



Netherlands Enterprise Agency

Information day

***Hydrogen Innovation
Mission to the Netherlands
1-5 October 2018***

**Embassy of the Kingdom of the
Netherlands, Tokyo**

30 May, 2018

>> *Sustainable. Agricultural.
Innovative. International.*





Welcome

Mr. Jan-Hein Chrisstoffels, Counsellor for Innovation
Netherlands Embassy

Agenda of today



(14:45 - 15:15	Registration)
15:15 - 15:20	Welcome by Mr. Jan-Hein Chrisstoffels, Counsellor for Innovation, Netherlands Embassy
15:20 - 15:30	1. Mr. Rob Stroeks, Senior Advisor Innovation, Netherlands Embassy Introduction of the Netherlands, purpose of mission
15:30 - 15:45	2. Dr. Marcel Weeda, TKI-Gas Policy, roadmap, goals for the energy transition and role hydrogen
15:45 - 15:50	3. Video
15:50 - 16:00	Break
16:00 - 16:15	4. Mr. Robert Dencher, Hydrogen Platform Use of hydrogen in mobility
16:15 - 16:30	5. Mr. Wolter Veenhoven, KIWA representative in Japan Standardization, certification, testing
16:30 - 17:00	6. Netherlands Government (RVO) Mission 1-4 October: Program, local support, conditions, registration, Q&A
17:00 - 18:00	Small reception with drinks for informal discussion



1. Introduction and purpose of Mission

Introduction



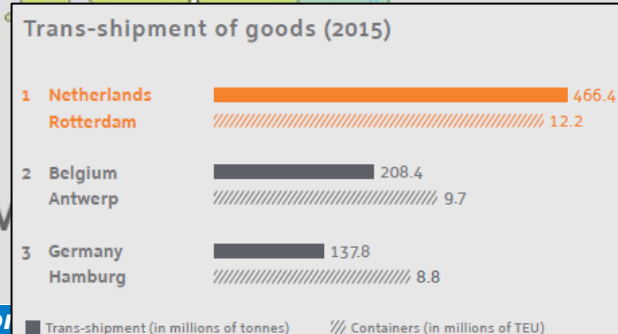
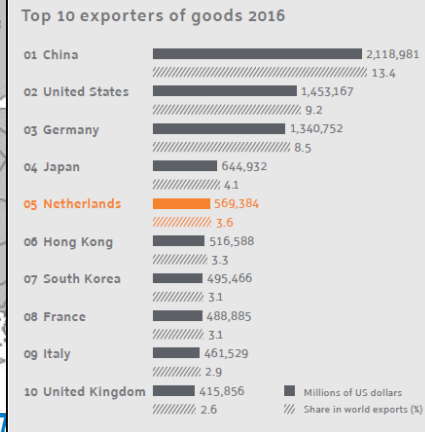
The Netherlands

	Japan	The Netherlands	JP : NL
Surface 面積	377,873 km ²	37,291 km ²	10 : 1
Population 人口	127 Mln	17 Mln	8 : 1
Economy (ranking)	\$ 4,850 Billion (#3)	\$ 850 Billion (#18)	6 : 1
GDP per person	\$ 44,000	\$ 56,000	1 : 1.3



Main industries agriculture-related industries, oil and natural gas, metal and engineering products, electronic machinery and equipment, chemicals, petroleum, construction, microelectronics, fishing

Exports ▲\$528.2 billion (2016 est.)
Export goods natural gas, machinery and equipment, chemicals, fuels; foodstuffs



