DRIVING THE SHIFT

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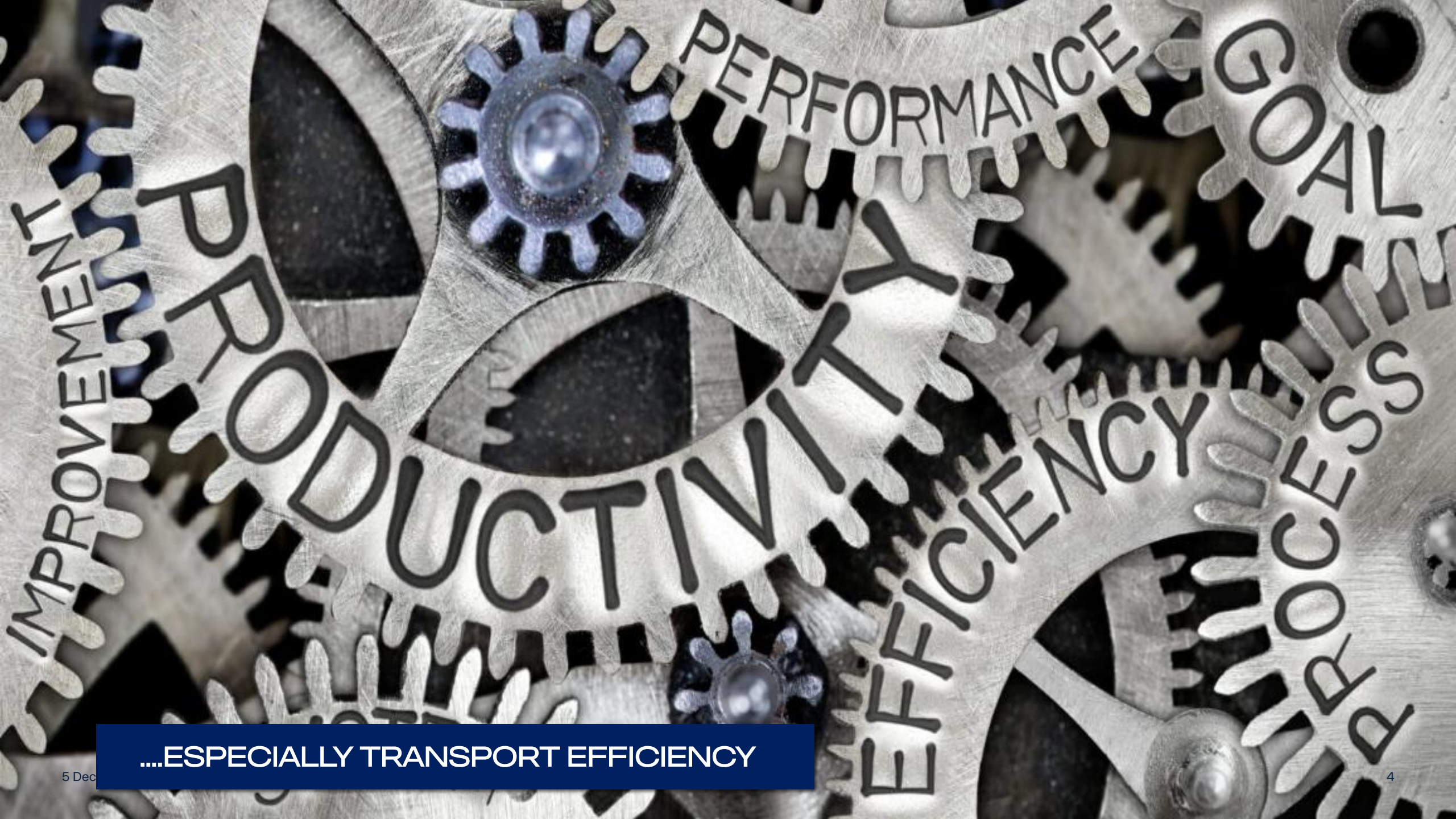
SCANIA

