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Understanding the regulations for natural gas vehicles and refuelling infrastructures

The use of natural gas vehicles is growing fast in Québec, following the rapid adoption of this clean and economical fuel by various transport fleets. This category of vehicles, the refuelling infrastructures and maintenance facilities, are all regulated by laws and regulations, each relating to design and maintenance codes and standards. These laws, regulations, codes and standards entail legal obligations that are sometimes not known by the owners and operators of vehicles, nor by the professionals who work in this field. This article will detail the different laws, regulations, codes and norms in effect.

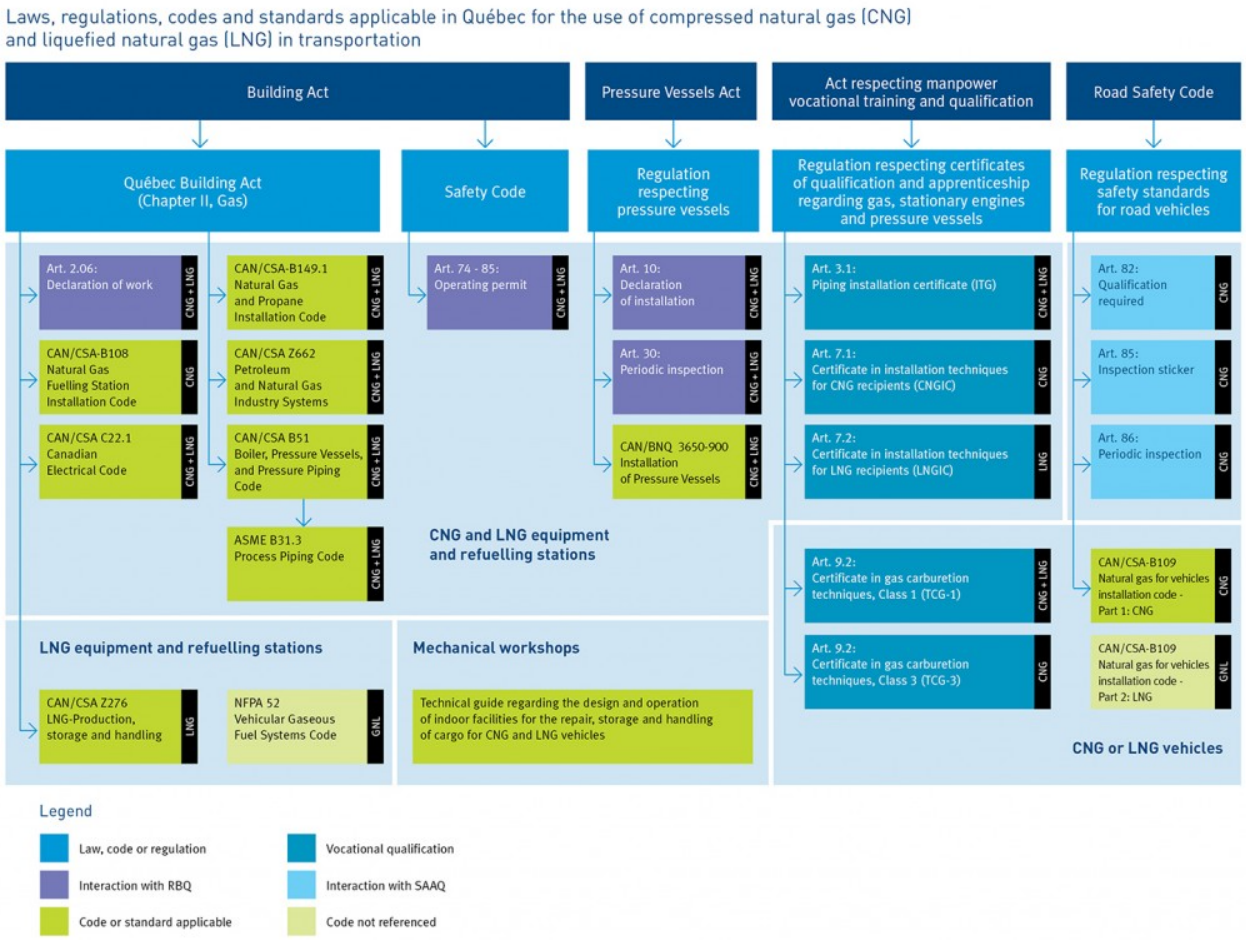
Laws and codes applicable to CNG/LNG vehicles and infrastructures

Refuelling stations

Three laws govern the construction and operation of compressed natural gas (CNG) and liquefied natural gas (LNG) refuelling stations, the principal one being the Building Act. It covers, through the Québec Building Act (Chapter II – Gas), all aspects of the design, construction and operation of equipment used to fuel vehicles with CNG or LNG. Public safety is assured through the following codes and standards:

- Natural Gas Vehicle and Fuelling Station Installations (CAN/CSA–B108)
- Canadian Electrical Code (CAN/CSA C22.1)
- Natural Gas and Propane Installation Code (CSA-B149.1)
- Petroleum and Natural Gas Industry Systems (CAN/CSA Z662)
- Boiler, Pressure Vessels and Pressure Piping Code (CAN/CSA B51)
- Process Piping Code (ASME B31.3)
- Liquefied Natural Gas (LNG) – Production, Storage, and Handling (CAN/CSA Z276)

Regarding CNG, a large majority of the directives related to the design of refuelling installations principally stem from code CAN/CSA-B108, which was reissued in 2014. From now until this new edition comes into effect, which normally is six months following publication of the French version, the earlier 1999 version still governs in Québec. It should be noted that, until the 2014 edition of the code, the 1999 edition limits refuelling of vehicles to a pressure of 3000 psi at public stations, unlike the 3600 psi permitted at private stations, which has now been standardized and harmonized worldwide for vehicle technology and tanks. The 2014 edition of the Code will come into effect officially on July 1, 2015 in Québec.



In the case of LNG refuelling stations, the Liquefied Natural Gas (LNG) – Production, Storage, and Handling Standard (CAN/CSA Z276-07) applies. The U.S. Standard NFPA 52 serves as reference here, even if it is not referenced officially.

The two principal requirements laid down by the Québec Building Act are the obligation to declare all work to be carried out to the *Régie du bâtiment du Québec* (RBQ) and to obtain an operating permit. The operating permit is renewable annually.

The second law regulating the construction and operation of CNG or LNG refuelling stations is the Pressure Vessels Act. It covers the installation and maintenance of pressurized reservoirs used to store natural gas at CNG refuelling stations. The installer must have the reservoir installation approved by the RBQ, which will ensure its inspection every four years.

The third and final law is the Act respecting manpower vocational training and qualification, which sets certain restrictions on the tasks related to the installation and maintenance of equipment at a CNG or LNG refuelling station. A certificate in installation techniques for CNG recipients (TIRGNC) is required for the initial start-up, maintenance, repair or removal of any compressed natural gas refuelling centre. Similarly, a certificate in installation techniques for recipients of liquefied natural gas (TIRGNL) is required for any LNG refuelling centre.

Note: A piping installation certificate (ITG) is sufficient for installing the piping.

TIRGNC and TIRGNL certificates are issued by *Emploi-Québec* following the successful completion of the compulsory professional training and a 1,000-hour on-the-job apprenticeship. The *École de technologie gazière* (ETG) offers the training required as a prerequisite to taking the TIR (GNC or GNL) examination. Holders of an equivalent certificate

issued by another Canadian province or territory, or by another recognized organization, may, after an analysis of their file, be exempted from the examination and obtain a qualification certificate from *Emploi-Québec*.

Vehicles

New factory-built vehicles fuelled by CNG or LNG must comply with Transport Canada safety regulations and respect Environment Canada regulations on emission standards. However, the after-sale conversion of vehicles falls under provincial jurisdiction. In Québec, any conversion of a vehicle to run on CNG or LNG must comply with CAN/CSA-B109 and be supervised by a mechanic who holds a Certificate in gas carburetion techniques (TCG) issued by *Emploi Québec*. The Regulation respecting safety standards for road vehicles sets forth the obligations with which vehicle owners are expected to comply. Articles 85 and 86, among others, stipulate that the fuelling system must be inspected periodically. An inspection sticker must be attached by a mechanic who holds a competency certificate. (TCG)

Again, a Certificate in gas carburetion techniques is issued by *Emploi-Québec*. The *École de technologie gazière* (ETG) offers the training required as a prerequisite to taking the examination.

Note: No qualification certificate is required for refuelling a vehicle with CNG or LNG.

Mechanical workshops

At this time, Canada does not have an official code in effect that specifies the requirements for indoor maintenance facilities for natural gas vehicles at this time. In the meantime, Natural Resources Canada (RNCan) and the Canadian Natural Gas Vehicle Alliance have produced a technical guide defining the requirements to be respected to ensure the safe maintenance of CNG/LNG vehicles indoors.

Parking and tunnels

Parking vehicles indoors in permitted everywhere where fuel engine vehicles are authorized, including underground commercial or residential parking. Also, driving through tunnels is permitted everywhere, as long as the CNG or LNG is used to fuel the vehicles.

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Informa-TECH is a publication of DATECH Group of Gaz Métro offered free of charge. For further information on these topics, contact Marie-Joëlle Lainé, Eng., at 514-598-3507.