



Storing vital  
products  
with care

Hari Dattatreya  
February 18, 2020



# Vopak's meaning to society



## Storing vital products...

- The world's population is increasing
- Vital products like energy, food and chemicals are in growing demand



## ... with care

- Through our global network of terminals, we connect supply and demand
- We ensure safe, efficient and clean storage of these vital products and reduce our impact on the environment



# Vopak at a glance

Full year 2019



## Market capitalization

In EUR billions

6.2



## Number of employees

In FTE

5,559



## Total Injury Rate (TIR)

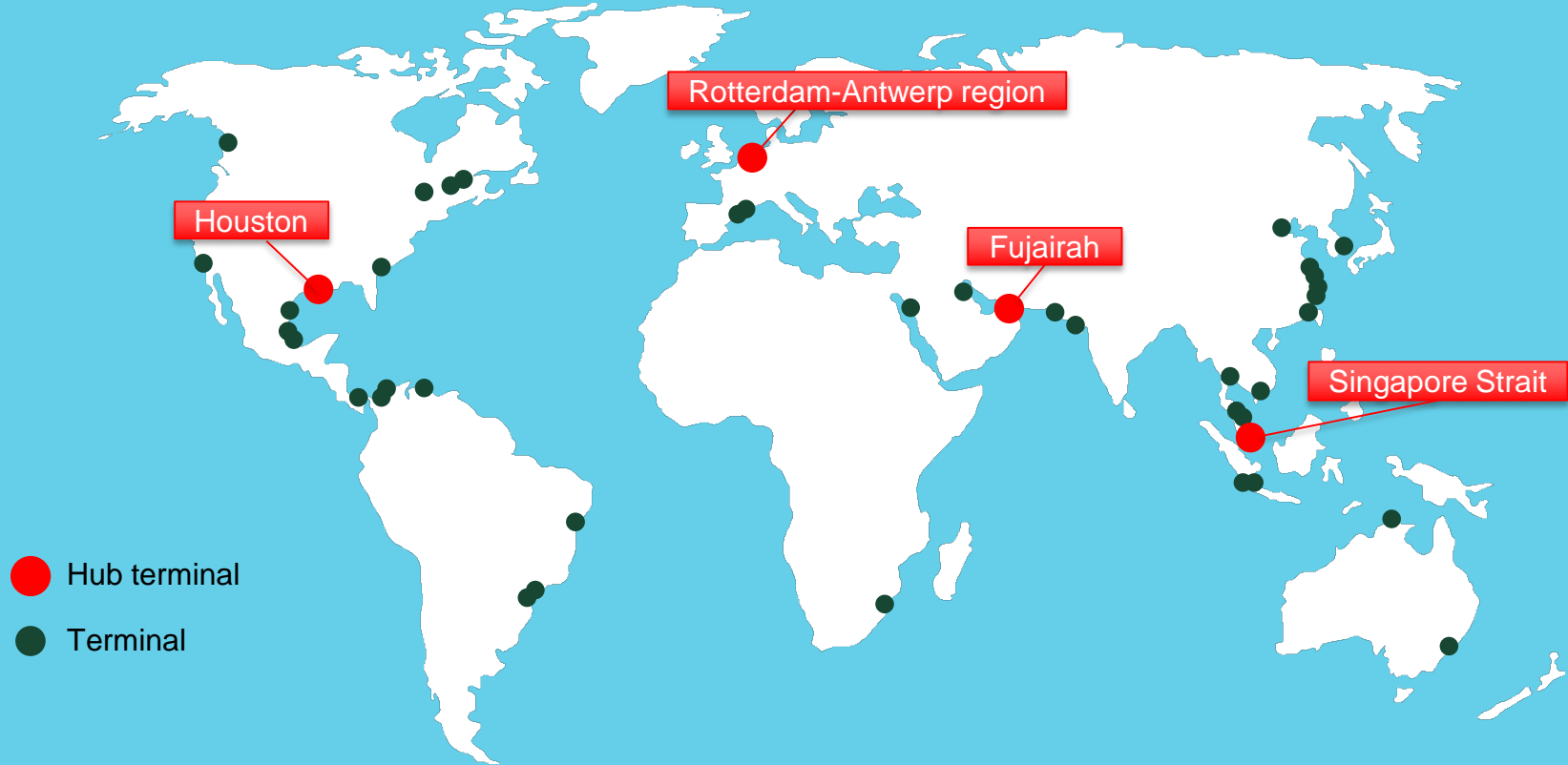
In 200,000 hours worked

Own personnel and contractors

0.34



# Global presence



# Our independent position



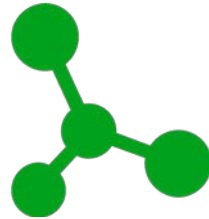
We never own the product we store.



