

Waterstofnet
Antwerp, March 27, 2019

Hydrogen on the rise(-ogen)

Insights in a clean energy future for Belgium



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plan.be



Context



- The FPB is an **independent** public agency that makes forecasts, carries out research and analyses public policy measures. Its main mission is to support the political decision-making process.
- Every 3 years, the **Federal Planning Bureau** draws up LT Belgian energy projections for different sectors and energy forms

Most recent Energy Outlook (October 2017)

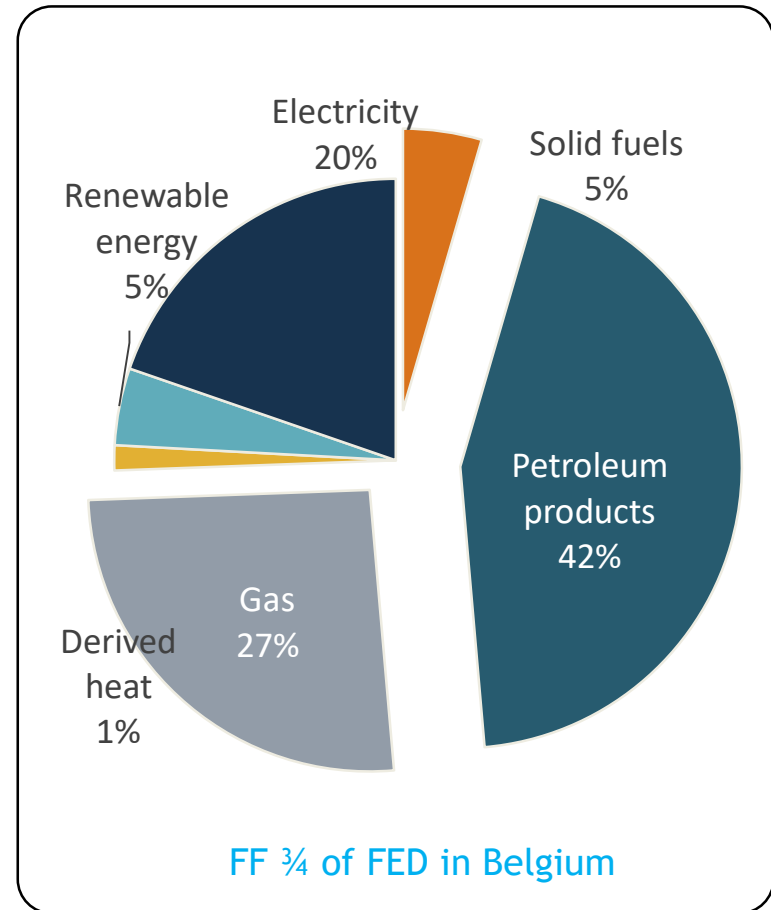
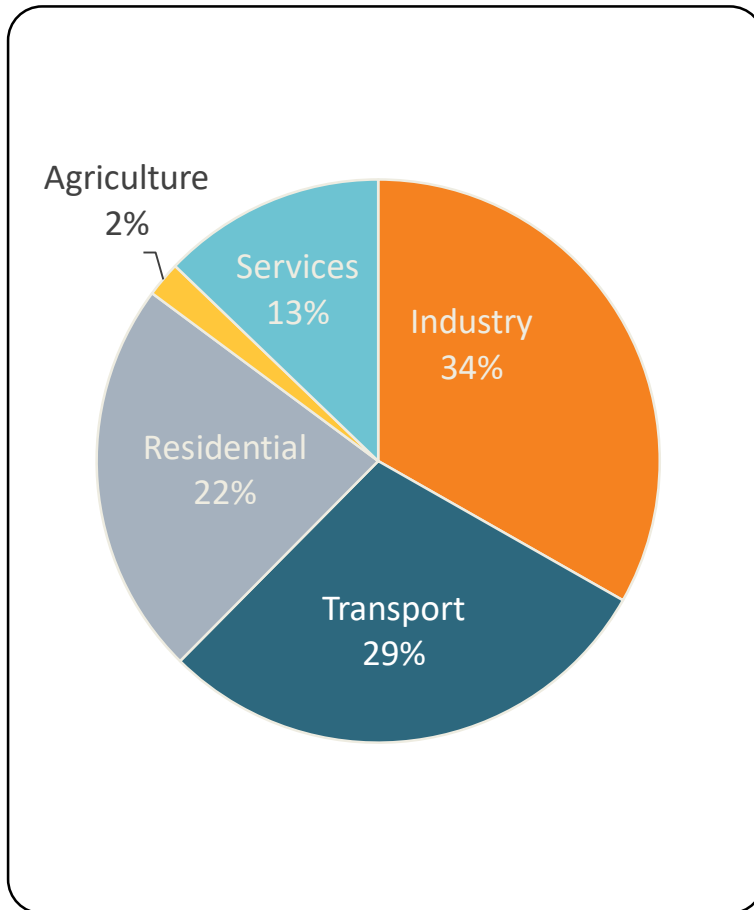
- Simulates a **reference** scenario for Belgium up to 2050
- Simulates the entire Belgian **energy** system (supply and demand) and its evolution
- Integrates the **2020 C/E package**, but no additional PAMs or targets after 2020

