

December 2, 2015

The Independent Electricity System Operator  
120 Adelaide Street West  
Toronto, Ontario M5H 1T1

**Attention:** Mr. Bruce Campbell, President and Chief Executive Officer  
Ms. JoAnne Butler, Vice President, Market and Resource Development

**Re:** NERA Economic Consulting's Opinion as to the Fairness of the Amended and Restated Bruce Power Refurbishment Implementation Agreement

Dear Sirs and Mesdames:

In December 2013, the Ontario Long Term Energy Plan ("LTEP")<sup>1</sup> was released in its final form, representing the official policy of the Province with respect to the future of the electricity sector in Ontario. A key element of the LTEP is the Refurbishment of the remaining nuclear units at the Bruce Site that are yet to be refurbished. The Refurbishment of these six units encompasses approximately 4800 MW<sup>2</sup> of nuclear capacity and billions of dollars of capital investment. To implement the plan, the IESO<sup>3</sup> was charged with negotiating an agreement with Bruce Power that would enable the Refurbishment and continued operation of the Bruce Site in a way that is consistent with the principles established by the LTEP. The Amended and Restated Bruce Power Refurbishment Implementation Agreement ("ARBPRIA" or "Agreement") is the end result of these negotiations.

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<sup>1</sup> Attachment A to this letter contains a compendium of commonly used acronyms and terms.

<sup>2</sup> The total capacity of the Bruce Site is 6,300 MW when you add the remaining two units to this value. All units are currently operating.

<sup>3</sup> The Ontario Power Authority ("OPA") was the entity charged with this responsibility. On January 1, 2015 the OPA was merged with the IESO and all references herein to the IESO encompass the OPA.

Subject to the limitations outlined in the last section of this letter, NERA concludes that the Agreement is fair to the IESO and satisfies the principles set forth in the LTEP.

We reached this conclusion because the Agreement satisfies the evaluation criteria articulated in this letter. We note that the Agreement accomplishes the following:

- The Agreement secures 6300 MW of Bruce Site capacity for the long term benefit of Ontario and effectively incorporates lessons from the BPRIA, the agreement currently in place for the Bruce Site;
- The Agreement incorporates pricing mechanisms that enable a fair price to be determined over time, limit the exposure of the IESO to unanticipated costs, and provide the flexibility to determine the cost of Refurbishment and Asset Management at the time investments are optimally made;
- The Agreement is structured so that Bruce Power bears all investment cost risk once these costs are agreed upon;
- The Agreement is premised on cost and technical assumptions that have been subject to thorough technical review and due diligence and are currently reasonable;
- The Agreement contains cost sharing, cost limits, and IESO cost estimate oversight provisions that should be effective to ensure that binding cost values provided by Bruce Power in the future are reasonable;
- The pricing mechanism in the Agreement is designed to provide an opportunity for Bruce Power to earn a Target Rate of Return on agreed costs that is reasonable and not excessive;
- The Agreement places all operating (availability, sustaining capital cost, and ongoing O&M cost) risk on Bruce Power;
- The Agreement contains off-ramps that will enable the IESO to change course if the costs of Bruce Site Refurbishment become excessive or if other more economic alternatives emerge;
- The Agreement's off-ramps are realistic and will enable the IESO to ensure that reliability is met if the off-ramps are exercised; and
- The Agreement secures for the IESO a large quantity of dynamic capability that will facilitate the efficiency and reliability of system operations.

The Agreement is fully consistent with the Principles of the LTEP relevant to the Bruce Site, namely the Agreement minimizes commercial risk; mitigates reliability risk; entrenches appropriate off-ramps; and holds Bruce Power accountable for schedule and price.

Moreover, from our review of the negotiations we believe IESO considered appropriate factors in developing the Agreement implementation plan. We also understand that there are ongoing efforts to ensure collaborative learning between Bruce Power and other CANDU operators outside of the Agreement.

In summary, the Agreement enables the IESO to efficiently achieve the nuclear mandate set forth in the 2013 LTEP, secures the operation of Bruce Power for the long term without exposing the IESO to operating risk and open-ended cost risk, and meets the criteria for fairness articulated in this Opinion.

The remainder of this letter describes in more detail the nature of our assignment, the Agreement, the criteria we applied, and the examinations we conducted to reach our Opinion.

