application, TransCanada said there will be 179 shut-off valves[56] along the length of the pipeline in Ontario. The preliminary location of these valves was determined by TransCanada's Valve Siting Optimization Process, which seeks to reduce risk by analyzing local topography, existing land use and the amount of oil that could be released. Staff in the Operations Control Centre in Alberta will remotely control and monitor these valves, with the exception of check valves at certain river crossings, which will close automatically in event of a spill to prevent backflow.

[56] Pg. 2-10, Volume 1: Energy East Project and Asset Transfer Applications, Section 2, Project Overview

If a spill occurs, TransCanada would initiate a shut down of that section of the pipeline within a maximum of 10 minutes and activate an Emergency Response Plan to coordinate the activities of first responders. TransCanada estimated that it will take an additional 12 minutes to close all the necessary valves and complete the shut down of the pumps. The company originally said the Emergency Response Plans would be developed and put in place after the Project is approved, but before it is in operation. However, in response to community concerns, TransCanada has indicated that the development and submission of these Emergency Response Plans will be brought to the NEB earlier in its process[57].

To reduce the risk of external corrosion and stress corrosion cracking, TransCanada said almost all of the new and converted pipeline will be coated with fusion bond epoxy. In its Engineering Assessment, TransCanada said that it will use two different in-line inspection tools to inspect the length of converted pipeline before and after it has been removed from gas service. If any problems are identified using these tools, TransCanada said it would fix them. The entire pipeline would then undergo another in-line inspection during its first year of service.

TransCanada stated in its application that there was one hydrostatic test failure in 2000 in section MLV 58 to 59 of Line 100-3, which it attributed to stress corrosion cracking, a form of environmentally assisted cracking. There was one leak in section MLV 51 due to mechanical damage in 1991[58].

4.2.2 THE VIEWS EXPRESSED[59]

Participants at nearly all of the community meetings generally felt the provisions ensuring the safety of the Energy East Pipeline needed to be strengthened. Many were concerned it would take too long to shut down the pipeline in event of an accident and that millions of litres of oil would leak out during the time it would take to close the valves. They also felt a communications breakdown could lead to delays in any shut down, as has occurred with other spills.

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[57] TransCanada's Submission (dated April 22, 2015) on the Energy East Pipeline Project — OEB Consultation and Review, Part Two, page 13 of 28

[58] Energy East Pipeline Ltd., Energy East Supplemental Report No. 1 — Project Update and Errata, A4G9T5, page 39

[59] A more complete look at all the views expressed during the consultation can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

> *TWENTY-TWO MINUTES IS NOT AN ACCEPTABLE SHUT DOWN TIME. THE SHUT DOWN PROCEDURE SHOULD USE PROGRAMMABLE LOGIC FAIL SAFE [CIRCUITS] SO THAT THE PIPE CAN SHUT DOWN IN A FEW MINUTES, NOT TWENTY–TWO MINUTES.*
>
> [NORTH BAY PARTICIPANT]

Other participants said they were confident in the pipeline's integrity because Canadian pipelines operate with a 99.5% reliability record. They were impressed with the pipeline's engineering standards and said that a well-maintained and professionally serviced pipeline can be safely operated for an indefinite period of time.

> *…TRANSCANADA PIPELINES HAS ALWAYS DISPLAYED A VERY CONSCIENTIOUS AND SAFE LEVEL OF MAINTENANCE ON THEIR INFRASTRUCTURE THAT PASSES THROUGH OUR COMMUNITY, [AND] WE ARE CONFIDENT THAT THIS SAME LEVEL OF ATTENTION WILL CONTINUE BOTH WITH THE DESIGN AND ONGOING MAINTENANCE OF THEIR PROPOSED ENERGY EAST PIPELINE.*
>
> [TOWNSHIP OF COLEMAN]

> *TRANSCANADA HAS DEMONSTRATED THEIR COMMITMENT TO PIPELINE SAFETY FOR COMMUNITIES, RESIDENTS, AND EMPLOYEES THROUGH SAFETY AND PREVENTATIVE MAINTENANCE PROGRAMS.*
>
> [TOWNSHIP OF MCGARRY]

Participants at the community meetings in Kapuskasing, Timmins, North Bay and Ottawa felt they needed more information to determine whether the project met "the highest available technical standards" as outlined in the letter from the Minister of Energy. They

were concerned that TransCanada is not planning for enough shut-off valves, given the number of rivers the pipeline will be crossing. Some also questioned the reliability of the leak detection system, especially for the detection of slow leaks, and wondered whether CSA Z662 itself was the highest available technical standard.

> *...IT IS IMPOSSIBLE TO SAY WHETHER OR NOT THE PROJECT APPLICATION MEETS THE STANDARDS SET OUT IN THE MINISTER'S LETTER. WE STRONGLY SUPPORT THE SEVEN RECOMMENDATIONS (#4–#10) SET OUT BY DNV GL THAT, IF FOLLOWED, WOULD HELP UNDERSTAND WHETHER OR NOT THE PROPOSED PROJECT MEETS THESE PRINCIPLES. WITH RESPECT TO RESPONSE CAPABILITY, WE NOTE OUR ONGOING CONCERN THAT ANY SPILL, AND ESPECIALLY A LARGE SPILL, INTO A TRIBUTARY OF THE OTTAWA RIVER OR THE OTTAWA RIVER ITSELF WILL NOT BE EFFECTIVELY MANAGED.*
>
> [OTTAWA RIVERKEEPER]

The lack of Emergency Response Plans was a concern at the meetings in Kenora, Kapuskasing, North Bay, Ottawa and Cornwall. Participants felt that TransCanada needed to consult with local communities about the location of emergency equipment, the amount of time it would take the teams to respond to a leak, and the type of oil that was being transported.

> *THE EMERGENCY RESPONSE PLANS NEED TO BE COMPLETED AND MADE AVAILABLE BEFORE ANY APPROVAL IS GRANTED. THESE PLANS NEED TO EXPLAIN HOW RISK WILL BE MITIGATED.*
> [NORTH BAY PARTICIPANT]

There was a widely shared belief that diluted bitumen is more corrosive than ordinary crude oil, and therefore poses an increased risk to pipeline safety. Others felt that the OEB's technical advisor needed to look beyond the commitments made in TransCanada's application and assess TransCanada's actual performance in operating pipelines.

> *WHILE THE DNV GL ASSESSMENT OF PIPELINE SAFETY BRINGS FORWARD SOME CRITICAL INFORMATION FOR THE OEB AND PROVINCE OF ONTARIO TO CONSIDER, IT FAILS TO MAKE ANY ASSESSMENTS BEYOND WHAT TRANSCANADA HAS PROPOSED IN ITS ENERGY EAST PROJECT APPLICATION. EVALUATING THE IMPACTS ON PIPELINE SAFETY AND THE NATURAL ENVIRONMENT MUST EXTEND BEYOND TRANSCANADA'S APPLICATION TO INCLUDE A REVIEW OF TRANSCANADA'S PIPELINE SAFETY TRACK RECORD.*
> [COUNCIL OF CANADIANS]

4.2.3 WORK OF TECHNICAL ADVISOR

The OEB retained an independent consultant, DNV GL to provide expert advice on whether the Energy East Pipeline met the principles in the Minister's letter and had the "highest available technical standards for public safety and environmental protection" and "world leading contingency planning and emergency response." In its report, DNV GL said it could

not determine whether Energy East met these principles because TransCanada had yet to file all the necessary information.

DNV GL used a risk-based approach to assess pipeline safety. In order to do this, DNV GL looked at two areas of TransCanada's application that provide details of what TransCanada is specifically planning to do:

- to minimize the likelihood of a pipeline failure; and
- to mitigate the consequences of a failure.

Minimizing the Likelihood of a Pipeline Failure

The first area to assess in pipeline safety is how will TransCanada prevent a pipeline failure from occurring: How would the mechanical properties of the pipeline, the manufacturing process and coating system, and the in-line inspection of the pipeline reduce the risk of a leak or spill?

Overall, DNV GL found that the existing natural gas pipeline has a higher resistance to fracture, cracking or mechanical damage than a new oil pipeline because it was built to carry natural gas under higher pressure.