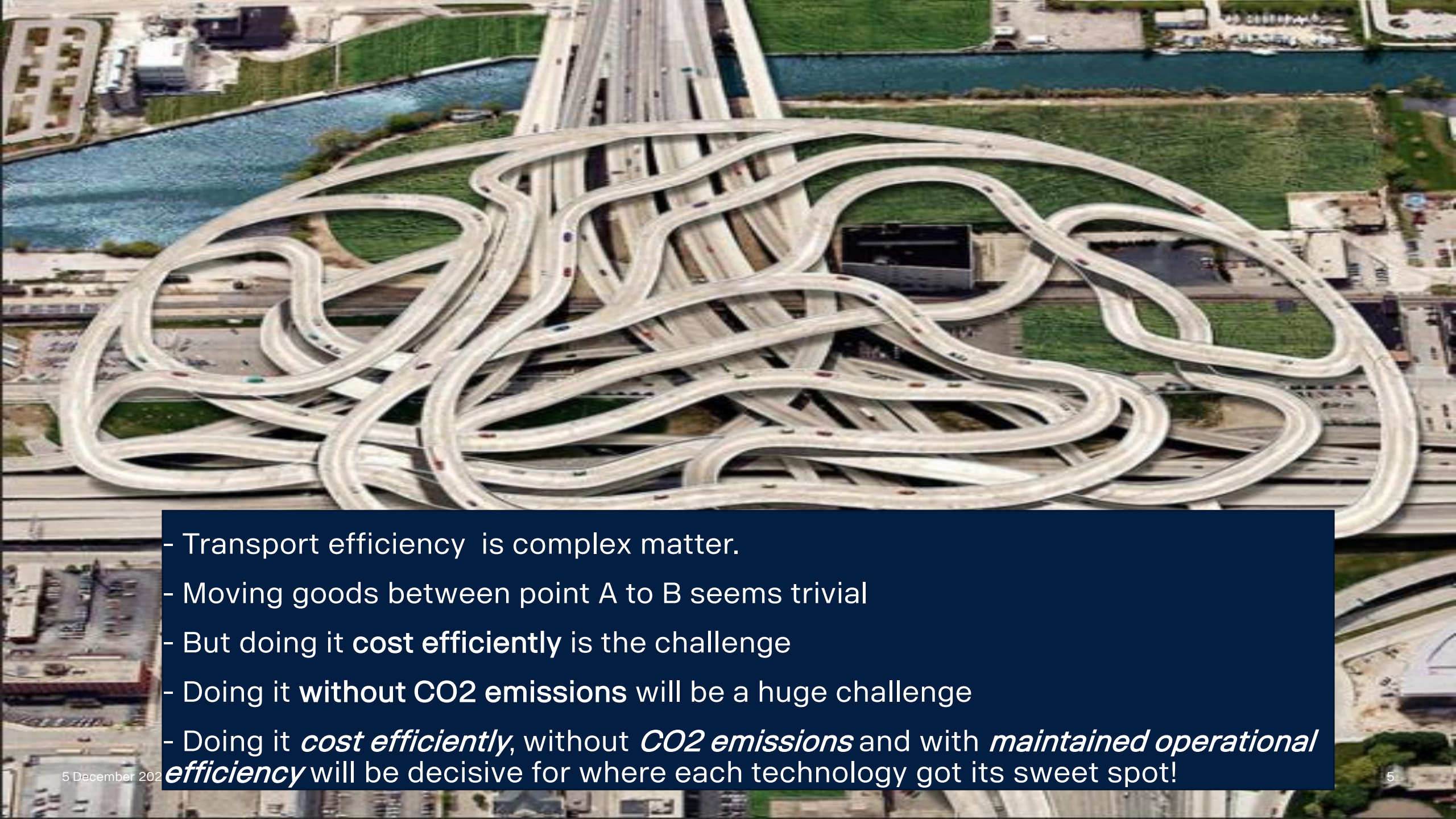
AGENDA

1. INTRO
2. HIGH LEVEL PRODUCT STRATEGY
3. WHY H2
4. WHY H2 ICE
5. WHAT ABOUT FCEV
6. DISCUSSION AND Q&A

EFFICIENCY MATTERS...



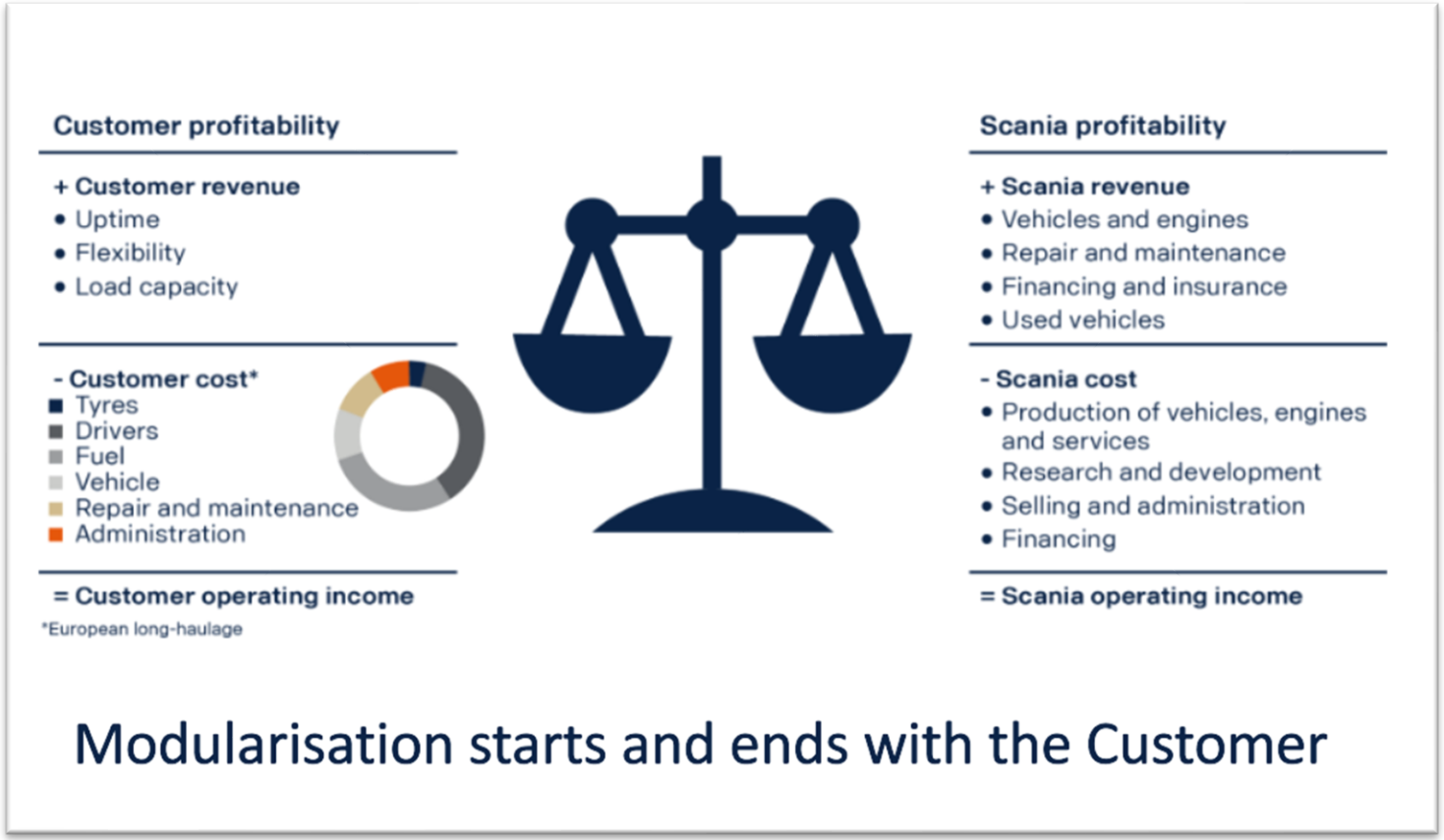
....ESPECIALLY TRANSPORT EFFICIENCY



- Transport efficiency is complex matter.
- Moving goods between point A to B seems trivial
- But doing it **cost efficiently** is the challenge
- Doing it **without CO2 emissions** will be a huge challenge
- Doing it ***cost efficiently***, without ***CO2 emissions*** and with ***maintained operational efficiency*** will be decisive for where each technology got its sweet spot!