We don't compete with our customers.



Our shareholders are not related to the chemical or oil market.



We are stock listed and transparent.



We give open access.



# Energy transition



For new energies, we focus on 4 market segments: hydrogen and CO2 storage, new feedstocks, flow batteries

We can help speed up the energy transition with our knowledge of infrastructure & supply chains and our global network

## Our 3 lines of action

Reducing our environmental and carbon footprint



Solar powered storage

Facilitating the switch to lighter fuels and feedstocks



LNG as bunker fuel

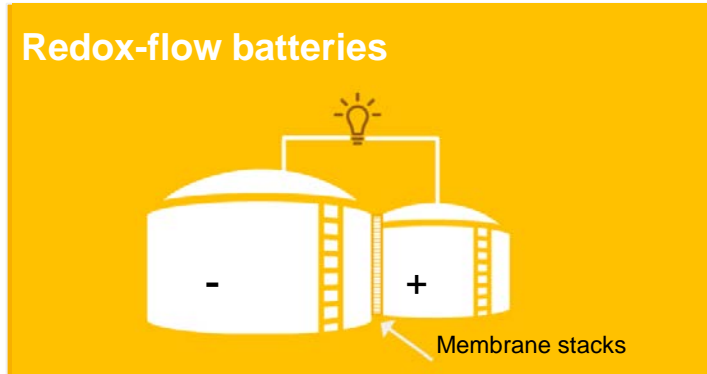
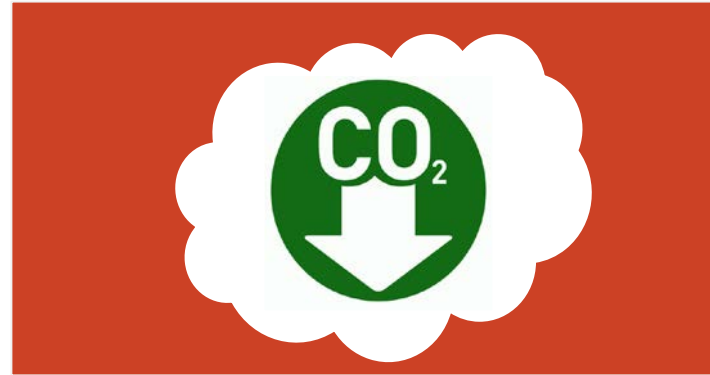
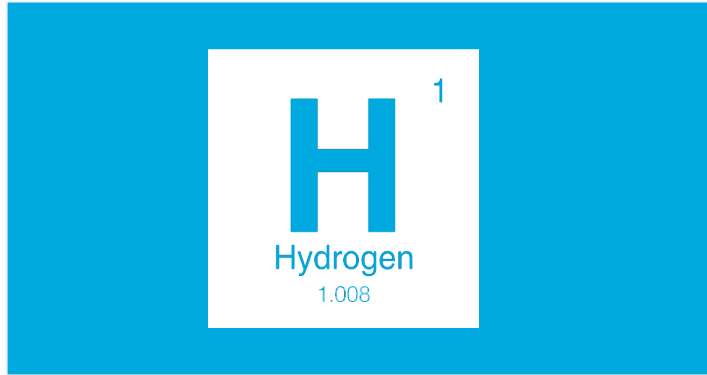
Developing infrastructure solutions for new energies



