Centro de Capacitación | AAP ASOCIACIÓN AUTOMOTRIZ DEL PERÚ FUNDADA EN 1926

ACTUALÍZATE

CONGRESO INTERNACIONAL NUEVAS TECNOLOGÍAS AUTOMOTRICES

I EDICIÓN VIRTUAL

Centro de Capacitación | AAP ASOCIACIÓN AUTOMOTRIZ DEL PERÚ FUNDADA EN 1926

EDUARDO LANDEO

SUSTAINABILITY HERE AND NOW

SCANIA

CONGRESO INTERNACIONAL DE NUEVAS TECNOLOGÍAS AUTOMOTRICES - I EDICIÓN VIRTUAL

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Sustainable transport

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18°
ANTARCTICA
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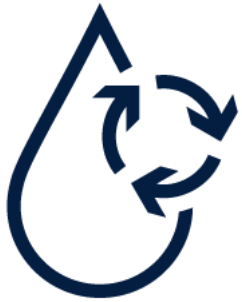
OUR APPROACH TO SUSTAINABLE TRANSPORT

Energy efficiency

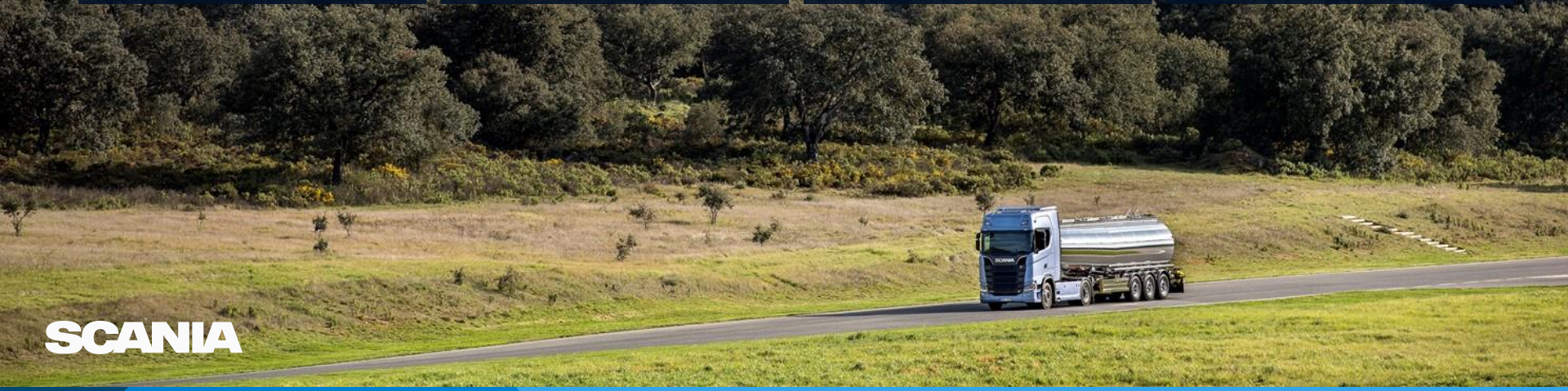
Smart and safe transport



Renewable fuels and electrification

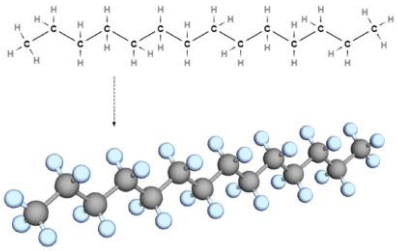
ENERGY EFFICIENCY

New truck range	Optimised specification	Optimised driving	Optimised maintenance
Average 5% fuel savings	Based on operational analysis	Scania Driver services	Maintenance+



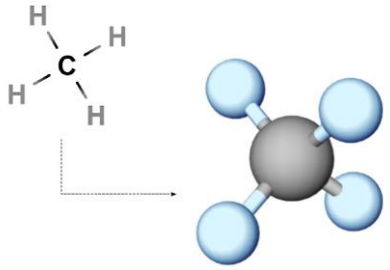
ENERGY EFFICIENCY

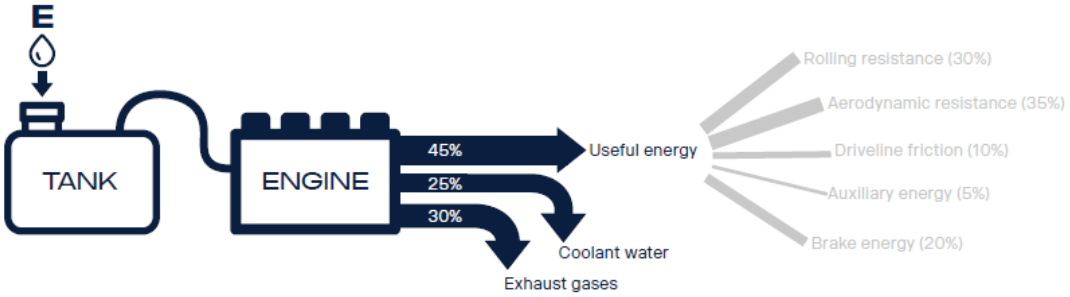
DIESEL MOLECULES

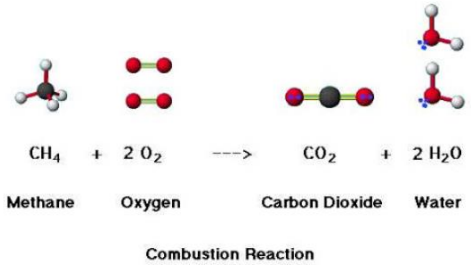


$$\text{Diesel Fuel} + \text{Air} \xrightarrow{\text{compression}} \text{Carbon Dioxide} + \text{Carbon Monoxide} + \text{Water} + \text{Oxygen} + \text{Nitrogen} + \text{Oxides of Nitrogen} + \text{Hydrocarbons} + \text{Particulates} + \text{Mechanical Energy}$$

METHANGAS







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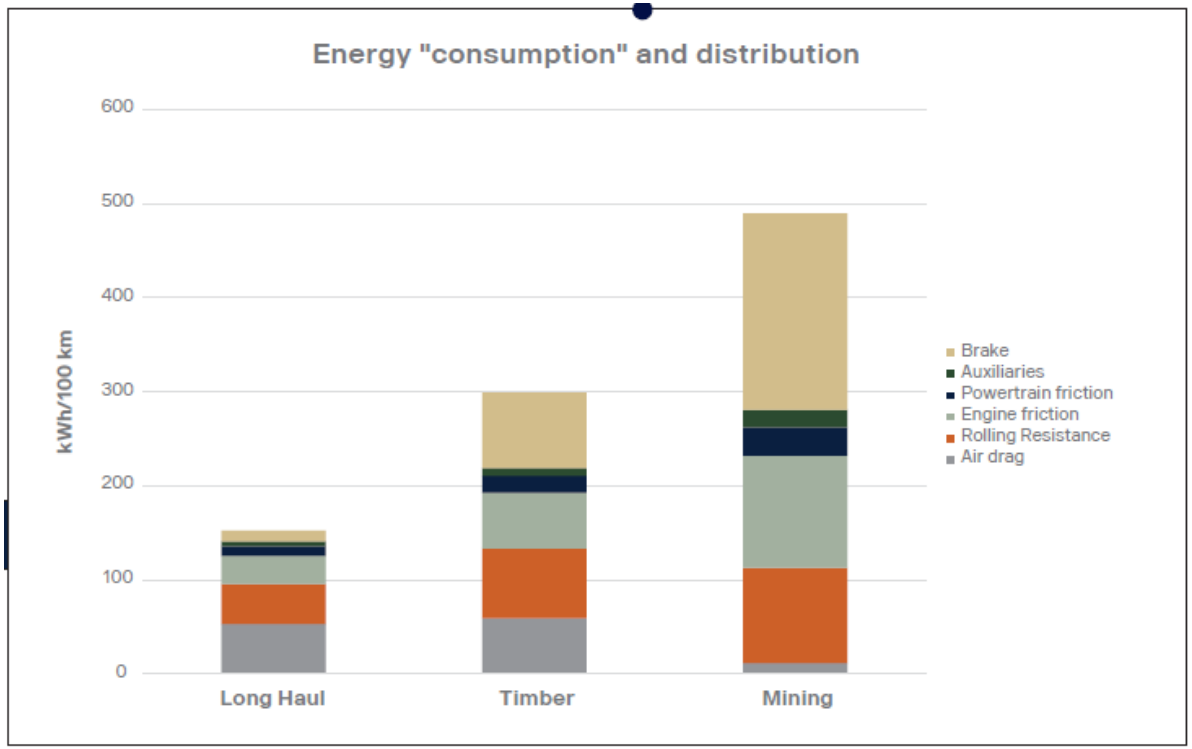
ENERGY EFFICIENCY



Fuel consumption= g/kWh · kWh/km » [g/km] ~ [L/km]

Reducing energy Losses [kWh/km]