Source: Wikipedia

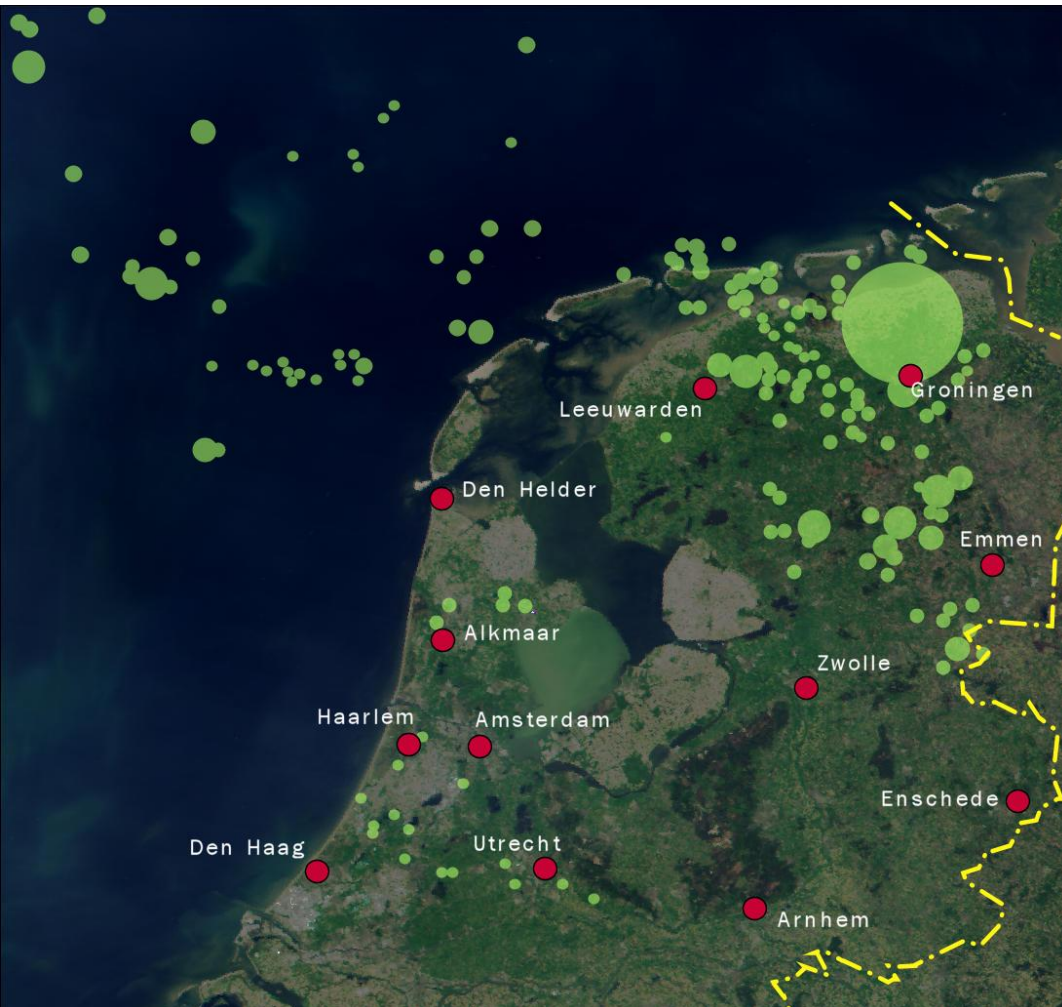


- **TPES: 78.6 Mtoe** (2012)
 - natural gas 41.7%
 - oil 39.4%
 - coal 10.4%
 - biofuels / waste 4.7%
 - nuclear 1.3%
 - wind 0.5%
 - solar 0.1%
- **Inland production: 64.7 Mtoe**
 - natural gas 88.8%
 - biofuels and waste 6.1%
 - oil 2.8%
 - nuclear 1.6%
 - wind 0.7%
 - solar 0.1%

Energy Agreement (2013):

