Executive Summary of Bruce C Initial Project Description Prepared for Municipalities

The Initial Project Description (IPD) is a document prepared by the project proponent that provides preliminary information about a designated project and includes the prescribed information set out in the *Impact Assessment Act* [R-1] and *Information and Management of Time Limits Regulations* [R-2]. The information contained in the IPD must be representative of the project at the time the IPD is submitted to the Impact Assessment Agency of Canada (IAAC) and must include information related to any alternatives that the proponent is considering in respect of any item in the description of the project [R-3]. The IPD is used to inform the decision by the IAAC on whether an impact assessment (IA) of the designated project is required [R-3]. The following provides a summary of the Bruce C IPD. Copies of the Bruce C IPD and the Plain-Language Summary of the Bruce C IPD are available on the Canadian Impact Assessment Registry (here).

Introduction

Bruce Power is the operator of the largest electric generating facility in Canada. Bruce Power currently produces 30 per cent of Ontario's electricity on a site that has been safely generating nuclear power for over 50 years. Through the IA, Bruce Power is evaluating the feasibility of expanding its nuclear fleet, to create an option for future electricity planning. The Project, referred to as "Bruce C", will evaluate the impact of adding up to 4,800 megawatts electric (MWe) of nuclear capacity on the existing Bruce Power site. As proposed, the Project considers several reactor technologies.

Bruce Power recognizes that the Bruce Power site is located within the Saugeen Ojibway Nation Territory, the shared treaty and traditional Territory of the Chippewas of Saugeen First Nation and Chippewas of Nawash Unceded First Nation (Neyaashiinigmiing). Bruce Power is dedicated to honouring Indigenous history and culture and is committed to moving forward in the spirit of reconciliation and respect with the Indigenous Nations and Communities we work with. We are committed to strong and respectful relationships with the Saugeen Ojibway Nation (SON), the Métis Nation of Ontario Region 7 (MNO) and Historic Saugeen Métis (HSM).

General Information

Project Location

Section 1 of the IPD provides general information including the Project name, type of Project and location information, and Section 2 provides proponent contact information. The Project will be sited within the existing fenced and secured 932-hectare Bruce Power site, along with new intake and discharge structures in Lake Huron. The Bruce Power site currently hosts several licensed nuclear facilities, which include Bruce Nuclear Generating Station A (Bruce A) and Bruce Nuclear Generating Station B (Bruce B), each comprised of four CANDU reactors, as well as ancillary facilities. Several support facilities are also located on the Bruce Power site and are operated and maintained by Bruce Power. Bruce Power leases these portions of the Bruce Power site, including Bruce A and Bruce B, from OPG under a long-term lease agreement.

During the Pre-Planning Phase of the Project, Bruce Power commenced a siting process to support conceptual layout development and evaluate suitable areas for potential development. The process included reviewing opportunities, constraints and exclusion areas present at the Bruce Power site. The siting process allowed for an objective, transparent and rigorous

understanding of the Bruce Power site relating to land footprint suitability and will provide foundational information that will assist with future engagement with Indigenous Nations and Communities and local communities regarding siting. Site maps of the proposed site layout scenarios are included in Section 13 of the IPD.

Summary of Early Public Engagement

Key interests and issues raised during the Pre-Planning Phase of the Project include:

- Project details: questions about the purpose and need of the Project, technology evaluation process and the use of the Plant Parameter Envelope (PPE), waste considerations and timeline of the Project;
- Potential cumulative effects: considerations of the effect of the Project and activities combined with the effect of other past, current or reasonably foreseeable projects and activities;
- Local municipal government and public engagement: considerations of the way groups wish to participate in the IA process;
- Environment: interests and issues raised about climate change, and natural heritage;
- Human health and community wellbeing: interests and issues raised including quality of life, recreation, safety, security and emergency management, and traffic; and
- Socio-economic conditions: including interests and issues related to local labour force, income, employment, education and childcare, health care, housing, population growth and development, training and business opportunities.

A comprehensive table summarizing the key interests and concerns heard during public engagement is included in Section 3 of the IPD for the Project.

Summary of Early Indigenous Engagement

Bruce Power is committed to early, frequent, community driven engagement to support collaboration and informed decision making with Indigenous Nations and Communities. As part of engagement and relationship development, Bruce Power's approach to engagement aims to facilitate:

- Understanding of the Project details, regulatory process and requirements;
- Greater organizational awareness and understanding of each Indigenous Nation and Community's interests, concerns, and priorities with respect to consultation and engagement on Project development and regulatory processes;
- Collaborative development of engagement processes, including approaches to the assessment of cumulative effects, potential impacts to rights, environment, and social, economic and health conditions, and mitigation/management measures;
- Support for Indigenous-led community engagement and study of the Project;
- A clear demonstration of how participation of Indigenous Nations and Communities is reflected in processes and regulatory submissions; and
- Potential benefits for Indigenous Nations and Communities from the Project such as training, jobs, and procurement opportunities.

