

1 DETAILED DESCRIPTION OF CONSTRUCTION COSTS
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3 On March 1, 2018, the OEB issued Procedural Order No. 2 in EB-2017-0182. In that
4 order, the OEB directed NextBridge, among other things, to submit additional evidence
5 on the reasonableness of construction costs. The additional evidence NextBridge is
6 filing on the reasonableness of construction costs includes: (1) a detailed explanation of
7 construction costs broken down in accordance with the categories set forth on
8 pages 2 and 3 of Attachment 1 to NextBridge's response to CCC Interrogatory #8 at
9 Exhibit I.B.NextBridge.CCC.8; and (2) a report completed by Charles River Associates
10 comparing NextBridge's construction costs to other similar transmission project
11 construction costs. While the following construction cost descriptions are detailed, they
12 are not exhaustive as it is not practical to describe all anticipated construction phase
13 activities in this evidence.

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15 Non-Engineering and Construction Costs

16 In Attachment 1 to NextBridge's response to CCC Interrogatory #8 at
17 Exhibit I.B.NextBridge.CCC.8, the construction cost budget has been split into
18 Engineering and Construction ("E&C") and Non-Engineering and Construction ("Non-
19 E&C") costs. The table below outlines the activities related to the non-Engineering and
20 Construction disciplines.

Non-Engineering and Construction Costs	
Environmental	<p>This cost category includes the Environmental Assessment (“EA”) (final EA comment and response period, field surveys associated with the EA, drafting and submitting an Amended EA, meetings with Regulators and stakeholders regarding the final and amended EA comments to help their reviews, and the amended EA comment and response period), Permit/approval acquisition, including from but not limited to the following Regulators: Department of Fisheries and Oceans; Transport Canada; Environment and Climate Change Canada; Indigenous and Northern Affairs Canada; Ministry of Natural Resources and Forestry; Ministry of Tourism, Culture and Sport; Infrastructure Ontario; Ministry of Environment and Climate Change; and Lakehead Region Conservation Authority (preliminary consultation, field surveys and assessments, drafting and submitting applications, further consultation), Construction Environmental Protection and Compensation Plan and Alignment Sheets (developing them as part of the EA and updating them prior to construction), Environmental training for field personnel for construction, Breeding Bird nest sweeps and Amphibian salvage prior to vegetation clearing, Fish salvage prior to in water works for water course crossings, and Environmental inspection during construction.</p> <p>The major services for external environmental consultants have been competitively sourced and the hourly rates of these services are consistent with NextBridge partner organization experience and expectations for these types of services, especially given the size, complexity, limited access and difficult terrain of this project.</p>
Land Rights	<p>This cost category includes activities to secure and maintain the necessary land rights for the Project. Such costs include completion of property owner and Crown interest holder acquisition; permitting activities including 3rd party crossing notification, negotiation and execution of agreements, submission of <i>Public Lands Act</i> applications, and other Provincial and Federal approvals; Land Title and legal document production and review, Project line list maintenance and updates, GIS, mapping and data support; appraisals, legal survey for plan registration; Expropriation support; in-field landowner related construction and post-construction site remediation activity coordination, and damage settlement; land</p>

Non-Engineering and Construction Costs	
	<p>compensation for requisite land rights including easement and incentive payments, Crown land payments, construction damage payments, and input towards and participation in the leave to construct process and Amended EA review process.</p> <p>The major services for external land consultant have been competitively sourced and the hourly rates of these services are consistent with NextBridge partner organization experience and expectations for these types of services.</p>
First Nation and Métis Participation	<p>First Nation and Métis economic participation costs include legal, project management and construction fees and labour costs to ensure that the commitments made during the negotiation of various agreements are carried out. For example, community liaison activities by community members providing general assistance and support in connection with the construction of the EWT Line Project. Negotiation costs with two First Nations (Pays Plat and Michipicoten) are included to account for legal fees and capacity funding to these communities to draft and conclude a Federal permit or designation to traverse reserve lands. Legal and program management costs to apply to the Aboriginal Loan Guarantee Program (“ALGP”) are included.</p>
First Nation and Métis Consultation	<p>This cost category includes engagement with and continued support to communities to facilitate the development, maintenance and participation in current environmental mitigation strategies for activities relating to, or in connection with, project permitting during the construction period. Advisory committee costs are included to enable NextBridge to meet with community members from the region to provide project updates and discuss potential issues that may arise during the construction period. Community investment funds are provided to support First Nation and Métis events and groups in the region. Costs also include support for First Nation and Métis training, employment and contracting to enable communities to maximize opportunities during the construction period.</p>
Other Consultation	<p>NextBridge has targeted larger engagement activities to coincide with major project milestones. Two rounds of open houses are planned, one at the commencement of construction and one at the conclusion of construction. Given that open houses provide the most transparent and open opportunity for stakeholders to engage with project staff, NextBridge considers that they are important for the success of the project and to satisfy stakeholder</p>