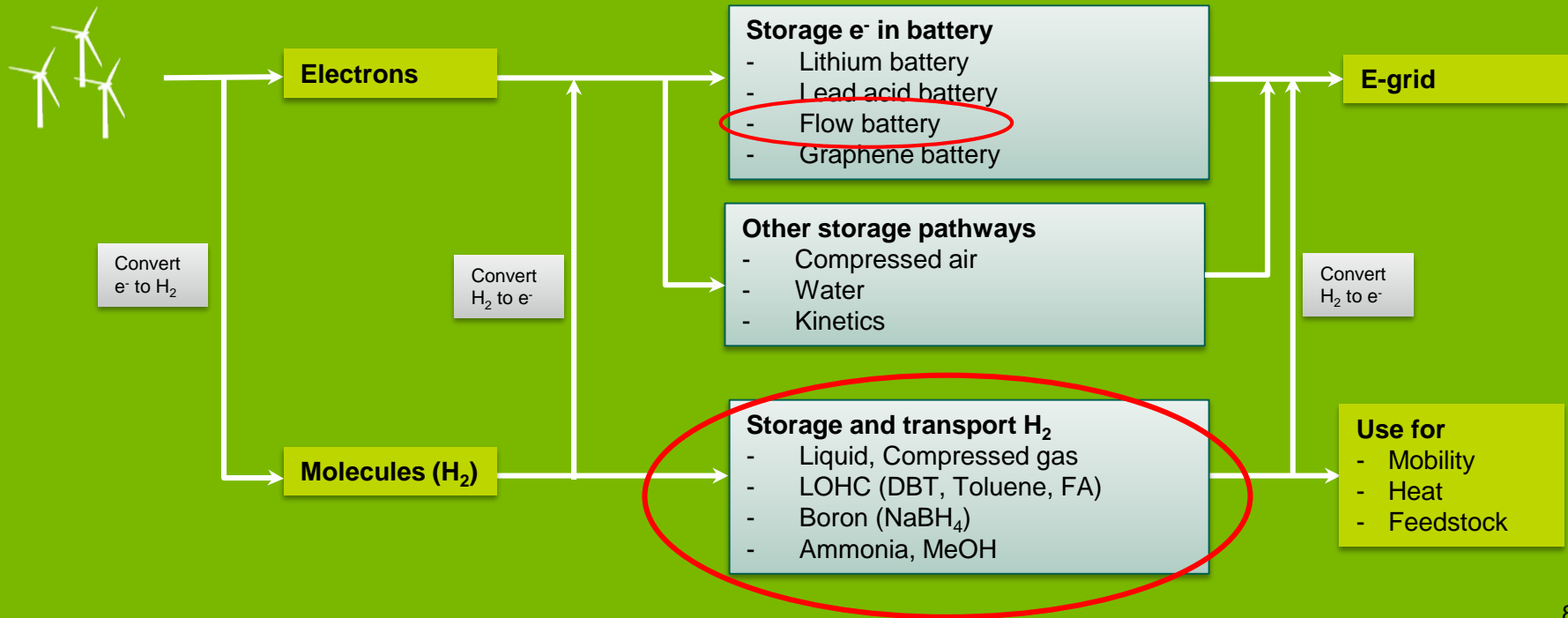
Hydrogen

Storing vital products with care

# New energies strategy



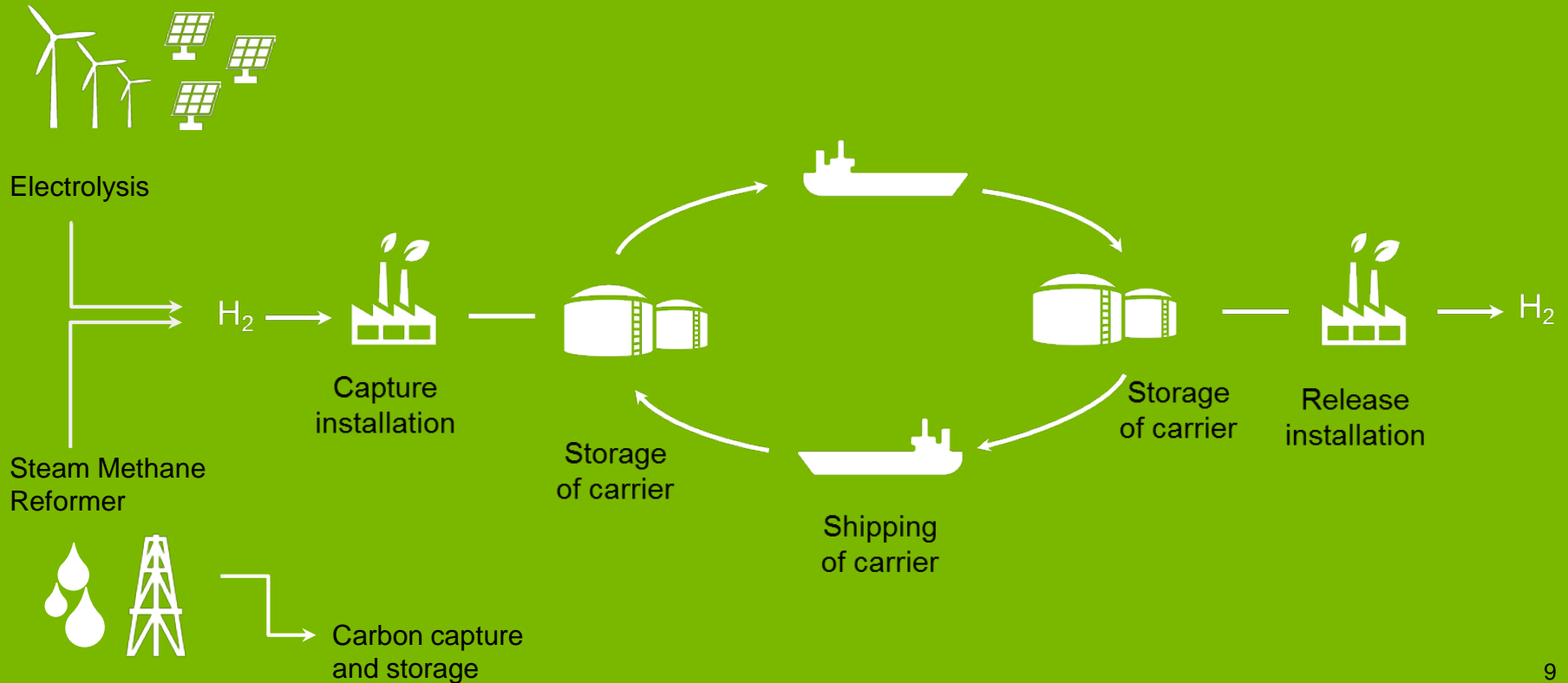
# Logistics for renewable energy





# Future logistics for hydrogen carriers

Existing or new infrastructure, dependent on H<sub>2</sub> carrier