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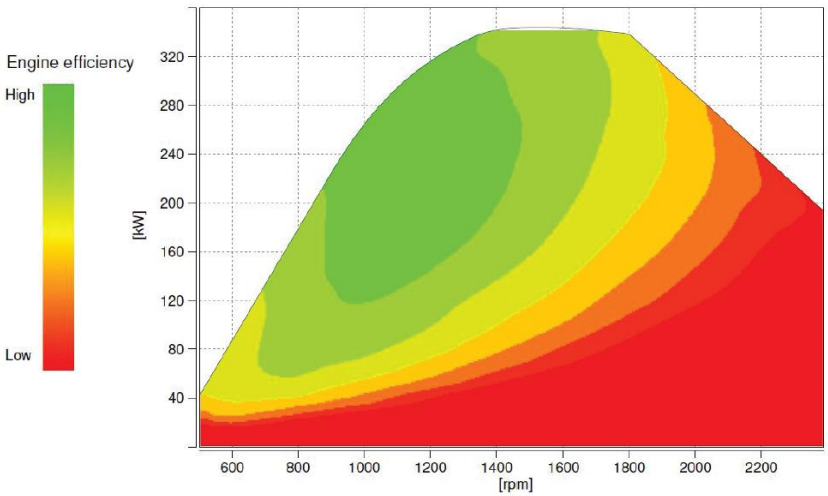
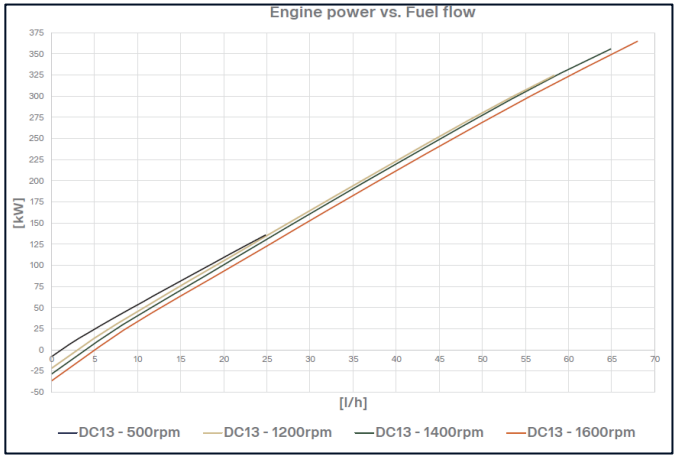
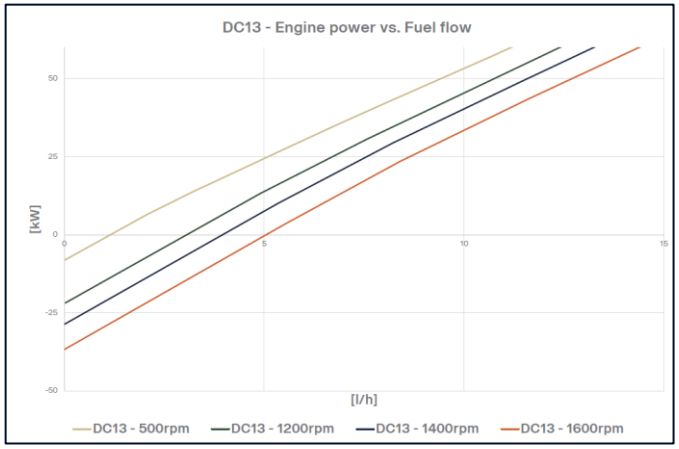
ENERGY EFFICIENCY







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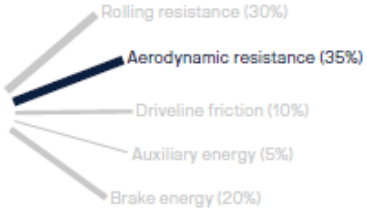
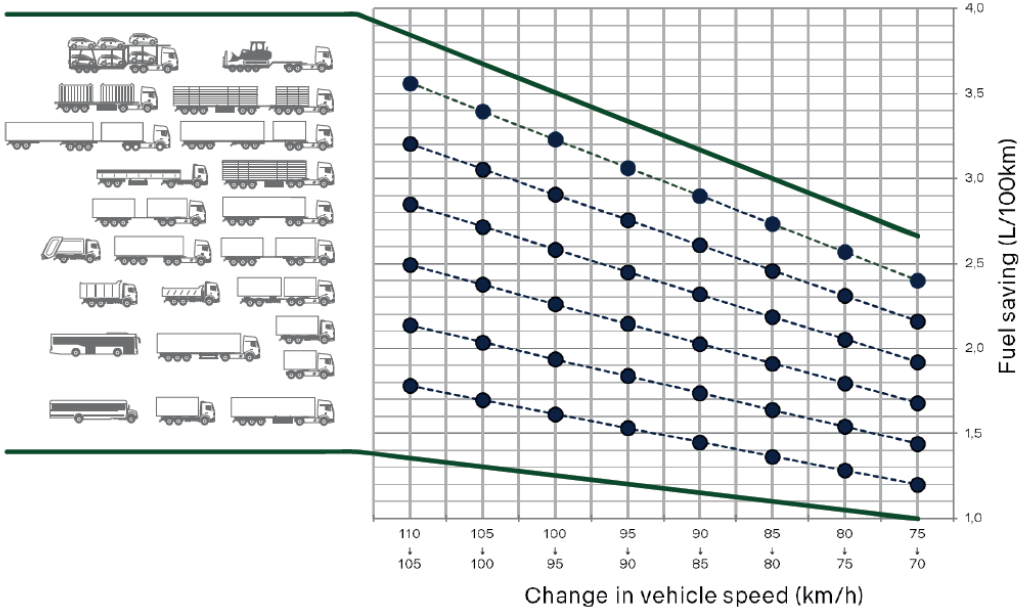
AIR RESISTANCE





To calculate the instantaneous air resistance (F_D), the following formula can be used:

$F_D = 1/2 \times \text{Area} \times \text{density} \times C_D \times \text{Velocity}^2$

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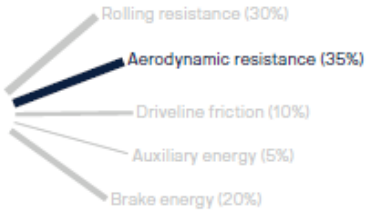
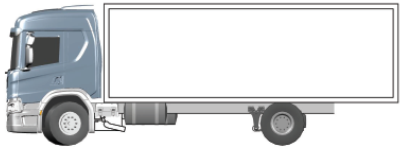
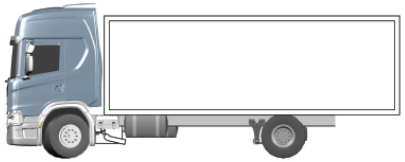
AERODYNAMIC RESIS

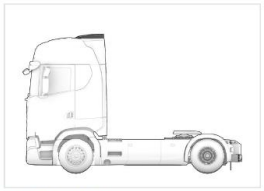


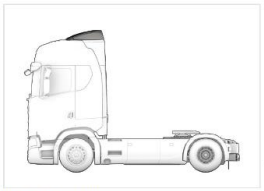
Case 1:
Cab is too high
As an example the total height of a G20H vehicle with a roof air deflector is approximately 3700mm as compared to a P20N truck with a height of 3400mm. If the P20N variant is more comparable with the height of the bodywork and the total height of the vehicle will be reduced by 300mm. This reduction in frontal area and thus aerodynamic drag will result in a fuel consumption reduction at 89 km/h of about 1.8 L/100km.





Case 2:
Wrong air deflector chosen
A roof air deflector that is higher than the bodywork results in an increased energy consumption due to the increased frontal area. The typical case would be a vehicle that is operated with a bodywork lower than 4m and which is specified with a 25cm or 65cm roof air deflector. For a R20N vehicle with a bodywork height of 3600mm the 5cm roof air deflector will have a fuel consumption that is approximately 1.2 L/100km lower than for the same vehicle with a 25cm roof air deflector.


(5cm_High_12cm_long)


(5cm_High_12cm_long)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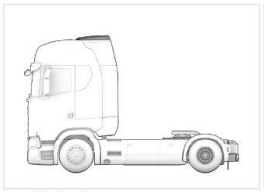
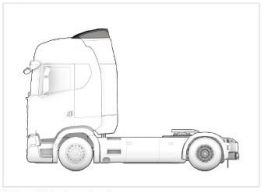
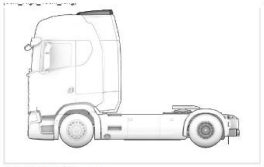
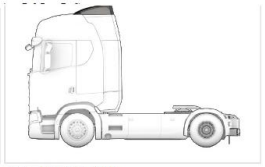

(5cm_High_45cm_long)


(25cm_High_45cm_long)


(5cm_High_53cm_long)


(25cm_High_53cm_long)

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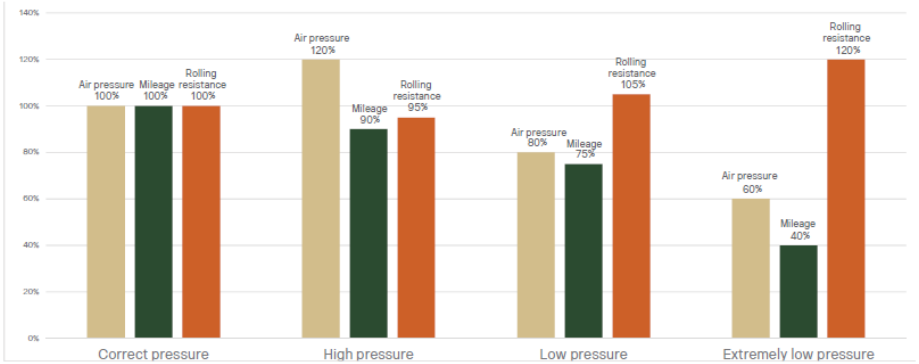
ROLLING RESISTANCE

$F_{ROLL} = C_r \times N$

Rolling resistance is low. There is no deformation in the tyre or the road surface.