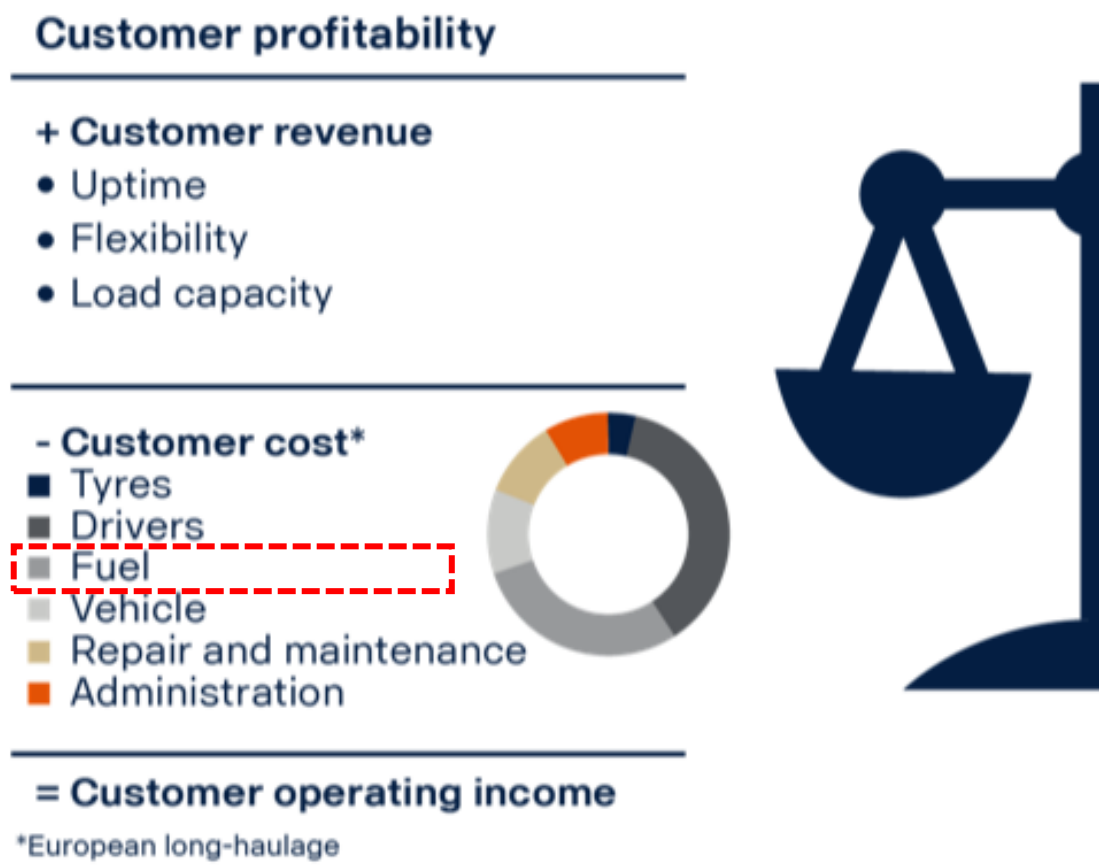
Customer first

- Understand transport efficiency
- Understand customer operations
- Understand customer challenges and reality

