



# BC Hydrogen Regulatory Mapping Study

## Executive Summary

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# Table of Contents

Executive Summary .....	1
Current Applicable Framework .....	2
Environmental Assessment .....	2
Provincial, Federal and Municipal Regulatory Framework .....	3
Indigenous Consultation .....	6
Literature Review of Other Jurisdictions .....	7
Conclusion and Recommendations .....	8
Conclusion .....	8



# Executive Summary

The Government of British Columbia (BC) released the BC Hydrogen Strategy in July 2021 (the Strategy) to provide a blueprint for using low-carbon hydrogen to help decarbonize sectors of the economy, achieve climate goals, and support an emerging clean-technology sector. A key objective of the Strategy is to remove roadblocks, harmonize regulations and permitting, and establish an effective regulatory regime for fast-tracking hydrogen deployment. The B.C. Centre for Innovation and Clean Energy (CICE) and the Ministry of Energy, Mines and Low Carbon Innovation (MEMLI) engaged Stantec Consulting Ltd. (Stantec) to prepare this regulatory mapping study to identify the current regulatory framework applicable to the development of hydrogen production projects in BC (the study). This study describes the current framework applicable to hydrogen development, including current barriers, and provides recommendations to streamline the regulatory process to accelerate hydrogen project deployment. The study has been undertaken in two distinct phases to support a regulatory review as well as government decision-making.

The study presents six representative low-carbon hydrogen projects to illustrate how different regulatory approvals may apply. The projects considered are listed in the box to the right.

Hydrogen development projects are subject to the same provincial, federal, and municipal regulatory frameworks as other larger-scale capital projects. Applicable requirements are typically based on the layout and design configuration of project components, process inputs, production methods, and production outputs.

## Low-carbon hydrogen projects presented in this study

- » Electrolytic hydrogen production using electricity from the BC Hydro grid
- » Electrolytic hydrogen production using electricity from an off-grid source (i.e., solar or wind)
- » Hydrogen produced from natural gas with carbon capture utilisation and storage (CCUS)
- » Hydrogen produced from the thermal decomposition of methane at high temperatures (i.e., pyrolysis)
- » Ammonia produced from low-carbon hydrogen
- » Methanol produced from low-carbon hydrogen



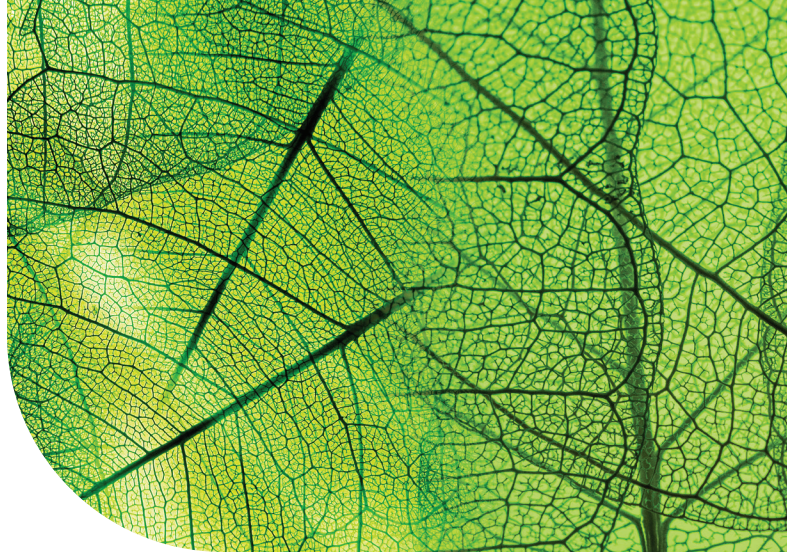
# Current Applicable Framework

## Environmental Assessment

The requirements of the BC *Environmental Assessment Act* (BCEAA) and the federal *Impact Assessment Act* (IAA) would precede all other provincial, federal, and municipal permitting. The Reviewable Project Regulation (RPR) under the BCEAA defines which projects require an environmental assessment (EA) through established thresholds. Hydrogen-specific production thresholds are defined under the organic and inorganic chemical industry grouping in the RPR. Specifically, a proposed hydrogen project would be automatically reviewable (i.e., require an EA) if production output of hydrogen is greater than 100,000 tonnes/year. Further, a hydrogen development project may also automatically trigger an EA through associated project components and/or ancillary infrastructure depending on the project design (e.g., wind generating facility, electricity transmission lines, marine terminal construction, shoreline modification).