However, DNV GL had concerns about four sections of the pipeline near the communities of Ignace, Martin, Nipigon and Jellicoe that together cover a total of about 100 km. A hydrostatic test in 2000 found stress corrosion cracking in the section east of Jellicoe. These four sections are coated with polyethylene tape, a practice that does not meet TransCanada's current standards for coating new pipelines. DNV indicated as well that polyethylene tape does not meet the highest available technical standard for coatings. This is because the tape can separate from the pipe, something that makes these sections more susceptible to corrosion and stress corrosion cracking.

DNV GL said the primary risk to the integrity of the converted pipeline is the potential for stress corrosion cracking in these four tape-coated sections. TransCanada has promised to check for stress corrosion cracking by performing an in-line inspection. However, DNV GL

pointed out that a recent study[60] has raised questions regarding the reliability of in-line inspection crack detection tools. In its submission to the OEB on April 22nd, TransCanada said it would use a second in-line inspection technique to corroborate the first set of tests[61].

DNV GL noted that concerns regarding the corrosive nature of diluted bitumen were raised numerous times at the community meetings. However, recently published reports[62] [63] have concluded that diluted bitumen does not have unique properties that make it more corrosive than other crude oils, and therefore it does not pose an increased risk for internal corrosion on pipelines. DNV GL's assessment was that the measures described in TransCanada's application for controlling internal corrosion on the pipeline are appropriate and will effectively manage this threat.

Mitigating the Consequences of a Pipeline Failure

A second area to assess in pipeline safety is what would happen after a failure occurs: how would the valve placement, the leak detection system and emergency response measures reduce any of the damage that could occur?

DNV GL believes that the location and type of valves are critical in limiting the amount of oil that would be released in the event of a rupture. TransCanada said valves would be installed to allow operators to isolate sections of the pipeline, but it did not specify the maximum amount of oil that could escape from these valves. Valves would be placed on either side of significant water crossings to stop the flow of oil and/or limit the amount that is discharged. At this time TransCanada has not identified which water crossings it considers to be "significant."

DNV GL also assessed TransCanada's leak detection system (i.e. the time it takes to shut down the pipeline system after a failure). DNV GL observed that TransCanada does not specify whether the leak detection system would conform to CSA Z662 Annex E *"Recommended Practice for Liquid Hydrocarbon Pipeline System Leak Detection."* Annex E

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[60] Pg. 11, *Assessment of Impacts on Pipeline Safety*, DNV GL

[61] Pg. 12, *Final Submission to OEB Consultation and Review,* Energy East Pipeline Ltd, April 2015

[62] Transportation Research Board. "TRB Special Report 311: Effects of Diluted Bitumen on Crude Oil Transmission Pipelines." 2013. Accessed March 2015. http://onlinepubs.trb.org/onlinepubs/sr/sr311.pdf

[63] Crosby, R. Fay, C. Groark, A. Kani, J. R. Smith, T. Sullivan, and R. Pavia. "Transporting Alberta Oil Sands Products: Defining the Issues and Assessing the Risks." September 2013. NOAA Technical Memorandum NOS OR&R 44

is voluntary for federally regulated pipelines in Canada, but it is required for provincially regulated pipelines in Alberta and Saskatchewan.

DNV GL noted that regulations and standards do not specify a time limit for analyzing and responding to an alarm. Alarm management has been a long-standing issue for the pipeline industry. The improper analysis of and response to alarms has been a contributing factor in numerous pipeline accidents. The 10-minute rule is intended to remove any discretion on the part of the control center operator and ensure a timely shut down of the pipeline system when an alarm cannot be conclusively explained as a non-leak.

DNV GL indicated that TransCanada has adopted the Incident Command System as part of its Emergency Management Program to enable effective and efficient response to an emergency. The Incident Command System is widely used by both industry and government and is consistent with world leading contingency planning and emergency response programs.

4.2.4 OEB'S ADVICE TO MINISTER

Pipeline safety (which includes emergency response) is the primary way to resolve people's concerns about the impact an oil spill could have on their lakes and rivers. In its decision on the proposed Northern Gateway pipeline, the NEB required Enbridge to meet or exceed the leak detection provisions of Annex E of CSA Z662.

In its written submission to the OEB, TransCanada said it would comply with current industry standards in Canada and the U.S., and would meet the requirements of Annex E of CSA Z662[64]. The OEB believes TransCanada needs to go further and exceed the leak detection provisions of Annex E. As discussed previously, the effects of an oil spill on Ontario's wildlife and water would be far more profound than the impacts associated from a natural gas pipeline failure.

Furthermore, we believe that TransCanada's pipeline safety record should be examined in the NEB hearing, including any changes to practices and procedures that were implemented following a failure.

[64] TransCanada's Submission (dated April 22, 2015) on the Energy East Pipeline Project — OEB Consultation and Review, Part Two, page 13 of 28

The OEB also offers the following additional advice:

Minimize the Likelihood of a Pipeline Failure

The primary integrity-related issue for Energy East in Ontario is the potential for stress corrosion cracking on the four tape-coated sections on Line 100-3. As a result:

- TransCanada needs to demonstrate the reliability of the in-line inspection tools that will be used to detect cracks on the four tape-coated sections of Energy East; and
- TransCanada should hydrostatically test section MLV 58-59 to determine the integrity of that section, and the reliability of its in-line inspection.

TransCanada should do an engineering assessment on the risk of damage to the converted section were a failure to occur in an adjacent gas pipeline. In particular, the assessment should focus on where the gas pipelines cross or are in close proximity to the converted pipeline carrying oil. Where the risk is considered unacceptable, mitigation measures should be put in place.

Mitigate the Consequences of a Pipeline Failure

In the absence of specific details regarding valve placement, leak detection and emergency response plans, it is not possible to assess whether Energy East satisfies the principles set out in the Minister's letter. In order to satisfy the principles:

- TransCanada needs to demonstrate that, in the event of a spill, the amount of oil that could be released is as low as reasonably practicable;
- TransCanada should provide more details of its Valve Siting Optimization Process, including whether a particular valve configuration effectively mitigates risk;
- TransCanada should use the latest generation of leak detection systems and these systems should exceed the provisions of Annex E of CSA Z662;
- TransCanada should work with First Nation, Métis and local communities to provide first responders with the information they need about the trajectory of spills at specific sites, along with the type of oil carried by the pipeline. It should also perform response capability assessments, including emergency drills, to demonstrate that it will be able to respond effectively and minimize the damage from spills; and
- TransCanada must demonstrate its financial ability (and associated guarantees) to cover the response, clean up and remediation costs in event of a spill, knowing that these costs could easily surpass $1 billion.

5 IMPACTS ON LOCAL COMMUNITIES AND ABORIGINAL COMMUNITIES

5.1 IMPACTS ON LOCAL COMMUNITIES

A significant number of communities are close to the route of the proposed Energy East Pipeline, including Kenora, Kapuskasing, North Bay, Ottawa (Stittsville) and Cornwall. The residents of these cities and towns felt that they would be most affected by a pipeline failure. In the City of North Bay for instance, there was widespread concern that a spill would harm Trout Lake, the source of the city's drinking water.

The concerns though were not limited to the areas closest to the pipeline. Communities that were dozens, if not hundreds, of kilometres away from Energy East believed that they could be affected by an oil spill because it would spread through their watershed into their local rivers and streams.

The views of participants at the community meetings generally fell into 10 key themes:

- an appreciation for the OEB's process but a feeling there was not enough information in TransCanada's application;
- a belief that just reviewing TransCanada's application was not enough;
- a deep apprehension of the risks of Energy East for Ontario;
- a conviction there was no acceptable level of risk to water;
- a belief that pipeline safety needs to be significantly strengthened;
- continued concern about climate change and an interest in green economy investments;
- a range of views on economic benefits;
- fears of natural gas price increases;
- worries about impacts on Aboriginal communities; and
- an unhappiness with the hearing process of the NEB.

A more detailed review is provided in Swerhun Facilitation's, *"Ontario Energy Board Energy East Consultation and Review Part Two Summary,"* which can be found on our website.