#### ***NERA's Retention by the IESO and the Purpose of this Opinion***

In May 2014, the IESO issued an RFP for qualified entities to provide a Fairness Opinion with respect to the terms of the transaction for the Refurbishment of the Bruce Site units envisioned by the LTEP. In August 2014, NERA Economic Consulting ("NERA") was selected to provide that Opinion to the IESO. NERA's charge is to evaluate and opine on the fairness of that transaction, which is memorialized as the ARBPRIA, to the IESO.

NERA is providing this Opinion to the IESO for the sole benefit of the IESO. The purpose of this Opinion is to inform the IESO of the scope of NERA's review of the Agreement, the criteria by which NERA assessed the fairness of the Agreement, and NERA's conclusions with respect to fairness. NERA conducted a thorough review of the Agreement and the IESO's associated due diligence to arrive at our Opinion. This Opinion has been written to present NERA's conclusions with respect to the fairness of the Agreement as well as to set forth major aspects of NERA's examination and findings without revealing information deemed confidential by the IESO and Bruce Power.

#### ***NERA's Credentials and Potential Conflicts***

NERA is a firm of several hundred professional economists with offices located throughout the world. NERA's qualifications to provide this Opinion stem from our extensive experience with respect to the following areas of expertise:

- Developing and reviewing key economic terms of power contracts;

- Familiarity with Ontario power markets and the organization of the electricity sector in Ontario;
- Assessment of nuclear economics and finance and particularly the assessment of potential nuclear investments;
- Experience in the modeling of financial projections for power plant investments and the analysis of customer rate impacts of commitments to support such investments;
- Understanding of power system planning; and
- Experience with FERC and state regulatory proceedings with respect to power contracts and nuclear development.

Developing our Fairness Opinion required the review of due diligence conducted by the IESO and the IESO's advisors and due diligence providers. While NERA did not conduct the primary due diligence on behalf of the IESO, NERA typically reviews such due diligence and has the experience and expertise to understand the due diligence work and conclusions.

NERA has no ongoing or recent business relationships of any kind with Bruce Power or the owners of Bruce Power. NERA has, prior to this assignment, provided consulting services to the IESO and the Ontario Ministry of Energy. NERA has no conflicts that impair the objectivity and independence of this Opinion. NERA's compensation for providing this Opinion is not contingent upon reaching any conclusion or upon any action or event with respect to the Agreement.

The NERA project team that conducted this assignment consisted of Mr. Eugene Meehan (Special Consultant and retired Senior Vice President), Mr. Edward Kee (Special Consultant and retired Vice President), Mr. Kurt Strunk (Vice President), Mr. Stephen Buryk (Senior Analyst) and Ms. Stephanie Gainger (Analyst). The work product and conclusions were subject to a NERA peer review led by Mr. Jonathan Falk (Vice President). All Special Consultants and officers on the NERA project team and the peer review team have decades of experience with respect to nuclear economics, power contracts, financial analyses, North American nuclear regulation, and the Ontario power sector.

### ***Context of the Agreement***

The Bruce Power Generating Station ("Bruce Site") is the largest operating nuclear station in the world. Located on Lake Huron in Tiverton Ontario, at full capacity it produces fifty terawatt hours of baseload generation per year, one-third of Ontario's electricity demand. The Bruce Site hosts eight operating units, all CANDU reactors, four in Bruce A (Units 1 through 4) and four in Bruce B (Units 5 through 8). As of 2012, all eight units were running with 6,300 MW of total capacity.

The Bruce Site's output is currently committed through an agreement between Bruce Power and the IESO known as the BPRIA. The original BPRIA was executed on October 17, 2005 between Bruce Power and the OPA. Bruce Power and the OPA subsequently made amendments to the original BPRIA on August 28, 2007, July 6, 2009, February 3, 2011, and April 3, 2013. The BPRIA offers a contract price to the Bruce A units in return for Refurbishments and a floor price to the Bruce B units to keep them running long enough to be incorporated in a new Refurbishment agreement.

The Parties learned from the implementation of the BPRIA. NERA understands that at the time the BPRIA was negotiated and executed, it was contemplated by all parties that continued operation of the Bruce A units would require that Bruce Power immediately proceed with a series of Refurbishments and that all components needed to achieve life extension would be refurbished during the Refurbishment outage. Hence, the BPRIA was developed as an agreement that assumed all contemplated Refurbishment would occur on a stated schedule and developed a price based on that assumption and a fixed cost estimate.

