DECARBONISATION JOURNEY IN BRIEF

IRTENZ CONFERENCE

HAMILTON - NEW ZEALAND

14/11/2023

ALFONS REITSMA

SENIOR PRODUCT ENGINEER E-MOBILITY

SCANIA NEW ZEALAND

SCANIA

OUR PURPOSE

Scania’s purpose is to drive the shift towards a sustainable transport system, creating a world of mobility that is better for business, society and the environment.

A SOCIETY STRIVING FOR SUSTAINABILITY

Need for transports is increasing

25% of global emissions from transports

Transports key to economic and social sustainability

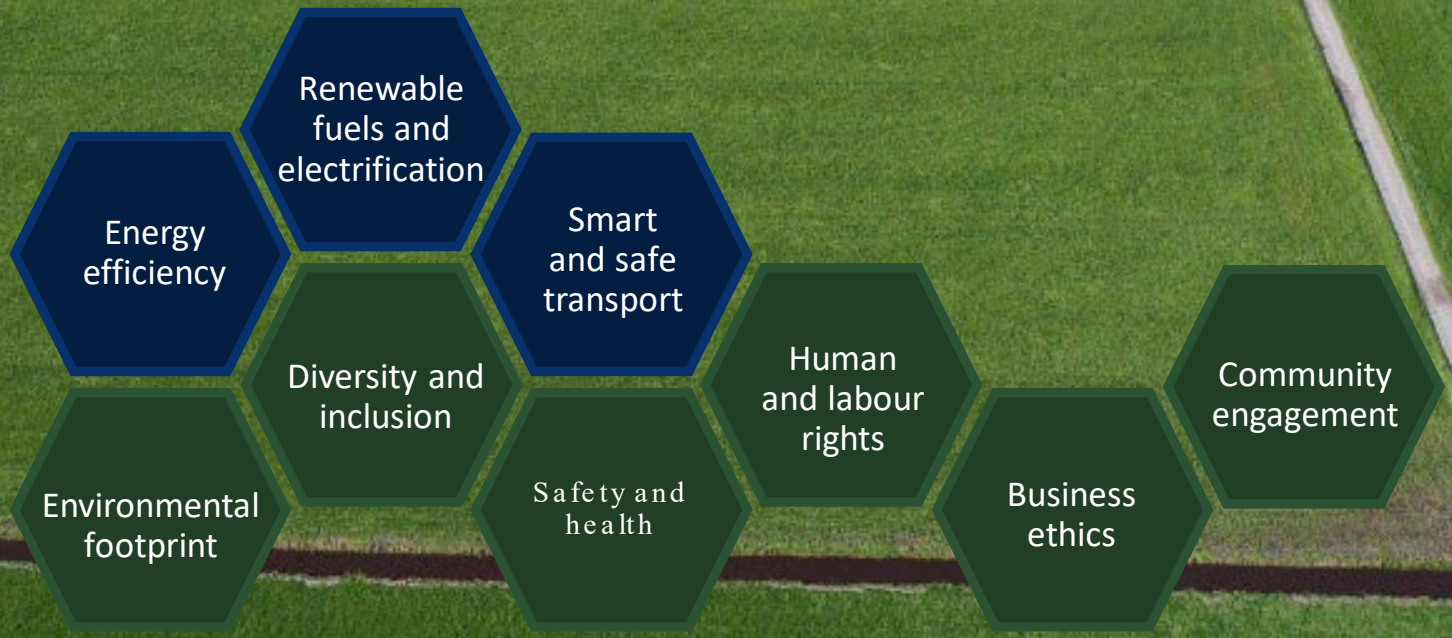
SUSTAINABILITY AT SCANIA

SUSTAINABLE TRANSPORT

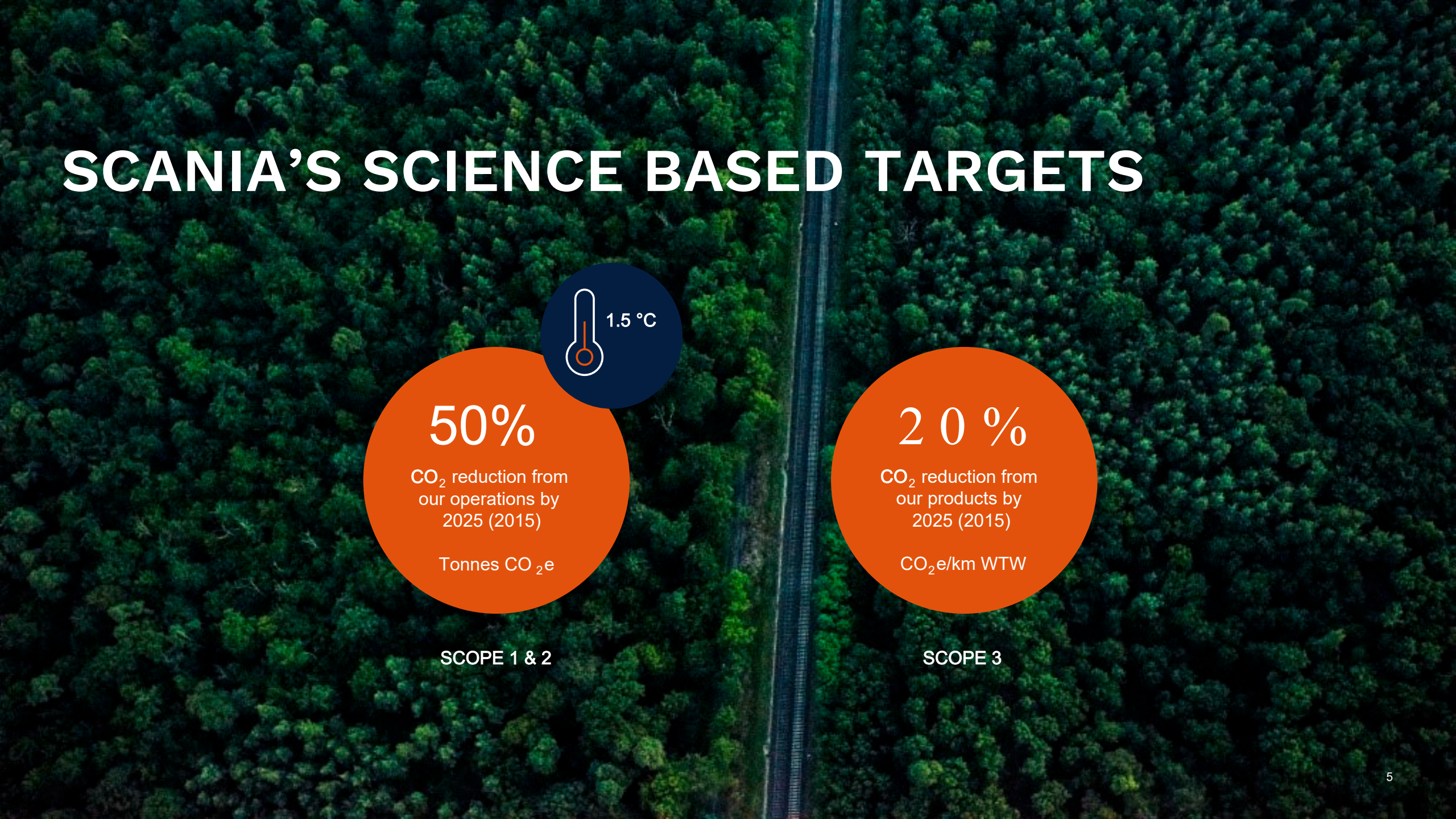
Doing the right things

RESPONSIBLE BUSINESS

Doing things right



SCANIA'S SCIENCE BASED TARGETS



SCANIA'S COMMITMENT – SCIENCE BASED TARGETS

<2°

Paris agreement 2015

Targets approved as "science -based" – in line with what is necessary to meet the goals of the Paris Agreement

f(x)

Aligning corporate carbon reduction targets with climate science

972

Companies committed (August, 2020)

PARTNER ORGANISATIONS

CDP DISCLOSURE INSIGHT ACTION

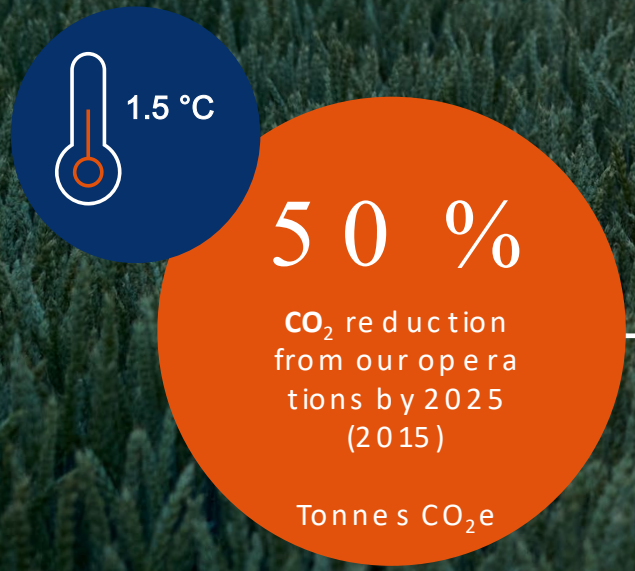
UN GLOBAL COMPACT

WORLD RESOURCES INSTITUTE

WWF

HOW TO REACH SBT

HOW TO IMPACT EMISSIONS FROM INTERNAL OPERATIONS?