5.1.1 THE VIEWS EXPRESSED[65]

The concerns outlined here are more fully addressed in other sections of this report. As was noted previously, pipeline safety was a significant concern in local communities. Their concern focused on spills and the threat they pose to local lakes and rivers. However, participants at the community meetings also cited the local economic benefits promised by TransCanada as one of the reasons to support the Project.

The concerns about water focused on four specific sources of water: Trout Lake, which supplies the drinking water for North Bay; the St. Lawrence River, which does the same for Akwesasne; and the Oxford-Marsh Aquifer, which supplies wells in North Grenville, outside Ottawa. Participants were also concerned about the damage a leak could cause to the Rideau River, one of Canada's Heritage Rivers.

Participants at the community meeting in North Bay felt the spill analysis done by TransCanada was inadequate. They said it only identified two creeks flowing into Trout Lake; had incorrectly mapped the flow of water in the lake; and underestimated the time a spill could reach Trout Lake. Participants asked for the pipeline to be rerouted.

The concerns about pipeline safety did not end there. Many participants in the community meetings looked beyond the OEB consultation and NEB hearing, and expressed a desire for an ongoing relationship with TransCanada. They wanted to ensure community concerns were addressed, and that they had the information they needed to be confident that the pipeline was not a threat to their environment and their communities.

Participants wanted to be engaged and consulted on the ongoing operation of the pipeline. They felt that information on testing, monitoring and ongoing operations of Energy East, as well as the Emergency Response Plans, should be publicly available. Participants suggested that TransCanada should disclose all incidents on the pipeline, large and small, and communicate regularly with the local communities and first responders. Further, a number of participants proposed that a third-party should be hired to independently investigate the impacts of the Project, and make its findings public.

[65] A more complete look at all the views expressed during the consultation can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

There was a wide range of views at the community meetings on the economic benefits that local communities could expect from Energy East. Some felt that the jobs that would come from the construction, operation and maintenance of the pipeline would have a significant economic benefit. Local municipal representatives stated that the Project would also generate an important increase to their tax base. Others felt the economic benefits for Ontario would be short term and would be outweighed by the potential risks.

There were a smaller number of participants who had more immediate economic concerns. They were the landowners whose properties are crossed by the pipeline. They were worried the value of their land would decrease now that it is host to an oil pipeline and said TransCanada had not responded to their concerns about the pipeline.

5.1.2 WORK OF TECHNICAL ADVISORS

The OEB's technical advisor on pipeline safety told the communities that the existing gas pipeline was more resistant to cracking and stress fractures than a new oil pipeline. DNV GL outlined concerns about the four sections of the existing pipeline that were wrapped with polyethylene tape, which falls short of being the highest available technical standard. DNV GL acknowledged as well that while TransCanada has committed to putting valves on either side of "significant waterways," it had provided no information on what the "significant waterways" would be.

The OEB's technical advisor on environmental impact could not say whether the Energy East application met the "highest available technical standards" because TransCanada has not yet filed all the necessary material. DNV GL said as well that TransCanada's assessment of the environmental impacts of an oil spill was limited and needed to be broadened. DNV GL also said that TransCanada needs to justify why a route chosen for a natural gas pipeline is appropriate for transporting crude oil.

Participants at First Nation, Métis and local community meetings all felt that there should be local economic benefits from the construction of Energy East. In its application, TransCanada said the peak years of employment would be the two years of construction and conversion, now estimated to be 2018 and 2019[66].

[66] On April 2, TransCanada announced a two-year delay in the Project

REGION	DEVELOPMENT AND CONSTRUCTION PEAK YEAR EMPLOYMENT	OPERATIONS ANNUAL EMPLOYMENT
Northern Ontario (conversion)	2,206	190
Eastern Ontario (new build)	735	10
Total in Ontario	2,941	200

FIGURE 8: DIRECT EMPLOYMENT ON THE ENERGY EAST PIPELINE IN ONTARIO

Source: The Mowat Energy Report

In its report *"A Review of the Economic Impact of Energy East on Ontario*[67]*,"* Mowat Energy found that local economic benefits would likely be small (as illustrated in Figure 8), especially in northern Ontario where the pipeline would be converted, not built. The vast majority of the local economic benefits would be short term and located in eastern Ontario, the area where the new pipeline will be built. Mowat Energy commented that there is also uncertainty about the longer term, operational jobs. TransCanada said that there will be 200 operational jobs, but did not say whether these will be new jobs or jobs transferred from the operation of the existing natural gas pipeline.

Mowat Energy also said that municipalities in northern Ontario are unlikely to see significant increases in tax revenue as a result of Energy East. It is estimated that a new pump station would bring in an additional $125,000 in property taxes for a local municipality. That would amount, for example, to a 1% increase in property tax revenue for the City of Dryden[68].

The new pipeline to be built in eastern Ontario is expected to provide a proportionately bigger increase in property taxes for the five municipalities it goes through. Mowat Energy estimated that, if the additional tax revenue is shared equally among the five communities, they could each expect to see an additional $2.1 million per year in property taxes. This would amount to about a 3% increase in their property tax revenue.

[67] *A Review of the Economic Impact of Energy East on Ontario*, Mowat Energy, Feb. 2015

[68] Pg. 43, *A Review of the Economic Impact of Energy East on Ontario*, Mowat Energy, Feb. 2015

5.1.3 OEB'S ADVICE TO MINISTER

While participants in the Energy East consultation were generally grateful to be asked their views of Energy East, and to see their views incorporated into the OEB's work, their desire for engagement did not end there. Members of local, First Nation and Métis communities overwhelmingly expressed the need for continued involvement in the development and operation of the pipeline.

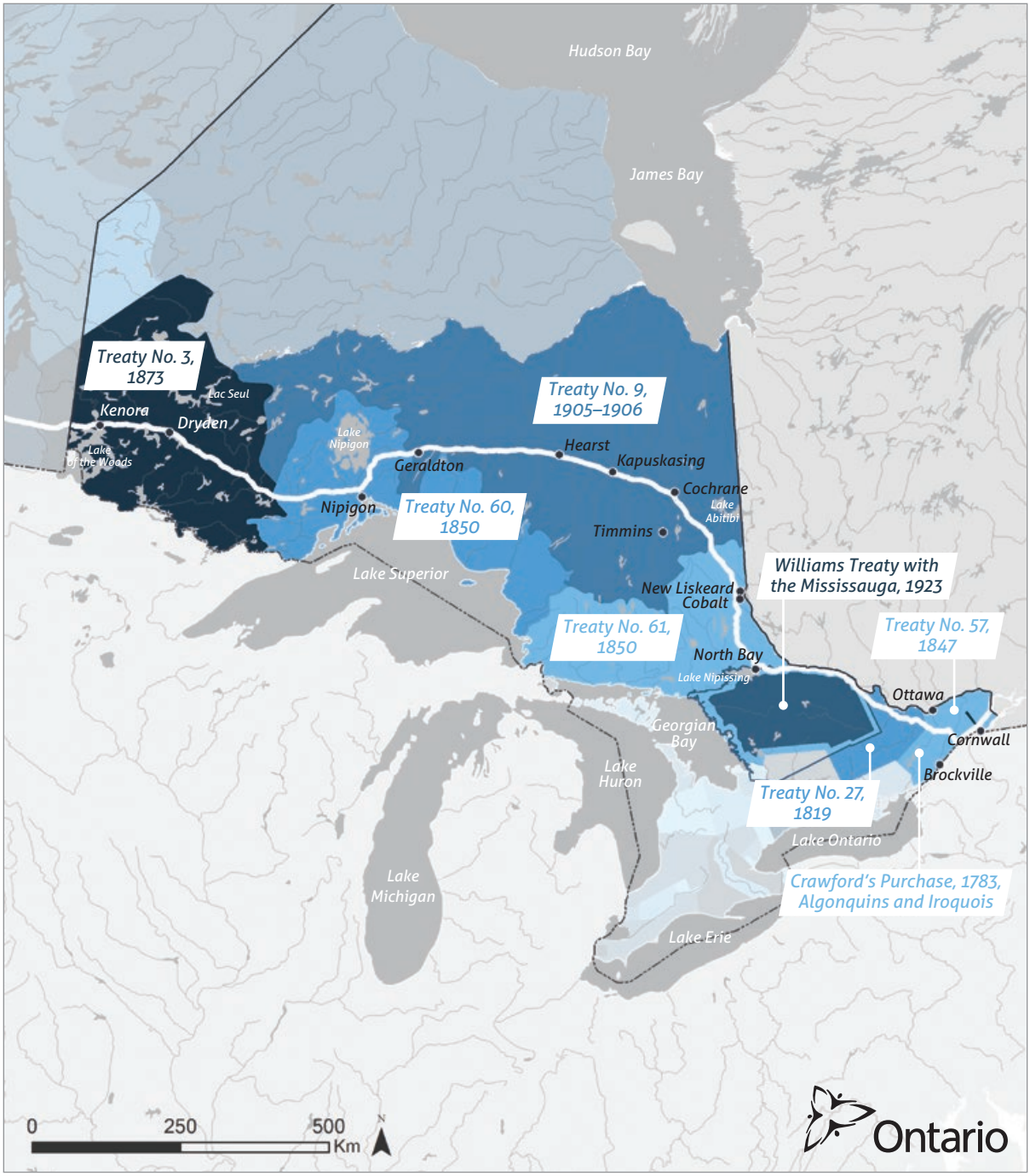
The OEB believes that TransCanada must ensure community engagement in the definition of "significant water crossings" and any possible rerouting around Highly Sensitive Receptors.

