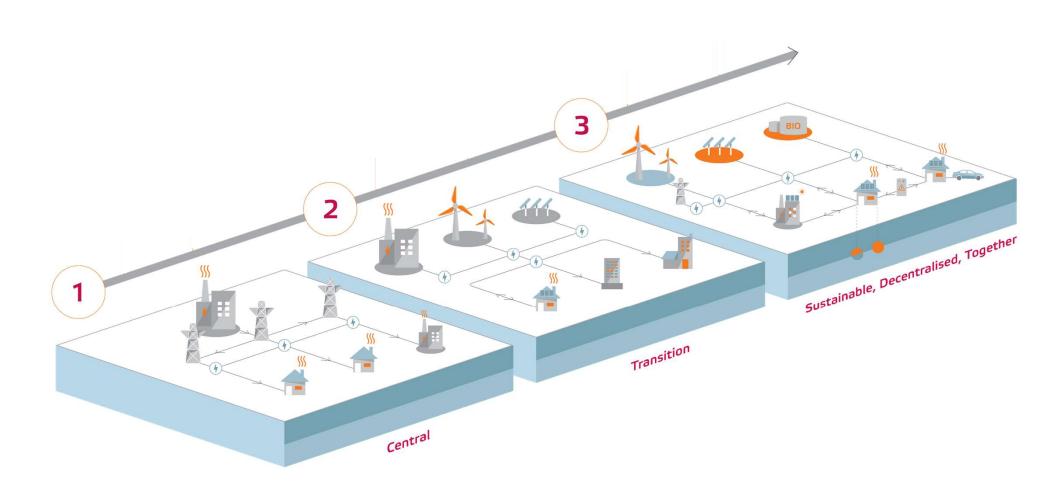
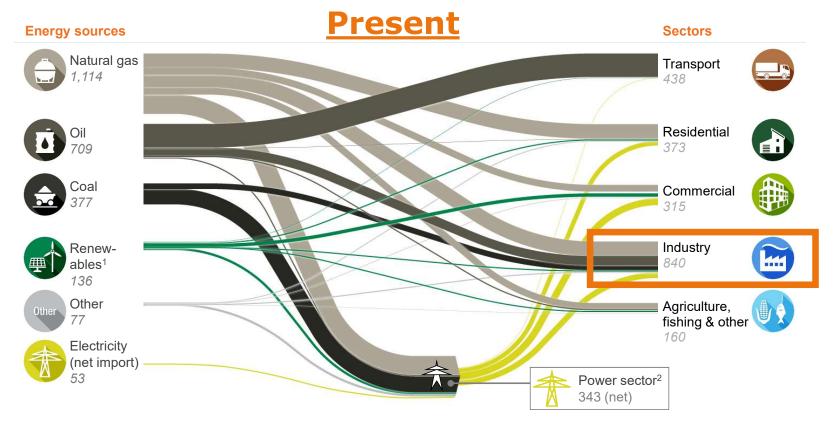


## The energy system in transition



## Current energy sources: mainly fossil



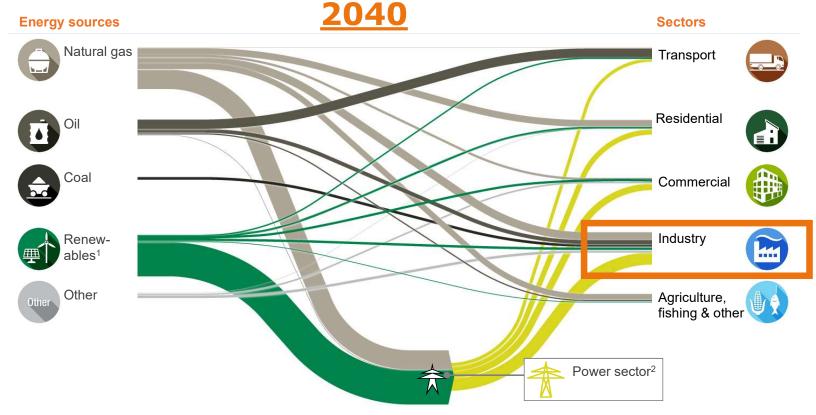
Source: McKinsey, "realistic scenario" 2017 (CBS (2014), "Energiebalans" and "Energieverbruik" databases)

SOURCE: Centraal Bureau voor de Statistiek (2014), "Energiebalans" and "Energieverbruik" databases

<sup>1</sup> Includes: hydro, geothermal, solar, wind, and biomass

<sup>2</sup> Only includes net use for central power production (320 PJ) and transmission and distribution losses (23 PJ); energy sector own use (e.g., oil consumption in refining is included in industry)

### Electrification key in decarbonisation

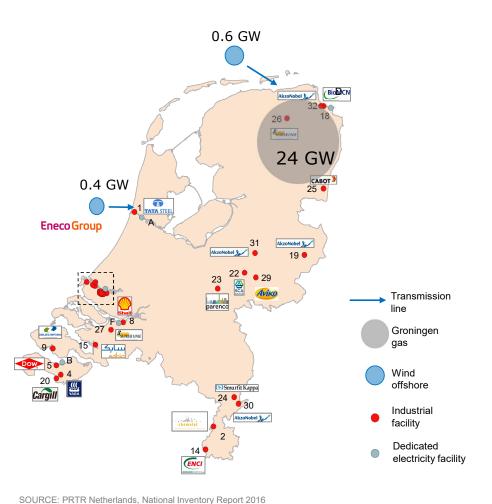


Source: McKinsey, "realistic scenario" 2017 (CBS (2014), "Energiebalans" and "Energieverbruik" databases)