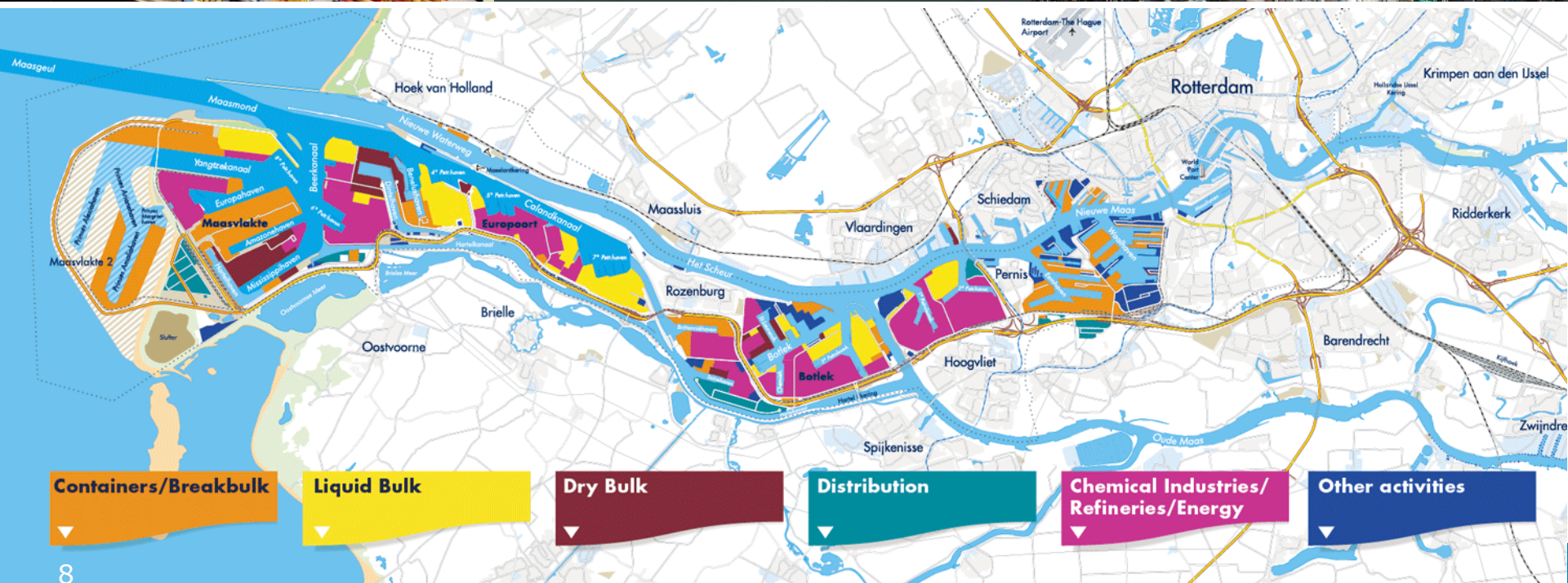
- efficiency savings to 1.5% by 2020.
- renewables to 14% by 2020 and 16% by 2023.

Groningen



- Gas production since 1963
- 265 billion euros from gas revenues for the Netherlands
- About 780 billion m³ gas produced
- Earthquakes

Rotterdam





Purpose of this Hydrogen Innovation Mission



The Netherlands has:

- Strong gas sector, major hub for global oil and gas flows.
- Strong (petro-)chemical industry.
- Strong position in offshore wind.
- Electricity and gas markets fully integrated in NW Europe.

But, significant changes are imminent:

- Political decision to stop domestic natural gas resources.
- Political decision to increase renewables and non-fossil resources: a carbon free economy in 2050.
- Increasing electrification of the industry.

Currently, the Netherlands is proactively putting hydrogen on the map as key to the transition for energy and resources.



The Netherlands can play a strategic role for hydrogen

- Gas related experience and knowledge in Groningen.
 - (Petro-)chemical related experience and knowledge in Europe's #1 harbor Rotterdam.
 - Government is formulating roadmaps, innovation support schemes.
 - Industry is developing for H₂-chain, from production to use.
 - H₂ Platform roll out H₂ fueling stations demonstration projects.
 - Business is internationally oriented.
- This Hydrogen Innovation Mission is organized around the Innovation Expo (Oct. 4), the Largest Innovation Event in the Netherlands, organized by the Netherlands Government (cf. ICEF in Japan).
- The Netherlands recognizes Japan's advancements in the field of Hydrogen, some in close collaboration with Dutch counterparts.



2. Policy, roadmap, goals



Netherlands Enterprise Agency

New impetus for hydrogen in the Netherlands

Dr. Marcel Weeda
Coordinator Hydrogen
TKI New Gas

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Framework and drivers for current energy policy

- **EU 2020 Climate and Energy Package (2007-2009):**
 - 20-20-20 targets for 2020; NL target RES 14%
- **NL Agreement on Energy for Sustainable Growth (2013):**
 - Energy efficiency and RES; NL target RES 16% in 2023
- **Judgment Urgenda Climate case against NL Government:**
 - Increase effort to reduce GHG-emissions to 25% in 2020
 - Appeal from the NL Government will be heard on 28 May 2018

- **Role hydrogen so far:**
 - No role in meeting the targets
 - No structural role in R&D and innovation



But, ... The Times They Are A-Changin'

- **Drivers for new policy:**

- Paris Climate Agreement
- Clear outlook for GHG-emission reduction by 2050: 80-95%
- EU 2030 climate targets: roughly 43% reduction GHG-emissions
- Changing view on natural gas as a result of earthquakes
- Large cost reduction of Offshore Wind