Bruce Power has a history of engagement with SON, HSM, and MNO related to the Bruce Power site and will continue to engage with these Indigenous Nations and Communities for the Project. Bruce Power's relationships with local Indigenous Nations and Communities are of the

utmost importance and as such, Bruce Power remains committed to meaningful engagement and collaboration in shaping the future of the Bruce Power site and ensuring participation in and benefit from any future development. A summary of early engagement with Indigenous Nations and Communities, including a summary of key issues raised and a description of planned future engagement is provided in Section 4 of the IPD. At the request of MNO, details of engagement related to the Project with the MNO are not included in the IPD.

Relevant Studies

The Bruce Power site has been highly studied and characterized and has demonstrated over 50 years of safe nuclear power generation. Bruce Power's environmental monitoring program conducts extensive year-round sampling to verify the protection of the local environment. This includes water temperature and surface water quality sampling on site and in Lake Huron, and routine monitoring of soil, sediment, groundwater, vegetation, agricultural products, and wildlife. Section 5 of the IPD contains information related to Indigenous-Led Assessments, and Regional Studies and Plans relevant to the Project, and Section 6 of the IPD outlines strategic assessment relevant to the Project.

Project Information

Statement of Purpose and Need for the Project

The Project aims to expand nuclear capacity at the Bruce Power site by up to 4,800 MWe, supporting Ontario's energy needs and carbon emissions goals. The Independent Electricity System Operator's (IESO) 2022 Pathways to Decarbonization Report highlighted the need for 69,000 MWe of non-emitting supply by 2050, including 17,800 MWe of nuclear capacity [R-4]. In response, Powering Ontario's Growth report emphasized developing long-lead assets like nuclear [R-5]. Bruce Power's IA was identified as an important option for the province, complemented by a provincial request for the IESO to work with Bruce Power on a cost-recovery framework for completing pre-development work, which was formally executed between the IESO and Bruce Power in April 2024. Beyond electricity supply and net zero targets, the Project will create and sustain high-quality jobs in Bruce, Grey, and Huron Counties and beyond by supporting a highly technical and robust supply chain, as well as meaningful economic benefits to Indigenous Nations and Communities. Section 7 of the IPD provides a statement of the purpose of and need for the Project.

Project Activities and Anticipated Schedule

The Project has a proposed capacity of up to 4,800 MWe or 13,600 megawatts thermal (MWth) and will be located on the Bruce Power site. As such, the Project is a "designated project" as described in subsection 27(a) of the Physical Activities Regulations as outlined in Section 8 of the IPD. Section 9 of the IPD summarizes all known activities, infrastructure, structures, and physical works associated with the site preparation, construction, operation, decommissioning, and abandonment of the Project, as understood at this stage in the Project planning. The Project activities will continue to be refined as the Project progresses. The Project schedule is provided in Section 11 of the IPD and provided below. The schedule is subject to change based on factors like selected technology, funding certainty, and expected demand ramp up and new nuclear generation needs.

Project Phase	Anticipated Schedule (Start – Finish)	Notes
Impact Assessment	Approximately 3 - 4 years (2024 – 2027/2028)	The 2024 Federal Budget set a three-year target for nuclear project reviews, but Bruce Power believes the IA process could take up to four years due to necessary engagement. The IA will also include an application for a CNSC Licence to Prepare Site.
Site Preparation	Approximately 3 years (2028 – 2031)	Requires integrated approval for IA and Licence to Prepare Site.
Construction & Commissioning	Approximately 14 years (2031 –2045)	Requires CNSC Licence to Construct. Assumes one year between subsequent unit deployments.
Active Operation	Approximately 60 - 100 years	Requires CNSC Licence to Operate. Assumes 60 - 100 year operational lifespan dependent on the technology selected.
Safe Storage Operation	Approximately 30 years	Application under CNSC Licence to Operate.
Decommissioning	Approximately 10 years	Requires Detailed Decommissioning Plan.
Abandonment	Thereafter	Application under CNSC Licence to Abandon.

Estimate of the Maximum Production Capacity, Description of the Production Processes

The Project will be technology-neutral, using a PPE to evaluate multiple reactor technologies. The PPE defines reactor characteristics and ensures no individual design has a greater impact than the PPE's parameters. This approach, used in Canada and the United States, informs health, social, cultural, and economic impacts, including those on Indigenous Nations and Communities. The bounding envelope currently includes the available information of the following designs for reactor models, Atkins Réalis – MONARK, Électricité de France – European Pressurized Water Reactor (EPR), Hitachi-GE Nuclear Energy – Advanced Boiling Water Reactor (ABWR), GE Hitachi Nuclear Energy – BWRX-300, and Westinghouse – AP1000 Pressurized Water Reactor. The list of technologies currently considered in the PPE are subject to change based on the ongoing technology evaluation process, continued internal development and engagement with Indigenous Nations and Communities. Additional information on the use of the PPE is provided in Section 10 of the IPD.

