



June 10, 2022

VIA RESS

Ontario Energy Board
P.O. Box 2319,
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4
Attention: Registrar

Dear Ms. Marconi,

**Re: Enbridge Gas Inc. ("EGI")
Dawn to Corunna Replacement Project
Board File Number: EB-2022-0086**

We are counsel to Chippewas of Kettle and Stony Point First Nation, together with Southwind Corporate Development Inc. ("**CKSPFN**") in the above-noted proceeding. Please find enclosed the interrogatories of CKSPFN to EGI., pursuant to Procedural Order No.1.

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel Vollmer".

DT Vollmer

c. Tania Persad, EGI
Adam Stiers, Manager, Regulatory Applications, EGI
Charles Keizer, Torys LLP
Philip Lee, CKSPFN
Don Richardson

Encl.

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, Sched. B, as amended (the “**Act**”);

AND IN THE MATTER OF an Application by Enbridge Gas Inc. (“**EGI**”) for an Order or Orders granting leave to construct natural gas pipelines and ancillary facilities from the Township of Dawn-Euphemia to St. Clair Township;

AND IN THE MATTER OF an Application by EGI for an Order or Orders approving the proposed forms of agreements for Pipeline Easement and Options for Temporary Land Use (the “**Application**”).

EB-2022-0086

INTERROGATORIES

OF

**CHIPPEWAS OF KETTLE AND STONY POINT FIRST NATION WITH SOUTHWIND
CORPORATE DEVELOPMENT INC. (“CKSPFN”)**

June 10, 2022

Introduction

The Chippewas of Kettle and Stony Point First Nation together with Southwind Corporate Development Inc. (“**CKSPFN**”) are pleased to submit the following interrogatories to Enbridge Gas Inc. (“**EGI**”). CKSPFN continues to have outstanding concerns regarding the cumulative effects of EGI’s gas infrastructure across our territory and the very significant fugitive emissions that directly impact all our relatives through ground level ozone exposure.

CKSPFN notes that it submitted the below request for information to EGI via email on May 25, 2022, following discussion during a May 11, 2022 meeting with EGI. The request sought to provide clarity to EGI on CKSPFN’s outstanding concerns. These concerns are both universally applicable to recent projects (e.g., EB-2021-0078 and EB-2021-0248) and directly relevant to this proceeding, EB-2022-0086.

Excerpt from May 25, 2022 email:

“Fugitive Emissions

- A complete inventory of all methane and other greenhouse gases (“**fugitive emissions**”) emitted to the atmosphere through the entire Enbridge Gas Distribution system in CKSPFN Treaty territory, including transportation, underground storage, and above ground infrastructure (e.g., compressor stations and storage wells).
- A methodology explaining whether the inventory is based on modelling, or physical measurements.
- Please explain all assumptions made, including the fugitive leakage rate (%) and global warming potential factor used for methane.
- Please share Enbridge’s plan to reduce fugitive emissions across the Enbridge Gas Distribution system in CKSPFN Treaty territory.

Map

- A GIS shapefile of the entire Enbridge Gas Distribution system in CKSPFN Treaty territory, including transmission pipelines, distribution pipelines, gathering pipelines, production pipelines, and post metering, with large point sources of fugitive emissions clearly identified (e.g., compressor stations, storage wells, and other point sources).”

CKSPFN has not received a response to this request to-date.

As further background, please note that CKSPFN’s 2017 Water Assertion is attached at **Appendix A** to these interrogatories.

Question: 1-CKSPFN-1

- Reference:
- Exhibit B, Tab 1, Schedule 1, pp.1, 31
 - Exhibit B, Tab 1, Schedule 1, Attachment 2, Page 3 of 53

Preamble: EGI requests leave to construct approximately 20 km of NPS 36 pipeline from the Dawn Operations Centre (“**Dawn**”) in the Township of Dawn Euphemia to the Corunna Compressor Station in St. Clair Township (the “**Project**”). EGI notes in the Application that it is proposing to retire and abandon 7 reciprocating compressor units located within the Corunna Compressor Station (“**CCS**”) site. [p.1]

EGI’s conclusions regarding the purpose and need of the Project include, among others, EGI’s forecasted storage requirements based on its 2021 and 2022 Annual Gas Supply Plan Updates.

EGI notes that CCS has two main modes of operation: injection and withdrawal. “Injection operating mode takes gas from the two twin 30 NPS transmission pipelines from Dawn and flows the gas through CCS to the offsite storage pools. Withdrawal operating mode takes gas from the storage pool pipelines and flows through CCS into the transmission pipelines back to the Dawn facility.” [p.3]

- a) Please explain what “retire and abandon” means and provide a description of the process EGI proposes to undertake in relation to same.
- b) Please discuss EGI’s regional planning and gas supply and demand forecasts for Southwestern Ontario and indicate how the Project supports and is aligned with EGI’s service growth forecasts in the region.
- c) Please indicate whether the 7 compressor units at the CCS site are to be left in place as part of the Project. If yes, please discuss the potential and/or probable environmental or health impacts associated with leaving the compressors in place. If no, please provide details regarding the removal of the compressors.
- d) Has EGI considered non-pipeline alternatives, such as installing new compressors at the CCS?
- e) Please discuss whether new compressors could be powered electrically.
- f) Please indicate how the remaining four compressors will be powered.
- g) Please provide details regarding what will happen to the two pipelines currently running from Dawn to Corunna and indicate whether they will they still transport natural gas or whether they are to be abandoned and purged with nitrogen.

- h) If the two existing pipelines are no longer required, would EGI consider removing them from the right-of-way and re-purposing the right-of-way for the new Dawn to Corunna 36" pipeline?

- i) Please indicate whether EGI has or will consider equity participation of First Nations, including CKSPFN, in relation to the Project. If yes, please discuss what equity participation means to EGI and how First Nations may participate. If no, please explain why not. Please provide all related policies, documents, presentations, or other written materials relating to same.

Question: 4-CKSPFN-2

- Reference:
- Dawn – Corunna Project: Environmental Report - FINAL REPORT - Prepared by: Stantec Consulting Ltd., September 21, 2021 (the “**Environmental Report**”)
 - Ontario Energy Board: Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (the “**Environmental Guidelines**”)
 - Exhibit F, Tab 1, Schedule 1, Attachment 3, p. 6

Preamble: The Environmental Guidelines state at Section 4.3.14 Cumulative Effects that “[i]n many situations, individual projects produce impacts that are insignificant. However, when these are combined with the impacts of other existing or approved projects, they become important.” Further, the Environmental Guidelines state: “[p]articular attention should be paid to environments of known sensitivity and high eco-value (as defined by provincial policies and public input), to situations where opportunities exist to remedy past negative impacts, and to situations in which a combination of actions may result in identifiable environmental impacts that are different from the impacts of the actions by themselves”. The Environmental Guidelines also indicate that, “[c]umulative impacts may result from pipeline projects which loop existing systems and should be addressed. This may include an examination of areas of known soil erosion, soil compaction or soil productivity problems. It may mean the examination of impacts associated with continued loss of hedgerows and woodlots in the same area. As well, it could mean the increased loss of enjoyment of property because of disruptions caused by the construction of successive pipelines on a landowner's property. There may also be heightened sensitivities as a result of improper or ineffective practices and mitigation measures in the past.”

CKSPFN has identified the proposed project area as an area of known sensitivity and high cultural and ecological importance to the First Nation. CKSPFN has made several requests to EGI via interrogatories and written submissions in OEB proceedings including the 2022 Storage Enhancement Project (EB-2021-0078) and Coveny and Kimball Colinville Well Drilling Project (EB-2021-0248). CKSPFN has also met virtually and in person with EGI representatives, highlighting the issue of cumulative effects and a desire to better understand current and future EGI infrastructure across CKSPFN territory. The cumulative effects issue was also raised by Aamjiwnaang First Nation (“**AFN**”) in their November 16, 2021, comments to EGI.

The Environmental Guidelines clearly outline the approach to Cumulative Effects Assessment:

“The first step in assessing cumulative effects is to define appropriate study area boundaries. It is critical not to restrict the study area to a proposed pipeline easement and temporary work areas. The applicant is required to

consider four distinctive cumulative effects pathways when delineating the study area and analyzing and assessing the cumulative effects:

1. additive effects of pipeline construction occurring slowly over time (e.g. erosion of the easement due to inadequate grading);
2. interactive or magnifying effects from pipeline construction (e.g. soil fertility loss and soil drainage degradation due to compaction during construction);
3. additive effects of pipeline construction and other existing and future projects in the area (e.g. additive forest cover losses due to tree clearing for pipeline construction and subdivision development);
4. interaction of pipeline construction with other existing and future projects in the area (e.g. cold stream fish habitat degradation, as an interactive effect of increased erosion and sedimentation due to pipeline stream crossing and floodplain development downstream).”
[p.47]

EGL has repeatedly held that 100m is a sufficient boundary to assess cumulative effects. CKSPFN has repeatedly rejected the idea that a 100m boundary around proposed project locations is appropriate. 100m is an arbitrary boundary of which natural ecosystems and all living relatives do not know the borders. We have raised this issue in previous OEB filings, without an appropriate remedy. CKSPFN notes that nowhere in the Environmental Guidelines does the OEB state that 100m is an appropriate boundary for cumulative effects assessment.

In EGL’s reply submission to CKSPFN comments on the 2022 Storage Enhancement Project (Filed: 2022-02-25, EB-2021-0078, p.9), EGL stated, “Enbridge Gas is committed to engaging with CKSPFN regarding cumulative effects to better understand how CKSPFN’s Aboriginal or Treaty rights may be impacted by EGL’s ongoing development and operations in the Project area, how the Project may further contribute to this impact and what may be done to avoid, offset or minimize the impact.”

In EGL’s reply submission to CKSPFN interrogatories on the Coveny and Kimball-Colinville Well Drilling Project (EB-2021-0248), EGL responded to our outstanding cumulative effects concerns by once again writing, “Enbridge Gas is committed to engaging with CKSPFN regarding cumulative effects to better understand how CKSPFN’s Aboriginal or Treaty rights may be impacted by Enbridge Gas’s ongoing development and operations in the Project area, how the Project may further contribute to this impact and what may be done to avoid, offset or minimize the impact.” EGL then added, “Enbridge Gas would like to have a discussion with CKSPFN to determine funding requirements for a study of this nature. While the Company commits

to further engagement with CKSPFN regarding this matter, Enbridge Gas maintains that it has appropriately followed the Guidelines for this Project.”

CKSPFN has clearly stated that it is extremely difficult for the First Nation to assess the cumulative effects of EGI activities on CKSPFN’s Aboriginal or Treaty Rights when projects are filed and assessed on a piecemeal basis. To truly assess cumulative effects in our territory, CKSPFN must be able to consider the larger picture of existing and planned gas infrastructure and the residential, commercial, and industrial development that may be enabled by expanded gas services in the region.

- a) Please outline what steps EGI has taken to address CKSPFN’s outstanding concerns about the cumulative effects of gas infrastructure and expansion across CKSPFN territory.

Please provide the instructions EGI provides to its environmental consultants for assessing cumulative effects for this Project; for other projects commenced or undertaken in the past three years in the Three Fires treaty territory.

- b) Please discuss whether EGI has considered all past, present, and future conditions in the cumulative effects assessment, including existing projects, the current project, and any future projects. Please note that p.28 of the Environmental Guidelines states that, “[c]umulative effects that may result from the interaction between the effects of the proposed project and the effects of other developments already in place or planned within or near the study area, are expected to be addressed.”
- c) Does EGI agree that non-provincially significant wetlands should be included in the Environmental Report methodology alongside “Provincially Significant Wetlands” and unevaluated wetlands? If not, please explain why not considering CKSPFN’s water assertion and the cultural significance of wetlands other than those deemed “Provincially Significant Wetlands”.
- d) Please indicate and provide details of whether EGI assessed the cumulative effects of the existing two natural gas pipelines running from the Dawn Hub to the Corunna Compressor Station and the expansion/brand new right-of-way for the Dawn to Corunna pipeline project.
- e) Please indicate and discuss whether EGI assessed the state of soil erosion, soil compaction or soil productivity problems at both the existing right-of-way and the preferred route right-of-way. If yes, did EGI also assess the cumulative effects of expanding the land taken up for pipeline right-of-way?
- f) Please indicate and discuss whether EGI assessed the cumulative effects associated with continued loss of hedgerows and woodlots in the Project area.

- g) Please indicate whether EGI considered the cumulative effects of multiple pipeline right-of-ways crossing the waters included in CKSPFN's 2017 Water Assertion (attached at **Appendix A**). If yes, please provide details and all related reports, presentations or other documents. If no, please explain why not.
- h) Please explain why Table 6.1: Project Inclusion List for Cumulative Effects (PDF p. 87 of the Environmental Report) does not consider any existing, currently under construction, or future projects being conducted by EGI.
- i) Section 6.1 of the Environment Report outlines methodology for the cumulative effects assessment. Please explain why accidents or emergency events were not considered in the cumulative effects assessment and discuss whether EGI believes that constructing numerous pipelines in close proximity to each other amplifies the risk of accidents and emergency events.
- j) Please provide all analysis performed by EGI (and all related documents) to determine that 100m is an appropriate boundary for cumulative effects assessment? If no such analysis was undertaken, please explain why not.
- k) Please explain how EGI considered each of the four distinctive cumulative effects pathways listed on PDF p. 47 of the Environmental Guidelines when delineating the cumulative effects study area of 100m.
- l) Please explain and provide details of how EGI considered each of the four distinctive cumulative effects pathways listed in the Environmental Guidelines when analyzing and assessing the cumulative effects of the proposed project.
- m) Please explain how EGI has made progress on its commitment to "engag[e] with CKSPFN regarding cumulative effects to better understand how CKSPFN's Aboriginal or Treaty rights may be impacted by Enbridge Gas's ongoing development and operations in the Project area, how the Project may further contribute to this impact and what may be done to avoid, offset or minimize the impact". Although this commitment was made during EB-2021-0078 and again at EB-2021-0248, please explain how CKSPFN's outstanding concern regarding cumulative effects has been considered in EGI's evaluation of the Project and in the present Application.

Question: 4-CKSPFN-3

Reference: • Exhibit B, Tab 1, Schedule 1, pp.3-4

Preamble: EGI indicated in the Application that the Project will have negligible impacts on the environment and there are no environmental concerns that cannot be mitigated and there are no significant cumulative impacts resulting from the Project.

- a) Please identify and describe all data sources available to EGI on fugitive methane emissions associated with EGI's infrastructure in southwestern Ontario.
- b) Please confirm whether EGI has access to, and uses, high-resolution satellite data to identify, measure and monitor point sources methane across EGI's infrastructure in southwestern Ontario. If yes, please describe the data available and explain how it is used. If no, please explain why not.
- c) Has EGI modelled the fugitive methane emissions that will be released by the proposed Project, including at the CCS, pipe connection at the CCS, along the pipeline right-of-way, and at the connection with the Dawn Hub? If yes, please describe the modelling that was undertaken and provide all related results. If not, please explain.
- d) Please indicate whether EGI considered fugitive emissions and the resulting increase in ground level ozone in the cumulative effects assessment? If EGI has not considered the cumulative effects of such fugitive emissions, please explain why not.
- e) Please provide information on EGI's leak detection, repair and reporting protocol for related infrastructure, including accounting for fugitive emissions.
- f) Canada has committed to developing a plan to reducing oil and gas methane emissions by at least 75 percent below 2012 levels by 2030, pursuant to the Global Methane Pledge (see **Appendix B**).¹ Please explain EGI's understanding of Canada's commitments under the Global Methane Pledge and describe how:
 - (i) EGI's operations contribute to or detracts from those commitments; and
 - (ii) The Project contributes to or detracts from those commitments.

¹ Government of Canada, News Release, "Canada confirms its support for the Global Methane Pledge and announces ambitious domestic actions to slash methane emissions" (October 11, 2021), available online at: <https://www.canada.ca/en/environment-climate-change/news/2021/10/canada-confirms-its-support-for-the-global-methane-pledge-and-announces-ambitious-domestic-actions-to-slash-methaneemissions.html>

Question: 4-CKSPFN-4

- Reference:
- Exhibit F, Tab 1, Schedule 1, Attachment 4, p. 1
 - Dawn – Corunna Project: Environmental Report - FINAL REPORT - Prepared by: Stantec Consulting Ltd., September 21, 2021, p.86
 - Enbridge Inc. “Net Zero by 2050: Pathways to reducing our emissions”² (The “**Net Zero Plan**”), pp. 2 and 9-11
 - Ontario’s “Low-Carbon Hydrogen Strategy: A Path Forward” (see **Appendix E**)
 - Ontario “Discussion Paper: Geological Carbon Storage In Ontario”³

Preamble: The Environment Report lists Operation and Maintenance of the pipeline to occur between 2024-2074, but an asterisk to those dates explains, “Fifty years of operation is used as an assumption, although the pipeline may be operational beyond fifty years”.

In their December 9, 2021, comments on the Environment Report, Walpole Island First Nation (“**WIFN**”) stated, “[t]here is currently no consideration for climate changes in terms of both adaptation and mitigation. Please include an assessment of greenhouse gas (GHG) emissions for the lifespan of the Project. Please also provide information on EGI’s leak detection, repair and reporting protocol for related infrastructure, including accounting for fugitive emissions. This information will better inform WIFN of EGI’s efforts to mitigate and reduce GHG emissions from its infrastructure.”

In March 2022, EGI published the Net Zero Plan which includes targets of reducing the intensity of GHG emissions from their operations by 35% by 2030 and achieving net zero greenhouse gas (“**GHG**”) emissions from their business by 2050 (the “**Commitments**”).

- a) Please indicate and provide details of how Enbridge Inc. and EGI intend to reach the Commitments as it relates to the Application and the Project. Please comment on, and file any and all analysis EGI has performed in connection with, how the shipping and burning of methane gas across CKSPFN territory into 2074 and beyond will, or is anticipated to, affect the Commitments.
- b) Please discuss whether EGI considered a “no-go” alternative where the compressors presenting a danger to EGI employees are retired and abandoned

² Enbridge Inc. “Net Zero by 2050: Pathways to reducing our emission” (March 2022), available online at: https://www.enbridge.com/~media/Enb/Documents/About%20Us/Net_Zero_by_2050.pdf?la=en.

³ Government of Ontario, Discussion Paper, “Geologic Carbon Storage in Ontario” (January 2022), available online at: https://prod-environmental-registry.s3.amazonaws.com/2022-01/Geologic%20Carbon%20Storage%20Discussion%20Paper%20-%20FinalENG%20-%202022-01-04_0.pdf.

and the Project does not proceed. If EGI did not consider such an alternative, please explain why not in light of the Commitments.

- c) Please provide a detailed outline of EGI's consultation with First Nations and Indigenous Communities on the alternatives studied and considered to the Project.
- d) Please discuss and provide details regarding any revisions to the Project by EGI resulting from the comments put forward by AFN on November 16, 2021 and WIFN on December 9, 2021.
- e) Please file any and all analysis EGI has performed to assess GHG emissions over the lifespan of the Project. If EGI has not undertaken any such analysis, please explain why no such analysis has been undertaken, in light of the Commitments.
- f) Ontario has identified the Dawn Hub storage facilities and the potential to blend hydrogen with natural gas to lower its carbon footprint as an important part of its Low-Carbon Hydrogen Strategy and meeting Ontario's emission reduction targets of 30 percent below 2005 levels by 2030. Please explain EGI's understanding of Ontario's Low-Carbon Hydrogen Strategy and describe how:
 - (i) EGI's operations support and are aligned with the strategy; and
 - (ii) The Project contributes to or detracts from the strategy.
- g) Ontario has released a discussion paper on the geologic storage of carbon in Ontario and is currently considering amendments to the *Oil, Gas and Salt Resources Act* and the *Mining Act* to allow and support the geological storage of carbon dioxide in deep underground geologic storage projects. Please explain EGI's understanding of Ontario's discussion paper and proposed regulatory amendments and please file any and all analysis EGI has performed to assess the potential for any deep underground geological storage projects in Ontario, including in relation to the Project.

Question: **5-CKSPFN-5**

Reference: • Exhibit G, Tab 1, Schedule 1, p. 1

Preamble: “The proposed pipeline is approximately 20 km in length requiring approximately 95.68 hectares (236.44 acres) of permanent easement. Enbridge Gas plans to acquire the land rights to 42.14 hectares (104.13 acres) of the required permanent easement. Enbridge Gas will also require approximately 53.54 hectares (132.31 acres) of temporary land use for construction and topsoil storage purposes.”

- a) Please indicate whether all the land required for permanent easement and temporary land use are held in fee simple? If not, please identify the location of such other lands and indicate the applicable land rights.

Question: **5-CKSPFN-6**

Reference: • Exhibit A, Tab 2, Schedule 1, Attachment 1, p. 1

Preamble: Section 94 of the Act requires applicants for an order granting leave under the relevant part to file a map showing the general location of the proposed work and the municipalities, highways, railways, utility lines and navigable waters through, under, over, upon or across which the proposed work is to pass.

The map provided in the Application identifies “watercourse”, but not “navigable waters”.

- a) Please indicate whether there are any navigable waters impacted by the proposed project. If yes, please provide details and all analysis undertaken by EGI with respect to the impacts on navigable waters by the Project.

Question: **6-CKSPFN-7**

Reference: • Exhibit A, Tab 2, Schedule 1, p. 2

Preamble: EGI states that parties affected by the Application include the (i) owners of lands, government agencies and municipalities over which the pipeline will be constructed and (ii) customers resident or located in the municipalities, police villages, ***Indigenous communities and Métis organizations*** served by EGI, together with those to whom EGI sells gas, or on whose behalf EGI distributes, transmits, or stores gas. [emphasis added]

a) Please file any and all analysis EGI has performed, that is not already provided in the Application, in connection with how the Application will, or is anticipated to, affect residents and members, including off-reserve members, of CKPSFN:

- (i) that EGI serves;
- (ii) to which EGI sells gas; and
- (iii) on whose behalf EGI distributes, transmits, or stores gas.

If EGI has not undertaken any such analysis, please explain why no such analysis has been undertaken, in light of the above paragraph.

b) Please indicate whether EGI recognizes that the following groups are also affected by this application:

- (i) Indigenous nations whose Aboriginal and Treaty Rights are impacted by the continued expansion of gas infrastructure across Treaty territory and directly impacted by the increased ground level ozone caused by fugitive emissions; and
- (ii) current and future generations who will face the challenges of accelerated anthropogenic climate change.

Question: 6-CKSPFN-8

- Reference:
- Exhibit A, Tab 2, Schedule 1, Attachment 1
 - Exhibit B, Tab 1, Schedule 1, p. 3
 - Exhibit G, Tab 2, Schedule 2, p. 4
 - Exhibit H, Tab 1, Schedule 1, Attachment 2, p. 1
 - Exhibit H, Tab 1, Schedule 1, Attachment 4
 - Exhibit H, Tab 1, Schedule 1, Attachment 5, p. 6
 - Exhibit H, Tab 1, Schedule 1, Attachment 6
 - Truth and Reconciliation Commission of Canada (“**TRCC**”) “Calls to Action”⁴ (**Appendix C**)
 - United Nations Declaration on the Rights of Indigenous Peoples (“**UNDRIP**”)⁵ (**Appendix D**)

Preamble: EGI’s natural gas infrastructure and the proposed natural gas pipeline that EGI is requesting board approval to construct as part of the Application, traverses First Nation Treaty lands, including the lands described in the Huron Tract, Treaty No. 29, 1827, as well as reserve lands impacted by EGI’s natural gas infrastructure.

The then Ministry of Energy, Northern Development and Mines (“**ENDM**”) determined that the Project may have the potential to adversely affect the established or credible asserted Aboriginal or Treaty rights of First Nations in the vicinity of the Project.

Enbridge Inc.’s “Enbridge Indigenous Peoples Policy” recognizes the “importance of [UNDRIP] within the context of existing Canadian and U.S. law and the commitments that governments in both countries have made to protecting the rights of Indigenous Peoples.”

Section 4(a) of the *United Nations Declaration on the Rights of Indigenous Peoples Act*,⁶ affirms UNDRIP as a universal international human rights instrument with application in Canadian law.

