

# Summary of Economic Benefits Linked to Adaptive Phased Management at an Economic Region Level

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AECOM Canada Ltd.

**nwmo**

NUCLEAR WASTE  
MANAGEMENT  
ORGANIZATION

SOCIÉTÉ DE GESTION  
DES DÉCHETS  
NUCLÉAIRES



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## **Nuclear Waste Management Organization**

The Nuclear Waste Management Organization (NWMO) was established in 2002 by Ontario Power Generation Inc., Hydro- Québec and New Brunswick Power Corporation in accordance with the *Nuclear Fuel Waste Act (NFWA)* to assume responsibility for the long-term management of Canada's used nuclear fuel.

NWMO's first mandate was to study options for the long-term management of used nuclear fuel. On June 14, 2007, the Government of Canada selected the NWMO's recommendation for Adaptive Phased Management (APM). The NWMO now has the mandate to implement the Government's decision.

Technically, Adaptive Phased Management (APM) has as its end-point the isolation and containment of used nuclear fuel in a deep repository constructed in a suitable rock formation. Collaboration, continuous learning and adaptability will underpin our implementation of the plan which will unfold over many decades, subject to extensive oversight and regulatory approvals.

## **NWMO Social Research**

The objective of the social research program is to assist the NWMO, and interested citizens and organizations, in exploring and understanding the social issues and concerns associated with the implementation of Adaptive Phased Management. The program is also intended to support the adoption of appropriate processes and techniques to engage potentially affected citizens in decision-making.

The social research program is intended to be a support to NWMO's ongoing dialogue and collaboration activities, including work to engage potentially affected citizens in near term visioning of the implementation process going forward, long term visioning and the development of decision-making processes to be used into the future. The program includes work to learn from the experience of others through examination of case studies and conversation with those involved in similar processes both in Canada and abroad. NWMO's social research is expected to engage a wide variety of specialists and explore a variety of perspectives on key issues of concern. The nature and conduct of this work is expected to change over time, as best practices evolve and as interested citizens and organizations identify the issues of most interest and concern throughout the implementation of Adaptive Phased Management.

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## Introduction

This document is a brief summary of the possible economic benefits derived from the implementation of the Adaptive Phased Management (APM) program for used nuclear fuel in Canada. The data and information for this summary is drawn from the analysis conducted for NWMO in 2005<sup>1</sup> in support of the final report to the federal government recommending APM (*Choosing a Way Forward*<sup>2</sup>).

This summary report draws on economic impact results developed for several representative Economic Regions<sup>3</sup> in Canada. This data represents the “order of magnitude” impact on employment, income and local municipal taxes from the expenditure of \$16 to \$24 billion for APM over the course of the project.

Canada comprises 76 Economic Regions. Each region is generally large in area and contains many individual communities and a variety of natural, economic and social resources. The original economic impact assessment was conducted using four representative (or sample) economic regions to provide an illustration of the possible range and magnitude of economic effects derived from the APM project. These economic regions were selected to broadly represent the spectrum of communities in Canada, varying by population density, demographics, environment (terrestrial ecozone and drainage), transportation distance from used fuel sources, and economic base.

Results of the economic benefit assessment presented in 2005 have been summarized here as an average of these four Economic Regions. Although the analysis reflects the possible economic effects at an economic region level it does not provide detail about how an individual host community (that resides in one of these economic regions) might be affected. This more in-depth assessment is to be conducted.

For the purpose of this analysis, it is assumed that the project would proceed in an expeditious manner as reflected in assumed dates for which siting, construction, and operations phases of the project would be initiated. The actual timing of these phases will be determined in consultation with the host community, potentially affected parties and regulatory authorities.

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<sup>1</sup> Golder Associates and Gartner Lee Limited, 2005. Assessment of Benefits, Risks and Costs of Management Approaches for Used Nuclear Fuel by Illustrative Economic Region. A technical report prepared for the NWMO. February 2005. Gartner Lee has since become AECOM.