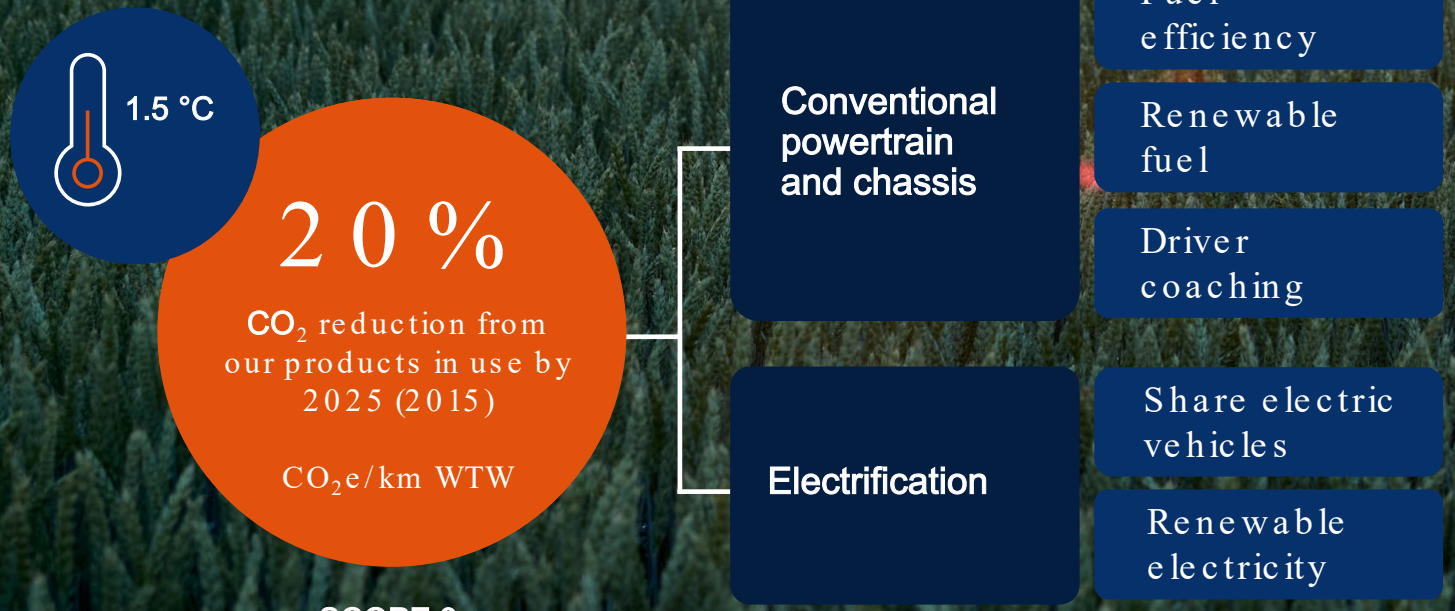


SCOPE 1 & 2

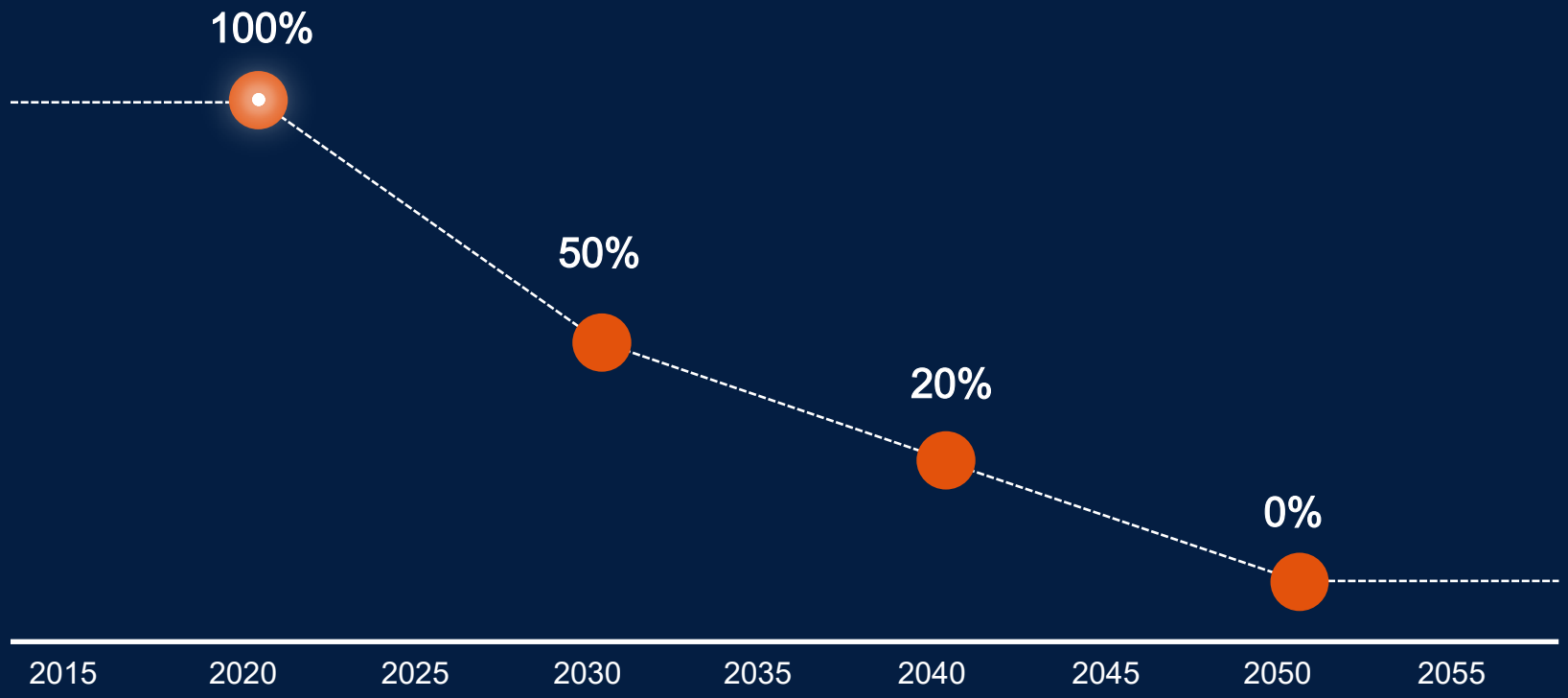
Energy Waste	Eliminate energy waste with e.g. Energy Kaizen
Energy Efficiency	Optimise heating, ventilation, lighting and production processes
Renewable energy	Fossil free electricity agreements Exchange fossil fuels to renenewables

HOW TO REACH SBT

HOW TO IMPACT CUSTOMER EMISSIONS?