Impact Assessment of the EU **2030 C/E Framework** and **2050 LCE** (May 2018)

- Analysis of a set of **policy scenarios** compatible with 2030/2050 EU objectives but differing in the assumption on BE n-ETS GHG reductions



Final Energy Demand in Belgium (2016)



Source: Eurostat (August 2018).

Energy outlook

Go towards a low-carbon economy?



G7 leaders target zero-carbon economy

08 Jun 2015, 17:00 | Simon Evans & Sophie Yeo



Bundesregierung/Kugler

Global climate talks received a symbolic boost today, as the G7 group of rich nations threw their weight behind a long-term goal of decarbonising the global economy over the course of this century.

The [joint communique](#) from the leaders of Japan, Germany, the US, UK, Canada, Italy and France reaffirms their [commitment](#) to the internationally agreed [target](#) of limiting warming to less than 2C above pre-industrial levels. It also reiterates their commitment to deep cuts in emissions by 2050.

[Bron: www.carbonbrief.org](http://www.carbonbrief.org), www.abc.net.au, www.euractiv.com.



Energy outlook

Go towards a low-carbon economy?



“You say you want a [climate] revolution...
We'd all love to see the plan”

The Beatles, White Album, 1968

“We know what we want
And the future is certain
Give us time to work it out”

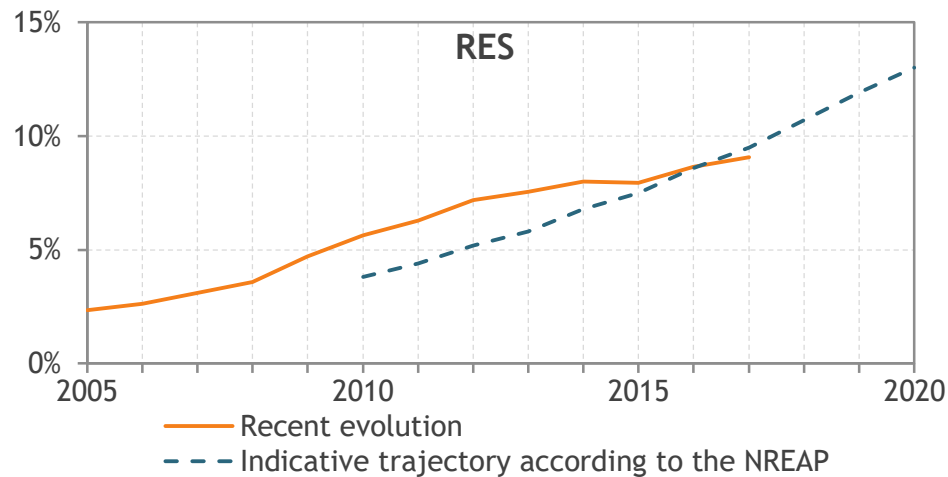
Talking Heads, 1985

(V)LT model → Scenario analysis
3 scenarios: Alt1, Alt2 and Alt3

Renewables in Belgium

RES in Gross Final Energy Consumption

- Recent development (source: Eurostat SHARES)