As well, TransCanada should continue its community engagement efforts in the ongoing monitoring of the Project. This approach to community engagement would simply reflect the life-cycle approach used for other aspects of the pipeline's operations. TransCanada should be accountable to the local communities for its monitoring and emergency response measures.

5.2 IMPACTS ON ABORIGINAL COMMUNITIES

Many of Ontario's First Nation and Métis communities have shown a keen interest in the Energy East project. As shown in Figure 9, the vast majority of the pipeline's route goes through their treaty territories, and in the case of the Algonquins of Ontario, through land that is subject to an agreement in principle to settle the Algonquins' land claim.

Due to their history, culture and their communities' connection to land and water, the concerns of the First Nations and Métis speak to the very heart of their identity. As a result, their engagement with Energy East was wide-ranging and philosophical. A number of their representatives said they bear responsibilities not just for their generation but for the next seven generations as well.



Map Sources
Treaty Boundaries: Ministry of Aboriginal Affairs
TransCanada: Proposed Energy East pipeline route
Statistics Canada and Natural Earth: Geospatial data

Disclaimer
Proposed pipeline route is approximate and subject to change. The treaty boundaries are for illustrative purposes only and are not Ontario's legal position.

FIGURE 9: PROPOSED ENERGY EAST PIPELINE AND FIRST NATION TREATY AREAS

The OEB engaged John Beaucage, Principal of Counsel Public Affairs and former Grand Council Chief of the Anishinabek Nation to lead the planning, facilitation and reporting of the First Nation and Métis Community Meetings.

Our facilitator reached out directly to all of the Aboriginal communities in the vicinity of the proposed Energy East route. Invitations were sent to approximately 60 representatives of First Nation and Métis communities to discuss what impacts the OEB should focus on in its report to the Minister of Energy. We travelled across the route of the pipeline twice to meet and hear the views of Aboriginal communities that would potentially be affected. Meetings were specifically held with First Nation communities in Kenora, Nipigon, Thunder Bay, North Bay, Timmins, Pembroke and Akwesasne. A separate meeting was held with the Métis Nation of Ontario. We also received and considered numerous written submissions.

The Duty to Consult

While the OEB's meetings and other outreach efforts represent a thorough engagement with Ontario's First Nations and Métis, they were not meant to serve as a "consultation" for the purposes of the duty to consult.

The duty to consult is a legal obligation owed to Aboriginal peoples by the Crown. The duty to consult arises "when the Crown has knowledge, real or constructive, of the potential existence of an aboriginal right or title and contemplates conduct that might adversely affect it[69]." The extent of the duty to consult varies depending on size of the adverse impacts and the scope of the claim. Although the duty to consult, and where appropriate accommodate, rests with the Crown, procedural elements of the duty can be delegated to third parties.

The Province of Ontario and the OEB are not the decision makers for the Energy East project; this authority rests with the NEB and the Federal Cabinet. As Energy East is not for Ontario or the OEB to approve or reject, Ontario and the OEB cannot discharge the duty to consult. For this reason, the OEB was clear throughout its meetings with Aboriginal communities that this engagement was not meant to satisfy the duty to consult. Although the OEB is not responsible for the duty to consult for the Energy East Project, we did hear

[69] Haida Nation v. British Columbia (Minister of Forest), 2004 S.C.C. 73, para. 35. The duty to consult has been further fleshed out in a number of subsequent cases as well.

a great deal about this issue in our engagement activities. The OEB recognizes that this is a very important issue.

The following is a summary of what we heard during our Aboriginal engagement efforts. A more detailed review is provided in the *"Summary Report: Part Two of the First Nation and Métis Community Discussions re: TransCanada's Proposed Energy East Pipeline*[70]*,"* prepared by John Beaucage, Principal Counsel Public Affairs, which can be found on our website.

5.2.1 THE VIEWS EXPRESSED[71]

The OEB's extensive engagement revealed there is widespread opposition to Energy East from the province's First Nations and Métis. Many participants expressed grave concerns about the potential environmental impacts of the project, in particular the effect of an oil spill in water. Many said that they are being asked to bear all of the risks, and getting none of the benefits. They also felt they do not have enough information to understand all of the potential ramifications of the Project.

In every one of the meetings, representatives expressed an unwavering commitment to protecting the land and water; resources they feel were entrusted to them by the "Creator." This is especially true of water, which they describe as the "lifeblood of Mother Earth" and something that must be protected at all costs.

> *"WOULD YOU PUT SOMETHING IN YOUR MOTHER'S BLOOD THAT WOULD POISON HER, YOUR MOTHER WOULDN'T BE ABLE TO HOLD YOU THEN.*
>
> **[NIPIGON FIRST NATION PARTICIPANT]**

While there is a variety of opinions and interests among First Nation and Métis communities, they all share a profound unease at the prospect of putting the natural environment at risk. They said it was impossible to overstate the importance of their ability to drink and fish the waters, and use them for recreational purposes and for sustaining plants and animals.

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[70] http://www.ontarioenergyboard.ca/html/oebenergyeast/documents/parttwo/SummaryReports/Summary_Report_Part_Two_FNM.pdf

[71] A more complete look at all the views expressed during the consultation can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

Participants said the incompleteness and significant omissions in TransCanada's application did little to allay their fears. Participants noted that the application did not define what it considers a "significant waterway," a classification that would require additional shut-off valves. Some felt that "significant waterways" should be determined jointly with local communities or by someone else other than TransCanada.

> *"THE ENVIRONMENTAL IMPACT ON OUR HOMELANDS AS A RESULT OF THIS PROJECT WILL NOT BE GOOD…MANY STILL PRACTICE THEIR TRADITIONAL WAY OF LIFE AND HAVE ALREADY WITNESSED DISEASE THROUGH THE WATER AND WILDLIFE THEY RELIED ON FOR SURVIVAL AND TRADITIONAL WAYS OF LIFE.*
> [TIMMINS FIRST NATION PARTICIPANT]

In Timmins, local First Nation representatives pointed out there are 20 main rivers that flow through their watersheds. The Algonquins of Ontario said there are 23 watercourses and tributaries that could be threatened by a spill in their traditional territory.

First Nations and Métis were especially troubled by the perceived threat to their way of life because they did not see a lot of economic benefit coming from Energy East. They felt the benefits were skewed in favour of TransCanada, while they were bearing disproportionate risks.

> *"WHEN THE PIPELINES WERE BUILT, WE WERE PROMISED A LOT AND WHEN THE TREATY WAS REGISTERED SO MUCH WAS COMMITTED TO US, BUT WE GOT NOTHING.*
> [NORTH BAY FIRST NATION PARTICIPANT]

Some communities, whose territories are crossed by the pipeline, indicated they were seeking revenue sharing agreements with TransCanada. One participant in Nipigon estimated that

$16 million worth of oil would be passing through his community every day, and that his community and many others were interested in getting a percentage of that revenue.

First Nation and Métis communities also felt their treaty and constitutional rights were not being respected by either TransCanada or the Federal Government. They felt there is not just a duty to consult but also a "duty to accommodate."