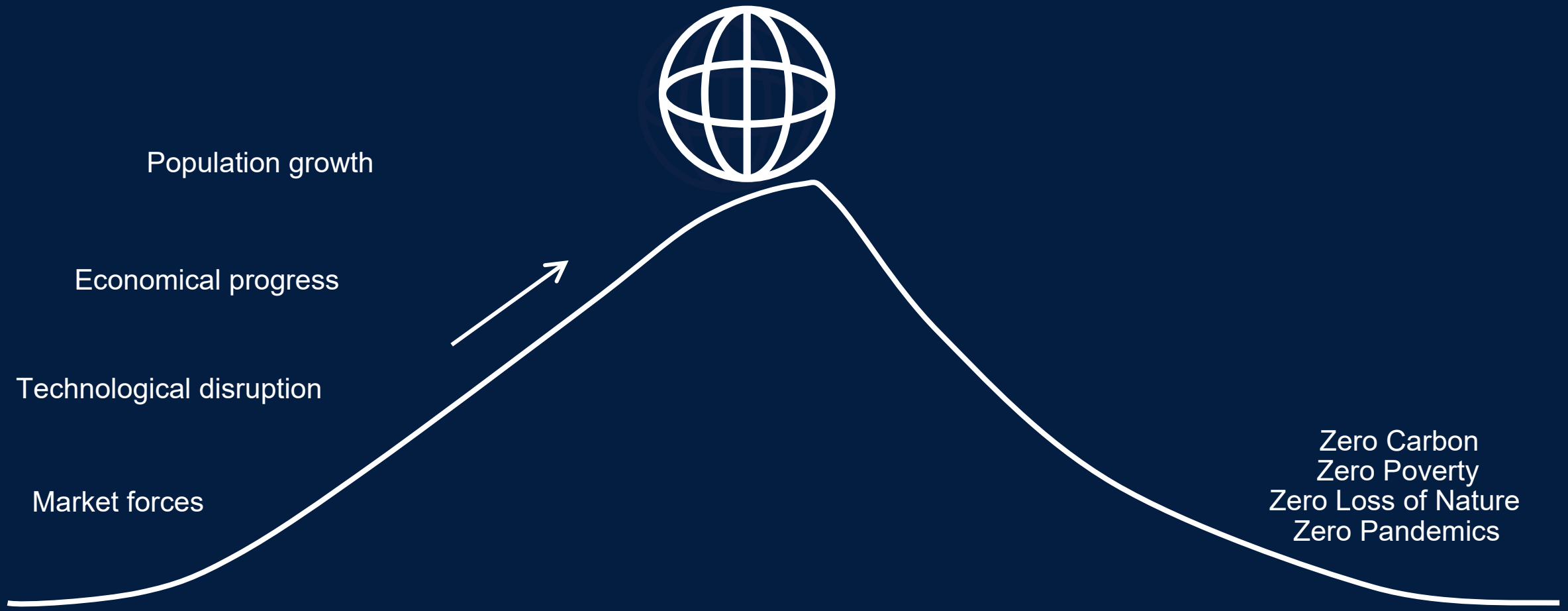


CARBON LAW – TRUE CHALLENGE FOR THE TRANSPORT SECTOR

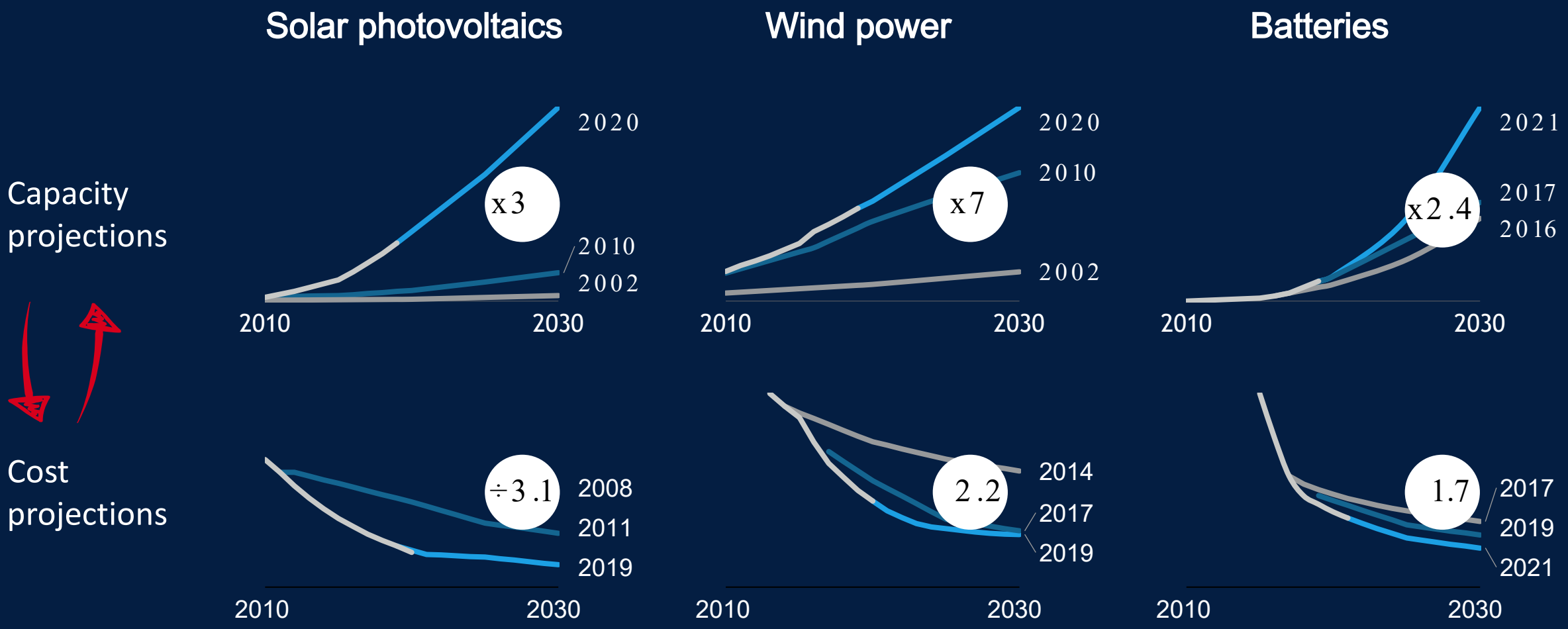


-50%
Every decade

2020S: THE FASTEST ECONOMIC TRANSITION IN HISTORY



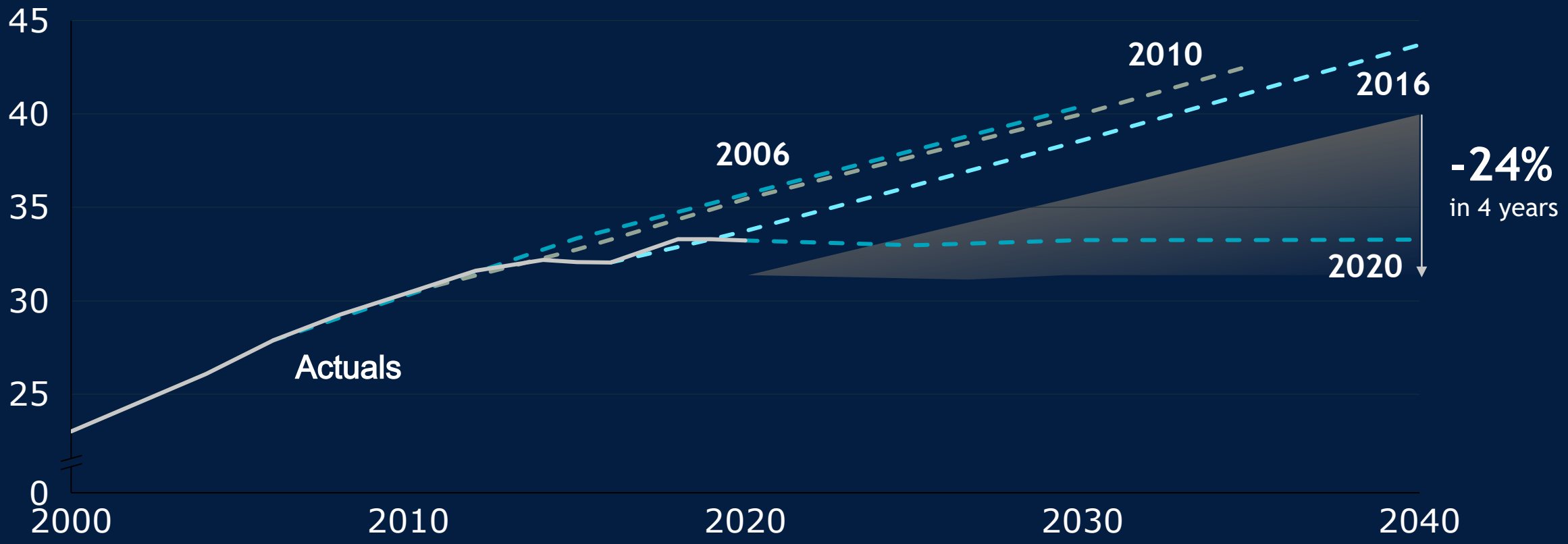
WE CAN‘T AFFORD TO UNDERESTIMATE TECHNOLOGY PROGRESS



From BCG - Source: IEA, BNEF, IRENA, BCG

WE CAN‘T AFFORD TO UNDERESTIMATE POLICY PROGRESS

Energy-related CO_2 emissions trajectory under IEA's most conservative scenario[1] *(Gt)*