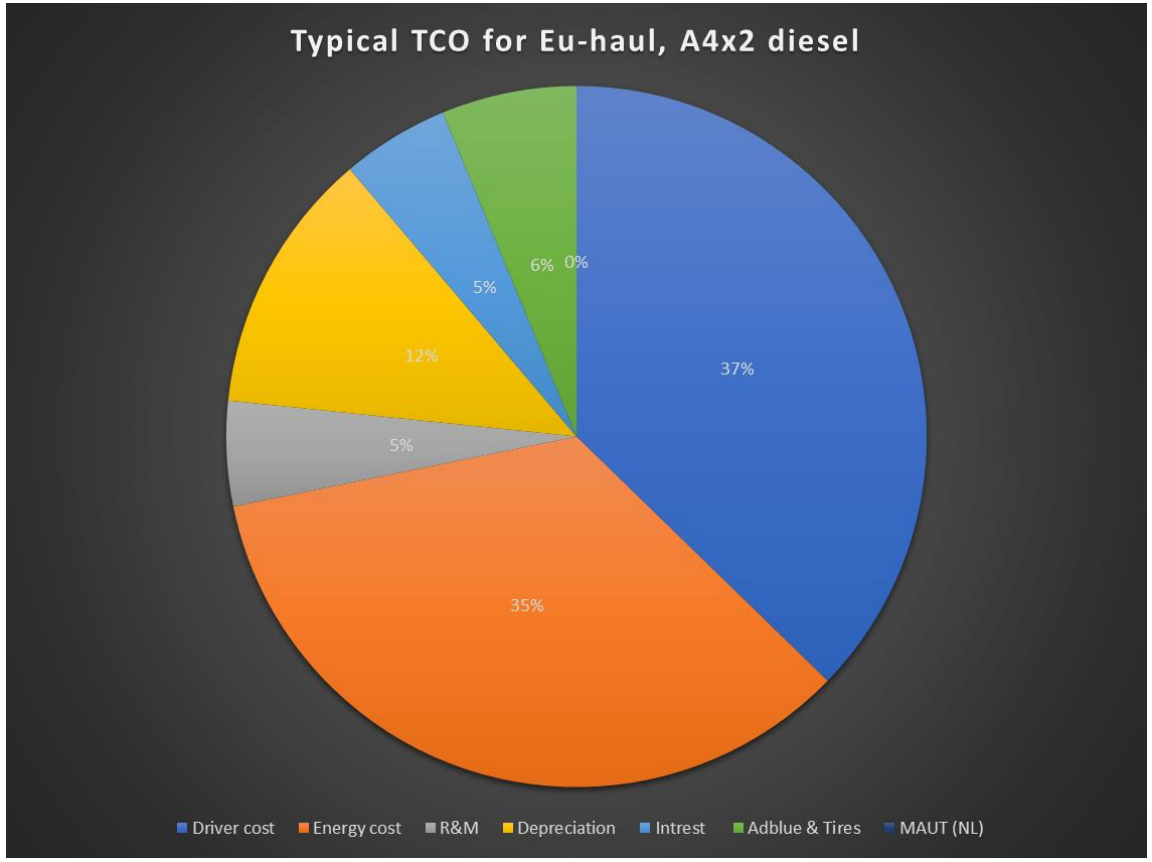


Cost is important

- Energy efficiency has always, and will always, be important.

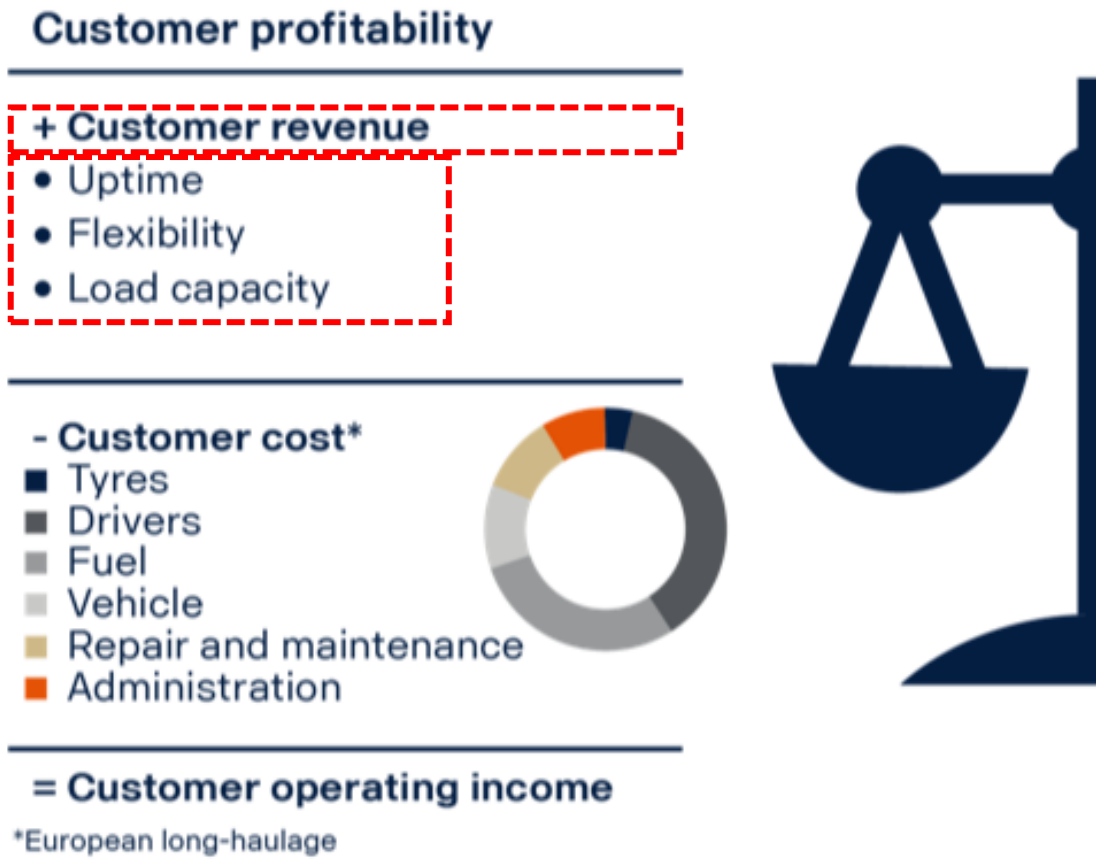


- Typical cost pie for a long haul company
- Fuel is 1/3 of the cost pie
- Reducing energy cost without hampering revenues goes straight down on bottom line
- But if revenues are being affected, the savings of fuel is quickly vanished on the bottom line



Revenues are fundamental

- But revenues is what is bringing the food to the table.
- Uptime, flexibility and load capacity must always be considered when looking at new solutions and technologies



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The Scania renewable fuel strategy

- Been a long time strategy at Scania, which started with progressive customers that searched for alternative, low emission, solutions before sustainability became a fashion and a must.
- Strong, “here and now” and long term sustainable solutions with excellent environmental- and economical performance
  - Bio-CNG
  - Bio- LNG
  - Bio- diesel (FAME)
  - Bio-diesel (HVO)
  - Ethanol (ED95)
- 2000km range when using bio-LNG, ie Sweden-Paris without refill, is a strong sales pitch
- Range will be the new gold, for efficient transport and logistics in the future fossile CO2 free society

The Scania e-strategy

- Energy efficiency is key for the energy system transformation
- Battery electric vehicles are a far more energy efficient solution compared to any other technology.
- Even though there will be hydrogen, driven by the heavy industry, steel, cement, fertilizers, the firm Scania view is that the energy logic will prevail, and has a clear stance for battery electric to be the main pathway for decarbonization of the transport sector.
- **But**…. locally, on big H2 producing markets, or locally around H2 consuming industri, there will likely arise a market for hydrogen powered vehicles.
- **And**…in specific applications and businesses, where for example payload, range (flexibility) and uptime is required, hydrogen do represent an attractive solution.
- **And**…not the least, we're 100% dependent on the movements in the energy sector and politics.

