

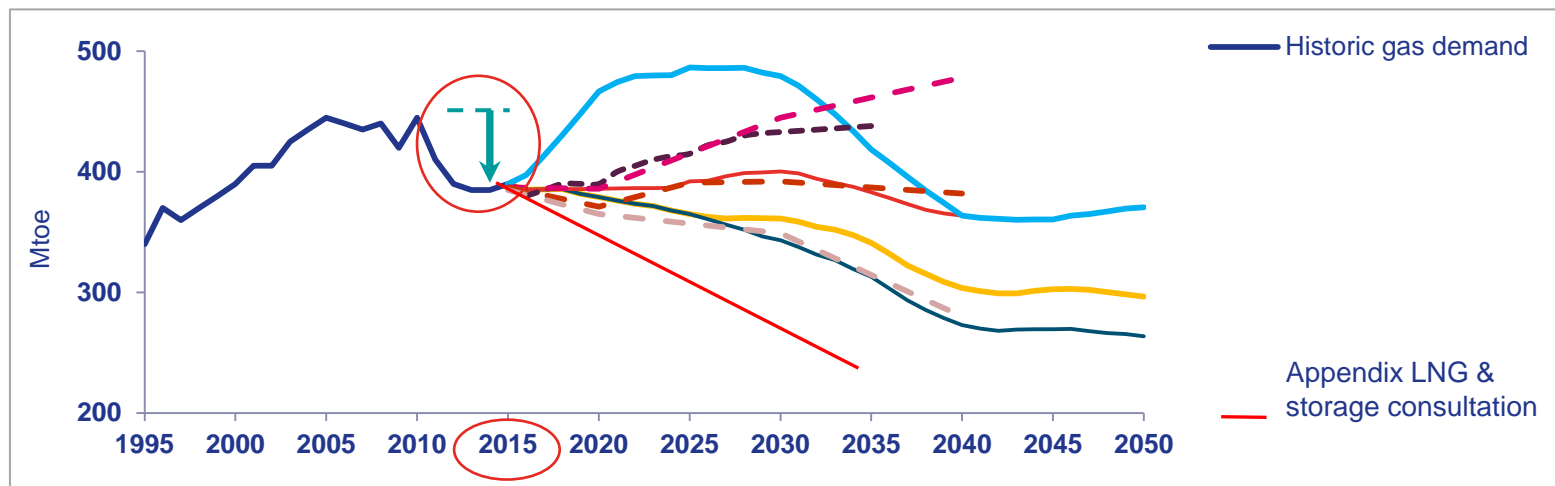
Gas by design

A Dutch approach for gas to remain relevant in the energy transition

Anne Braaksma



The context - a European view...