- Projections

	2015		2030				2040		
		REF	Alt1	Alt2	Alt3	REF	Alt1	Alt2	Alt3
Overall RES	8	15	18	19	20	17	30	31	32
RES-H&C	8	14	14	15	15	16	24	24	25
RES-E	15	28	37	37	38	30	44	44	44
RES-T	3	12	15	16	17	14	70	72	74

Renewables in Belgium (II)

RES-H&C

Industry + buildings =>

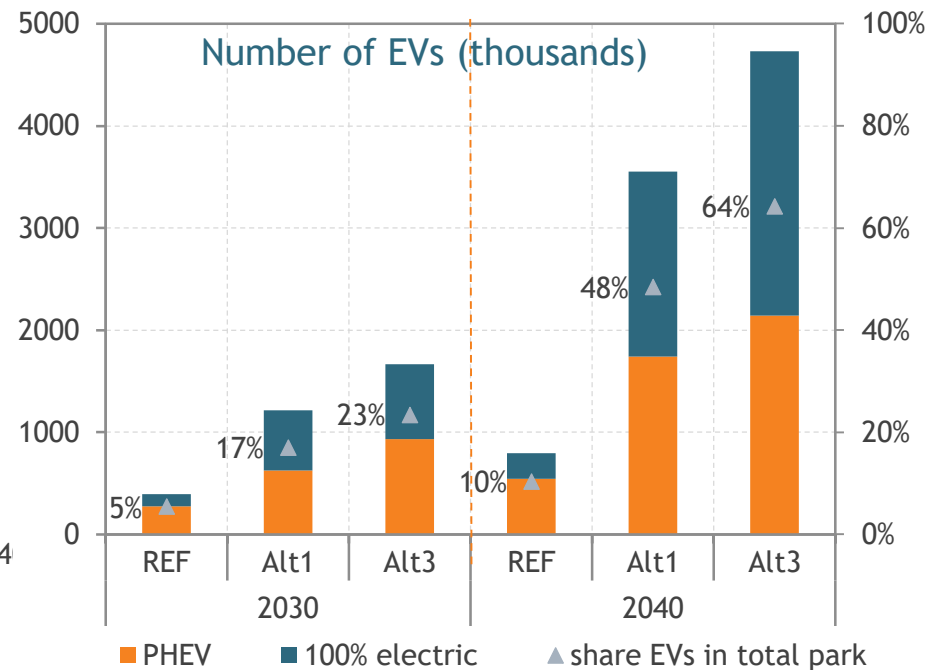
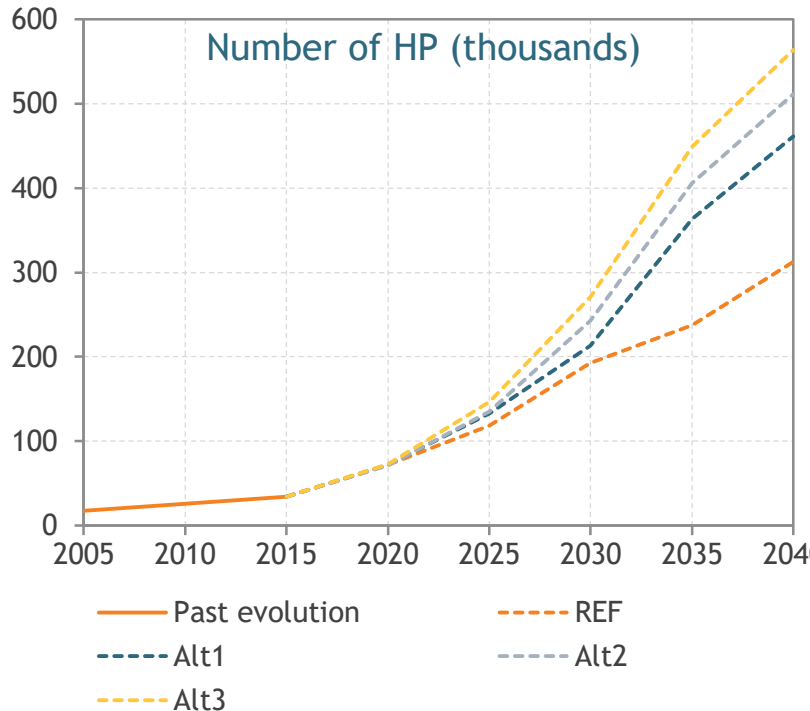
Biomass + solar thermal +
heat pumps (HP)