> *"CONSULTATION IS EASY, BUT WHEN IT COMES DOWN TO ACCOMMODATION THERE IS OFTEN RESISTANCE.*
> [NORTH BAY FIRST NATION PARTICIPANT]

Many participants felt that the consultation efforts to date had been clearly inadequate. Others insisted that the NEB acknowledge Canada's support of the United Nations Declaration on the Rights of Indigenous People, which says First Nations have the right of free, prior and informed consent before anything is done affecting their treaty or Aboriginal rights.

The Long Lake First Nation filed a comprehensive written submission that described their concerns with the proposed Project. Their submission highlighted a lack of information in TransCanada's filing about potential environmental impacts and spill response preparedness. The Long Lake First Nation also expressed deep concern over what it views as a lack of appropriate consultation.

The Algonquins of Ontario were concerned that the Federal Government is leaving the duty to consult with the NEB. They said this falls short of the Federal Government's obligations, as the NEB has the authority to recommend that the Project be approved and has placed limits on the number of interveners who can participate in its hearing process. Many participants felt misled by the process to date, and were sceptical that things would improve. Specifically, they felt that neither the Crown, nor the NEB, nor TransCanada had demonstrated due regard for their treaty rights. The Algonquins of Ontario would like to discuss a possible coordination of efforts on some issues with the Government of Ontario before the NEB hearing.

The Algonquins of Ontario have been involved in a lengthy negotiation with the governments of Canada and Ontario with respect to their long standing land claims in north eastern Ontario. In June 2015, the parties reached an agreement in principle to settle the Algonquins' land claim. This is an important development that should continue to be monitored.

There were also concerns about what was described as TransCanada's inadequate use of Traditional Ecological Knowledge (TEK) studies. These are supposed to be incorporated into TransCanada's application to the NEB, but many representatives said they were not being given enough money or time to complete them. They stated that TEK studies require observation of the natural environment over a "thirteen moon" cycle, with the involvement of elders and other community leaders.

First Nation and Métis peoples also insisted that TransCanada preserve and return any archaeological artifacts that are discovered during the work on Energy East. These are important for future discussions with governments, as they offer evidence of how long Aboriginal peoples have been living on the land in question.

The First Nation peoples in Akwesasne also requested that the new pipeline to be built along the St. Lawrence River be moved away from the river, because it is the source of their drinking water. They said that the route should instead be built next to the CP rail line, some 13 to 17 km inland from the St. Lawrence River.

5.2.2 OEB'S ADVICE TO MINISTER

The OEB took away several important insights from its engagement with Ontario's First Nation and Métis communities. The most prominent among these were the need to ensure the protection of the natural environment (and in particular water), and the need for TransCanada and/or the Crown to consult more on treaty and Aboriginal rights with respect to the Project. Several communities expressed their desire for direct and long-term economic benefits, if the Project goes forward. A complete summary of all the recommendations received by the OEB can be found in Counsel Public Affairs' *Summary Report: Part Two if the First Nation and Métis Community Discussions re: TransCanada's Proposed Energy East Pipeline,* which can be found on our website.

We recognize that the preservation of the natural environment, and in particular water resources, is of critical importance to Ontario's Aboriginal communities. The Province of Ontario should take all necessary steps in the hearing before the NEB to ensure that the Project, if approved, meets the highest available technical standards for public safety and environmental protection (see further discussion in section 4).

Ontario's Aboriginal communities are also justifiably interested in ensuring that Aboriginal and treaty rights are preserved. The duty to consult is of primary importance to virtually every First Nation and Métis community we spoke with. We therefore recommend that the Province of Ontario encourage the NEB to insist that all Aboriginal and treaty rights, and the duty to consult, are respected.

The OEB also believes that TransCanada should be encouraged to engage the province's First Nation and Métis peoples to ensure they benefit from the economic opportunities associated with the Project. This would balance the risks that they, and indeed all Ontarians, are being asked to bear.

6 SHORT- AND LONG-TERM ECONOMIC IMPACTS

ECONOMIC BENEFITS ARE AN IMPORTANT PART OF ANY LARGE INFRASTRUCTURE PROJECT. FOR ENERGY EAST, THEY CAN HELP BALANCE THE RISKS THAT HAVE BEEN IDENTIFIED EARLIER IN THE REPORT.

While Ontario expects short- and long-term economic benefits from the Project, it will not see benefits comparable to some of the other provinces involved. As with all pipelines, the benefits will largely accrue to the region producing the goods going into the pipeline and the region taking the goods out of it.

6.1 TRANSCANADA'S APPLICATION

TransCanada conducted two studies on the economic and fiscal benefits associated with the Project. The first study was prepared by Deloitte & Touche LLP[72] (Deloitte) and was posted on TransCanada's Energy East website. The Conference Board of Canada[73] (Conference Board) prepared the second study, which was filed by TransCanada as part of its Energy East application. The Canadian Energy Research Institute (CERI) conducted its own independent analysis[74] in May 2014.

The Conference Board estimated the impact of Energy East on the gross domestic product (GDP), tax revenue and jobs, both across Canada and by province. It said the economic impact of the Energy East would occur in two phases. The first is the development phase,

[72] *Energy East, The Economic Benefits of TransCanada's Canadian Mainline Conversion Project,* Deloitte & Touche LLP, September 2013

[73] *Energy East Pipeline Project: Understanding the Economic Benefits for Canada and its Regions,* Conference Board of Canada, October 2014

[74] *An Economic Analysis of TransCanada's Energy East Pipeline Project,* Canadian Energy Research Institute, 2014.

which occurs when Energy East is planned, converted, built, and equipment is purchased and installed. The second phase is the operational period and includes the annual expenditures on labour, facilities, maintenance, and other costs during the lifetime of the Project.

The Conference Board estimated three different types of economic impact, for each of the two phases of the proposed Project. It said there would be:

- direct benefits: Energy East's immediate spending and employment. This would include employees working directly for TransCanada;
- indirect benefits: the spending and employment associated with the Project, such as the goods and services purchased by TransCanada to build or maintain the pipeline; and
- induced benefits: the spin-off spending by people employed in the development and operation of Energy East, including the money they spend in stores and restaurants.

The Conference Board used an input-output model to calculate the direct, indirect and induced economic benefits of Energy East. An input-output model measures the effect of "shocks" to the economy, and is a commonly used technique to assess the economic impact of large infrastructure projects. In this case, the "shock" is the money TransCanada spends to build, convert and operate the pipeline. The model then calculates the effect of that spending as it ripples through the entire economy.

Figure 10 outlines the economic and fiscal benefits estimated by the three studies. There are three primary reasons for their different outcomes:

- the Conference Board report included the economic impact of the Eastern Mainline Pipeline, a proposed new natural gas pipeline from Markham to Iroquois, Ontario. This pipeline project is associated with Energy East and its inclusion increases the total benefits flowing from Energy East;
- the three reports used different timeframes to estimate the Project's economic benefits. The Conference Board estimated a 20-year lifespan for Energy East, CERI used a 25-year lifespan, and Deloitte used 40 years. The longer the timeframe, the bigger the benefits; and
- the Deloitte report included a discount rate[75], while the other two do not. A higher discount rate reduces the projected economic benefits.

[75] A discount rate is used to estimate future costs and benefits in today's dollars. If higher discount rates are used, the projected future benefits would be significantly lower.

ONTARIO		CONFERENCE BOARD			DELOITTE			CERI
		Development and construction	Operations	Total	Development and construction	Operations	Total	Total
GDP (in $ billions)	Direct	$1.38	$10.46	$11.84	$0.92	$1.41	$2.33	$11.90
	Indirect	$1.32	$3.02	$4.35	$1.06	$6.74	$7.80	
	Induced	$1.21	$1.54	$2.74	$0.71	$2.19	$2.90	
	Total	$3.91	$15.02	$18.93	$2.69	$10.34	$13.03	
Tax revenue (in $ billions)		$3.20			$3.66			$2.21
FTEs	Direct	16,189	4,372	20,560	6,813	7,240	14,053	114,000
	Indirect	13,550	32,618	46,168	11,019	43,440	54,459	
	Induced	11,531	14,408	25,940	6,456	21,560	28,016	
	Total	41,270	51,398	92,668	24,288	72,240	96,528	

FIGURE 10: ESTIMATED ECONOMIC IMPACT OF ENERGY EAST ON GDP AND JOBS IN ONTARIO
Sources: Conference Board, Deloitte and CERI[76]

All three of these studies recognize the limitations of their modelling. According to Deloitte, "the output economic impacts of this study's input-output model runs should be considered directionally correct, rather than scientifically precise[77]."