From BCG - 1. 'Reference scenario" in 2006, Current Policies scenario in 2010 and 2016, Stated policies scenario in 2020
Source: IEA World Energy Outlook for 2006, 2010, 2016, 2019, 2020

SCANIA SBT SCOPE 3 KPI (-20% CO_2E/KM WTW)

Life Cycle Assessment (LCA)

Well-to-wheel (WtW)

Well-to-tank (WtT)

Tank-to-wheel (TtW)

Raw material extraction and refining

Battery production

Vehicle production

Fuel/electricity production, distribution

§ Legal scope = tailpipe

Maintenance

End-of-Life: Reuse, remanufacture, recycle, reuse

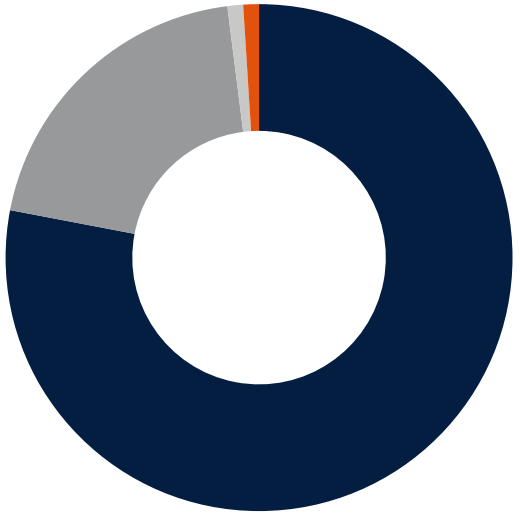
Biofuels comparisons (WtW)

Complete comparisons (full LCA)

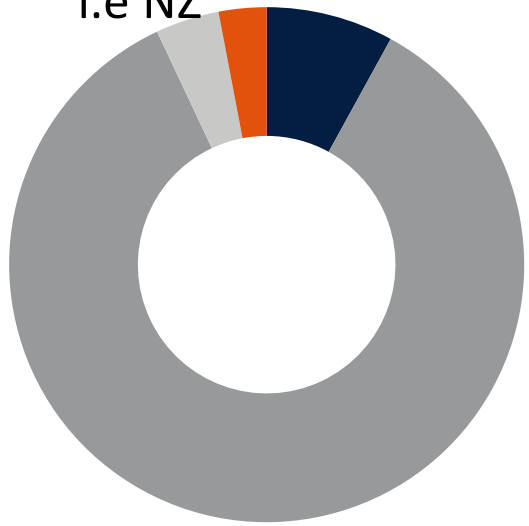
OUR CO2 IMPACT STEMS MAINLY FROM OUR PRODUCTS' USE PHASE
– BUT WILL CHANGE IN THE FUTURE

Combustion engine

BEV
(std electricity mix)



