ePURE
european renewable ethanol

How renewable ethanol can be produced sustainably

While Europe is generally considered as a global leader in the fight against climate change, its transport emissions are the exception. Transport is now responsible for 26% of Europe's total GHG emissions and is the only major sector in Europe in which GHG emissions have increased compared to 1990 levels.

As a result, decarbonising the transport sector is considered a key objective of Europe's climate and energy policies, to achieve a 40% GHG emission reduction and at least 27% renewable energy use by 2030, and how to achieve this will form a key part of discussions at COP21 and beyond.

At ePURE, the association representing European ethanol producers, we believe that renewable ethanol can play an important role in decarbonising transport.

Because ethanol can be blended with petrol to run in existing engines, it is one of the ways we can immediately begin reducing emissions from transport and cut our dependence on fossil fuels.

But historically there has been uncertainty around whether we have the available biomass to produce enough food and fuel to meet the global demand of each.

This short booklet contains a collection of the most recent and compelling research that explores the role renewable ethanol can play in Europe when produced sustainably. The reports summarised here find that concerns over land use can be mitigated, and that there will be enough available biomass to cater for the increased use of renewable ethanol and to feed a growing population.

Robert Wright
Secretary General
+32 (0)2 657 66 79
wright@epure.org

University of Utrecht –
ILUC Prevention Project
(January 2015)

This report suggests that the risk of indirect land use change (ILUC) has so far only been analysed using aggregated, global economic models that have paid limited attention to measures that can prevent displacement, such as increased agricultural productivity.

Therefore, the ILUC prevention project investigated:

- How ILUC risks can be mitigated by taking a sustainable approach to all crop production
- How this can be quantified
- How ILUC mitigation may be regulated.

The key ILUC prevention measures studied in this project were above-baseline yield increases and cultivation of currently under-utilized land. The ILUC prevention measures were quantified for four case studies (Lublin province in Poland, Hungary, Eastern Romania and north-east Kalimantan in Indonesia) by assessing how much additional biofuels can be produced with a low risk of causing ILUC. These case studies were assessed for three different scenarios.

The case studies show that large amounts of additional biofuels can be produced with a low risk of causing ILUC. In the high scenario, already 1.3% of the total energy use, or 13% of the renewable energy use in road transport in the EU in 2020 could be met by low-ILUC-risk biofuels produced in the three European case studies investigated. Thus, low-ILUC-risk biofuels produced from these three EU case studies alone could meaningfully contribute to sustainable biofuels in the EU in 2020.

In addition, other countries in Europe and elsewhere have untapped low-ILUC-risk potentials that could be further explored and mobilised, e.g. double cropping and yield increases. Therefore, ILUC as determined in economic models is not an irreversible fact, but is a risk that can be mitigated and in many cases prevented.

The report recommended that substantial investment in the agricultural sector is essential to realise the low-ILUC-risk potential of biofuels as well as to strengthen and enforce land use policies. The project's key highlights include:

- Stimulating increasing productivity and resource efficiency in the agricultural sector through support and incentives schemes
- Providing support and incentives for production on currently underutilised land
- Promoting land zoning that excludes high carbon stock, high conservation value and important ecosystem service areas from conversion to any agricultural use.

SCOPE -
Bioenergy & Sustainability:
bridging the gaps (April 2015)

The report from the Scientific Committee on Problems of the Environment (SCOPE) finds that bioenergy is the key to improving energy security for the 1.3billion people with no access to electricity, lifting rural areas out of poverty and securing them a sustainable future.

The report, a collective effort with contributions from 137 researchers of 82 institutions in 24 countries, finds that land availability is not a limiting factor in this shift towards further use of bioenergy. Bioenergy can contribute to sustainable energy supplies even with increasing food demands, preservation of forests, protected lands, and rising urbanization. While it is projected that 50 to 200 million hectares would be needed to provide 10 to 20% of primary energy supply in 2050, available land is estimated to be at least 500 million hectares, and possibly 900 million hectares if pasture intensification or water-scarce, marginal and degraded land is considered.

The report outlines how:

- Development of bioenergy can replenish a community's food supply by improving management practices and land soil quality
- New technologies can provide communities with food security, fuel, economic and social development
- The use of bioenergy, if done thoughtfully, can actually help lower air and water pollution
- Bioenergy initiatives, monitored and implemented, can protect biodiversity and provide ecosystems services
- Efficiency gains and sustainable practices of recent bioenergy systems can help contribute to a low-carbon economy by decreasing greenhouse gas emissions and assisting carbon mitigation efforts
- With current knowledge and projected improvements, 30% of the world's fuel supply could be biobased by 2050

However, the report acknowledges that just because bioenergy can be beneficial, it does not mean that it will be. Research and development, good governance and innovative business models are essential to address knowledge gaps and foster innovation across the value chain of the industry. With these measures, the report argues a sustainable future is more easily achieved with bioenergy than without it, and not using the bioenergy option would result in significant risks and costs for regions, countries and the planet.

Agra CEAS Consulting & E4tech- High Ethanol Blends Fuel: *Ethanol Demand-Supply Scenarios 2017-2035 (July 2015)*

The High Ethanol Blends study provides an independent review of potential future fuel ethanol demand between 2017 and 2035 (primarily in the EU but also worldwide) arising from the introduction of higher ethanol blends in petrol than currently covered by the Fuel Quality Directive. The report also assesses whether this demand could be met by sustainably produced ethanol.

The study presents scenarios which show that potential ethanol supply far exceeds potential demand in 2035 for an E20 or E25 ethanol blend in Europe. These scenarios are based on the technical potential for ethanol demand and supply rather than applying the equilibrium approaches of economic models. The supply potential is made after accounting for feedstock use for food and other uses, based on rain-fed cultivation potential, current GMO policies, and current performance of conversion technologies, as well as the present sustainability standards of the Renewable Energy Directive.