6.2 THE VIEWS EXPRESSED[78]

A number of participants expressed support for Energy East because of the economic benefits it would provide. The jobs that would be created in converting the pipeline and building the pump stations were mentioned at the community meetings in Cornwall and Thunder Bay. Furthermore, municipal representatives in northern Ontario felt that the Project would also increase the tax base of the hosting municipalities. Jobs and tax revenues were especially important to communities that have seen the closing of local resource and manufacturing industries. One participant said plant and mill closures have, in some cases, caused a 20 to 30% drop in the municipalities' tax revenue.

[76] *Pg. 13, A Review of the Economic Impact of Energy East on Ontario, Mowat Energy, Feb. 2015*

[77] Pg. 22, *Energy East, The Economic Benefits of TransCanada's Canadian Mainline Conversion Project*, Deloitte & Touche LLP, September 2013

[78] A more complete look at all the views expressed during the consultation can be found on the OEB's Energy East Website: http://www.ontarioenergyboard.ca/html/oebenergyeast/resources.cfm#.VVNcDGBDmMM

> *OIL IS A FACT OF LIFE AND WE HAVE TO FIND A SAFER WAY TO MOVE IT. THE NEW JOBS CREATED THROUGH THE REBUILDING AND MAINTENANCE OF THE ENERGY EAST PIPELINE WILL BE A BIG PLUS FOR ONTARIO.*
> [THUNDER BAY PARTICIPANT]

Others believed the Project would stimulate broader economic benefits through a reduction in the cost of fuel and a reduction in Canada's dependency on foreign oil.

> *WE BELIEVE THAT THE ECONOMIC BENEFITS OF ENERGY EAST HAVE BEEN OVERSTATED AND EXAGGERATED.*
> [THUNDER BAY PARTICIPANT]

Many participants at the community meetings said the benefits would be mostly short term and that most of the local jobs would go to non-locals and vanish after the conversion and construction of the pipeline is finished. Other participants pointed out that this happens with all construction jobs.

> *EVERY CONSTRUCTION JOB, EVEN WHEN THE BOYS BUILT THE PYRAMIDS, IS A TEMPORARY JOB. ONCE THE PYRAMID'S DONE, YOU MOVE ON.*
> [CANADA'S BUILDING TRADES UNIONS]

Some participants questioned why more of the crude oil produced in western Canada is not refined in Canada, instead of exported abroad. They said jobs are being shipped overseas along with the crude oil.

A number of participants at the community meetings said that more jobs could be created if Canada invested in alternative energy projects instead of pipelines. One person said this would create seven times more jobs than the equivalent investment in fossil fuels.

A number of organizations submitted written comments on the expected economic benefits of Energy East. These organizations believed that Energy East would create manufacturing jobs in Ontario and bolster long-term economic growth in Ontario and across Canada.

6.3 WORK OF TECHNICAL ADVISOR

The OEB engaged Mowat Energy, the Energy Research Hub of the Mowat Centre (Mowat Energy), to review the existing studies and analyze any long-term economic risks and opportunities that might not be included. Mowat Energy concluded that the Conference Board likely overestimated Energy East's economic impact in Ontario. It said in the long term, the Project could be neutral or even negative when a broader analysis is conducted[79]. Its report[80] found that all three studies by CERI, Deloitte, and the Conference Board overemphasized the economic benefits anticipated to flow to Ontario and did not include any of the risks. "The results from the previous studies should be understood as suggested or plausible, rather than predictive[81]."

Many of the reasons for Mowat Energy's concerns come from the very nature of the input-output models that were used:

- input-output models do not take into account any potential negative impacts of the Project;
- because they do not take into account shortages of labour or resources, input-output models tend to overestimate the indirect and induced job creation and other benefits;
- the use of the most recent 2009 trade figures from Statistics Canada do not account for the manufacturing slowdown in Ontario in recent years; and
- increases in municipal property taxes are overstated, as most of the Project in Ontario will involve the conversion of an existing pipeline.

Mowat Energy outlined a number of additional long term policy risks that were not captured by the Conference Board report. These include the risk that increased oil exports will push up the value of the Canadian dollar, hurting the province's manufacturing sector. An increase in oil exports could also exacerbate Ontario's unequal treatment under the federal Equalization Program.

[79] Pg. 39, *A Review of the Economic Impact of Energy East on Ontario,* Mowat Energy, Feb. 2015

[80] *A Review of the Economic Impact of Energy East on Ontario,* Mowat Energy, Feb. 2015

[81] Pg. 38, *ibid*

6.4 WRITTEN SUBMISSIONS ON MOWAT ENERGY'S ANALYSIS

Three organizations, CERI, Conference Board, and Deloitte submitted written comments on the analysis done by Mowat Energy. These organizations had similar concerns. CERI, for instance, said that despite the well-known limitations of economic impact analysis highlighted by Mowat Energy, the results provide important information for decision makers on the economic impacts of projects[82]. Deloitte said that, while Mowat Energy has criticisms of the input-output model, it did not suggest an alternative model that would better estimate the economic impact of the Project[83].

The Conference Board said[84]:

- the status quo of the supply chain is as valid as any other assumption as to how supply chains would be organized in the future. Further, this assumption may understate the impacts rather than inflate them;
- the assumption regarding the availability of workers to undertake the Project is valid. Construction workers should be able to adjust to swings in activity caused by the Project, just as construction workers have in the past. It was noted that Ontario has the largest construction workforce in the country and that the peak employment for Energy East in Ontario would amount to just 1.3% of the province's construction jobs;
- using the 2009 version of Statistics Canada's input-output model will likely lead to the indirect economic impacts for Ontario being underestimated rather than overestimated; and
- it did use a discount rate in the economic impact calculations. It used the inflation rate so that the impacts are reported in 2013 dollars.

6.5 OEB'S ADVICE TO MINISTER

Even though almost half of Energy East runs through Ontario, the OEB believes the pipeline will result in only modest economic benefits for the province. As with all pipelines, the benefits will largely accrue to the region producing the goods going into the pipeline and the region taking the goods out of it.

[82] Canadian Energy Research Institute submission, April 24, 2015

[83] Deloitte submission, April 23, 2015

[84] Conference Board of Canada submission, April 13, 2015

We recognize that economic benefits that will occur in Ontario will likely materialize in the following areas:

- short term: construction jobs, apprenticeships and training; and
- long term: tax revenues, permanent jobs, a better trained local workforce.

This report has noted before that there is uncertainty with long-term forecasts and modelling, and that long-term economic impacts cannot be quantified with any certainty. Regardless, we believe there is an imbalance between the risks of the Project and the expected benefits for Ontarians.

The OEB therefore advises the Minister that, in light of the modest economic benefits from the pipeline's development and operation, the economic concerns over pipeline capacity and access to natural gas supplies assume increasing importance for Ontarians. In order to ensure that Ontario's gas consumers are not harmed by Energy East, Ontario must be assured there is sufficient pipeline capacity and access to natural gas to meet Ontario's medium- and long-term needs.

7 CONCLUSION

AFTER INPUT FROM ONTARIANS AND THE ADVICE OF OUR TECHNICAL ADVISORS, THE OEB HAS MADE A NUMBER OF OBSERVATIONS ABOUT ENERGY EAST AND ITS IMPLICATIONS FOR ONTARIO.

We have provided our advice in response to the Minister's request that we help inform Ontario's intervention in the NEB proceeding. The advice is based on TransCanada's application filed with the National Energy Board on October 30, 2014 and additional technical material filed on January 30, 2015.

The following summary contains the highlights of the OEB's advice to the government. A more complete discussion can be found at the end of the relevant sections of this report.