Rolling resistance is due to tyre deformation.

Very high resistance due to soft road surface.



Regional
Tyres designed to operate on secondary roads, in urban areas, city traffic and frequent stop-and-go traffic. Also suitable for long-haulage operation on rough roadways.

Urban
Tyres for urban traffic with many starts and stops. These tyres may have thicker side walls in order to withstand wear against kerb edges. Optimised for lower speeds.

Construction
Tyres to drive mainly on gravel roads or other uneven surfaces where there is a greater risk of punctures and where traction is required.

Off-road
Tyre designed to perform best outside the regular roads. These tyres are excellent for traction but are ill suited for traveling longer distances on regular roads since they have a huge fuel penalty and will wear out fast.

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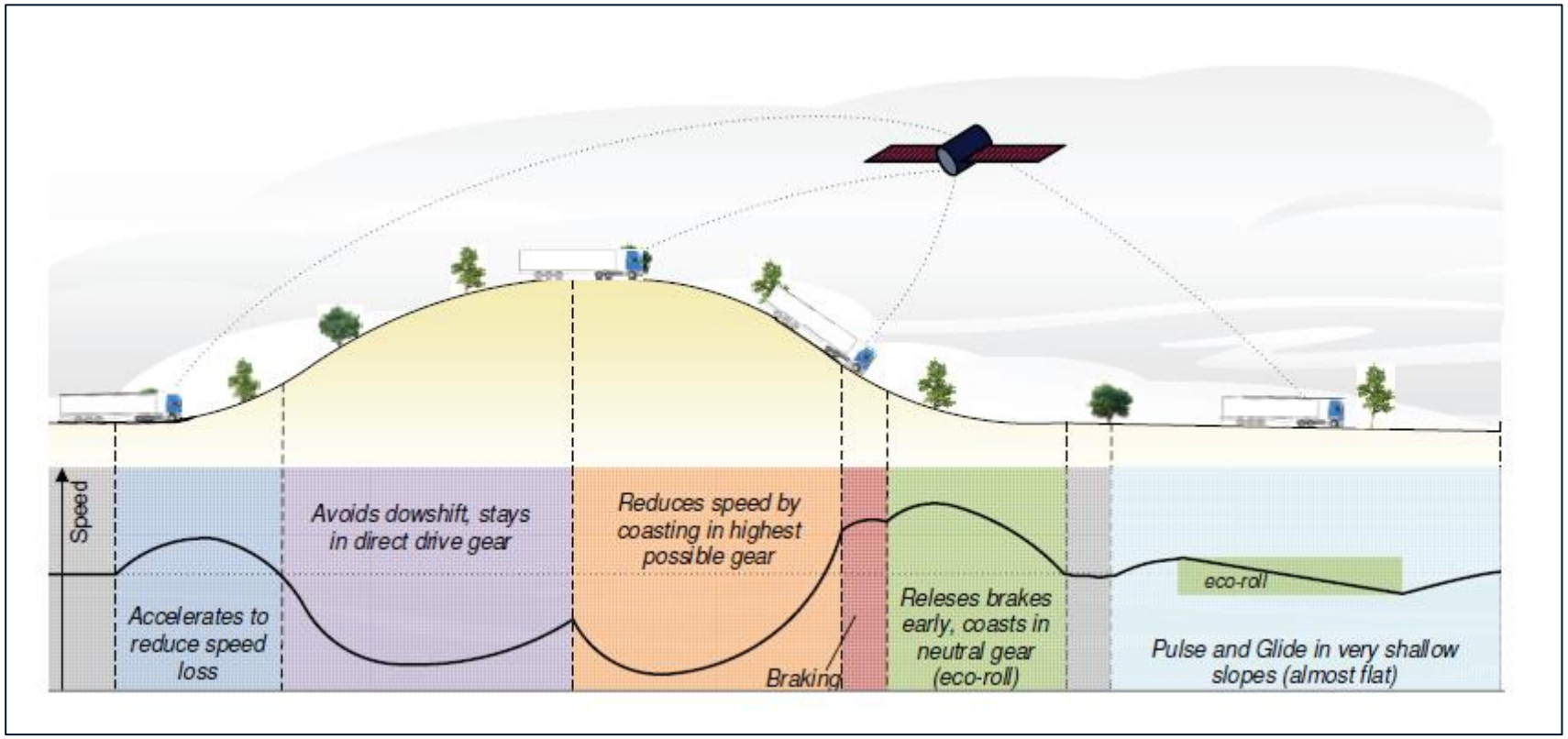
DRIVER BEHAVIOUR



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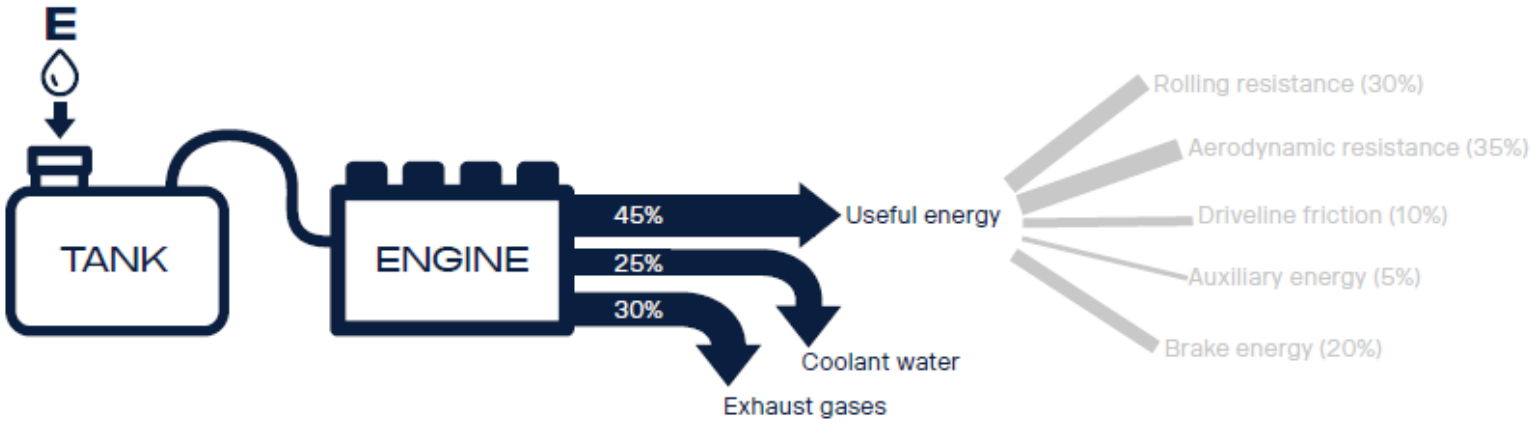
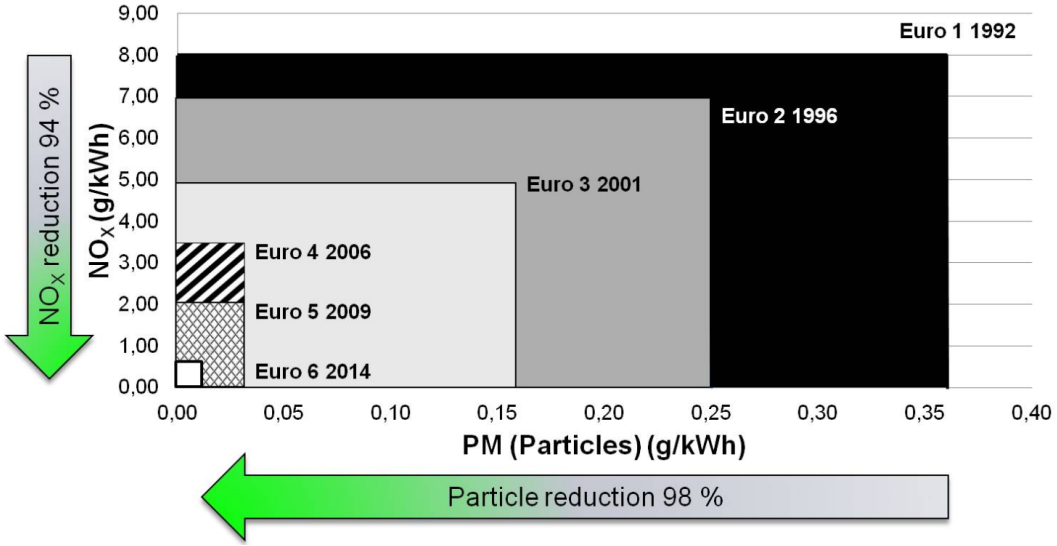
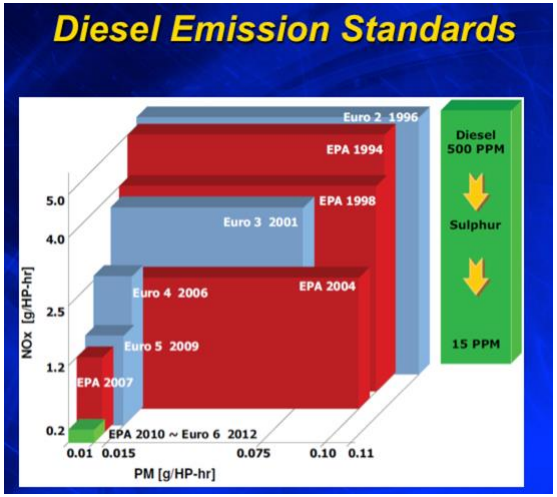
ENERGY EFFICIENCY



