ROADMAP TO 2030

The role of ethanol in decarbonising Europe's road transport

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About us

The European renewable ethanol association (ePURE) is the association representing the common interests of the European renewable ethanol industry, including producers of conventional and advanced ethanol, at the EU-level.

ePURE is a members-driven association, with a Board of Directors, Working Groups, Task forces, and a permanent Secretariat based in Brussels which is responsible for the overall organisation and coordination of the association's activities.

ePURE's Board is made up of 25 companies who produce renewable ethanol in Europe or have a high degree of participation in the sector. These companies collectively represent 50 production plants in 16 Member States and account for 90% of the installed renewable ethanol capacity in Europe. We also have a number of associate members across Europe and elsewhere. Typically these organisations are involved in the ethanol value chain and cover a diverse range of sectors including engineering and enzyme technology.

The objective of the organisation, established in 2010, is to promote the beneficial uses of ethanol throughout Europe by contributing in a constructive and pro-active manner to the development and implementation of EU policies and legislation that benefits both our industry and society. We do this by providing expert advice and input on a range of issues to the EU Institutions, Member State Governments, Brussels-based stakeholders and wider society.

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The European Union has set the objectives to have at least 27% of renewables in its energy mix by 2030 and reduce its greenhouse gas (GHG) emissions by 40% compared to 1990 levels. The transport sector currently accounts for 25% of the EU's total emissions, and while it has started to experience a small decrease of its emissions since 2008, it is the only one whose emissions have increased (by 20.5%) compared to 1990 levels[1]. This means that to achieve the 2030 targets and put the EU on track for its 2050 objectives (a 60% reduction set out in the 2011 Transport White Paper), considerable efforts will be required to decrease emissions in transport. The impact assessment accompanying the Communication on the 2030 energy and climate framework estimates between 12-20% emissions reduction in transport is needed along with 12-14% incorporation of renewable energy sources in transport (RES-T)[2]. Decarbonising transport is therefore of key importance to ensuring the success of the 2030 ambitions.

The European Council gave a mandate to the European Commission to '*further examine instruments and measures for a comprehensive and technology neutral approach for the promotion of emissions reduction and energy efficiency in transport, for electric transportation and for renewable energy sources in transport also after 2020*'[3]. The European Commission is preparing a Communication on transport decarbonisation for the period post-2020 (due July 2016), which should lead to actions for the 'development and deployment of electric vehicles, second and third generation biofuels and other alternative, sustainable fuels'.

The EU must propose clear, consistent and binding measures that increase the climate performance of transport fuels, while decreasing the over-reliance on diesel and include incentives for the deployment of sustainable low carbon fuel technologies, including both conventional and cellulosic ethanol. The recommendations outlined in this Roadmap should be considered in the context of a number of industry wide issues that need to be addressed in policy formation.

1. Directorate General Climate Action, European Commission
2. Impact Assessment "A policy framework for climate and energy in the period from 2020 up to 2030", European Commission (2014)
3. European Council Conclusions, October 2014

Overview of policy recommendations

Ahead of the publication of the European Commission's Communication on the decarbonisation of transport, this Roadmap outlines policy measures that ePURE considers essential for Europe to harness the benefits of sustainable ethanol and its contribution to achieving Europe's 2030 targets.

SUSTAINABILITY OF BIOFUELS

- Low ILUC risk biofuels, such as EU ethanol, should contribute without restriction to the 2030 targets.
- Biofuels from existing investments should be allowed to contribute to the 2030 targets if they comply with the GHG thresholds set in the current legislation.
- The use of palm oil and its derivatives should be prohibited in the EU until global peatland conversion is controlled.
- EU agricultural cross-compliance obligations should be extended to biofuels produced from non-EU feedstock.
- Existing sustainability criteria for biofuels must be maintained and extended to all bioenergy uses.

TRANSPORT FUEL EMISSIONS REDUCTION

- The Fuel Quality Directive must be extended and strengthened by introducing an ambitious and binding ramping up target to reduce the carbon intensity of transport fuels by at least 12% (against a 2010 baseline) by 2030, of which at least a quarter should come from advanced biofuels.
- Member States should be encouraged to maintain at least 10% renewable energy use in transport beyond 2020 to preserve the baseline agreed under the Renewable Energy Directive.