BALANCING RISKS AND BENEFITS FOR ONTARIANS

Even though almost half of Energy East runs through Ontario, the OEB believes the pipeline will result in only modest economic benefits for the province. As with all pipelines, the benefits will largely accrue to the region producing the goods going into the pipeline and the region taking the goods out of it. This leads to an imbalance between the economic and environmental risks of the Project, and the expected benefits for Ontarians. While there may be economic benefits, Energy East has costs and risks that Ontarians, and the province's natural gas consumers, do not currently have to bear. As a result, their concerns about access to natural gas, pipeline safety and the natural environment assume an increased importance.

The OEB's advice is set out below, and is intended to ensure a better balance between the risks and benefits for Ontarians.

IMPACTS ON ONTARIO NATURAL GAS CONSUMERS

Even with TransCanada's Eastern Mainline Pipeline, consumers are rightly concerned that the reduction in pipeline capacity in eastern Ontario would create a capacity shortfall. This shortfall would decrease their access to supply and increase their price of natural gas. While there may be economic benefits, Energy East has costs and risks that Ontario consumers currently do not have to bear.

A report commissioned by the OEB states that Energy East will likely increase the price of gas during the months of December, January and February in eastern Ontario by an average of 12% between 2016 and 2035.

The OEB therefore advises the Minister that:

- TransCanada should update its gas demand, supply and price forecasts to reflect current and projected market conditions and the delays that have been announced in the Project. TransCanada's calculation of the expected costs and benefits of the Project should also be updated to reflect these delays. This update should also include specific tolling impacts for Ontario customers. Ongoing market monitoring is essential;

- Ontario consumers need to be assured that enough pipeline capacity and natural gas supply will be available to meet Ontario's medium- and long-term needs, particularly in eastern Ontario. TransCanada needs to ensure that transportation capacity requirements are appropriately established; and
- Ontario natural gas consumers should not subsidize the Energy East oil pipeline. The tolls for Ontario shippers should match the costs of the services they purchase.

IMPACTS ON THE NATURAL ENVIRONMENT

Ontarians are worried about the possibility of an oil spill and the damage it could cause to their rivers, lakes and streams. The OEB believes that TransCanada needs to assess whether it is appropriate to take a route chosen for a natural gas pipeline and use it for the transportation of crude oil.

The OEB therefore advises the Minister that:

CONSIDER ALTERNATIVE ROUTES

- where the existing pipeline route may be too close to Highly Sensitive Receptors, TransCanada should reroute the pipeline or justify why rerouting is not necessary, listing the specific mitigation measures that will be used to protect the environmentally sensitive areas;
- TransCanada should study the alternative railway route, near the CP rail line, for the new pipeline that it proposes to build close to the St. Lawrence River. It should use the 10 criteria listed in its Environmental and Socio-Economic Assessment to evaluate the alternative railway route against the currently planned route using, as well as its proximity to the St. Lawrence River; and
- TransCanada should reroute the pipeline to follow the railway route or justify why rerouting is not necessary, including a listing of the specific mitigation measures that will be used to protect the Highly Sensitive Receptors.

ENSURE COMMUNITY INPUT

- TransCanada should work with local communities and Ontario's First Nations and Métis to develop a list of all the environmentally sensitive areas, also known as Highly Sensitive Receptors;
- TransCanada should overlay the Highly Sensitive Receptors with the comprehensive mapping of spill trajectories it has promised to develop for the entire length of the pipeline; and
- TransCanada should use the map of the spill trajectories near Highly Sensitive Receptors and consult with local communities and Ontario's First Nations and Métis on the designation of "significant water crossings." TransCanada should pay special attention to Nipigon Lake, Trout Lake, the Ottawa River, the Rideau River, the Oxford-Marsh Aquifer, the Nepean Aquifer, and other areas where there is elevated public concern.

IMPACTS ON CLIMATE CHANGE

Ontarians are concerned about Energy East's impact on upstream and downstream emissions of greenhouse gases, especially since the National Energy Board will only look at the emissions directly caused by the construction and operation of the pipeline. People at the community meetings said any assessment of Energy East would not be complete unless it studied the pipeline's full potential impact on climate change. That is why we added climate change to the impacts under review. While the issue of climate change is bigger than any one pipeline, or any one province, the discussion paper on climate change that the OEB commissioned is a valuable contribution that should be used as part of a broader discussion of the issue.

IMPACTS ON PIPELINE SAFETY

Participants at nearly all the Community meetings generally felt that the provisions to ensure the safety of the Energy East Pipeline needed to be strengthened. They understood that the effects of an oil spill on Ontario's wildlife and water would be far more profound than the impacts associated from a natural gas pipeline failure.

The OEB says the primary integrity-related issue for Energy East is the potential for stress corrosion cracking on four sections near the communities of Ignace, Martin, Nipigon and Jellicoe that are coated with polyethylene tape. It also notes that the natural gas pipeline planned for conversion generally has a higher resistance to cracking and fracture than a newly installed oil pipeline.

The OEB therefore advises the Minister that:

MINIMIZE THE LIKELIHOOD OF A PIPELINE FAILURE

- TransCanada needs to demonstrate the reliability of the in-line inspection tools that will be used to detect cracks on the four tape-coated sections of Energy East;
- TransCanada should hydrostatically test section MLV 58-59 to determine the integrity of that section, and the reliability of its in-line inspection; and
- TransCanada should do an engineering assessment on the risk of damage to the converted section were a failure to occur in an adjacent gas pipeline. In particular, the assessment should focus on where the gas pipelines cross or are in close proximity to the converted pipeline carrying oil. Where the risk is considered unacceptable, mitigation measures should be put in place.

MITIGATE THE CONSEQUENCES OF A PIPELINE FAILURE

- TransCanada needs to demonstrate that, in event of a spill, the amount of oil that could be released is as low as reasonably practicable;
- TransCanada should provide more details of its Valve Siting Optimization Process, including whether a particular valve configuration effectively mitigates risk;
- TransCanada should use the latest generation of leak detection systems and these systems should exceed the provisions of Annex E of CSA Z662;
- TransCanada should work with First Nation, Métis and local communities to provide first responders with the information they need about the trajectory of spills at specific sites, along with the type of oil carried by the pipeline. It should also perform response capability assessments, including emergency drills, to demonstrate that it will be able to respond effectively and minimize the damage from spills; and
- TransCanada must demonstrate its financial ability (and associated guarantees) to cover the response, clean up and remediation costs in event of a spill, knowing that these costs could easily surpass $1 billion.

IMPACTS ON LOCAL COMMUNITIES

Participants at the Community Meetings appreciated the OEB's consultation and review process. The process raised awareness and the desire for ongoing engagement with TransCanada on the operation of Energy East, in particular on pipeline safety and emergency response. The OEB believes community engagement needs to be long lasting and treated as an important part of the life-cycle approach of operating Energy East.

The OEB therefore advises the Minister that:

- TransCanada needs to ensure community engagement in the definition of "significant water crossings" and any possible rerouting around environmentally sensitive areas; and
- TransCanada should continue its community engagement effort in the ongoing monitoring of the Project. TransCanada should be accountable to the local communities for its monitoring and emergency response measures.

IMPACTS ON ABORIGINAL COMMUNITIES

There is widespread opposition to Energy East in Ontario's First Nation and Métis communities. They are concerned that an oil spill would contaminate their local lakes and rivers, a resource they consider to be "the lifeblood of Mother Earth." They also feel neither TransCanada nor the National Energy Board has respected their treaty or Aboriginal rights.

The OEB therefore advises the Minister that:

- The Province of Ontario should encourage the NEB to insist that all Aboriginal and treaty rights are respected at the Energy East hearing, as well as the duty to consult.