UNDRIP requires that Indigenous Peoples are consulted in good faith in order to obtain their free, prior and informed consent (“**FPIC**”) (i) before measures are adopted that affect them (article 19) or (ii) when undertaking a project that affect their rights to land, territory and resources (article 32).

⁴ Truth and Reconciliation Commission of Canada “Calls to Action” (29 March 2016), available online at: <https://crc-canada.org/wp-content/uploads/2016/03/trc-calls-to-action-english.pdf>.

⁵ UN General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples : resolution / adopted by the General Assembly* (2 October 2007), A/RES/61/295, available online at: https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf.

⁶ *United Nations Declaration on the Rights of Indigenous Peoples Act* S.C. 2021, c. 14.

CKSPFN met with EGI on February 11, 2022, to discuss the Project. During that meeting, EGI expressed a commitment to the recommendations of the TRCC, specifically Call to Action #92. Call to Action #92 calls upon the corporate sector in Canada to adopt UNDRIP as a reconciliation framework and to apply its principles, norms, and standards to corporate policy and core operational activities involving Indigenous peoples and their lands and resources.

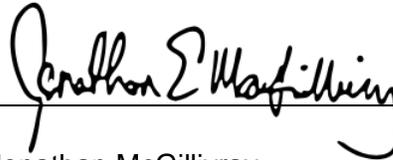
- a) Please indicate whether EGI notified CKSPFN that it may contact the Crown directly, and provide CKSPFN with the relevant ministry's contact details should they have any questions or concerns? If EGI did not provide such notification, please explain.
- b) Does EGI recognize CKSPFN as a rights holder and does it confirm receipt and acknowledgement of the 2017 Water Assertion attached in Appendix A?
- c) Did EGI identify to CKSPFN whether the Project is on privately owned or Crown controlled land?
- d) Did EGI provide information on the potential effects of the Project, including, in particular, any likely adverse impacts on established or asserted Aboriginal or Treaty rights, specifically CKSPFN's 2017 Water Assertion attached at **Appendix A**?
- e) Did EGI inform AFN and WIFN how their concerns were taken into consideration and whether the Project proposal was altered in response to their concerns? If so, please provide this correspondence and documentation. If not, please explain why.
- f) Does EGI believe that all Indigenous consultation requirements from the Environmental Guidelines have been followed? If yes, please explain how they have been followed? If no, please explain why not.
- g) Did EGI provide a description to potentially impacted First Nations of other provincial or federal approvals that may be required for the Project to proceed?
- h) What agreements, authorizations, and or approvals with and/or from First Nation government, including CKSPFN, does EGI envision needing or entering into to support the Application?
- i) Please provide details of any analysis undertaken by EGI to assess and determine the impacts on Treaty lands, generally, and on the Treaty lands of CKSPFN. If no analysis was performed, please explain why not.

- j) Please provide a detailed response to how CKSPFN was consulted with the objective of obtaining their FPIC. In your response, please discuss whether EGI has received CKSPFN's FPIC regarding crossing the water bodies covered by CKSPFN's Water Assertion, passed by Band Council Resolution #2851, in 2017 and as provided in **Appendix A**.
- k) Please discuss and provide any updates, as it pertains to CKSPFN, to the "Indigenous Consultation Report; Log and Project Correspondence" in tabular format.
- l) Please provide details of how EGI has taken steps to implement TRC #92 with respect to CKSPFN over the last 4 months, including as part of the Application.

ALL OF WHICH IS RESPECTFULLY
SUBMITTED THIS
10th day of June, 2022



Lisa (Elisabeth) DeMarco
Resilient LLP
Counsel for CKSPFN



Jonathan McGillivray
Resilient LLP
Counsel for CKSPFN

Appendix A: CKSPFN Declaration to the Waterways and Lakebeds within its Traditional Territory



Chippewas of Kettle & Stony Point First Nation

6247 Indian Lane
Kettle & Stony Point FN, Ontario, Canada N0N 1J1

Wednesday, May 31, 2017

Minister Carolyn Bennett
Indigenous Affairs and Northern
Development Canada
Terrasses de la Chaudiere
10 Wellington, North Tower
Gatineau, Quebec
K1A 0H4



Dear Minister Bennett:

Re: Chippewas of Kettle and Stony Point First Nation Band Council Resolution # 2851

Enclosed please find the Chippewas of Kettle and Stony Point First Nation BCR #2851 regarding the affirmation of the First Nation's declaration of ownership to the lakebeds and waterways located within our traditional land base.

Please direct inquiries to Chief Thomas Bressette at your convenience.

Sincerely,

Toni George
Council Assistant

Attach. (1)

c: Ministry of Indigenous Relations & Reconciliation
Ministry of Natural Resources
Ministry of Environment
Municipality of Lambton Shores



FIRST NATION COUNCIL RESOLUTION

REFERENCE NO. 2851	DATE OF DULY CONVENED MEETING: 2017 / 05 / 29 (YEAR/MONTH/DAY)	PROVINCE OF ONTARIO
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THE CHIPPEWAS OF KETTLE AND STONY POINT FIRST NATION DO HEREBY RESOLVE:

WHEREAS the "Chippewas Nation of Indians and His Majesty King George IV as represented by the Superintendent of Indian Affairs" entered into the Provisional Agreement of 1825 and Treaty of 1827 regarding a certain tract of land in Southwestern Ontario and which surrendered certain parts of the tract and created the Reserves designated as Kettle Point #44 and Stony Point #43, and,

WHEREAS in neither agreement or Treaty was there a surrender of the waterways known as Lake Huron including the lakebed or any other waterways within the traditional territory; and

WHEREAS under Aboriginal and Treaty Rights, the Chippewas of Kettle and Stony Point First Nation assert ownership and jurisdiction over said waterways to the International Boundary and the land underlying the waterways (lakebed); and

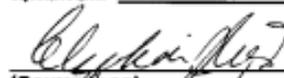
WHEREAS the Chippewas of Kettle and Stony Point First Nation make DECLARATION to the waterways and lakebeds in its traditional territory including the waterway known as Lake Huron to the International Boundary, and including the lands under the waterway of Lake Huron known as the lakebed; and

WHEREAS the Lake Huron waterways are described as the point of intersection of the surrendered lands with Lake Huron as its most northerly point, extending directly out into Lake Huron to the International Boundary, then running along the International Boundary to the southerly limit of the herein described lands at the water's edge of the St. Clair River, and the land underlying this portion of Lake Huron (lakebed) and assert this waterway and lakebed has never been surrendered; and

THEREFORE BE IT RESOLVED THAT the Chippewas of Kettle and Stony Point First Nation hereby notify each government- Federal, Provincial and Municipal, company, individual, or groups of individuals, and any others who use or who plan to use any part or portion of this territory that they must disclose their use to the First Nation, and seek express permission from the government of the First Nation, namely the elected Chief and Council for the proposed usage; and

FINALLY THEREFORE BE IT RESOLVED the Chief and Council of the Chippewas of Kettle and Stony Point First Nation pass and affirm this "DECLARATION TO THE WATERWAYS AND LAKEBEDS WITHIN ITS TRADITIONAL TERRITORY FOR THE MANAGEMENT, USE AND ENJOYMENT OF THE FIRST NATION AND ITS PEOPLES" as confirmed within the First Nation's Aboriginal and Treaty Rights.

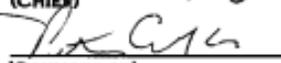
QUORUM 6


(COUNCILLOR)


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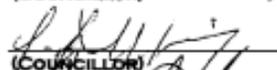

(COUNCILLOR)


(CHIEF)


(COUNCILLOR)


(COUNCILLOR)


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Appendix B: Global Methane Pledge

Government
of CanadaGouvernement
du Canada[Canada.ca](#) > [Environment and Climate Change Canada](#)

Canada confirms its support for the Global Methane Pledge and announces ambitious domestic actions to slash methane emissions

From: [Environment and Climate Change Canada](#)

News release

October 11, 2021 – Vancouver, British Columbia

Methane is responsible for around 30 percent of the global rise in temperatures to date and half a million premature death globally each year. It also accounts for about 13 percent of Canada's total greenhouse gas emissions. Slashing emissions from methane is one of the fastest and lowest cost ways to fight climate change and is one of the top recommendations made by climate scientists in the most recent report of the Intergovernmental Panel on Climate Change.

During today's Global Methane Pledge Ministerial Meeting, co-chaired by the United States and the European Union, the Honourable Jonathan Wilkinson, Minister of Environment and Climate Change, announced Canada's support for the Global Methane Pledge, which aims to reduce global methane emissions by 30 percent below 2020 levels by 2030. In support of the Pledge and the goals in Canada's climate plan, Minister Wilkinson also announced Canada's commitment to developing a plan to reduce methane emissions across the broader Canadian economy and to reducing oil and gas methane emissions by at least 75 percent below 2012 levels by 2030. Canada is the first and only country to support the Pledge and the 75 percent goal, and our approach will include regulations. Moving forward, Canada will mobilize and work with the energy sector, provinces, territories, Indigenous Peoples, and other stakeholders in developing our approach.

The International Energy Agency has made it clear that curbing methane emissions from oil and gas operations represents one of the best near-term opportunities for limiting the worst impacts of climate change and has called on countries and companies to reduce methane emissions from the sector by 75% below 2012 levels by 2030. At the Meeting, the Minister noted the importance of the 75% goal and called on other oil-producing nations to join Canada in adopting it.

The commitments announced today build on Canada's existing actions to curb methane emissions. In 2016, Canada set a target of reducing methane emissions from the oil and gas sector by 40–45 percent below 2012 levels by 2025 and has put in place regulations to help achieve it, making it one of the first countries in the world to regulate methane emissions from the oil and gas sector at the national level. Achieving this 2025 goal is an important part of the Government's efforts to meet its new Nationally Determined Contribution of reducing greenhouse gas emissions by 40–45 percent by 2030. Last year, the Government also launched the Emissions Reduction Fund, which will, in part, achieve methane reductions beyond those prescribed in the federal regulations.

Globally, agriculture and landfills are among the largest sources of methane emissions. The 2030 objective in the Pledge is expected to help prevent over 20 million tonnes of crop losses a year by 2030 by reducing ground-level ozone pollution, caused in part by methane. The Government of Canada is committed to supporting Canadian farmers and industry partners who are taking action to reduce emissions, sequester carbon and make their operations more sustainable, productive and competitive. This includes through investments in new programs, such as the Agricultural Climate Solutions initiative and

the Agricultural Clean Technology Program, which aim to help farmers adopt new, beneficial management practices and clean technologies to boost productivity and lower emissions—including from methane. The Government is also committed to developing an approach to increase the number of landfills that collect and treat methane, and ensure existing systems capture as many methane emissions as possible.

Internationally, Canada has played a leading role and is an active participant in global initiatives to reduce methane emissions, including as Chair of the Global Methane Initiative, and as a founding partner in the Climate and Clean Air Coalition and the Arctic Council. Moving forward, Canada will work with the United States, the European Union, and other early supporters of the Global Methane Pledge to encourage additional countries to support the Pledge and commit to ambitious action on methane. The Government will also continue to encourage other oil-producing nations to commit to its 2030 goal of reducing methane emissions from oil and gas by 75 percent below 2012 levels, and will work with partners to deliver on its existing and new commitments to slash methane emissions and fight climate change.

Quotes

“This is a critical year for climate action and Canada is proud to be among the early supporters of the Global Methane Pledge, a critical initiative that will increase global action to fight climate change. Climate change is accelerating, and Canadians expect ambitious action to address it. That means doing the hard work at home to set ambitious goals and develop concrete plans to get there. It also means working with international partners to increase the scope and scale of climate action around the world. Today’s announcement, coupled with Canada’s existing efforts to slash methane emissions and fight climate change, will bring us another step closer to securing a healthier planet and economy for decades to come.”

– The Honourable Jonathan Wilkinson, Minister of Environment and Climate Change

“Combatting climate change means tackling methane, and that’s what the Global Methane Pledge does. Canada’s oil and gas workers have the skills, ingenuity and determination to get it done, so we’re working with the provinces and territories to put those workers front and centre. They’re the ones who’ll get the job done.”

– The Honourable Seamus O’Regan Jr., Minister of Natural Resources

“A healthy environment goes hand-in-hand with a sustainable agriculture sector that continues to provide good jobs and healthy food for Canadians. Canada’s farmers and ranchers are good stewards of the land, and have made significant progress increasing production while lowering methane emissions. Our government will continue to help farmers adopt agricultural management practices and clean technologies to support sustainability and reduce emissions.”

– The Honourable Marie-Claude Bibeau, Minister of Agriculture and Agri-Food

Quick facts

- Methane is a potent greenhouse gas and short-lived climate pollutant that has eighty-six times the warming power of carbon dioxide over a twenty-year period after being released into the atmosphere.
- According to the Global Methane Assessment from the Climate and Clean Air Coalition and the United Nations Environment Programme, reducing methane emissions by 30 percent below 2020 levels by 2030 can prevent over 200,000 premature deaths, hundreds of thousands of asthma-related emergency room visits, and over 20 million tonnes of crop losses a year by 2030 by reducing ground-level ozone pollution caused in part by methane.
- Methane accounts for 17 percent of global greenhouse gas emissions from human activities, principally from the energy, agriculture, and waste sectors.
- The Global Methane Pledge is an initiative to reduce global methane emissions that will be launched at the UN Climate Change Conference (COP26) in Glasgow.
- On October 7, 2021, the International Energy Agency released a report on the need for countries and companies to commit to reducing methane emissions from fossil fuel operations by 75 percent below 2012 levels by 2030. The International Energy Agency's Net Zero by 2050 roadmap, released earlier this year, also envisions the 75 percent reduction. Canada is the first and only country to support the Global Methane Pledge and the 75 percent goal.

Associated links

- [Canada's strengthened climate plan: A Healthy Environment and a Healthy Economy](#)
- [Canada joins over 40 countries at final, formal multilateral opportunity to prepare for COP26](#)

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[Jonathan Wilkinson](#)

Date modified:

Appendix C: Truth and Reconciliation Commission of Canada “Calls to Action”



Truth and
Reconciliation
Commission of Canada

Truth and Reconciliation Commission of Canada: Calls to Action



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2015

Truth and Reconciliation Commission of Canada, 2012

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Calls to Action

In order to redress the legacy of residential schools and advance the process of Canadian reconciliation, the Truth and Reconciliation Commission makes the following calls to action.

Legacy

CHILD WELFARE

1. We call upon the federal, provincial, territorial, and Aboriginal governments to commit to reducing the number of Aboriginal children in care by:
 - i. Monitoring and assessing neglect investigations.
 - ii. Providing adequate resources to enable Aboriginal communities and child-welfare organizations to keep Aboriginal families together where it is safe to do so, and to keep children in culturally appropriate environments, regardless of where they reside.
 - iii. Ensuring that social workers and others who conduct child-welfare investigations are properly educated and trained about the history and impacts of residential schools.
 - iv. Ensuring that social workers and others who conduct child-welfare investigations are properly educated and trained about the potential for Aboriginal communities and families to provide more appropriate solutions to family healing.
 - v. Requiring that all child-welfare decision makers consider the impact of the residential school experience on children and their caregivers.
2. We call upon the federal government, in collaboration with the provinces and territories, to prepare and publish annual reports on the number of Aboriginal children (First Nations, Inuit, and Métis) who are in care, compared with non-Aboriginal children, as well as the reasons for apprehension, the total spending on preventive and care services by child-welfare agencies, and the effectiveness of various interventions.
3. We call upon all levels of government to fully implement Jordan's Principle.
4. We call upon the federal government to enact Aboriginal child-welfare legislation that establishes national standards for Aboriginal child apprehension and custody cases and includes principles that:
 - i. Affirm the right of Aboriginal governments to establish and maintain their own child-welfare agencies.
 - ii. Require all child-welfare agencies and courts to take the residential school legacy into account in their decision making.
 - iii. Establish, as an important priority, a requirement that placements of Aboriginal children into temporary and permanent care be culturally appropriate.
5. We call upon the federal, provincial, territorial, and Aboriginal governments to develop culturally appropriate parenting programs for Aboriginal families.

EDUCATION

6. We call upon the Government of Canada to repeal Section 43 of the *Criminal Code of Canada*.
7. We call upon the federal government to develop with Aboriginal groups a joint strategy to eliminate

educational and employment gaps between Aboriginal and non-Aboriginal Canadians.

8. We call upon the federal government to eliminate the discrepancy in federal education funding for First Nations children being educated on reserves and those First Nations children being educated off reserves.
9. We call upon the federal government to prepare and publish annual reports comparing funding for the education of First Nations children on and off reserves, as well as educational and income attainments of Aboriginal peoples in Canada compared with non-Aboriginal people.
10. We call on the federal government to draft new Aboriginal education legislation with the full participation and informed consent of Aboriginal peoples. The new legislation would include a commitment to sufficient funding and would incorporate the following principles:
 - i. Providing sufficient funding to close identified educational achievement gaps within one generation.
 - ii. Improving education attainment levels and success rates.
 - iii. Developing culturally appropriate curricula.
 - iv. Protecting the right to Aboriginal languages, including the teaching of Aboriginal languages as credit courses.
 - v. Enabling parental and community responsibility, control, and accountability, similar to what parents enjoy in public school systems.
 - vi. Enabling parents to fully participate in the education of their children.
 - vii. Respecting and honouring Treaty relationships.
11. We call upon the federal government to provide adequate funding to end the backlog of First Nations students seeking a post-secondary education.
12. We call upon the federal, provincial, territorial, and Aboriginal governments to develop culturally appropriate early childhood education programs for Aboriginal families.

LANGUAGE AND CULTURE

13. We call upon the federal government to acknowledge that Aboriginal rights include Aboriginal language rights.

14. We call upon the federal government to enact an Aboriginal Languages Act that incorporates the following principles:
 - i. Aboriginal languages are a fundamental and valued element of Canadian culture and society, and there is an urgency to preserve them.
 - ii. Aboriginal language rights are reinforced by the Treaties.
 - iii. The federal government has a responsibility to provide sufficient funds for Aboriginal-language revitalization and preservation.
 - iv. The preservation, revitalization, and strengthening of Aboriginal languages and cultures are best managed by Aboriginal people and communities.
 - v. Funding for Aboriginal language initiatives must reflect the diversity of Aboriginal languages.
15. We call upon the federal government to appoint, in consultation with Aboriginal groups, an Aboriginal Languages Commissioner. The commissioner should help promote Aboriginal languages and report on the adequacy of federal funding of Aboriginal-languages initiatives.
16. We call upon post-secondary institutions to create university and college degree and diploma programs in Aboriginal languages.
17. We call upon all levels of government to enable residential school Survivors and their families to reclaim names changed by the residential school system by waiving administrative costs for a period of five years for the name-change process and the revision of official identity documents, such as birth certificates, passports, driver's licenses, health cards, status cards, and social insurance numbers.

HEALTH

18. We call upon the federal, provincial, territorial, and Aboriginal governments to acknowledge that the current state of Aboriginal health in Canada is a direct result of previous Canadian government policies, including residential schools, and to recognize and implement the health-care rights of Aboriginal people as identified in international law, constitutional law, and under the Treaties.
19. We call upon the federal government, in consultation with Aboriginal peoples, to establish measurable goals to identify and close the gaps in health outcomes

between Aboriginal and non-Aboriginal communities, and to publish annual progress reports and assess long-term trends. Such efforts would focus on indicators such as: infant mortality, maternal health, suicide, mental health, addictions, life expectancy, birth rates, infant and child health issues, chronic diseases, illness and injury incidence, and the availability of appropriate health services.

20. In order to address the jurisdictional disputes concerning Aboriginal people who do not reside on reserves, we call upon the federal government to recognize, respect, and address the distinct health needs of the Métis, Inuit, and off-reserve Aboriginal peoples.
21. We call upon the federal government to provide sustainable funding for existing and new Aboriginal healing centres to address the physical, mental, emotional, and spiritual harms caused by residential schools, and to ensure that the funding of healing centres in Nunavut and the Northwest Territories is a priority.
22. We call upon those who can effect change within the Canadian health-care system to recognize the value of Aboriginal healing practices and use them in the treatment of Aboriginal patients in collaboration with Aboriginal healers and Elders where requested by Aboriginal patients.
23. We call upon all levels of government to:
 - i. Increase the number of Aboriginal professionals working in the health-care field.
 - ii. Ensure the retention of Aboriginal health-care providers in Aboriginal communities.
 - iii. Provide cultural competency training for all health-care professionals.
24. We call upon medical and nursing schools in Canada to require all students to take a course dealing with Aboriginal health issues, including the history and legacy of residential schools, the *United Nations Declaration on the Rights of Indigenous Peoples*, Treaties and Aboriginal rights, and Indigenous teachings and practices. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.

JUSTICE

25. We call upon the federal government to establish a written policy that reaffirms the independence of the

Royal Canadian Mounted Police to investigate crimes in which the government has its own interest as a potential or real party in civil litigation.

26. We call upon the federal, provincial, and territorial governments to review and amend their respective statutes of limitations to ensure that they conform to the principle that governments and other entities cannot rely on limitation defences to defend legal actions of historical abuse brought by Aboriginal people.
27. We call upon the Federation of Law Societies of Canada to ensure that lawyers receive appropriate cultural competency training, which includes the history and legacy of residential schools, the *United Nations Declaration on the Rights of Indigenous Peoples*, Treaties and Aboriginal rights, Indigenous law, and Aboriginal-Crown relations. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.
28. We call upon law schools in Canada to require all law students to take a course in Aboriginal people and the law, which includes the history and legacy of residential schools, the *United Nations Declaration on the Rights of Indigenous Peoples*, Treaties and Aboriginal rights, Indigenous law, and Aboriginal-Crown relations. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.
29. We call upon the parties and, in particular, the federal government, to work collaboratively with plaintiffs not included in the Indian Residential Schools Settlement Agreement to have disputed legal issues determined expeditiously on an agreed set of facts.
30. We call upon federal, provincial, and territorial governments to commit to eliminating the overrepresentation of Aboriginal people in custody over the next decade, and to issue detailed annual reports that monitor and evaluate progress in doing so.
31. We call upon the federal, provincial, and territorial governments to provide sufficient and stable funding to implement and evaluate community sanctions that will provide realistic alternatives to imprisonment for Aboriginal offenders and respond to the underlying causes of offending.
32. We call upon the federal government to amend the Criminal Code to allow trial judges, upon giving reasons, to depart from mandatory minimum sentences and restrictions on the use of conditional sentences.

33. We call upon the federal, provincial, and territorial governments to recognize as a high priority the need to address and prevent Fetal Alcohol Spectrum Disorder (FASD), and to develop, in collaboration with Aboriginal people, FASD preventive programs that can be delivered in a culturally appropriate manner.
34. We call upon the governments of Canada, the provinces, and territories to undertake reforms to the criminal justice system to better address the needs of offenders with Fetal Alcohol Spectrum Disorder (FASD), including:
 - i. Providing increased community resources and powers for courts to ensure that FASD is properly diagnosed, and that appropriate community supports are in place for those with FASD.
 - ii. Enacting statutory exemptions from mandatory minimum sentences of imprisonment for offenders affected by FASD.
 - iii. Providing community, correctional, and parole resources to maximize the ability of people with FASD to live in the community.
 - iv. Adopting appropriate evaluation mechanisms to measure the effectiveness of such programs and ensure community safety.
35. We call upon the federal government to eliminate barriers to the creation of additional Aboriginal healing lodges within the federal correctional system.
36. We call upon the federal, provincial, and territorial governments to work with Aboriginal communities to provide culturally relevant services to inmates on issues such as substance abuse, family and domestic violence, and overcoming the experience of having been sexually abused.
37. We call upon the federal government to provide more supports for Aboriginal programming in halfway houses and parole services.
38. We call upon the federal, provincial, territorial, and Aboriginal governments to commit to eliminating the overrepresentation of Aboriginal youth in custody over the next decade.
39. We call upon the federal government to develop a national plan to collect and publish data on the criminal victimization of Aboriginal people, including data related to homicide and family violence victimization.
40. We call on all levels of government, in collaboration with Aboriginal people, to create adequately funded and accessible Aboriginal-specific victim programs and services with appropriate evaluation mechanisms.
41. We call upon the federal government, in consultation with Aboriginal organizations, to appoint a public inquiry into the causes of, and remedies for, the disproportionate victimization of Aboriginal women and girls. The inquiry's mandate would include:
 - i. Investigation into missing and murdered Aboriginal women and girls.
 - ii. Links to the intergenerational legacy of residential schools.
42. We call upon the federal, provincial, and territorial governments to commit to the recognition and implementation of Aboriginal justice systems in a manner consistent with the Treaty and Aboriginal rights of Aboriginal peoples, the *Constitution Act, 1982*, and the *United Nations Declaration on the Rights of Indigenous Peoples*, endorsed by Canada in November 2012.

