Introduction

On July 12, 2011, Greenpeace and twenty four other organizations requested a full public hearing and review on the scope of the scope, transparency and public participation of the proposed environmental and safety reviews for Ontario Power Generation’s (OPG) proposal to refurbish and extend the life of the Darlington nuclear station be significantly expanded and modified.

Greenpeace is deeply concerned that Canadian Nuclear Safety Commission (CNSC) president Michael Binder decided to dismiss these concerns outright and proceed with this unprecedented low-level environmental review for a reactor refurbishment project.

Greenpeace notes that parallel to the current consultation on the scope of the environmental assessment guidelines, the CNSC is holding a public comment period on revisions Regulator Document-360 Life Extension of Nuclear Power Plants.

Through Access to Information (ATI) Greenpeace is aware that the CNSC has been revising this document in conjunction with the nuclear industry, specifically OPG, for at least the past two years. Greenpeace is deeply concerned that the CNSC is continuing is pattern of prioritizing industry interests and consultation above public consultation and scrutiny.

It is also noteworthy that in the CNSC’s proposed scoping document that proponent is expected to submit its Environmental Impact Statement in December 2011. It is difficult to understand how the proponent could be prepared to submit such a complex undertaking only a few months of the scope of the review is established.

Greenpeace is deeply concerned, then, that the scope of the environmental review has been pre-determined by CNSC staff and OPG.before the public has been consulted. Indeed, Greenpeace is deeply concerned that such decisions may have in fact been made before the Fukushima disaster.

Request: Greenpeace reiterates its request that a full hearing of the Commission be held for the public to present and ask questions of OPG and the CNSC on the scope, scale and public participation in both the environmental assessment and safety reviews of the project.

Request: Greenpeace requests that the at the same hearing the public can comment and ask questions of CNSC staff on the proposed revisions to Regulator Document 360, which will bound the scope of this environmental assessment.

While the CNSC and OPG provided public assurances regarding the safety of the Darlington nuclear station, we believe the Fukushima disaster has exposed failings in both Darlington’s design and the CNSC’s approach to safety. These should be transparently and rigorously reviewed before any approval is given to extend the operational life of the station.

The following are initial recommendations on how the scope of the Darlington Refurbishment and Life-Extension environmental and safety review should be broadened to take into account the post Fukushima reality and legal requirements under Canadian law.

Request: Greenpeace requests the CNSC and CEAA release how a document detailing how all comments on this proposed environmental review were determined applied or dismissed with a rationale or justification.
1. Project Level

If approved, the refurbishment and life-extension of the Darlington nuclear station will cause several significant and irreversible adverse environmental effects while contravening tenants of Canadian law:

- It will produce long-lived radioactive wastes that will transfer risks to future generations. This contravenes the Polluter-Pays principle and the Precautionary principle.
- It will contravene the Polluter-Pays principle (a tenant of Canadian law) by transferring the risk of significant nuclear accidents from Ontario Power Generation to Canadian society and future generations. This is contrary to Canadian jurisprudence.
- It will kill significant amounts of fish and harm the aquatic environment of Lake Ontario through thermal pollution and entrainment. This is in contravention of the Fisheries Act.

Request: Greenpeace recommends that the project be denied outright because of the significant environmental effects.

Request: Greenpeace requests that the CNSC acknowledge these adverse environmental effects and contraventions of Canadian law in its making its recommendation on the scope of the review.

Request: If the CNSC believes these significant environmental effects can be mitigated or justified, Greenpeace requests this environment review be upgraded to from the lowest-level possible Screening Study review to at a minimum a Comprehensive Study, although a full Panel Review is more appropriate.

As has been documented in past submissions to the CNSC and the Auditor General, the CNSC’s approach to the environmental and safety reviews for reactor refurbishment was set by licensees without input from the public.¹

The current proposed Screening Review is contrary to the Standing Senate Committee on Energy, the Environment and Natural Resources 2001 recommendation:

… that the Comprehensive Study List Regulations of the CEAA be amended to include the restart of a nuclear power reactor following the prolonged shut down of the reactor or significant modification to the reactor and/or the station.²

The Committee also recommended “…the Canadian Nuclear Safety Commission "CNSC" maintain an arm’s-length relationship with utilities when dealing with compliance to orders on critical matters of safety." The Committee, furthermore, recommended that “…the CNSC

¹ See: Shawn-Patrick Stensil (Greenpeace) to Shelia Fraser (Auditor General), Petition pursuant to Section 22 of the Auditor General Act, regarding the federal oversight of the nuclear industry in Canada, June 15, 2006
ensure public confidence in the federal environmental assessment process by: determining the scope of assessments independently of the project proponent.”