GLOSSARY OF TERMS

Bbl	barrel
Bpd	barrels per day
CAPP	Canadian Association of Petroleum Producers
Canadian Mainline	an existing natural gas transmission system in Canada, owned and operated by TransCanada, made up of several parallel natural gas pipelines that carry natural gas from the Alberta/Saskatchewan border east to Québec
Cathodic protection	as corrosion is an electrochemical process occurring at an anode, cathodic protection turns the entire pipeline into a cathode by applying a low voltage direct current to the entire structure, thereby eliminating corrosion
CEA Act 2012	Canadian Environmental Assessment Act, 2012
Check valve	a valve designed to permit flow in a single direction only; fluid flow in the desired direction opens the valve, while a backflow causes the valve to close automatically
CO_2	carbon dioxide, a greenhouse gas

Concentric	Concentric Energy Advisors
Concentric Report	Direct Evidence of John J. Reed, Concentric Energy Advisors, Inc., filed by TransCanada in September 20
Conference Board Report	*Energy East Pipeline Project: Understanding the Economic Report Benefits for Canada and its Regions,* Conference Board of Canada, September 2014
CSA	Canadian Standards Association
CSA Z662	a mandatory Canadian standard that regulates the design, construction, operation and maintenance of oil and gas pipelines
Design Day	refers to the daily gas demand that results in an area due to extreme cold weather conditions. Design day demand is usually determined from the actual demand on the coldest day over a given time interval, such as 20 or 30 years, and the expected growth in demand over time. Gas utilities typically plan their gas supply to meet a design day demand in the winter.
Diluted Bitumen	heavy crude oil from the Canadian oil sands; bitumen would not flow through a pipeline efficiently so it is mixed with dilutes such as natural gas condensate, naphtha or a mix of other light hydrocarbons
Discount Rate	a discount rate recognizes that a current amount of money will be worth less in the future, because of inflation and the cost of capital

Downstream Emissions	greenhouse gas emissions associated with the end use activities from the consumption of refined petroleum products
Duty to Consult	a legal requirement that the Crown must consult with First Nation and Métis peoples on projects that may affect their Aboriginal or treaty rights
Eastern Ontario Triangle (EOT)	the segment of TransCanada's Mainline system that runs east of North Bay and consists of pipelines that form a triangle connecting North Bay, Maple (near Toronto) and Iroquois, Ontario
Energy East Pipeline	a proposal to build a new oil pipeline and convert an existing natural gas pipeline to oil service; to carry crude oil from Hardisty, Alberta to Saint John, New Brunswick
Engineering Assessment (EA)	an assessment, using engineering principles, of variables that affect the fitness for service or integrity of a pipeline
EPP	an environmental protection plan
ERP	an emergency response plan
ESA	Environmental and Socio-Economic Assessment; an analysis of the environmental impacts of a project, and any adverse consequences
Fatigue	the weakening and eventual fracture (cracking) of a material through repeated or fluctuating stresses
FBE	a fusion bonded epoxy coating for pipelines that resists water and prevents corrosion

Firm Service Customer	a customer who has a transportation capacity contract giving it the right to receive natural gas on an uninterrupted basis for a fixed length of time
FTE	full time equivalent; one person working at a full-time job for one year
GDP	gross domestic product; a measurement of the goods and service produced by a country or smaller jurisdiction such as a province
GHG	greenhouse gas emissions; a compound capable of absorbing infrared radiation, trapping and holding heat in the atmosphere; greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming
Ha	hectare; a unit of area measurement that is equal to 10,000 square metres
HSR	Highly Sensitive Receptor; an environmentally sensitive area that can include commercially navigable waterways, populated areas or municipal water intakes
Hydrostatic testing	testing the safety of sections of a pipeline by filling the pipeline with water and increasing the pressure to a level above the maximum operating pressure of the pipeline
IHS Report	*Supply and Market Study for Energy East Project,* prepared by IHS Inc. September 2014
ILI	the in-line inspection of a pipeline using electronic instruments or tools that travel along the interior of the pipe

Issues List	a list of the issues that the NEB will examine in detail in a hearing
Joule	a measurement of the energy required to produce one watt of power for one second
Keystone XL	a pipeline proposed by TransCanada that would carry crude oil from Hardisty, Alberta to Steel City, Nebraska
km	kilometre
kt	kilotonne
kW	kilowatt
LDS	leak detection system
LNG	liquefied natural gas
Market Hub	a liquid, transparent market centre with many buyers and sellers
m^3	cubic metre
m^3/d	cubic metres per day
MMBtu	million British thermal units; British thermal units (BTUs) are a unit of energy, with one BTU being approximately equivalent to 1,055 joules
MMCFD	million cubic feet per day
MNO	Métis Nation of Ontario
MNR	Ontario's Ministry of Natural Resources

MECC	Ontario's Ministry of Environment and Climate Change
MW	megawatt; a unit of power equal to one million watts
NEB	National Energy Board
NPS	Nominal Pipe Size; diameter of pipeline based on inches
North Bay Shortcut	the segment of the TransCanada Mainline from North Bay, Ontario to west of Iroquois, Ontario
Northern Gateway	a proposed pipeline to carry crude oil from Alberta to Kitimat, British Columbia
Northern Ontario Line	the segment of TransCanada's Mainline that stretches from Manitoba-Ontario border (Geraldton, Ontario) to North Bay, Ontario
Notch toughness	as the notch toughness of a material increases, so does its resistance to the beginning and the spread of a fracture
Ontario East Segment	a new segment of Energy East to be built between Iroquois, Ontario and the Ontario-Québec border
OEB	the Ontario Energy Board
OPR	the Onshore Pipeline Regulations of the National Energy Board
Petajoule	a measurement of energy; one petajoule equals one quadrillion joules
Polyethylene tape coating	a flexible plastic tape or sheet that is applied on a pipeline to prevent corrosion; one side of the tape has a polymer adhesive

Prairies Line	the segment of TransCanada's Mainline that runs from Alberta to the Manitoba-Ontario border
Project	The proposed Energy East Pipeline
Québec Segment	a section of newly constructed pipeline proposed for Energy East that extends from the Ontario-Québec border to the Québec-New Brunswick border
Shipper	a large volume customer that contracts directly with TransCanada for pipeline capacity on the TransCanada Mainline system; large volume customers include Local Distribution Companies such as Enbridge Gas Distribution Inc., Union Gas Limited and Gaz Métro, industrial customers and electricity generators
Smart Pig	an internal or in-line inspection gauge that is run through pipelines to check for corrosion
Stress Corrosion Cracking	environmentally-assisted cracking produced by the action of corrosion and stress
Tcf	a trillion cubic feet of natural gas
TEK	the traditional ecological knowledge of First Nations and Métis
TDR	Technical Data Reports
TJ	terajoule; a measurement of energy; one trillion joules
TLRU	Traditional Land and Resource Use

Trans Mountain Pipeline	a proposal to expand an existing pipeline between Pipeline Edmonton and Vancouver British Columbia
TransCanada	TransCanada PipeLines Limited
Transfer Agreement	the agreement between TransCanada and Energy East to transfer natural gas assets from TransCanada Mainline to Energy East
Transfer price	the value of the sections of the TransCanada Mainline that will be transferred to Energy East
TSB	the federal Transportation Safety Board of Canada
Upstream Emissions	greenhouse gas emissions associated with the activities from the development of the oil sands
WCS	Western Canadian Select, a grade of crude oil
WCSB	Western Canada Sedimentary Basin
WTI	West Texas Intermediate, a grade of crude oil

APPENDIX A: TECHNICAL REPORTS AND SUMMARY REPORTS OF THE COMMUNITY DISCUSSIONS

As noted in the report, the OEB relied on the work of technical advisors, and its Community Discussions, respectively. Copies of these reports may be obtained from **OntarioEnergyBoard.ca**.

TECHNICAL REPORTS

"Energy East Oil Pipeline Potential Implications on Ontario Natural Gas Consumers" prepared by Elenchus Research Associates Inc.

"Impact of Energy East on Ontario Natural Gas Prices" prepared by ICF Consulting Canada

"Assessment of Impacts on the Natural Environment" prepared by DNV GL

"Discussion Paper: Greenhouse Gas Emissions Resulting from the Energy East Pipeline Project" prepared by Navius Research Inc.

"Assessment of Impacts on Pipeline Safety" prepared by DNV GL

"A Review of the Economic Impact of Energy East on Ontario" prepared by Mowat Energy, The Mowat Centre's Energy Research Hub

SUMMARY REPORTS

"Ontario Energy Board Energy East Consultation and Review Part Two Summary" prepared by Swerhun Facilitation

"Summary Report: Part Two of the First Nation and Métis Community Discussions re: TransCanada's Proposed Energy East Pipeline" prepared by John Beaucage, Principal Counsel Public Affairs