Reconciliation

CANADIAN GOVERNMENTS AND THE UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLE

43. We call upon federal, provincial, territorial, and municipal governments to fully adopt and implement the *United Nations Declaration on the Rights of Indigenous Peoples* as the framework for reconciliation.
44. We call upon the Government of Canada to develop a national action plan, strategies, and other concrete measures to achieve the goals of the *United Nations Declaration on the Rights of Indigenous Peoples*.

ROYAL PROCLAMATION AND COVENANT OF RECONCILIATION

45. We call upon the Government of Canada, on behalf of all Canadians, to jointly develop with Aboriginal peoples a Royal Proclamation of Reconciliation to be issued by the Crown. The proclamation would build on the Royal Proclamation of 1763 and the Treaty of Niagara of 1764, and reaffirm the nation-to-nation relationship between Aboriginal peoples and the Crown. The proclamation would include, but not be limited to, the following commitments:

- i. Repudiate concepts used to justify European sovereignty over Indigenous lands and peoples such as the Doctrine of Discovery and *terra nullius*.
 - ii. Adopt and implement the *United Nations Declaration on the Rights of Indigenous Peoples* as the framework for reconciliation.
 - iii. Renew or establish Treaty relationships based on principles of mutual recognition, mutual respect, and shared responsibility for maintaining those relationships into the future.
 - iv. Reconcile Aboriginal and Crown constitutional and legal orders to ensure that Aboriginal peoples are full partners in Confederation, including the recognition and integration of Indigenous laws and legal traditions in negotiation and implementation processes involving Treaties, land claims, and other constructive agreements.
46. We call upon the parties to the Indian Residential Schools Settlement Agreement to develop and sign a Covenant of Reconciliation that would identify principles for working collaboratively to advance reconciliation in Canadian society, and that would include, but not be limited to:
- i. Reaffirmation of the parties' commitment to reconciliation.
 - ii. Repudiation of concepts used to justify European sovereignty over Indigenous lands and peoples, such as the Doctrine of Discovery and *terra nullius*, and the reformation of laws, governance structures, and policies within their respective institutions that continue to rely on such concepts.
 - iii. Full adoption and implementation of the *United Nations Declaration on the Rights of Indigenous Peoples* as the framework for reconciliation.
 - iv. Support for the renewal or establishment of Treaty relationships based on principles of mutual recognition, mutual respect, and shared responsibility for maintaining those relationships into the future.
 - v. Enabling those excluded from the Settlement Agreement to sign onto the Covenant of Reconciliation.
 - vi. Enabling additional parties to sign onto the Covenant of Reconciliation.

47. We call upon federal, provincial, territorial, and municipal governments to repudiate concepts used to justify European sovereignty over Indigenous peoples and lands, such as the Doctrine of Discovery and *terra nullius*, and to reform those laws, government policies, and litigation strategies that continue to rely on such concepts.

SETTLEMENT AGREEMENT PARTIES AND THE UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES

48. We call upon the church parties to the Settlement Agreement, and all other faith groups and interfaith social justice groups in Canada who have not already done so, to formally adopt and comply with the principles, norms, and standards of the *United Nations Declaration on the Rights of Indigenous Peoples* as a framework for reconciliation. This would include, but not be limited to, the following commitments:
- i. Ensuring that their institutions, policies, programs, and practices comply with the *United Nations Declaration on the Rights of Indigenous Peoples*.
 - ii. Respecting Indigenous peoples' right to self-determination in spiritual matters, including the right to practise, develop, and teach their own spiritual and religious traditions, customs, and ceremonies, consistent with Article 12:1 of the *United Nations Declaration on the Rights of Indigenous Peoples*.
 - iii. Engaging in ongoing public dialogue and actions to support the *United Nations Declaration on the Rights of Indigenous Peoples*.
 - iv. Issuing a statement no later than March 31, 2016, from all religious denominations and faith groups, as to how they will implement the *United Nations Declaration on the Rights of Indigenous Peoples*.
49. We call upon all religious denominations and faith groups who have not already done so to repudiate concepts used to justify European sovereignty over Indigenous lands and peoples, such as the Doctrine of Discovery and *terra nullius*.

EQUITY FOR ABORIGINAL PEOPLE IN THE LEGAL SYSTEM

50. In keeping with the *United Nations Declaration on the Rights of Indigenous Peoples*, we call upon the federal government, in collaboration with Aboriginal organizations, to fund the establishment of Indigenous law institutes for the development, use, and

understanding of Indigenous laws and access to justice in accordance with the unique cultures of Aboriginal peoples in Canada.

51. We call upon the Government of Canada, as an obligation of its fiduciary responsibility, to develop a policy of transparency by publishing legal opinions it develops and upon which it acts or intends to act, in regard to the scope and extent of Aboriginal and Treaty rights.
52. We call upon the Government of Canada, provincial and territorial governments, and the courts to adopt the following legal principles:
 - i. Aboriginal title claims are accepted once the Aboriginal claimant has established occupation over a particular territory at a particular point in time.
 - ii. Once Aboriginal title has been established, the burden of proving any limitation on any rights arising from the existence of that title shifts to the party asserting such a limitation.

NATIONAL COUNCIL FOR RECONCILIATION

53. We call upon the Parliament of Canada, in consultation and collaboration with Aboriginal peoples, to enact legislation to establish a National Council for Reconciliation. The legislation would establish the council as an independent, national, oversight body with membership jointly appointed by the Government of Canada and national Aboriginal organizations, and consisting of Aboriginal and non-Aboriginal members. Its mandate would include, but not be limited to, the following:
 - i. Monitor, evaluate, and report annually to Parliament and the people of Canada on the Government of Canada's post-apology progress on reconciliation to ensure that government accountability for reconciling the relationship between Aboriginal peoples and the Crown is maintained in the coming years.
 - ii. Monitor, evaluate, and report to Parliament and the people of Canada on reconciliation progress across all levels and sectors of Canadian society, including the implementation of the Truth and Reconciliation Commission of Canada's Calls to Action.
 - iii. Develop and implement a multi-year National Action Plan for Reconciliation, which includes research and policy development, public education programs, and resources.

- iv. Promote public dialogue, public/private partnerships, and public initiatives for reconciliation.

54. We call upon the Government of Canada to provide multi-year funding for the National Council for Reconciliation to ensure that it has the financial, human, and technical resources required to conduct its work, including the endowment of a National Reconciliation Trust to advance the cause of reconciliation.
55. We call upon all levels of government to provide annual reports or any current data requested by the National Council for Reconciliation so that it can report on the progress towards reconciliation. The reports or data would include, but not be limited to:
 - i. The number of Aboriginal children—including Métis and Inuit children—in care, compared with non-Aboriginal children, the reasons for apprehension, and the total spending on preventive and care services by child-welfare agencies.
 - ii. Comparative funding for the education of First Nations children on and off reserves.
 - iii. The educational and income attainments of Aboriginal peoples in Canada compared with non-Aboriginal people.
 - iv. Progress on closing the gaps between Aboriginal and non-Aboriginal communities in a number of health indicators such as: infant mortality, maternal health, suicide, mental health, addictions, life expectancy, birth rates, infant and child health issues, chronic diseases, illness and injury incidence, and the availability of appropriate health services.
 - v. Progress on eliminating the overrepresentation of Aboriginal children in youth custody over the next decade.
 - vi. Progress on reducing the rate of criminal victimization of Aboriginal people, including data related to homicide and family violence victimization and other crimes.
 - vii. Progress on reducing the overrepresentation of Aboriginal people in the justice and correctional systems.
56. We call upon the prime minister of Canada to formally respond to the report of the National Council for Reconciliation by issuing an annual "State of Aboriginal Peoples" report, which would outline the government's plans for advancing the cause of reconciliation.

PROFESSIONAL DEVELOPMENT AND TRAINING FOR PUBLIC SERVANTS

57. We call upon federal, provincial, territorial, and municipal governments to provide education to public servants on the history of Aboriginal peoples, including the history and legacy of residential schools, the *United Nations Declaration on the Rights of Indigenous Peoples*, Treaties and Aboriginal rights, Indigenous law, and Aboriginal–Crown relations. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.

CHURCH APOLOGIES AND RECONCILIATION

58. We call upon the Pope to issue an apology to Survivors, their families, and communities for the Roman Catholic Church's role in the spiritual, cultural, emotional, physical, and sexual abuse of First Nations, Inuit, and Métis children in Catholic-run residential schools. We call for that apology to be similar to the 2010 apology issued to Irish victims of abuse and to occur within one year of the issuing of this Report and to be delivered by the Pope in Canada.
59. We call upon church parties to the Settlement Agreement to develop ongoing education strategies to ensure that their respective congregations learn about their church's role in colonization, the history and legacy of residential schools, and why apologies to former residential school students, their families, and communities were necessary.
60. We call upon leaders of the church parties to the Settlement Agreement and all other faiths, in collaboration with Indigenous spiritual leaders, Survivors, schools of theology, seminaries, and other religious training centres, to develop and teach curriculum for all student clergy, and all clergy and staff who work in Aboriginal communities, on the need to respect Indigenous spirituality in its own right, the history and legacy of residential schools and the roles of the church parties in that system, the history and legacy of religious conflict in Aboriginal families and communities, and the responsibility that churches have to mitigate such conflicts and prevent spiritual violence.
61. We call upon church parties to the Settlement Agreement, in collaboration with Survivors and representatives of Aboriginal organizations, to establish permanent funding to Aboriginal people for:
- i. Community-controlled healing and reconciliation projects.

- ii. Community-controlled culture- and language-revitalization projects.
- iii. Community-controlled education and relationship-building projects.
- iv. Regional dialogues for Indigenous spiritual leaders and youth to discuss Indigenous spirituality, self-determination, and reconciliation.

EDUCATION FOR RECONCILIATION

62. We call upon the federal, provincial, and territorial governments, in consultation and collaboration with Survivors, Aboriginal peoples, and educators, to:
- i. Make age-appropriate curriculum on residential schools, Treaties, and Aboriginal peoples' historical and contemporary contributions to Canada a mandatory education requirement for Kindergarten to Grade Twelve students.
 - ii. Provide the necessary funding to post-secondary institutions to educate teachers on how to integrate Indigenous knowledge and teaching methods into classrooms.
 - iii. Provide the necessary funding to Aboriginal schools to utilize Indigenous knowledge and teaching methods in classrooms.
 - iv. Establish senior-level positions in government at the assistant deputy minister level or higher dedicated to Aboriginal content in education.
63. We call upon the Council of Ministers of Education, Canada to maintain an annual commitment to Aboriginal education issues, including:
- i. Developing and implementing Kindergarten to Grade Twelve curriculum and learning resources on Aboriginal peoples in Canadian history, and the history and legacy of residential schools.
 - ii. Sharing information and best practices on teaching curriculum related to residential schools and Aboriginal history.
 - iii. Building student capacity for intercultural understanding, empathy, and mutual respect.
 - iv. Identifying teacher-training needs relating to the above.
64. We call upon all levels of government that provide public funds to denominational schools to require such schools to provide an education on comparative religious studies, which must include a segment on

Aboriginal spiritual beliefs and practices developed in collaboration with Aboriginal Elders.

65. We call upon the federal government, through the Social Sciences and Humanities Research Council, and in collaboration with Aboriginal peoples, post-secondary institutions and educators, and the National Centre for Truth and Reconciliation and its partner institutions, to establish a national research program with multi-year funding to advance understanding of reconciliation.

YOUTH PROGRAMS

66. We call upon the federal government to establish multi-year funding for community-based youth organizations to deliver programs on reconciliation, and establish a national network to share information and best practices.

MUSEUMS AND ARCHIVES

67. We call upon the federal government to provide funding to the Canadian Museums Association to undertake, in collaboration with Aboriginal peoples, a national review of museum policies and best practices to determine the level of compliance with the *United Nations Declaration on the Rights of Indigenous Peoples* and to make recommendations.
68. We call upon the federal government, in collaboration with Aboriginal peoples, and the Canadian Museums Association to mark the 150th anniversary of Canadian Confederation in 2017 by establishing a dedicated national funding program for commemoration projects on the theme of reconciliation.
69. We call upon Library and Archives Canada to:
- i. Fully adopt and implement the *United Nations Declaration on the Rights of Indigenous Peoples* and the *United Nations Joint-Orientlicher Principles*, as related to Aboriginal peoples' inalienable right to know the truth about what happened and why, with regard to human rights violations committed against them in the residential schools.
 - ii. Ensure that its record holdings related to residential schools are accessible to the public.
 - iii. Commit more resources to its public education materials and programming on residential schools.
70. We call upon the federal government to provide funding to the Canadian Association of Archivists to undertake, in collaboration with Aboriginal peoples, a national review of archival policies and best practices to:

- i. Determine the level of compliance with the *United Nations Declaration on the Rights of Indigenous Peoples* and the *United Nations Joint-Orientlicher Principles*, as related to Aboriginal peoples' inalienable right to know the truth about what happened and why, with regard to human rights violations committed against them in the residential schools.
- ii. Produce a report with recommendations for full implementation of these international mechanisms as a reconciliation framework for Canadian archives.

MISSING CHILDREN AND BURIAL INFORMATION

71. We call upon all chief coroners and provincial vital statistics agencies that have not provided to the Truth and Reconciliation Commission of Canada their records on the deaths of Aboriginal children in the care of residential school authorities to make these documents available to the National Centre for Truth and Reconciliation.
72. We call upon the federal government to allocate sufficient resources to the National Centre for Truth and Reconciliation to allow it to develop and maintain the National Residential School Student Death Register established by the Truth and Reconciliation Commission of Canada.
73. We call upon the federal government to work with churches, Aboriginal communities, and former residential school students to establish and maintain an online registry of residential school cemeteries, including, where possible, plot maps showing the location of deceased residential school children.
74. We call upon the federal government to work with the churches and Aboriginal community leaders to inform the families of children who died at residential schools of the child's burial location, and to respond to families' wishes for appropriate commemoration ceremonies and markers, and reburial in home communities where requested.
75. We call upon the federal government to work with provincial, territorial, and municipal governments, churches, Aboriginal communities, former residential school students, and current landowners to develop and implement strategies and procedures for the ongoing identification, documentation, maintenance, commemoration, and protection of residential school cemeteries or other sites at which residential school children were buried. This is to include the provision of

appropriate memorial ceremonies and commemorative markers to honour the deceased children.

76. We call upon the parties engaged in the work of documenting, maintaining, commemorating, and protecting residential school cemeteries to adopt strategies in accordance with the following principles:
- i. The Aboriginal community most affected shall lead the development of such strategies.
 - ii. Information shall be sought from residential school Survivors and other Knowledge Keepers in the development of such strategies.
 - iii. Aboriginal protocols shall be respected before any potentially invasive technical inspection and investigation of a cemetery site.

NATIONAL CENTRE FOR TRUTH AND RECONCILIATION

77. We call upon provincial, territorial, municipal, and community archives to work collaboratively with the National Centre for Truth and Reconciliation to identify and collect copies of all records relevant to the history and legacy of the residential school system, and to provide these to the National Centre for Truth and Reconciliation.
78. We call upon the Government of Canada to commit to making a funding contribution of \$10 million over seven years to the National Centre for Truth and Reconciliation, plus an additional amount to assist communities to research and produce histories of their own residential school experience and their involvement in truth, healing, and reconciliation.

COMMEMORATION

79. We call upon the federal government, in collaboration with Survivors, Aboriginal organizations, and the arts community, to develop a reconciliation framework for Canadian heritage and commemoration. This would include, but not be limited to:
- i. Amending the Historic Sites and Monuments Act to include First Nations, Inuit, and Métis representation on the Historic Sites and Monuments Board of Canada and its Secretariat.
 - ii. Revising the policies, criteria, and practices of the National Program of Historical Commemoration to integrate Indigenous history, heritage values, and memory practices into Canada's national heritage and history.

- iii. Developing and implementing a national heritage plan and strategy for commemorating residential school sites, the history and legacy of residential schools, and the contributions of Aboriginal peoples to Canada's history.

80. We call upon the federal government, in collaboration with Aboriginal peoples, to establish, as a statutory holiday, a National Day for Truth and Reconciliation to honour Survivors, their families, and communities, and ensure that public commemoration of the history and legacy of residential schools remains a vital component of the reconciliation process.
81. We call upon the federal government, in collaboration with Survivors and their organizations, and other parties to the Settlement Agreement, to commission and install a publicly accessible, highly visible, Residential Schools National Monument in the city of Ottawa to honour Survivors and all the children who were lost to their families and communities.
82. We call upon provincial and territorial governments, in collaboration with Survivors and their organizations, and other parties to the Settlement Agreement, to commission and install a publicly accessible, highly visible, Residential Schools Monument in each capital city to honour Survivors and all the children who were lost to their families and communities.
83. We call upon the Canada Council for the Arts to establish, as a funding priority, a strategy for Indigenous and non-Indigenous artists to undertake collaborative projects and produce works that contribute to the reconciliation process.

MEDIA AND RECONCILIATION

84. We call upon the federal government to restore and increase funding to the CBC/Radio-Canada, to enable Canada's national public broadcaster to support reconciliation, and be properly reflective of the diverse cultures, languages, and perspectives of Aboriginal peoples, including, but not limited to:
- i. Increasing Aboriginal programming, including Aboriginal-language speakers.
 - ii. Increasing equitable access for Aboriginal peoples to jobs, leadership positions, and professional development opportunities within the organization.
 - iii. Continuing to provide dedicated news coverage and online public information resources on issues of concern to Aboriginal peoples and all Canadians,

including the history and legacy of residential schools and the reconciliation process.

85. We call upon the Aboriginal Peoples Television Network, as an independent non-profit broadcaster with programming by, for, and about Aboriginal peoples, to support reconciliation, including but not limited to:
- i. Continuing to provide leadership in programming and organizational culture that reflects the diverse cultures, languages, and perspectives of Aboriginal peoples.
 - ii. Continuing to develop media initiatives that inform and educate the Canadian public, and connect Aboriginal and non-Aboriginal Canadians.
86. We call upon Canadian journalism programs and media schools to require education for all students on the history of Aboriginal peoples, including the history and legacy of residential schools, the *United Nations Declaration on the Rights of Indigenous Peoples*, Treaties and Aboriginal rights, Indigenous law, and Aboriginal-Crown relations.

SPORTS AND RECONCILIATION

87. We call upon all levels of government, in collaboration with Aboriginal peoples, sports halls of fame, and other relevant organizations, to provide public education that tells the national story of Aboriginal athletes in history.
88. We call upon all levels of government to take action to ensure long-term Aboriginal athlete development and growth, and continued support for the North American Indigenous Games, including funding to host the games and for provincial and territorial team preparation and travel.
89. We call upon the federal government to amend the Physical Activity and Sport Act to support reconciliation by ensuring that policies to promote physical activity as a fundamental element of health and well-being, reduce barriers to sports participation, increase the pursuit of excellence in sport, and build capacity in the Canadian sport system, are inclusive of Aboriginal peoples.
90. We call upon the federal government to ensure that national sports policies, programs, and initiatives are inclusive of Aboriginal peoples, including, but not limited to, establishing:
- i. In collaboration with provincial and territorial governments, stable funding for, and access to, community sports programs that reflect the diverse

cultures and traditional sporting activities of Aboriginal peoples.

- ii. An elite athlete development program for Aboriginal athletes.
 - iii. Programs for coaches, trainers, and sports officials that are culturally relevant for Aboriginal peoples.
 - iv. Anti-racism awareness and training programs.
91. We call upon the officials and host countries of international sporting events such as the Olympics, Pan Am, and Commonwealth games to ensure that Indigenous peoples' territorial protocols are respected, and local Indigenous communities are engaged in all aspects of planning and participating in such events.

BUSINESS AND RECONCILIATION

92. We call upon the corporate sector in Canada to adopt the *United Nations Declaration on the Rights of Indigenous Peoples* as a reconciliation framework and to apply its principles, norms, and standards to corporate policy and core operational activities involving Indigenous peoples and their lands and resources. This would include, but not be limited to, the following:
- i. Commit to meaningful consultation, building respectful relationships, and obtaining the free, prior, and informed consent of Indigenous peoples before proceeding with economic development projects.
 - ii. Ensure that Aboriginal peoples have equitable access to jobs, training, and education opportunities in the corporate sector, and that Aboriginal communities gain long-term sustainable benefits from economic development projects.
 - iii. Provide education for management and staff on the history of Aboriginal peoples, including the history and legacy of residential schools, the *United Nations Declaration on the Rights of Indigenous Peoples*, Treaties and Aboriginal rights, Indigenous law, and Aboriginal-Crown relations. This will require skills based training in intercultural competency, conflict resolution, human rights, and anti-racism.

NEWCOMERS TO CANADA

93. We call upon the federal government, in collaboration with the national Aboriginal organizations, to revise the information kit for newcomers to Canada and its citizenship test to reflect a more inclusive history of the diverse Aboriginal peoples of Canada, including

information about the Treaties and the history of residential schools.

94. We call upon the Government of Canada to replace the Oath of Citizenship with the following:

I swear (or affirm) that I will be faithful and bear true allegiance to Her Majesty Queen Elizabeth II, Queen of Canada, Her Heirs and Successors, and that I will faithfully observe the laws of Canada including Treaties with Indigenous Peoples, and fulfill my duties as a Canadian citizen.

Truth and Reconciliation Commission of Canada

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Appendix D: United Nations Declaration on the Rights of Indigenous Peoples



UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES



United Nations



UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES



United Nations



Resolution adopted by the General Assembly on 13 September 2007

*[without reference to a Main Committee (A/61/L.67
and Add.1)]*

61/295. United Nations Declaration on the Rights of Indigenous Peoples

The General Assembly,

Taking note of the recommendation of the Human Rights Council contained in its resolution 1/2 of 29 June 2006¹, by which the Council adopted the text of the United Nations Declaration on the Rights of Indigenous Peoples,

Recalling its resolution 61/178 of 20 December 2006, by which it decided to defer consideration of and action on the Declaration to allow time for further consultations thereon, and also decided to conclude its consideration before the end of the sixty-first session of the General Assembly,

1 See Official Records of the General Assembly, Sixty-first Session, Supplement No. 53 (A/61/53), part one, chap. II, sect. A.



Adopts the United Nations Declaration on the Rights of Indigenous Peoples as contained in the annex to the present resolution.