BEV
(green electricity)
i.e NZ



Use Production Maintenance Recovery

Source: Scania Life Cycle Assessment, 2020

WHERE WE ARE HEADING

AUTOMATION

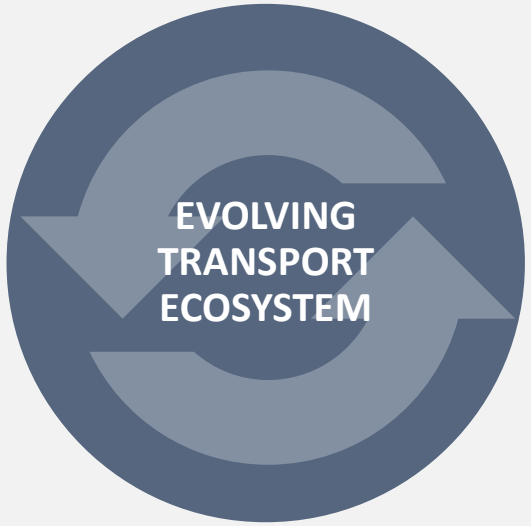
CONNECTIVITY

ELECTRIFICATION

TRANSPORT ECO-SYSTEM IS TRANSFORMING

GLOBAL TRENDS

- URBANISATION
- SUSTAINABILITY
- DIGITALISATION



INDUSTRY TRENDS

- CONNECTIVITY
- ELECTRIFICATION
- AUTOMATION

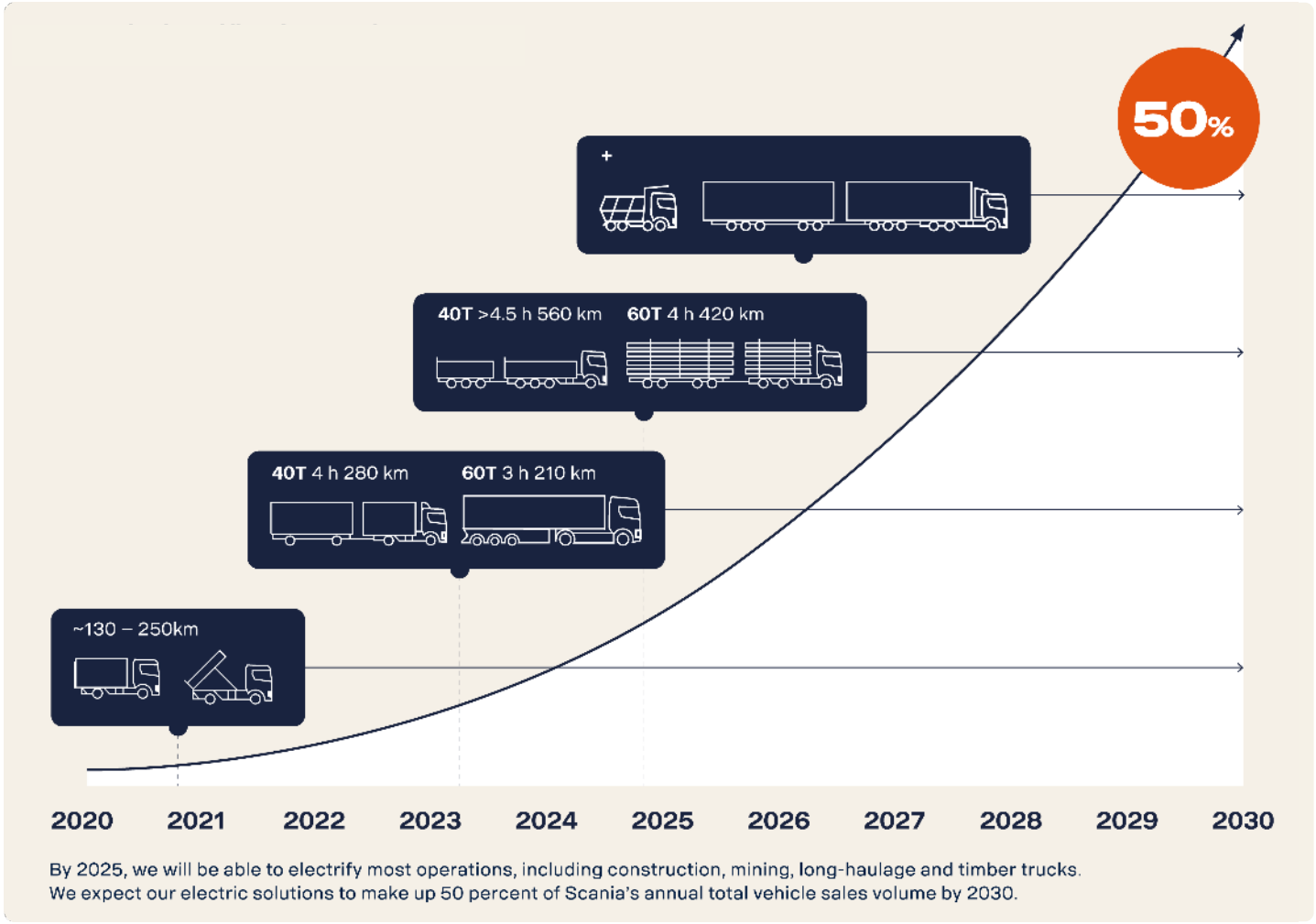
THE TRANSPORT INDUSTRY IS CHANGING

ELECTRIFICATION

50%

By 2030, more than half of our new vehicles sales volume is expected to come from electrically powered vehicles.

OUR ELECTRIFICATION ROADMAP



By 2030, more than half of our new vehicles sales volume is expected to come from electrically powered vehicles

REGIONAL BEV – 610 HP 6X4 @ 625 KW INSTALLED CAPACITY
PALMERSTON NORTH - WELLINGTON- NZ

IRTENZ EXAMPLE

Regional BEV

Results

Vehicle definition

Vehicle type
Regional BEV

Wheel config
B6x2*4 + Trailer

Average GTW
30 ton

Application
General cargo

Transport mission

Climate
Mixed (8°C)

Topography
Mostly flat

Daily distance
300 km

Yearly mileage
120000 km

Driving conditions
Regional - Mixed traffic

Batteries

Installed battery capacity
624 kWh

SOC window
75 %

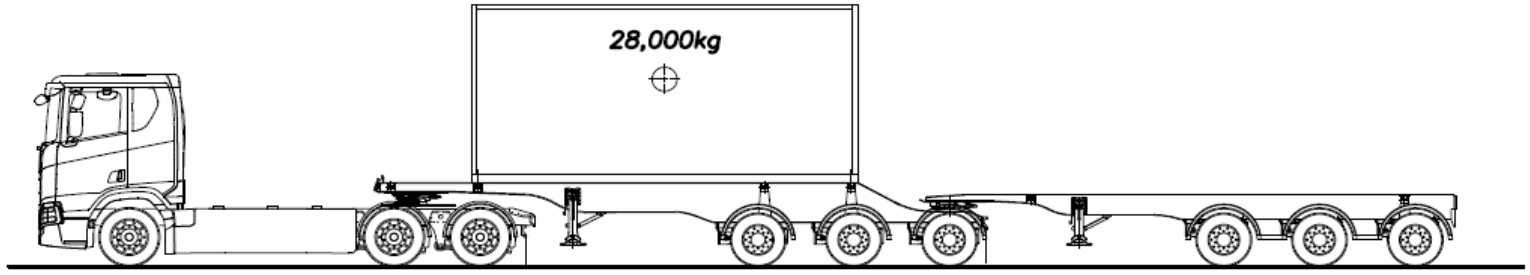
80% SoH range:
290 km

Energy consumption (kWh/km)		Driving range (km)	
Without PTO	With PTO	Without PTO	With PTO
1.29	1.29	363	363