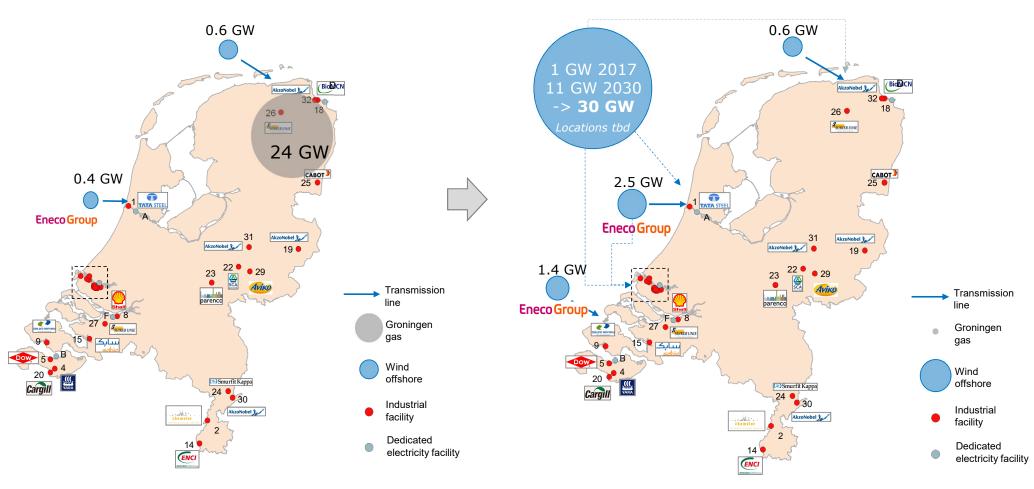
<sup>1</sup> Includes: hydro, geothermal, solar, wind, biomass, and hydrogen

<sup>2</sup> Includes net biomass use (94 PJ), gas use (111 PJ) and own use and transmission and distribution losses

## Offshore wind is still small vs. Groningen gas



## Wind (offshore) will be 'the new gas'



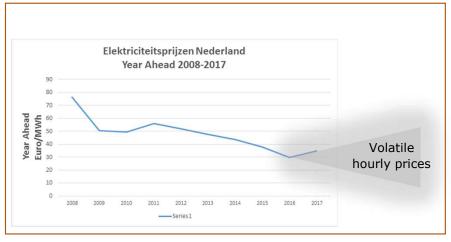
SOURCE: PRTR Netherlands, National Inventory Report 2016

### Offshore wind cost declined 70% since 2011



## Low & volatile power prices challenge the energy sector and offer opportunities to industry

Wholesale power price (year ahead) has decreased and hourly prices become more volatile







minimum subsidy

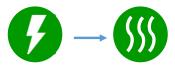
infrastructure costs

### Wind power enables sustainable industry



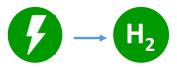
**Heat-pumps** 

- -> almost cost-competitive baseload heat up to ~120°C
- -> CO<sub>2</sub> reductions almost without subsidies



Electrode or e-boilers

- -> higher temperature heat and flexibility to power system
- -> operational subsidies may create substantial impacts



Wind power electrolysis-> sustainable 'green' hydrogen (vs 'blue' from SMR/ATR CCSU)

-> competitive & sustainable industry



### Conclusions

### **Growth of offshore wind power offers opportunities for Dutch industries**

Heat-pumps -> almost cost-competitive low-temperature heat -> small incentive may *tilt* most cases

Electrode boilers -> sustainable heat & flexibility power system -> still needs a CO<sub>2</sub> price-incentive

Power to hydrogen -> 'green hydrogen' as sustainable feedstock for chemical sector and other industries

### Eneco is the logical partner as the biggest Dutch producer of wind energy

Largest sustainable power supplier; will double sustainable generation over next five years

Cross sector cooperation can reduce overall risks, increase efficiency and accelerate the transition

Energy and industry sectors should focus with government on cross-sector value chain impacts

Most emission reductions need a CO<sub>2</sub>-price incentive (through subsidy, tax on natural gas or a CO<sub>2</sub>-levy)

Together we can create sustainable industry and affordable energy!



## Eneco Group

www.enecogroup.com

# Eneco has 3 growth areas with strong synergies between them







### Eneco: from supplier to sustainable partner



**Dutch Railways** 



Heineken Breweries



AkzoNobel



Unilever NL & UK



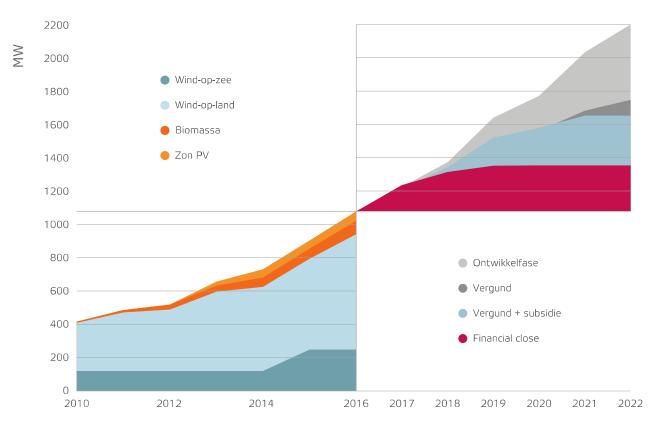
Google



Royal Schiphol

**Eneco Groep** 

# Our sustainable power capacity is doubling every five years



**Eneco Groep** 

## We are Eneco Group

#### **Shareholders**

53 Dutch multicipalities







### **Total revenues**

€ 2.746 million



#### **EBIT**

€ 106 million

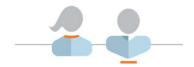


# FTE average 2,882



### Customer contracts

4,3 million



### **Employee motivation**



### Industry emits ~40% of NL emissions