CO2

EU EMISSION





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LEGAL REGULATION

II.7 VEHÍCULOS CON MOTORES CONVENCIONALES DIESEL, INCLUYENDO DE INYECCIÓN ELECTRÓNICA, RECIRCULACIÓN DE GASES DE ESCAPE y/o CATALIZADORES DE OXIDACIÓN								
VEHÍCULOS DE PASAJEROS o DE CARGA > 3,5 Ton PBV								
Año aplicación (**)	Norma	Ciclo	Directiva	CO g/kW-h	HC g/kW-h	NOx g/kW-h	PM g/kW-h	Humo (m^{-1})
2003 al 2006	EURO II o mayor	13 pasos	96/1/EC	4,00	1,10	7,00	0,15 0,25 (1)	-----
2007 al 2015	EURO III o mayor	ESC + ELR	1999/96/EC: A	2,10	0,66	5,00	0,10 0,13 (1)	0,80
2016 en adelante	EURO IV o mayor	ESC + ELR	1999/96/EC: A	1,50	0,46	3,50	0,02	0,50

* Para vehículos pesados la certificación corresponde al motor

(1) Para motores con cilindradas de menos de 750 cc por cilindro y una potencia máxima a más de 3000 RPM

DISPOSICIONES COMPLEMENTARIAS FINALES

Primera.- Cronograma que establece la implementación periódica de la comercialización y uso del Diésel B5 con un contenido de azufre no mayor a 50 ppm

A propuesta del Grupo de Trabajo Multisectorial, la Autoridad Competente aprobará mediante Decreto Supremo, en un plazo no mayor a treinta (30) días hábiles contados a partir de la entrada en vigencia de la presente norma, un cronograma para la implementación periódica de la comercialización y uso del Diésel B5 con un contenido de azufre no mayor a 50 ppm en los departamentos priorizados, de acuerdo a los criterios establecidos en la normatividad vigente.

Segunda.- Aplicación del Euro IV y Tier 2

Dispónganse la aplicación de los Límites Máximos Permisibles de los acápites II.3 a II.8 del Anexo I del Decreto Supremo N° 047-2001-MTC, que aprueba los Límites Máximos Permisibles de Emisiones Contaminantes para Vehículos Automotores que Circulen en la Red Vial, para vehículos con tecnología Euro IV y Tier 2, a partir del 31 de diciembre del 2017.

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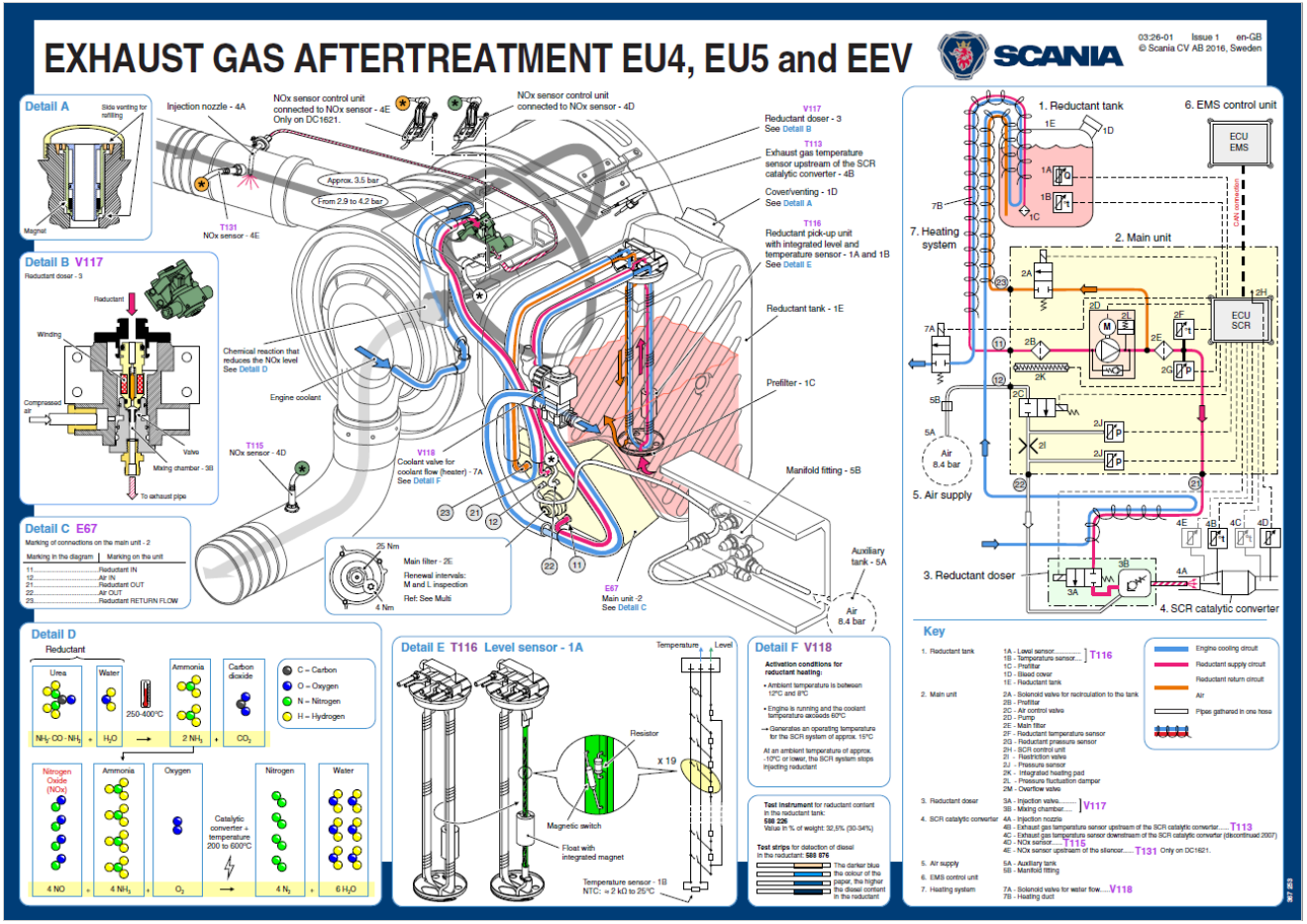
EXHAUST GAS AFTERTREATMENT EU4, EU5 and EEV
SCANIA
03:26-01 Issue 1 en-GB
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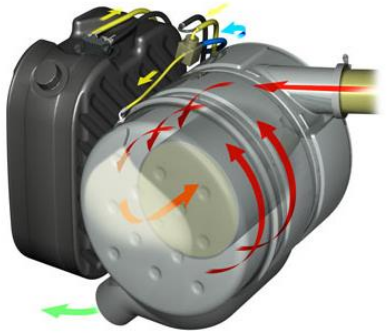
Detail A
Detail B V117
Detail C E67
Detail D
Detail E T116 Level sensor - 1A
Detail F V118
Injection nozzle - 4A
NOx sensor control unit connected to NOx sensor - 4E Only on DC1621.
NOx sensor control unit connected to NOx sensor - 4D
V117 Reductant doser - 3 See Detail B
T112 Exhaust gas temperature sensor upstream of the SCR catalytic converter - 4B
Cover/venting - 1D See Detail A
T116 Reductant pick-up unit with integrated level and temperature sensor - 1A and 1B See Detail E
Reductant tank - 1E
Prefilter - 1C
Manifold fitting - 5B
Auxiliary tank - 5A
Air 8.4 bar
Engine coolant
Chemical reaction that reduces the NOx level See Detail D
V118 Coolant valve for coolant flow (heater) - 7A See Detail F
T131 NOx sensor - 4E
T115 NOx sensor - 4D
E67 Main unit -2 See Detail C
Main filter - 2E
Renewal intervals: M and L inspection
Ref: See Multi
Approx. 3.5 bar
From 2.9 to 4.2 bar
1. Reductant tank
6. EMS control unit
ECU EMS
7. Heating system
2. Main unit
ECU SCR
5. Air supply
3. Reductant doser
4. SCR catalytic converter
Key
Engine cooling circuit
Reductant supply circuit
Reductant return circuit
Air
Pipes gathered in one hose
Reductant
Urea
Water
Ammonia
Carbon dioxide
250-400°C
C – Carbon
O – Oxygen
N – Nitrogen
H – Hydrogen
Nitrogen Oxide (NOx)
Oxygen
Nitrogen
Catalytic converter + temperature 200 to 600°C
Resistor
x 19
Magnetic switch
Float with integrated magnet
Temperature sensor - 1B
NTC: ≈ 2 kΩ to 25°C
Activation conditions for reductant heating:
Ambient temperature is between 12°C and 8°C
Engine is running and the coolant temperature exceeds 60°C
Generates an operating temperature for the SCR system of approx. 15°C
At an ambient temperature of approx. -10°C or lower, the SCR system stops injecting reductant
Test instrument for reductant content in the reductant tank: 588 226
Value in % of weight: 32,5% (30-34%)
Test strips for detection of diesel in the reductant: 588 876
The darker blue the colour of the paper, the higher the diesel content in the reductant



ALTERNATIVE FUELS

Renewable fuels
and electrification

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FUEL IMPACT AVAILABILITY

Three elements that can impact on the availability of the fuel

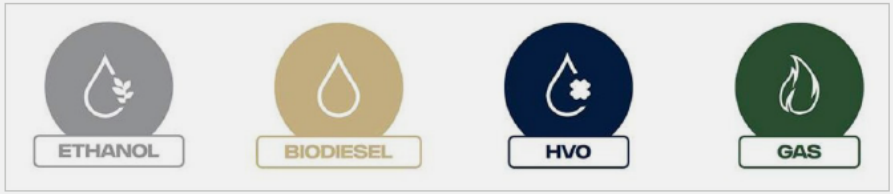
First, the fuel has to reduce CO_2 because otherwise it will never contribute to reducing the climate impact.