RES-T

Transport =>

Biofuels (1st & 2nd generation) +
electricity from RES

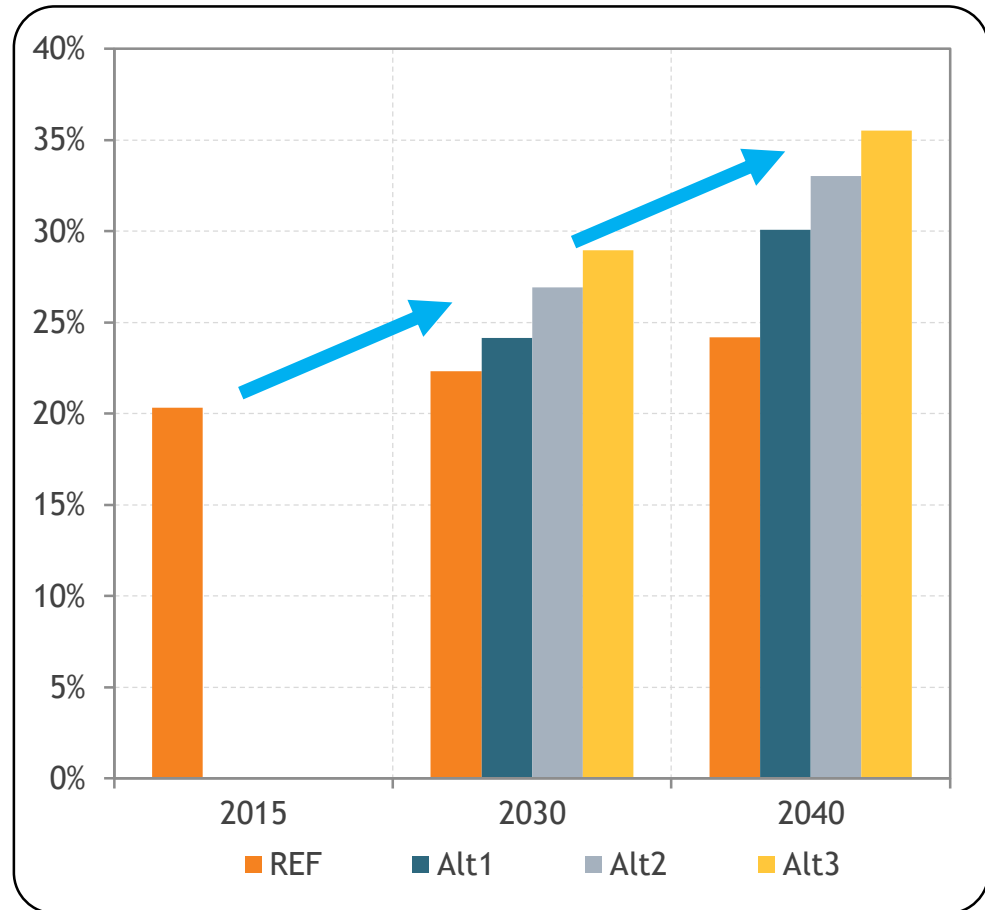


Source: FPB (WP 05-18).

Electrification

- From 1/5th to 1/4th-1/3th of the Final Energy Consumption in 2040
- Impact 2030 Framework & 2050 LCE on
 - Electricity demand?
 - Import?
 - Way of generating?
 - Investments?