*107th plenary meeting
13 September 2007*

Annex

United Nations Declaration on the Rights of Indigenous Peoples

The General Assembly,

Guided by the purposes and principles of the Charter of the United Nations, and good faith in the fulfilment of the obligations assumed by States in accordance with the Charter,

Affirming that indigenous peoples are equal to all other peoples, while recognizing the right of all peoples to be different, to consider themselves different, and to be respected as such,

Affirming also that all peoples contribute to the diversity and richness of civilizations and cultures, which constitute the common heritage of humankind,



Affirming further that all doctrines, policies and practices based on or advocating superiority of peoples or individuals on the basis of national origin or racial, religious, ethnic or cultural differences are racist, scientifically false, legally invalid, morally condemnable and socially unjust,

Reaffirming that indigenous peoples, in the exercise of their rights, should be free from discrimination of any kind,

Concerned that indigenous peoples have suffered from historic injustices as a result of, inter alia, their colonization and dispossession of their lands, territories and resources, thus preventing them from exercising, in particular, their right to development in accordance with their own needs and interests,

Recognizing the urgent need to respect and promote the inherent rights of indigenous peoples which derive from their political, economic and social structures and from their cultures, spiritual traditions, histories and philosophies, especially their rights to their lands, territories and resources,

Recognizing also the urgent need to respect and promote the rights of indigenous peoples



affirmed in treaties, agreements and other constructive arrangements with States,

Welcoming the fact that indigenous peoples are organizing themselves for political, economic, social and cultural enhancement and in order to bring to an end all forms of discrimination and oppression wherever they occur,

Convinced that control by indigenous peoples over developments affecting them and their lands, territories and resources will enable them to maintain and strengthen their institutions, cultures and traditions, and to promote their development in accordance with their aspirations and needs,

Recognizing that respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable development and proper management of the environment,

Emphasizing the contribution of the demilitarization of the lands and territories of indigenous peoples to peace, economic and social progress and development, understanding and friendly relations among nations and peoples of the world,



Recognizing in particular the right of indigenous families and communities to retain shared responsibility for the upbringing, training, education and well-being of their children, consistent with the rights of the child,

Considering that the rights affirmed in treaties, agreements and other constructive arrangements between States and indigenous peoples are, in some situations, matters of international concern, interest, responsibility and character,

Considering also that treaties, agreements and other constructive arrangements, and the relationship they represent, are the basis for a strengthened partnership between indigenous peoples and States,

Acknowledging that the Charter of the United Nations, the International Covenant on Economic, Social and Cultural Rights² and the International Covenant on Civil and Political Rights,² as well as the Vienna Declaration and Programme of Action,³ affirm the fundamental importance of the right to self-determination of all peoples, by

2 See resolution 2200 A (XXI), annex.

3 A/CONF.157/24 (Part I), chap. III.



virtue of which they freely determine their political status and freely pursue their economic, social and cultural development,

Bearing in mind that nothing in this Declaration may be used to deny any peoples their right to self-determination, exercised in conformity with international law,

Convinced that the recognition of the rights of indigenous peoples in this Declaration will enhance harmonious and cooperative relations between the State and indigenous peoples, based on principles of justice, democracy, respect for human rights, non-discrimination and good faith,

Encouraging States to comply with and effectively implement all their obligations as they apply to indigenous peoples under international instruments, in particular those related to human rights, in consultation and cooperation with the peoples concerned,

Emphasizing that the United Nations has an important and continuing role to play in promoting and protecting the rights of indigenous peoples,



Believing that this Declaration is a further important step forward for the recognition, promotion and protection of the rights and freedoms of indigenous peoples and in the development of relevant activities of the United Nations system in this field,

Recognizing and reaffirming that indigenous individuals are entitled without discrimination to all human rights recognized in international law, and that indigenous peoples possess collective rights which are indispensable for their existence, well-being and integral development as peoples,

Recognizing that the situation of indigenous peoples varies from region to region and from country to country and that the significance of national and regional particularities and various historical and cultural backgrounds should be taken into consideration,

Solemnly proclaims the following United Nations Declaration on the Rights of Indigenous Peoples as a standard of achievement to be pursued in a spirit of partnership and mutual respect:

Article 1

Indigenous peoples have the right to the full enjoyment, as a collective or as individuals, of all



human rights and fundamental freedoms as recognized in the Charter of the United Nations, the Universal Declaration of Human Rights⁴ and international human rights law.

Article 2

Indigenous peoples and individuals are free and equal to all other peoples and individuals and have the right to be free from any kind of discrimination, in the exercise of their rights, in particular that based on their indigenous origin or identity.

Article 3

Indigenous peoples have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development.

Article 4

Indigenous peoples, in exercising their right to self-determination, have the right to autonomy or self-government in matters relating to their internal and local affairs, as well as ways and means for financing their autonomous functions.

4 Resolution 217 A (III).



Article 5

Indigenous peoples have the right to maintain and strengthen their distinct political, legal, economic, social and cultural institutions, while retaining their right to participate fully, if they so choose, in the political, economic, social and cultural life of the State.

Article 6

Every indigenous individual has the right to a nationality.

Article 7

1. Indigenous individuals have the rights to life, physical and mental integrity, liberty and security of person.
2. Indigenous peoples have the collective right to live in freedom, peace and security as distinct peoples and shall not be subjected to any act of genocide or any other act of violence, including forcibly removing children of the group to another group.



Article 8

1. Indigenous peoples and individuals have the right not to be subjected to forced assimilation or destruction of their culture.
2. States shall provide effective mechanisms for prevention of, and redress for:
 - (a) Any action which has the aim or effect of depriving them of their integrity as distinct peoples, or of their cultural values or ethnic identities;
 - (b) Any action which has the aim or effect of dispossessing them of their lands, territories or resources;
 - (c) Any form of forced population transfer which has the aim or effect of violating or undermining any of their rights;
 - (d) Any form of forced assimilation or integration;
 - (e) Any form of propaganda designed to promote or incite racial or ethnic discrimination directed against them.



Article 9

Indigenous peoples and individuals have the right to belong to an indigenous community or nation, in accordance with the traditions and customs of the community or nation concerned. No discrimination of any kind may arise from the exercise of such a right.

Article 10

Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation and, where possible, with the option of return.

Article 11

1. Indigenous peoples have the right to practise and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature.

- 
2. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with indigenous peoples, with respect to their cultural, intellectual, religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs.

Article 12

1. Indigenous peoples have the right to manifest, practise, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains.
2. States shall seek to enable the access and/or repatriation of ceremonial objects and human remains in their possession through fair, transparent and effective mechanisms developed in conjunction with indigenous peoples concerned.

Article 13

1. Indigenous peoples have the right to revitalize, use, develop and transmit to future genera-



tions their histories, languages, oral traditions, philosophies, writing systems and literatures, and to designate and retain their own names for communities, places and persons.

2. States shall take effective measures to ensure that this right is protected and also to ensure that indigenous peoples can understand and be understood in political, legal and administrative proceedings, where necessary through the provision of interpretation or by other appropriate means.

Article 14

1. Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning.
2. Indigenous individuals, particularly children, have the right to all levels and forms of education of the State without discrimination.
3. States shall, in conjunction with indigenous peoples, take effective measures, in order for indigenous individuals, particularly children, including



those living outside their communities, to have access, when possible, to an education in their own culture and provided in their own language.

Article 15

1. Indigenous peoples have the right to the dignity and diversity of their cultures, traditions, histories and aspirations which shall be appropriately reflected in education and public information.
2. States shall take effective measures, in consultation and cooperation with the indigenous peoples concerned, to combat prejudice and eliminate discrimination and to promote tolerance, understanding and good relations among indigenous peoples and all other segments of society.

Article 16

1. Indigenous peoples have the right to establish their own media in their own languages and to have access to all forms of non-indigenous media without discrimination.
2. States shall take effective measures to ensure that State-owned media duly reflect indigenous



cultural diversity. States, without prejudice to ensuring full freedom of expression, should encourage privately owned media to adequately reflect indigenous cultural diversity.

Article 17

1. Indigenous individuals and peoples have the right to enjoy fully all rights established under applicable international and domestic labour law.
2. States shall in consultation and cooperation with indigenous peoples take specific measures to protect indigenous children from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development, taking into account their special vulnerability and the importance of education for their empowerment.
3. Indigenous individuals have the right not to be subjected to any discriminatory conditions of labour and, inter alia, employment or salary.

Article 18

Indigenous peoples have the right to participate in decision-making in matters which would affect



their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.

Article 19

States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Article 20

1. Indigenous peoples have the right to maintain and develop their political, economic and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities.
2. Indigenous peoples deprived of their means of subsistence and development are entitled to just and fair redress.



Article 21

1. Indigenous peoples have the right, without discrimination, to the improvement of their economic and social conditions, including, inter alia, in the areas of education, employment, vocational training and retraining, housing, sanitation, health and social security.
2. States shall take effective measures and, where appropriate, special measures to ensure continuing improvement of their economic and social conditions. Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities.

Article 22

1. Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities in the implementation of this Declaration.
2. States shall take measures, in conjunction with indigenous peoples, to ensure that indigenous women and children enjoy the full protection and guarantees against all forms of violence and discrimination.



Article 23

Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions.

Article 24

1. Indigenous peoples have the right to their traditional medicines and to maintain their health practices, including the conservation of their vital medicinal plants, animals and minerals. Indigenous individuals also have the right to access, without any discrimination, to all social and health services.
2. Indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health. States shall take the necessary steps with a view to achieving progressively the full realization of this right.



Article 25

Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Article 26

1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned.



Article 27

States shall establish and implement, in conjunction with indigenous peoples concerned, a fair, independent, impartial, open and transparent process, giving due recognition to indigenous peoples' laws, traditions, customs and land tenure systems, to recognize and adjudicate the rights of indigenous peoples pertaining to their lands, territories and resources, including those which were traditionally owned or otherwise occupied or used. Indigenous peoples shall have the right to participate in this process.

Article 28

1. Indigenous peoples have the right to redress, by means that can include restitution or, when this is not possible, just, fair and equitable compensation, for the lands, territories and resources which they have traditionally owned or otherwise occupied or used, and which have been confiscated, taken, occupied, used or damaged without their free, prior and informed consent.
2. Unless otherwise freely agreed upon by the peoples concerned, compensation shall take



the form of lands, territories and resources equal in quality, size and legal status or of monetary compensation or other appropriate redress.

Article 29

1. Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.
2. States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent.
3. States shall also take effective measures to ensure, as needed, that programmes for monitoring, maintaining and restoring the health of indigenous peoples, as developed and implemented by the peoples affected by such materials, are duly implemented.



Article 30

1. Military activities shall not take place in the lands or territories of indigenous peoples, unless justified by a relevant public interest or otherwise freely agreed with or requested by the indigenous peoples concerned.
2. States shall undertake effective consultations with the indigenous peoples concerned, through appropriate procedures and in particular through their representative institutions, prior to using their lands or territories for military activities.

Article 31

1. Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the



right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.

2. In conjunction with indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.

Article 32

1. Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.
2. States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.
3. States shall provide effective mechanisms for just and fair redress for any such activities, and



appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.

Article 33

1. Indigenous peoples have the right to determine their own identity or membership in accordance with their customs and traditions. This does not impair the right of indigenous individuals to obtain citizenship of the States in which they live.
2. Indigenous peoples have the right to determine the structures and to select the membership of their institutions in accordance with their own procedures.

Article 34

Indigenous peoples have the right to promote, develop and maintain their institutional structures and their distinctive customs, spirituality, traditions, procedures, practices and, in the cases where they exist, juridical systems or customs, in accordance with international human rights standards.



Article 35

Indigenous peoples have the right to determine the responsibilities of individuals to their communities.

Article 36

1. Indigenous peoples, in particular those divided by international borders, have the right to maintain and develop contacts, relations and cooperation, including activities for spiritual, cultural, political, economic and social purposes, with their own members as well as other peoples across borders.
2. States, in consultation and cooperation with indigenous peoples, shall take effective measures to facilitate the exercise and ensure the implementation of this right.

Article 37

1. Indigenous peoples have the right to the recognition, observance and enforcement of treaties, agreements and other constructive arrangements concluded with States or their successors and to have States honour and re-



spect such treaties, agreements and other constructive arrangements.

2. Nothing in this Declaration may be interpreted as diminishing or eliminating the rights of indigenous peoples contained in treaties, agreements and other constructive arrangements.

Article 38

States in consultation and cooperation with indigenous peoples, shall take the appropriate measures, including legislative measures, to achieve the ends of this Declaration.

Article 39

Indigenous peoples have the right to have access to financial and technical assistance from States and through international cooperation, for the enjoyment of the rights contained in this Declaration.

Article 40

Indigenous peoples have the right to access to and prompt decision through just and fair procedures for the resolution of conflicts and disputes with States or other parties, as well as to effective



remedies for all infringements of their individual and collective rights. Such a decision shall give due consideration to the customs, traditions, rules and legal systems of the indigenous peoples concerned and international human rights.

Article 41

The organs and specialized agencies of the United Nations system and other intergovernmental organizations shall contribute to the full realization of the provisions of this Declaration through the mobilization, inter alia, of financial cooperation and technical assistance. Ways and means of ensuring participation of indigenous peoples on issues affecting them shall be established.

Article 42

The United Nations, its bodies, including the Permanent Forum on Indigenous Issues, and specialized agencies, including at the country level, and States shall promote respect for and full application of the provisions of this Declaration and follow up the effectiveness of this Declaration.



Article 43

The rights recognized herein constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world.

Article 44

All the rights and freedoms recognized herein are equally guaranteed to male and female indigenous individuals.

Article 45

Nothing in this Declaration may be construed as diminishing or extinguishing the rights indigenous peoples have now or may acquire in the future.

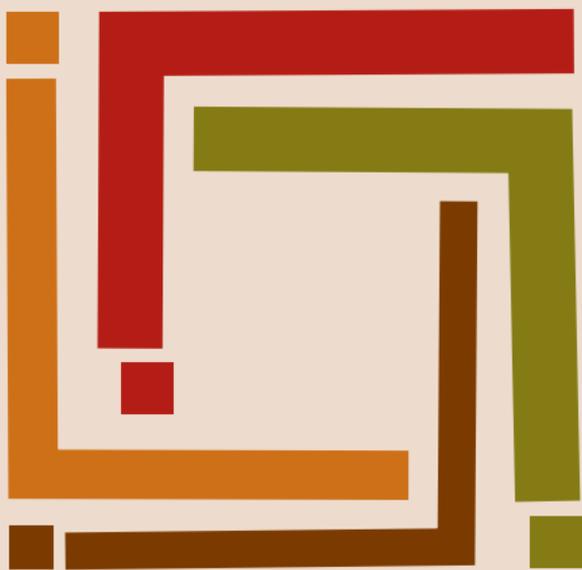
Article 46

1. Nothing in this Declaration may be interpreted as implying for any State, people, group or person any right to engage in any activity or to perform any act contrary to the Charter of the United Nations or construed as authorizing or encouraging any action which would dismem-



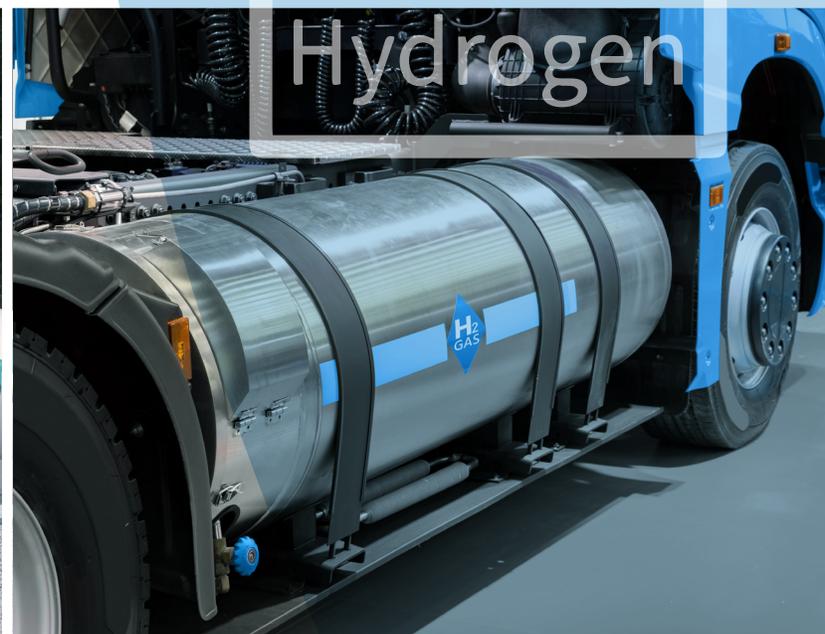
ber or impair, totally or in part, the territorial integrity or political unity of sovereign and independent States.

2. In the exercise of the rights enunciated in the present Declaration, human rights and fundamental freedoms of all shall be respected. The exercise of the rights set forth in this Declaration shall be subject only to such limitations as are determined by law and in accordance with international human rights obligations. Any such limitations shall be non-discriminatory and strictly necessary solely for the purpose of securing due recognition and respect for the rights and freedoms of others and for meeting the just and most compelling requirements of a democratic society.
3. The provisions set forth in this Declaration shall be interpreted in accordance with the principles of justice, democracy, respect for human rights, equality, non-discrimination, good governance and good faith.



Designed by the Graphic Design Unit, Department of Public Information, United Nations

Appendix E: Ontario's Low-Carbon Hydrogen Strategy



Ontario's Low-Carbon Hydrogen Strategy

A PATH FORWARD

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● Message from the Premier and Minister



Doug Ford, Premier of Ontario.



Todd Smith, Minister of Energy.

Since taking office our government has worked to make Ontario the best place to build the industries of the future. By reducing electricity costs, lowering taxes and cutting red tape we have significantly reduced the cost of doing business and seen companies and investment flow into our province as a result.

Under the previous government, the surplus generation from our nuclear and hydroelectric fleets was sold at a loss to competing jurisdictions in the United States. We are aiming to turn that electricity into a Made-in-Ontario opportunity for economic development. By leveraging that electricity for hydrogen production, electric vehicle charging and energy storage we are creating economic growth while lowering rates for families and businesses across the province.

We've rebuilt our manufacturing sector following years of neglect – securing new automotive mandates and major investments in steel production and other sectors that are supporting hundreds of thousands of jobs.

We know that to continue this growth, industries of the future require clean energy. Corporate decisions on where to invest and grow are increasingly influenced by environmental and sustainability goals.

Ontario comes from a position of strength. Our families and businesses have already done the heavy lifting of building one of the cleanest electricity systems in the world, giving us a clean energy advantage. Our government is leveraging this competitive advantage to help create jobs, including through creation of a clean energy credits registry that will allow companies to demonstrate their electricity has been sourced from a non-emitting resource.

Our strategy for a low-carbon hydrogen economy lays out the immediate actions we will take, together with job creators and other partners, in building that advantage. We are confident it will help us attract trade and investments while decarbonizing our energy sector.

Our hydrogen strategy identifies innovative projects that can help secure a clean energy future with hydrogen playing a critical role as a clean and safe energy source, from hydrogen production projects and hydrogen hubs to exploring electricity rate options for hydrogen producers. Our world-class talent and companies with cutting-edge hydrogen technologies paired with a competitive business climate can propel that work even further.

When energy is clean, reliable and affordable our whole province benefits. Our low-carbon hydrogen strategy is just the first step as we seize Ontario's opportunity to grow into the clean manufacturing hub of the future, for the benefit of businesses and people across the province.

We forward to continuing our work together to shape the future of Ontario's exciting hydrogen sector.

Sincerely,



Doug Ford
Premier of Ontario



Todd Smith
Minister of Energy

● Executive Summary

Ontario's low-carbon hydrogen strategy sets out a vision for a low-carbon hydrogen economy in our province – *one where we can leverage our many strengths to develop a self-sustaining sector in Ontario, evolve our energy system, create local jobs and attract investment while reducing greenhouse gas (GHG) emissions.*

Ontario's hydrogen strategy sets out a path where eight concrete and immediate actions are expected to lead to an eight-fold increase in the province's production capacity of low-carbon hydrogen and support the nascent market to meet its potential.

Ontario is well-positioned to become a leader in the low-carbon hydrogen sector. Our province's current advantages include:

- **Open for Business:** Ontario has a highly skilled workforce, global hydrogen technology manufacturers and many established industrial sectors that can support growth of the province's low-carbon hydrogen economy (e.g., cleantech, steel, auto manufacturing and chemicals).
- **Clean, Reliable and Affordable Electricity System:** Ontario's electricity system is among the world's cleanest with very low emissions. In addition, Ontario now has competitive electricity rates for large electricity consumers through a number of programs that could benefit hydrogen producers particularly by using off-peak electricity.
- **Existing Storage and Pipeline Infrastructure:** Ontario has existing and planned pipeline and storage infrastructure

that can be used to store hydrogen and deliver it to homes and businesses. This includes geological storage opportunities and an extensive natural gas distribution network.

- **Enabling Regulatory Environment:** Ontario is prioritizing red-tape reduction to attract investment and create jobs. Ontario's regulatory framework for fuels has already enabled a pilot project to blend hydrogen into natural gas pipelines, as approved by the Ontario Energy Board (OEB) with support from the Technical Standards and Safety Authority (TSSA).
- **Clean Biofuel Resources:** Ontario's rich forest, agricultural and municipal biomass resources could be used to create low-carbon hydrogen or other renewable fuels. This includes using diverting waste streams from these sectors, as well as material from sustainably managed forests and purpose-grown crops.

Ontario also recognizes the importance of working with the federal government and other provinces and territories to advance commercial development of hydrogen. This strategy calls on the federal government to offer tangible supports and partnerships with the province including funding and risk-sharing opportunities, and clear and efficient regulations that are harmonized across leading jurisdictions and support for innovation.

To become a leader in the low-carbon hydrogen economy, Ontario's strategy is guided by the following objectives:

- **Generate Economic Development and Jobs:** Capitalize on Ontario's competitive and regional advantages, including our talent, infrastructure and resources, to accelerate growth in Ontario's low-carbon hydrogen economy.
- **Reduce Greenhouse Gas Emissions:** Support our Made-in-Ontario Environment Plan targets to reduce GHG emissions by encouraging the use of low-carbon hydrogen.
- **Promote Energy Diversity:** Consider how low-carbon hydrogen can cost-effectively support Ontario's evolving energy system and build redundancies through electricity storage and clean fuel supply.
- **Promote Innovation and Investment:** Enable opportunities for low-carbon hydrogen use and position Ontario as a leading destination for investment.
- **Strengthen Collaboration:** Work with the private sector, the federal government, municipalities, Indigenous communities, academic institutions and other stakeholders to grow and sustain a low-carbon hydrogen economy in Ontario.

Ontario's strategy is grounded in immediate actions to enable production and expand the low-carbon hydrogen economy in our province:

1. Launching the Niagara Falls Hydrogen Production Pilot: Atura Power proposes to produce hydrogen in Niagara Falls using electricity from the Sir Adam Beck hydroelectric generating station as part of its grid regulation services to Ontario's electricity system. The government filed a regulatory

exemption to the Gross Revenue Charge (GRC) for electricity used by this project.

- 2. Identifying Ontario's Hydrogen Hub Communities:** Atura Power is working to identify additional strategic locations across the province for hydrogen "hubs" where low-carbon hydrogen demand can be matched by low-carbon hydrogen production that leverages existing electricity infrastructure and Ontario's clean electricity grid. The Ministry of Energy will also undertake its own third-party led feasibility study to explore opportunities to establish new low-carbon hydrogen or clean fuel hubs in Ontario.
- 3. Assessing the Feasibility of Hydrogen Opportunities at Bruce Power:** Bruce Power will launch a feasibility study to explore opportunities to leverage excess energy from the Bruce Nuclear Generating Station for hydrogen production and support a centre of excellence in the region.
- 4. Developing an Interruptible Electricity Rate:** Ontario will be working towards reducing electricity rates to support low-carbon hydrogen production through a proposed Interruptible Rate pilot that would offer large electricity consumers reduced electricity rates in exchange for reduced consumption during system or local reliability events. The Ministry of Energy will also undertake consultations on other electricity rates that could help to further grow Ontario's low-carbon hydrogen economy.
- 5. Supporting Hydrogen Storage and Grid Integration Pilots:** Ontario will ask the Independent Electricity System Operator (IESO) to report back on program options to support hydrogen storage and grid integration pilot projects.

- 6. Transitioning Industry Through the Use of Low-carbon Hydrogen:** Ontario is taking immediate steps to support the efforts of industry to phase out their use of coal by transitioning to low-carbon processes and hydrogen-ready equipment. For example, Ontario is contributing \$500 million in support to the \$1.8 billion project by ArcelorMittal Dofasco at its Hamilton facility to replace coal-fed furnaces with a hydrogen-ready electric arc furnace (EAF). This project will reduce GHG emissions by about three million tonnes annually.
- 7. Consulting on an Ontario Carbon Sequestration and Storage Regulatory Framework:** Ontario is proposing changes to the Oil, Gas and Salt Resources Act and the Mining Act frameworks to enable carbon storage activities on Crown land. Carbon sequestration offers the opportunity to produce low-carbon hydrogen using natural gas.
- 8. Supporting Ongoing Hydrogen Research:** Ontario is supporting two independent hydrogen research projects in partnership with Natural Resources Canada to advance hydrogen development in the province.

Ontario is ready to do our part so we can attract investment and good-paying jobs in science, technology, engineering and the skilled trades.