The Scania H2-strategy

- Follow the technology, do early pilot testing, understand challenges and identify opportunities
- Work with small series to be present on the H2 market and learn, with FCEV’s already in customer operation via our Pilot Partner setup, and more in the making.
- Pilot Partner on H2ICE in the planning to further explore and understand the H2 ICE feasibility.

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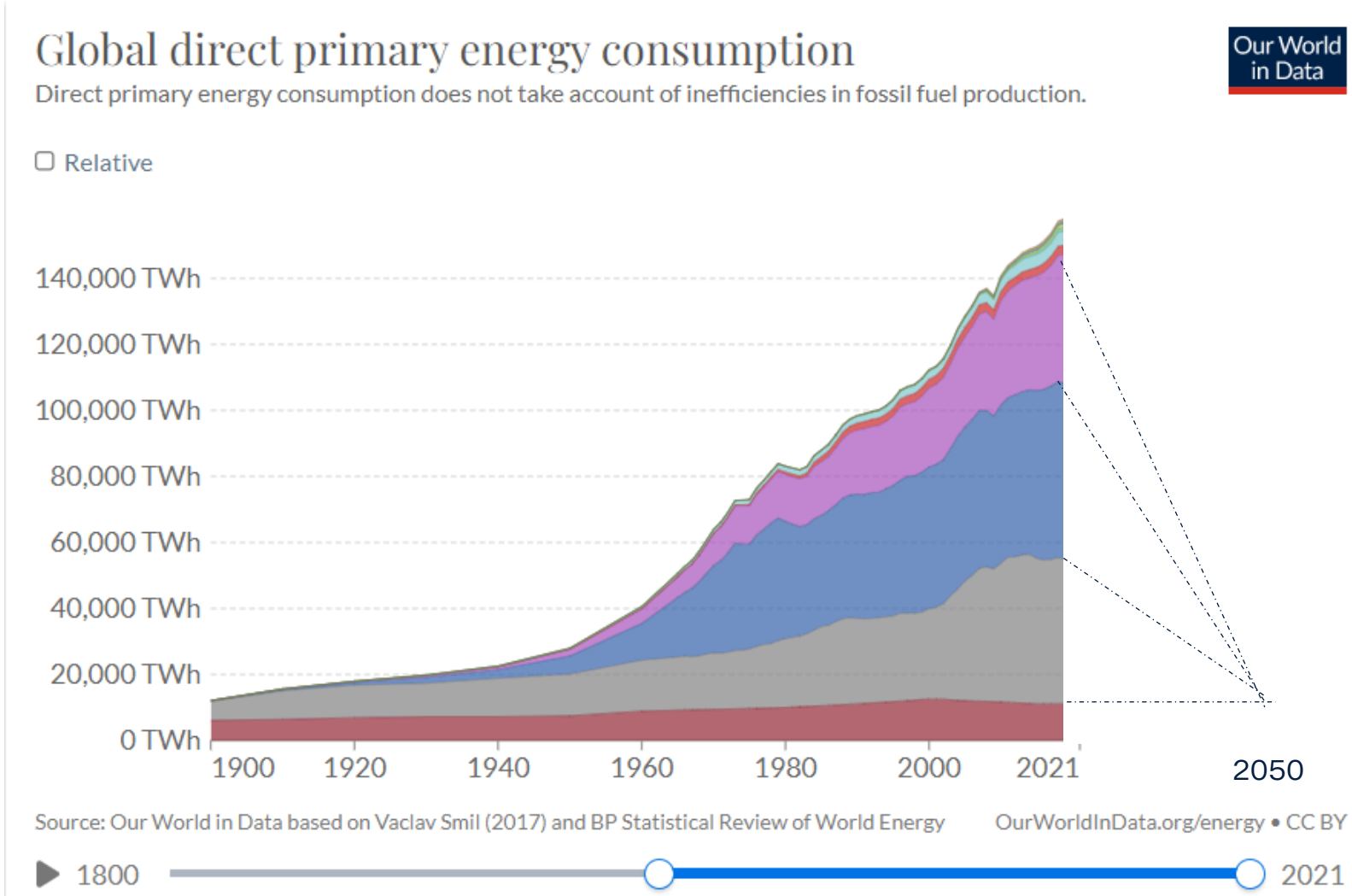
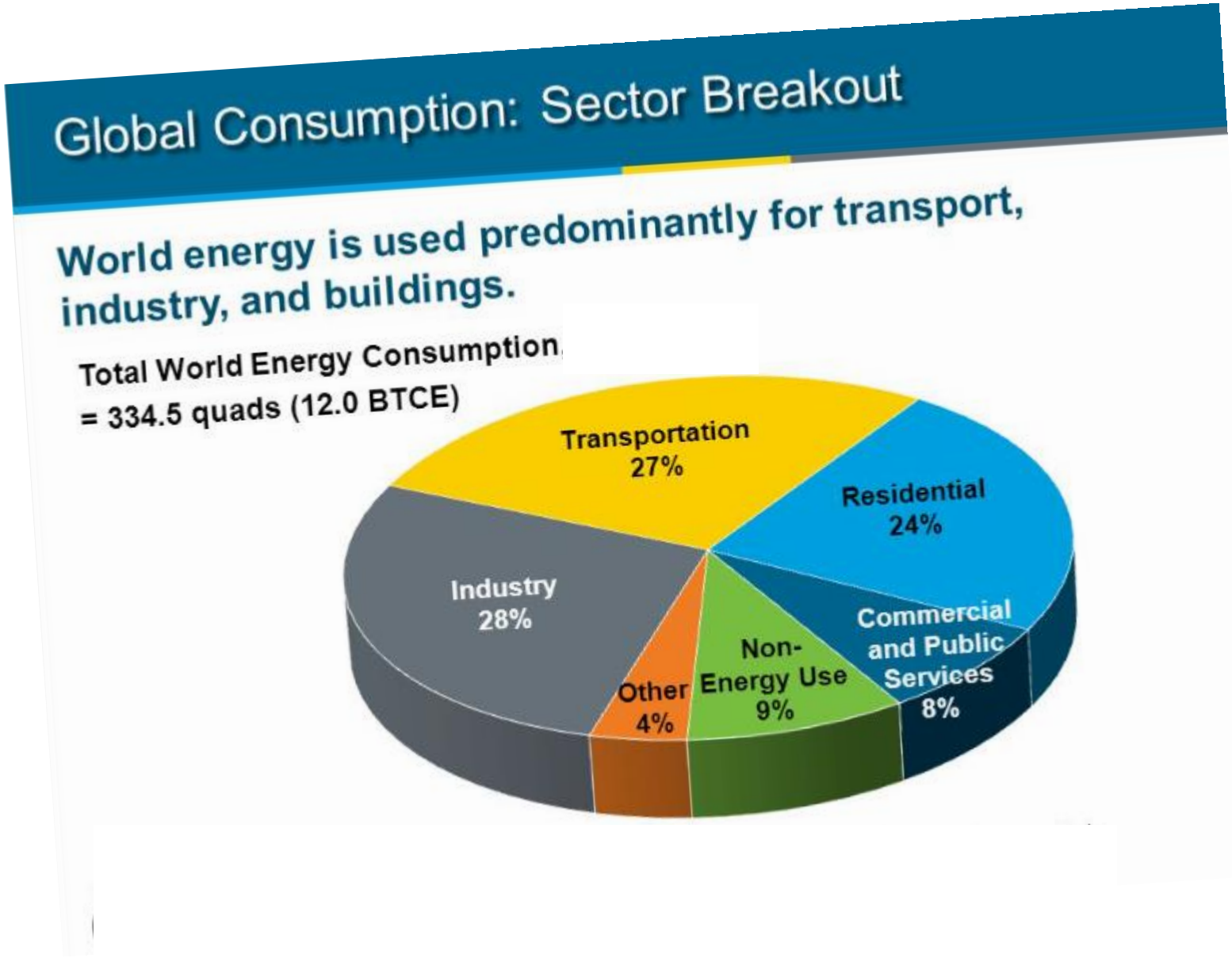
The challange





