

# Centre for Canadian Nuclear Sustainability

Sept 15, 2020



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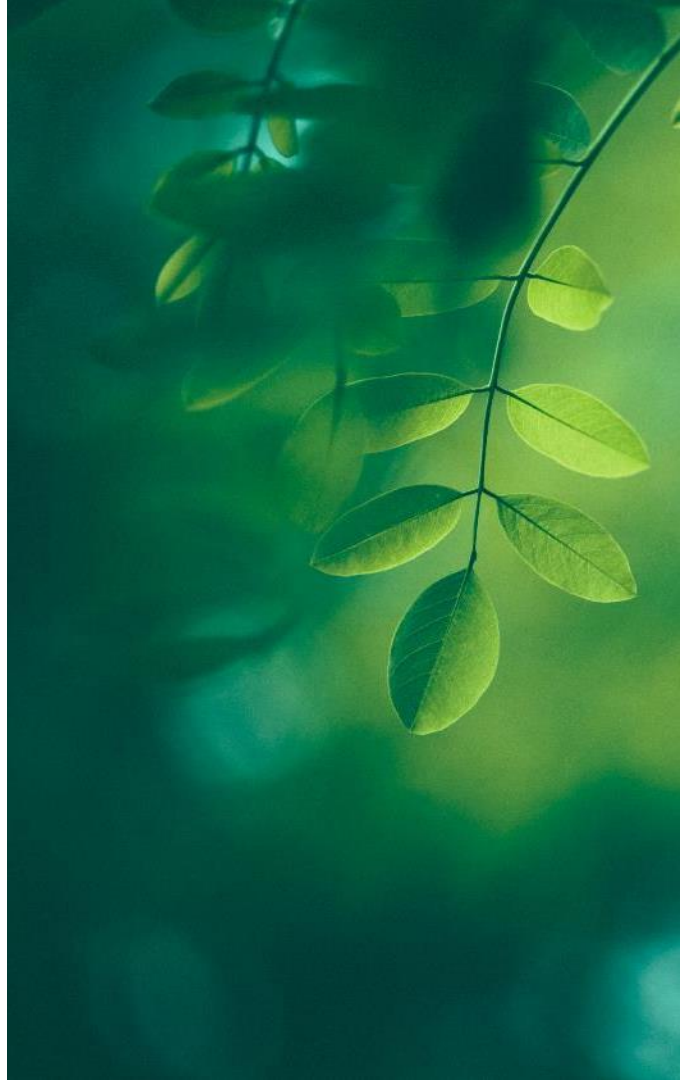


# Sustaining the Clean Energy Lifecycle

The nuclear generation lifecycle includes multiple decades of clean energy production before it enters its final decommissioning phase.

This phase includes decontamination, reactor station dismantlement, potential nuclear material storage, and site remediation.

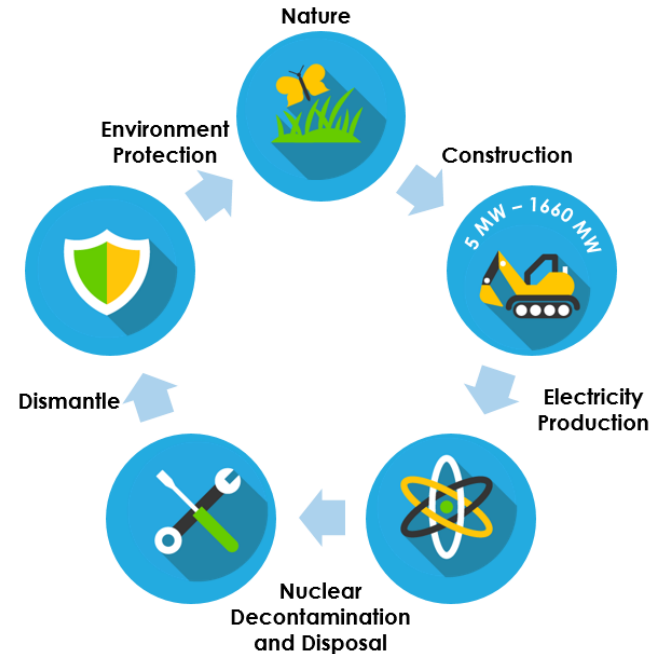
Successful solution of the lifecycle supports the development and deployment of future nuclear generation options, such as Small Modular Reactors to support a low-carbon future for Ontario and the world.



