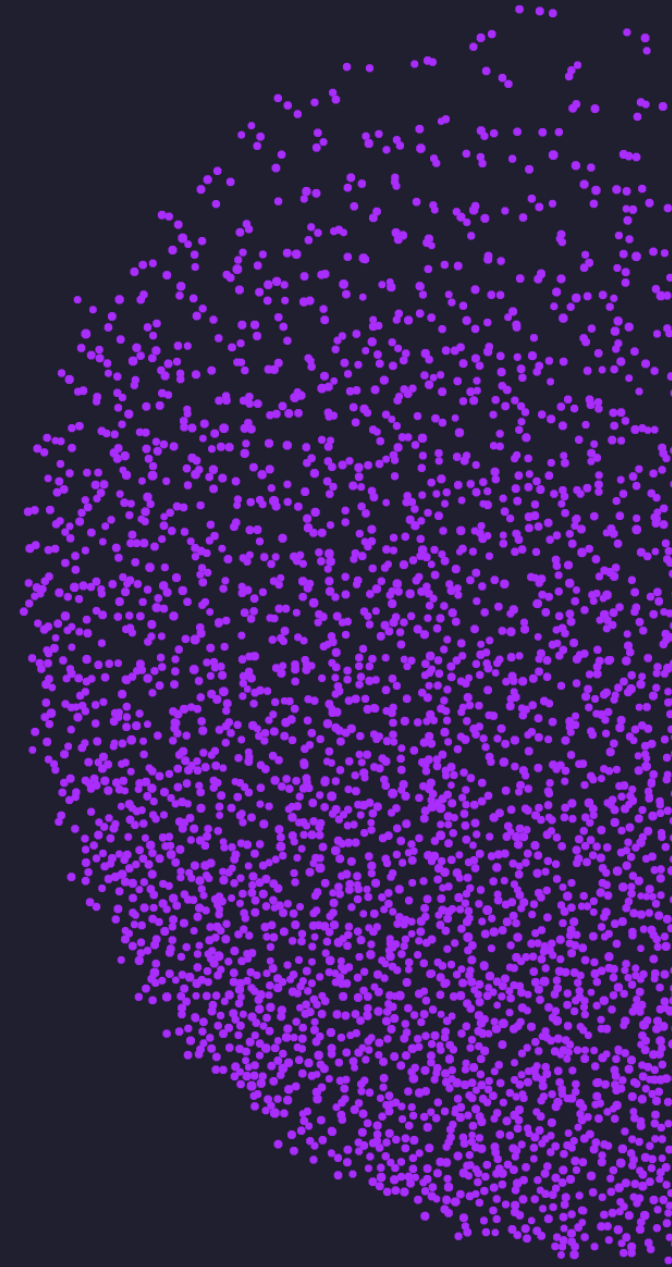


# RENEWABLE HYDROGEN OUTCOMPEETING FOSSIL ALTERNATIVES

JON ANDRE LØKKE

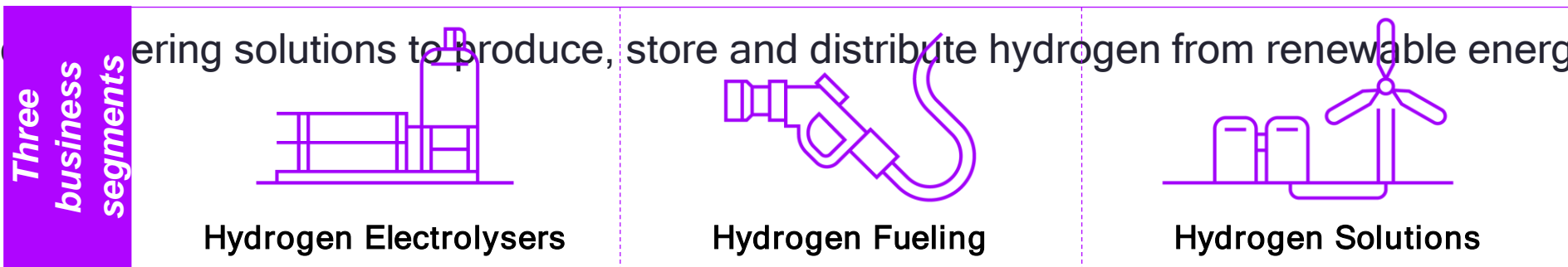
CEO Nel Hydrogen



# Nel in brief

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- Global, listed pure-play hydrogen company - facilities in Norway, Denmark and the U.S., ~16,000 shareholders
- Significant foothold in fast-growing markets with several breakthrough contracts
- World-leading on hydrogen electrolyzers and fueling equipment - unrivalled performance and track-record
  - >3,500 hydrogen solutions delivered in ~80 countries world wide since 1927
  - ~40 hydrogen fueling stations delivered to 9 countries, and delivering to South Korea in 2019
- Capable of offering solutions to produce, store and distribute hydrogen from renewable energy