ADVANCED BIOFUELS

- A dedicated binding target to reduce transport fuel emissions by at least 3% should be achieved solely from advanced biofuels by 2030.
- Intermediate and long-term targets for advanced biofuels should be set that allow investments.

FUEL BLEND SPECIFICATIONS

- Higher ethanol blends should be incentivised across the fuels value chain to maximise the reduction of emissions and air pollutants further.

ISSUES IMPACTING THE EU TRANSPORT FUEL MARKET

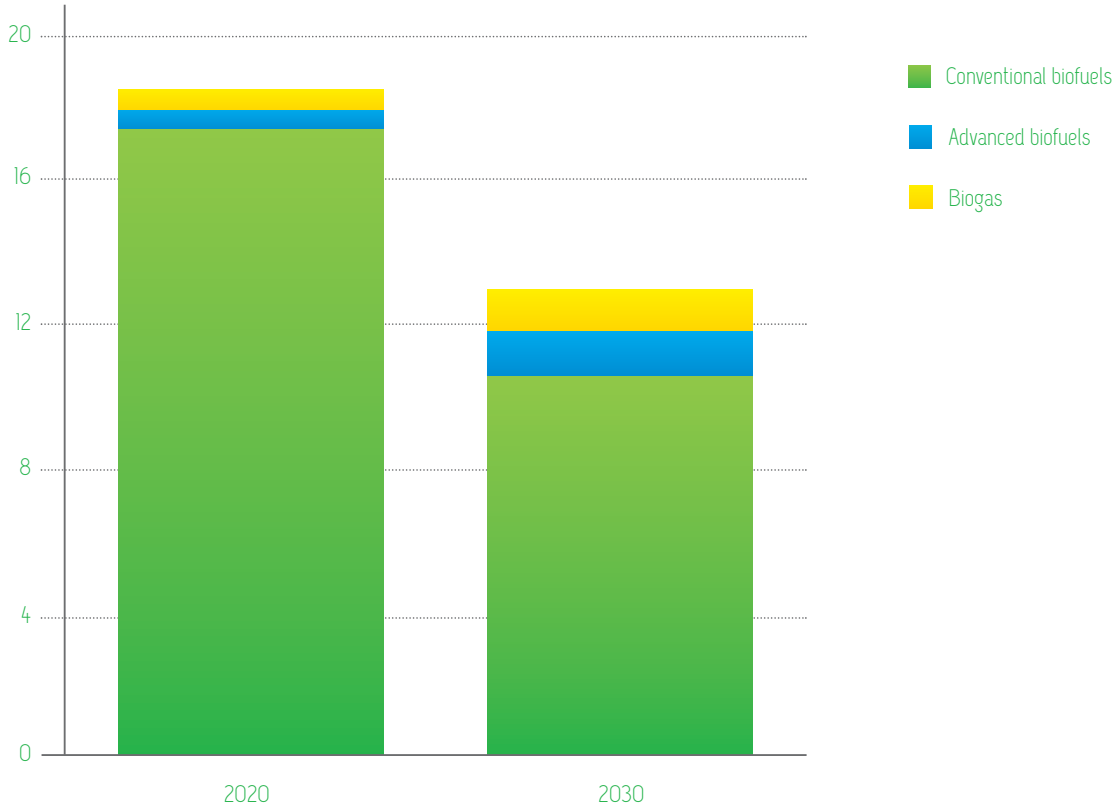
A binding policy framework to decarbonise transport is crucial to meeting EU climate ambitions

A recent study by E4Tech[4] has found that in the absence of an EU framework fostering their uptake beyond what is currently expected from some Member States, biofuels' share in transport would decrease from an expected 8.7% in 2020 to 5.5% of the energy use in road and rail transport by 2030. This would render the 12-14% RES-T and 12-20% emissions reduction for the transport sector anticipated in the Commission's impact assessment unachievable as other options are either not fully available or will not ramp up fast enough. Without such a framework:

- There would be an increased use of fossil fuels in transport – such a scenario would render the 2030 strategy dysfunctional to its stated aims.
- A considerable part of the GHG savings triggered by biofuels would be lost.
- With the transport sector accounting for 25% of the EU's emissions, substantial additional savings would be required from the other non-ETS sector to achieve the targeted 30% emissions reduction compared to 2005.