Working together with Ontario businesses and industrial partners, the federal government, municipalities, Indigenous communities, academic institutions and other key stakeholders, we are going to connect Ontario with global markets to develop an economically sustainable low-carbon hydrogen sector.

By leveraging our talent, infrastructure and resources, we will seize this opportunity and unleash our fullest potential by becoming a world-class hub for low-carbon hydrogen innovation.

● Introduction and Need for Action

I. What is Hydrogen

Hydrogen is the first element on the periodic table. It is colourless and odourless and makes up about 75 per cent of mass in the universe. But energy is required to break the bond it has with other elements to release it from the materials where it is naturally found, for example in water (H₂O), to create pure hydrogen gas (H₂).

There are various feedstocks and ways to “break the bonds” to make hydrogen such as with electricity, fossil fuels, renewable fuels and biomass (for example forestry and crop residues). Depending on how it is produced, hydrogen has the potential to be a low-carbon fuel.

Globally, most hydrogen is made from natural gas through a process called steam methane reformation, which is currently the cheapest way to make hydrogen but has a higher carbon footprint. Hydrogen made from natural gas could potentially be paired with carbon capture, utilization and storage (CCUS) to keep most of the carbon dioxide from its production from entering the atmosphere. Hydrogen made from clean electricity or biomass results in zero or near-zero greenhouse gas (GHG) emissions over its lifecycle. This is relevant in Ontario since our world-class electricity grid is one of the cleanest, with most

electricity generated from carbon-free nuclear or hydroelectric sources.

Low-carbon hydrogen (e.g., made from clean electricity) currently represents only 0.5 per cent of the global market share.¹ Globally, electricity-based hydrogen is expected to be cost-competitive with hydrogen made from natural gas by 2030 due to economies of scale and technological improvements.²

Currently, producing low-carbon hydrogen is costly in Ontario in part because of the cost difference between producing hydrogen using electricity versus using natural gas. Given that specific challenge, and the opportunity of promoting the production and use of low-carbon hydrogen to help decarbonize our energy system, Ontario is interested in exploring technologies and business models that can improve cost-competitiveness of producing low-carbon hydrogen.

Hydrogen is a proven safe form of fuel and subject to the same strict standards of safety as other gaseous fuels in Ontario. In fact, some of hydrogen’s properties make it safer to handle and use than other fuels. According to the U.S. Department of Energy, hydrogen is non-toxic, and because hydrogen is much lighter than air, it dissipates rapidly when it is released, allowing for relatively rapid dispersal of the fuel in case of a leak.³

1. Wood Mackenzie, 2020.

2. IHS Markit, 2020.

3. U.S. Department of Energy, *Safe Use of Hydrogen*

Hydrogen Terminology

Hydrogen is often referred to as green, blue or grey:

- Green hydrogen is made using low-carbon sources like electricity from Ontario's grid or renewable organic material (i.e., biomass).
- Blue hydrogen is made from natural gas with carbon capture, utilization and storage.
- Grey hydrogen is made from natural gas.

Low-carbon hydrogen refers to the smaller carbon footprint of the hydrogen production method compared to other methods and includes blue and green hydrogen.

II. Seizing the Opportunity

Companies across the globe are putting capital towards reducing industrial emissions, shifting to zero-emission transportation vehicles and finding new low-carbon ways of heating our homes and businesses. Addressing climate change by lowering our GHG emissions presents Ontario with new opportunities for economic development rooted in the emerging global demand for low-carbon and net zero.

Meeting climate change targets and reducing overall GHG emissions is a challenge for all jurisdictions. Ontario is committed to action on climate change, including reducing GHG emissions to 30 per cent below 2005 levels by 2030.

There are a number of technologies and pathways to help Ontario meet its targets. For practical

and cost-effectiveness reasons, different low-carbon technologies are better suited for specific applications in the near term. In some cases, electrification makes sense; in others, clean fuels will provide the flexibility needed to abate emissions.

The province's Made-in-Ontario Environment Plan speaks to the important role that hydrogen can play as a low-carbon fuel that can support low-carbon vehicle adoption (e.g., public transportation, forklifts, heavy-duty trucks), decarbonization of space and water heating for homes and businesses and helping industry to decarbonize their processes and meet compliance obligations under Ontario's Emissions Performance Standards program.

Since 2018, Ontario has already embarked on a wide range of initiatives that include low-carbon technologies:

- Lowering the carbon footprint of industrial processes such as reducing the use of industrial coal in the steel industry;
- Introducing industrial Emissions Performance Standards;
- Building zero-emission electric vehicles;
- Developing Canada's first grid-scale small modular reactor and investigating future hydroelectric opportunities in Ontario's North;
- Integrating more electricity storage and distributed electricity generation resources into the provincial electricity grid;
- Supporting new transmission infrastructure to connect more businesses to Ontario's clean grid;
- Blending renewable content into gasoline, diesel and natural gas; and

- Increasing production of biogas and renewable natural gas for space and water heating, transportation and other applications.

Ontario is also leveraging and maximizing the province's existing energy infrastructure to ensure successful and cost-effective application of clean technologies across the province.

As we cast an eye to the future, clean fuels like low-carbon hydrogen present an opportunity to expand Ontario's clean energy advantage, remain a leader in manufacturing and meet climate and clean energy goals.

Ontario already has a strong foundation to grow Ontario's low-carbon hydrogen economy. Through this strategy, we will showcase opportunities and actions across government and outside of it that are helping to build momentum and support for Ontario's hydrogen economy in the near term and into the future.

III. Ontario's Hydrogen Economy – Setting the Stage

Ontario has conducted extensive consultations for more than a year in developing Ontario's Low-Carbon Hydrogen Strategy, including hearing from industry, academia, environmental groups, Indigenous communities and the public.

We have a lot more work to do. Growing our low-carbon hydrogen sector in Ontario will take

time. We will continue to closely collaborate with the private sector, academics, municipalities and industry to refine our actions and advocate the federal government for investment. We will leverage Ontario's existing advantages and work within the broader framework that is being created on the national level.

This document sets the stage. It lays the foundation that will help Ontario create the right climate for businesses to take the lead.

Consultation to Develop Ontario's Low-Carbon Hydrogen Strategy

Ontario engaged in several types of targeted and broader public consultation on low-carbon hydrogen to help inform the development of Ontario's Low-Carbon Hydrogen Strategy:

- **Clean Technology Sector Engagement:** *As part of the Ontario Jobs and Recovery Committee's work, the government consulted with the clean technology sector, including hydrogen stakeholders, in spring 2020. The purpose was to understand COVID-related disruptions and how government could support the sector to continue to grow and prosper beyond the immediate recovery.*
- **Low-Carbon Hydrogen Discussion Paper:** *The government posted a discussion paper to the Environmental Registry of Ontario for public consultation in fall 2020. The purpose of the discussion paper was to begin a dialogue and seek input to better understand the needs of the sector, the challenges of supporting a complex hydrogen market, and ways to enable the private sector to expand adoption of hydrogen and support regional growth.*
- **Stakeholder Webinars:** *Ontario hosted two webinars in January 2021 to broaden the reach and obtain additional feedback from stakeholders, and shared information with Indigenous communities. Ontario received 145 comments from 140 organizations and individuals on the hydrogen discussion paper, including comments from industry, academia, environmental groups and the public.*
- **Hydrogen Strategy Working Group:** *Ontario established the Hydrogen Strategy Working Group that met nine times from February to June in 2021 and was made up of 23 industry and academic experts who provided advice on how to use hydrogen across various sectors and help Ontario compete in the global hydrogen market.*

● The Case for Low-Carbon Hydrogen

I. Environment and Economy

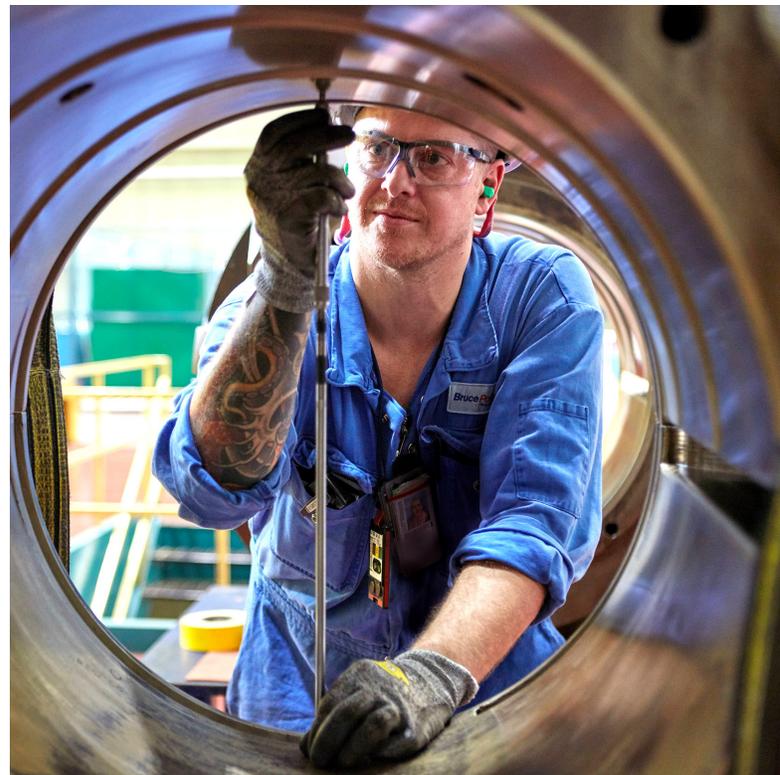
Using hydrogen as a fuel and feedstock (i.e., raw material used for industrial processes) has re-emerged as an exciting and potential long-term way to address climate change while providing clean energy and creating opportunities for economic growth. This is especially important since in 2019, about 75 per cent of Ontario's GHG emissions came from energy usage (such as for transportation, buildings and industry) and about 15 per cent from industrial processes and product use. While electrification may provide a low-carbon alternative for some applications, hydrogen could be that alternative for others.

To take advantage of the potential of low-carbon hydrogen, we need to act now to scale up existing technologies and encourage investment.

Many countries and subnational jurisdictions around the world have established or are creating plans to support market ramp-up of low-carbon hydrogen to help address climate change, secure their energy supply and support economic growth. In recent years, Canada and a number of other countries and regions, including Germany, the United States, Australia, the European Union, Japan and Spain and jurisdictions like British Columbia, Alberta, California and New South Wales, Australia have issued hydrogen strategies or plans.

Natural Resources Canada (NRCan) modelling shows that hydrogen could make up about 30 per cent of the country's fuels and feedstock by 2050, create about 350,000 jobs and remove up to 190 megatonnes of GHG emissions per year, with both domestic and international market opportunities.⁴

By 2050, Ontario's share of these projected benefits could include over 100,000 jobs and GHG emissions reductions of 50 megatonnes per year, according to preliminary estimates. This reduction in GHG emissions would be equivalent to about a quarter of the province's 2005 emissions or removing 15 million cars off the road.



Worker on Bruce Power's Turbine Floor.

4. *Hydrogen Strategy for Canada*, p. 69.

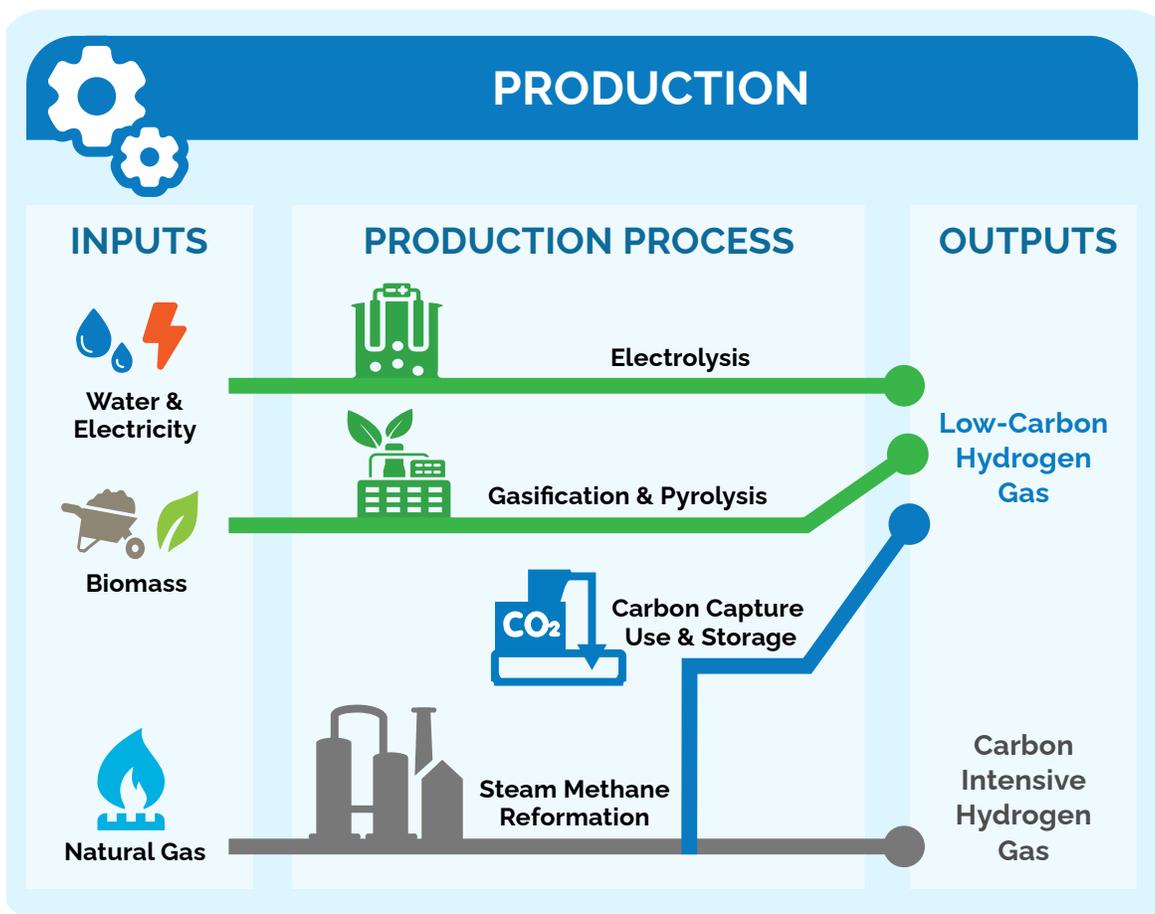
II. Low-Carbon Hydrogen Supply Chain

Production

Energy is needed to separate hydrogen from other elements to create pure hydrogen gas. Today, most hydrogen is produced using natural gas through a process called steam methane reformation, which results in a more carbon intensive hydrogen gas. This is often referred to as “grey” hydrogen. Lower-carbon hydrogen can be produced from natural gas using steam methane reformation that incorporates Carbon Capture Utilization and Storage (CCUS) to reduce the carbon emissions associated with hydrogen production. This is often referred to as “blue”

hydrogen. Low-carbon electricity (e.g., nuclear, hydroelectric, wind, solar) can be used for electrolysis to produce low-carbon hydrogen or biomass and renewable natural gas can be converted into hydrogen through processes such as gasification and pyrolysis. This is called “green” hydrogen.

Using electricity generated from non-emitting sources to produce hydrogen may also help with the affordability of electricity in Ontario. For example, increasing electricity demand during off-peak hours when demand for electricity is lowest provides a new customer base for Ontario’s low-carbon electricity, allowing existing system costs to be shared across a large consumption base



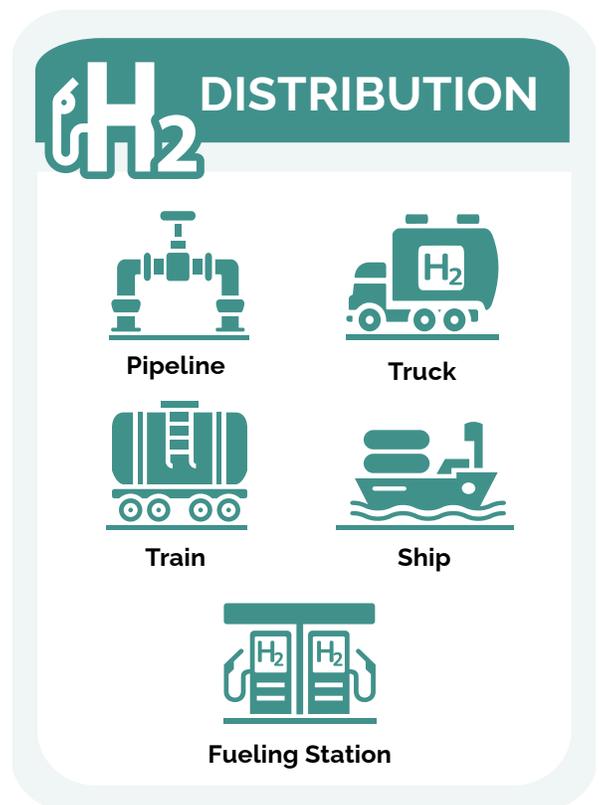
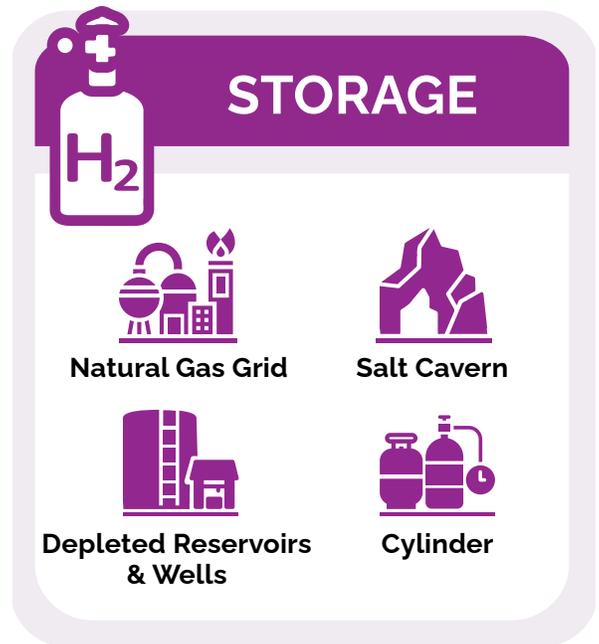
Storage and Distribution

Once produced, hydrogen can be stored in gaseous form in high pressure cylinders and in liquid form in insulated tanks. It can also be stored in gaseous form in natural gas pipelines, salt caverns and depleted reservoirs. It can then be transported in tanks on trucks, trains and ships or transmitted or distributed through the existing natural gas system or dedicated pipelines.

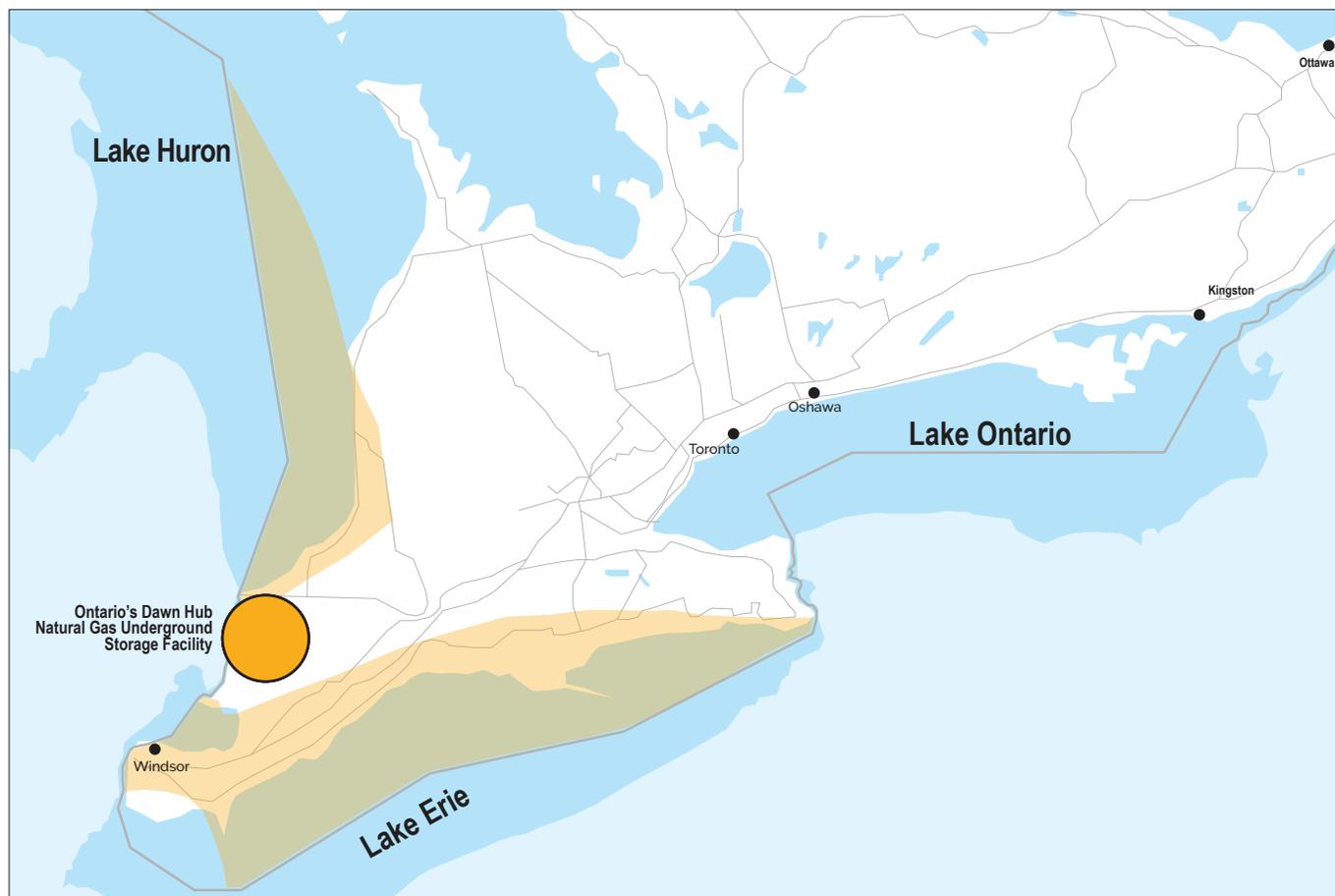
Ontario is currently home to one of the largest natural gas storage facilities in North America, referred to as the Dawn Hub, which is located in southwestern Ontario. Ontario's unique Dawn Hub is also the second most physically traded natural gas hub in North America.

The Dawn Hub is a series of underground depleted cavernous natural gas reservoirs that are filled each summer when demand for natural gas is low and natural gas is cheaper and discharged in the winter to serve increased heating demand. This allows optimum utilization of pipeline capacity into Ontario, lowers natural gas prices for Ontario families and businesses, and ensures the province has the energy it needs throughout the winter. Each year Ontario stores approximately 35 per cent of its total winter natural gas demand in the Dawn Hub storage facilities.

In a similar manner, Ontario's geology may provide opportunities for large scale low-carbon hydrogen production or storage. Advancement of carbon dioxide (CO₂) storage opportunities may allow for industrial producers of hydrogen (e.g., petroleum refiners) to use natural gas to manufacture blue hydrogen by capturing and sequestering the CO₂ emissions or use the local geology to provide significant hydrogen storage capabilities.



General area of saline aquifers with CO₂ storage potential and existing natural gas storage in Ontario



Source : *Geological Sequestration of Carbon Dioxide: A Technology Review and Analysis of Opportunities in Ontario*, Ontario Ministry of Natural Resources, 2007.

In 2007, a review of sequestration opportunities for CO₂ in Ontario undertaken by the Ontario Ministry of Natural Resources suggested that, from a geological perspective, the most suitable geology for CO₂ storage may be located in an area of Southern Ontario underlain by sandstones that act as saline aquifers.