Challange:

- Energy effiency improvments needed in all sectors
- Replace fossile with green alternatives needed in all sectors
- HDV transports contributes with 7-8% of total consumption
- **Green electricity will have many customers and ”power on demand” will be a scarce resource.**
- All solutions needed

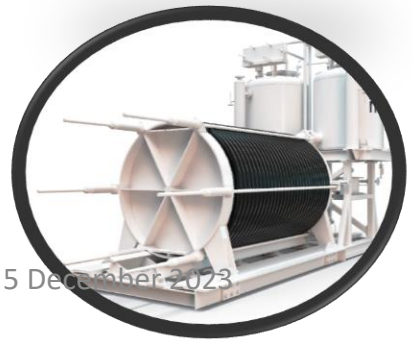
#AllHandsOnDeck

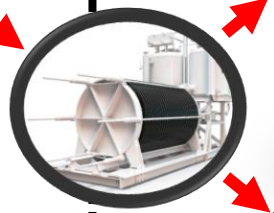
#NoSilverBullet

Renewable energy cost

Transmission cost

Power-on-demand





CCS: 150 kW
MCS: 1 MW

HRS: 10-15MW

ref Diesel

~70MW

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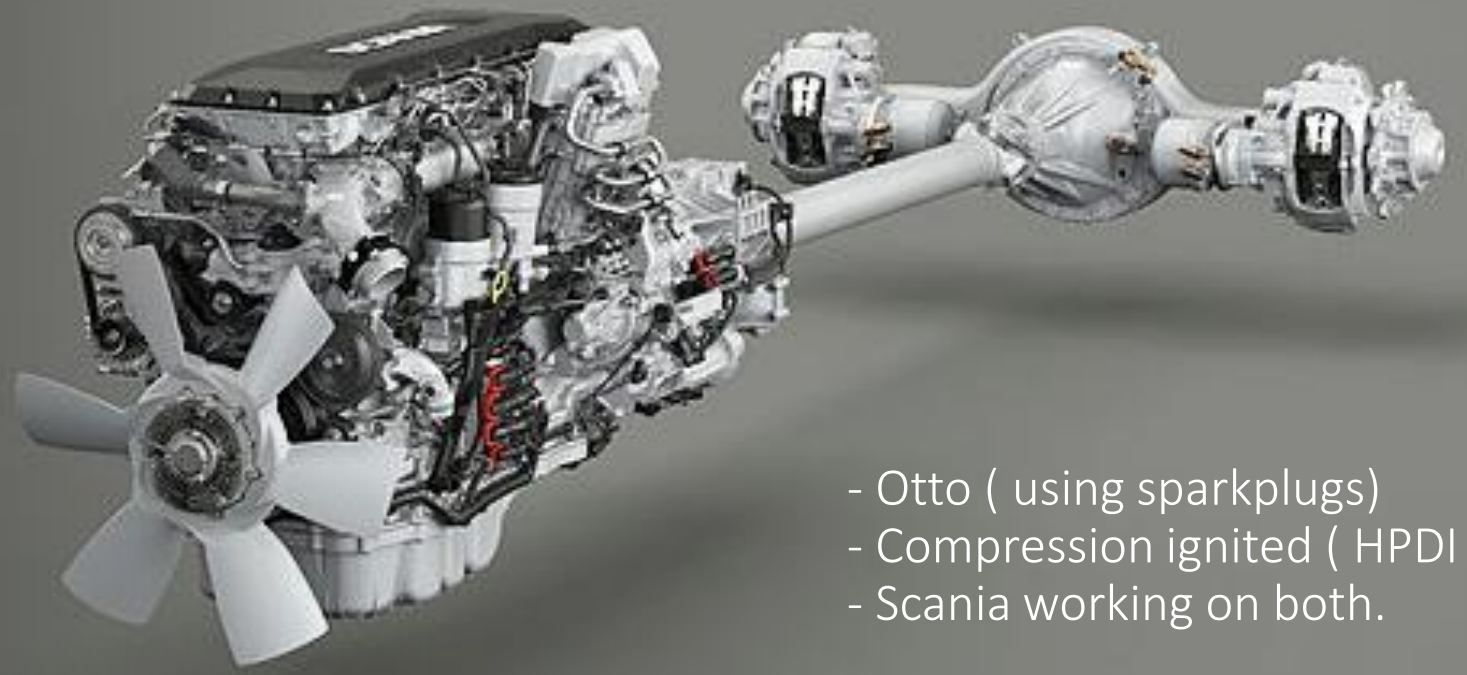
Why H2 ICE?