> Biofuels use in road transport would contract substantially in the absence of an EU-wide binding framework post-2020

EU biofuels supply in the absence of an EU policy framework for transport (Mtoe/Year)



4. Policy scenarios for transport under the 2030 Energy and Climate framework, E4Tech (2016)

Rebalancing the diesel-petrol market is vital – preferential support for diesel must end

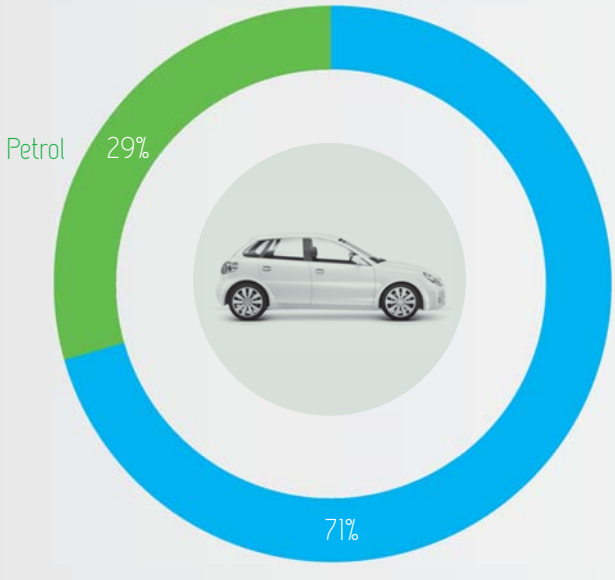
- In 2014, 17 EU Member States were found to be in breach of the EU air quality legislation. Poor air quality is a major cause of increased respiratory disease and therefore has a major negative impact on human health for many thousands of people across Europe, particularly in urban areas. Over reliance on diesel as a transport fuel in cities is a key source for this worsening air pollution in urban areas.
- In many ways Europe's diesel emissions problem is a self-inflicted one, because in all EU Member States, except the UK, diesel fuel is taxed less than petrol because of national tax policies guided by Europe's Energy Taxation Directive. In 33 out of 34 OECD countries diesel is taxed lower than petrol and biodiesel is taxed lower than ethanol[5]. This preferential tax treatment is also true for diesel vehicles, where in many EU Member States road and car taxes are linked to CO_2 emissions. An OECD report concluded that the high environmental and human costs of diesel emissions mean that "there is no public policy case for applying preferential tax treatment to diesel" [6], a call supported by the WHO[7].
- Rebalancing the diesel-petrol market is imperative if the EU is to achieve its objective of improving urban air quality and climate change mitigation (c.f. soot, NOx). In light of the COP21, the Commission and Member States must align energy and taxation policy with decarbonisation and air quality goals. It would also fit with the ambitions to remove environmental harmful subsidies.
- Going forward, transport fuels should be taxed on their energy content and carbon footprint and all preferences for diesel cars and fuel should be removed.

"There is no environmental justification for taxing diesel less than petrol. Air pollution is destroying our health and the planet. Phasing out tax incentives on diesel would be a step towards reducing the costs to both and in fighting climate change".