# Sustaining the Clean Energy Lifecycle

## Ontario Power Generation (OPG) is proud to launch the Centre for Canadian Nuclear Sustainability (CCNS)

- CCNS will support Pickering Nuclear Station as it nears the end of commercial operations,
- Advance solutions for minimizing nuclear materials and recycling clean materials;
- Focus on developing sustainable solutions for the industry, environment, community and the Ontario ratepayer.



# The Centre's Mandate

***To advance collaboration and research in nuclear material management and CANDU reactor dismantlement by identifying new and innovative solutions.***

The Centre will operate as a hub that will:

- ✓ **LEAD** the safe, cost effective, environmentally and socially responsible decommissioning of OPG's nuclear legacy
- ✓ **FOCUS** on strategic and innovative solutions for decontamination, dismantling, site remediation and nuclear material management
- ✓ **MOBILIZE** research and development efforts across academia
- ✓ **ALIGN** the nuclear supply chain to advance technologies required with a focus on economic stimulus for Ontario
- ✓ **COLLABORATE** with industry, community, academia and other stakeholders for the creation of best practices for CANDU decommissioning

# CCNS – Four Pillars

To achieve the CCNS Mandate the center will be focused around four pillars:

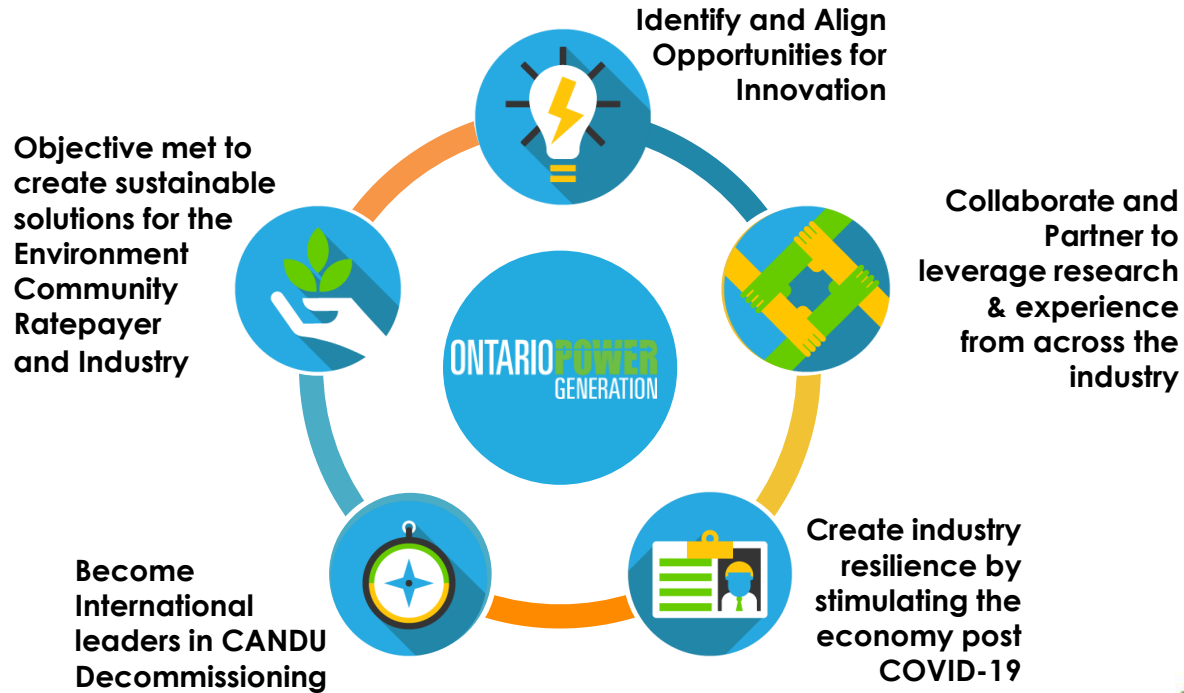
- **Environment**
  - ❖ Leading First of a Kind CANDU Decommissioning in a safe, cost effective, environmentally and socially responsible
- **Economy**
  - ❖ Prepare and advance technologies and projects with a focus on economic stimulus
  - ❖ Increase opportunities for skilled jobs in our solutions
- **Community**
  - ❖ Information hub (all invited to visit and learn what's new at the CCNS)
  - ❖ Outreach on the approach to repurpose the land
- **Industry**
  - ❖ Academia & Government (collaborative research and development)
  - ❖ External Companies & Nuclear Vendors (join forces on strategic and innovative solutions)
  - ❖ Operating Experience (work together for the advancement of comprehensive solutions and the creation of best practices for CANDU decommissioning)