55 million tons of hydrogen







nel



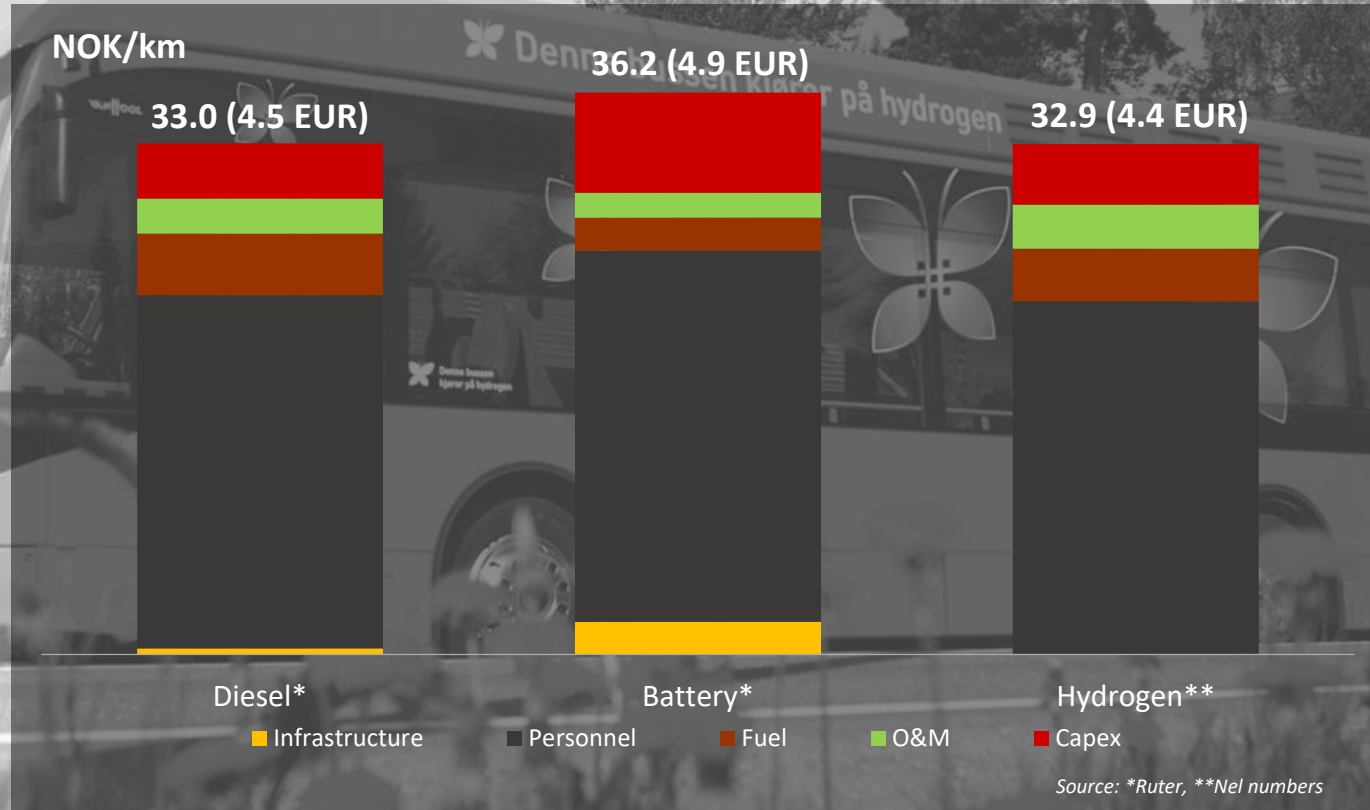
# HYDROGEN BUSES

COMPETITIVE WITH DIESEL AND BATTERY





# HYDROGEN BUSES COMPETITIVE WITH DIESEL AND BATTERY



## HYDROGEN TRAINS

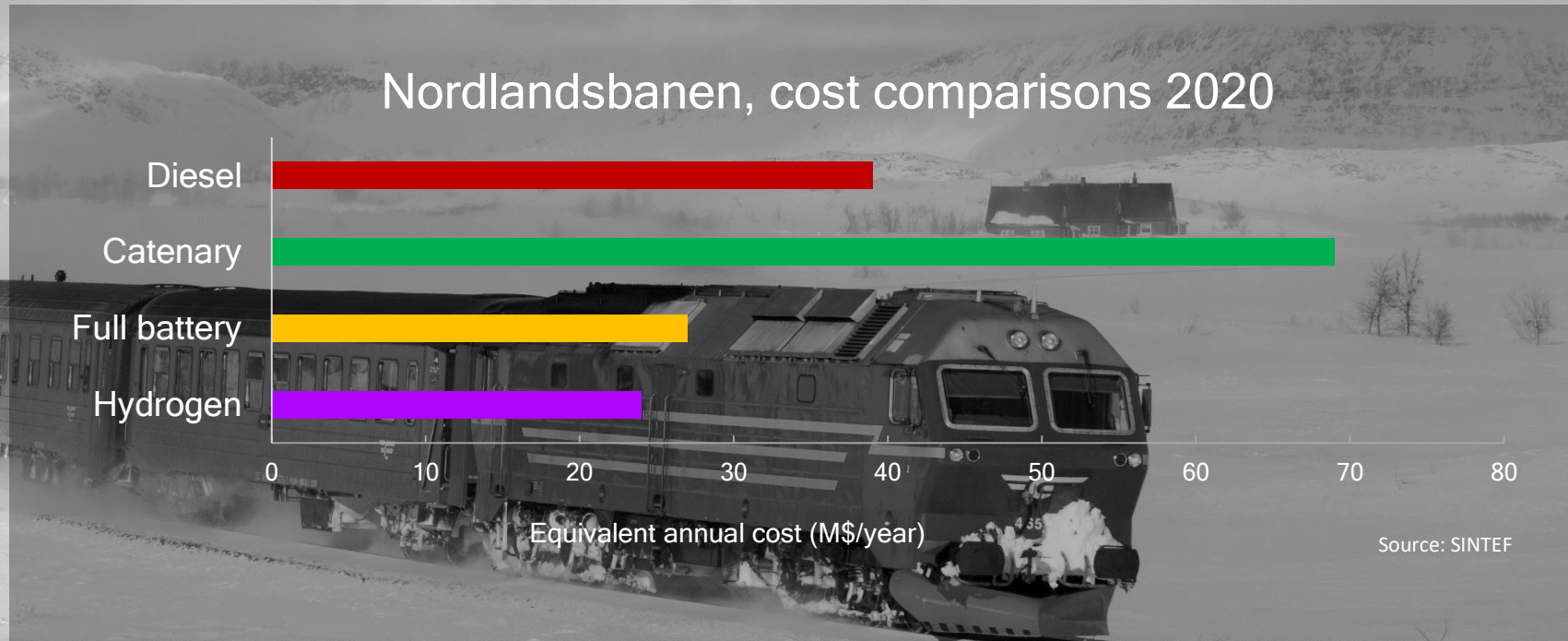
CURRENTLY 40% OF EU & 1550 KM OF NORWEGIAN RAILROAD IS DIESEL  
COST OF ELECTRIFYING WITH WIRES: ~15 MNOK/KM (2 MEUR/KM)





## HYDROGEN TRAINS ARE COMPETITIVE WITH DIESEL

CURRENTLY 40% OF EU & 1550 KM OF NORWEGIAN RAILROAD IS DIESEL  
COST OF ELECTRIFYING WITH WIRES: ~15 MNOK/KM (2 MEUR/KM)