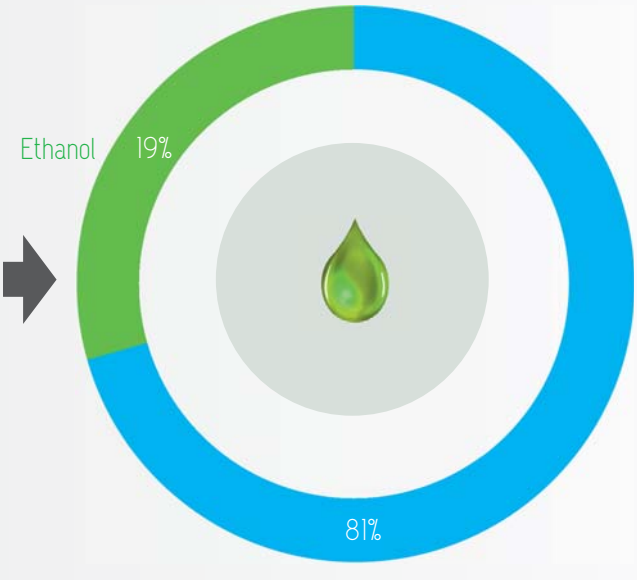
Angel Gurría, Secretary-General, OECD

EU taxation policy has made diesel the dominant liquid fuel and biodiesel the dominant biofuel in European transport

EU liquid transport fuel market (2014)



EU liquid biofuel market (2014)



Source: Eurostat (2016)

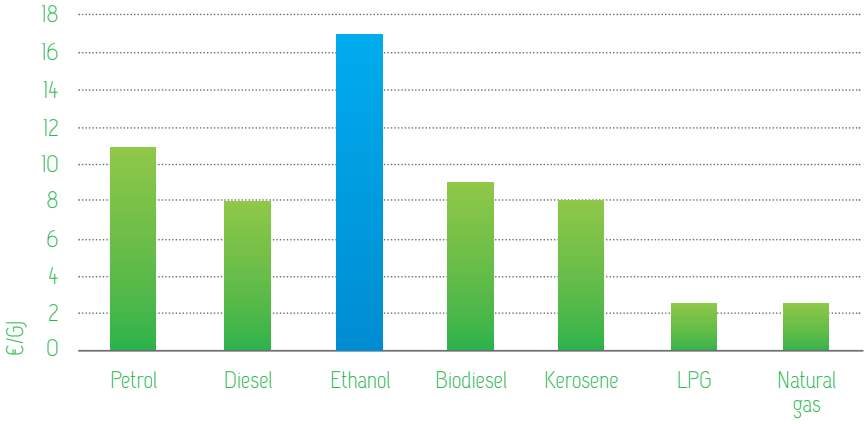
5. The Diesel Differential: Differences in the Tax Treatment of Gasoline and Diesel for Road Use, OECD (2014)
6. The Cost of Air Pollution: Health Impacts of Road Transport, OECD (2014)
7. Diesel Engine Exhaust Carcinogenic, WHO (2012)

Taxation must support climate friendly fuels, not hinder them

- A fairer energy taxation system is needed because, based on volume, ethanol is the most taxed transport fuel in Europe despite its GHG saving benefits.
- With Europe's dependence on imported diesel increasing – in particular from Russia – a fairer taxation regime would enable Europe to readdress its fuel balance, allowing for further petrol-ethanol penetration and to properly address issues such as air quality, energy security and long term cost.

Ethanol is the most heavily taxed transport fuel

Taxation of transport fuels (by energy content)



Source: DG TAXUD, European Commission

Multiple counting rules work against the overall ambition to decrease the use of oil and reduce GHG emissions in transport

Multiple counting as a methodology for incentivising the market take up and growth of renewable sources in transport, be it for electricity or advanced biofuels, has worked against the overall ambition to decrease the use of oil and reduce GHG emissions.

Biochemtex/Novozymes

SUSTAINABILITY OF BIOFUELS

Sustainability certification must incentivise better performance and seek to minimise the risks of adverse effects

It is a welcome step that the Commission is currently reviewing the sustainability of all bioenergy sources and final uses for the period after 2020, to account for potential sustainability risks such as lifecycle GHG emissions from bioenergy production and use; impacts on the carbon stock of forests and other ecosystems; impacts on biodiversity, soil and water, and emissions to the air; indirect land use change impacts; as well as impacts on the competition for the use of biomass between different sectors (food, industrial uses, energy). ePURE believes that strict sustainability criteria, which currently apply only to biofuels and bioliquids, should apply to all uses of biomass as well as fossil resources.

ePURE agrees with the Commission that *"the development of bioenergy also needs to be seen in the wider context of a number of priorities for the Energy Union, including the ambition for the Union to become the world leader in renewable energy, to lead the fight against global warming, to ensure security of supply and integrated and efficient energy markets, as well as broader EU objectives such as reinforcing Europe's industrial base, stimulating research and innovation and promoting competitiveness and job creation, including in rural areas"*[8].

