



Ministry of Infrastructure
and Water Management



Hydrogen mobility in the Netherlands

Vision, perspective and the challenges

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Mobility



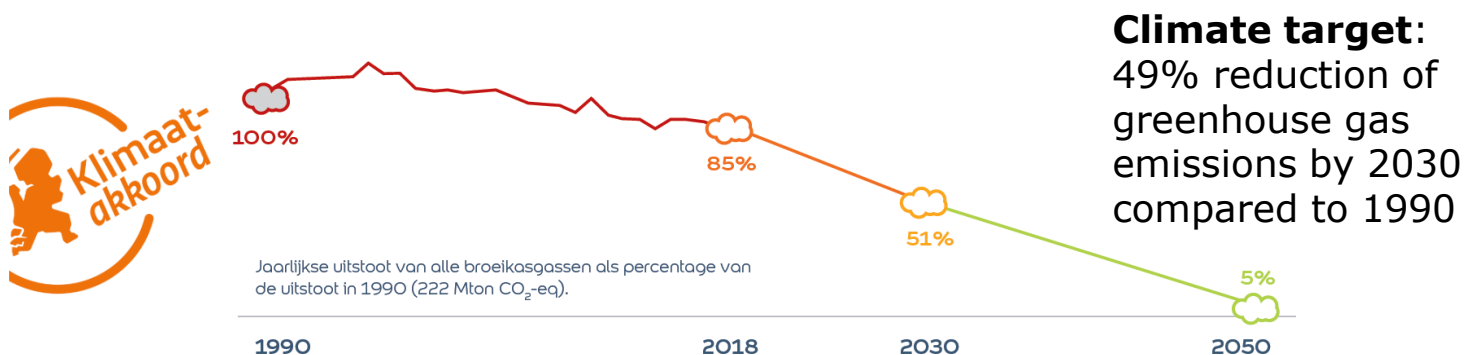
Content

- Ambitions towards zero emission mobility and hydrogen goals in the Netherlands
- Challenges
- Policy and tools to roll-out hydrogen in mobility
- Safety regulations and potential safety issues
- Questions



Quick overview – Hydrogen Mobility in the Netherlands

An ambitious climate policy: National Climate Agreement (*June 2019*)



Transport accounts for a quarter of all emissions.

- New cars to be emission free by 2030.
- Together with the **logistics sector and municipalities**, the government aims to reduce bus, lorry and delivery van emissions to zero in 30-40 of our city centers by around 2025.
- A **major future role for hydrogen as an energy carrier** not only in passenger transport, but also in heavy transport, such as lorries, public transport buses and as a potential replacement for diesel trains.



Mobility

→ Reduction 7,3 Mton CO₂-eq.
Hydrogen should contribute to this reduction goal

	2020	2025	2030
Hydrogen goals in the Dutch National Climate Agreement	An agreement with the sector (public - private)	15.000 FCEV cars/ passenger transport	300.000 FCEV cars/ passenger transport
		3000 heavy duty	75.000 heavy duty
		50 Hydrogen filling stations	200+ HRS

Rephrased in amount of Hydrogen → ~141 million kg H₂

There are challenges: costs need to fall; infrastructure needs to be developed; cleaner hydrogen is needed; and regulatory barriers persist.

As of 2020:

- 265 Hydrogen cars (taxis and passenger cars) and 10 Hydrogen buses
- 5 public and a couple of private Hydrogen filling stations
- Financial subsidy is granted for 25 filling stations till 2025



Policy in the Netherlands

Both EV and FCEV are needed for ZE-transition in mobility.

FCEV more suitable for:

- Long distance;
- Medium and heavy duty vehicles;
- When short refuelling time is necessary.

(e.g buses, taxis, ambulances, garbage trucks, road sweepers, long distance road transport)

Challenge in FCEV's: getting vehicles produced and delivered

Chicken and egg dilemma: first vehicles or first filling stations?

Implementation strategy Hydrogen in Mobility in the making (end 2020) by the Ministry of Infrastructure and Water Management

Roadmap:

- adaptation path - investment agenda, financing strategy
- solving obstacles in cooperation with the private sector
- input for negotiations on European level (rules and regulations)



Approach Roll-out H2 in mobility

- **Green Deals** in specific sectors, such as:
 - Buses for public transport
 - Vehicles for waste collection
 - Taxi fleets
 - Zero Emission city logistics
- **DKTI subsidy** with focus on innovation:
(*Demonstration climate technologies and innovation in Transport*)
 - Heavy duty
 - HRS-infrastructure
- **Fiscal stimulation** Vehicle registration tax (BPM - 0 Euro tot 2024)
/Additional tax liability (bijtelling – for lease)/ Road tax – 0 Euro in 2020 /MIA/ VAMIL
- **Regulations** – Environmental zones/zero-emission zones/parking policy/EU guidelines
- **European policy:** AFID, RED2, Clean Vehicle Directive
- **EU financing:** FCH-JU, CEF, Interreg
- **Government as launching customer** (e.g. ZE non-road machinery)

Example:

Overall Ambition *Green Deal Zero Emission PT Buses:*

- **By 2025:** all new buses should be zero emission;
- **By 2030:** all buses should be zero emission.



