



SCANIA

PRESS info

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No reason to wait: Start the transition to renewable fuels now!

Scania maintains its position that the transition to renewable fuels can and should start without delay. Several renewable fuels compatible with existing engine technology are available on the market. Pending hybrid technology can also use these fuels initially. Waiting for new fuels or new engine technology would delay the process many years, a delay we cannot afford in view of the ongoing climate change.

Scania has a long tradition of engines running on other fuels than diesel. Gas engines have been built since the early 1980s and production of ethanol engines for city buses started in 1989 and the third generation has just been launched.

Scania's modern diesel engines can also run on FAME fuels (fatty acid methyl ester), e.g. RME (rapeseed methyl ester). Up to 100% RME is permitted, provided that certain conditions are met.

Scania is participating in a 3-year large-scale trial with bio-based synthetic diesel. This fuel looks very promising. Changing to this fuel alone in an engine will reduce emissions considerably.

Overleaf is a summary of Scania's position on renewable fuels.

In view of conflicting messages and opinions, vehicle operators must be able to feel confident about the renewable fuels they choose to use.

Scania therefore proposes that a uniform system for certification and marking of biofuels is developed.

To be viable, biofuels must give substantial net reductions in CO₂-emissions compared with fossil fuels without competing directly with food production or threatening biodiversity.

Scania is convinced that biofuels can fulfil these criteria and that they can contribute to economic growth and welfare in developing countries.

Bioethanol – liquid renewable fuel

Produced from

- Sugar cane (best CO₂ effect)
- Sugar beets, cereals, biowaste, etc.

Main features

- Easy-to-handle liquid fuel
- Ample supply world-wide
- Risk of conflict with food production
- Lower energy content than diesel

Emissions

- CO₂ reduction up to 90%
- Sensitive to production method

Scania diesel engine with Scania EGR

- 270 hp, 1200 Nm, 9 litres
- Complies with Euro 5 and EEV

Thermal efficiency

- Diesel up to 44%
- Ethanol up to 43%

Fuel

- Ethanol with 5% ignition improver (not E85)

Technology in place since 1989

- 600 buses

Ethanol production is growing rapidly all over the world. Ethanol is comparatively easy to produce, also on a smaller scale, and can thus contribute to reduce oil dependency for developing countries. There is a risk of competition with food production. Choosing the most effective production method – from sugar cane grown in Brazil – the reduction of fossil CO₂ is up to 90%.

For efficiency reasons, Scania has chosen to adapt its diesel engines to run on ethanol. Ethanol inherently gives low emissions and the emission gains reported by Stockholm Public Transport from 18 years of ethanol bus operation are truly impressive of all measured substances.

Scania recently launched its third-generation ethanol engine. It is certified for both Euro 5 and EEV. At 43%, the thermal efficiency of Scania's new ethanol engine is on a par with its diesel engines. ^{*)}

The fuel use for diesel combustion is ethanol mixed with 5% ignition improver. Scania has sold some 600 ethanol buses in Sweden since the start in 1989 and the technology is tried-and-proven since many years.

Taking all environmental factors into account, as well as economical factors, we consider ethanol the best and most economical renewable fuel available on the market right now for urban operation in trucks and buses. Besides the environmental benefits, this is primarily because supply is ample and existing technology can be used.

^{*)} Ethanol can be used in petrol (Otto) engines, either in an 85% mix (E85) or 100%. An Otto engine achieves 35% at best and much lower efficiency at part load.

FAME – liquid renewable fuel, often referred to as “biodiesel”

Must comply with EN14214

Examples of fame fuels

- RME = rapeseed methyl ester
- SME = soybean methyl ester
- Etc.

Main features

- Diesel efficiency
- Easy-to-handle liquid fuel
- Limited agricultural capacity
- Risk of conflict with food production

Emissions

- NO_x up 17%
- PM down 43%
- CO₂ reduction up to 70%

Scania recommendation

- Mix between 5 and 100% in co-operation with Scania distributor
- Not recommended with inline injection pump
- Shorter oil-change intervals (halved at 100% FAME fuel)

Remarks

- Power down
- Non-esterified plant oils unsuitable for modern diesel engines

FAME is a collective term for diesel fuel based on esterified plant oils. Pure plant oil cannot be used in modern diesel engines. A FAME fuel must comply with the European fuel standard EN14214, but then it has predictable properties.

The most common FAME fuel is RME, which is based on rapeseed oil. This fuel is often referred to as “biodiesel”. Efficiency is high since the engine operates according to the diesel principle, but power is down by 17%. NO_x is up by 17%, particulates are down substantially and fossil CO₂ is reduced by up to 70%.

Scania permits the use of up to 100% RME in its modern engines under certain conditions. Oil-change intervals are halved and the vehicles must be continuously monitored in operation if the mix exceeds 5%. This should be done in cooperation with a Scania distributor, for example via a maintenance agreement.

RME production has grown rapidly in Europe, but even if the entire arable land surface was used to grow rapeseed, it would only be possible to substitute 15% of the diesel used. RME production is thus in competition with food, which is a dilemma.

Synthetic diesel – fossil or renewable

Produced from

- Natural gas (fossil), GTL (gas-to liquid)
- Biowaste, BTL (biomass-to-liquid)
- Plant oil, fish oil, etc.

Main features

- Diesel efficiency
- Easy-to-handle liquid fuel

Scania recommendation

- Free mix with diesel
- Suitable for all diesel engines

Emissions (GTL and BTL)

- NO_x down 18%
- PM down 28%
- CO₂ reduction up to 80% (BTL)

Synthetic diesel can be closely tailored to diesel combustion and if produced from biological raw material, great emission gains are possible.

For BTL, fossil CO₂ emissions are reduced by up to 80%.

There are no restrictions for running on this fuel. It can be mixed freely with standard diesel and, in addition, works in all diesel vehicles.

With gradually increasing mixing proportions, synthetic diesel produced from biomass thus enables a smooth transition to renewable fuel for the entire diesel vehicle population.

Production is being expanded both for GTL (primarily in oil-producing regions) and BTL (local production possible in any country), but there is a long way to go to replace all fossil diesel fuel.

Gas – fossil or renewable

CNG (compressed natural gas) or biogas (methane)

Features

- Otto engine, lower efficiency than diesel
- Heavy and bulky tanks
- Limited operating range
- Excellent emission potential

Availability

- CNG widely available
- Huge biogas production potential in combination with waste and sewage plants
- Limited supply of biogas
- Risk of inconsistent biogas quality

Emissions

- Lower than Euro 5 and EEV
- Low noise

Gas is favoured by some operators and also some authorities for several reasons. Gas does give low emissions and noise is reduced, but since the engine operates according to the Otto principle, efficiency is considerably lower than for a diesel.

Another reason to choose gas as an automotive fuel may be that natural gas is cheap in some regions because of ample supply. Natural gas is even subsidised in some countries.

However, natural gas is not an ideal replacement for diesel fuel. Although emissions of regulated substances are handily reduced there is no CO₂ reduction with natural gas. On the contrary, efficiency is lower and consumption higher than for a diesel engine.

With biogas supplied locally, e.g. from waste or sewage plants, gas operation has excellent emission reduction properties. The CO₂ reduction is then almost 100%.

The main drawbacks are the need to carry gas onboard the vehicle in heavy gas tanks. Because of this, weight limitations may give a short operating range.

The quality of biogas can be a bit unpredictable, which might lead to unwanted downtime for the vehicles.

Although better suited to stationary use, for instance in district heating plants, biogas is a useful contribution in the gradual changeover to renewable fuels.

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