Potential Alternative Means and Potential Alternatives to the Project

Alternative means for the Project include developing a bounding PPE strategy for multiple reactor technologies, considering alternative locations on the Bruce Power site, and exploring different condenser cooling strategies. Switchyard designs will be consulted with Hydro One. Radioactive waste management strategies will be implemented at licensed facilities. The Nuclear Waste Management Organization (NWMO) is responsible for the long-term management of used nuclear fuel, with transportation regulated by the CNSC and Transport Canada [R-6]. Alternative means will continue to be refined based on engagement with Indigenous Nations and Communities, and the result of engineering, feasibility and environmental studies that will be completed to determine economic and technical feasibility. Bruce Power’s focus is on nuclear power generation. This Project would represent a partial

implementation of the Province of Ontario's energy plan which is also considering many other clean energy developments. Therefore, this Project is not an alternative to other clean energy projects but would be implemented together with other clean energy projects by other proponents on behalf of the Province of Ontario. Additional information on alternative means and alternatives to the Project is provided in Section 12 of the IPD.

Physical and Biological Environment of the Project's Location

The Bruce Power site has been the subject of numerous environmental assessments and is a highly characterized site. It is home to diverse natural environment that contains hundreds of species of plants and wildlife. Surrounding the Bruce Power site are areas of natural, physical, and cultural significance, such as the Lake Huron shoreline, commercial, recreational, and subsistence fisheries, and the Baie du Doré Provincially Significant Wetland (PSW). The Bruce Power site is also in close proximity to two provincial parks (Inverhuron and MacGregor Point) and three conservation areas (Brucedale, Saugeen Bluffs, and Stoney Island). A description of the physical and biological environment of the Project's location that is available to the public is provided in Section 14 of the IPD.

Health, Social and Economic Context

The Municipality of Kincardine has a population of 12,268 as reported in the 2021 Census. Immediately north of the Municipality of Kincardine is the Town of Saugeen Shores. The Town of Saugeen Shores has a population of 15,905 as reported in the 2021 Census. The area has traditionally relied on agriculture and small-scale manufacturing as economic mainstays.

The Bruce Power site is located within the Grey Bruce Health Unit. Social services are predominantly administered at the county level. Bruce County provides both paramedic services and community paramedic services. The closest hospital to the Bruce Power site is the Kincardine Site of the South Bruce Grey Health Centre.

The 2021 Census of Population recorded that the median total income of household in 2020 for Bruce County is $87,000. According to the Grey Bruce Public Heath, 60% of Grey Bruce residents rate their health as very good or excellent, and 97% of Grey Bruce residents feel satisfied or very satisfied with their lives. An estimated 20% of Grey and 18.4% of Bruce County children live in low-income households, although this varies greatly by local municipality.

The utilities industry employs the largest amount of Bruce County's workforce, followed by retail trade industry, and the health care and social assistance industry. Today, Bruce Power is by far the largest employer in the county, employing more than 4,000 people. Ontario's Long-Term Energy Plan is counting on Bruce Power to provide a reliable and carbon-free source of affordable energy through 2064. Bruce Power is currently carrying out its Major Component Replacement (MCR) Project, securing an estimated 22,000 jobs directly and indirectly from operations, and an additional 5,000 jobs annually throughout the investment program, injecting billions into Ontario's economy. Bruce Power has a substantial impact on the municipalities of Kincardine and Saugeen Shores, the tri-county region, and the province. In terms of the economic impact, the Nuclear Innovation Institute (NII) found that in 2020, Bruce Power's contribution to the provincial GDP was $4.03 billion from direct, indirect and induced effects. In 2020, employment income induced by the local nuclear sector supported $1.43 billion in household spending in Bruce, Grey and Huron counties combined. Additional information on the health, social and economic context is provided in Section 15 of the IPD.

Federal, Provincial, Territorial, Indigenous and Municipal Involvement

Sections 16, 17 and 18 of the IPD summarize funding provided by the Government of Canada (Natural Resources Canada) through its Electricity Predevelopment Program, confirms that no federal lands will be utilized for the Project, and regulatory agencies that may be involved with the assessment of the Project, including a preliminary list of permits and approvals that may be required for the lifecycle of the Project.

