



*A sustainable biofuel
for heavy transport*

ED95

**ETHANOL
HERE AND NOW**



Ethanol – a worldwide biofuel

The world's future energy supply is threatened in two respects: Peak Oil and global warming. The expectation is that oil extraction soon will reach its peak and then decline, and at the same time the global climate systems are threatened by an increasing greenhouse effect.

Globally, most countries are in agreement that we have to find alternatives to fossil fuels. The transition to renewable fuels must take place soon and, in a global perspective, the principal and most credible alternative to petrol and diesel is ethanol.

Ethanol offers a realistic alternative to a large part of the fossil oil and its use leads to a considerable reduction in the emission of greenhouse gases. Ethanol is by far the largest, and the fastest growing biofuel in the world.

**YOU CAN
MAKE A
GREEN
CHOICE**



Climate friendly transportation

The transport sector is responsible for an increasing share of global emissions and it must be adjusted towards renewable fuels. ED95 is a renewable fuel developed for diesel engines. It is based on bioethanol and is already a well-established green alternative fuel for heavy transport applications.

ED95 provides comparable energy efficiency as well as a markedly reduced climate impact – emissions of fossil carbon dioxide can be reduced by as much as 80 to 90 percent.

WHAT IS ED95?

Besides biologically produced ethanol, ED95 contains a small percentage of ignition improvers, denaturants, lubricants and anticorrosive additives in order to optimize combustion and operation in adapted diesel engines.

Since ethanol is a biofuel, ED95 is a powerful tool in combating the greenhouse effect – when producing ethanol in the right way, emissions of fossil carbon dioxide can be reduced by as much as 80 to 90 percent.

As a biofuel, ED95 has major environmental and technical advantages both in internal combustion engines and in hybrid vehicles. Compared with other fuels, ethanol burns cleanly which has a very positive effect on emissions such as nitrogen oxide, carbon monoxide and hydrocarbons. Particulate emissions are also very much reduced compared with diesel.



WHY SHOULD YOU CHOOSE ED95?

Ethanol is by far the most dominant and well-tested renewable alternative fuel. The difference between ethanol and other biofuels is that it already exists in quantity and its production can readily be scaled up. At the same time, development efforts continue to maximise its environmental benefits even further.

Ethanol has been used in engines for over a hundred years and has a given place in today's distribution system for liquid vehicle fuels. Ethanol is, moreover, the only alternative which, in terms of volume, can possibly replace large parts of today's fossil fuels.

ED95 engines run with the same high efficiency as diesel engines. At the same time, the clean burning of ethanol in an adapted diesel engine makes it possible to meet the most stringent emission requirements even without a particle filter. Not only does that entail cleaner exhausts but also helps reduce fuel consumption.

THE CLIMATE IMPACT OF ETHANOL

For all biofuels there is a simple rule – a good production process will result in a good product.

Ethanol is most often produced from sugar- and starch-rich vegetation, for example sugar cane, sugar beet and cereal grains. In Sweden, we mostly use ethanol produced in Brazil and derived from sugar cane. This ethanol has been proved to give a much reduced climate impact – emissions of fossil carbon dioxide being reduced by up to 95 percent.



THE NEXT GENERATION...

The production of ethanol is already at a high level but it can be higher still. By using new raw materials and making still better use of the old ones, we can produce even greater volumes which in turn will benefit the climate still further.

Vegetation consists mainly of cellulose. For this reason, scientists all over the world are researching more efficient ways of producing ethanol from cellulose, a raw material source which is virtually inexhaustible.

In a pilot plant in Örnsköldsvik, SEKAB, together with scientists from a number of Swedish universities, has been working since spring 2004 on refining the processing stage that breaks down cellulose into various sugars. The method makes it possible to use waste products from forestry and farming, such as wood chips and sugar cane bagasse, for the production of ethanol.

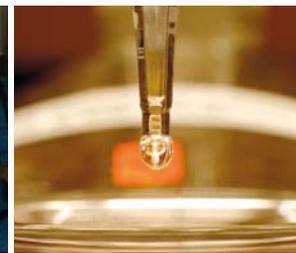
Producing ethanol from cheap raw materials which are available in large quantities – and which do not compete with food production – is an important step in the development of large-scale ethanol production and in breaking the transport sector's oil dependency.

New technology increases output

Litres per hectare

Traditional production
Sugarcane juice 8 000

Second-generation ethanol
Sugarcane juice + cellulose 12 000



Why should I choose ethanol as a fuel?

- In order to strongly reduce emissions of fossil carbon dioxide. Compared with petrol and diesel, ethanol can reduce such emissions by between 80 and 90 percent, depending on the raw material.
- Because oil is found in specific countries and gives rise to land conflicts, wars and injustice. In contrast, bio-fuels can be produced in a democratic, environmentally sustainable and ethically defensible way.
- Because shipwrecked oil tankers with their spillage and oil emissions repeatedly produce environmental catastrophes. A transition to ethanol minimises the transport of oil and petroleum products and thus the risks of polluting emissions.
- Because bio-ethanol can be produced from natural resources such as sugar cane, wheat, maize and sugar beet. Ethanol can also be produced from cellulose-containing products such as residues from tree felling and thinning, sawdust, energy forests, straw, bagasse, haulm as well as household and industrial waste. Today, ethanol has the greatest raw materials availability and potential of any bio-fuel in the world.
- Because bio-fuels can be produced on a large scale and in an ecologically sustainable way.
- Because ethanol is much less noxious to human beings and the environment than other fuels. Unlike diesel and petrol, ethanol contains no carcinogenic substances and is completely degradable in the event of spillage.
- To reduce our dependency on imports from a few oil-exporting countries. The transport sector accounts for about 70 percent of all oil currently consumed in the EU countries, and this proportion is continuing to rise.
- Because ethanol can be easily combined with hybrid technology and fuel cells.
- Because other emissions hazardous to health, such as nitrogen oxides, particles, benzene and carcinogenic hydrocarbons, are also reduced when vehicles run on bio-ethanol.
- Because existing filling stations can be adapted easily and inexpensively to ethanol.
- Because ethanol production creates opportunities for a new industrial sector in countries with an appropriate climate and raw materials.
- Because ethanol can be manufactured almost anywhere from numerous raw materials and is thus a globally practicable fuel.
- Because ethanol can be easily combined with hybrid technology and fuel cells.
- Because increased domestic ethanol production would make use of unutilised land resources and create many new jobs in Sweden.

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SEKAB

As a society we are faced with a huge challenge as old energy sources have to be replaced by new ones. SEKAB wants to contribute to a future in which the need for fossil fuels and raw materials is decreasing. We do this through the ethanol we produce and import which is turned into various biofuels and green chemical products.

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