Non-Engineering and Construction Costs

expectations. The open house scheduled for the commencement of construction will provide information on what people can expect in their community as workers mobilize and construction activity begins. This contains an important safety element as well. While effective, not everybody will or can attend an open house, so NextBridge is also proposing a Construction Awareness Campaign to coincide with construction commencement. The campaign will consist of advertisements in local newspapers letting readers know what's happening, what they can do to stay safe in and around construction activity, and who to contact should they have concerns or perceive safety violations. A final round of open houses will take place at the end of construction to inform of operational activities and remediation work that may take place after the project is in service.

Also, NextBridge intends to expand Community Investment activity in the project area. Outreach with communities will identify key priorities for the communities in 2018 and 2019, and budgeted Community Investment money will be distributed along the ROW to help address those priorities.

In conjunction with open houses and attendance at Community Investment events, NextBridge will meet with municipal and other stakeholders in the communities to provide additional project and construction updates. These meetings will primarily be tied to activities that require attendance in the communities to reduce travel costs, however, additional meetings with municipal stakeholders may be scheduled should they be needed.

Engagement that is required by regulatory processes, including notifications and responding to inquiries and comments on regulatory filings, will continue. Other inexpensive but effective methods of stakeholder and municipal outreach will also continue, including project update letters, newsletters and regular updating of the project web site for access to timely information and project documentation.

Non-Engineering and Construction Costs	
Regulatory	<p>This cost category addresses predicted costs related to regulatory activities anticipated to be required in advance of the EWT Line Project being able to enter into service. A proceeding related to NextBridge’s Leave to Construct (“LTC”) application is currently underway and, if NextBridge’s proposal is approved by the Ontario Energy Board, will result in authorization for NextBridge to construct the EWT Line Project in July 2018. Additional anticipated regulatory activity for the period includes preparation of an application for rates for the EWT Line Project in 2019, with a hearing expected mid-2020 to achieve December 2020 in-service. Should land acquisition negotiations not be 100% successful, mediation and/or expropriation proceedings are anticipated to be required, as well as post-expropriation compensation proceedings should landowners disagree with proposed compensation amounts.</p> <p>External counsel services will be engaged to provide legal advice and support in relation to these matters. Limited external consultant services are also expected to be incurred in support of the rate application. Hearing costs and costs related to intervenor participation in each of the LTC, rate application and any mediation and/or expropriation and compensation proceedings are also included in this category.</p> <p>Ongoing regulatory support activities and limited expenses related to project development, environmental assessment processes and construction will also continue in this period.</p>
Project Management	<p>This cost category includes the overall project management activities including task/schedule management, internal/external reporting including Ontario Energy Board reports and requests, management communication and directives, overall cost management including team lead variance discussions, back office functions including accounting, financial reporting, accounts payable, vendor management/supply chain, cash management, tax, audit management, regulatory support, and financial modeling.</p>
Contingency – Non-E&C	<p>Estimating project costs involves risk and assumptions. In recognition of these risks, NextBridge examined the current project definition and calculated the contingency based on the non-Engineering & Construction tasks.</p>
Site Remediation -Non-E&C	<p>It is assumed there will be 2 years of post-construction requirements based on conditions of EA and permit approvals for site reclamation</p>

Non-Engineering and Construction Costs	
	work. This cost includes environmental inspectors (“EIs”) required to monitor the entire length of the right of way (“ROW”), including temporary work spaces, access roads, laydown and storage yards, construction camps, etc. The EIs will evaluate reclamation activities, watercourse crossings, surface water at permanent watercourse crossings and roadside drainage structures for function and condition and streamflow rates. Internal labour costs are included for two years to manage the environmental inspectors, obtain any licences/approvals required in relation to follow-up work and report on post construction monitoring and succession to the regulators as part of the Environmental Assessment and permit conditions. This category also includes budgeted costs to contribute to making the project neutral to the environment by mitigating footprint impacts.
Interest During Construction	This cost category represents the calculation of financing costs using prescribed rates and assumed cash flow. Please see NextBridge response to Board Staff Interrogatory # 14 at Exhibit I.B.NextBridge.STAFF.14 for a description of the methodology used.