Given this context, the updated bioenergy sustainability policy should take into account that increased feedstock demand for the production of European ethanol has had no adverse effect[9]. The future sustainability policy should also take into consideration the impact of the absence of a bioenergy policy on agricultural markets. It should also take into consideration and build upon the fact that the European Union already has a unique system that requires biofuels used in the EU to comply with strict sustainability criteria if they are to count towards the 2020 energy and climate targets.

8. Consultation document: A sustainable bioenergy policy for the period after 2020, European Commission (2016)
9. Renewable energy progress report {SWD(2015) 117 final}

POLICY RECOMMENDATIONS

1. The latest available study to estimate the potential land use impacts of the EU's biofuels policy confirms that European renewable ethanol has low risk of adverse land use change impacts (LUC). As a 'low-ILUC risk biofuel', European renewable ethanol has high net GHG savings compared to the petrol it replaces and consequently it should be entitled to contribute towards the 2030 targets without any restriction.

2. Consistent with both the spirit of and legal obligations of the existing regulatory framework, biofuels from investments made in good faith resulting from the 2009 Renewable Energy Directive, should also be entitled to count towards the EU targets provided they comply with the GHG thresholds set in the existing sustainability criteria (50% for existing installations under the current rules for calculating the greenhouse gas impact of biofuels).

3. In order to meet the objectives and fundamental principles of the EU's sustainability strategy, the use of palm oil and its derivatives should be prohibited in the EU until global peatland conversion is brought under control.

4. Feedstocks produced in the European Union and used in the production of biofuels must comply with the 'cross compliance rules' under the Common Agricultural Policy, thereby ensuring that their impact on soil, air and water is taken into account. These rules should also apply to biofuels produced from feedstocks of non-EU origin.

5. Existing sustainability criteria for biofuels should be maintained (and where necessary strengthened to ensure robust and fraud proof certification) post-2020. Sustainability criteria and traceability requirements equivalent to those for conventional biofuels should be introduced for all advanced biofuels and bioenergy sources, as well as fossil fuels used in transport, in order to safeguard their environmental performance and ensure a level playing field between renewable energy sources.

10. The land use change impact of biofuels consumed in the EU- Quantification of area and greenhouse gas impacts, Ecofys, IIASA, E4Tech (October 2015)

Our assessment of the GLOBIOM study

A consortium composed of Ecofys, the International Institute for Applied Systems Analysis (IIASA) and E4Tech was commissioned in 2013 by the European Commission to assess 'the land use change impact of the EU biofuels policy' using an economic model called GLOBIOM[10], property of IIASA. The project was completed in August 2015 and released in February 2016.