Ontario is engaged with the federal government to advance work under the federal Hydrogen Strategy for Canada in collaboration with other provincial and territorial governments. This includes research to better understand Ontario's opportunities for underground CO₂ storage as well

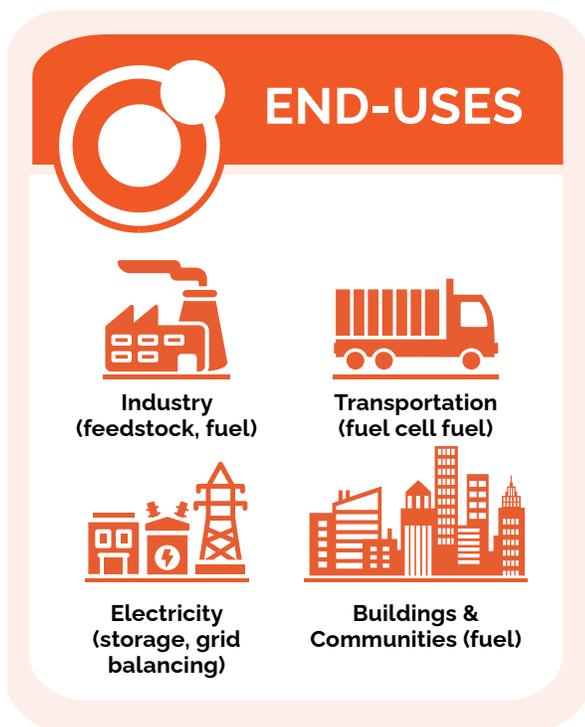
as working on codes and standards for the storage and distribution of hydrogen.

Usages

At present, the main uses for hydrogen in Ontario are in petroleum refineries and for fertilizer production. Additionally, at least two large companies in Ontario – Canadian Tire and Walmart – are using hydrogen-powered forklifts in their warehouses because they are already cost competitive when operated for 24 hours a day. Since hydrogen-powered forklifts only emit water, they support indoor air quality for workers. This equipment has also improved productivity and

reduced greenhouse gas emissions.

There are several uses where low-carbon hydrogen could replace natural gas, diesel, gasoline, coal or high-carbon hydrogen. It can be converted to electricity through a fuel-cell in electric vehicles to power trucks and heavy machinery. It can be used by industry as fuel for industrial processes or as feedstock to produce other products like fertilizer, ammonia, renewable diesel or refinery products. It can also be used to create low or carbon-free heat for buildings and communities, and for large scale long-term electricity storage and balancing services to



support the electricity grid (i.e., helping adjust to real-time variations in electricity supply and demand).

There is already a pilot project being led by Enbridge Gas and Cummins to inject hydrogen into natural gas pipelines in Markham, adding up to 2 per cent hydrogen by volume into the gas stream for 3,600 customers.

Hydrogen could have applications to decarbonize heavy industry. For instance, hydrogen could be used to remove oxides from iron ore (instead of coke or coal in a blast furnace) in steelmaking. Hydrogen would support the province's initiatives related to the phase-out of industrial coal and the government's support for clean steelmaking investments.

Major transportation routes could be leveraged to support the development of hydrogen transportation corridors that provide demand nodes for Ontario hydrogen production.

Low-carbon hydrogen use in these applications can complement other low-carbon fuels and technologies such as battery electric vehicles, heat pumps and renewable fuels like renewable natural gas.

III. Energy Diversity

Energy diversity is a key advantage of Ontario’s energy sector contributing to its reliability, flexibility and resilience.

Ontario’s clean electricity grid is powered primarily by a combination of nuclear, hydroelectric, other renewable electricity and natural gas, providing reliable and flexible electricity supply from a diversity of sources. Similarly, Ontario’s broader energy system (i.e., supporting transportation, industrial, home heating and other applications) includes a diverse mix of fuels such as natural gas, petroleum fuels and biofuels. Different fuel sources and energy solutions make sense in different circumstances. A diverse energy mix allows end-users to find solutions that best meet their needs.

Low-carbon hydrogen is an important part of Ontario’s path to decarbonizing its energy system

and can also support continued energy diversity in a low-carbon Ontario.

For example, low-carbon hydrogen can serve as a complementary fuel source in the evolving transportation sector. By 2030, it is expected that one out of every three automobiles sold will be electric. Ontario’s automotive sector is a key part of that transformation.

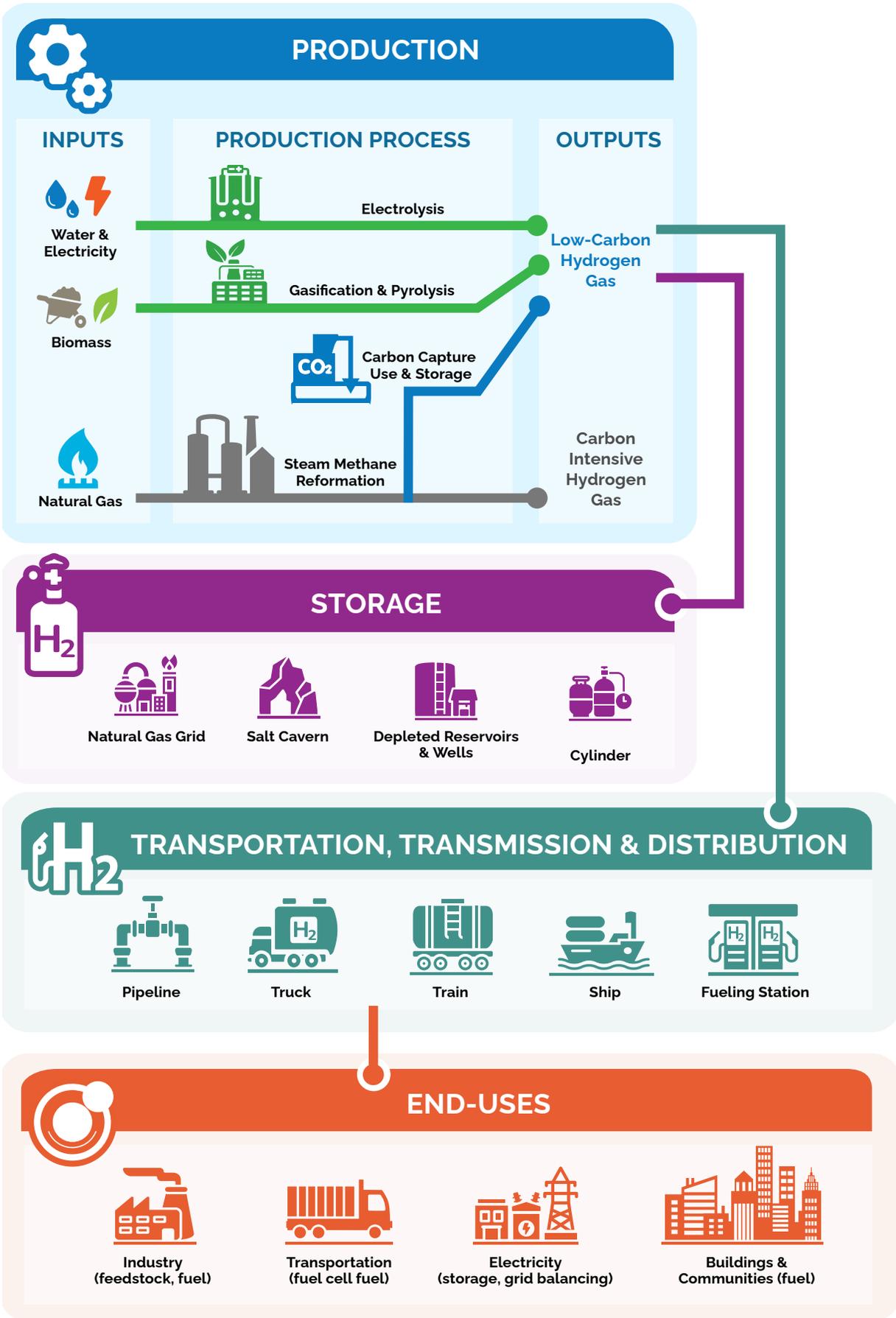
Hydrogen fuel cell vehicles have attracted interest, particularly for heavy-duty vehicle applications. For example, hydrogen fuel cells tend to be favourable for long-distance trucking applications given their comparability in range and fueling times with conventional diesel trucks. Hydrogen fuel cells also offer a smaller onboard battery pack compared to battery-electric vehicles and can support increased payload capacity. Hydrogen fuel cell applications may be more easily scalable to fleet and long-haul operations, such as transit buses, transport trucks, ships and trains, allowing for more efficient use of energy infrastructure.

Low-carbon hydrogen fuel cell powered vehicles can also complement transportation vehicles powered by lower-carbon ethanol and bio-based diesel blends. In this way, low-carbon hydrogen contributes to the diversity of transportation fuel options in Ontario, promoting energy diversity and resilience.

Low-carbon hydrogen can also be used in a complementary way to renewable natural gas (RNG), another low-carbon fuel that is critical to meeting the province’s environmental goals. RNG is an important driver of economic growth in rural communities, generating value through organic waste recovery in Ontario’s agrifood sector. As identified in the Made-in-Ontario Environment Plan, RNG and hydrogen can be key drivers for fuel-switching in sectors alongside electrification.



Vehicle traffic on Ontario’s highways.

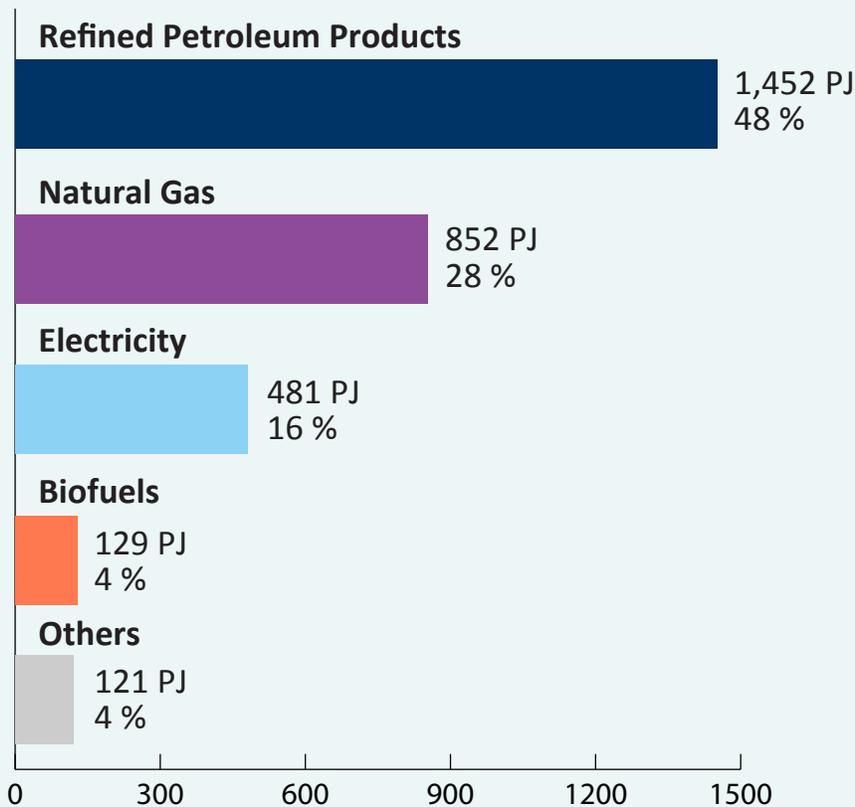


Like RNG, low-carbon hydrogen can be blended with natural gas in existing natural gas networks, reducing its carbon footprint. Similar to RNG, hydrogen can also be blended into natural gas-fired electricity generation facilities where feasible, helping lower the carbon footprint of these peaking units when they are required. Low-carbon hydrogen and RNG complement each other as low-carbon fuels with locational and production diversity.

Low-carbon hydrogen can also play a role in linking the electricity grid to the natural gas distribution grid, such as converting off-peak electricity from the provincial power grid into hydrogen that can be blended into the natural gas distribution system.

Ontario's Energy Mix

In 2017, about 28 per cent of Ontario's energy use was natural gas and 16 per cent was electricity. Hydrogen has the unique potential to help solve to major energy challenges including clean energy storage, green transportation and linking the electricity and natural gas distribution grids.



Source: Canada Energy Regulator

● Key Considerations for Hydrogen Deployment

I. Open for Business

Ontario has many advantages that will help advance a globally competitive low-carbon hydrogen economy for consumers in Canada and around the world. Ontario has a world-class clean electricity system, highly skilled workforce, global hydrogen technology manufacturers and innovative companies that are working to advance low-carbon hydrogen technology.

Ontario's location within the Great Lakes region is beneficial for trade with the United States and overseas markets including Europe and Asia, which could include trading low-carbon hydrogen and associated technologies in the future. Ontario is uniquely positioned to deliver the cutting-edge low-carbon hydrogen equipment and services needed to meet the demand of the global market.

Certain regions in Ontario have opportunities to advance low-carbon hydrogen, for example:

- **Niagara Region:** run-of-the-river hydroelectricity and electricity grid regulation services that can be used for large-scale hydrogen production;
- **Bruce-Huron Region:** large-scale clean electricity generation and geological storage;
- **Windsor-Quebec Corridor:** busiest freight corridor in North America;
- **Windsor and Sarnia-Lambton Region:** refineries and chemical production

transformation, gaseous fuel storage, and underground caverns for subsurface hydrogen storage;

- **Northern Ontario:** feedstock from sustainably managed forests;
- **Greater Toronto Area:** large density of end-users, such as vehicle fleets and heavy-duty trucking;
- **Hamilton:** major steel producers and manufacturing hub;
- **Southern Ontario:** heavy industry transformation; and
- **Resource recovery across Ontario:** feedstock from landfills as well as food and organic waste processing facilities.

Ontario has a solid foundation for innovation with a world-class education system and research ecosystem. Ontario's universities and colleges are recognized globally and include several institutions that work on hydrogen and fuel cell related research.

Ontario is committed to providing services and programs to individuals and businesses that can be leveraged to support a low-carbon hydrogen economy in the province:

- Ontario launched a second round of the Skills Development Fund in September 2021. The fund encourages applicants to submit proposals that will address employer challenges to hiring and training workers during the COVID-19

pandemic, including priority sectors such as advanced manufacturing, life sciences and technology, which can include hydrogen technology.

- Ontario launched the 2021-22 Pre-Apprenticeship Training Program Call for Proposals in December 2021. The program introduces individuals seeking a career in the skilled trades to the technical training needed for apprenticeship in a specific trade, including those related to hydrogen technology. The goal of the program is to increase the number of new entrants to apprenticeship programs, while addressing skilled trade shortages in high-demand trades.
- Ontario has a number of programs and services for enterprises that can be leveraged to support low-carbon hydrogen in Ontario. Examples include services that provide business opportunity analysis and market insights, client-centric advice and facilitation, site selection and export assistance.
- In addition, Ontario has regional economic development funds that can support low-carbon hydrogen in Ontario. This includes the Eastern Ontario Development Fund, the Southwestern Ontario Development Fund and the Northern Ontario Heritage Fund Corporation's funding programs.

Ontario also provides several income tax incentives to encourage business investment and job creation. These incentives include:

- The Ontario Research and Development Tax Credit, Ontario Innovation Tax Credit and the Ontario Business-Research Institute Tax Credit for qualified expenditures on scientific research and experimental development performed in the province;

- Paralleling federal measures that allow businesses to accelerate write-offs of investments made in most depreciable assets. These measures include an immediate 100 per cent write-off for manufacturing and processing machinery and equipment, specified clean energy equipment and zero-emission vehicles; and
- The Regional Opportunities Investment Tax Credit for certain capital investments in designated regions of the province.

Ontario's industrial sectors are already exploring measures to reduce their carbon footprint. Adopting low-carbon hydrogen could further help industry reduce its GHG emissions and aligns with programs like Ontario's Emissions Performance Standards (EPS). The EPS program is a key commitment of the government to reduce GHG emissions from large, industrial emitters with a system that is tough but fair, cost-effective and flexible to the needs and circumstances of our province.

Some Ontario regions have taken steps to champion their area as potential hydrogen hubs. For instance, Sarnia-Lambton has highlighted the region's cluster of current and potential low-carbon hydrogen producers and users (e.g., in the petroleum refining and chemical sectors), energy and infrastructure assets, research capabilities and skilled workforce as attributes that position this region to be a key player in the low-carbon hydrogen economy. Ontario's support for clean steelmaking in Hamilton also provides an opportunity for companies, research centres and workers in that region to begin partnering on hydrogen hub opportunities.

Other regions have potential as low-carbon hydrogen hubs and Ontario has engaged in

preliminary research to evaluate potential opportunities, along with the federal government's Hydrogen Strategy which is also looking to identify potential hubs for Canada.

Ontario has many established industrial sectors that can support growth of the province's low-carbon hydrogen economy. This includes businesses with experience in cleantech, steel, auto manufacturing and chemicals. These businesses are ready to collaborate and deliver innovative solutions for the future of low-carbon hydrogen in Ontario. Two such sectors, chemicals and autos, are profiled below.

Chemical Manufacturing

With 40 per cent of the country's total production, Ontario is a chemical manufacturing powerhouse. The chemical sector has a longstanding presence in Ontario and has played a vital role in the province's economy.

From a burgeoning sector that mass-produced synthetic rubber in Sarnia-Lambton during Canada's World War II efforts, the sector has grown to become the largest in Canada, providing 26,000 direct jobs to Ontarians (in 2020)⁵, and is the fourth largest exporting manufacturing sector in the province. With over \$16 billion in sales, the sector's value chain includes the production of ethanol fuel from biomass feedstock, as well as commodity chemicals, synthetic resins, a wide range of specialty chemicals and plastics as well as a leading producer of chewing gum.

The sector's products are direct enablers of other key sectors in the province, including automotive, aerospace, health and life sciences, food

packaging and electronics. As the sector continues to focus on environmental sustainability, the province's chemical manufacturers are investing in technologies that contribute to waste and carbon emission reductions, as well as the evolving circular economy.

Sarnia-Lambton is also a major player in the production of fertilizer and ammonia. Ammonia is comprised of three parts hydrogen and one-part nitrogen. At present, ammonia production is one of the largest industrial uses of hydrogen, though the vast majority of it is grey hydrogen. Low-carbon hydrogen presents an opportunity to decarbonize ammonia production.

In addition to being used to produce fertilizer, ammonia can also be used as a chemical carrier to enable the cost-effective transport of hydrogen within Canada and to export markets across the continent and beyond. Ammonia's higher volumetric energy density compared to hydrogen gas, enables hydrogen to be transported and stored using existing ammonia transportation infrastructure, which is already highly developed including pipelines, railways, ports and distribution facilities across Canada, North America and the globe.

Ammonia is also a fuel in its own right. It can be used directly for power generation in ammonia-fired turbines, engines and marine vessels. As well, the International Maritime Organization has identified ammonia and hydrogen as key fuels for a decarbonized shipping industry.

5. <https://www.investontario.ca/chemical-and-biochemical>

Automotive Sector

Ontario is North America's second largest vehicle producer, with a sector that includes world-leading vehicle assemblers, parts manufacturers and research centres. As the only subnational jurisdiction with five original equipment manufacturers that, despite the global pandemic and supply chain issues, produced nearly 1.4 million vehicles in 2020, Ontario is well-positioned to manufacture the next generation of low-carbon vehicles, including hydrogen fuel cell vehicles.

The Government of Ontario's auto sector strategy, Driving Prosperity, aims to strengthen and build on leadership in automotive assembly and parts production as well as technology innovation and adoption. Over the next decade, global sales of electric vehicles (EVs) are forecasted to grow exponentially. Ontario's automotive plan includes maintaining and growing Ontario's auto sector by building at least 400,000 electric vehicles and hybrids by 2030.

Ontario's automotive sector is going through a transformation to produce green vehicles. Recent landmark investments from global automakers totaling around \$4 billion firmly establish Ontario as a hub for EV manufacturing and Ontario companies are at the forefront of developing zero-emissions technologies including fast-charging batteries, connected charging infrastructure, battery recycling and EV powertrains. Recent, transformative investments in Ontario include:

- \$1.8 billion by Ford to produce electric vehicle battery packs and five new electric vehicle models in Oakville, including historic investments of \$295 million each from the governments of Ontario and Canada
- \$1.5 billion by Stellantis to upgrade its Windsor Assembly Plant and build electric vehicles
- \$1 billion by GM to produce the BrightDrop all-electric delivery van in Ingersoll, the first produced by a mainstream automaker in Canada



Hydrogen Fuelled Truck.

Hydrogen Investments

Ontario is also a world leader in hydrogen technology development. The world's first commercial hydrogen powered trains, North America's first hydrogen-blended natural gas project in Markham and the commercialization of large-scale hydrogen production systems all rely on hydrogen technologies developed by Ontario-based companies.

These early-stage investments in hydrogen technology reflect Ontario's desirability as a jurisdiction for research and development, innovation and manufacturing.

Cummins & Hydrogen Optimized

Cummins' Fuel Cell and Hydrogen Technologies group is based in Mississauga, Ontario following its acquisition of Hydrogenics in 2019. Since the acquisition, Cummins has dramatically scaled up its Mississauga operations more than doubling its headcount and expanding its facilities. Cummins is also the leading developer of large-scale proton exchange membrane (PEM) water electrolyzer equipment for the production of low-carbon hydrogen. Enbridge Gas and Hydrogenics built the first large scale low-carbon hydrogen facility in Markham, Ontario, which was commissioned in 2018.

For over 20 years, Cummins has developed high performance fuel cell power modules for many equipment manufacturers and integrators including transit buses in China, Class 8 trucks in California and Europe, and in the world's first fuel cell electric train, the Coradia iLint, developed by French train manufacturer Alstom.

Hydrogen Optimized, located in Owen Sound, Ontario, develops and commercializes large-scale hydrogen production systems. Their RuggedCell water electrolyzer converts clean electricity into low-carbon hydrogen for industrial, chemical, utility and energy end users. The recent operation of a 50,000 ampere RuggedCell unipolar electrolyzer represents a breakthrough in large-scale hydrogen production technology and a direct pathway toward the commercialization of single electrolysis modules up to 100 megawatts (MW).

These companies and other Ontario businesses are already leading the world and place Ontario at the forefront of clean energy technologies and development.

II. Clean, Reliable and Affordable Electricity System

Ontario is well positioned to be a significant contributor in low-carbon hydrogen production using its abundance of clean electricity. The province's clean electricity grid is powered primarily by a combination of nuclear, hydroelectric, other renewable electricity sources and natural gas.

Today, Ontario's electricity system is among the cleanest in the world with the majority of electricity generation coming from non-emitting sources. Due to the nature of the electricity system, surplus generation occurs when electricity production from baseload facilities exceeds demand. This typically occurs overnight when demand for electricity is at its lowest and generation is the cleanest. The province can maximize this surplus electricity, including from nuclear, hydroelectric and wind generation, by utilizing it to produce hydrogen and potentially storing it to generate electricity during times of system need.



Minister of Energy Todd Smith tours the Smoky Falls Generating Station located on the Mattagami River near Kapuskasing. Smoky Falls Generating Station is operated by OPG in partnership with Moose Cree First Nation and has been in service since 1931 with a capacity of 267 MW.

Ontario is undertaking several initiatives to ensure that consumers in Ontario continue to have access to clean, reliable electricity, including:

- Asking the Independent Electricity System Operator (IESO) to evaluate a moratorium on the procurement of new natural gas generation in Ontario and develop an achievable pathway to phase out contracted natural gas generation and move to zero emissions in the electricity system, while maintaining reliability and affordability. As part of this work, the IESO is giving consideration to the possibility of maintaining natural gas generating facilities but replacing natural gas with clean fuels such as hydrogen and renewable natural gas or the development of utility-scale carbon capture and storage;
- The development of a clean energy credit (CEC) registry and trading system that would allow consumers to ensure that their electricity consumption comes from 100 per cent emission free energy resources to fulfil their corporate, environmental and sustainability goals and promote the development of clean energy supply in Ontario;
- Completed the demolition of the last coal-fired generating station in Ontario, Lambton Generating Station, in February 2022; and,
- Re-contracting Ontario's biomass generation facilities and enabling storage and distributed energy resources in the province, while investigating opportunities for future hydroelectric power generation in Northern Ontario.

