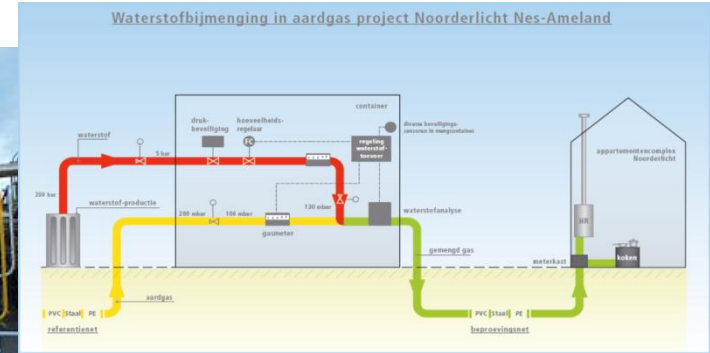


Advances in hydrogen activities in the Netherlands

Marcel Weeda

WHTC2015, Sydney, Australia
14 October 2015

Recent history



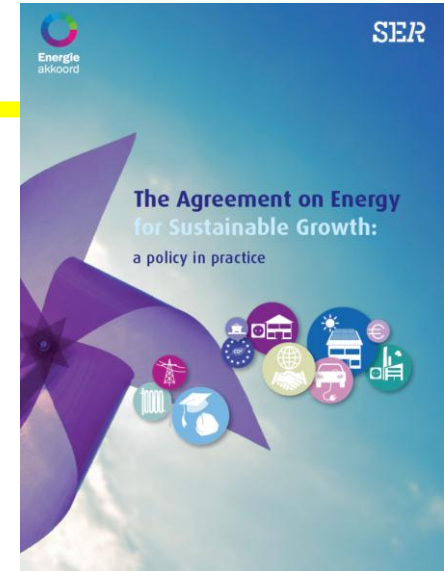
Recent policy developments

- **Energy Agreement for Sustainable Growth**

- Concluded on September 9, 2013 by more than 40 organisations
- General and sector specific targets, including targets for transport
- Transport targets:
 - 2020: 15 – 20 PJ energy saving
 - 2030: maximum of 25 Mton CO_{2,eqv} relative to 1990 (-17%)
 - 2035: all new passenger cars are capable of zero-emission driving
 - 2050: 60% CO2 emission reduction relative to 1990

- **EU Directive on deployment of alternative fuels infrastructure (2014/94/EU)**

- Directive effective from the 22nd of October 2014
- Ensures a common legal framework
- Sets out minimum requirements for build-up
- Calls for development of national policy frameworks (action plans)