Past

- 1/2 ↓ Prices
- 1/6 ↓ Economy
- 1/3 ↓ Temperature

Present

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

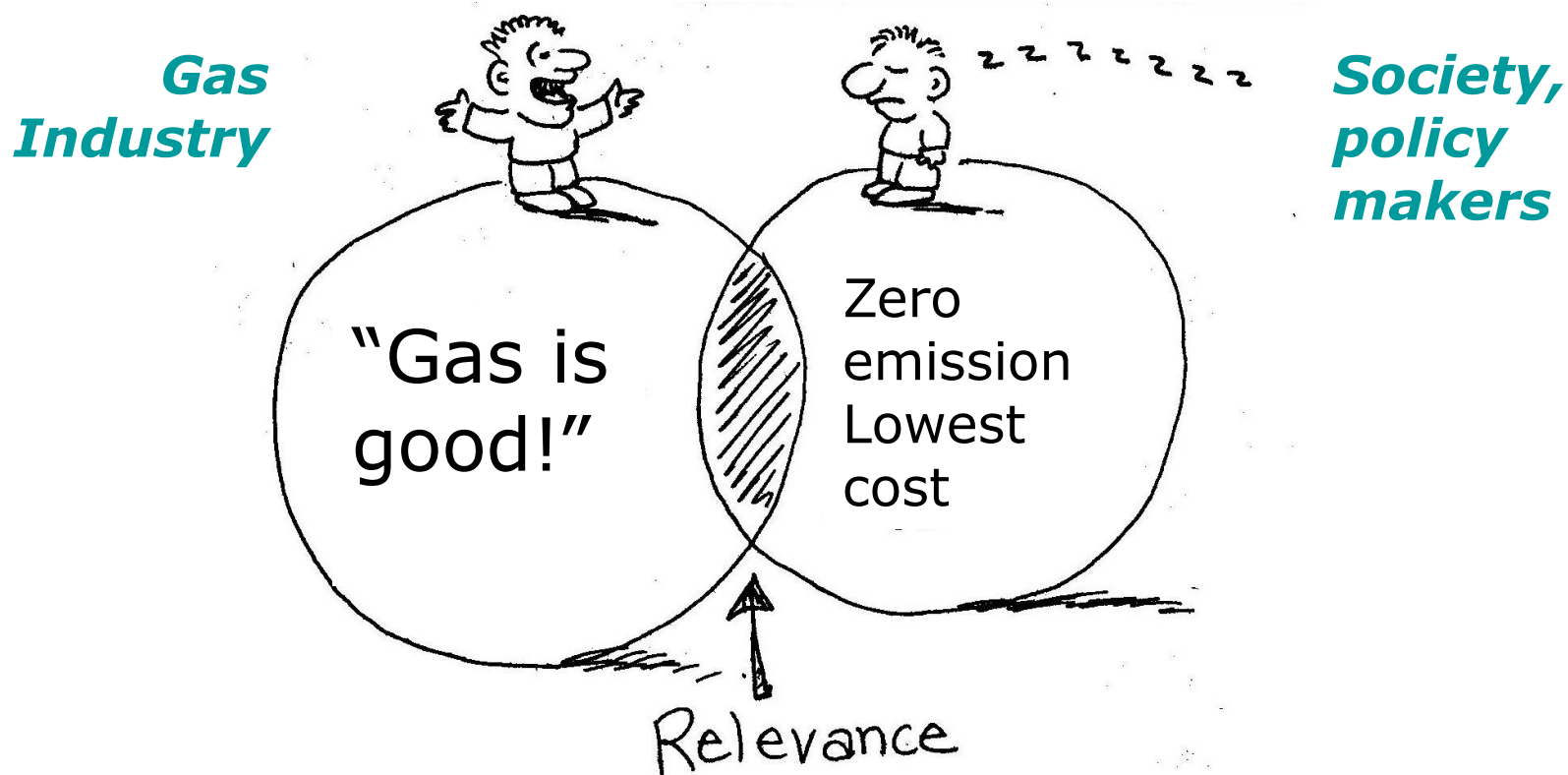
Future...?

Perceived value

Technological innovation

... but how to realize this?

A need to reinvent our relevance

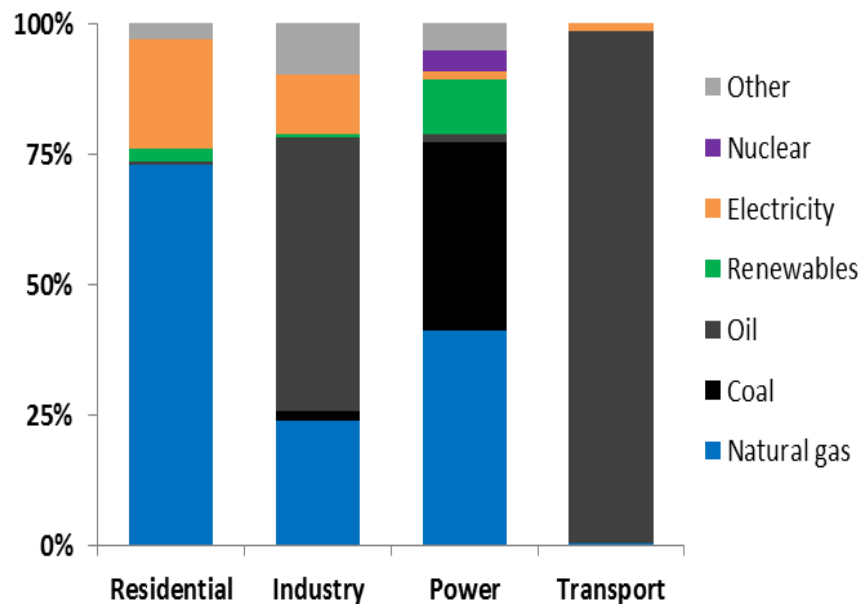


The societal and political core objective is to tackle climate change...
...But what does this imply, and how to assess the new role?