The Ontario landscape has changed in the past few years. In addition to its clean energy advantage, Ontario now has competitive electricity rates for large electricity consumers through programs

like the Industrial Conservation Initiative (ICI) and the Northern Industrial Electricity Rate Program (NIERP). In 2021, Ontario introduced the Comprehensive Electricity Plan (CEP), which included shifting funding from the electricity rate-base to the province for a portion of non-hydro renewable energy contract costs, which are above market and not competitive. The CEP is forecasted to reduce rates for industrial consumers by about 15 per cent and for mid-sized commercial consumers by about 17 per cent in 2022 by removing the above-market costs of electricity generating contracts for wind, solar and biomass from electricity bills.

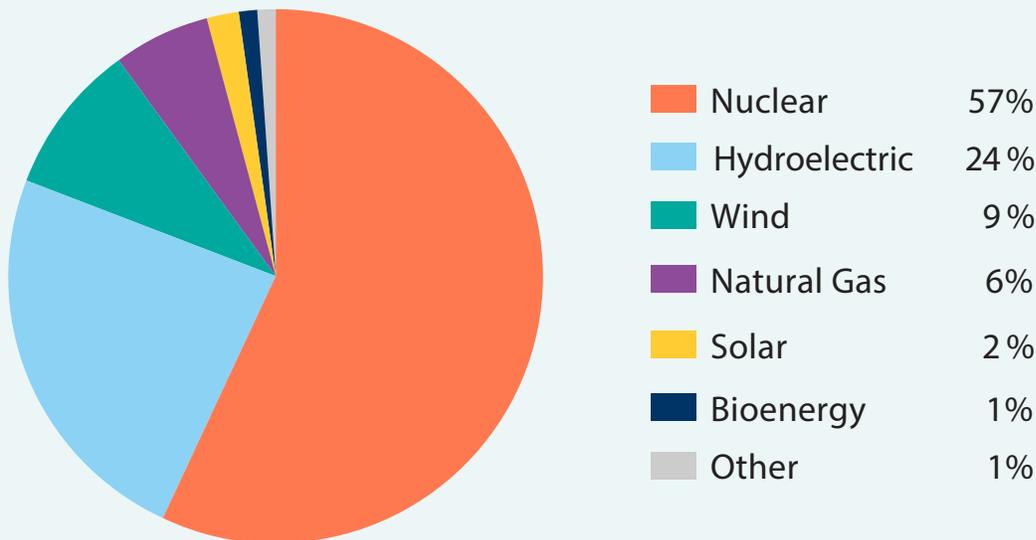
Most large Ontario electricity consumers participate in the ICI and can reduce their electricity costs by avoiding consumption during periods of

peak system need, which helps avoid the need to build energy generation infrastructure only to meet short periods of peak demand. The ICI program is especially well-suited to hydrogen production, as consumers with flexible consumption profiles can achieve electricity rates among the lowest in North America.

For example, under current system conditions, an ICI participant that is directly connected to the high-voltage transmission grid and that does not consume electricity during peak hours could achieve all-in electricity costs of about \$35 per megawatt-hour or lower (based on 2021 rates), which is well below rates in competing jurisdictions.

Ontario's Clean Electricity Generation

In 2020, about 94 per cent of Ontario's electricity came from non-emitting sources, including nuclear, hydroelectric, biomass, wind and solar. Natural gas generation is required to help meet temporary supply gaps due to the refurbishment of Ontario's nuclear fleet and provide back-up generation when the sun is not shining and the wind is not blowing.



Ontario's Nuclear Advantage

Ontario is a leader in nuclear energy. About 95 per cent of Canada's nuclear generation occurs in Ontario. In 2020, nuclear electricity generation accounted for about 60 per cent of Ontario's electricity mix. Only five countries have a higher share of annual electricity generation from nuclear power than Ontario. The refurbishments of the Bruce and Darlington nuclear generating stations will secure a long-term supply of reliable and emission-free energy for decades to come.

Ontario is also leading the way in nuclear innovations such as Small Modular Reactors (SMRs) which could provide scalable clean energy across Canada and around the world. Ontario has been collaborating on SMR development with Saskatchewan, New Brunswick and Alberta through a Memorandum of Understanding (MOU). Under the MOU, the provinces were tasked with developing a Strategic Plan with a path forward for the advancement of SMRs across Canada.

Some designs for SMRs that may be considered are well-suited for producing high-temperature steam for hydrogen production. In addition, the Province supports Ontario Power Generation's plan to build a grid-scale SMR at the Darlington nuclear site – which would be its first new reactor since 1993 and is planning for it to be operational as early as 2028. The Darlington SMR would help meet Ontario's growing demand for clean electricity that can be leveraged for the production of clean hydrogen.



Ontario Power Generation's Darlington Nuclear Generating Station.

III. Existing Storage and Pipeline Infrastructure

Ontario has existing and planned pipeline and storage infrastructure that can be used to store hydrogen and deliver it to homes and businesses, as it is currently being used to transport and store natural gas and RNG. Leveraging existing assets to the extent possible will help offset the need to build new storage and distribution facilities. Existing natural gas assets include:

- **Natural Gas Distribution Network:** Ontario's natural gas pipeline network currently supplies about 3.5 million homes and 340,000 businesses in the province. Ontario is also working to expand natural gas access to thousands of households and businesses across northern, rural and Indigenous communities.
- **Salt Layers:** Southwestern Ontario has geologic salt layers potentially suitable for creating large salt caverns deep underground that are currently a typical storage method for liquid hydrocarbons and hydrogen. Ontario currently has 73 active storage caverns in the Windsor and Sarnia area serving the petrochemical industry, which could be evaluated for conversion to hydrogen storage.⁶ Within North America, there are three hydrogen salt storage caverns that have been in operation since 1983.

- **Underground Natural Gas Storage:** Ontario has the second largest underground natural gas storage capacity in Canada at about eight billion cubic metres.⁷ This underground storage uses depleted oil and gas reservoirs.

In the future, as low-carbon hydrogen production and use increases in the province, existing underground hydrocarbon and liquified petrochemical storage facilities could be explored for potential use to store blended natural gas and hydrogen where feasible. Additional research will be required to confirm the suitability of Ontario's existing underground storage assets to new applications.

Home heating is one of the largest contributors to a household's GHG emissions. By blending low-carbon hydrogen into the natural gas system, residential customers can reduce their carbon footprint while keeping their existing furnaces, water heaters and other gas appliances. Blending projects are happening around the globe and are safe, effective ways of leveraging low-carbon hydrogen. Ontario is already home to an exciting pilot project that is blending hydrogen into the natural gas distribution system – the Low-Carbon Energy Project in Markham. The federal government, natural gas pipeline companies and natural gas distributors are reviewing codes and standards to assess hydrogen blending limits in natural gas pipelines.

6. *Ontario Petroleum Institute.*

7. *Canada Energy Regulator.*

North America's First Utility-Scale Power-to-Gas Facility

In 2018, Enbridge Gas and Hydrogenics (subsequently purchased by Cummins Inc.) developed and built the Markham Energy Storage Facility, which converts Ontario's clean electricity from the provincial power grid into low-carbon hydrogen. From 2018 to 2021, Ontario's IESO contracted with the facility to help maintain electricity grid reliability by providing regulation services to help balance electricity supply and demand.

Enbridge Gas recently put into service the Low-Carbon Energy Project which is blending hydrogen into the natural gas system on a pilot basis, offsetting a portion of fossil natural gas with hydrogen. This utility-scale facility, commissioned on October 1, 2021, is the first of its kind in North America and will:

- *Replace up to two per cent by volume of natural gas for 3,600 homes and businesses; and*
- *Reduce GHG emissions by up to 120 tonnes a year.*

According to Natural Resources Canada, natural gas blend ratios of up to 20 per cent hydrogen are being trialled around the world, with limited impact on infrastructure and end-use appliances.⁸

In Europe, hydrogen blending has been started in Germany, France and the United Kingdom, with a demonstration project in Scotland set to deliver up to 100 per cent hydrogen for a small number of homes.⁹



8. *Hydrogen Strategy for Canada, p. 41.*

9. <https://h100fife.co.uk/>.

IV. An Enabling Regulatory Environment

Ontario is prioritizing red tape and burden reduction to create an open for business climate that attracts investment and creates jobs. The government's goal is to make life better for people and remove regulatory roadblocks for businesses and reduce their costs by \$400 million.

To date, Ontario has taken actions to modernize, streamline and remove out-dated or duplicative processes and regulations to the tune of a reduction of 2 per cent per year.

This work has already been successful in the clean fuels sector by unlocking the value of RNG resources, particularly by streamlining approvals for on-farm biogas anaerobic digestors in 2020 to increase RNG production in Ontario.

Ontario and the Technical Standards and Safety Authority (TSSA) have also been proactive in developing regulations and codes to support the safe adoption and use of hydrogen;

- Ontario worked with the TSSA to modernize operational compliance obligations for hydrogen refueling stations by updating the Operating Engineers regulation (O. Reg. 219/01) that adopts a risk-informed framework to enable the use of modern technology and updates operating engineer certification and requirements without compromising public safety. This change was introduced as part of a package of measures announced alongside the Better for People, Smarter for Business Act in 2020.

- Ontario in collaboration with the TSSA adopted the Canadian Hydrogen Installation Code in 2007. Ontario's Fuel Industry Certificates includes a hydrogen certificate to support fuels safety in Ontario, which is the first of its kind in Canada.

Ontario has worked with industry and environmental groups to update "Guideline A-5: Atmospheric Emissions from Stationary Combustion Turbines" to include provisions for the use of hydrogen in stationary combustion turbines. This update aligns with federal guidelines, incorporates industry best practices, and reduces overall air emissions that contribute to air pollution, such as nitrogen oxides, from individual combustion turbine systems.

V. Clean Biofuel Resources

Ontario's rich forest, agricultural and municipal biomass resources could be used to create low-carbon hydrogen or other renewable fuels. This includes using diverted waste streams from these sectors, as well as material from sustainably managed forests and purpose-grown crops.

Ontario's sustainably managed Crown forests can supply approximately 30 million cubic metres of wood annually. As outlined in Ontario's Draft Biomass Action Plan, Ontario's forest sector is highly integrated. For example, mill by-products from one facility are the feedstock to produce energy for another and fuel Ontario's northern fleet of biomass electricity generators, which helps reduce waste and promotes a circular economy. The existing forest products manufacturing infrastructure provides for a solid foundation to leverage future investments for the development of new bioproduct and revenue streams while avoiding added pressure on landfills.

Bioenergy production from low-grade forest biomass can support existing and new uses of wood waste, including emerging uses such as production of RNG from the methane captured as organic material decomposes, and producing low-carbon hydrogen.

As other sectors of the economy move to transition away from fossil fuels and toward more circular and sustainable alternatives, the forest sector can provide valuable supply chain benefits to participants in the emerging green economy. This has the potential to contribute to the Northern Ontario economy and support forestry sector jobs.

Currently, about 3.5 million tonnes of food and organic waste is generated in the province every year, some of which is captured and cleaned to produce RNG for injection into the natural gas grid.

RNG from food and other organic waste could then be used to produce low-carbon hydrogen. Alternatively, dry organic waste could be used to produce low-carbon hydrogen directly.

CHAR Technologies

In October 2021, CHAR Technologies Ltd. started surveying and testing at the proposed site of its woody biomass-to-RNG High Temperature Pyrolysis (HTP) project near Kirkland Lake, Ontario. This project may potentially produce 500,000 gigajoules per year of RNG and 10,000 tonnes per year of CHAR's proprietary CleanFyre bio-coal. The company has a letter of interest signed in July 2021 for biomass supply to the project, and an exclusive letter of interest signed in September 2021 with a Canadian gas utility for long term RNG offtake. CleanFyre from the proposed Kirkland Lake facility will be earmarked for future sale to the steelmaking and metal smelting industries.

CHAR is expanding its activities in the United States as well. The company has a definitive agreement for a project with Hitachi Zosen Inova to develop an HTP to hydrogen system at their existing San Luis Obispo anaerobic digestion facility in California. The HTP system is being developed to produce up to 1 million kilograms of green hydrogen per year.



Biogas Digesters at StormFisher's London Biogas Facility.

StormFisher and ZooShare Biogas

The StormFisher London Biogas Facility and the Toronto-based ZooShare Biogas Plant are both converting thousands of tonnes of organic waste into biogas for electricity and to upgrade biogas to RNG for heating and fuel transportation.

StormFisher partnered with Enbridge Gas to upgrade the biogas produced in their facility to RNG to inject in the Ontario natural gas system. Over 70,000 tonnes of organic waste from restaurants, grocery stores, municipalities and other organizations are converted to about 3 million cubic metres of RNG annually using an anaerobic digestion process. The RNG diverts waste from landfills and eliminates over 8,000 tonnes of GHG emissions. The digested organics are then used to produce fertilizer. The StormFisher London Biogas Facility received the 2021 Project of the Year award from the Canadian Biogas Association for its RNG production system accomplishments.

The ZooShare Biogas Plant, Canada's first biogas plant to use zoo animal waste as the primary biogas feedstock, turns food waste and Toronto Zoo animal waste into renewable power for the Ontario grid. ZooShare converts 2,000 tonnes of zoo animal waste and 15,000 tonnes of food waste into renewable power for about 250 homes. This reduces GHG emissions by up to 20,000 tonnes per year. At the end of the biogas production process, the remaining solid waste is used as a nutrient-rich fertilizer to grow food. ZooShare began to generate power to the grid on April 1, 2021.

In regard to hydrogen opportunities, biogas can be used as a low-carbon feedstock for hydrogen production or to generate clean electricity which can produce hydrogen using electrolysis technology.

● Working Cooperatively with the Federal Government

Ontario will continue to work with the federal government as well as with other provinces and territories to collectively advance the hydrogen economy across Canada.

The Hydrogen Strategy for Canada, launched in December 2020, aims to make hydrogen a central part of Canada's goal of achieving net-zero emissions by 2050, while building up Canada as a global leader in clean renewable fuels. The federal hydrogen strategy includes an ambitious near-to long-term framework for actions.

The proposed Roadmap to 2050 in the federal hydrogen strategy covers a wide range of policies and activities, such as:

- Using the proposed Clean Fuel Standard to drive near-term investment in the sector;
- Incentivizing regional hydrogen hubs;
- Enabling larger scale hydrogen production for relevant industrial applications; and
- Deploying large-scale hydrogen technologies.¹⁰

In addition, the federal hydrogen strategy emphasizes the importance of developing strategic partnerships and of collaborating across multiple levels of government in order to align programs and policies and to identify areas for federal/provincial/territorial (FPT) collaboration. Ontario

is already participating on intergovernmental hydrogen working groups established by the federal government. There is work underway to create about 16 intergovernmental working groups to collaborate on different aspects of hydrogen development, including natural gas, nuclear energy, hydrogen hubs, codes and standards, mining and transportation.

The federal government is also undertaking further studies to advance its own hydrogen strategy (e.g., identifying export markets, off-grid opportunities, harmonizing codes, standards and modelling, co-location of hydrogen and nuclear assets) that will help to inform the FPT work that is already unfolding.

Participation in these working groups allows Ontario to reflect the province's interests, for example by seeking its fair share of federal funding and aligning approaches to low-carbon hydrogen development where appropriate. Ontario is also promoting its existing low-carbon hydrogen strengths, needs and opportunities to the federal government to leverage potential resources.

10. *Hydrogen Strategy for Canada.*



Steel manufacturing, Brantford.

Ontarians have done their part in our electricity system by paying for the phase-out of coal. To meet our climate change goals, we need the federal government to play a role in Ontario's low-carbon economy, including the commercial development of hydrogen.

To make hydrogen a success in Ontario will require the federal government to offer a full suite of tangible supports and partnerships, including:

- Funding and risk-sharing opportunities;
- Clear and efficient regulations that are harmonized across leading jurisdictions; and
- Support for innovation.

We also call on the federal government to ensure that ample funding is available for Ontario companies to engage in research and demonstration projects for the production, storage, distribution and end-use of hydrogen as well as exporting hydrogen to global markets.

● Ontario's Low-Carbon Hydrogen Future

I. Core Objectives

Ontario's vision for the low-carbon hydrogen strategy is to develop a self-sustaining low-carbon hydrogen economy in Ontario that would create local jobs, attract investment and reduce GHG emissions.

Ontario's strategy lays out a framework that builds on our existing strengths and our government's broader commitment to reducing barriers, driving innovation and encouraging collaborative partnerships.

The core objectives of Ontario's strategy are to:

- **Generate Economic Development and Jobs:** Capitalize on Ontario's competitive and regional advantages, including our talent, infrastructure and resources, to accelerate growth in Ontario's low-carbon hydrogen economy.
- **Reduce Greenhouse Gas Emissions:** Support our Made-in-Ontario Environment Plan targets to reduce GHG emissions by encouraging the use of low-carbon hydrogen.
- **Promote Energy Diversity:** Consider how low-carbon hydrogen can cost-effectively support Ontario's evolving energy system and strengthen reliability through electricity storage and clean fuel supply.
- **Promote Innovation and Investment:** Enable opportunities for low-carbon hydrogen use and position Ontario as a leading destination for investment.
- **Strengthen Collaboration:** Work with the private sector, the federal government, municipalities, Indigenous communities, academic institutions and other stakeholders to grow and sustain a low-carbon hydrogen economy in Ontario.

Through this strategy, the province will showcase additional areas of work across government and outside of it that are helping to build momentum and support for Ontario's low-carbon hydrogen economy in the near term and into the future.



Sir Adam Beck Hydroelectric Generating Station.

II. Immediate Actions

Ontario is taking immediate and meaningful steps through eight specific actions to enable production and expand the low-carbon hydrogen economy. Through these actions, Ontario's hydrogen strategy is expected to increase the amount of annual production capacity of low-carbon hydrogen eight-fold in the province and support the nascent market to meet its potential.

Action 1: Launching the Niagara Falls Hydrogen Production Pilot

The Ontario Government is supporting Atura Power's proposal for the province's largest low-carbon hydrogen production facility. Atura Power is a wholly owned subsidiary of Ontario Power Generation (OPG).

Atura Power proposes to build, own and operate

this facility in Niagara Falls, Ontario, which would be a catalyst for the low-carbon hydrogen economy in Ontario. Atura Power has completed a feasibility study and preliminary design for the Niagara Hydrogen Centre. The facility plans to include a 20 MW electrolyzer that is capable of providing grid balancing services and use low-cost off-peak electricity to produce low-carbon hydrogen. With this local hydrogen supply, it is anticipated that the Niagara facility can be a prominent low-carbon hydrogen hub for heavy-duty trucking, municipal mobility and heavy industrial consumers in Ontario.

The proposed facility would be a source of low-carbon hydrogen that can be used in the merchant market for hydrogen as well as blending with natural gas in natural gas combustion turbines (to be performed in the near term at Atura Power's facilities). The low-carbon hydrogen produced at the Niagara facility would support emission reductions equivalent to taking more than 4,000 cars off the road.

The main source of electricity for the electrolyzer would be the nearby Sir Adam Beck Hydroelectric Generating Station on the Niagara River. Hydrogen produced via electrolysis at this location has an exceptionally low life-cycle carbon intensity. The Niagara facility location allows direct access to Highway 405, which connects the northern portion of the I-90 in New York with the Queen Elizabeth Way (QEW) and the Greater Toronto Area (GTA). This area has a strong industrial base, and the location enables efficient access to the 400 series highway network and end-users in the GTA and upstate New York.

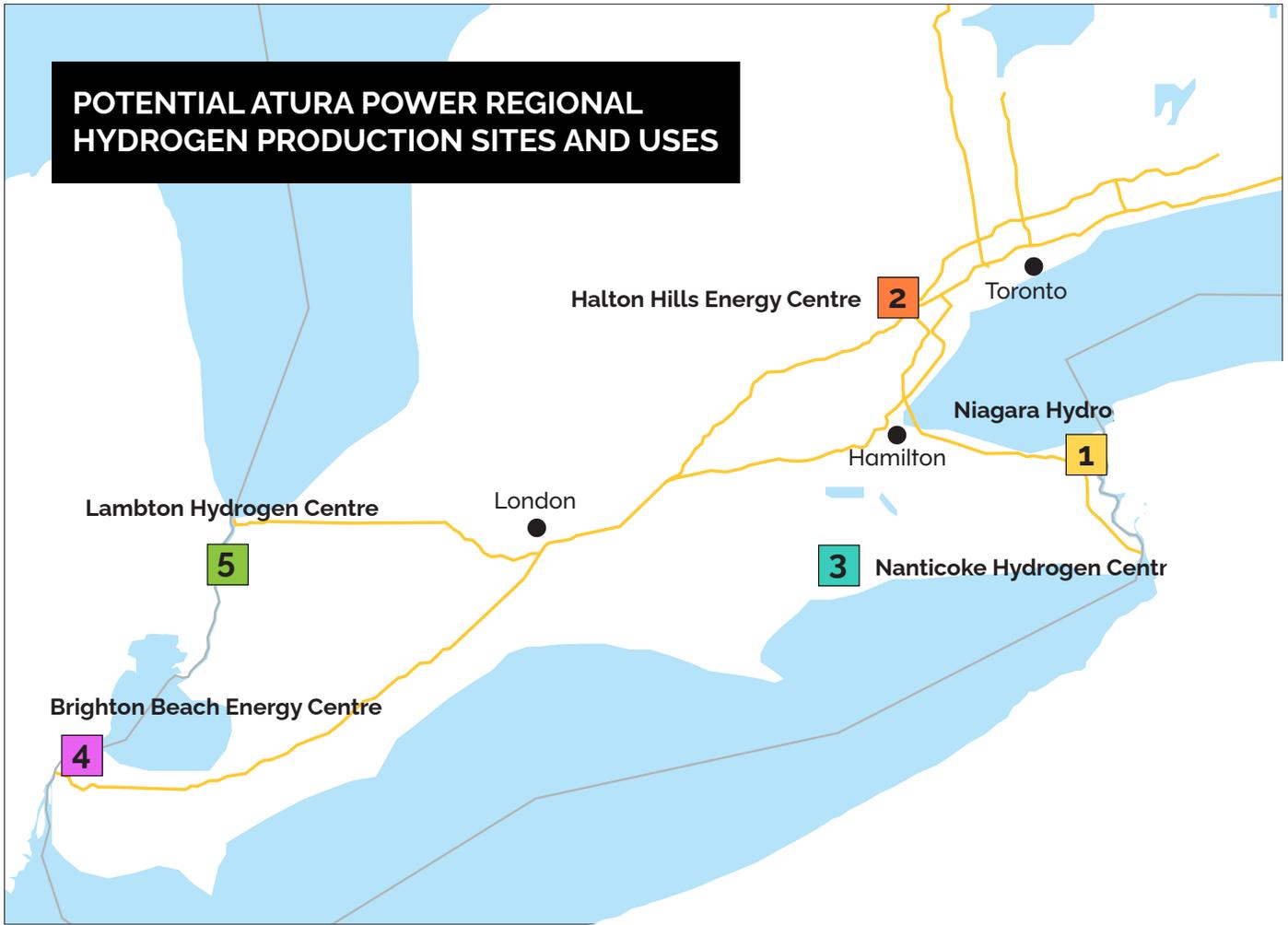
The benefits of near-term low-carbon hydrogen production at the proposed Niagara facility include local and provincial economic development through investment, jobs and developing the first large-scale low-carbon hydrogen hub in Ontario. Atura Power is advancing the detailed design and conducting long-lead procurement for the electrolyzer that will support a final investment decision for the facility in summer 2022. The final investment decision will depend on the outcome of federal funding submissions made to the Natural Resources Canada Clean Fuels Fund. If successful, the facility is expected to achieve commercial operations by the end of 2023.

Ontario is supporting the proposed hydrogen production facility in Niagara through a regulatory exemption to the Gross Revenue Charge (GRC). The regulation, filed in January 2022, provides GRC property tax and waterpower rental charge savings from 2024-33 for electricity generated at the Sir Adam Beck station used specifically for hydrogen production while providing electricity grid regulation under prescribed conditions. The proposed Atura Power project and the Province's actions will enable better utilization of the Niagara Falls hydroelectricity resource, while being capable of providing electricity grid frequency regulation

to produce low-cost, low-carbon hydrogen. The Province is supportive of innovative solutions like the Niagara Hydrogen Centre that maximize Ontario's low-carbon electricity resource utilization and kick-start the low-carbon hydrogen economy.