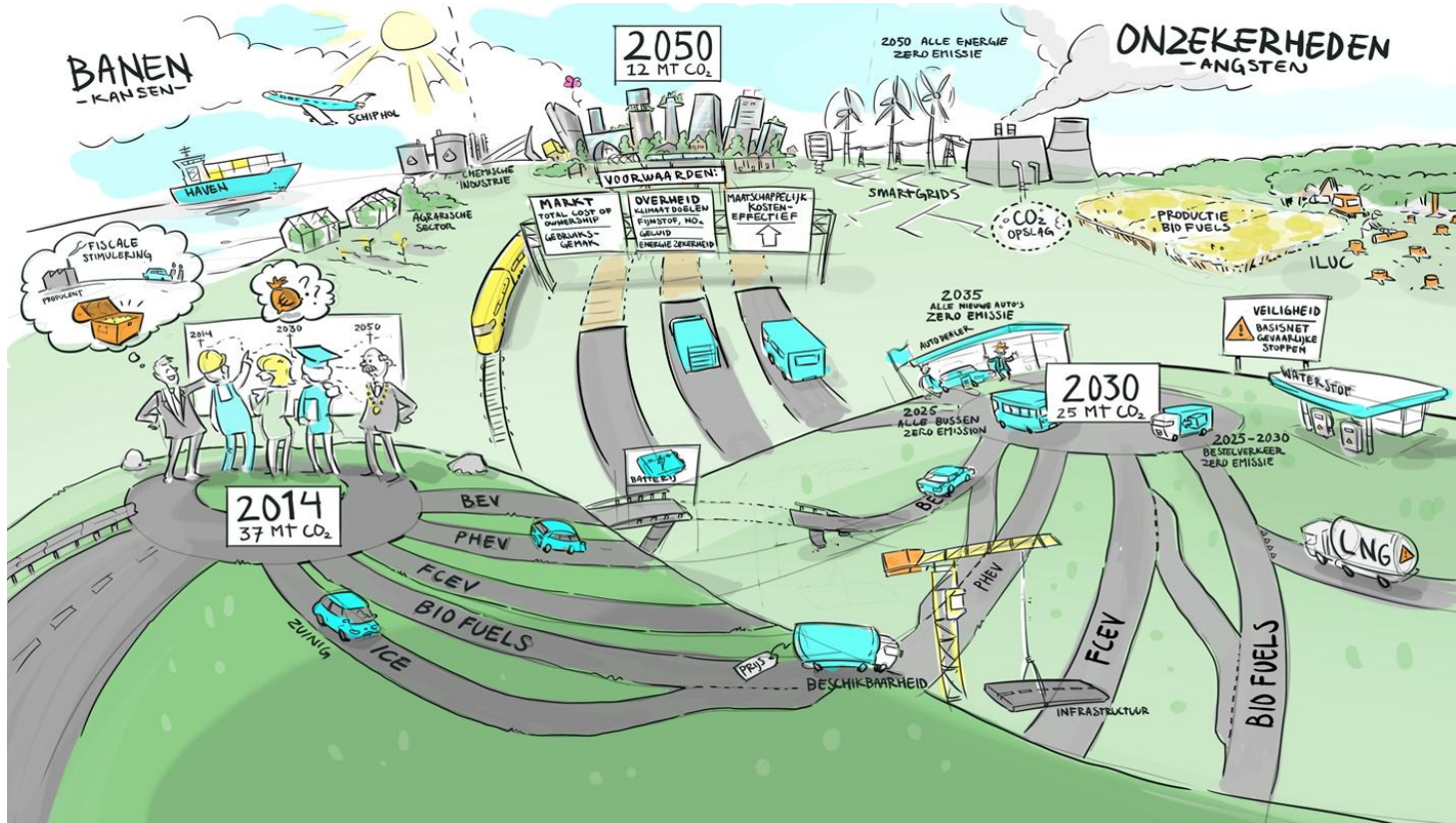


Dutch vision and action plans on sustainable fuels for transport

- Dutch government decision september 2013
- Comprehensive process involving >150 stakeholders
 - 4 roundtables road transport: liquid, natural gas, electric, hydrogen
 - Separate roundtables on shipping and aviation
 - Cross-cutting roundtable on Green Growth and Sustainable Energy
- Vision presented June 2014 to Secretary of State
- Cabinet endorse the vision and defines implementation agenda
 - Vision and agenda sent to and adopted by Parliament on July 10, 2015
 - Strengthening existing policy (measures) to support implementation agenda
 - New commitments under discussion



Wide range of options and aspects, integral vision



Main outcomes of vision process

- Transition to electric propulsion if promising:
 - Cars: Electrification including battery and hydrogen/fuel cells; back-up biofuels
 - Trucks: Short distance electrification; Long distance LNG
- Other transport segments:
 - Rail: Use of renewable energy, and replace diesel trains by LNG
 - Shipping: Improvement efficiency and transition to LNG
 - Aviation: Biokerosine
- Further findings and intentions:
 - Infrastructure for alternative fuels needed
 - Innovative funding needed for investments and business cases
 - Periodic vision/strategy review and update – adaptive policymaking