 **FPB publications**



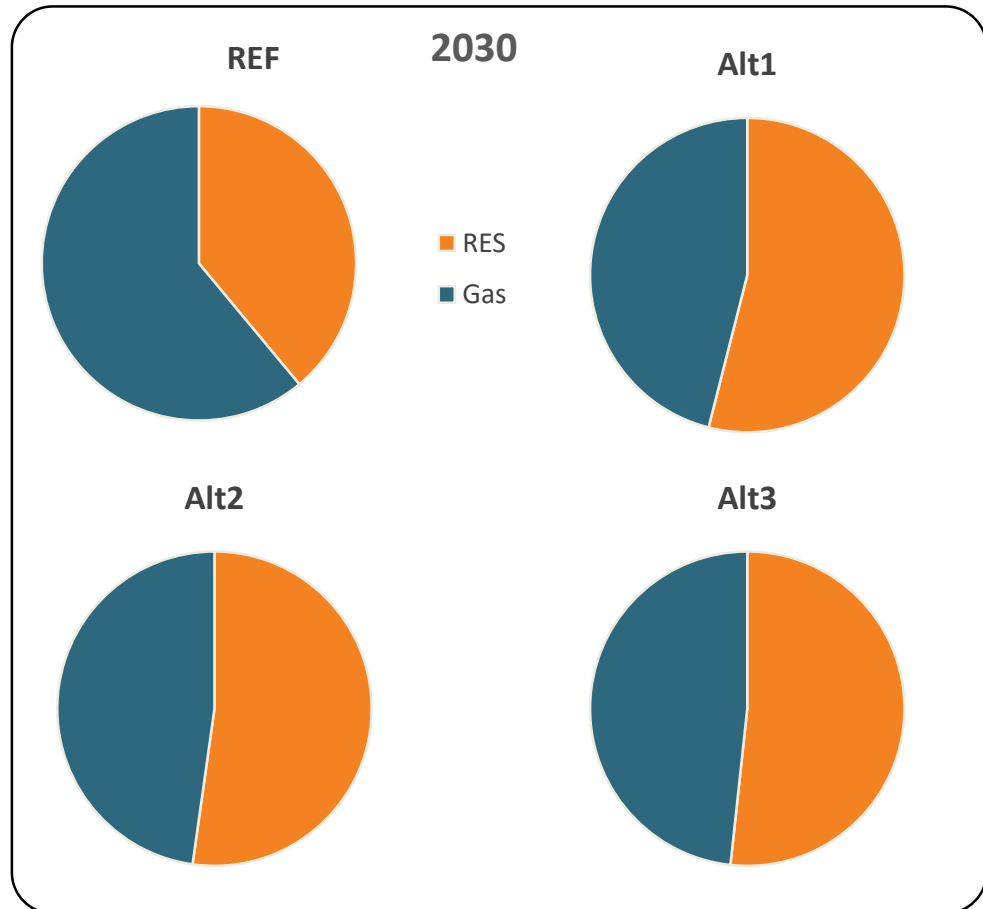
Source: FPB (WP 05-18).

Power generation outlook

- Already in 2030 (2040), around 52-54% (58-61%) RES
 - Double phase-out
 - Triple target
- Important to wisely integrate in system
- Out-of-model exercise

"If you intervene in part of the system without thinking about effects on the whole, you get a mess"

M. Keay, Oxford Institute for Energy Studies



Source: FPB (WP 05-18).