As will be discussed, past reactor refurbishment reviews have not maintained an arms length relationship with utilities. Indeed, the CNSC’s regulator approach of closed door negotiation between CNSC staff and licensees to determine many of the bounding elements of environment reviews has undermined the credibility of past reviews.

2. Justification and Alternatives

Request: Greenpeace requests that the justification and alternatives to the project be considered within the scope of the environmental assessment.

The current review scope excludes such an analysis stating: “…need for the electricity to be generated by OPG would involve consideration of broader public policy issues that are under the authority of the Province of Ontario and over which the CNSC has no regulatory authority.”

The sections 16(1) and (2) of the Canadian Environmental Assessment Act (CEAA), however, call for the “need”, “purpose”, “alternatives to”, and “alternative means” to be assessed in environmental reviews.

Moreover, the federal government through the Nuclear Liability Act provides a subsidy to the operation of provincially owned nuclear operations. The federal government and taxpayer will therefore carry a liability if the province of Ontario proceeds with the project.

Greenpeace submits that it is appropriate and a responsibility for a federal authority such as the CNSC to consider the justification and alternatives to a provincial project if federal subsidies or backstopping are involved.

As well, Greenpeace submits that an analysis of justification and alternatives to the projects is required based on the CNSC’s use of the ALARA (As Low As Reasonably Achievable) principle in regard to radiation exposure. Under the principle all exposure to radiation must be first ‘justified’ and, if necessary, ‘optimized’; that is be as low as possible.

The refurbishment and continued operation of the Darlington nuclear station will create radioactive substances that will cause exposure to workers, but also long-lived radioactive wastes that will cause exposure in the future to the environment or humans. Under the ALARA principle, the CNSC must thus ask OPG to justify and provide alternatives to the undertaking.

Request: Greenpeace requests that alternatives and justification for the project be considered within the scope of the current review in light of requirements under the Canadian Environmental Assessment Act (CEAA) and the CNSC’s use of the ALARA principle.

3. Accidents and Malfunctions

Request: Greenpeace requests that the environmental review enable Canadians to consider the full range of accident and terrorist risks imposed on them by the refurbishment and continued operation of the Darlington nuclear station.

The danger of accidents, malfunctions or terrorist attacks at a nuclear power plant remains one of the defining features of nuclear power generation because such events have the potential to create catastrophic and irreversible harm to Canadian society and the environment.

While the CEAA requires accidents to be included in environmental assessments, the Canadian Nuclear Safety Commission’s (CNSC) approach to implementing this requirement overlooks assessing a full range of realistic accidents in environmental assessments.

Typically, the CNSC deems certain levels estimated risk acceptable to Canadians. These are based on accidents that would not result in radioactive material leaving the plant boundaries. Accident risks beyond this level of risk are deemed ‘incredible’ and do not merit consideration within environmental assessments according to the CNSC – even if those risks would result in catastrophic environmental damage.

While the nuclear industry and its regulator claim publicly that catastrophic accidents are “incredible” and don’t require consideration, the nuclear industry considers internally that such accidents are a realistic possibility. A special piece of legislation - the Nuclear Liability Act (NLA) - was created to indemnify the industry from paying the full costs of clean up and compensation in the event of an accident.

This practice of ignoring accidents or threats deemed “incredible” when the nuclear vendors, suppliers and operators consider them realistic is contrary to precautionary principle. This transfer of residual risks for accident and malfunctions from nuclear operators and supplier to the Canadian public is in violation of the Polluter-Pays and Precautionary principles.

Request: Greenpeace requests that the CNSC acknowledge that its current approach to assessing accidents and malfunctions in environmental reviews violates both the Precautionary principle and the Polluter-Pays principle by requiring the proponent to release the full range of risks and liabilities imposed on Canadian society by the project.

As will be discussed, OPG’s safety studies have historically been used to “bound” or exclude catastrophic accidents from the scope of environmental assessments. OPG has shown a pattern of behaviour to minimize the risk of such accidents in the past. Given the high-level of concern in light of the Fukushima disaster and OPG’s refusal to assume the responsibility for severe accidents, Greenpeace believes that any decision to exclude severe accident from this environmental assessment must allow public participation and accountable public decision making.