The Second criteria means that there must be sufficient quantities of the fuel available in the work because otherwise it will never be able to make a difference.

And thirdly, not only refers to the price of the fuel itself but the complete package.

So if a fuel fulfill these three crieterias we say that it is a commercial alternative fuel. There are today four commercial alternative fuels that fulfills these criterias.

Those are Ethanol, Biodiesel, HVO and Methane gas.



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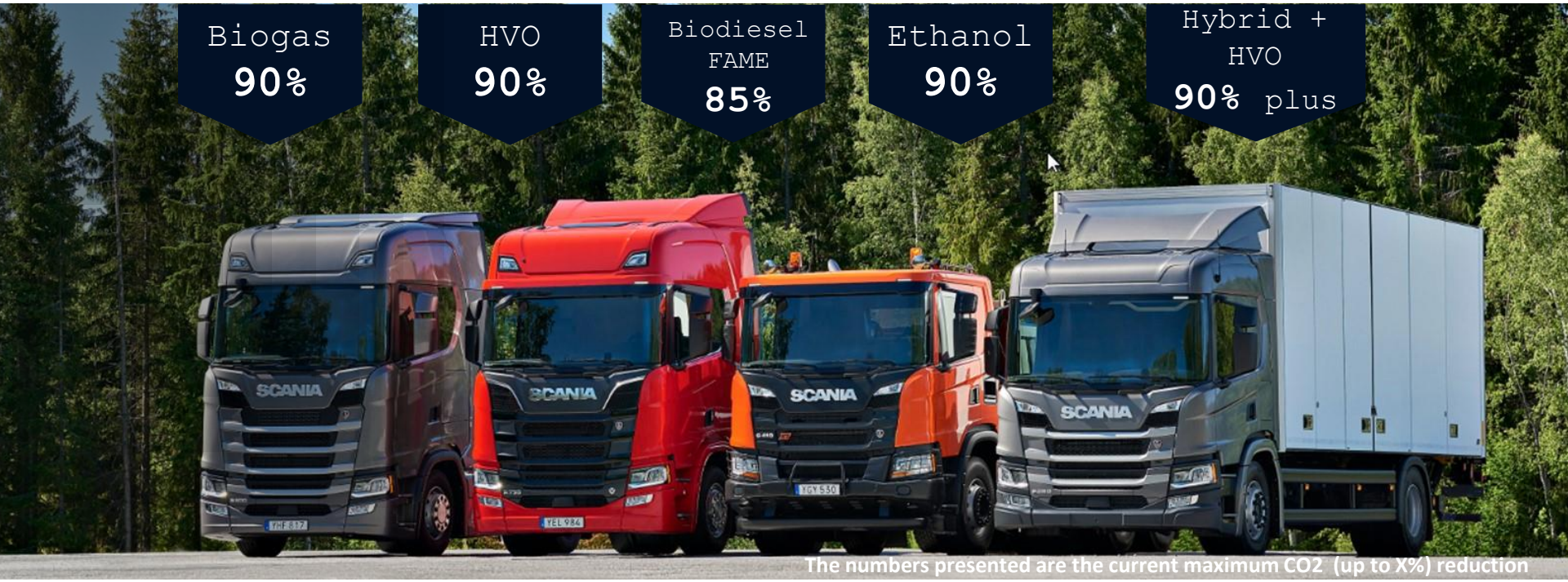
CO2 REDUCTION TO BE REACHED HERE AND NOW



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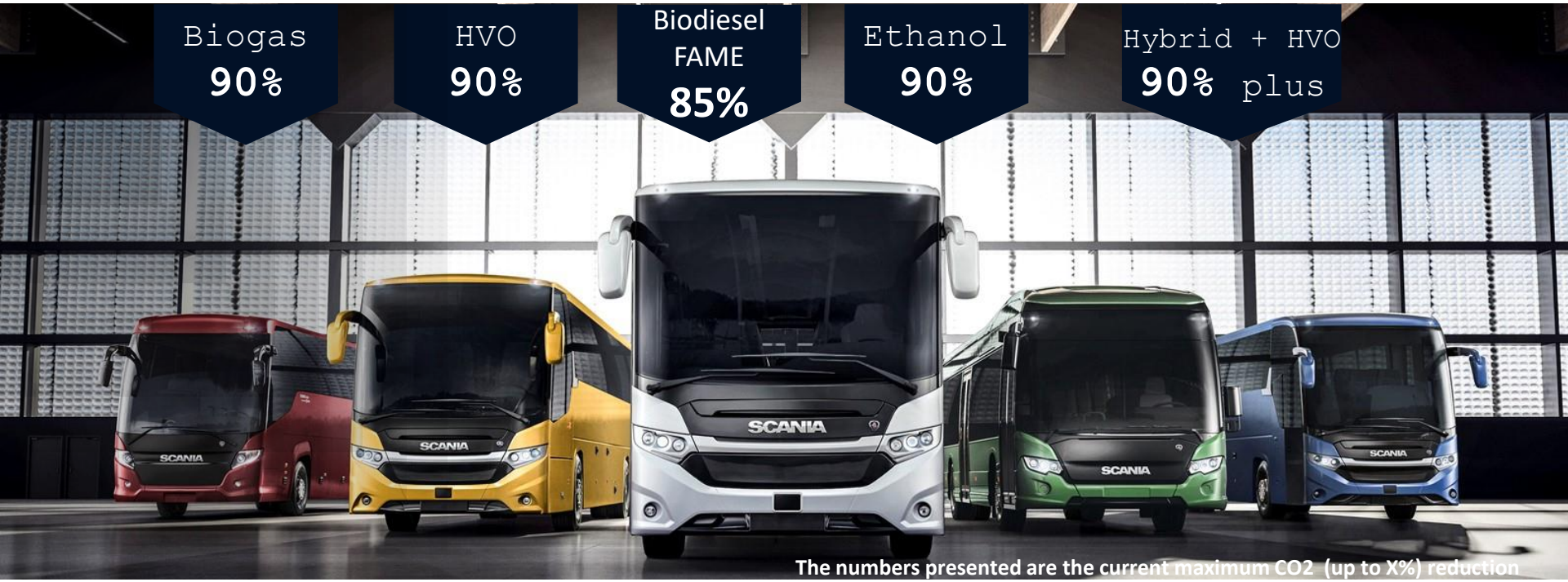
CO2 REDUCTION TO BE REACHED HERE AND NOW



The numbers presented are the current maximum CO2 (up to X%) reduction

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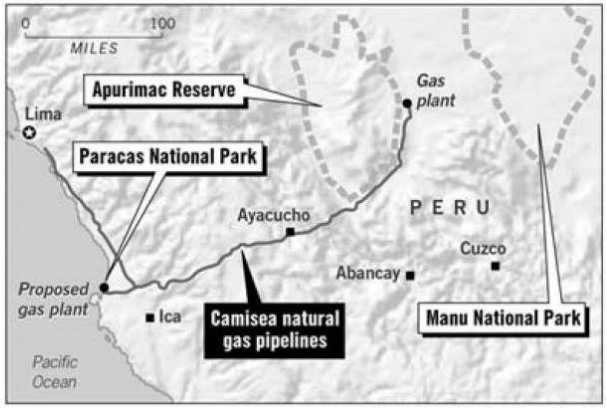
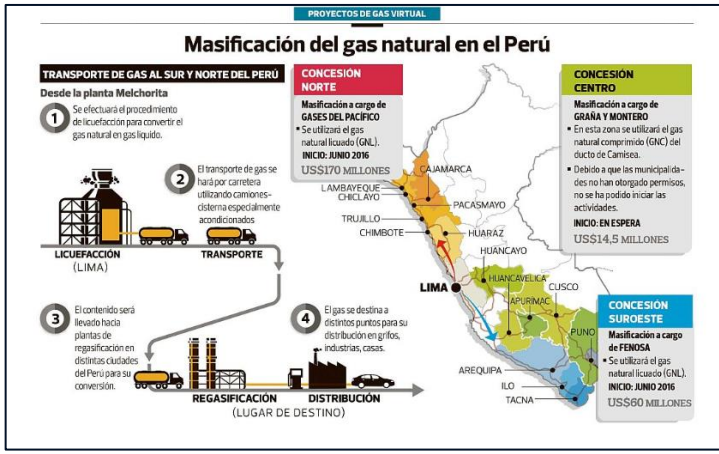
START WITH NATURAL



Source: ESRI Chronicle and New York Times Graphic



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ADVANTAGES OF NATURAL GAS

There are more gas than oil available in the world

Natural gas is a fossil fuel but results in up to 15% less CO2

Biomethane (biogas) is renewable.
often made from local waste products. Up to 90% less CO2.