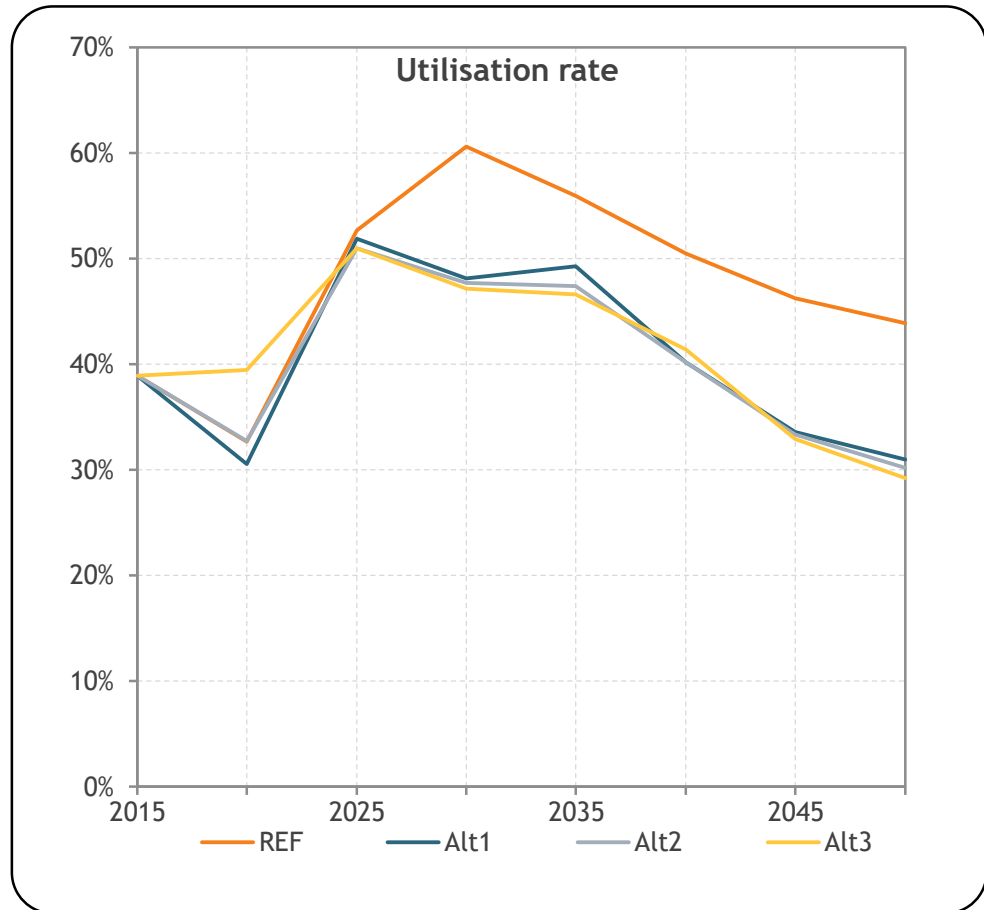
Impact on generation park

- Utilisation rate of NG PP
- Demand Response
- Net imports
- Storage
 - PSH
 - Batteries
 - Hydrogen

Ørsted geeft bouwgarantie bij bod windpark in Noordzee

Het Deense groene energiebedrijf Ørsted meldt zich vol overtuiging in de race om de aanbesteding van een groot Nederlands windpark in de Noordzee. Een 100% bouwgarantie en de aankondiging van productie van groene waterstof op land moeten de overheid ervan overtuigen de bouw van windpark Hollandse Kust Zuid III+IV aan de Denen te gunnen.

Volger
Aanbes
Bouw



Source: FPB (WP 05-18).