H2 ICE is built on mature and well proven technology. TRL at peak condition!

- Fill it with green hydrogen and you got a great green energy converter!
- ~45-55% efficient



- Otto (using sparkplugs)
- Compression ignited (HPDI - using pilot starter)
- Scania working on both.

Because it’s there!

H2 ICE

- H2 ICE HPDI

H2ICE - HPDI

- Diesel-like combustion
- Dual injector for direct injection of diesel and H2
- Diesel injection used for ignition
- Main energy carrier is H2
- Technology close to diesel engine
- H2-Compressor needed for high pressure direct injection

H2 ICE

- H2 ICE HPDI

Westport Fuel Systems

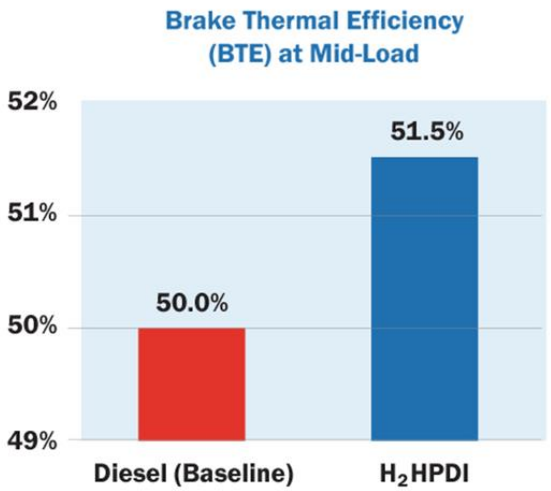
Westport and Scania Announce Impressive Test Results of H_2 HPDI™ Fuel System for Heavy-Duty Transport

October 26, 2022 17:00 ET | Source: Westport Fuel Systems Inc

VANCOUVER, British Columbia, Oct. 26, 2022 (GLOBE NEWSWIRE) -- Westport Fuel Systems Inc. ("Westport") (TSX: WPRT / Nasdaq: WPRT) a global leader in low-emissions alternative fuel transportation technologies, and Scania AB, a world-leading provider of transport solutions, announced today impressive engine test results of Westport's H_2 HPDI fuel system for heavy-duty vehicle applications.

Westport Fuel Systems | Investors | Why Invest | News | Events & Presentations | Financials | Stock In