Across USA, 2020-2028

700





nel

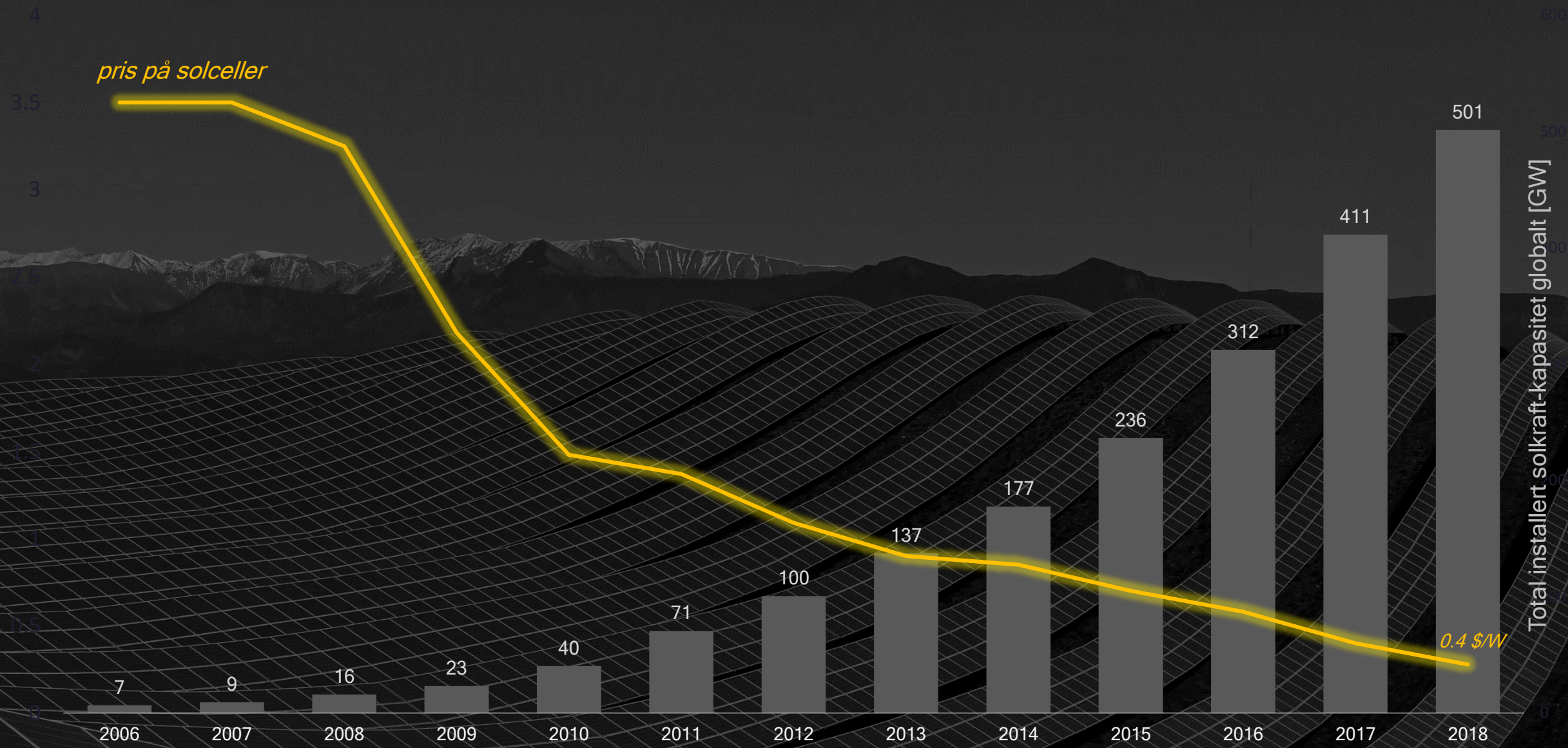


NIKOLA TRE™



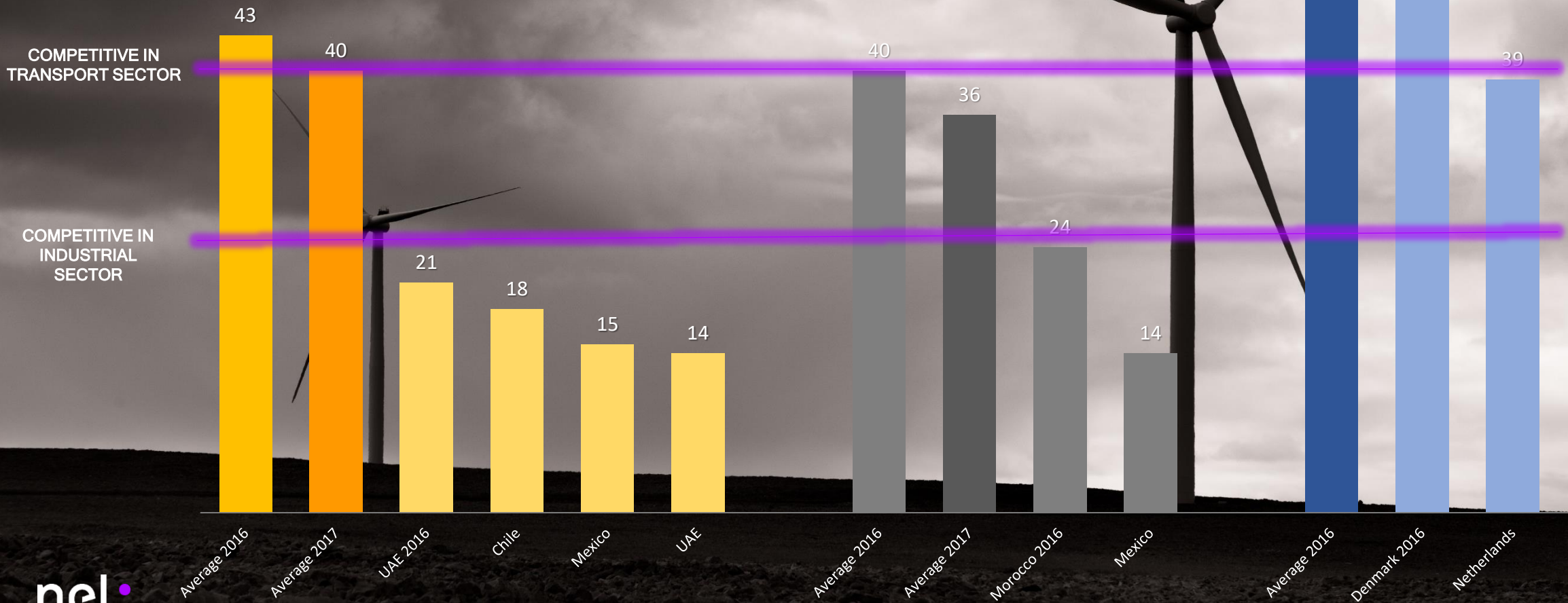








# How competitive is renewable hydrogen

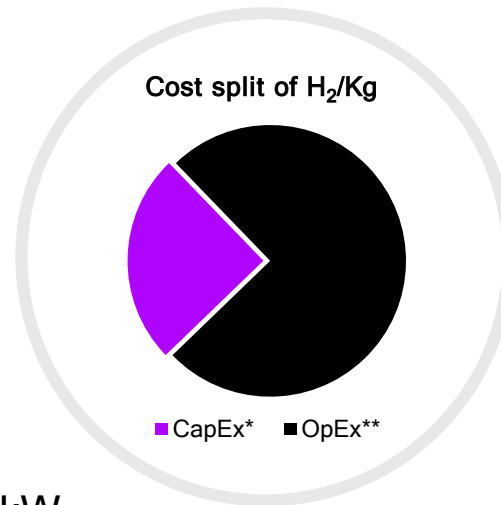
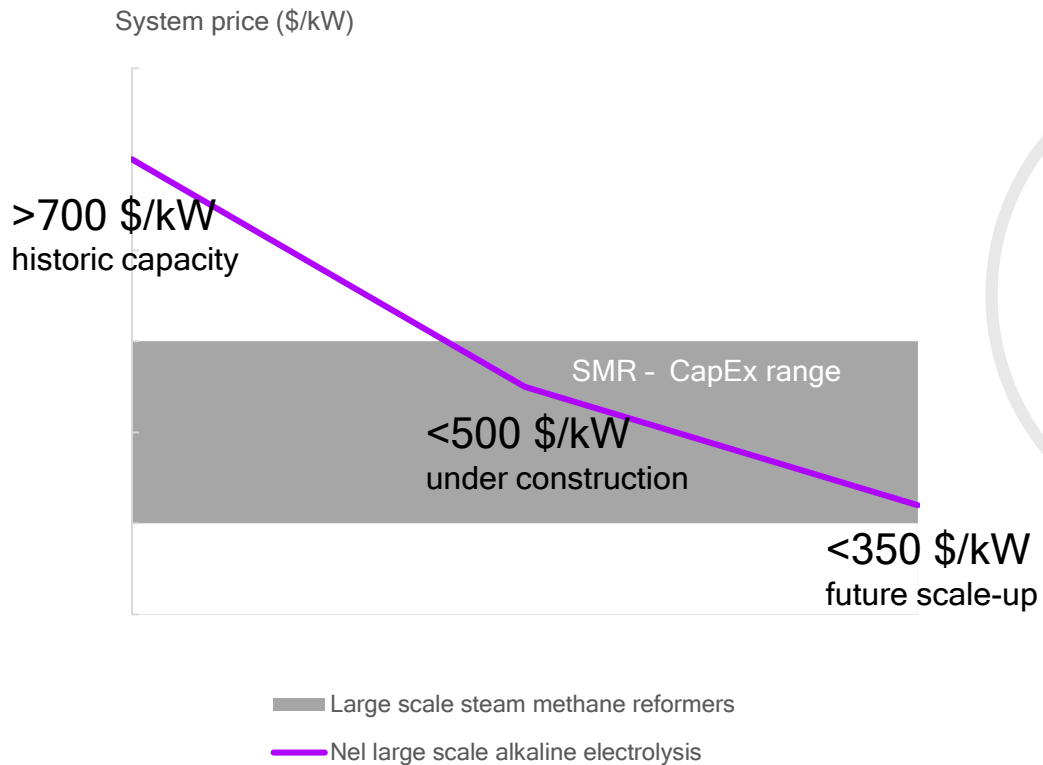




# Renewable hydrogen from electrolysis becoming more and more competitive

General market update

## CapEx: Electrolyzers from Nel - becoming competitive with SMR



- Lower cost of renewable impacts  $\frac{3}{4}$  of total cost of renewable hydrogen
- $\frac{1}{3}$  relates to CapEx and other operating cost like maintenance, etc.
- By aggressively driving this down, renewable hydrogen is in the process of outcompeting fossil hydrogen
- Produced from coal, oil and natural gas



# Constructing world's largest electrolyzer manufacturing plant

Nel ASA Q3 2018

Nel in brief & segment updates

## Name plate capacity of 360 MW per year, more than 10x current annual production

- Highly automated and designed according to lean manufacturing principles