Experience revealed that life extension investments could defer the need for Refurbishment. Also, many aspects of Refurbishment could be conducted during normal outages through a condition-based Asset Management investment program. The change in these assumptions – that Refurbishment can be deferred and that Asset Management investments need not be made during the Refurbishment outage – led the Parties to develop the Agreement to be more complex than the BPRIA. This complexity is necessary in order for the Agreement to be flexible enough to schedule investments when required by actual conditions and not on a pre-determined schedule, and to take advantage of more accurate cost estimates made closer in time to project execution. We discuss the Agreement in detail in the next section.

### ***Summary of the Agreement***

The Agreement secures the generation from all eight units at the Bruce Site and allows for the Refurbishment of the six units not yet refurbished under the BPRIA.<sup>4</sup> NERA's understanding of the key points of the Agreement is described below.

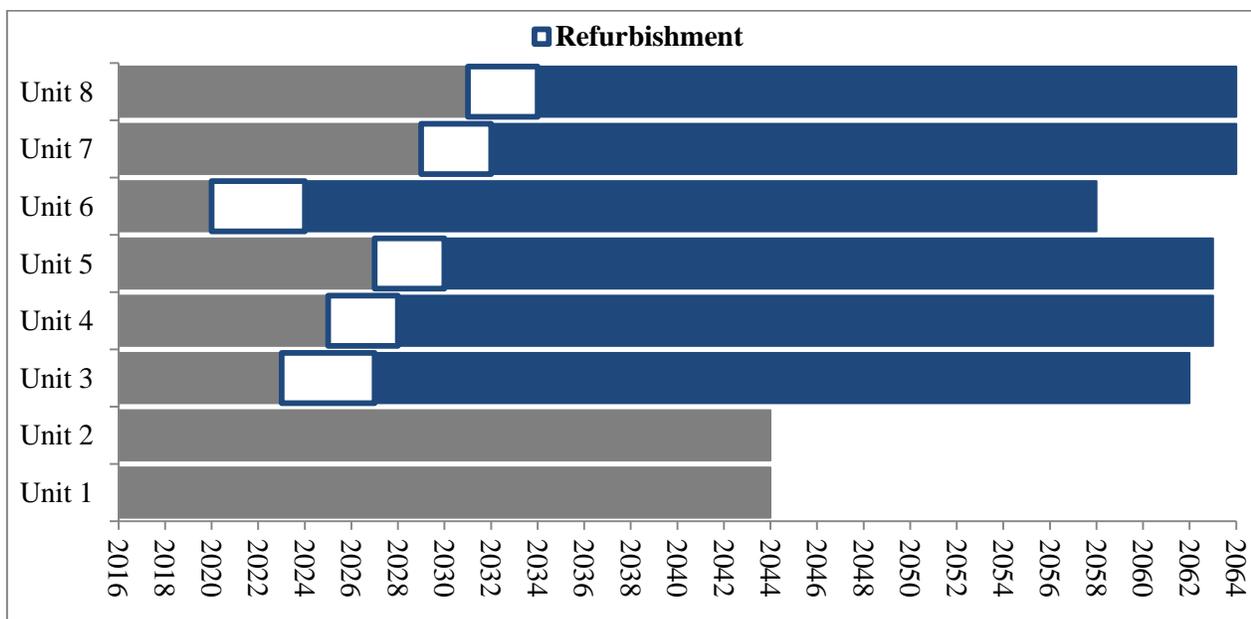
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<sup>4</sup> In this letter we refer to the Agreement "securing" the operation of all eight units at the Bruce Site. More precisely this means securing the opportunity for the long term operation of all eight units. Consistent with the LTEP, the Agreement contains off-ramps for the IESO if Refurbishment is too costly and not economic, and an off-ramp for Bruce Power if the asset is impaired.

Refurbishment Schedule

The two units that have been refurbished under the BPRIA will reach their end of life in 2043. The six units that will be refurbished under the Agreement will reach their end of life in the late 2050s or early 2060s. Figure 1 shows an approximate Refurbishment schedule and the life of the units under the Agreement.

**Figure 1:** Term of the Agreement and approximate Refurbishment outages



Pricing

Under the Agreement, the Parties will price all power from the Bruce Site using a cash flow model (the “Financial Model”) that provides Bruce Power an opportunity to earn a negotiated, Target Rate of Return on agreed financial commitments. The model solves for the \$/MWh price that provides Bruce Power with an opportunity to earn the Target Rate of Return on funds invested in the business assuming a certain level of generation over the entire term of the Agreement. The Parties will represent agreed financial commitments as cash outflows in the Financial Model, including the following:

- Starting value (capital previously invested under the BPRIA but not yet recovered);
- Unit Refurbishment capital;
- Asset Management capital; and
- Sustaining capital.

