Sustainability at Sea:
A Study On The Integration of Environmentally Sustainable Initiatives from Canada's Defence Policy in the Arctic and Offshore Patrol Ships Project

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BACKGROUND

In 2015, the Government of Canada (GC) awarded Irving Shipbuilding Incorporated (ISI) a $2.6 billion dollar build contract for the development of six (now eight) Arctic and Offshore Patrol Ships (AOPS), marking the initiation of one of the most expensive defence projects in Canadian history[1]. The AOPS are a project under the National Shipbuilding Strategy, created to renew Canadian fleets and support Canada's marine industry[2]. The project is included in Canada's latest defence policy, "*Strong, Secure, Engaged"* (SSE), developed by the Trudeau Government[3]. In this Defence Policy, two initiatives and five sub-initiatives are outlined for addressing climate change[4].

This study seeks to understand how the contents of Canada's Defence Policy have been integrated into the Arctic and Offshore Patrol Ship project. It will contribute to existing literature that focuses on environmental sustainability as it relates to, and is included in the policies, procedures, and actions of Canada's Department of National Defence. This study also adds to discussions on the efficacy of Federal policy and will provide insight on the relationship between Canadian Defence operations and the goals of the Government of Canada, as they relate to environmental sustainability.

RESEARCH QUESTION

How have environmentally sustainable initiatives, as outlined in Canada's defence policy, "*Strong, Secure, Engaged,*" been integrated into the Arctic and Offshore Patrol Ships project?

LITERATURE REVIEW

- Both federal and departmental policy and strategy show a strong push from the Government of Canada to address the impacts of climate change in its operations.
- As government awareness of environmental issues has increased, awareness within shipbuilding has not.
- Environmental sustainability in relation to shipbuilding varies between nations, with European countries leading global industry and navies.

METHODS

The research question was investigated using a qualitative, instrumental case study.

Policy & Document Review:
A full review of policies and grey literature was conducted to identify the key environmentally sustainable initiatives and points of integration into the AOPS project. Results were thematically coded to highlight initiatives that were either highly integrated or absent.

Media Analysis:
An ongoing review of media was conducted from December 2020 to April 2021 to include any new or updated information presented by government, media, or industry organizations.

RESULTS

The document review indicates that none of the sub-initiatives, which focus primarily on infrastructure, vehicles, and construction, apply to the scope of the AOPS project; only the two main initiatives could be further researched

Initiatives	Findings
Reduce greenhouse gas emissions by 40% from the 2005 levels by 2030.	• Lack of specific findings.
Examine alternative energy options and their potential use for operations.	• The AOPS design includes a twin-screw, all-electric power and propulsion system; • The AOPS will be the first RCN vessel to be fully electric[5].

Literature & Documents
A 2012 Environmental Impact Assessment found that the AOPS project, considering its entire lifecycle, is unlikely to cause significant adverse environmental impacts[6]. The Impact Assessment Act was republished in 2019.

Academic and industry literature identifies several key methods used to increase the environmental sustainability of warships and commercials vessels[7]. None of which were found in the literature on the AOPS; with the exception of electric power and propulsion systems.

The majority of technical and progress reporting focuses on the AOPS Arctic capabilities and marine condition resilience.

Media
Data largely focuses on the economic impact of the AOPS project and NSS. Very little environmental or sustainability discussion has been held in the media.

Image: *Royal Canadian Navy*

DISCUSSION & CONCLUSION

The AOPS project meets all standard requirements of a warship of it's intended purpose and operational capacity. It's engineering is innovative and considerate of the environment in comparison to previous Canadian vessels. The use of electric power and propulsion systems contribute to both of the key environmentally sustainable initiatives outlined in SSE, and show a moderate integration of it's contents.

However, it ultimately cannot be determined that environmentally sustainability initiatives were meaningfully integrated into the AOPS project. While naval assets and needs vary widely from nation to nation, available literature shows that greenhouse gas emissions and alternative energy can be integrated at a higher degree than the AOPS project affords.

Rather, the results of this study identify a project focused on economic and operational sustainability. These key themes strongly align with other priorities in Canada's defence policy that relate to investment in military capabilities, capacity building, innovation, and responsible funding in Canada's Armed Forces. The lack of integration of these environmentally sustainable initiatives into the project may be due to the project's timing.

RECOMMENDATIONS

Future study topic suggestions include:

- Analysis of the integration of SSE into Defence projects undertaken after 2017. The last two AOPS, being built on behalf of the Canadian Coast Guard, may provide a good case.
- Comparison between modern Canadian and international navy warship designs, with specific focus on environmentally sustainable engineering and design.
- Time-series analysis of all Canadian warships to identify possible industry challenges in relation to environmental sustainability.

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