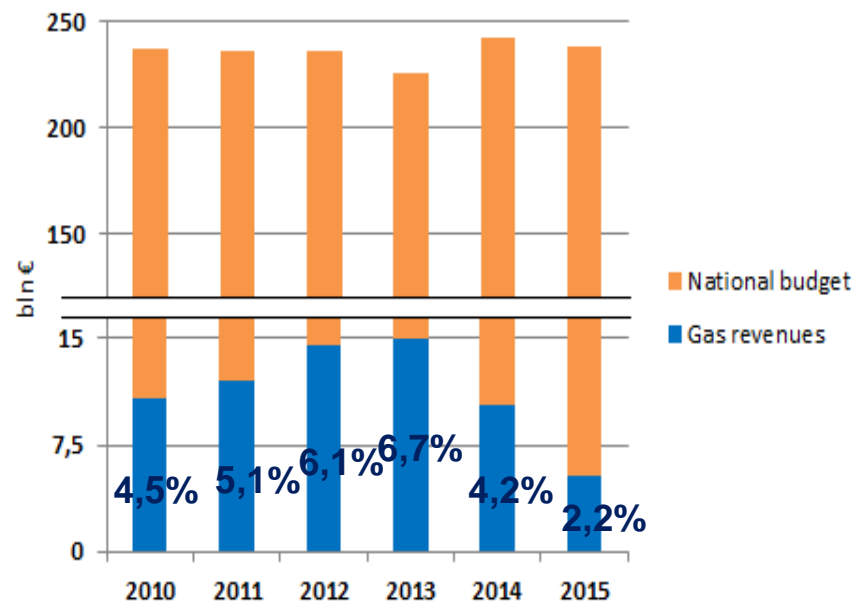
The context of the Netherlands

Natural Gas in the Netherlands

Energy demand per sector (2015)



Gas revenues in the national budget



Going Dutch

Poldermodel,



consensus-based
economic and social
policy making

"cooperation
despite differences"

Energy agreement...



The Energy Agreement for Sustainable Growth brings together more than 40 organizations – including government, unions, NGOs, business and financial institutions

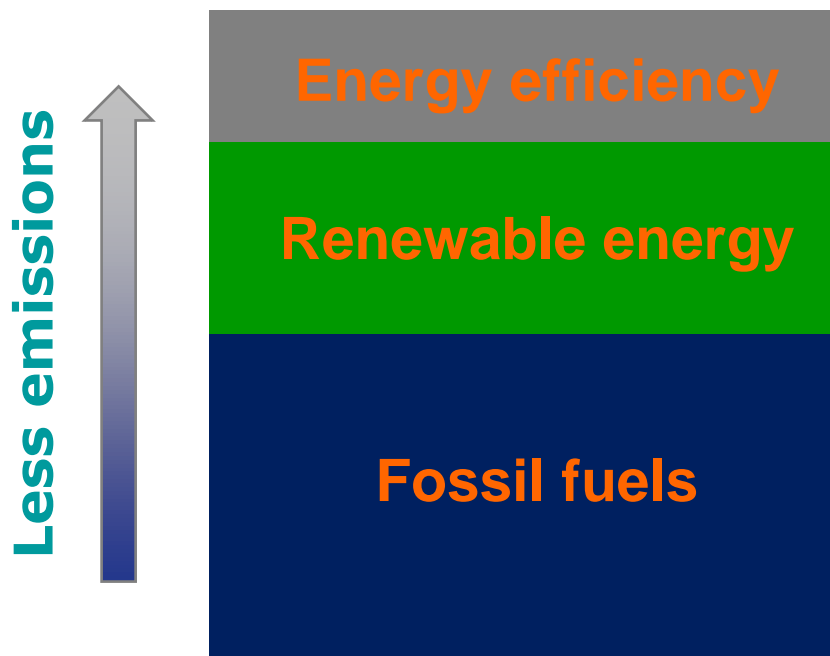
...without gas



The argument for gas as a transition fuel became compromised by earthquakes.