The Parties agreed to the starting value in advance recognizing that Bruce Power will continue to be responsible for cost overruns related to the Refurbishment of Units 1 and 2 completed under the BPRIA. Agreed investments in future Refurbishment and Asset Management are not included in the Financial Model upon signing the Agreement, save for the initial two periods of Asset Management. Prior to being included in the Financial Model, these investments will be subject to pre-determined thresholds and a detailed review by the IESO.

The price from the Financial Model will also incorporate operating and maintenance (“O&M”) expenditures. The level will be fixed but labor and non-labor components will escalate at appropriate inflation indices. Every nine years certain wage- and escalation-related assumptions will be adjusted on a going-forward basis.

The prices set by the Financial Model provide Bruce Power with an opportunity to earn the Target Rate of Return. The recovery of capital is priced on a nominal levelized basis and starts when such capital is actually committed. Under this structure, Bruce Power takes the majority of operating risk and short-term Refurbishment risk.

#### Off-ramps

IESO will have the opportunity to exercise off-ramps for each unit to be refurbished if Refurbishment costs escalate above pre-established thresholds. Bruce Power will have a similar right based on a higher threshold. In addition to the threshold off-ramps, there will be an IESO economic off-ramp that can be exercised prior to the third and fifth units to be refurbished. This will enable Ontario to change course if in the future more economic sources of power emerge or demand reduces. Bruce Power has the right to analogously-timed off-ramps that may be exercised if they can prove their investment is significantly impaired.

#### Rate of Return

The Financial Model solves for the price needed to provide Bruce Power an opportunity to earn a Target Rate of Return. The Financial Model will:

- Reflect capital investment agreed upon by the Parties, which means that Bruce Power’s Achieved Rate of Return will be diminished by investment overruns with respect to Refurbishment and Asset Management investments and will be enhanced by Bruce Power’s share of investment efficiencies;
- Reflect a fixed level of O&M expenses, with certain carve outs for wage- and escalation-related adjustments every nine years. Bruce Power’s Achieved Rate of Return will be

diminished by higher O&M expenses or an inability to manage within the escalation index and will be enhanced by Bruce Power's share of O&M efficiencies;

- Reflect assumed generation from the Bruce Site at agreed upon levels which result in an 87%<sup>5</sup> capacity (availability) factor over the entire term of the Agreement. Bruce Power's Achieved Rate of Return will be diminished if it cannot achieve this level of availability; and
- Reflect certain costs such as Bruce Power's lease payments to OPG and fuel costs.

The Target Rate of Return will be reset using an agreed formula before the Refurbishment of the third unit to be refurbished and once more before the Refurbishment of the fifth unit to be refurbished. The reset will only apply to Refurbishment and Asset Management investments made after those dates. NERA finds that this is a reasonable approach given the length of the Agreement.

The price is a function of the Target Rate of Return. The Target Rate of Return is a negotiated result, one of many trade-offs made by the parties. The IESO conducted its own due diligence on the Target Rate of Return and engaged the assistance of independent financial advisors as part of that process. As part of this financial due diligence review process, the IESO determined a range for a fair Target Rate of Return for Bruce Power (as measured by the after tax weighted-average cost of capital) applicable to the transaction.

NERA considered the IESO's due diligence on the reasonable transaction specific rate of return range and drew upon our experience quantifying the cost of capital in various contexts in evaluating that range. We concluded that the Agreement's Target Rate of Return, which is within the range of fair transaction specific returns determined by the IESO process, is reasonable and not excessive.

In reaching the conclusion that the Target Rate of Return is reasonable and not excessive, we specifically considered that the cost of capital (Target Rate of Return) was higher but not disproportionately higher than that which would be allowed by regulators for generation investments and higher but not disproportionately higher than that which would be quantified by financial analysts applying quantitative techniques for utilities and generation companies.

### Pricing Updates

The Parties will recalculate the \$/MWh price annually and the recalculated price will apply from April 1<sup>st</sup>. The Parties will only reflect investments related to Refurbishment and Asset Management in the

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<sup>5</sup> The 87% value is the result of detailed assumptions with respect to maintenance requirements and intervals and forced outages. The term capacity factor as used herein applies to availability not generation.

Financial Model when they are agreed on and will imminently proceed. Thus, unlike the BPRIA which developed a price from the outset predicated on a fixed investment plan, the price under the Agreement will only reflect investments as they are committed and such investments will be recovered over the remaining term of the Agreement. The IESO's exposure to costs will be limited. The IESO will not be exposed to Refurbishment costs which are in excess of a threshold absent explicit agreement, will have audit rights for cost estimates, and will face a fixed scope of work for Asset Management activities.