What GLOBIOM does and does not do

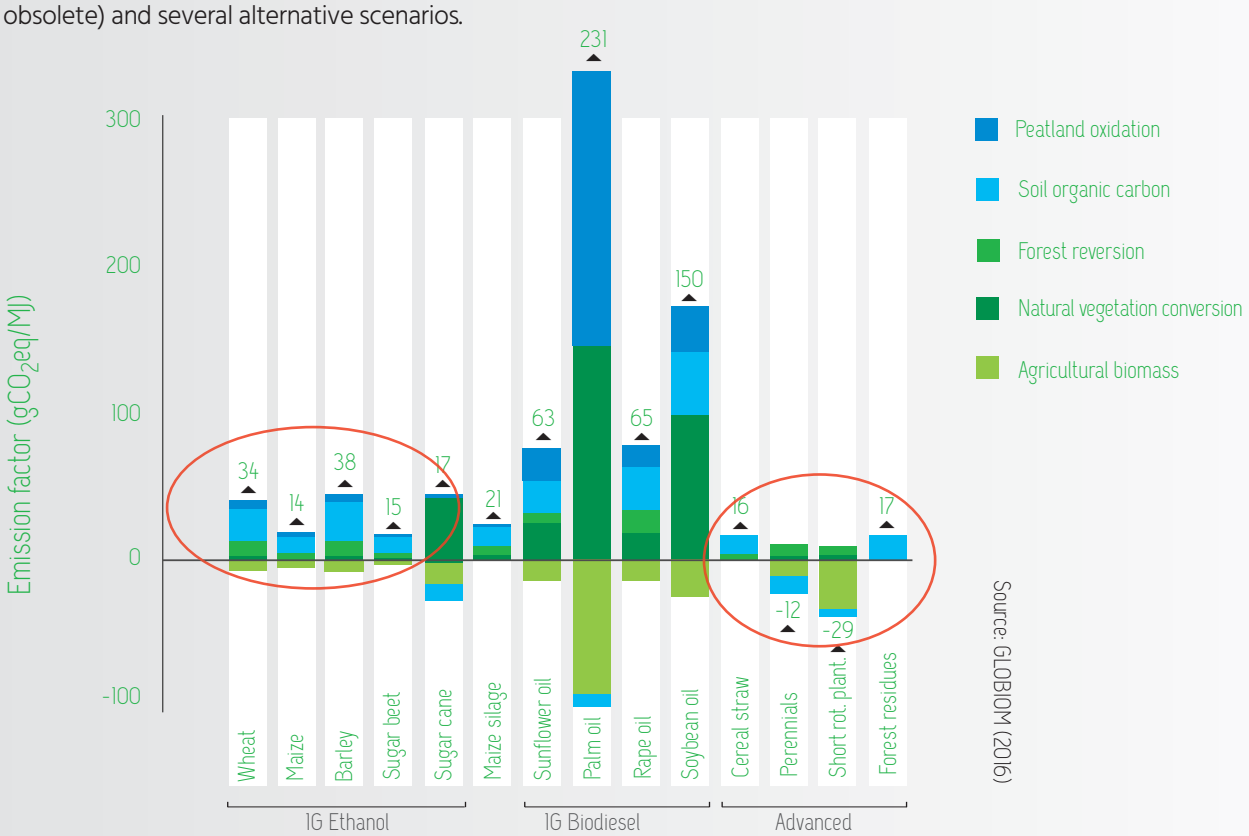
- The study estimates, within predefined model scenarios, the area and emissions impacts of the 2020 biofuels policy above a 2008 baseline, when the Renewable Energy and revised Fuel Quality Directives were adopted. The report does not assess the impact of the actual volumes of biofuels used in the EU market in 2008.
- It provides an assessment of the potential impact of the extra demand for feedstocks driven by the EU biofuels policy by 2020 on terrestrial GHG emissions: indirect land use change (ILUC) soil organic carbon (SOC), agricultural biomass, forest reversion, peatland oxidation).
- It uses a consequential life cycle analysis approach, which is different from the approach for determining the direct emissions and GHG savings of biofuels under the existing methodology of the EU legislation. One cannot 'simply' add the two to provide the "overall" emissions for biofuels.
- The impact of ethanol uptake alone to 2020 is not calculated. The report combines the results for biodiesel and ethanol in a central scenario based on the national renewable action plans of the 28 Member States (which are obsolete) and several alternative scenarios.
- The feedstocks specific results are simply an estimate of the associated LUC emissions **if** the EU biofuels policy was to create an extra 5 billion litres demand of a biofuel produced from this given feedstock. This is clearly not the expectation for some feedstocks that have seen their use for biofuels production decrease or increase modestly since 2008 (e.g. wheat and barley).

GLOBIOM is the latest approach to model LUC. Like all models, it has limitations and uncertainties, the major one being the introduction of the concept of "foregone sequestration"[11]. There are also data gaps, some of which are unavoidable. But the authors have strived to handle assumptions objectively by consultation with stakeholders.