Potential Effects of the Project

Part E of the IPD (Sections 19 through 24) summarize the potential effects of the Project. Section 19 provides a list of any changes to components of the environment that are within the legislative authority of Parliament (i.e., fish, fish habitat, aquatic species, Species at Risk (SAR), and migratory birds). The Project is located in Ontario and no changes to the environment in another province or outside Canada are anticipated. Potential effects and impacts will be further assessed in detail in the Impact Statement, as described in Section 20.

Potential Impacts to Indigenous Peoples

Bruce Power has engaged with SON, HSM, and MNO since 2011, 2009, and 2012, respectively. Bruce Power understands current issues and concerns from Indigenous Nations and Communities but recognize that new issues may arise through ongoing engagement. The prospect of new nuclear power generation brings both environmental concerns and opportunities for collaboration on environmental monitoring, protection, and mitigation. For Indigenous Peoples, environmental impacts are closely linked to Aboriginal and treaty rights and ways of life, specifically those environmental impacts that may alter the physical and cultural ways that Indigenous People interact with the environment. Therefore, environmental topics have always been the focus of Bruce Power's engagement with SON, HSM, and MNO. Based on review of Bruce Power's past and current engagement discussions, as well as any input on the IPD, the potential impacts of the Project to Indigenous Peoples are:

- Impacts to fish and fish habitat from thermal impacts of cooling water or industrial water effluents;
- Impacts to fish from impingement and entrainment in water intakes and structures;
- Impacts to aquatic invertebrate, plant and nearshore wetland health related to thermal impacts from cooling water or industrial water effluents;
- Impacts to terrestrial environments, species and habitat connectivity;
- Impacts related to accidental spills released to the terrestrial and aquatic environments;
- Impacts to ability of SON Members to access the SON Spirit Site / Burial Ground – Chiibegmegoong;
- Impacts related to the production, treatment, and storage of nuclear Waste (all levels);
- Cumulative impacts related to the combined past, present and future impacts of Bruce Power's operations and the operations of the Project (other operations at the Bruce

Power site – Ontario Power Generation, Canadian Nuclear Laboratories, and Hydro One), climate change, and other local and regional environmental stressors;

- Radiological dose to public and general radiological safety; and
- Impacts of changing climate to environmental regulatory approvals and limits.

Bruce Power recognizes that census data is not the most reliable source of information as it relates to First Nations and Métis. We will report more information about social, health and economic conditions of the Indigenous Nations and Communities through our engagement. Through longstanding engagement, Bruce Power has worked with SON, HSM, and MNO to support the areas of training, employment, and economic and business development, and provides annual funding support for Indigenous Nation or Community-based programs. The prospect of new nuclear power generation may be associated with concerns about socio-economic impacts as well as with the prospect of new opportunities to work together to address these issues and to create benefits related to socio-economic and health conditions. In order to identify potential impacts to social, economic and health conditions of Indigenous Peoples in the IPD, Bruce Power reviewed prior assessments from previous regulatory reviews, and past and current engagement discussions, including any input provided on the IPD. Bruce Power will, as part of the IA, engage SON, HSM, and MNO to discuss the criteria to be considered for the assessment of health, social, and economic conditions and how Indigenous Knowledge can further support these discussions and assessments. Additional information on the potential impacts to Indigenous Peoples is provided in Section 21 and 22 of the IPD.

Estimate of Greenhouse Gas Emissions and Types of Waste and Emissions Generated by the Project

Sections 23 and 24 of the IPD provide an estimate of the greenhouse gas emissions (GHG) associated with the Project, using methodology consistent with the Strategic Assessment of Climate Change (SACC) [R-7]. Section 24 outlines potential waste and emissions that may occur as a result of the Project to air, and in or on water and land.

REFERENCES:

[R-1] Impact Assessment Act. S.C. 2019.

[R-2] Information and Management of Time Limits Regulations (SOR/2019-283) [Internet]. Available from: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2019-283/index.html

[R-3] Guide to Preparing an Initial Project Description and a Detailed Project Description [Internet]. Available from: https://www.canada.ca/en/impact-assessment agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guide-preparing-project-description-detailed-project-description.html

[R-4] Pathways to Decarbonization: A report to the Minister of Energy to evaluate a moratorium on new natural gas generation in Ontario and to develop a pathway to zero emissions in the electricity sector [Internet]. Independent Electricity System Operator; 2022 Dec. Available from: https://www.ieso.ca/en/Learn/The-Evolving-Grid/Pathways-to-Decarbonization

[R-5] Powering Ontario's Growth [Internet]. Available from: https://www.ontario.ca/page/powering-ontarios-growth

[R-6] Nuclear Waste Management Organization [Internet]. 2024. Available from: https://www.nwmo.ca/

[R-7] Strategic Assessment of Climate Change Revised, October 2020 [Internet]. Available from:https://www.canada.ca/en/services/environment/conservation/assessments/strategic-assessments/climate-change.html