*Dynamic Capability*

The Bruce Site is able to provide "flexible nuclear generation" via steam discharge by-pass valves that allow it to curtail and maneuver its generation, especially during times of excess baseload generation. This arrangement will avoid costly and inflexible shutdowns of the Bruce Site units or other baseload generators. Bruce Power will receive \$1.33/MWh for this service in addition to the payments described above that are determined based on the Target Rate of Return. The IESO estimates the benefits of this service to be in excess of the payments in most scenarios.

*Initial Price of the Agreement*

The initial price of the Agreement is as follows:

Component	Price (\$/MWh)
Contract price	56.40
+ Fuel costs estimate	8.00
+ Dynamic capability payment	1.33
= Initial price per MWh	\$65.73

The Parties have elected to break down the contract price into different components to allow for indexation. Each component of the price will escalate in accordance with an index that reflects the path of future prices for that particular component. Non-staff costs are exposed to inflation, staff costs are exposed to wage increases, and committed capital costs are not subject to cost increases or escalation.

The initial contract price (applicable through March 31, 2016) reflects recoverable Refurbishment investments already made by Bruce Power in Units 1 and 2, as well as life extension investments. Over the term of the Agreement the initial \$/MWh contract price will adjust based on the escalation indices described above, and will also evolve as Refurbishment and Asset Management capital are layered into the price. The Agreement contemplates other price adjustments for events such as off-ramps and updating O&M assumptions.

### ***The Criteria NERA used to Evaluate Fairness***

NERA has evaluated the fairness of the Agreement according to the following criteria:

- Whether the Agreement provides for financial terms that will provide a reasonable, but not excessive risk-adjusted Target Rate of Return to Bruce Power if it efficiently refurbishes and operates the units at the Bruce Site;
- Whether the Agreement is consistent with the principles applicable to the Bruce Site Refurbishment set forth in the LTEP;
- Whether the Agreement ensures that IESO appropriately shares in any benefits that may result from cost or operating efficiencies achieved by Bruce Power;
- Whether the Agreement ensures that IESO and the Government will have limited risk and financial exposure;
- Whether the Agreement is based on realistic assumptions that have been carefully reviewed;
- Whether the Agreement fairly resolves outstanding issues with respect to the BPRIA and incorporates lessons learned from the BPRIA; and
- Whether the Agreement provides incentives to allow for the appropriate mix and timing of Asset Management and Refurbishment investment to promote efficient capital investment.

### ***NERA Review and Examinations***

NERA's engagement to review the Agreement began in October 2014 after our selection as part of the RFP process. Over the course of the last year, NERA had multiple discussions with representatives of the IESO, including the senior representatives negotiating the Agreement and financial modelling staff. NERA also had discussions with IESO's due diligence providers, including the IESO's technical due diligence provider and financial advisor.

NERA attended in person meetings at IESO's office in Toronto, Ontario from June 1 through June 4, 2015. NERA met with senior representatives negotiating the Agreement, financial modelling staff, IESO legal representatives, and IESO's financial advisors.

In addition to these meetings, we have examined the following:

- the final Term Sheet representing the agreed terms between the IESO and Bruce Power;

- the Agreement<sup>6</sup> between the parties and comparisons between the agreed Term Sheet and a draft of the Agreement;
- the original BPRIA and amendments agreed to prior to the Agreement;
- the projected financial performance of Bruce Power under the original BPRIA and its amendments;
- work developed by IESO related to the major provisions in the Term Sheet;
- work conducted for the IESO by the IESO's technical, financial, tax policy, modelling and other advisors and due diligence providers related to nuclear cost and operational assumptions, cost of capital, income tax allowances, the Agreement's Financial Model and starting value model, and other related matters;
- the risks that could affect Bruce Power's Achieved Rate of Return;
- the risks that could affect IESO's cost for power from Bruce Power and contractual risk mitigation measures; and
- the off-ramps in the Agreement to allow the IESO to implement contingency plans in the event of non-performance.

### ***Conclusion***

NERA concludes that the Agreement is fair to the IESO and satisfies the principles set forth in the LTEP. This conclusion is reached as the Agreement satisfies the evaluation criteria specified herein viewing the Agreement in its entirety. The Agreement is unique in that enables the IESO to secure the opportunity for the long term operation of all units at the Bruce Site while very effectively limiting exposure to unknown and open-ended costs and only pays for performance. The Agreement provides the IESO off-ramps that can be realistically exercised if conditions change.