For reviewable projects, the BCEAA establishes a seven-step EA process that encompasses early engagement, EA readiness, process planning, application development and review, effects assessment, recommendation, and decision. Currently, hydrogen production is grouped in the RPR within a broad category of industrial projects, which includes the manufacturing of poisonous/toxic chemicals. This broad grouping does not distinguish low-carbon hydrogen production from other industries that may have a much larger environmental footprint.

The IAA governs the preliminary approval process for large capital projects across Canada. The Physical Activities Regulations under the IAA set out the thresholds for a designated project. There are currently no specific hydrogen production thresholds; however, depending on the design of a specific project other thresholds may be applicable (e.g., development of a marine terminal for ships larger than 25,000 deadweight tonnage).



## Provincial, Federal and Municipal Regulatory Framework

In November 2022, the BC Government passed the *Energy Statutes Amendment Act* changing the BC Oil and Gas Commission (BC OGC) to the BC Energy Regulator (BCER), and establishing its authority to regulate the manufacturing of hydrogen, ammonia, methanol as well as carbon dioxide (CO<sub>2</sub>) transportation. This is an important first step in establishing a more streamlined regulatory framework for hydrogen projects. The legislation has created a regulatory framework with a single-window regulator for hydrogen development and replaces the former *Oil and Gas Activities Act* with the *Energy Resources Activities Act*.

The legislative changes enable the BCER to regulate all scales of hydrogen, ammonia, methanol, and carbon storage projects, in addition to oil and gas projects. The BCER will also regulate pipelines, facilities, wells, and related activities.

Technical Safety BC (TSBC) authority related to hydrogen, includes regulating storage utilization of hydrogen in industrial processing and production applications in accordance with the *Safety Standards Act* and Gas Safety Regulations. TSBC also governs ancillary equipment such as electrical

equipment and systems, hydrogen systems, boilers, pressure vessels, and refrigeration systems.

TSBC and the BCER currently coordinate on their spheres of regulatory authority for the oil and gas sector. Similar coordination is expected as it relates to the regulation of hydrogen.

The BC Utility Commission (BCUC) would play a role in regulating projects that are considered a public utility. Public utility companies must comply with the *Utilities Commission Act*; this includes rate applications, compliance filings, and submitting applications for capital expenditures, and may also include long-term resources and conservation plans, as required.

The BCUC is expected to clarify the regulation of hydrogen energy services in 2023 as an outcome of its inquiry into the regulation of hydrogen energy services, and how aspects of the *Utilities Commission Act* will apply.

Depending on the design and configuration of projects, regulatory approvals applicable to hydrogen development can be categorized into design-based requirements and site location-specific requirements.

**Provincial design-based requirements that could apply to hydrogen projects include, but are not limited to:**

<i>Water Sustainability Act</i>	Water licences
<i>Environmental Management Act</i>	Waste discharge approvals for air emissions and effluent discharge permits
<i>Utilities Commission Act</i>	Approvals for public utilities
<i>Oil and Gas Activities Act</i>	Permits for the construction and operation of facilities, pipelines and related activities
BC Hydro	Connection standards and approvals
<i>Transportation of Dangerous Goods Act (BC)</i>	Transport requirements

**Provincial location-based regulatory requirements that could apply to hydrogen projects include, but are not limited to:**

<i>Water Sustainability Act</i>	Notification/approval for changes in and about a stream
Contaminated Sites Regulation	Release notices for contaminated sites
<i>Wildlife Act</i>	Permits related to fish and wildlife
<i>Heritage Conservation Act</i>	Investigation and alteration permits
<i>Land Act</i>	Licences of occupation
<i>Forest Act</i>	Licences/permits to cut
<i>Agricultural Land Commission Act</i>	Approvals for non-farm use of Agricultural Land Reserve