Main outcomes

- Transition to electric

- Cars: Electric
- Trucks: Short

- Other transport systems

- Rail: Urban
- Shipping: Inland
- Aviation: Domestic

- Further findings

- Infrastructure
- Innovative fuels
- Periodic vision



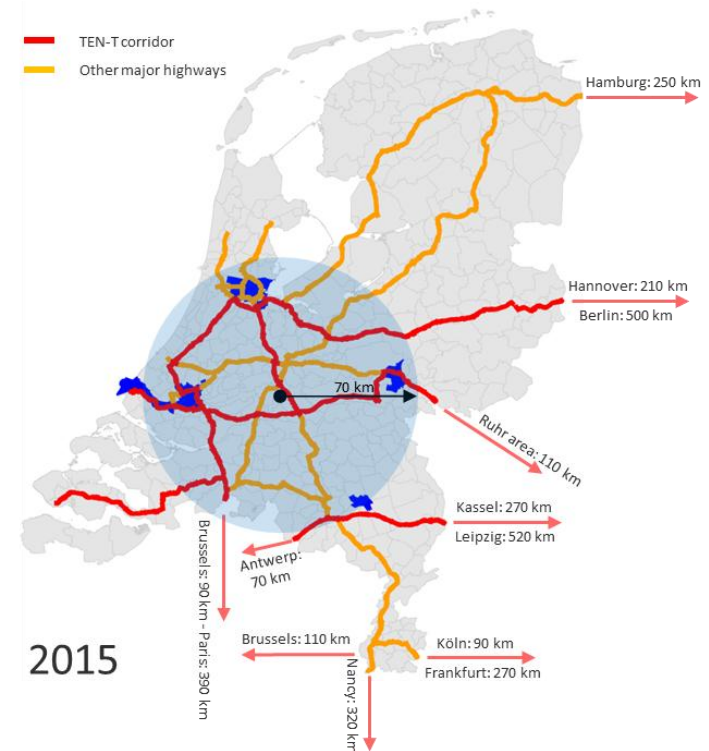
fuel cells (back-up biofuels)

rains by LNG

micymaking

Hydrogen roundtable ambition

- The Netherlands aims for a position in a leading group of countries
- Unique selling points for early market development in the Netherlands:
 - High population/market density
 - High GDP per capita/purchasing power
 - Large hydrogen industry
 - Centrally located in NW-Europe, well connected to DE, DK, BE, FR and UK
 - Strong track record for early and wide adoption of innovative clean cars, e.g.:
 - largest share of hybrids in EU
 - frontrunner in plug-in cars

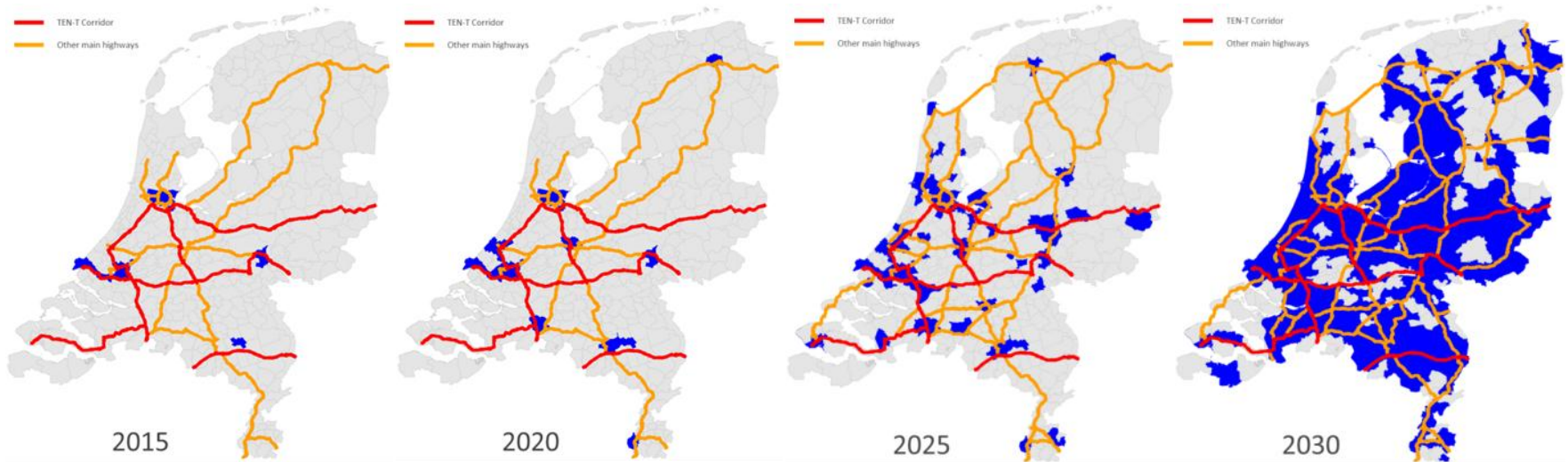


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Hydrogen roundtable high-level view on rollout