# Supporting OPG's Decommissioning Strategy

- The CCNS initiative will help coordinate innovation solutions for OPG in managing and reducing nuclear materials (including from refurbishment of Darlington and Bruce sites)
- The CCNS will address Canadian Nuclear Safety Commission (CNSC) regulatory considerations for nuclear materials management and long-term solutions
- The CCNS will create employment opportunities in Ontario and other economic spin-offs for the supply chain
- Potential for the CCNS to position Ontario and Canada as a world leader in CANDU nuclear decommissioning technology and services



# How the Centre Works



# Collaboration and Partnership

**As the owner of the largest CANDU reactor fleet in Canada, OPG has the unique ability to harness its strong foundation and consolidate the many activities and stakeholders to provide sustainable solutions.**

- In addition to looking for innovative partnerships with post-secondary, nuclear industry and vendor partners, OPG will form partnerships with community stakeholders, local businesses, organizations, Indigenous communities, skilled trades and the general public.
- OPG's goal of transparency will be achieved through information sharing, collaboration and partnership with multiple key stakeholders in the planning of the decommissioning of the Pickering Nuclear Station and the eventual repurposing of the lands.



**Énergie NB Power**



# Identify and Align Innovation

**CCNS will identify and launch research and development opportunities by collaborating and forming partnerships with industry, government, academia and wider global leading entities.**

To enable continuous innovation within the nuclear industry's decommissioning and nuclear material programs, the CCNS will build upon OPG's current innovation investments and act as an innovation hub to identify and evaluate further opportunities for innovative solutions.



Engage with various sources to obtain ideas/ opex/ inputs



Feasibility & Cost-benefit assessment; Prioritization



Implementation planning into a roadmap





# Creating Economic and Industry Resilience

**To create economic resilience for the Canadian economy and support new nuclear opportunities, the CCNS will coordinate the assessment of launching specific CANDU decommissioning and nuclear material management capital intensive projects.**

Opportunities will be evaluated on benefits to economy, in particular on impact to increasing the need for human capital, innovation and nuclear sustainability. If projects get launched including R&D activities, this could create a significant number of jobs.



## Potential Projects

1. Investments in solutions to achieve fuel bay emptying post shutdown at Pickering.
2. Further enhancing waste sorting and minimization efforts with respect to materials currently in storage.
3. Dismantling and remediating conventional Pickering Station assets.
4. Decontaminate and dismantle Pickering's non-operational contaminated facilities and structures.
5. Deep Detritiation of CANDU heavy water (D2O).
6. Increased research and development investments in nuclear decommissioning and waste solutions.
7. Advanced manufacturing concepts - remote robotic development for characterization, cleaning, dismantling activities.
8. Processing and Removal of Pickering's Retube Project's pressure tubes.
9. Diversion of metallic components from the low level waste stream through metal melt technology.

# Leadership in CANDU Decommissioning

**The CCNS will become one of the few worldwide organizations focused on CANDU decommissioning and nuclear material solutions.**

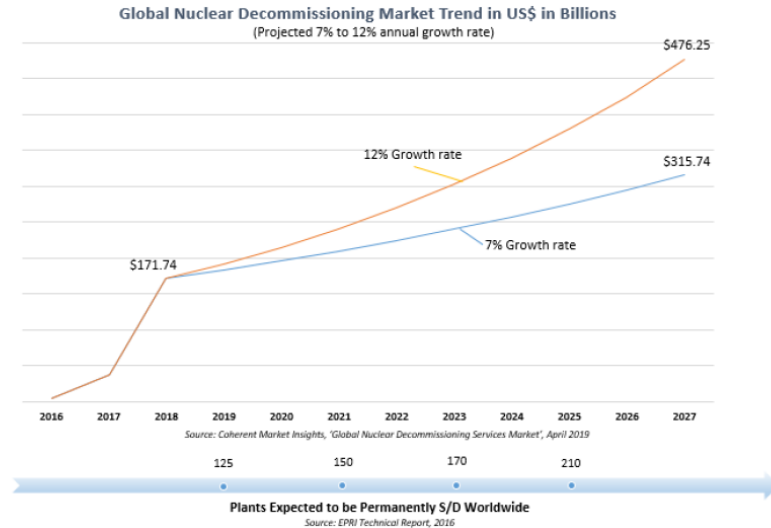
The CCNS will leverage Canadian and Ontario talents and competencies with the objective of successfully planning and completing this unique and complex phase in the nuclear lifecycle,