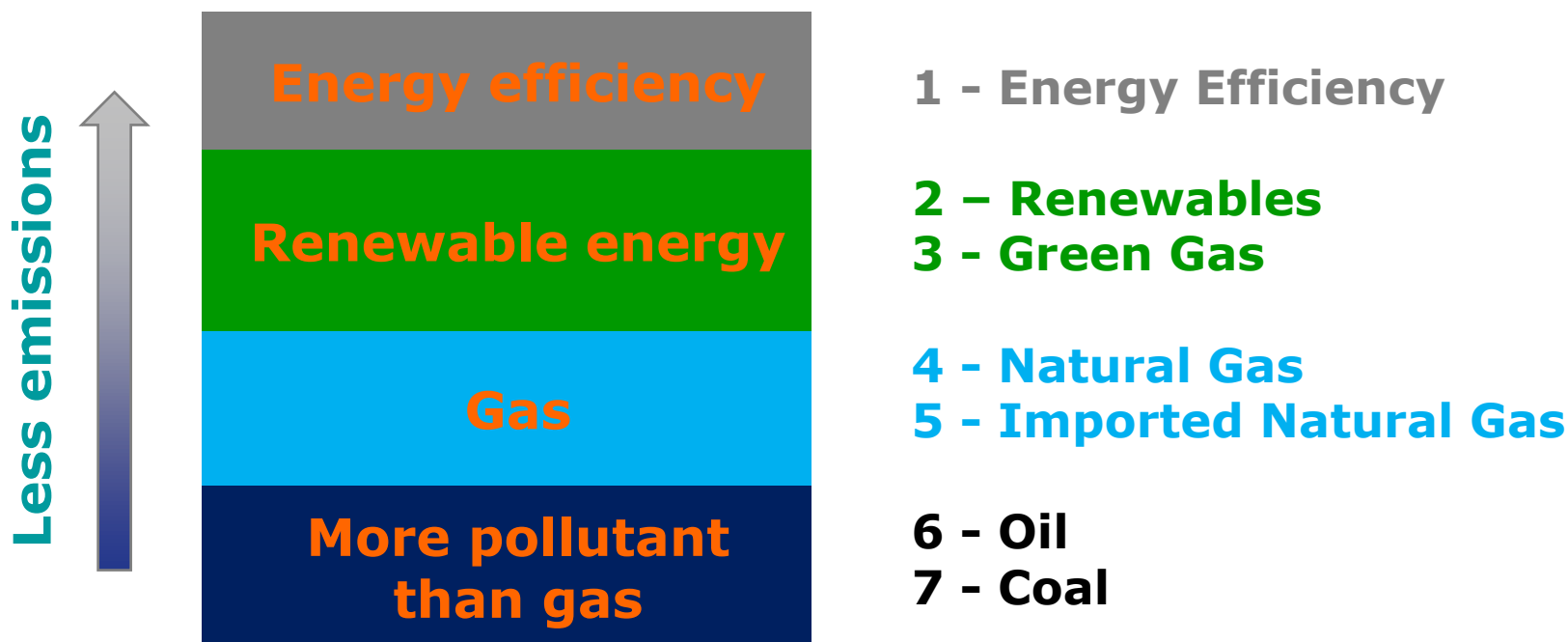
Gas by design a tailored role for natural gas

The role of gas is there where cleaner alternatives are not available.
 The new role by our own version of the **'trias energetica'**



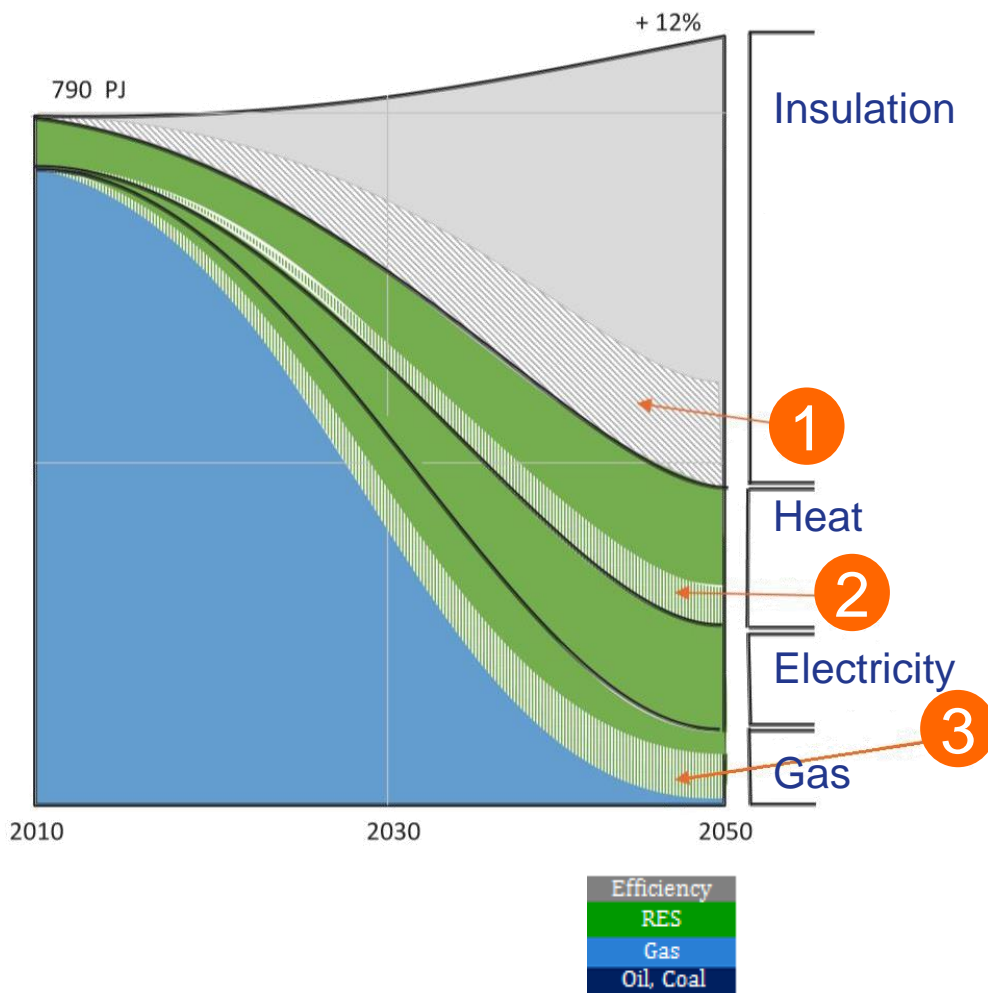
Gas by design a tailored role for natural gas