More countries have gas than those who have oil

The price can be locally set.
It can give low price

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WHAT IS NATURAL GAS?

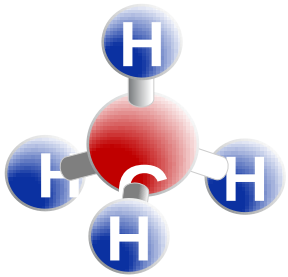
CNG
Compressed natural Gas

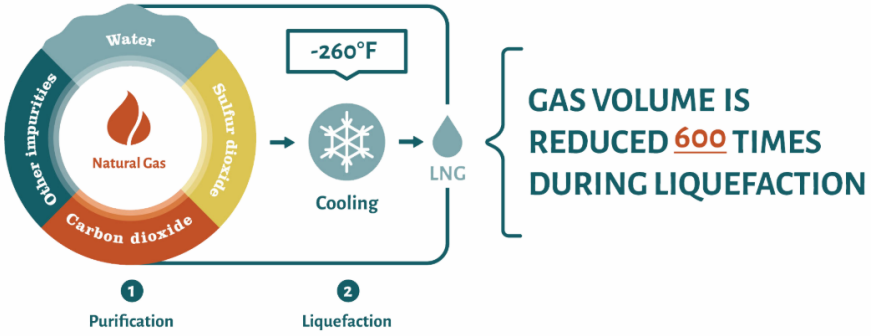
CBG
Compressed Biogas

LNG
Liquefied natural Gas

LBG
Liquefied Biogas

- Natural gas is 95% CH_4, 3% C_2H_6, 1% C_x
- Biogas is ~60% CH_4 & ~40% CO_2
- Biomethane is refined biogas >97% CH_4





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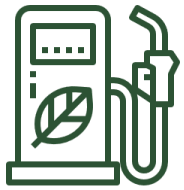
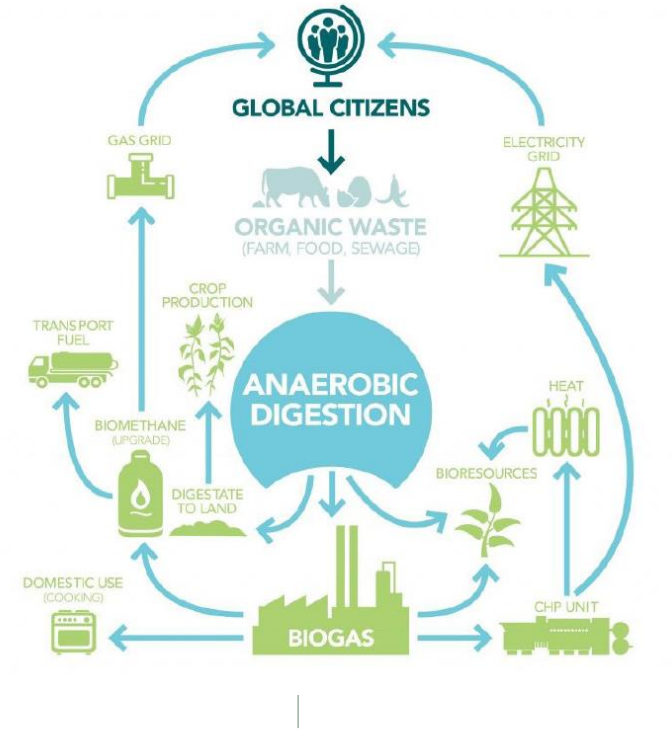
BIOGAS

City / Suburban

Sewage / Organic waste

Digestor biogas production





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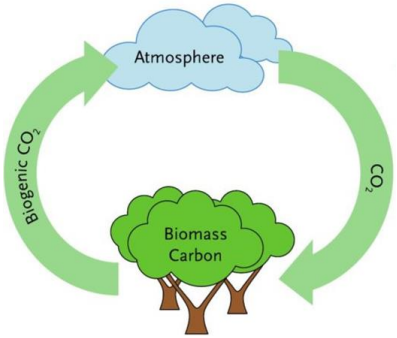
BIOGAS

Up to

90%

reduction



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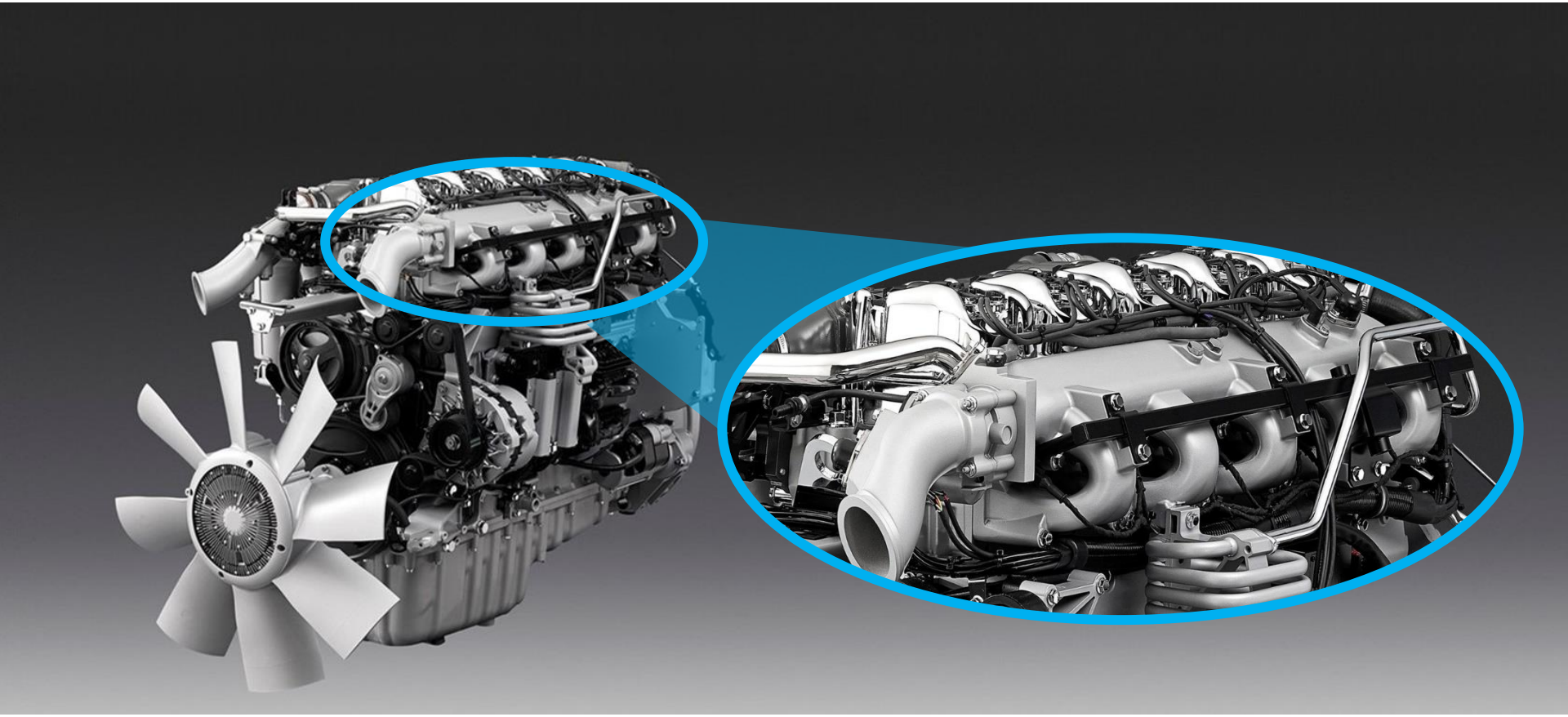
SCANIA GAS ENGINE



SCANIA

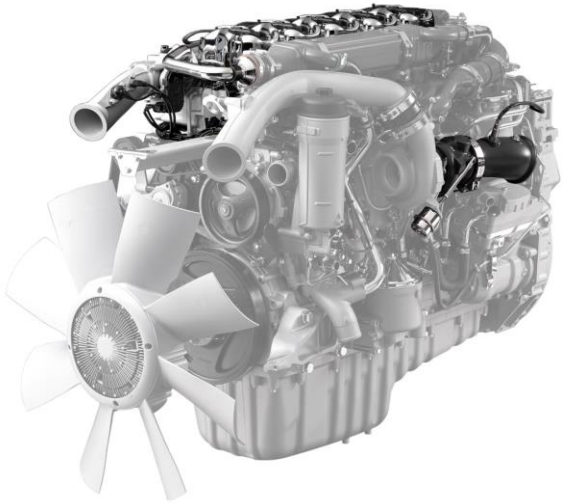
SCANIA GAS ENGINE

Otto engine with diesel performance and efficiency
Gas Diesel torque performance levels