# Leadership in CANDU Decommissioning

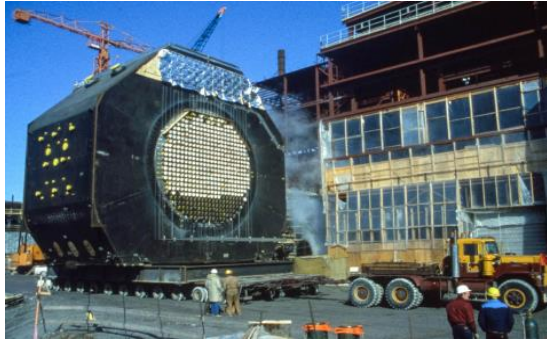
- Work undertaken by the Centre will significantly advance export potential for OPG, Ontario's nuclear supply chain, its skilled workforce and establish Ontario as a world leader in this highly specialized industry.

## Increasing Nuclear Plant Closures and Decommissioning Market



# What's Happening at the CCNS

Open to the Public to  
learn more about the  
Centre



Roundtable  
Collaborative R&D  
Sessions



Hosting Events



Pod-Casts – Coffee Chats  
with Senior Leadership



Technology  
Demos

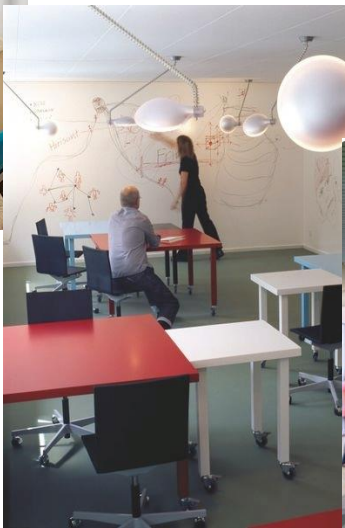
WORKSHOPS

# CCNS Imagined...



Modular furniture  
with whiteboard  
walls

Tech-enabled meeting  
space with large TV to  
project laptops



fresh paint  
colors to define  
the space



movable  
whiteboards &  
stationary supplies

# Creating A Collaborative Space

CCNS Space will meet the Key criteria as defined with a target Opening Date of Fall 2020:

## Innovation Environment

- Large multi-purpose common room for collaboration and events

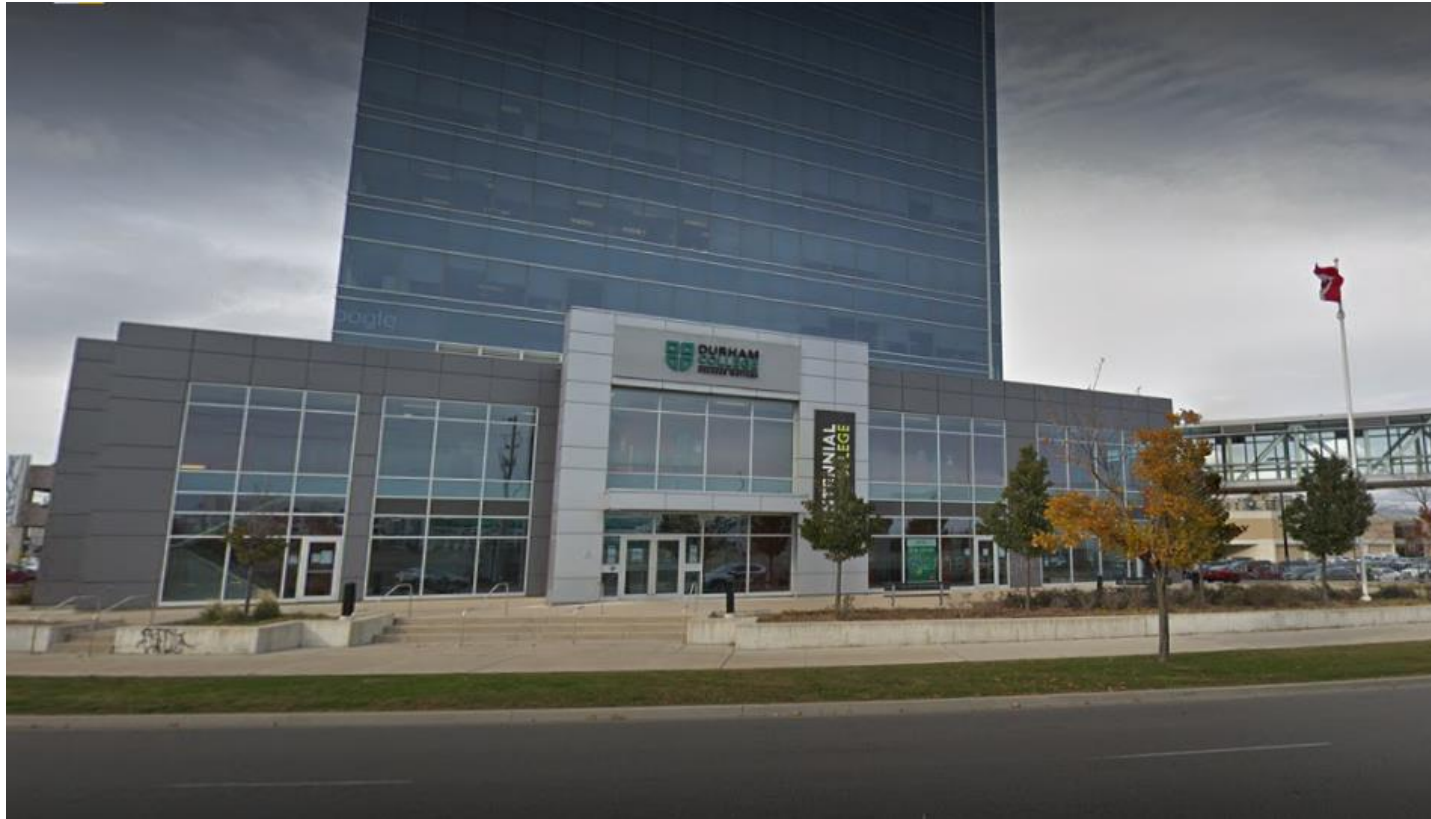
## Location & Available Space

- 10,156 ft<sup>2</sup> available space for all CCNS members
- Easily accessible (Transit or Car)
- Amenities in close proximity
- Highly Visible/ High Traffic