	Market preparation	Early market introduction	Full market introduction	Mass market
Car fleet	Few → 1,500	1,500 → 15,000	15,000 → 125,000	→ > 2.5 mln
HRS network	2 → 20	20 → 50	50 → 200	→ > 1,000
Population	3.3 mln (20%)	8.0 mln (50%)	15.0 mln (90%)	(100%)

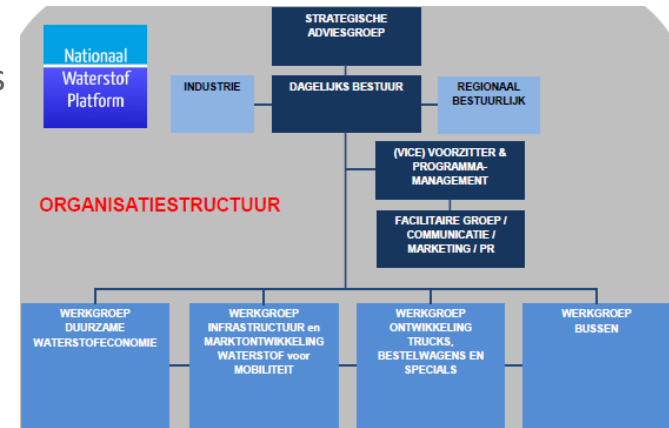
Outcome of hydrogen roundtable is starting point for action

- Vision and ambitions converted into targets for 2015 - 2020:
 - 20 public hydrogen refueling stations
 - 1.500 up to 2.000 fuel cell cars
 - 100 public transport fuel cell buses and corresponding refueling stations
 - Up to 500 vans and 20 trucks for zero-emission logistics in urban areas
- Preconditions for success:
 - Initial network of hydrogen refueling stations
 - Proactively organizing FCEV customers, fleets
 - Appropriate regulatory framework (road safety, HRS permitting, etc.)
 - Supportive policy measures: financial and non-financial
 - Information provision and communication (gain public acceptance)
 - EU and international coordination

Converting of momentum into coordinated action

- National Hydrogen Platform (H2NL) for public-private cooperation:

- Combining and strengthening individual initiatives
- Identification barriers, and priority setting of actions
- Coordination of actions and new initiatives
- Four task forces:
 - Sustainable hydrogen economy
 - Infrastructure for mobility
 - Buses
 - Van, trucks and specials

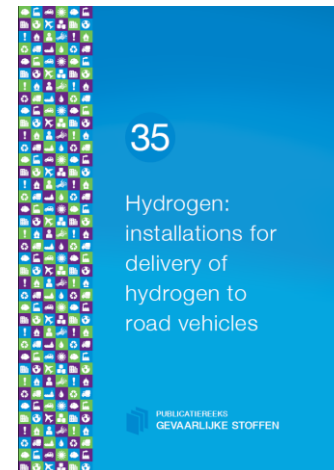


- Capturing of commitments of, and agreements between public and private stakeholders in covenants, so-called “Green Deals”:

- Green Deal Zero-Emission Public Bus Transport
- Green Deal Zero-Emission City Logistics
- Green Deal on hydrogen is under development

Recent achievements and upcoming projects

- New EU bus project 3EMotion:
 - 2 buses in Rotterdam
 - 4 buses in Province of South-Holland
- TEN-T project with fuel cell bus and HRS in city Arnhem
- Two other bus projects, including HRS under development



Publication Series on Dangerous Substances. Document to support smooth permitting of HRS; standards and guidelines for design, building and operation of HRS

Thank you for your attention

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