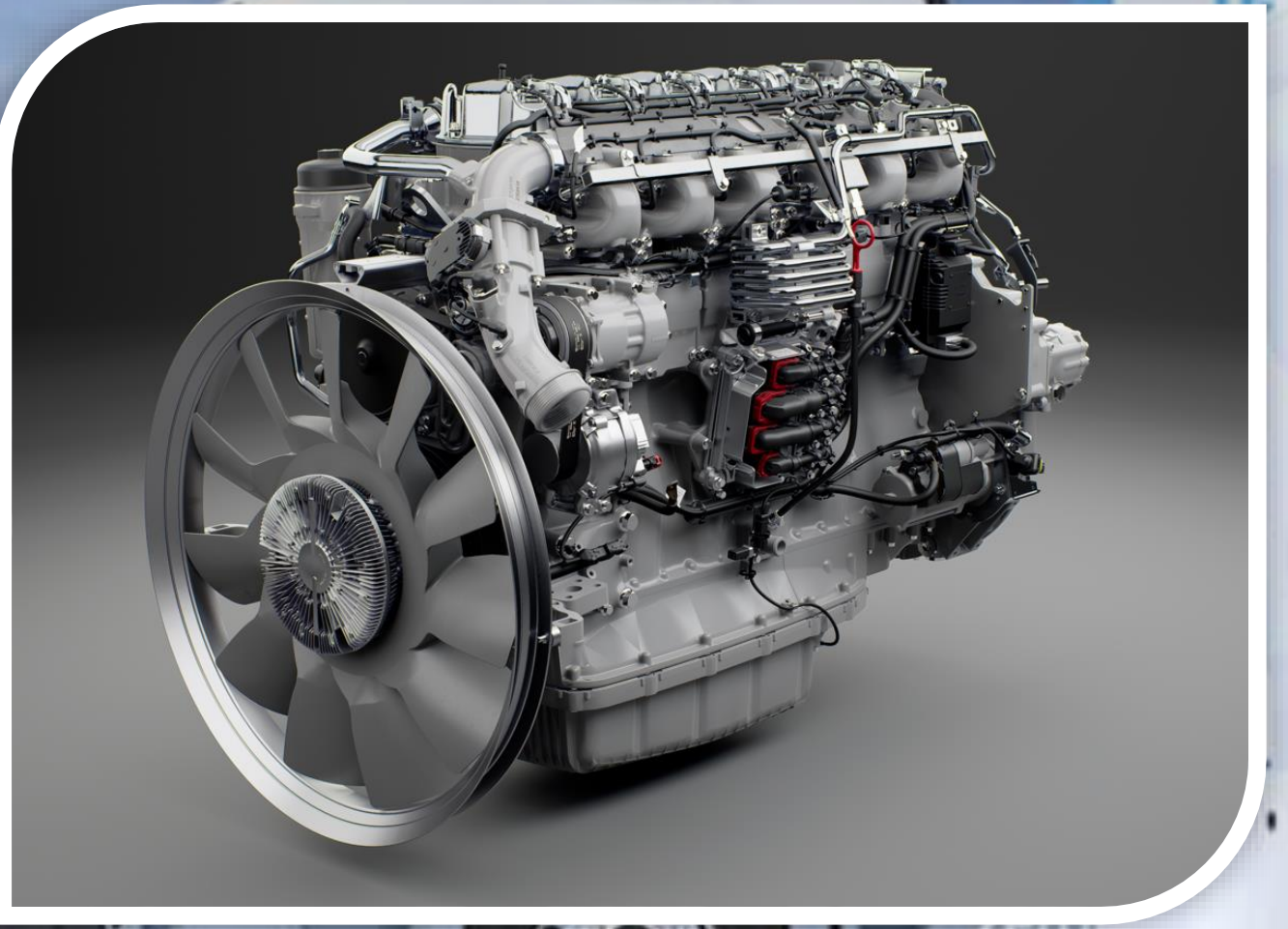
Westport Fuel Systems | HPDi™



The engine test results from the Scania 13-Litre CBE1 platform running with Westport's H_2 HPDI fuel system demonstrates even higher efficiency than the already super-efficient diesel engine.

H2 ICE

- H2 ICE Otto



Otto technology is well proven at Scania. Need some tweaking to enable hydrogen.

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FCEV

FCEV

- Will ultimately have better economics compared to H2ICE

    - Due to;
        - Lower complexity
        - Lower product cost
        - Higher efficiency
        - Zero tailpipe emissions and acoustics

- But it will take time to elevate the maturity- and robustness level
- Also cost will be journey to bring down. Require scale.
- We are running development and pilot testing, but sees a later market timing compared to H2ICE.

H2 ICE will over time likely be relevant in certain heavy duty applications, due to high power density, robustness and cooling capacity.

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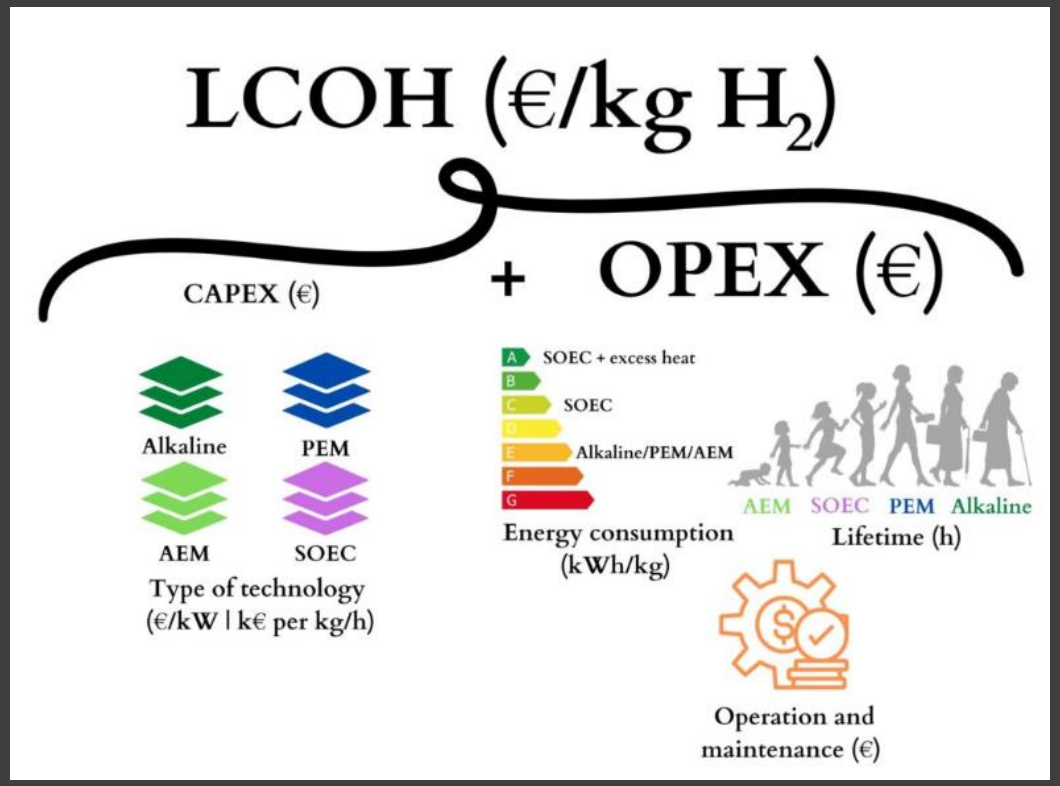
Now the question, from our perspective, is rather **when** there will be green hydrogen **at a filling station**, at the **right price**, next to **our customers**.



What is your view on H2 availability and cost?

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