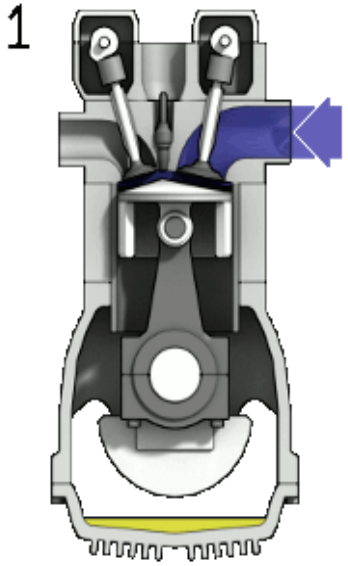
Consumption
25-45 kg/100km CH4 (35-56 liter/100km diesel)
500-700km range with all applications

High CO_2-reduction/invested $
Up to 90% CO_2 -reduction with biogas

Features
Less sensitive to gas quality
100% operability on 3 000 m
Operates on both CNG and LNG



4-stroke engine



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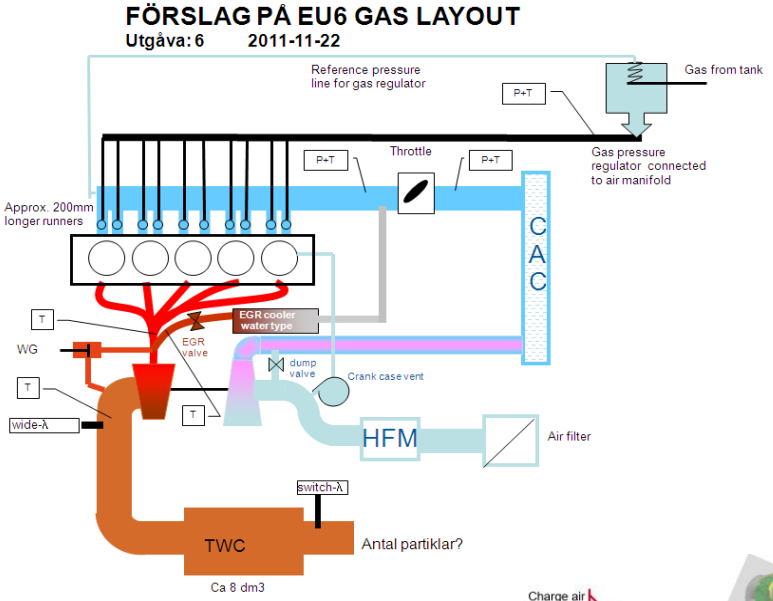
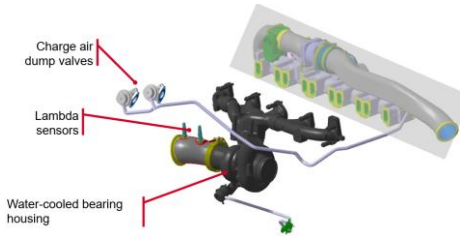
GAS ENGINE SYSTEM LAYOUT





3-WAY CATALYST
(Lambda=1 => "eats" NO_X)

IN
OUT

H_2O

CO_2

HC + NO_x

CO_2

N_2

CO + NO_x

N_2

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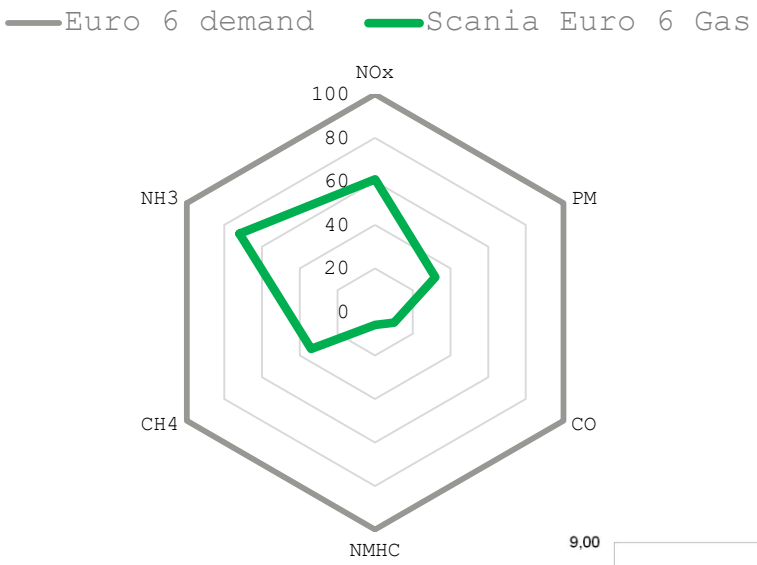
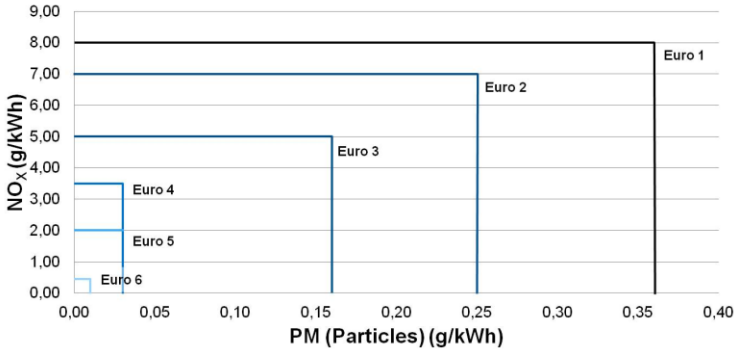
GAS ENGINE SYSTEM LAYOUT



Emissions	NOx	PM	CO	NMHC	CH_4	NH_3
	g/kWh	*mg/kWh*	*g/kWh*	*g/kWh*	*g/kWh*	*ppm*
Euro 6 demand	0,46	10	4	0,16	0,5	10
OC09 101 and 102	0,28	3,2	0,41	0,01	0,17	7,2
% of limit	61	32	10	6	34	72



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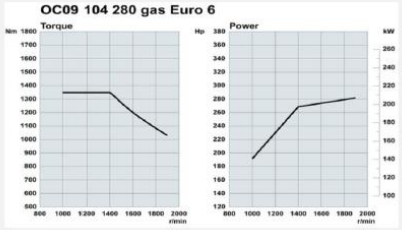
SCANIA GAS PORTFOLIO