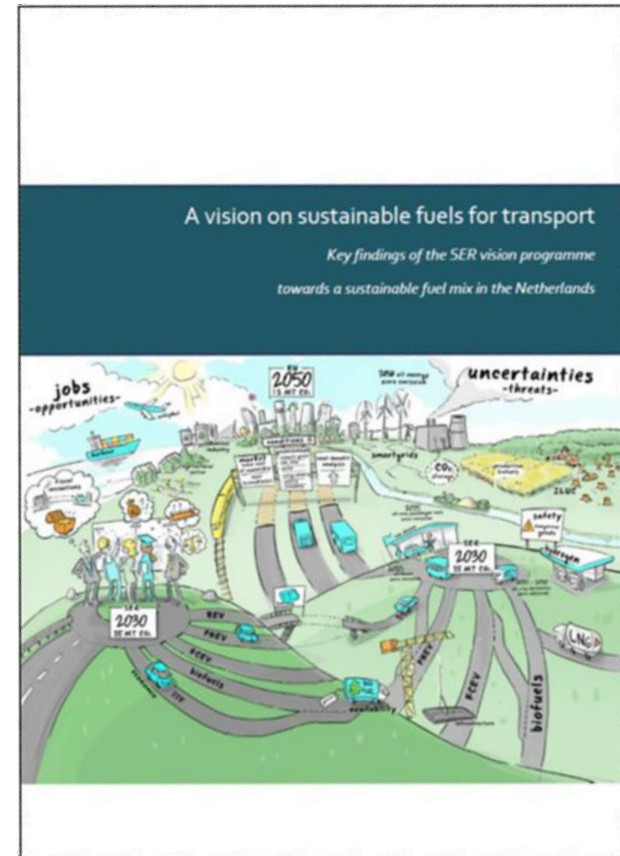
- **First signs of change for hydrogen:**

- 2014-2015, NL Vision and action plan on sustainable fuels for transport; FCEVs included (Ministry of Infrastructure and Water Management)
- 2016, Adding Hydrogen as innovation pillar to TKI New Gas (PPP)
- 2017-2018, Ministry of Economic Affairs and Climate Policy commissions a hydrogen roadmap; published March 2018



Vision on sustainable fuel for transport

- **Based on extensive consultation of the market :**
 - All types of transport
 - All alternative fuels
- **Capture of commitments in public-private Green Deals, e.g.:**
 - Zero-emission Public Bus transport (from 2025 onwards)
 - Zero-emission City Logistics (related to closing of inner cities for polluting cars and trucks)
 - ...





Current status hydrogen-FCEV in the Netherlands

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell Vehicles	2000 by 2020	41 (March 2018)	Working Group "Joint Procurement", (part of the Dutch Hydrogen Platform). Main Task: Stimulate and coordinate activities of fleet-owners and HRS-business	Some Fiscal measures: <ul style="list-style-type: none"> • No purchase tax (BPM) • No road tax (MRB). • Low addition of 4% (instead of 22%). per year to income tax • Fiscal rebate on investments in a hydrogen car.
FC Bus	100 by 2020	12 (scheduled), of which 6 in operation, +50 planned till 2020	Green Deal Zero Emission Public Transport by Bus.. Participate in EU joint procurement	<ul style="list-style-type: none"> • Fiscal rebate on investments in a hydrogen bus
Fuel Cell Trucks	500 vans and 20 trucks by 2020	12 (scheduled) of which 1 in operation; 8 more (scheduled) for European pilots	Green Deal Zero Emission InnerCity Logistics	
Forklifts	No target	0		
HRS	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
70 MPa	20 by 2020	2 (Project financing secured for 12 more by 2020)	Covenant (Green Deal) Sustainable Hydrogen Economy	Scheme for up to 90% subsidy on Investments costs for a HRS
35 MPa	20 by 2020	4 (Feb. 2018)		



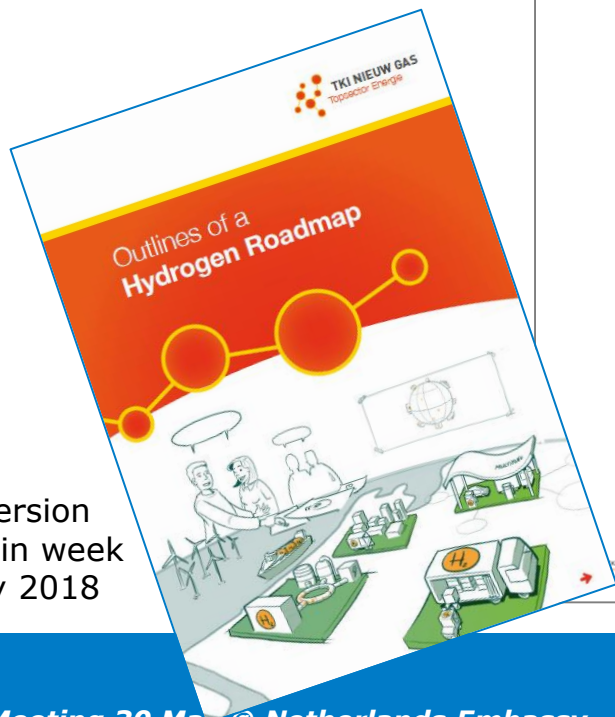
Innovation pillar Hydrogen – TKI New Gas