Request: Greenpeace requests a public hearing of the CNSC take place at which OPG’s risk studies can be presented and scrutinized before accident scenarios are excluded from the proposed environmental review.
3.1 Access to Information - Probabilistic Risk Assessments

Request: Greenpeace requests that the CNSC direct the proponent to proactively release information related to risk to the public from its Probabilistic Risk Assessments.

While it is may be reasonable to withhold information from these risks studies that may reveal vulnerabilities of the station, information related to the risk imposed on the public and Canadian society by the continued operation of the Darlington nuclear station should be proactively released.

Such information should include: accident probability estimates, source term and public dose estimates for accident scenarios (known as Ex-Plant Release Categories), and any economic consequence estimates.

An environmental review should be an opportunity for the public to fully understand and assess the risks of a project. This should include the full risk imposed on public by the proponent’s project. It should also be noted that there has never been a full proper environmental assessment on the existing Darlington reactors to assess such risks.

OPG refuses to accept full responsibility for the consequences of a nuclear accident at Darlington nuclear station and has asked for special protection from the federal government in case of a Fukushima-scale accident. OPG has requested and received such protection— in the form of the Nuclear Liability Act - because it knows Fukushima-scale accidents in Canada are a realistic possibility.

The federal Nuclear Liability Act transfers the responsibility for the Darlington nuclear station from OPG to Canadian society. Greenpeace thus submits that Canadians have the right acquire, scrutinize and understand the full range of risks posed by the Darlington nuclear station.

Greenpeace agrees that it may be in the public interest to withhold certain security related to the design vulnerabilities from public release. However, we submit that it is contrary to the public interest to extend such an exclusion to withhold information on risks imposed by the Canadian public by OPG’s project. OPG has withheld such information historically.

Request: Greenpeace requests OPG be directed to proactively release information from its Probabilistic Risks Assessments on risks imposed on Canadian society by the continued operation of the Darlington nuclear station. This should include at a minimum accident probability estimates, source term and public dose estimates for accident scenarios (known as Ex-Plant Release Categories), and any economic consequence estimates.

3.2 Polluter-Pays Principle – Adverse Economic Effects

Request: Greenpeace requests that OPG be required to calculate and publish the subsidy provided the federal government’s Nuclear Liability Act as part of its environmental review.

This will serve to both acknowledge the extent to which the project violates the Polluter-Pays principle and provide information on liability to the federal tax-payer that would accompany approval of the project.
The Supreme Court of Canada unanimously upheld the polluter-pays principle. In a 2003 decision, the Court stated that the polluter-pays principle “has become firmly entrenched in environmental law in Canada”.

The Court explained the principle as follows:

To encourage sustainable development, that principle assigns polluters the responsibility for remedying contamination for which they are responsible and imposes on them the direct and immediate costs of pollution. At the same time, polluters are asked to pay more attention to the need to protect ecosystems in the course of their economic activities.

OPG proposal to rebuild and extend the life of the Darlington nuclear station assumes the transfer responsibility for costs and risks onto Canadian society, the federal tax-payer and future generations. This violates the Polluter-Pays principle.

In assessing the projects contribution to sustainability, this violation of sustainability must be considered. OPG’s sustainability assessment does not do this.

In 2009, Greenpeace commissioned nuclear risk expert Dr. Gordon Thompson to assess the government’s proposed revision to the Nuclear Liability Act against modern concepts of sustainability, precaution and the Polluter-Pays principle. The report concludes that transfer of responsibility from the nuclear industry to the Canadian public acts as substantial subsidy to nuclear operators. It also puts other clean energy technologies at a disadvantage.

Any future approval of the Darlington refurbishment and life-extension by the CNSC will be accompanied by the Canadian public providing a large and significant subsidy to OPG through the Nuclear Liability Act. As noted, this large federal subsidy also provides a justification for the CNSC as a federal authority to examine the justification and alternatives to the project.

**Request:** If the CNSC chooses to continue the practice of excluding large-scale accidents from its environmental review, it should at a minimum acknowledge and provide information to the public and decision-makers on the extent to which the project violates the Polluter-Pays principle. Specifically, OPG should be required to calculate and disclose an estimate of the implicit subsidy provided to it by the federal tax-payer from the liability protection it is provided by the federal Nuclear Liability Act.

**Request:** Greenpeace requests that release of risk information should take place before decisions are made on the exclusion of certain accident scenarios from the environmental review.

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3.3 Terrorism

The draft scoping document makes no mention terrorism or malevolent events. This is unacceptable in a post-September 11th world and is a significant reduction from past reviews, including the environmental review on proposed new reactors at the Darlington nuclear station.