<sup>2</sup> This report can be found on the NWMO website at [www.nwmo.ca](http://www.nwmo.ca)

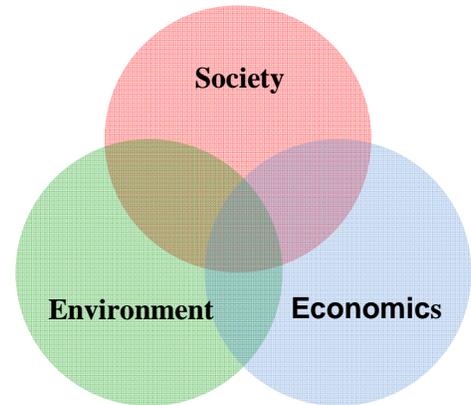
<sup>3</sup> The term “Economic Region” is defined by Statistics Canada. It is a geographical unit generally composed of several census divisions within a province. In the case of Prince Edward Island, the province constitutes one economic region.

## Linking Community Well-Being and Economic Benefits

The Adaptive Phased Management (APM) approach to managing used nuclear fuel for the long term involves significant investment over many decades to prepare and develop a suitable site in a host community and region. This overall investment is currently estimated in the range of \$16 to \$24 billion and for illustrative purposes is expected to be implemented in two phases as follows:

1. Siting and Construction; Years 1 to 30
2. Operation and Maintenance; Years 31 +

Fundamental to enhanced community well-being is the ability to maintain and protect the environment, and enable social values to prosper while creating economic opportunities for growth. All three pillars of sustainable development are important. However, this document provides a summary of the economic effects of the proposed APM project. The discussion of economic benefit starts with employment opportunities within an economic region and is then followed with an overview of income/wealth creation possibilities.



## Expected Economic Benefits to a Host Region and Community

The APM project will employ a diverse range of skilled and semi-skilled people on site during construction and operations, currently estimated to be 600 to 800 workers per year. In addition, others will be employed by product and service companies who directly provide goods and services to the project. Both sources of labour are referred to as the “direct labour”.

In addition to the above, many other people will be employed in the local community to provide support products and services such as; food catering, accomodation, transportation, and equipment. This type of labour is referred to as “indirect labour”. In other words they will be employed indirectly, through others, primarily because of the APM project.

**Numerous employment opportunities will be provided directly in association with construction and operations and indirectly in surrounding communities to support all aspects of the project over a long time period.**

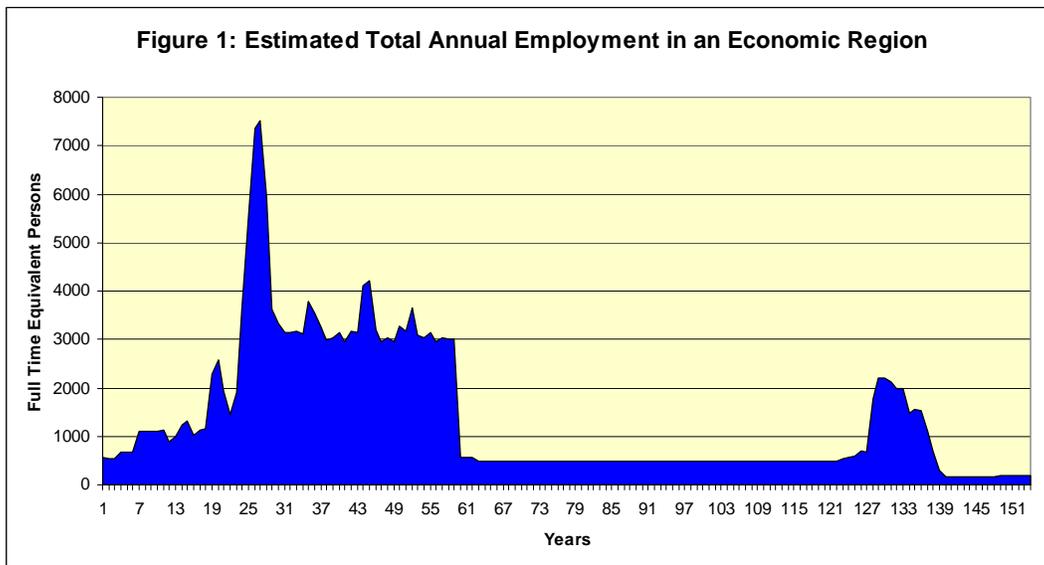
As the direct and indirect employees make expenditures for consumer goods, such as housing, food, clothing and entertainment, a portion of these expenditures will be made in the local host community(s) ultimately creating “induced” demand for more labour in these and other service industries.

Together, all three levels of employment (direct, indirect and induced) are estimated to rise significantly within an economic region, peaking at some 7,500 people during the height of construction in years 25 to 30, until used fuel is expected to be in place within the APM facility. Preliminary annual employment projections within an economic region will vary over the course of the project ranging from about 500 to 1,000 people during site establishment to about 3,000 people per year over the course of about 40 years during facility operations<sup>4</sup>.