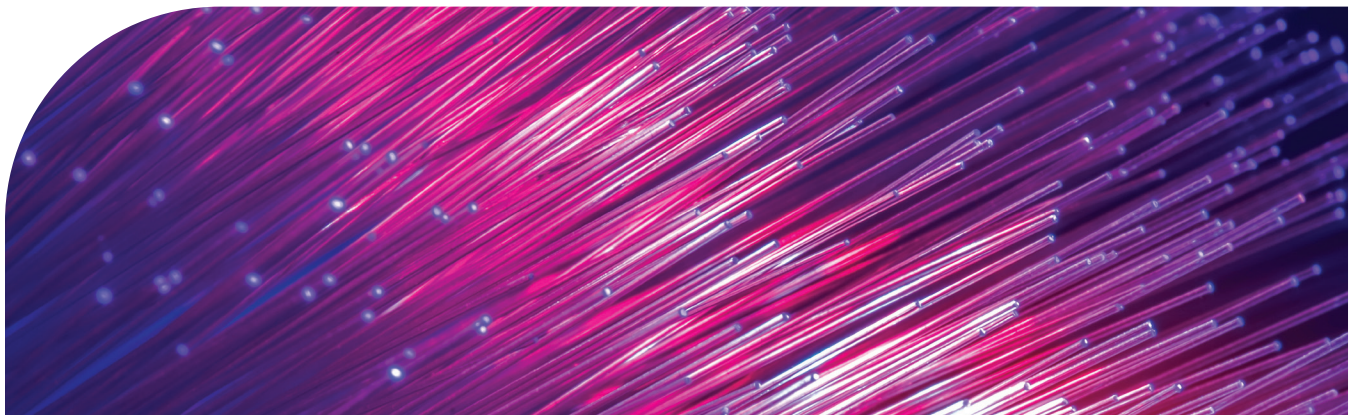
NOTE: These are high level summaries, further details are provided in the BC Hydrogen Regulatory Mapping Study.

Depending on specific design components and the location of each hydrogen project, federal requirements that could potentially apply to hydrogen projects include, but are not limited to:

<i>Impact Assessment Act</i>	Relevant port authority project review
<i>Canadian Environmental Protection Act</i>	Disposal at sea permits
<i>Canadian Navigable Waters Act, 1999</i>	Approvals for work that interferes with navigation
<i>Fisheries Act</i>	Request for review/authorization
<i>Species at Risk Act</i>	Authorization for relocation of species of risk or destruction of a residence
<i>Aeronautics Act</i>	Aeronautical obstruction clearance
<i>Transportation of Dangerous Goods Act (Canada) / Ammonia Code of Practice</i>	Transport requirements

NOTE: This is a high level summary. Details are provided in the BC Hydrogen Regulatory Mapping Study.

Hydrogen projects developed within municipal boundaries would also require approvals established in bylaws enabled by the *Local Government Act* and Community Charter. In situations where there is regulatory overlap with a provincial agency such as the BCER, a municipality typically works with the senior level of government for review and approval.





## Indigenous Consultation

For projects subject to a provincial EA, the BCEAA incorporates consensus-seeking with Indigenous groups for key decisions throughout the EA process. This approach is consistent with the United Nation's interpretation of free, prior and informed consent which emphasizes the importance of the process of dialogue and negotiation over the course of a project from planning to implementation. If a project does not require a provincial EA under the BCEAA, consultation requirements will be met through specific permitting processes. For example, the BCER expects proponents to engage with Indigenous groups prior to and throughout the permitting process.

The Government of Canada must consult and, where appropriate, accommodate Indigenous groups when the Crown contemplates conduct (issuance of a permit) that might adversely impact potential or established Aboriginal or Treaty rights within areas of federal jurisdiction. The IAA has a focus on early planning and engagement as well as increasing opportunities for Indigenous peoples to participate in the assessment process. If a project does not trigger a federal EA under the IAA, federal consultation requirements would be met through specific permitting requirements, such as *Canada Marine Act* relevant port authority project review, *Canadian Navigable Waters Act*, and/or the *Fisheries Act* depending on the applicability to a specific project.