### ***Limitations***

This Fairness Opinion has been prepared exclusively for the benefit of the IESO by the NERA project team and has been subject to a NERA peer review process. NERA assumes no responsibility related to

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<sup>6</sup> NERA reviewed the Agreement as it evolved over time and changes thereto. The final NERA review was performed on the execution version of the Agreement.

the unauthorized use of this Opinion including any use of this Opinion by any entity other than the IESO. In formulating this Opinion NERA has reached its conclusion solely based on the criteria for fairness articulated herein and solely based on the review and examinations described herein. This Fairness Opinion does not constitute a Fairness Opinion as described in Standard 510 of the Canadian Institute of Chartered Business Valuators and is not provided for the benefit of any security holders or any entity other than the IESO. The Opinion is issued as of the date of this letter and NERA assumes no responsibility to update this Opinion should the transaction parameters change after that date.

In formulating its Opinion, NERA has, as agreed with the IESO, relied upon data and information provided by the IESO. NERA is not providing an independent opinion as to the accuracy of the Financial Model. We have not been asked to and have not reviewed how the ultimate costs and benefits of power provided under the Agreement compare to the costs and benefits of power from alternate sources nor whether the expected costs of power under the Agreement are consistent with cost levels that the Government may have implicitly considered when deciding to pursue the Bruce Site Refurbishment consistent with the nuclear Refurbishment principles in the LTEP.

The Agreement is structured in a way that requires ongoing IESO and Bruce Power collaboration and ongoing IESO oversight. A fair Agreement is only the first step toward realizing the benefits provided for in the Agreement. The IESO will need to undertake a variety of activities including developing annual pricing updates, monitoring of Refurbishment estimates, monitoring of Asset Management plans, and management of off-ramp opportunities in order to realize the benefits made possible by the Agreement.

Yours truly,



Eugene T. Meehan  
Special Consultant

Yours truly,



Kurt Strunk  
Vice President

*Attachment A: Common Acronyms and Terms<sup>7</sup>*

**“Achieved Rate of Return”**: The realized rate of return earned by Bruce Power over the course of the Agreement.

**“Agreement”**: Transaction between the Independent Electricity System Operator and Bruce Power that would amend and restate the Bruce Power Refurbishment Implementation Agreement. Also known as the “Amended and Restated Bruce Power Implementation Agreement” or the “ARBPRIA” for short.

**“Asset Management”**: Capital investment that manages the life of a unit until its respective Refurbishment and thereafter.

**“BPRIA”**: The Bruce Power Refurbishment Implementation Agreement executed in 2005 and the First through Fourth Amendments.

**“Bruce A”**: Units 1 through 4 of the Bruce Site.

**“Bruce B”**: Units 5 through 8 of the Bruce Site.

**“Bruce Power”**: A limited partnership owned by a Canadian consortium of TransCanada Corporation, Borealis Infrastructure Management (a division of OMERS) and two Unions, Power Worker’s Union and the Society of Energy Professionals. Bruce Power is the operator of the Bruce Site and the lessee of the Bruce Site from OPG.

**“Bruce Site”**: The Bruce Power Generating Station that consists of eight nuclear generating units across Bruce A and Bruce B.

**“Dollars”**: All references to dollars are Canadian dollars unless otherwise noted.

**“Fairness Opinion” or “Opinion”**: NERA’s Fairness Opinion.

**“FERC”**: The United States Federal Energy Regulatory Commission, which is the entity that regulates most wholesale electric power contracts in the vast majority of the United States.

**“Financial Model”**: The Financial Model for the Agreement.

**“Government”**: The Provincial Government of Ontario.

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<sup>7</sup> NERA’s use of defined terms does not necessarily track the use of defined terms in the Agreement.

**“IESO”**: The Independent Electricity System Operator of Ontario.

**“LTEP”**: The Long-Term Energy Plan for Ontario released on December 2, 2013, which represents the official policy of the Government.

**“OPA”**: The Ontario Power Authority. The OPA merged with the IESO as of January 1, 2015.

**“OPG”**: Ontario Power Generation.

**“Parties”**: The IESO and Bruce Power.

**“Refurbishment”**: Capital investment that extends the life of a unit through replacement of major components during an extended outage.

**“Target Rate of Return”**: The target rate of return defined in the Agreement and used to solve for the price in the Financial Model.