The role of gas is there where cleaner alternatives are not available.
 The new role by our own version of the 'trias energetica' - **the ladder of 7**



...points to new key projects for our industry

Residential sector already maximum share



- Almost all houses use gas for heating and cooking.
- Current societal framing is that gas blocks progress to decarbonisation.
- The Dutch gas industry offers solutions, by

- 1 hybrid heat pump
- 2 geothermal energy
- 3 Green Gas

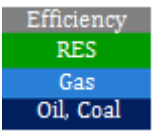
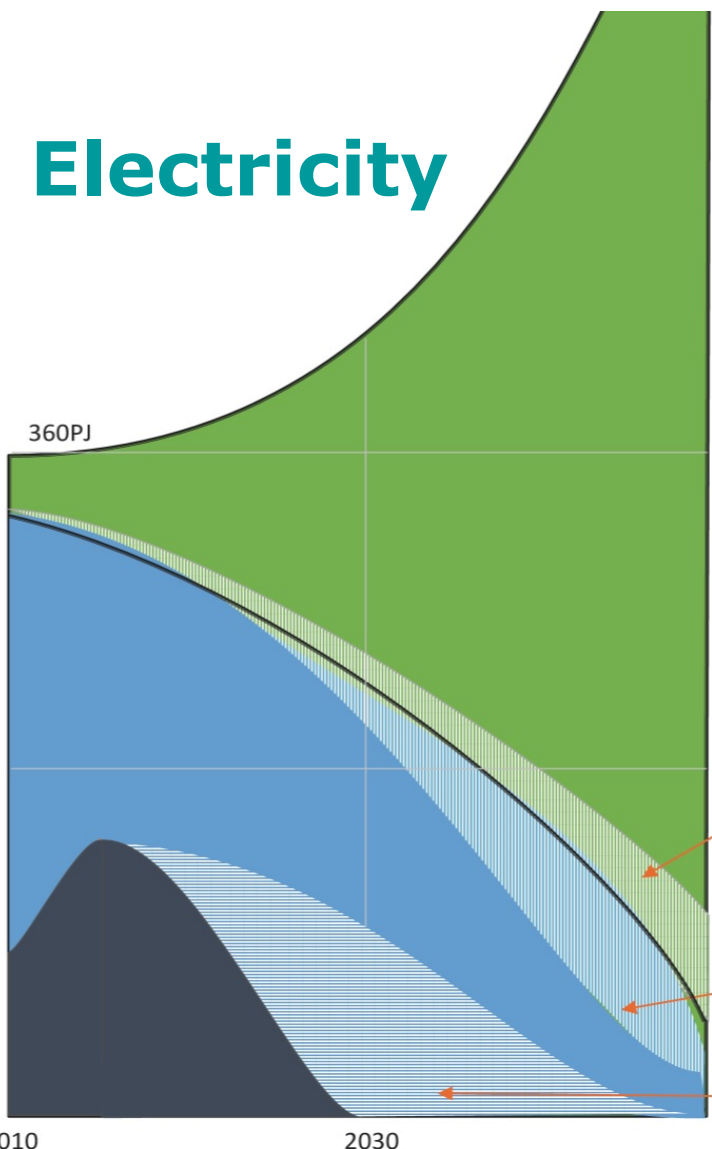
- Contribute to the development of a comparative assessment tool

Europe

- 76% of current houses still stand in 2050 it requires the renovation rate to double or triple.
- According to the Ladder of 7, there is potential for the role of gas in Europe in the residential sector, by fuel switching