What is most interesting about the expected employment profile depicted in Figure 1 is both the magnitude and duration of employment opportunities associated with this APM project. In short, there will be thousands of new jobs created within the host economic region that will be sustained for over 50 years, followed by long-term employment for monitoring and management until the next phase of facility management with its earliest possible date in year 140.

**A large portion of new employment will stay within the host economic region and community.**

Further analysis indicates that of the total employment opportunities created by this project, between 70% and 80% of the new jobs stay within the host province. More important, between 50% to 70% of all new jobs will stay within the host economic region. It stands to reason that a particular host community(s) within this “representative” economic region will be the focal point for much of this new employment opportunity.



Wealth creation in the host economic region and community(s) will be derived from a combination of local business profits as well as employment income. New sources of income will vary throughout each phase of the project, ranging from \$50 million to \$150 million per year during site preparation, to \$150 to \$350 million

<sup>4</sup> It is possible that the duration of the operations phase may be longer, depending on the final volume of used fuel to be managed. In that case, the operations employment level of some 3000 full-time persons, depicted in Figure 1, could be extended

during construction, and stabilizing at about \$150 million per year during operations and management for the next 40 years. Long term monitoring and facility management plans will continue to provide income to local business and employees for an extended period of time estimated at some \$25 million per year. Together, all of these activities within the host community and region will generate billions of dollars of economic benefit over the course of the project.

In addition to this, the host community and region will benefit from having a larger, more diverse, and more balanced tax base. Together, this new wealth can be a catalyst for sustainable community well-being as it provides a long-term and stable resource for investment in new community infrastructure and social networks. In general, some of these investments typically include;

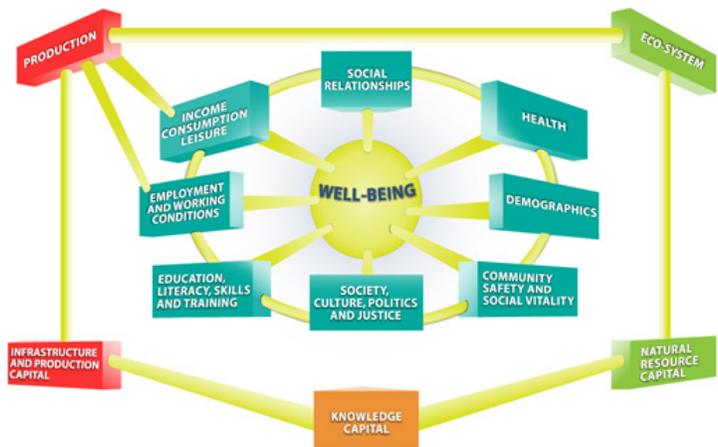
- Transportation (regional and local roads, rail and air),
- Education,
- Municipal services (water, waste, health, social services, etc.)
- Skills development and training,
- Recreational facilities, and
- Opportunities for innovation and new business/social ventures.

**Significant income and wealth is created both in the host economic region and community(s). This provides a valuable resource for new investment in various community assets.**

## Enhancing Community Well-Being

In many communities across Canada that have been host to large development projects of this nature, the project owner has become an important and active community member. Not only does the project owner sponsor community events, but their employees volunteer in community programs and organizations. The overall well-being of the community becomes an equally important objective for both the project owner and the host community.

NWMO has made a commitment to enhancing the well-being of the host community for the APM project. This commitment goes beyond employment and wealth creation opportunities. It is about helping to ensure the long-term sustainability of the community, while recognizing that this relies on contributing to the social, physical, environmental, financial and human assets of the community.



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## ***Factors That Influence Community Benefits***

The actual level and nature of benefits that any one community might realize will be influenced by a number of factors such as, but not limited, to the following:

1. Geographic location,
2. Population size, characteristics and dynamics,
3. Availability and composition of labour, supporting businesses and industry,
4. State of supporting infrastructure and services, and
5. The vision, goals and objectives of the host community.

Projects of the nature and scale described above provide a unique opportunity for a host community, economic region, and province. The wealth created in the host community provides a valuable source of funding for investment in the human, social, physical, and environmental capital or assets that define a community and its future sustainability. The degree to which any host community might enhance its long-term community well-being, using the APM project as a catalyst, will vary according to the vision and commitment of the host community.