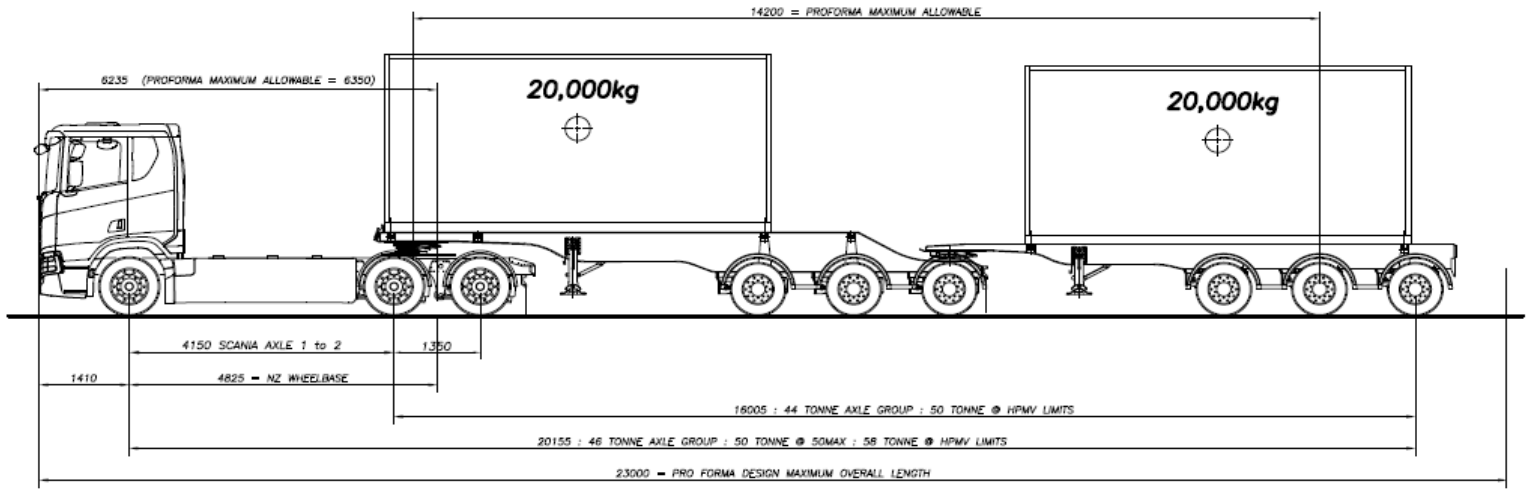
DECARBONISING HEAVY FREIGHT IN NEW ZEALAND IS POSSIBLE

THAT IS IF CURRENT VEHICLE AND DIMENSIONS (VDAM) ARE ADAPTED TO SUIT

PRELIMINARY ONLY – SUBJECT TO CLIENT APPROVAL



AXLE LOADING :	7980	16775	18995	2250	46000kg GROSS



AXLE LOADING :	7925	16140	17185	16750	58000kg GROSS

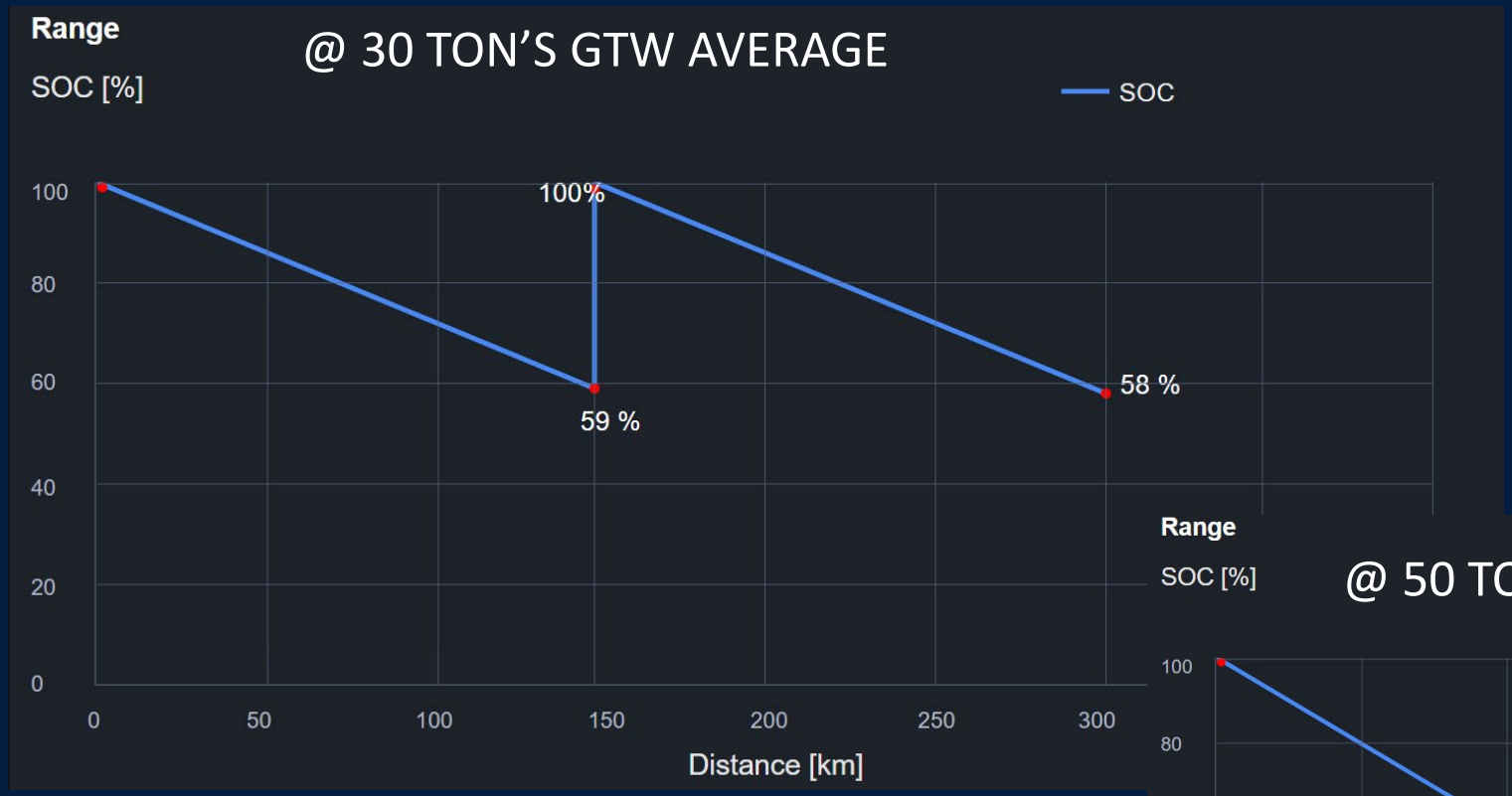
** NOTE : COMBINATION GROSS OF 58 TONNE ASSUMES 50T AXLE 3 TO 9 LIMIT PLUS 8.0 TONNE* LIMIT ON STEER AXLE / 17 TONNE* LIMIT ON DRIVE AXLES * SUBJECT TO APPROVAL FOR EV TRACTOR

PATCHELL

HPMV 23 METRE "LONG TRACTOR" B' TRAIN PROFORMA DESIGN

ESTIMATED TARE WEIGHTS – TRUCK 11700kg / FRONT SEMI 3450kg / REAR SEMI 2850kg – 18000kg TOTAL TARE
SCANIA ESTIMATED TARE SPLIT 6975kg FRONT, 4725kg REAR WITH DRIVER, FIFTH WHEEL AND NO SIDE SKIRTS