- **Status, so far:**
 - 2016 approval “Hydrogen” as separate innovation topic; industrial research and experimental development (TRL 4-7)
 - 2017 modest start of program: 0,85 M€
 - 2018 budget 6.1 M€ for projects, plus budget for studies
 - >2018 hydrogen selected for setting up of a “mission-driven multi-year innovation program”
- **Current focus:**
 - Renewable hydrogen production, especially electrolysis
 - Heavy-duty transport applications (vans, trucks, inland shipping)
 - Technology for reliable, efficient and cost-effective HRS
 - Use of existing natural gas infrastructure for hydrogen, and technology and pilots for use of hydrogen in natural gas applications

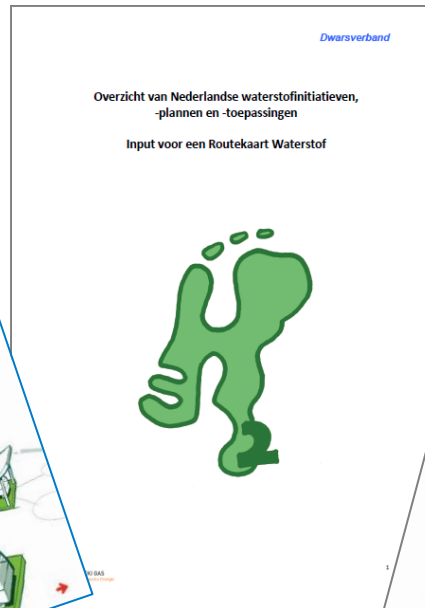


Hydrogen Roadmap

- **Commissioned by Min. Economic Affairs and Climate Policy:**
 - Potential role hydrogen in a sustainable energy system in 2050?
 - Projects, developments and actors in the Netherlands?
 - Identify promising next steps and actions



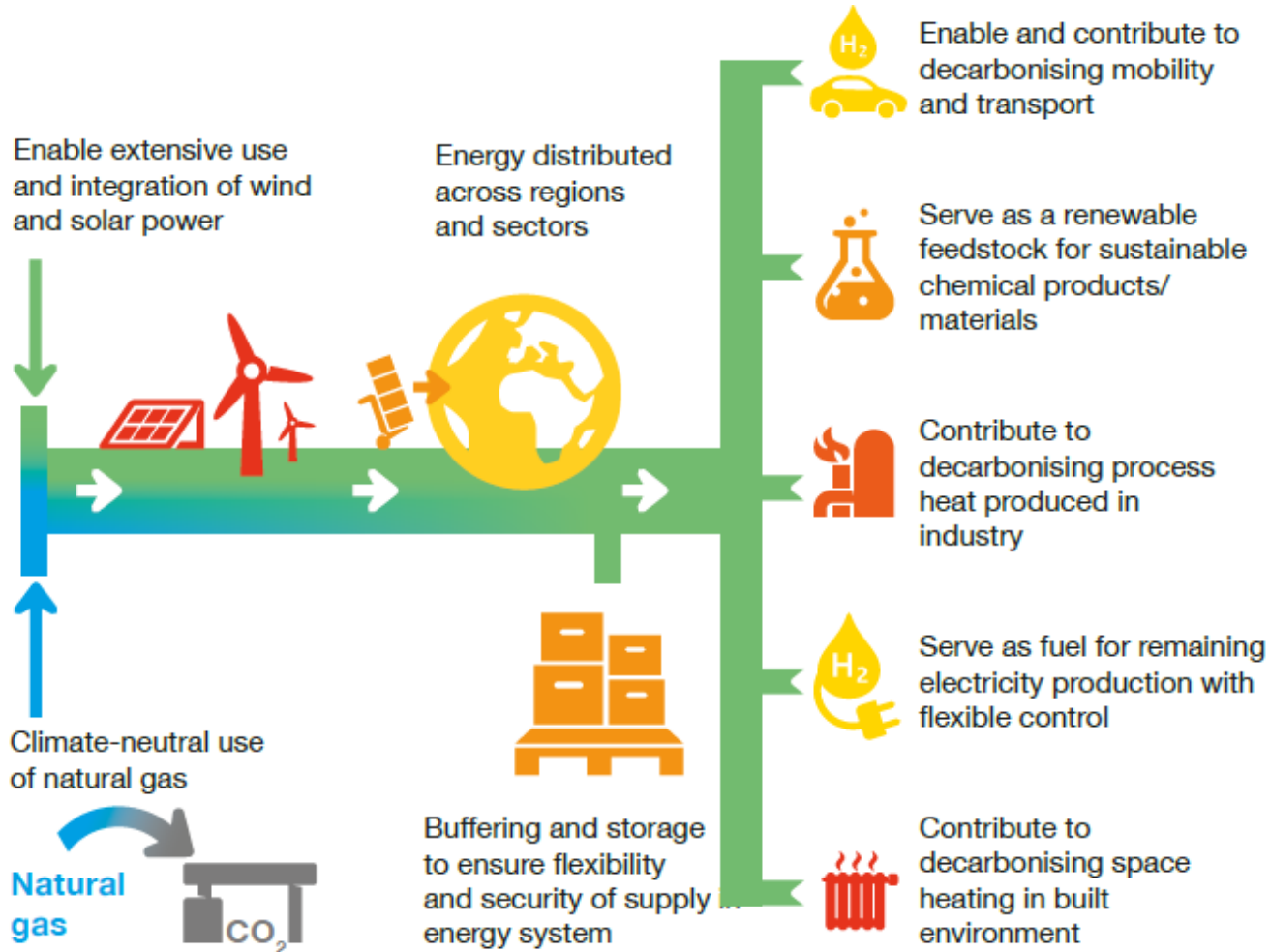
English version
available in week
of 14 May 2018