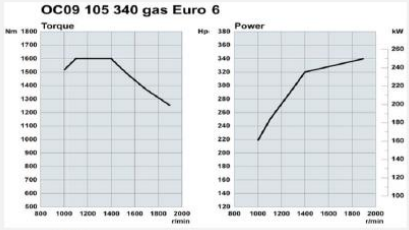
280 hp

9 Liters
5 cylinder
Cabs P/G
Opticruise / Allisson
280hp @ 1900rpm
1350Nm 1000-1400rpm



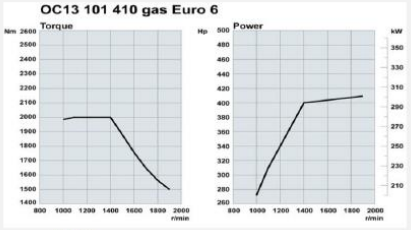
340 hp

9 Liters
5 cylinder
Cabs P/G
Opticruise / Allisson
340hp @ 1900rpm
1600Nm 1100-1400rpm



410 hp

13 Liters
6 cylinder
Cabs G/R
Opticruise
410hp @ 1900rpm
2000Nm 1000-1400rpm



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NATURAL GAS HERE & NOW

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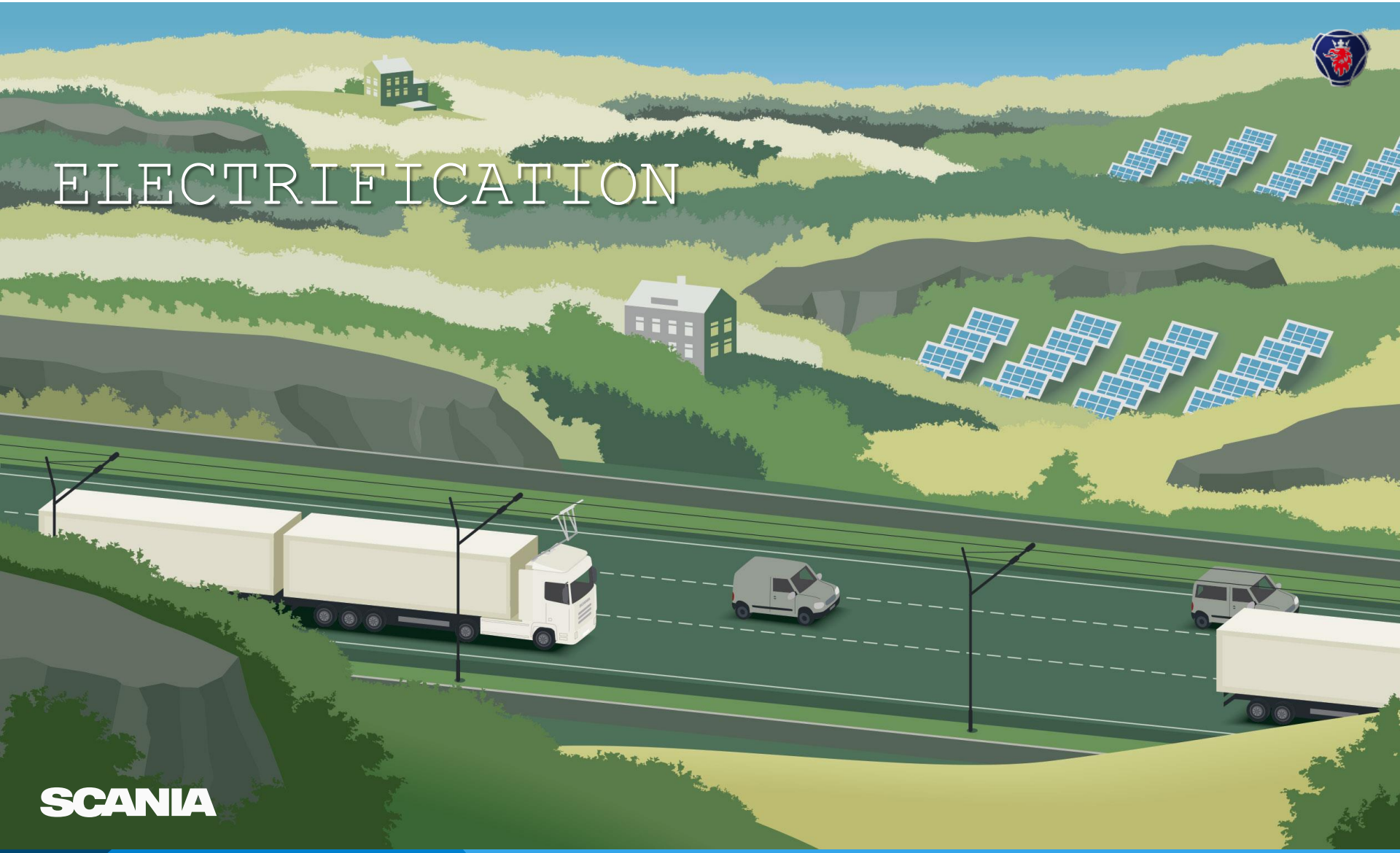
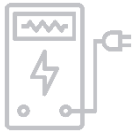


CONGRESO INTERNACIONAL DE NUEVAS TECNOLOGÍAS AUTOMOTRICES - I EDICIÓN VIRTUAL

VIABILITY OF ELECTRIFICATION

CAPEX

batteries



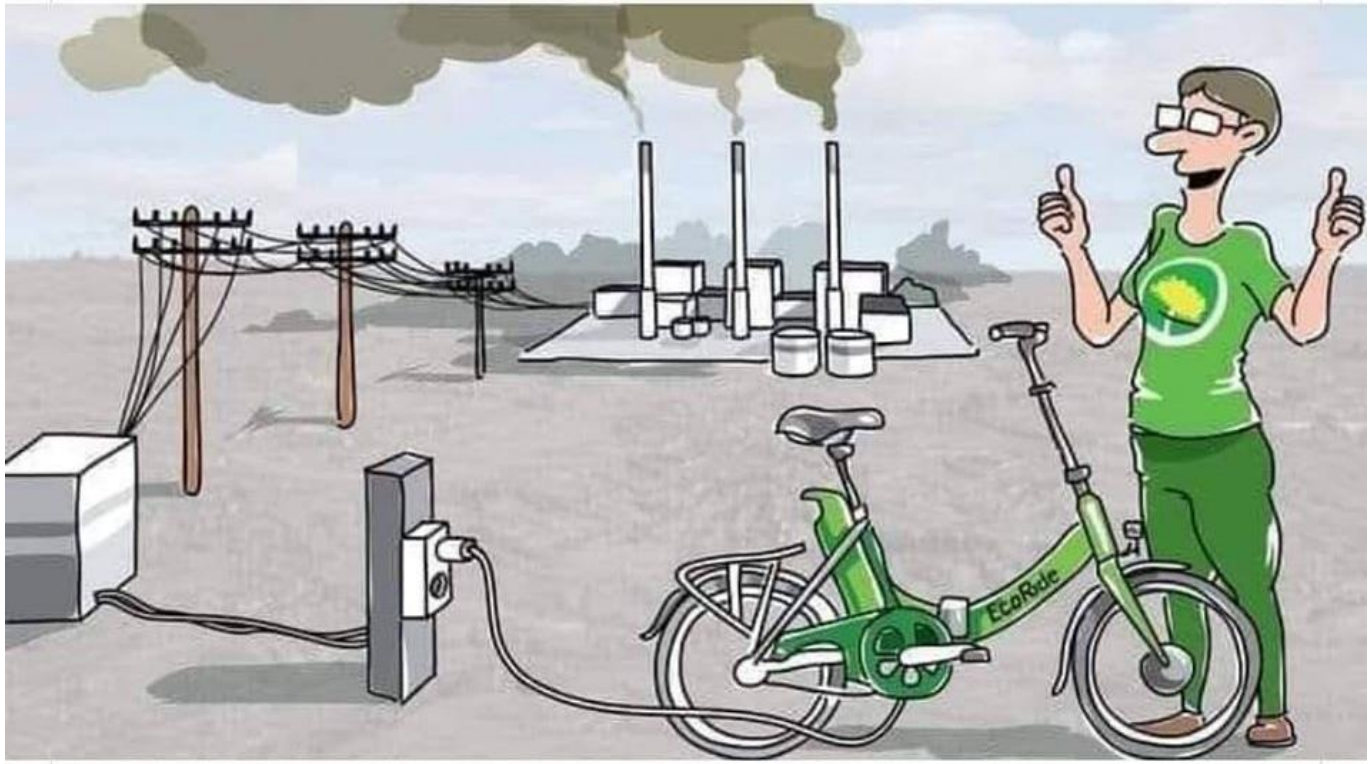
CHARGING MODE

AUTONOMY

INFRASTRUCTURE

recycling

SCANIA


EcoRide

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trification TERMINO

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e-Highway
"Dynamic PHEV"

A transformation sparked by technology

Today	Tomorrow
 Big combustion engine	 Small e-machine
 Big fuel tank	 Even bigger battery pack(s)
 ~15 minutes re-fuelling diesel	 ~45 minutes re-charging electricity
 Beloved V8 sound	 Silent electric drive

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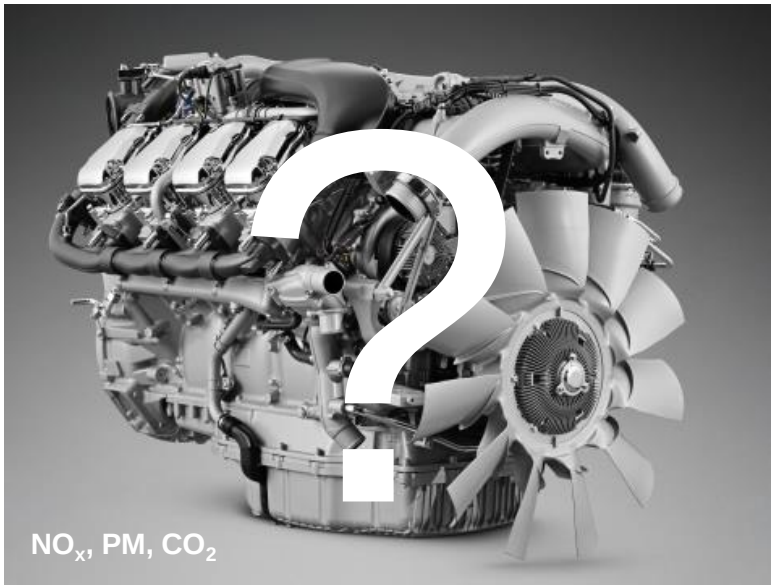
GOING FULL ELECTRIC

Alternatives to combustion engine there are three technologies available



BATTERY VEHICLES

ELECTRIC ROADS

FUEL CELL VEHICLES

By combining those three technologies, replacing the combustion engine is possible

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BATTERY ELECTRIC BUSES

Alternative fuels and electrification

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WIRELESSLY CHARGED
Alternative fuels
and electrification
Elhybrid med trådlös snabbladdning
I samarbete för ett hållbart samhälle
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YBH 872
SCANIA

BEV-Hydrogen-Fuel-Cell in Norway

BEV-contact charged in Östersund, Sweden

ELECTRIC ROAD IN GÄVLE, SWEDEN

E-HIGHWAY - GERMANY

- Charging and propulsion from catenary lines
- 40 ton long-haulage transport
- Roof-mounted pantograph
- 1 & 4 battery hybrid trucks
- 4 trucks function testing at Siemens test track outside Berlin
- 5-6 km of test track in each direction

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FUEL CELL ELECTRIC – TRONDHEIM, NORWAY

- Fuel cell mounted on the chassis
- Hydrogen generated from solar panelss at logistic center (ASKO Trondheim)
- 3 battery hybrid trucks with P160
- 4 Trucks @ASKO in Trondeheim Norway
- Up to 450 km of operating range

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WHAT´S NEXT?
METRO
App
SCANIA

autónomos


SCANIA
AUTONOMOUS TRANSPORT SYS
SCANIA
AUTONOMOUS TRANSPORT SYSTEMS

autónomos


What´s now?
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SUSTAINABLE PUBLIC TRANSPORT

CONGRESO INTERNACIONAL DE NUEVAS TECNOLOGÍAS AUTOMOTRICES - I EDICIÓN VIRTUAL


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