- Industrial scale production, the most efficient electrolyzers in the market at a game changing cost
- Manufacturing plant will be constructed as an extension of the current facility at Notodden, Norway
- Operational in 2020 with ramp-up aligned to customer requirements



A high degree of automation is planned for the new facility



# Making renewable hydrogen mainstream – changing industries

Nel ASA Q3 2018

Nel in brief & segment updates

## Aiming at system cost reduction of more than 40%

- Electrolysis has for several decades been a niche solution, will now become competitive with steam methane reforming of natural gas (SMR)
- The largest hydrogen consumers globally are already evaluating switching to electrolysis and away from SMR
  - Replacement market alone represents a potential market opportunity of ~20 BUSD/year
- Expansion will support ambitions of Nikola as well as other customers who want to make a significant change to their business model



8-cluster electrolyzer solution, produce 8 tons of hydrogen per day



# Officially opened large-scale H2Station production facility in Denmark

Nel ASA Q3 2018

Nel in brief & segment updates

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## Annual nameplate production capacity of up to 300 H2Stations

- First production line in the world for hydrogen stations
- Serial production according to lean principles represents significant improvements in existing production efficiency
  - Hydrogen compression, cooling and gas control assembled onto one skid
  - Allows both CE- and UL-certified stations off the line
- H2Stations for Europe, US and Asia running on same production line (70MPa and 35MPa fueling option)





Hyundai's new FCEV NEXO just launched in Norway – looking forward to next gen. Toyota

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Thanks for the ride dinosaurs,  
we'll take it from here!

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