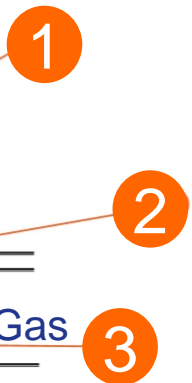
Electricity

a green-blue sea



Renewables

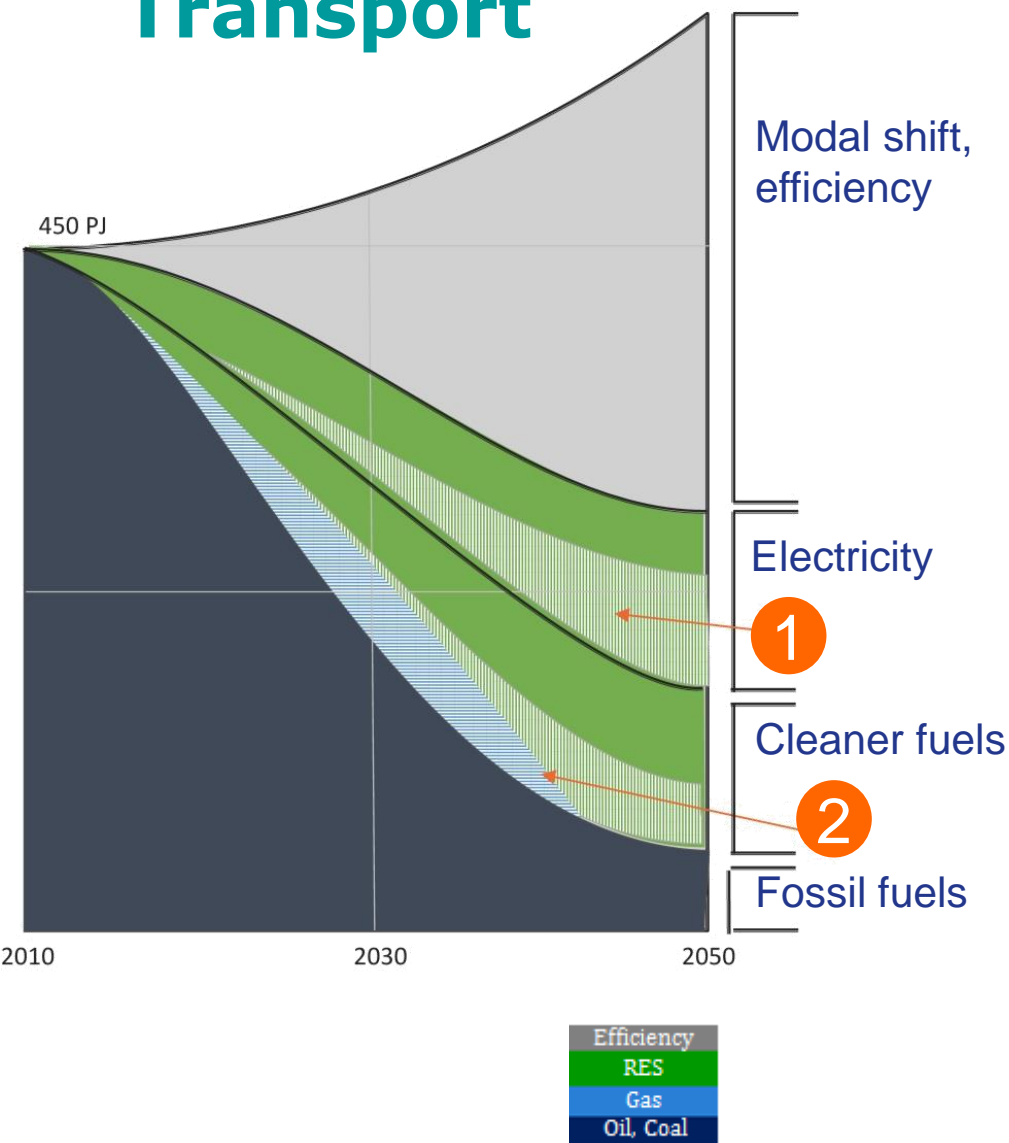
- Electricity demand to double by 2050
- Major share for more renewables, such as wind and solar.
- The role for gas is set by:
 - 1 Power to gas**
 - 2 CCS for gas plants**
 - 3 Fuel switch**
- A cost-effective integration of wind on the North-Sea is the aim of the Gas-meets-wind programme



Europe

- Power to gas offers solutions for integrating large shares of renewable energy into the system, by making use of existing infrastructure and thereby limiting costs.

