A state-of-the-art review on the development of CNG infrastructure and mapping / digitalisation of the natural gas transmission network in Estonia

Gaasi tanklate infrastruktuuri arendamise ja maagaasi jaotusvörgu kaardistamise / digitaliseerimisega seotud ajakohane ülevaade Eestis.

Funding: National (Estonia)
Duration: Jan 2005 - Dec 2024
Status: Ongoing

Background & policy context:

Understanding the local gas grid is often the first step in the development of gas refueling infrastructure. The present gas network creates a lot of opportunities to add new filling stations. The systematic digitalisation of the natural gas transmission network in Estonia began in 2000 and was mostly completed by 2006. Nevertheless, in the following years work continued in the refinement and specification of the gas refueling infrastructure.

Furthermore, the project covers some background principles related to the EU Project of Common Interest (PCI) in and around the Gulf of Finland and a major infrastructure project in and around the Baltic Sea, which aim to better interconnect energy networks towards a single energy market in Europe.

Objectives:

In Estonia, in order to reduce emissions from transport, efforts are focused on increasing the use of forward-looking vehicle technologies, alternative fuels, and improving vehicle efficiency.

However, there are several barriers which slow development, and they include:

- the high emission mitigation when compared to other sectors;
- the high retail price of alternative fuel vehicles;
- the high cost of non-food-based biofuel production;
- the lack of infrastructure or access to the natural gas transmission network.

Methodology:

This project has been prepared with the intention to increase knowledge in the area of natural gas vehicles and the fuel supply infrastructure in Estonia. It includes reviews of technical reports, peer-reviewed scientific publications, and various websites, informed by experience from the oil and gas industry.

Other funding sources: Ministry of Economic Affairs and Communications, Eesti Gaas AS

Lead Organisation:

Eesti Energia As

Address:
LELLE 22
11318 TALLINN
Estonia
In this project, the state-of-the-art gas technologies in transport have been reviewed, including the advantages and disadvantages of natural gas vehicles, market driving forces and the barriers for the development of natural gas vehicles.

Most commercial passenger and light duty natural gas vehicles are either dedicated fuel (CNG) or bi-fuel vehicles that run on gasoline and CNG; without losing the ability to drive on gasoline. The driving range of most bi-fuel cars in CNG mode is about 400 km. And most commercial heavy duty natural gas vehicles are devoted (CNG/LNG) vehicles or dual-fuel (CNG/LNG and diesel) vehicles.

The main emissions benefits of natural gas vehicles over diesel and petrol cars are: reduced CO2 emissions, nearly zero particulate matter emissions, decreased NOx emissions, and decreased hydrocarbon emissions at equal fuel economy. However, the high added vehicle cost, limited model variants, and deficiency of infrastructure are some of the challenges facing the natural gas vehicles market.

The availability and access to CNG filling stations are of extraordinary importance for the development of the natural gas vehicles industry.

As a mature but emerging technology, Estonia successfully promotes natural gas vehicles and has created favourable conditions in the starting period to push the technology using different policy instruments; market-based and regulatory based policies. Regulatory-based policies include: easing the bureaucracy associated with project approval for CNG filling stations; establishing standards, regulations and certifications programs for the industry; demanding emission regulations in metropolitan areas.

In Estonia there are 21 acts that give rise to restrictions and about 100 features that must be collected. Objects that give rise to restrictions are any land objects that give rise to a restriction zone (42 different zones) and can be spatially identified (X,Y,Z). An example of such a feature is utility networks. 23 different utility network companies share data with the Estonian Land Board, starting from the year 2005. One of these companies is the major natural gas company in Estonia - Eesti Gaas AS.

Restrictions: legal grounds for the natural gas transmission network have been and are Law of Property Act article 140 to 141 - a restriction pursuant to law is valid without entry in the land register and Land Cadastre Act article 12 - the cadastral registrar shall enter the location of objects which give rise to restrictions on the restrictions map.
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**STRIA Roadmaps:** Low-emission alternative energy for transport, Infrastructure

**Transport mode:** Road transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Environmental/Emissions aspects, Decarbonisation

**Geo-spatial type:** Other