Other two
reports only
available in
Dutch



Roles of hydrogen in the energy system





Proposal for next steps

- **Transition program Hydrogen:** a planned, coordinated approach with the following elements:

1. Integral Plan-making for energy system with hydrogen
(for the next 10-15 yrs, and outlook to 2050)

2. Putting into practice hydrogen
(start immediately with what is already available)

3. Research & Development for hydrogen
(fundamental and applied in view of NL strengths)

Provide guidance/coordination and facilitation/support for hydrogen
(next 5 yrs, then review and adapt if needed)



Dutch Climate and Energy Agreement 2.0

- **Roundtable discussions ongoing to achieve an agreement in 2018 on how to realise 2030 climate targets:**
 - Initiated by Ministry of Economic Affairs and Climate Policy
 - Coordinated by the Social Economic Council
 - >100 organisations involved; broad social and political support needed
 - Commitment for plans to achieve 49% GHG reduction relative to 1990
- **Consensus building structured via thematic roundtables**
 - Built environment (homes and buildings); Mobility and Transport; Industry; Power/energy sector; Agriculture and Land-use
 - Portfolio of measures should be "2050-proof"; 80-95% GHG reduction
 - Concrete plans and associated Knowledge & Innovation Agenda
- **Hydrogen roadmap present on each table and well received**
 - Positive signs for concrete plans in Industry, Power/energy sector and Mobility and Transport



Examples of NL Hydrogen projects and initiatives

- **Mobility and Transport:**

- Expansion of public refueling station network (about 15 by 2020)
- 27 ton and 40 ton truck (H2Share project and Hydrogen Region 2.0)
- 15 garbage trucks; battery electric with FC-range ext. (REVIVE-project)
- Additional 50 Fuel Cell Buses (JIVE-2 project)

- **Industry and Power/Energy sector**

- Hydrogen Symbioses: use of section of natural gas transmission pipeline for transport of byproduct hydrogen from DOW to YARA
- TSO2020-project joint project electricity and natural gas TSO to test PEM-electrolysis: grid services and future incorporation offshore wind
- Expansion and scale-up deployment of electrolysis; first step 20 MW
- H-Vision and Hydrogen-to-Magnum: large-scale central decarbonization of natural (CCS) and use of hydrogen as fuel and feedstock (GW-scale)
- Explorative studies on partial conversion of natural gas grid to hydrogen backbone – connect main industrial regions



Thank you for your attention

Looking forward to meet you
at the Dutch Innovation Expo
1 - 4 October, the Netherlands

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3. Video

<https://youtu.be/h7tpR3YRvzM>