# Innovative hydrogen logistics



# H-vision: H<sub>2</sub> as low-carbon energy source for the Rotterdam industry

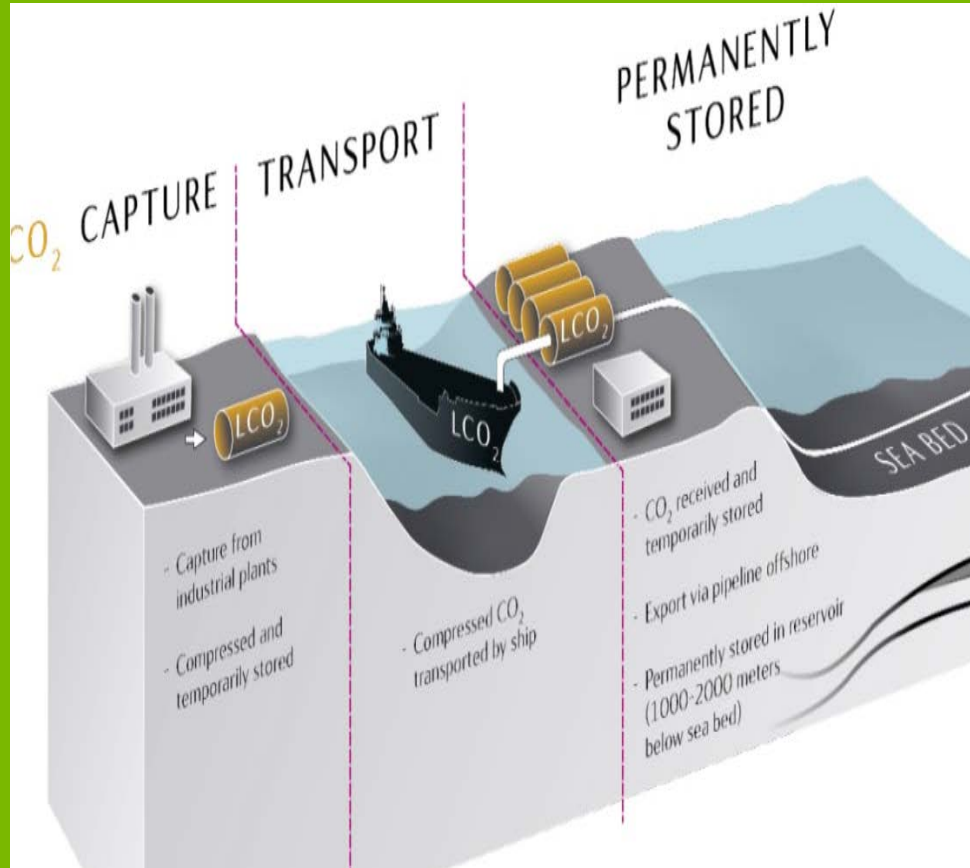


## Enabling

- reuse of refinery fuel gases
- use of low-carbon hydrogen as a fuel for the industry (gas/RFG + CC(U)S)
- transition to green hydrogen
- hub creation