The Darlington nuclear station was not designed to withstand terrorist attacks. Extending its operational life will create continual terrorist risks to the people of Ontario and the Great Lakes Basin for decades to come. Given the significance of terrorism risks in post-September 11th world it is unacceptable that an environmental review not public consider such risks and how to mitigate their consequences.

Greenpeace along with other organizations raised the issue of terrorism risks in our July 12th letter to CNSC President Michael Binder. We have received no acknowledgement of concerns or how they will be addressed.

Request: Greenpeace request that terrorist events be considered within the scope of the environmental review.

Request: Because of this significant oversight, Greenpeace requests that a full hearing of the Commission with public participation take place to how terrorism issues will be addressed within the environmental review.

3.4 Information Disclosure – OPG and CNSC Correspondence

Request: Greenpeace requests that CEAA and the CNSC address and rectify the barriers to information disclosure that undermined public transparency and participation in previous reactor refurbishment reviews.

During the environmental and safety review of the Pickering refurbishment and life-extension review, OPG informed CNSC staff that public stakeholders would be required to use provincial Freedom of Information (FOI) to access any correspondence or submissions made by OPG to CNSC staff. If permitted during the proposed review, this will be a significant barrier to transparency and public participation.

Given the CNSC regularly uses OPG’s safety studies to ‘bound’ the scope of environmental reviews, the lack of access to such information will undermine the credibility of the review.

Greenpeace would also like to highlight that the public interest is better served if safety information is pro-actively released. During the review of the Pickering refurbishment and life-extension project, Greenpeace acquired correspondence showing that OPG had excluded ‘external events’, which are a major contributor to the risk posed by a nuclear station as seen by the Fukushima disaster, from risk assessments used to justify the safety of the station.

Greenpeace publicly identified this as an issue of significant concern. This forced CNSC staff to admit that an accident category – referred to as EPRC-5 – was a ‘credible’ accident for environmental assessment purposes. It was thus included within the scope of the environmental assessment.
The EPRC-5 accident scenario involved radioactive releases that would trigger evacuations or sheltering in a 10 km area around Pickering station. Its inclusion caused significant changes to the final OPG’s Environmental Impact Statement.

It was only included within the environmental review, however, because Greenpeace devoted a significant amount of time and resources in acquiring CNSC and OPG correspondence through federal Access to Information and provincial Freedom of Information requests.

Greenpeace submits that access to CNSC and proponent correspondence is essential to a more arms-length relationship between the CNSC and the proponent. As demonstrated with the Pickering review, more public disclosure will lead to more rigorous and appropriate environment reviews.

Request: Greenpeace requests that the CNSC and CEAA require the proponent and CNSC to create a registry and proactively release all correspondence between the proponent and responsible authority staff for the environmental and safety reviews for the project.

3.5 Accidents: Adverse Economic Effects

Request: Greenpeace requests that OPG be required to calculate the adverse economic effects of accidents included within the environmental review.

As noted, CNSC staff and OPG were forced to include an accident scenario within the scope of the Pickering B refurbishment and life-extension review after Greenpeace highlighted that OPG was underestimating the risk of the station. This ‘credible’ accident scenario included radiation releases that would trigger evacuations or sheltering in a 10 km area around Pickering B. Given the population density around the Pickering station, this accident scenario would expose a large population to radiation and/or evacuation.

Greenpeace and CNSC staff requested that OPG release an estimate of the economic costs of such an accident as part of its environmental impact report. OPG refused stating that it wasn’t required under the environmental assessment guidelines. A consultant hired by Greenpeace estimated this accident would cause $1.2 billion in health cost damages alone.5

Request: Greenpeace requests that the proponent be required to calculate the economic impact of all accident scenarios within the scope of the environment review.

3.6 Accidents: Earthquake Risks

Request: Greenpeace requests that the OPG and the CNSC proactively release the vulnerabilities of the existing Darlington station to earthquakes in the environmental review.

There is double standard in earthquake design-resistance being applied at the Darlington nuclear station. The new reactors OPG hopes to build at Darlington are to be designed to withstand movement of 0.3 G (peak ground acceleration), which approximates a magnitude 6 earthquake. The existing Darlington reactors, however, were only designed to

5 Dr. Gordon Thompson, The Nuclear Liability and Compensation Act: Is it appropriate for the 21st century, Institute for Security Studies, Commissioned by Greenpeace, November 2009
withstand 0.08% G, almost four times less than OPG deems necessary for its new plant on the same site.