## Literature Review of Other Jurisdictions

To contextualize the BC regulatory findings, a high-level review was conducted of other national and international jurisdictions to identify supporting policies and progressive initiatives that have been implemented to remove regulatory barriers in those jurisdictions. Policy developments were reviewed in Ontario, Alberta, Australia, United Kingdom, the Netherlands, Germany, and the United States (California and Texas). In many jurisdictions, legislators appear to be playing catch-up with policy to incentivize hydrogen and interest in developing the industry, and hydrogen projects at this time are largely expected to be developed and operated within existing regulatory regimes. Governments in all jurisdictions reviewed appear to be in the early stages of adapting regulations and developing new approaches to the emerging hydrogen industry.



# Conclusion and Recommendations

## Conclusion

The BC Government has made significant steps towards streamlining the regulatory framework for hydrogen projects by replacing the *Oil and Gas Activities Act* with the *Energy Resource Activities Act* and expanding the BCER's mandate to become the single window regulator for hydrogen.

Although important legislative changes have occurred, there will likely be a transitional period during which BCER regulation of hydrogen, ammonia, and methanol projects will rely on permit conditions. It is unclear when the new supporting regulatory framework will be in place, the support available to proponents during the transitional period, as well as the length of time required for the BCER to build capacity and issue specific guidance. Some of the former BC OGC regulations will likely require modification to facilitate the regulation of hydrogen, ammonia, and methanol as well as the storage of carbon dioxide. Several regulations that are tailored specifically to technologies and approaches in the oil and gas industry will likely require changes, or new regulations may be needed to accommodate hydrogen, ammonia, and methanol.

In some jurisdictions, a hydrogen production facility will require permitting or approvals from the BCER, TSBC, and the local municipality. It is unclear how these regulators will work together and reduce duplication and inefficiencies to streamline the process. Hydrogen projects could be proposed at a small scale to meet local requirements in proximity to demand. A tiered approach to regulation may be appropriate in line with the nature and scale of projects.

Indigenous groups have successfully entered into decision-making agreements with the provincial and federal governments regarding implementation of their own environmental standards (e.g., Tahltan Central Government and the Province of BC), which potentially adds another layer of approvals for projects to proceed.

Finally, some urban municipalities may lack suitably zoned industrial land within Official Community Plans and Zoning Bylaws to accommodate hydrogen developments, given substantial residential and commercial development pressure.

As hydrogen is an emerging technology in BC, it is anticipated that awareness and technical knowledge of hydrogen (including potential risks) amongst municipalities, Indigenous groups, and the public is very low, which could add risks for new projects.

## Recommendations to address barriers to hydrogen development

- » Consider changes to regulations and/or new regulations that can be scaled to different sizes of hydrogen projects.
- » Provide guidance to proponents on how to obtain a *Water Sustainability Act* authorization for water diversion and use for hydrogen production.
- » Develop regulatory framework guidance for hydrogen proponents navigating the regulatory process, including providing additional guidance to first of their kind projects that are at the permitting stage.
- » Modify and/or develop new agreements and processes with other regulators to enhance the BCER single window approach, where appropriate.
- » Review of national and international technical codes and standards to support the regulatory framework to ensure safety and public confidence in the hydrogen industry.
- » Clarify the regulation of hydrogen services through the BCUC inquiry.
- » Establish a working group to review and consider the applicability of the hydrogen production threshold under the provincial environmental assessment process.
- » Provide Local and municipal permitting support for hydrogen projects, including building capacity within the BCER and TSBC to support municipalities in line with the new framework.
- » Work with Indigenous groups to co-develop consent-based decision-making agreements that formalize targets.
- » Undertake Education and further engagement with Indigenous and non-Indigenous communities regarding hydrogen development to improve awareness and technical knowledge.



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**We acknowledge with respect and gratitude that this report was produced on many traditional and unceded territories, covering all regions of British Columbia whose deep connections with this land continue to this day.**



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