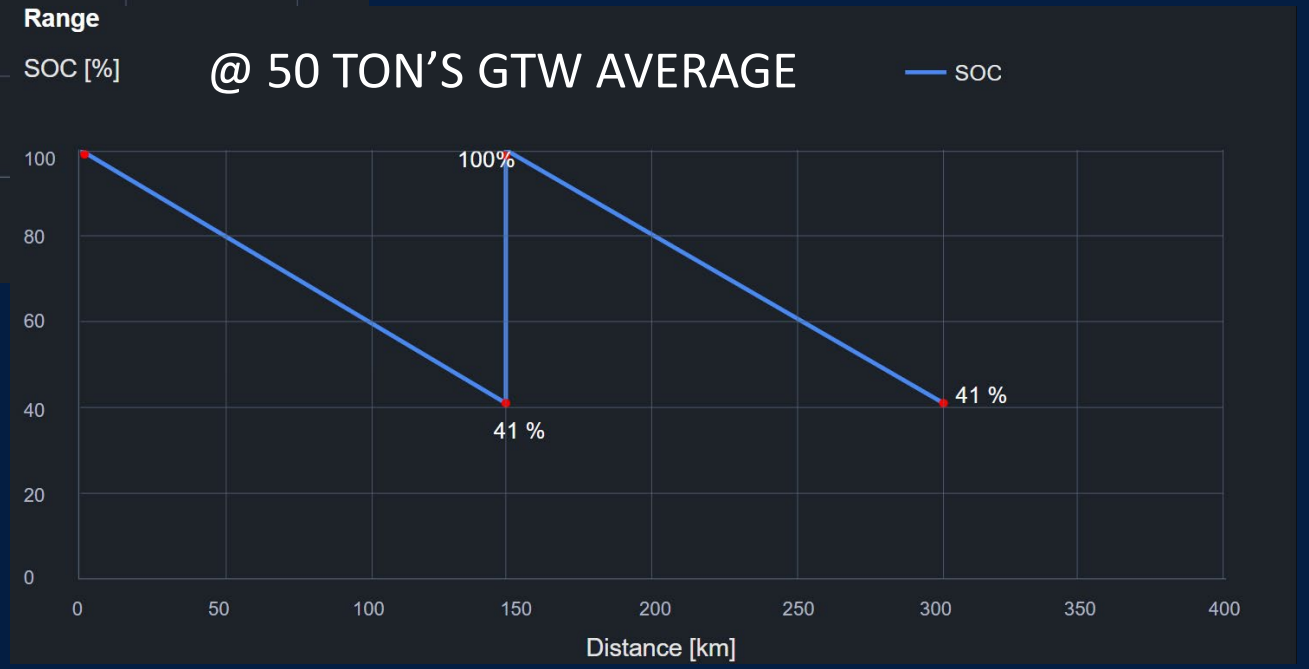
PRELIMINARY ONLY – SUBJECT TO CLIENT APPROVAL

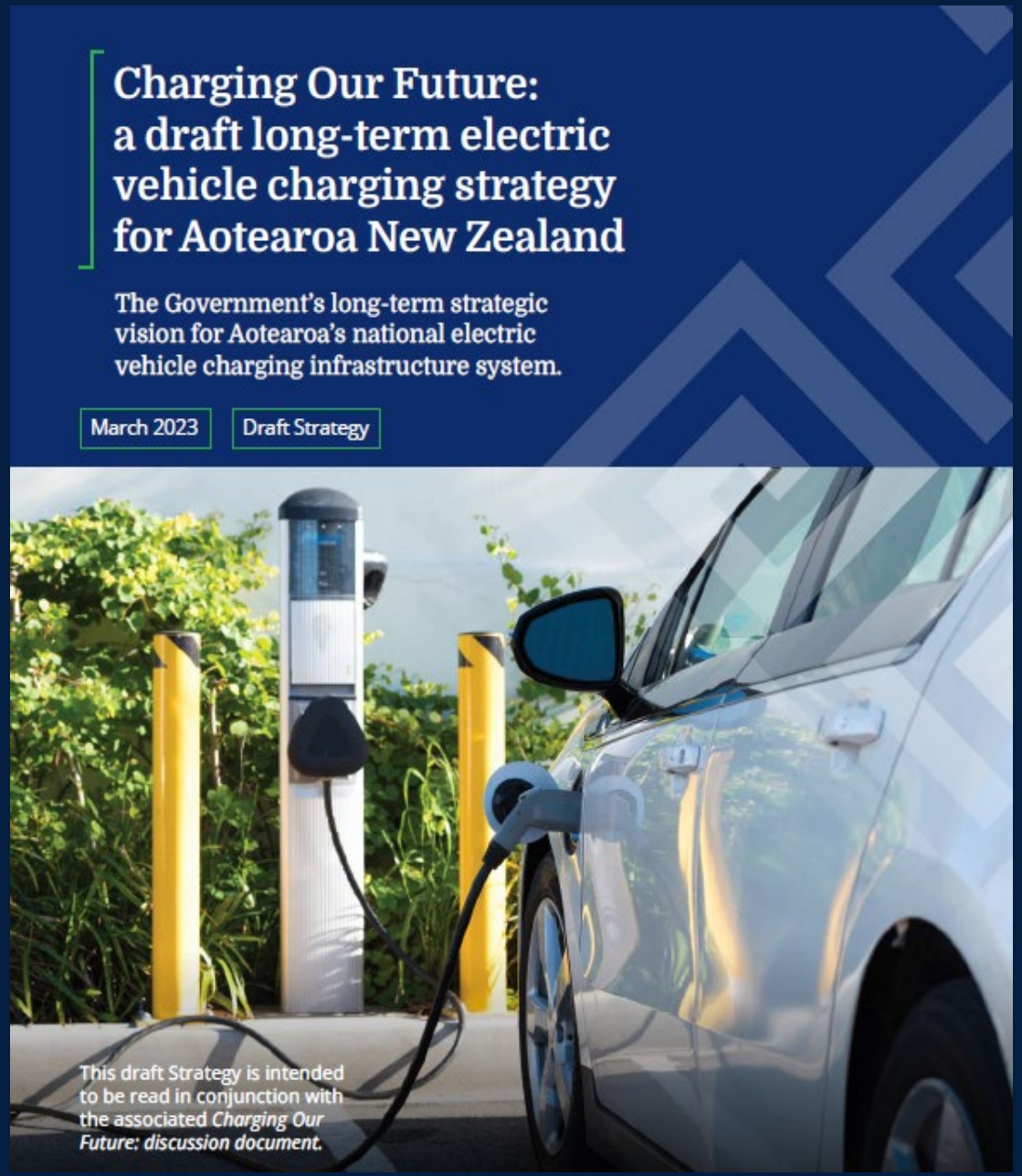


Route Analysis
Palmerston North – Wellington

Charger @ 375 KW

Time 45 Min < Less





THE NATIONAL CHARGING STRATEGY AND ROUTE INFRASTRUCTURE ROLL OUT FOR HEAVY FREIGHT IS CRITICAL.

- ROUTE
- DEPOT
- DESTINATION

NZ POLITICAL DECARBONISATION AMBITION

VDAM future for Heavy BEV / Hydrogen

Prescriptive or Adaptable ?

Will Pavement and Asset Protection deter decarbonisation efforts ?

Increased Dimensions
Axle Mass & Overall Length ?

Improving, Retaining or Sacrificing Freight Efficiency ?

- **Axle Mass increase**
  - **Front Axle**
  - **Rear Axle**
- **Wheel base increase**
- **Overall Length**

New Pro-forma Developments for BEV/ Hydrogen

Industry Working group ?

SCANIA

SCANIA