### 3.7 Cumulative Accident Risk Analysis

**Request:** Greenpeace requests that the scope of the environmental review include an analysis of cumulative effects of multiple reactor accidents in the site study area.

Such an analysis will provide the public with a greater understanding of the possible environmental effects of the project and help determine if additional emergency planning measures are required.

In the July 12th letter to the CNSC, Greenpeace and other organizations highlighted the hazards the Darlington nuclear station’s multi-unit reactor design in light of the Fukushima disaster. Greenpeace is disappointed that the CNSC decided to dismiss these concerns.

It is noteworthy that the Joint Review Panel reviewing new reactors at the Darlington station has acknowledged the need for an analysis of cumulative effects analysis a multi-reactor accident scenario similar to Fukushima. The Joint Review Panel recommends:

> The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to evaluate the cumulative effect of a common-cause severe accident involving all of the nuclear reactors in the site study area to determine if further emergency planning measures are required.

**Recommendation # 63 (Section 8.1):**

**Request:** Greenpeace requests that the CNSC implement the Joint Review Panel’s recommendation for cumulative effects assessment of multiple simultaneous reactor accidents by including it within the scope of the Darlington refurbishment environmental review.

### 3.8 Emergency Planning

**Request:** Greenpeace requests that the review consider the adequacy of emergency planning for the Darlington station and whether restrictions need to be placed on population growth around the station.

This request is supported by a recommendations made by the Joint Review Panel that reviewed building new reactors at the Darlington site, which stated:

> The Panel recommends that the Canadian Nuclear Safety Commission engage appropriate stakeholders, including OPG, Emergency Management Ontario, municipal governments and the Government of Ontario to develop a policy for land use around nuclear generating stations. **Recommendation # 43 (Section 6.2)**
4. Radioactive Waste

The refurbishment of the Darlington nuclear station will cause significant adverse environmental effects through the production of long-lived radioactive wastes. The imposition of such hazardous wastes on future generations violates the Polluter-Pays principles. Aside from contravening Canadian law, Greenpeace submits that the production of such waste is simply unethical.

**Request:** The environmental review should include a detailed and comprehensive description of low, medium, and high-level wastes created by the refurbishment, operation and decommissioning of the Darlington reactors.

OPG generally asserts that the long term management of long-lived radioactive fuel waste will be transferred to the Nuclear Waste Management Organization (NWMO). It also argues that medium level waste will be transferred to another facility.

The Joint Review Panel reviewing new reactors at Darlington, however, has admitted that there is a risk that these waste management options are not implemented and this possibility must be addressed. It made the following recommendations:

The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to make provisions for on-site storage of all used fuel for the duration of the Project, in the event that a suitable off-site solution for the long-term management for used fuel waste is not found. **Recommendation # 52 (Section 6.8):**

The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to make provisions for on-site storage of all of low and intermediate-level radioactive waste for the duration of the Project, in the event that a suitable off-site solution for the long-term management for this waste is not approved. **Recommendation # 53 (Section 6.8):**

**Request:** Greenpeace requests that the environmental review assess scenarios where long-lived radioactive wastes are not transferred to other facilities and must be managed on site in the long-term.

**Request:** Greenpeace requests that the environmental assessment report provide an inventory of the long-lived radioactive waste produced by the refurbishment and life-extension of Darlington.

5. The Impact of Darlington on Lake Ontario

**Request:** Greenpeace requests that the proposed environmental review be upgraded to a Panel review, or at a minimum, a Comprehensive Study, in order to adequately address Darlington’s non-compliance with the *Fisheries Act.*

During public hearings on OPG’s proposal to build new reactors at the Darlington nuclear station, the Department of Fisheries admitted that the Darlington nuclear station violates the Fisheries Act. The Department of Fisheries stated during the hearings that:
At the moment the existing Darlington plant is not in compliance with the Fisheries Act for Section 32 of the Fisheries Act for the mortality of fish. They are not in compliance. They do not have an authorization for that.

The Darlington station is currently operating in violation of Canadian law. Greenpeace believes that the adverse environmental effects caused by the station’s operation, including fish impingement, entrainment and thermal pollution, are unacceptable.

If the CNSC believes that these adverse environmental effects can be justified or mitigated, it is incumbent on the Commission to upgrade the level of the review beyond the lowest-level of environmental review.

**Request:** The scope of the environmental review must consider best available technology to mitigate or eliminate the adverse environmental effects caused by the operation of the Darlington nuclear station, including thermal pollution as well as fish impingement and entrainment.