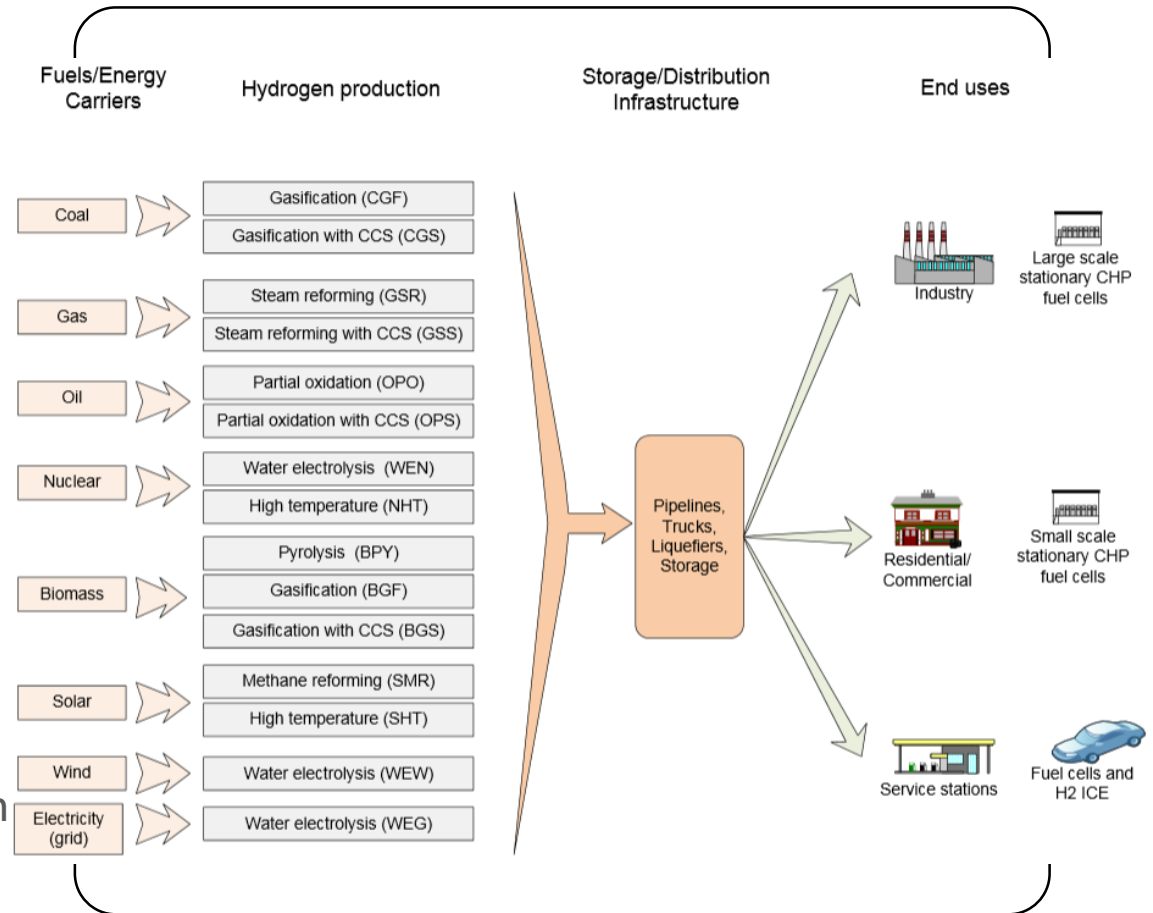
Hydrogen outlook



"I believe that water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly or together, will furnish an inexhaustible source of heat and light, of an intensity of which coal is not capable."

J. Verne, *The Mysterious Island* (1874)

- Hydrogen is an energy carrier
- Upcoming share in FED by 2050 in **policy scenarios**
- Can be used in
 - Industry
 - Residential/commercial
 - Transport
 - Power/steam production
 - Electricity storage
 - Round-cycle PtGtP



Source: PRIMES.

Hydrogen use in PG?



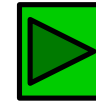
- Investments in NGPP: how much?

- ✓ **Projections:** 3,3 GW - 4,4 GW - 4,7 GW - 5,8 GW

- ✓ **Electricity studies:** 2,9 GW - 3,9 GW - 4,4 GW - 6,5 GW

Gas=necessary

- Even in a strongly decentralised future
- ST: balancing, (M)LT: SoS and demand increase
- CO₂ emissions
 - **ETS**: reference year 2005
 - In **2030**: [42,63]% decrease in CO₂ wrt 2005
- Build now: 25 years part of the system
 - Phasing out by 2050 (zero carbon society)
 - Part of P2G (methane, hydrogen, ...)



Vattenfall aims for carbon-free gas power in Eemshaven

Key takeaways

“We are in a sector that is very dependent on the regulatory framework”,
Chris Peeters, CEO Elia



- Smart policy is essential
 - Difference between REF and policy scenarios
 - « *La classe politique actuelle sera jugée aux actions qu'elle pose aujourd'hui* » (COP24)
- Increasing role of RES in system
 - Reflection (and decisions) required on how to smoothly integrate (and thereby) increasing shares of RES
 - (Changing) role of (new) actors, (new) fuels, (new) business (models)
 - “Skills are definitely our next challenge, we have to attract new talents in the energy industry”
- Investments in energy system of the future are huge
 - Infrastructure investments <> expenditures
 - Feedback loops, carbon pricing, ETS, ...
 - Means to realise objectives



Thank you!

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