Under these scenarios, both the EU and the Rest of World have the technical capacity to be self-sufficient in food and livestock feed as well as feedstock crops for other uses than ethanol. In order to determine a credible upper limit on EU ethanol demand, the analysis is based on a set of assumptions that would 'maximise ethanol demand within reason'. Reasoned assumptions regarding passenger car sales, vehicle efficiency improvements, user mileage trends and the timing of the phase in of the corresponding biofuel blends were compiled.

Under the E25 scenario, potential EU-27 ethanol demand in 2035 would be around 21% of the EU-27 technical supply potential (17% under the E20 scenario).

	Mtoe	Million m3	% share
Ethanol supply potential	50.3	98.9	-
Ethanol demand- E20	8.4	16.5	16.7%
Ethanol demand- E25	10.3	20.2	20.5%

Addressing the myths about Europe renewable ethanol production

MYTH: European ethanol use is driving food price increases

FACTS

- In 2014 only 2%, of Europe's cereals supply was used to produce ethanol – not enough to reduce cereals supply to food markets.
- Europe's ethanol consumption has only been responsible for 1-2% of any increase in global cereals prices since 2006. It is projected that further increases to European biofuels consumption to meet Europe's biofuels targets in 2020 will have a very small impact on food commodity prices.[1]
- Rising oil prices have been found to be responsible for almost 66% of all food price increases.[2]

MYTH: European ethanol production uses too much land

FACTS

- European ethanol production uses less than 1% of EU agricultural land, an area of land that is much less than the amount of unused farmland in Europe.
- In 2014, the animal feed co-produced at Europe's ethanol biorefineries displaced animal feed imports and, by doing so, freed up nearly 1 million hectares (Mha) of agricultural land outside Europe, meaning our industry's net land use is close to zero.
- It is projected that 50-200 Mha of land would be needed to grow bioenergy crops to provide 10 to 20% of the world's primary energy supply in 2050, while the available land is estimated to be at least 500 Mha.[3]
- Increased demand for agricultural crops for biofuels has been mostly met by increased crops yields, multi-cropping and higher frequency of harvesting, not by forest or land conversion.[4][5]

MYTH: European ethanol is over-subsidied and too expensive

FACTS

- In 2014, our industry produced enough green fuel to displace 4.8% of Europe's petrol volumes, saving €1.5 billion to the EU oil bill.
- Biofuels are proven to be the most cost-effective carbon abatement tool to decarbonise transport.[6]
- Ethanol companies in Europe today sell their product, on average, for much less than 50 cents/liter with GHG savings of 60%.
- In Germany and France, ethanol (E10) is sold cheaper than regular petrol.
- Direct subsidies for biofuels are mostly defunct since oil companies are now obliged to blend biofuels. In the vast majority of EU countries the only incentives that support biofuels use are the EU's 2020 targets.[7]

MYTH: European ethanol consumption is causing deforestation in 3rd countries

FACTS

- European ethanol production does not cause any direct deforestation in 3rd countries because EU sustainability rules forbid this.
- If other industries adopted the same stringent sustainability rules that are applied to biofuels used in Europe then deforestation could be stamped out.

MYTH: European ethanol production competes with food supply

FACTS

- Ethanol production produces both food and fuel, because for each tonne of ethanol produced from grains, one tonne of a high protein, GMO-free animal feed is also produced.
- A 2014 study by the University of Utrecht found that it is possible to sustainably increase biofuels production in Europe, with no negative impacts on food availability, when biofuels are produced from agricultural yield increases and when unused land is used to grow crops for biofuels production.
- European ethanol production utilised only 2% of EU grain supply and only 8% of EU sugar substrate in 2014. Under EU sugar rules only surplus sugar that cannot be used for food production can be used to produce ethanol.
- The amount of cereals used to produce ethanol in Europe in 2014 was more than offset by EU cereals production increases, meaning there was no competition between ethanol and food production.
- Europe is the world's largest food exporter, which means it produces enough food and biofuels for its own use and still helps feed the world.

MYTH: ILUC nullifies the GHG savings of European ethanol

FACTS

- In 2014, European ethanol achieved around 60% GHG savings compared to petrol, thereby reducing Europe's annual GHGs emissions by 5 MT, the equivalent to taking 3 million cars off Europe's roads for a year.
- All ILUC studies confirm European ethanol's high net GHG savings EVEN after ILUC emissions have been taken into account
- A 2014 study by the University of Utrecht found that ILUC-risks can be mitigated and avoided through agricultural yield increases and when unused land is used to grow crops for biofuels production.

MYTH: European biofuels policy has caused landgrabs in Africa

FACTS

- No ethanol produced in Africa has been used as a biofuel in Europe. In our view, biofuels produced in Africa should be used first-and-foremost to displace domestic oil use in Africa and not be exported.
- Research from the Land Matrix Global Observatory shows that the level of land grabs taking place in Africa has been massively exaggerated because many of the projects did not move beyond planning phase. [8]

[1] Renewable Energy Progress Report, European Commission (2015)
[2] Long-Term Drivers of Food Prices, World Bank (2013)
[3] Bioenergy & Sustainability: bridging the gaps, Scope (2015)
[4] Using Recent Land Use Changes to Validate Land Use Change Models, Iowa University (2014)
[5] Biofuel Cropping Systems: Carbon, Land and Food, Langeveld et al (2014)
[6] Database says level of global 'land grabs' exaggerated, BBC (2013)
[7] The Role of Biofuels Beyond 2020, Element Energy (2013)
[8] World Energy Outlook 2014, IEA (2015)

ePURE
european renewable ethanol
Rue de la Loi 223
1040 Brussels
Belgium