Hydrogen Bus in Rotterdam area



Co-financed by the European Union
Connecting Europe Facility

Example project: H2Benelux

To solve the dilemma between filling stations and vehicles: hydrogen mobility along the TEN-T corridors in Belgium, the Netherlands and Luxembourg

➤ **Project information:**

Total budget: 17.4 M€

Co-funding: 1. European Unions' Connecting Europe Facilities (CEF)
2. (DKTI Transport) from Netherlands Enterprise Agency (RVO)

- 8 hydrogen filling stations
- 80 FCEV's



Rijkswaterstaat
Ministry of Infrastructure and the
Environment



Potential safety issues FCEV

- Generation (H₂): Lots of small scale sites expected, electrolysers and possibly methane reformers
- Storage (H₂): high pressure equipment
- Road transport (H₂): main roads allowed, local regulations may apply. [Yearly evaluation](#) main roads. [More tube trailers](#) expected
- Refuelling/charging: leakage (H₂)
- Vehicle use and parking: confined spaces

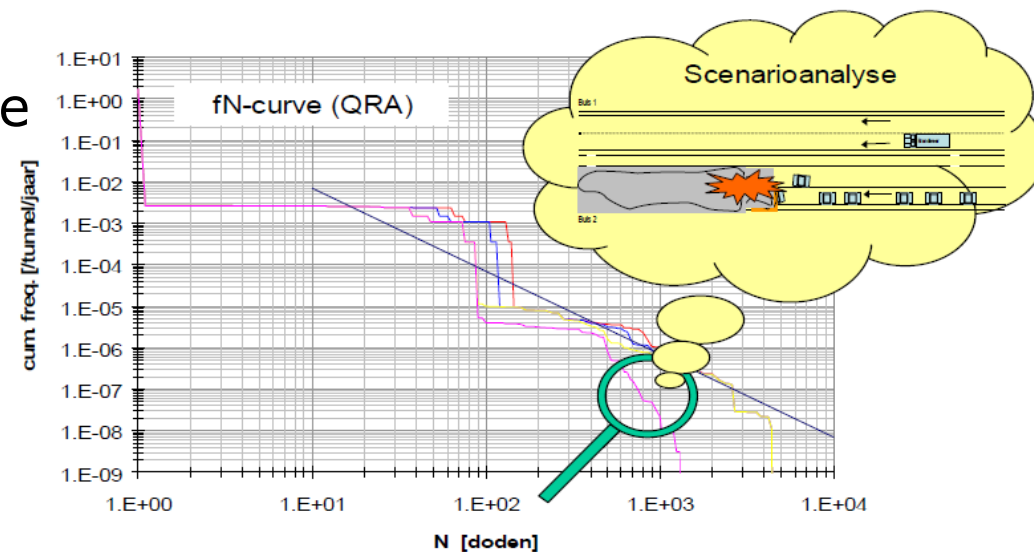
Wide-spread use of new techniques by non-professionals

Regulation exists, further examination necessary due to expected growth H₂ vehicles



Example: Tunnel safety

- EU directives: [Tunnel 2004/54](#) and [Safety management 2008/96](#), and [Evaluation report](#)
- Risk assessment [models](#) and [software](#) impact probability chart
 - heavy duty H2 vehicles to be included
 - users, vehicles, facilities, traffic, infrastructure
 - scenario's to be elaborated: traffic increase and collision failure, explosion probability, overpressure/broken windows





Developments about hydrogen safety

- **Parking garages**

Revision Dutch National standard (exp 2021)

- **Hydrogen**

[CEN/CENELEC: JTC6](#) TR *Safe use of hydrogen in built constructions*

- Research agenda by [CEN-SFEM](#) and [Hysafe \(HSE report #1159\)](#)

- [Dutch government strategy on hydrogen](#), mentions [Safety Innovation Programme](#)

- [Summary of Guide permitting process hydrogen refuelling station](#), in English



Thank you for your attention!