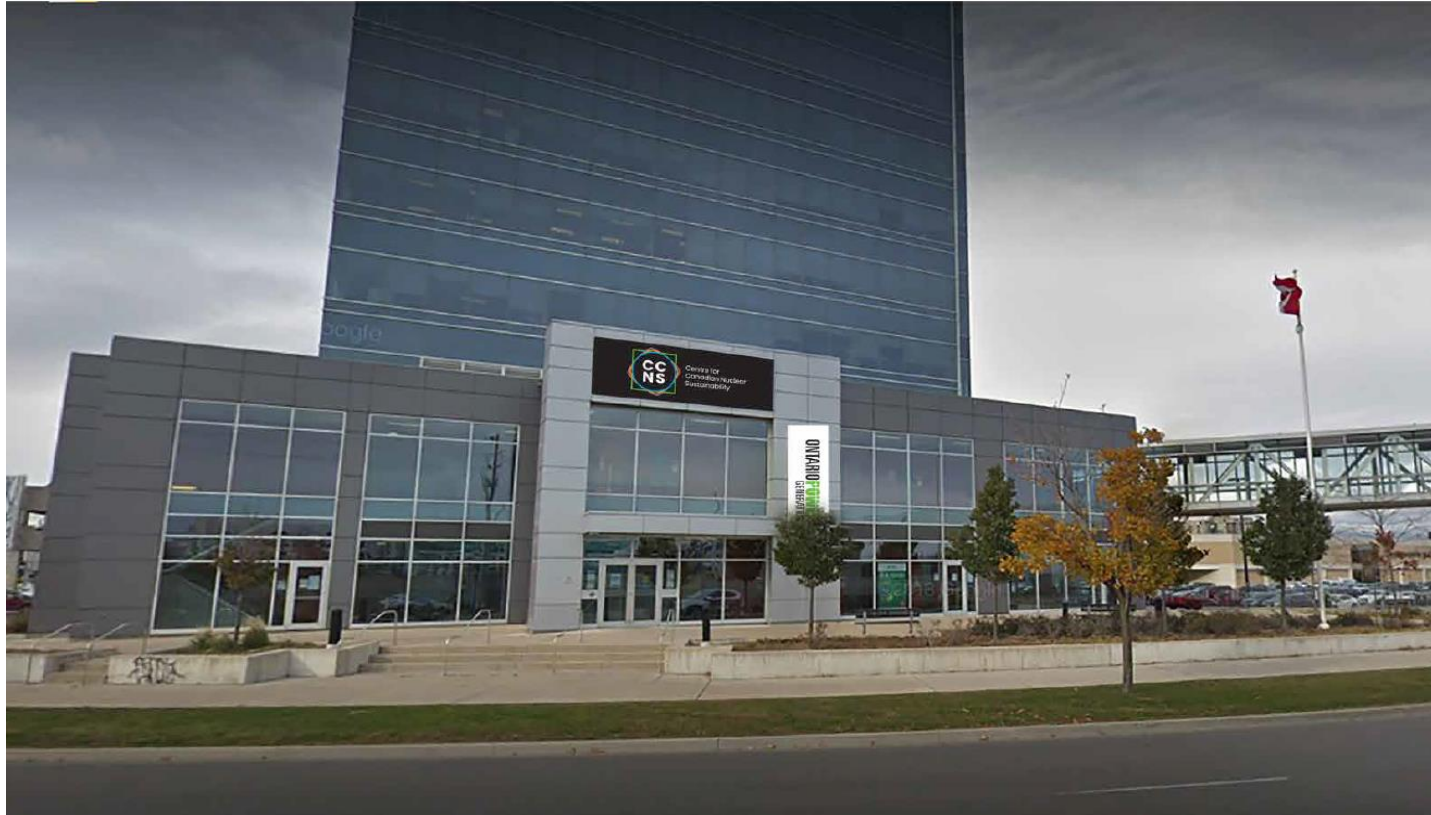
## General Public Welcome Area


- Information area
- Common Lounge area (can also be utilized for networking events/ meetings)

# CCNS Location Before...




# CCNS Location Future...





*“Durham Region is proud to be the Clean Energy Capital of Canada. It is home to some of the strongest energy and engineering businesses in Canada, including OPG,” **said John Henry, Chair, Region of Durham.** “We are excited about OPG’s Centre for Canadian Nuclear Sustainability which will no doubt create jobs and attract new suppliers and businesses to the Region and allow for continued collaboration with our post-secondary institutions, businesses and local stakeholders. OPG has been a vital part of the Region for many years and we look forward to a bright future.”*

*“The City of Pickering has valued OPG’s safe and reliable operations in our community for many years,” **said Deputy Mayor Kevin Ashe, City of Pickering.** “Now, as they launch the Centre for Canadian Nuclear Sustainability, we look forward to working together to attract new suppliers and business to the City and find new opportunities for economic development. The Pickering Nuclear Generating Station will be one of the first CANDU reactors in the world to be decommissioned, and we are excited to be a part of this new centre.”*



*“We celebrate the launch of the new Centre for Canadian Nuclear Sustainability, a hub for innovative nuclear solutions that will support Pickering Nuclear Generating Station’s decommissioning process and create immediate opportunities for economic development in the region,”* **said Greg Rickford, Minister of Energy, Northern Development and Mines.** *“OPG’s Pickering Nuclear Generating Station has been providing Ontario with safe and reliable nuclear power for decades. We’re fortunate to be home to world-class facilities like this in Ontario.”*

*“The Pickering Generating Station is world-class facility so it is only fitting that OPG leverages its years of expertise to create a centre that will support research, collaboration and innovation within the nuclear sector while also attracting jobs and strengthening the economy, right here in our community,”* **said Peter Bethlenfalvy, President of the Treasury Board and MPP for Pickering-Uxbridge.**



**Thank you.**