Transport

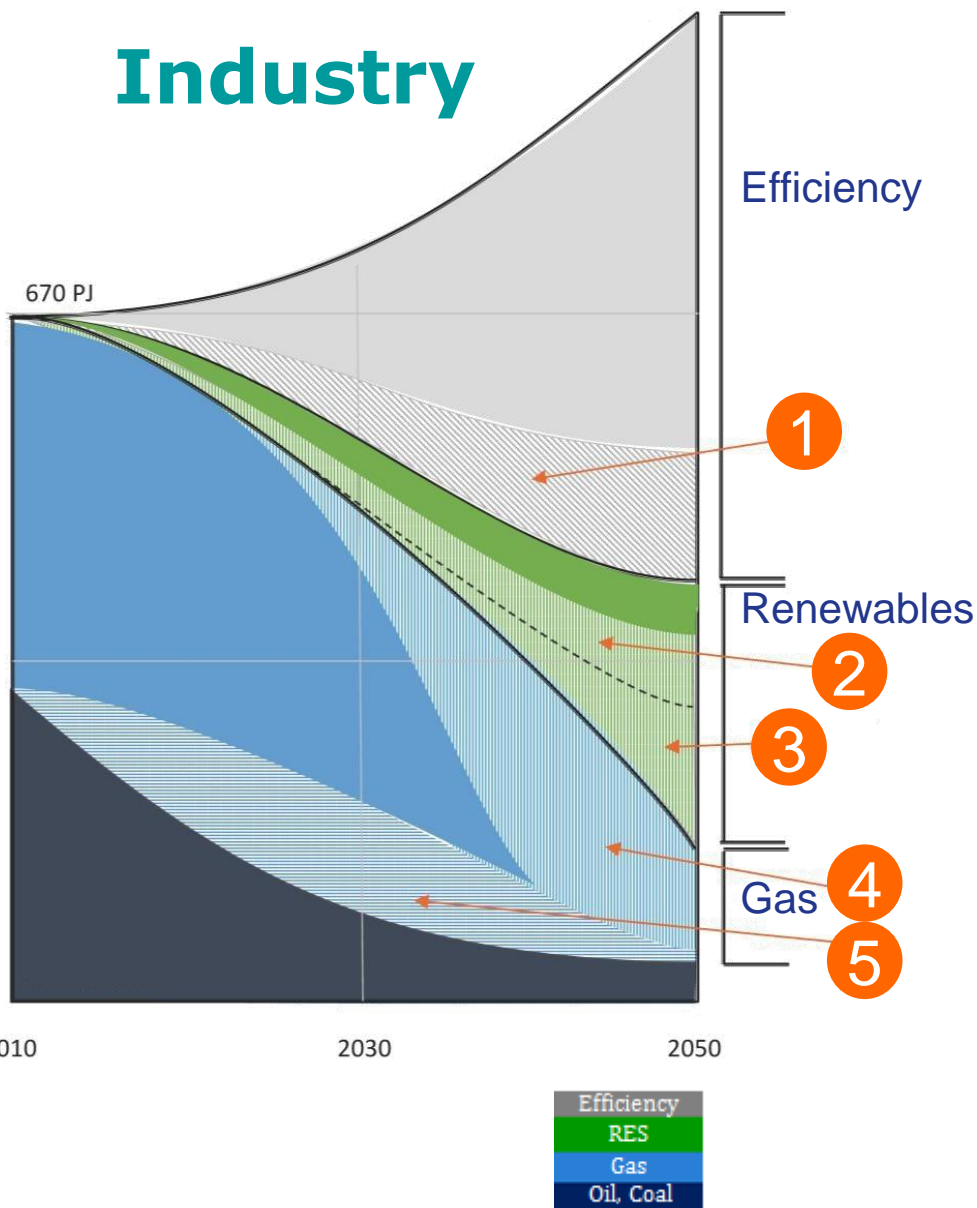


- Gas use in transport is as of yet only very small
- Particular focus on heavy transport

1 fuel cell and hydrogen
2 LNG

- Ahold and Unilever have started to use LNG in their trucks essential to their supply chain
- The Rotterdam LNG-import terminal has been extended to also serve as a break bulk terminal.

Industry



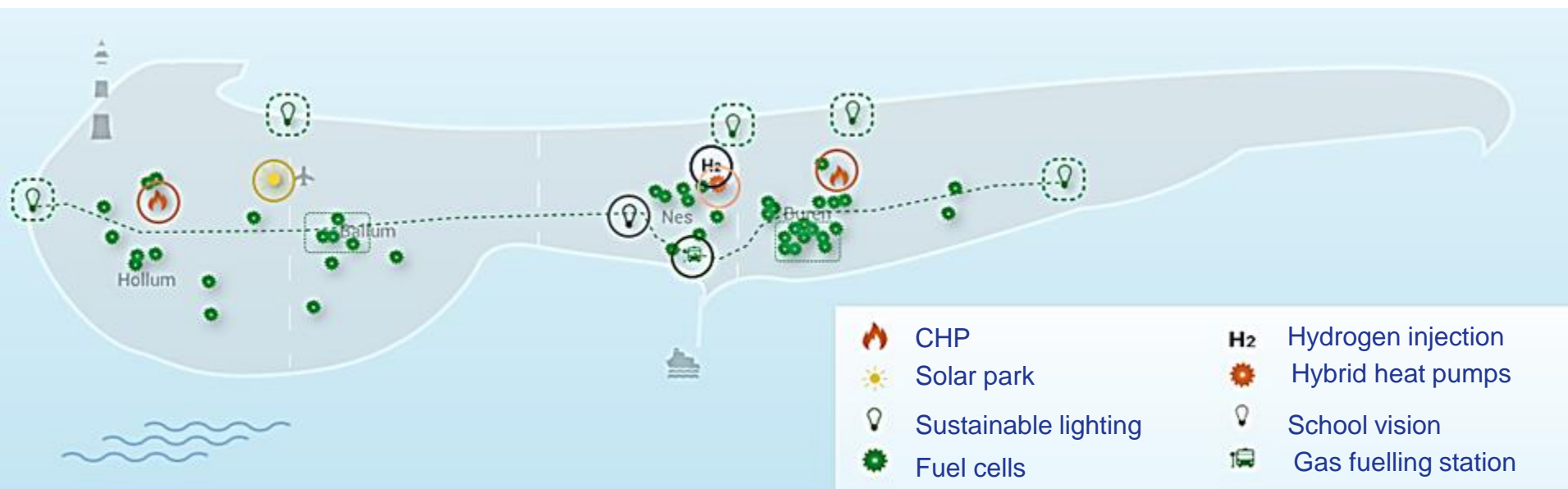
- Gas already has a major role
- Energy demand growth driven by the economy, using BAT-measures
- The role for gas is set by:

- 1 higher efficiency
by power-to-gas
- 2 green gas
- 3 Ultra deep geothermal
- 4 CC(U)S
- 5 fuel switch

Europe

- Gas demand is driven by the state of the economy. Is the economy to develop to a heavily services-based economy?
- Differences between forecasts for policy makers by – for example – the European Commission and IEA do not add to consistency for policy considerations.

Residential sector decentralized balancing in a new energy system

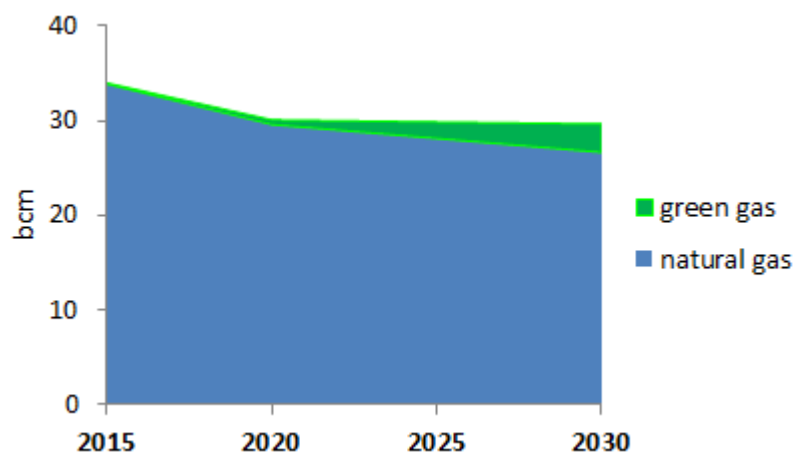


Exploring the use of hybrid heatpumps

- reducing emissions,
- Balancing decentral energy demand & back-up,
- using gas and green gas

Green gas contributing to decarbonisation

An additional gas source...



- Volumes are small but increasing
- Not a full green gas system in the near future

...with benefits

- Both in the short and long term, renewable gas can reduce CO₂ emissions in sectors that are otherwise difficult to decarbonise (industry, residential).
- Demand for gas would still remain important by 2050, justifying continued investment in gas infrastructure.

Does this work? Some first results

Since the Energy Agreement, new policy papers include

- Single target
- Only for new build houses no requirement for a connection to the gas grid
- Reference to CCS for industry
- Gas-meets-wind
- Interest in renewable gasses

The Dutch gas industry has been part of the national 'energy dialogue'.

A Gas Chapter for the Energy Agreement has been well-received to further spur the energy transition.

Wrap up **becoming part of the debate again**

- Gas by design: use gas where renewable energy is not available
- Gas by design aims to be relevant in the political and societal debate
- It puts CO₂-emission reduction first; rather than the use of gas itself
- Within the framework, gas use differs per sector:
 - In the residential sector, all houses use gas, so demand will be declining. Gas nevertheless has solutions to offer to this transition
 - In industry, gas use can be maintained by CCS
 - In power generation a fuel switch quickly reduces emissions
 - In mobility, gas demand is set to increase by use in heavy transport
- First signs indicate that the message is being well-received
- Going Dutch - a role for gas in a carbon neutral society



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Projects to make gas-by-design not only a framing

- Offshore energy integration “gas meets wind”
- Sustainable heat: synergy between natural gas and geothermal heat
- CO2 capture, utilization and storage (CCUS)
- Green gas and renewable gasses
- Hybrid heat-pump and geothermal heat
- Heavy transport (LNG, for trucks and ships)
- Reducing our own footprint, aiming at zero methane emissions