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Engineering and Construction Costs

At page 3 of Attachment 1 to NextBridge’s response to CCC Interrogatory #8 at Exhibit I.B.NextBridge.CCC.8 the E&C budget is split into “Contractors Costs” and “NEER Costs” – where “NEER” is NextEra Energy Resources, LLC.

All of the pricing in the sub-categories under “Contractor Costs”, as individually described below, are the result of a competitive request for proposal process, final negotiations and an executed construction contract for NextBridge’s General Contractor – which was awarded to Valard as the lowest evaluated bidder in the process. Final negotiations in the General Contractor process included the shift of some pricing risk responsibilities from NextBridge to the General Contractor, which Valard has accepted given their knowledge of the region, vast experience on similar projects and ability to

1 use their means and methods to mitigate risks as they manifest during the construction
 2 period.

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4 Those costs described as “NEER Costs” are those that NextEra Energy Resources,
 5 LLC (the NextBridge partner organization that is managing the engineering and
 6 construction discipline) will be procuring, as opposed to the General Contractor.

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8 The competitive sourcing of construction services, with some risk sharing components
 9 negotiated in the final agreement, creates a reasonable basis of cost that is
 10 representative of the current market, and, therefore is priced in the best interests of the
 11 Ontario rate payers.

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Contractors Costs	
Structure Framing & Setting	Structure framing and setting costs include construction equipment (crane, flatbed trucks, fork lift) and labour cost for all the craft required to assemble and install the structures at every location. This also includes installation of all insulators, line arresters and hardware, attachment of guy wires from the structures to the guy anchors, and installation of bird diverters and signage on the structures.
Cassions / Foundations	This line item cost includes construction equipment, material and labour costs for the craft required to install all the tower and guy anchor foundations. This foundation work involves excavation, backfill, compaction, formwork, rebar, concrete pouring, embedment, and dewatering among others.
Conductor Installation	Conductor installation costs include equipment and labour costs. Conductor installation requires the use of construction equipment such as tensioners, pullers, pilot line winders, and stringing box plus the labour craft for the stringing of all conductors, fiber optics, overhead ground wire, and installation of hardware such as splices, dampers.
Insulators	This is the materials cost for all types of insulators and jumpers to be installed on the structures to hang the transmission line cables and avoid contact with the towers.

Contractors Costs	
Assemblies	This includes all the materials cost for assembly of all the hardware required to attach the insulators to the towers and install. This line item also includes all equipment, material and labour to install the grounding system at the base of structures.
Civil Work - Access	This category involves all civil work associated with upgrading, improving or building new roads, matting installation, waterbody crossings to facilitate the movement of construction equipment, construction material and personnel to and from the transmission line corridor to access every proposed tower location where towers are to be installed. It also includes the construction of roads to have access to worker camps and laydown or storage yards and pads to facilitate the operation of cranes for the installation of towers.
Civil Work - Clearing	Clearing activities are related to timber cutting, grubbing and stump removal, preparation, staking and cutting of any vegetation along the transmission line "right-of-way" or route where structures are to be installed.
Civil Work - Yards	Yards include all those areas that are to be used as laydown or storage facilities and worker camps. The terrain of these areas requires preparation (earth work, Leveling and grading) before it can take up the worker camp containers and towers and materials to be used in the project.
Civil Work - Traffic Control	Traffic control includes cost associated with signage and personnel used to coordinate and control the regular traffic of vehicles and the higher volume of construction vehicles traffic during project construction to avoid accidents on the construction roads and on the existing roads and highways that will be used by construction vehicles.
Survey	Prior to construction, the transmission line route needs to be surveyed. Surveying involves identifying items, objects or matters such as structure location, guy anchors location, and any buried or overhead utilities.
Construction Staff	Construction staff cost is made up of all contractor supervision and management staff services throughout the duration of the project.
Contractors Costs Other	These additional costs are associated with Labour, equipment and material for contractor mobilization/demobilization, testing and commissioning of the facilities, and contractor performance bonds.