With the addition of the 20 MW electrolyzer, Ontario's potential for low-carbon hydrogen production capacity would expand eight-fold. Currently, the Markham Power-to-Gas facility has a capacity of 2.5 MW for hydrogen production. The addition of this new facility will increase Ontario's installed electrolyzer capacity to 22.5 MW.

POTENTIAL ATURA POWER REGIONAL HYDROGEN PRODUCTION SITES AND USES



1 NIAGARA HYDROGEN CENTRE



Grid balancing, power generation



Industry (feedstock, fuel)



Heavy-duty trucking

3 NANTICOKE HYDROGEN CENTRE



Industry (feedstock, fuel)

4 BRIGHTON BEACH ENERGY CENTRE



Storage: Salt Cavern



Power generation

2 HALTON HILLS ENERGY CENTRE



Power generation



Heavy-duty trucking

5 LAMBTON HYDROGEN CENTRE



Industry (feedstock, fuel)

Action 2: Identifying Ontario's Hydrogen Hub Communities

Further to the Niagara Hydrogen Centre, Atura Power has established partnerships with Ontario-based steel, oil and gas, ammonia, auto-manufacturing, academic and transit organizations to assess the feasibility of meeting distributed low-carbon hydrogen demand with hydrogen made from low-carbon Ontario electricity.

In addition to Niagara region, Atura has identified four strategic locations across the province where low-carbon hydrogen demand can be matched by electrolysis produced hydrogen that leverages existing electricity infrastructure and Ontario's clean electricity grid. The following locations have been identified as potential hydrogen hubs and have funding applications with the federal government to increase Ontario's hydrogen production or assess future feasibility:

- **Halton Hills Energy Centre:** Low-carbon hydrogen production in the GTA can meet the need for future mobility demand, particularly for heavy duty trucking. The Halton Hills Energy Centre is at the cross section of highways 401 and 407 and is well-positioned to provide hydrogen to a significant number of trucking and logistics companies in the area. As the demand for hydrogen for mobility applications grows, Atura Power's Halton Hills combined cycle gas turbine can be an anchor consumer of low-carbon hydrogen by blending hydrogen with natural gas during periods of peak electricity demand, thereby reducing emissions. Halton Hills is being assessed as a potential production site and home for a 20 MW electrolyzer and is pending federal funding decisions expected in Spring 2022.
- **Nanticoke Hydrogen Centre:** Nanticoke, located on Lake Erie near heavy industrial consumers of hydrogen, is an ideal location to leverage existing electricity infrastructure to meet heavy emitting industries' growing demand for hydrogen. The Nanticoke site was previously used by OPG as a coal-fired electricity generation site. The shutdown of this facility was a part of the world's single largest climate change action taken to date – eliminating coal generation from the province of Ontario. OPG has begun transforming the site into a clean energy centre, starting with 44 MW of solar generation in partnership with Indigenous communities. Atura Power is assessing opportunities to further develop this energy park with the addition of low-carbon hydrogen to support the decarbonization efforts of local industry. Execution of the feasibility study with partners will commence in summer 2022 subject to successful funding award decisions from the federal government.
- **Brighton Beach Energy Centre and Hydrogen Salt Cavern Storage:** Brighton Beach, located in Windsor, is one of the few locations in Ontario with suitable geology for underground salt cavern storage of hydrogen. Atura Power, in conjunction with a local industry partner, is proposing a feasibility study to assess hydrogen production and large-scale sub surface storage of hydrogen in salt caverns. Understanding the potential to expand or convert existing salt caverns, or develop new salt caverns for hydrogen storage, is an important component in hydrogen's decarbonization potential. As the hydrogen demand is established in the region, Atura Power's Brighton Beach combined cycle

gas turbine can consume the hydrogen, reducing emissions during peak generation periods. The feasibility study is subject to funding award decisions from the federal government, and if successful, the project will commence as early as summer 2022.

- **Lambton Hydrogen Centre:** The project proposed in the Lambton-Sarnia region is located at a former OPG coal-fired generation site. In February 2022, the smokestacks and powerhouse of the decommissioned Lambton Generating Station were safely imploded by OPG. The safe decommissioning and demolition of this facility represents an opportunity for new beginnings for this site as a clean energy centre. Atura Power is investigating the opportunity to produce large-scale low-carbon hydrogen at this site and serve heavy industry in the Sarnia-Lambton area in support of a local hydrogen hub. A feasibility study application for this site has been submitted to the federal government for funding and, pending award, will commence in summer 2022.

The Ministry of Energy will also undertake its own third-party led feasibility study to explore opportunities to establish new low-carbon hydrogen or clean fuel hubs in Ontario to give Ontario business a competitive edge by enhancing their abilities to develop and adopt low-carbon technologies.

Action 3: Assessing the Feasibility of Hydrogen Opportunities at Bruce Power

The Bruce Nuclear Generating Station is Ontario's largest nuclear facility and the largest operating nuclear plant in the world. Bruce Power will explore opportunities to leverage excess energy from the Bruce station (i.e., energy that is not currently being transmitted to the electricity system) for hydrogen production. This includes excess steam, diverted steam to address system manoeuvres, or incremental output as part of Bruce Power's Project 2030 to achieve 7,000 MW peak electricity generation at the site.

As a first step, Bruce will launch a Hydrogen Opportunities Study in 2022. The study will be led by Bruce Power in collaboration with Greenfield Global, Hydrogen Optimized and Ontario's Ministry of Energy to determine opportunities for hydrogen production using this excess energy and to recommend how this unique asset could become a centre of excellence for hydrogen production and a key hydrogen hub for the province. The project will be conducted in partnership with the Hydrogen Business Council and is expected to be completed in early 2023.

In addition, the Bruce Power Centre for Next Generation Nuclear at the Nuclear Innovation Institute is also exploring opportunities for Bruce Power's assets to maximize the impact they'll have on Canada's clean energy future. This includes three main activities:

- Leveraging investments being made in CANDU nuclear reactor technology through Ontario's refurbishment program to further clean innovation in other sectors of the economy;

- The Breakthrough Energy Program conducts research and policy work into small modular reactor technology as well as evaluates the long-term opportunities for fusion energy generation; and
- Bruce Power is exploring opportunities into the next 50 years for its assets to be optimized, enhanced, leveraged and extended.

Action 4: Developing an Interruptible Electricity Rate

Ontario is committed to exploring the use of surplus electricity, such as spilled hydropower or curtailed wind power, by hydrogen producers that are able to operate with flexibility. Providing reduced rates for this intermittent surplus electricity could provide an economic benefit to hydrogen producers with no negative impact for existing ratepayers. Although electricity rates in our province are competitive and continue to attract investment, some eligibility requirements to the ICI program create barriers for hydrogen producers. We are exploring potential changes while avoiding any negative impact to other ratepayers.

Ontario is working towards the launch of an Interruptible Rate pilot that would offer large electricity consumers reduced electricity rates in exchange for agreeing to reduce consumption during system or local reliability events, as identified by the Independent Electricity System Operator (IESO). Ontario is consulting with stakeholders on this proposal through a posting on the Regulatory Registry. Agreements like these could reduce the costs required to build new energy generation infrastructure by using existing production more efficiently.

In addition, the Ministry of Energy is undertaking consultations on other electricity rates that could help to further grow Ontario’s low-carbon hydrogen economy.

Ontario is also exploring potential Gross Revenue Charge exemptions for other hydroelectric facilities, specific to the use of surplus hydroelectric generation for hydrogen production.

Action 5: Supporting Hydrogen Storage and Grid Integration Pilot Projects

Hydrogen producers are very well suited to provide electricity system benefits and have previously worked with the IESO to provide ancillary services such as grid frequency regulation.

The Ministry of Energy will ask the IESO to report back on potential program options to support hydrogen electricity storage and grid integration pilot projects as Ontario’s electricity system continues to evolve. These projects will help to improve our experience and understanding of the potential benefits and limitations of hydrogen in supporting Ontario’s provincial electricity grid.

Action 6: Transitioning Industry Through the Use of Low-Carbon Hydrogen

We are taking immediate steps to support the efforts of industry to phase out their use of coal by transitioning to low-carbon processes and hydrogen-ready equipment.

In February 2022, Ontario announced an investment in ArcelorMittal Dofasco (AMD), Canada's largest producer of flat-rolled steel. This investment will support a \$1.765 billion project with hydrogen-ready equipment to convert the steel production process and phase out coal-fired steelmaking at its facilities in Hamilton, Ontario.

Together, with the government's significant investment in AMD in Hamilton and in Algoma Steel in 2021 to shift away from industrial coal to clean Ontario electricity, these projects alone will reduce the province's greenhouse gas emissions by up to 6 million tonnes – a significant step closing over 30 per cent of the remaining gap between now and the Made-in-Ontario Environment Plan emission reduction target for 2030.

These projects are equivalent to taking almost 2 million passenger vehicles off the road.

Action 7: Consulting on an Ontario Carbon Sequestration and Storage Regulatory Framework

Carbon sequestration offers the opportunity to produce low-carbon hydrogen using natural gas.

The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) regulates the drilling and operation of wells used for activities such as the exploration and production of oil and natural gas, the underground

storage of hydrocarbons and some compressed air energy storage projects under the Oil, Gas and Salt Resources Act and the Mining Act.

Recently, Ontario businesses have been interested in pursuing new underground geologic storage projects, such as the storage of carbon dioxide, which were not contemplated when these regulatory frameworks were developed. The result has been an unregulated business environment that is a barrier to advancing new technologies and business opportunities in our province.

In that context, NDMNRF is proposing that changes be made to the Oil, Gas and Salt Resources Act and the Mining Act frameworks that would clarify the regulatory framework under which carbon storage is permitted and allow the ministry to grant authorizations to use Crown land for carbon storage activities. It would also add the ability for NDMNRF to enter into agreements with companies that want to use wells to explore, test, pilot or demonstrate new technologies, such as carbon storage.

The government is committed to ensuring that potential projects like carbon storage can continue to progress, while recognizing that flexibility is currently needed to develop and test these technologies that are new to Ontario. These measures would ensure businesses have a path to enable their pilot or demonstration projects with the appropriate oversight and accountability, and would foster flexible, adaptable approaches, while protecting public and environmental safety.

Action 8: Supporting On-going Hydrogen Research

Ontario is supporting two independent hydrogen research projects in partnership with Natural Resources Canada to advance hydrogen development in the province:

- H2GO Canada is undertaking a comprehensive, technoeconomic evaluation of the province's low-carbon hydrogen supply opportunities and the principal end-use applications, around which sustainable markets can be developed. This study will lay the foundations for priority project developments by identifying highest value-creation potentials among numerous clusters and hubs of prospective hydrogen activity.
- Closely associated and integrated with the hydrogen value chain study described above, the related opportunities of seasonal storage of hydrogen and permanent sequestration of CO₂ within Ontario's geological prospects will be evaluated and mapped by H2GO Canada from a commercial utility perspective.

Another independent project led by H2GO Canada is Hydrogen Village, which is a resource centre providing information, education and assistance to individuals and organizations seeking to develop hydrogen projects, or to adopt and use hydrogen technologies in their lives, businesses and communities. Hydrogen Village launches in Spring 2022 with three inaugural program streams to engage audiences in the Greater Toronto and Hamilton Area, including workshops for fleet managers on the use of hydrogen as a vehicle fuel, promotional ride-and-drives in a fuel cell electric vehicle and an online course for self-directed learners on the basics of hydrogen systems.

● Path Forward and Future Areas of Work

Ontario's low-carbon hydrogen strategy showcases actions that are helping to build momentum and to support sustained growth in Ontario's hydrogen economy in the near term and into the future.

The strategy will build on the ongoing dialogue with stakeholders to better identify barriers to growing the low-carbon hydrogen economy in the province and to better support Ontario businesses.

Ontario, in collaboration with the private sector, the federal government, municipalities, Indigenous communities, academic institutions and other stakeholders will continue to support the development of Ontario's hydrogen economy. These future areas of work include:

- Additional actions to support Ontario's low-carbon hydrogen supply chain, including potential business supports, infrastructure and enabling more end-use applications;
 - Identifying and addressing regulatory barriers and gaps for hydrogen production, storage, distribution and integration into Ontario's electricity and natural gas systems;
 - Assessing production pathways and adoption scenarios to accelerate low-carbon hydrogen technology scale-up, commercialization and deployment;
 - Raising public and industry awareness of the benefits of low-carbon hydrogen, promoting Ontario's leadership in the hydrogen sector to the global market and building strategic partnerships across Canada and internationally; and
- Other considerations to increase the use of low-carbon hydrogen when and where it makes sense in an Ontario context.

Evaluating new pilot and demonstration projects will also allow Ontario to calibrate its strategy and enable future government direction. For example, we can further explore options to use hydrogen to support IESO initiatives to improve electricity grid stability and support additional clean generation and advance work on establishing hydrogen hubs in Ontario.

This future work will provide Ontario with insights that will help chart a course to the future for Ontario's low-carbon hydrogen economy and will focus on economic and environmental opportunities that will have the most impact for Ontarians. This is a future where the sector is cost-effective, economically competitive and driving clean economic growth.

Developing low-carbon hydrogen will be a key part of Ontario's efforts to electrify and decarbonize its economy over the near-term while charting a path ahead for decades to come. As low-carbon hydrogen and other clean fuels become a more prominent part of Ontario's energy system, the Province will consider how the electricity grid and clean fuels can work together to contribute to the energy transition. This will also help inform Ontario's development of its process for long-term energy planning.

● Conclusion

Ontario's low-carbon hydrogen strategy is all about clearing the path and laying the groundwork to support the private sector to take the lead in growing the low-carbon hydrogen economy.

This work is crucial to supporting Ontario's transition to a low-carbon economy, continuing the rebuild of the province's manufacturing and industrial base, and supporting good-paying jobs of the future.

By supporting private sector innovation in this clean technology now we will ensure that our energy system, environment and our economy can continue to thrive for generations to come.

Ontario is ready to do our part so we can attract more well-paying jobs in science, technology, engineering and the skilled trades; jobs where

people can be proud that they are contributing to a more sustainable and prosperous province.

Working together with Ontario businesses and workers, the federal government, municipalities, Indigenous communities, academic institutions, and other key stakeholders, we are going to connect Ontario with global markets to develop an economically sustainable low-carbon hydrogen sector.

By leveraging our talent, infrastructure and resources, we will seize this opportunity and unleash our fullest potential by becoming a world-class hub for low-carbon hydrogen innovation.

● Future Actions

1. Generate Economic Development and Jobs

Capitalize on Ontario's competitive and regional advantages, including our talent, infrastructure and resources, to accelerate growth in Ontario's low-carbon hydrogen economy.

Future Actions

Review Regulatory Barriers and Gaps While Ensuring Public Safety

Ontario will identify and assess regulatory barriers and gaps related to environmental approvals for low-carbon hydrogen projects including approvals for generating hydrogen from waste.

Ontario will ensure that its codes and standards for hydrogen storage, handling and transportation continue to support public safety as the adoption of low-carbon hydrogen increases across the province.

Enable Hydrogen Adoption Through a Streamlined, Client-Focused Approach to Investment Attraction

Ontario will provide a "one-stop" approach to low-carbon hydrogen companies and adopters to help them find services and programs that are most relevant to their needs. This will ensure Ontario continues to be a top-tier destination for investment and business growth.

Explore Options for Hydrogen Equipment

Ontario will work with the natural gas sector and industry associations to explore the current status and next steps for manufacturing higher hydrogen mix-ready heating equipment and identify hydrogen retrofitting options for existing natural gas-only equipment.

2. Reduce Greenhouse Gas Emissions

Support our Made-in-Ontario Environment Plan targets to reduce greenhouse gas emissions by encouraging the use of low-carbon hydrogen.

Future Actions

Harmonize Hydrogen Carbon-Intensity Performance with Other Jurisdictions

Ontario will continue to use the modelling tool currently used by the federal government to assess the GHG emissions of hydrogen production pathways throughout their lifecycle, known as GHGenius.

In the longer term, Ontario will work with federal and other provincial governments on a standardized approach to assessing lifecycle GHG emissions for hydrogen, with a focus on approaches that align with target export markets.

Raise Public Awareness of the Environmental Benefits of Low-Carbon Hydrogen

Ontario will share educational information with the public, including Indigenous communities, to increase knowledge of low-carbon hydrogen's environmental benefits and how its use can reduce emissions while growing the economy.

Build Industry Understanding of Low-Carbon Hydrogen

Ontario will share technical information, including from research studies, with industry to support the production and use of low-carbon hydrogen in industrial sectors when and where it makes sense as the best pathway to meeting their decarbonization goals.

3. Promote Energy Diversity

Consider how low-carbon hydrogen can cost-effectively support Ontario's evolving energy system.

Future Actions

Review Potential Barriers to Hydrogen Use in the Energy Sector

Ontario will assess potential barriers to the use of hydrogen as a fuel for electricity generation and the inclusion of low-carbon hydrogen and renewable natural gas in Ontario's natural gas distribution system, while ensuring appropriate standards and best practices are in place.

Identify Opportunities for Clean Energy Through Natural Resource Planning

Ontario's ongoing planning related to resource recovery, forest sector and critical minerals recognize the potential production or use of low-carbon hydrogen in the province. This includes the Food and Organic Waste Policy Statement, the Forest Sector Strategy and proposed Forest Biomass Action Plan, as well as the Critical Mineral Strategy Framework Discussion Paper.

Identify Opportunities for Clean Energy Through Future-Ready Transportation Infrastructure

Ontario released draft transportation plans in 2020 for Southwestern Ontario and for Northern Ontario. Each plan includes an action to support future-ready transportation infrastructure by reviewing locations for alternative fueling stations (including electric and hydrogen) for public use that will support potential private sector commercial partnerships and competitiveness.

The transportation plans for the Greater Golden Horseshoe, Eastern Ontario and the entire province are under development and will consider how best to support future-ready infrastructure.

4. Promote Innovation and Investment

Enable opportunities for low-carbon hydrogen use and position Ontario as a leading destination for investment.

Future Actions

Pursue Federal Support for Nuclear Energy to Facilitate Hydrogen Production

Ontario is calling on the federal government to allow nuclear projects to access all federal funding programs and incentives designed to accelerate the development and deployment of clean energy technologies, including those that are currently limited to renewable energy sources such as wind and solar. Nuclear energy can play a key role in hydrogen production due to the production of reliable baseload electricity and steam for use in high-temperature electrolysis.

Develop Industry Guidance Materials with Stakeholders

Ontario will work with stakeholders to develop guidance materials to reduce knowledge barriers related to hydrogen equipment. The guidance materials will seek to encourage the industrial and commercial

sectors to consider opportunities to adopt hydrogen as a fuel where existing applications are known and well understood (e.g., hydrogen-powered forklifts).

Ontario will also consider information sessions to increase awareness of new applications for hydrogen and other clean fuels to improve industrial competitiveness as investors consider their environmental and sustainability goals.

Explore Innovative Procurement Strategies

Ontario will explore how its government procurement strategies can be leveraged to promote the use of innovative low-carbon technologies. This could include identifying opportunities for the purchase of low-carbon hydrogen equipment and vehicles where applicable.

5. Strengthen Collaboration

Work with the private sector, the federal government, municipalities, Indigenous communities, academic institutions and other stakeholders to grow and sustain a low-carbon hydrogen economy in Ontario.

Future Actions

Ongoing Stakeholder Engagement and Partnership Opportunities

Building on the success of public consultations and the Hydrogen Strategy Working Group, Ontario will continue to meet with hydrogen sector stakeholders to gather information on additional pilot projects and research opportunities to help advance Ontario's low-carbon hydrogen economy. Ontario will also seek input on how to best promote collaboration among the private and public sectors to deliver innovative solutions for the future of low-carbon hydrogen in the province.

Engage Hydrogen Companies in Existing Export Initiatives

Ontario will engage hydrogen technology companies in interprovincial and international export trade missions and shows to promote the province's capabilities, increase foreign direct investment and create opportunities for export-ready businesses.

International Collaboration

Ontario will continue to participate on a hydrogen working group under the Canada-Germany Energy Partnership signed by the federal government in March 2021. The partnership recognizes the importance of

international collaboration in achieving Canada's and Germany's targets of net-zero emissions by 2050.

Canada and Germany have established a High-Level Steering Committee, co-chaired at the Deputy Minister level, to foster the energy transformation through exchanges on policy, best practices and technologies as well as through cooperative activities and projects focused on:

- Energy policy, planning and regulations;
- Resilient electricity systems that can integrate high levels of renewables;
- Energy efficiency;
- Sector coupling and low-carbon fuels; and
- Innovation and applied research.

The hydrogen working group will report to the Steering Committee on the challenges and opportunities of hydrogen trade between Canada and Germany.

Ontario will also engage with jurisdictions leading in low-carbon hydrogen to share best practices, collaborate on areas of mutual interest, promote current actions and attract future investment.

This includes building on existing partnerships and creating new opportunities to collaborate with jurisdictions like the U.K., France and Mexico.

Hydrogen Strategy Working Group Members

- **Atura Power**
- **Canadian Hydrogen and Fuel Cell Association (CHFCA)**
- **Canadian Steel Producers Association (CSPA)**
- **Cummins**
- **dynaCERT Inc.**
- **Emerald Energy from Waste**
- **Enbridge Gas**
- **EPCOR Utilities Inc.**
- **Evolugen**
- **GE Gas Power**
- **H2GO Canada**
- **Hydrogen Business Council of Canada**
- **Hydrogen Optimized**
- **Independent Electricity System Operator (IESO)**
- **Nuclear Innovation Institute**
- **Ontario Clean Technology Industry Association (OCTIA)**
- **Ontario Environment Industry Association (ONEIA)**
- **Ontario Power Generation (OPG)**
- **Ontario Public Transit Association**
- **Ontario Trucking Association**
- **Ryerson University**
- **Toyota**
- **Transition Accelerator**
- **TC Energy**

Glossary

Biogas: Mixture of gases produced by the breakdown of organic matter.

Biomass: Organic matter (plant and animal material), for example forestry and crop residues, purpose-grown crops.

Carbon capture, utilization, and storage (CCUS): Carbon capture use and storage is a process that captures carbon dioxide emissions (for example, when producing hydrogen from natural gas) that either uses or stores it, preventing it from temporarily or permanently entering the atmosphere.

Combustion: The process of burning something, that is, the chemical reaction involving the combination of a fuel (see Fuel), heat, and oxygen.

Electrolysis: A process that is performed using electricity to split water into hydrogen and oxygen gas. It is the reverse of the chemical reaction that takes place in a fuel cell.

Electrolyzer: A device that uses electricity to split water into hydrogen and oxygen.

Emissions-free electricity: A form of electricity that emits no greenhouse gases (see Greenhouse gas) or air emissions when produced. This includes renewable generation sources, like wind and solar and non-renewable sources, like nuclear.

Feedstock: Refers to the raw material used for industrial processes.

Fuel: A material used to create heat or power through conversion in processes like combustion.

Fuel cell: A device that produces electricity through an electrochemical process, usually from hydrogen and oxygen.

Gasification: A controlled process involving heat, steam and oxygen to convert carbon-based raw material such as coal or biomass to hydrogen and other products, without combustion.

Greenhouse gas: A gas that contributes to the greenhouse effect (warming of the planet) by absorbing and emitting infrared radiation (for example carbon dioxide and methane).

Grid balancing services: A suite of products and services procured by electricity grid operators to match the supply of electricity (from sources like nuclear, hydropower, natural gas, wind, solar and biomass) to the demand (for example, usage from businesses and homes).

Low-carbon hydrogen: hydrogen that has few greenhouse gas emissions from its production and upstream processes, such as extraction and production of fuels used.

Original equipment manufacturer: A company whose goods are used as components in the products of another company, which then sells the finished item to users.

Gigajoule (GJ): A unit of energy; for example, the heat generated, or energy expended.

Pyrolysis: The process of using heat to decompose the chemical composition of materials such as biomass producing fuels and char.

Renewable energy: A form of energy that is never exhausted because it is renewed by nature within short time scales (for example, wind, solar radiation, hydro power, biomass).

Small modular reactor: A nuclear reactor that is smaller than traditional nuclear power plants.

Steam methane reformation: The process for reacting natural gas with steam to produce hydrogen as a product.