# Future CO<sub>2</sub> flows



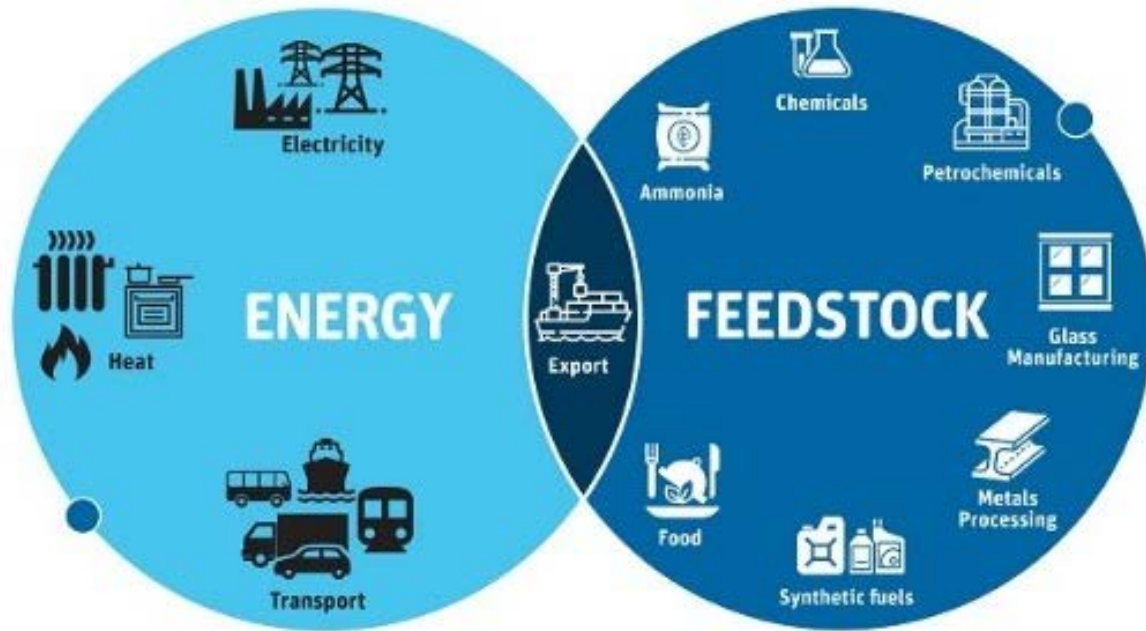
## Development of CO<sub>2</sub> storage

- to support CCS
- to support CCU
- to develop hydrogen markets & infrastructure (“blue hydrogen”)

## Many initiatives

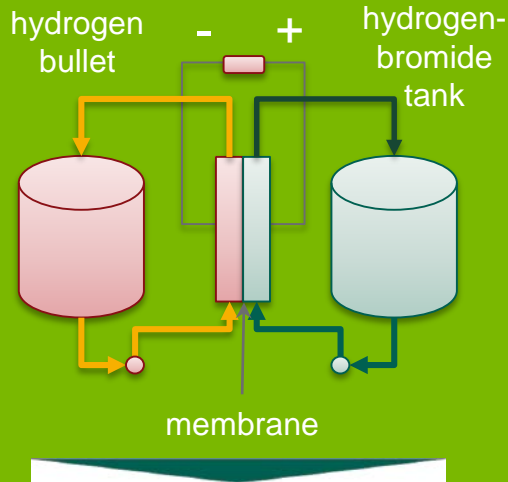
Only 17 large-scale CCS facilities in operation, mainly in US

# Feedstock decarbonization



# Tanks as batteries

Flow batteries store electricity as liquid and gas bulk



Development of **large-scale batteries** using standard tanks (25MW and 250MWh)

- One tank for hydrogen & one for hydrogen bromide
- Can store and release electricity

**This battery is modular** and can be scaled up in

- Power → change or add membranes
- Capacity → add tank or scale up tank

**Markets to serve:**

- Store overcapacity of wind energy
- Peak shaving
- Short- and long-term storage of electrons
- Trading



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# Challenges going forwards