NEER Costs	
Poles (Materials)	<p>These costs have been forecasted from experience and regular interactions with Tier 1 suppliers and are considered to be representative of the competitively sourced materials. NextBridge intends to run a competitive solicitation prior to finalizing the supply agreements for these structures. Budgeted amounts were based on the engineered weights of the structures as currently designed for this project, and vendors were contacted for current market prices on a \$/kg basis for the supply, fabrication and delivery of the structures. These measures are frequently used to support a more mature cost estimate and are relatively industry accepted as a diligent investigation to the costs.</p>
Conductor / OPGW / OHGW	<p>This cost category includes the supply of the electrical conductors ("cable"), the lightning shield wire and fiber optic communications cables. NEER procures a considerable amount of these types of cables every year for projects across all its affiliates through competitive solicitations. Given the high volume of procurement of these products, NEER gets some of the most favored pricing, terms and conditions for this supply in the industry. During the estimating process, the integrated supply chain team reached out to the typical suppliers in the market for current supply costs which were then incorporated into this cost category based on the engineered quantities. When the time is right to secure these products for this project, NextBridge will undertake a competitive solicitation to source these cables at the lowest evaluated costs.</p>
Engineering	<p>This cost category includes route surveying (LiDAR, ground surveys, topographical, as built), detailed engineering and design of the Transmission Line (alignment, structure spotting, plan & profiles, details), detailed lattice tower design/prototype fabrication and physical load testing of the 10 prototypes of lattice structures, conductor arrangement design, geotechnical investigation (desktop and fieldwork), foundation designs, weather studies, access survey and design, crossing designs (railroad, highways/roads, transmission lines, pipeline, pipeline mitigations), alternative/re-routing analysis, Independent Engineer peer review, Quality Assurance/Quality Control of material fabrications and engineering support during construction. Generally, these activities can vary in the level of effort needed due to the characteristics and needs of a specific transmission project and experience dictates that these costs can range from 2% to 5% of the total project costs. The major services included in this category of costs have been competitively</p>

NEER Costs	
	sourced and the hourly rates of these professional services are very consistent with NEER experience from other projects and given the complexity, limited access and difficult terrain of this project.
Internal Labor	This cost category includes NextBridge's internal costs for activity related to engineering management, internal subject matter expert services, support during construction, travel & expenses, legal support for procurement agreements and contract administration, construction management, administrative and project controls support, home office management, testing and commissioning. Most of these costs are typically estimated on a percentage basis, but given the complexity/size of this project and other costs drivers not expected to impact the staffing allowances, a reduction of the typical percentages were applied to effectively lower this allowance when compared to typical projects.
Other Non-Labor	This cost category includes miscellaneous Owner costs in support of the staffing and project construction such as: vehicles for field personnel, field office trailers, onsite facilities and infrastructure (sanitary, trash, and power), storage, safety equipment, site security and communication equipment. Most of these costs are typically estimated on a percentage basis, but given the complexity/size of this project and other costs drivers not expected to impact the staffing allowances, a reduction of the typical percentages were applied to effectively lower this allowance when compared to typical projects.
Escalation	The escalation rate used is approximately 2.8% of the total project construction costs. In NextBridge's experience, this is well within the industry averages of 3%.
Contingency	Estimating project costs involves risk and assumptions. In recognition of these risks, NextBridge examined the current project definition and, based on NextBridge partner organization experience from previous projects, calculated the contingency. This contingency cost represents approximately 6.7% of the total project construction costs. This is lower than the rate used at the designation filing (9%) and within the range of NextBridge partner organization project experience of 5-10% for a linear project of this magnitude and complexity. NextBridge's due diligence, well defined scope and contracted construction costs have resulted in a reduced risk and therefore a lower contingency on a percentage basis.

1 Construction Cost Estimate Comparisons

2 Included as an Attachment to this Exhibit at Exhibit B, Tab 15, Schedule 1, Attachment
3 is a report prepared by Charles River Associates (“CRA”) comparing NextBridge’s EWT
4 Line Project construction costs to other similar transmission project construction costs.

5 This analysis sets forth a comparative assessment of only the construction costs of
6 select transmission projects, escalated to have in-service dates of 2020. Where the
7 2017 CRA Benchmark Report compared projects on their total cost basis assuming
8 project lengths of 450 km and scaling for similar voltages, this report instead took the
9 projects as-is from both a length and voltage perspective. Therefore the attached report
10 should be considered a supplement to the benchmarking study, which was intended to
11 create an apples-to-apples comparison. The construction costs of the Hydro One
12 projects were taken as-is and escalated, without adjustments for differences in voltage,
13 which, as CRA understands from reviewing its previous filings, is the process that Hydro
14 One typically uses when presenting this information to the Board.

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16 In developing this comparative assessment, projects from the benchmarking study and
17 also projects with which the Ontario Energy Board would be familiar were included. The
18 Hydro One projects included in the CRA construction cost comparison report are those
19 that have been brought before the Ontario Energy Board in the past.