Despite these inherent limitations, the GLOBIOM study is relevant for the 2030 EU policy framework discussion as it can assist policy makers in designing future EU biofuels policy. If read and applied properly to the reality of the European biofuels market, the report's findings allows for the identification of:

- Those biofuels making a strong contribution to decarbonisation and with low risk of adverse LUC emissions, such as European renewable ethanol.
- Measures that could mitigate the risk of adverse LUC emissions, such as halting peatland conversion, or favouring the use of unused land in Europe for the cultivation of crops used in the production of biofuels.

GLOBIOM confirms ethanol feedstocks have low risk of LUC



11. Foregone sequestration is the concept that assumes in the absence of demand for biofuels, cropland area might decrease and partly revert into grassland and forest. This 'much debated and poorly documented concept' has a large impact on the results provided for ethanol feedstocks.

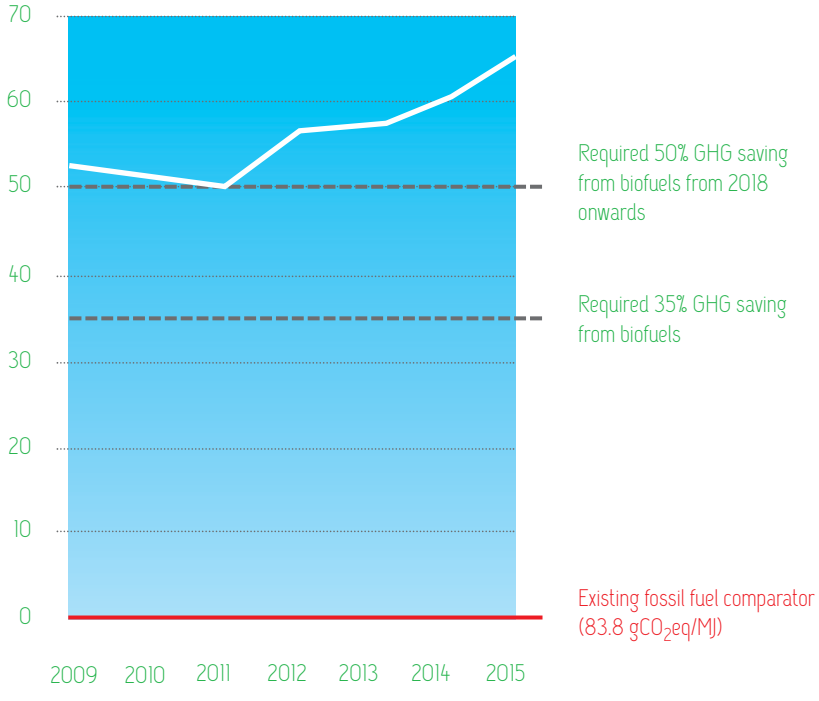
TRANSPORT FUEL EMISSIONS REDUCTION

The 2030 policy framework for transport decarbonisation needs to incentivise the continuous decrease of transport fuels' carbon intensity

To meet the Council's mandate and agreed targets, the post-2020 policy framework for transport decarbonisation needs to be ambitious and binding. The decarbonisation policy for transport should be based on the continuous improvement of the carbon footprint of transport fuels and include incentives for the deployment of sustainable low-carbon fuels, including both conventional and cellulosic ethanol.

The conventional ethanol industry has invested significantly over the last 15 years to develop a clean renewable fuel with currently certified savings of over 63% on average, an increase of 22% since 2009. Some European ethanol even achieves GHG savings as high as 90%. These savings need to be capitalised upon beyond 2020.

Average certified emissions savings from European renewable ethanol compared to fossil fuel (%)



Source: Copartner for ePURE (2016)

POLICY RECOMMENDATIONS

1. In line with the 12-20% emissions reduction needed in transport there should be a target to decrease continuously the carbon intensity of transport fuels (with UERs and refining optimisation to be applied as additional measures) by at least 12%[12] against a 2010 baseline by 2030. Ensuring policy continuity with the existing EU legislative framework (e.g Art. 7a of the Fuel Quality Directive) would allow for better and swift implementation of Europe's climate goals while also helping meet the Commission's objectives of 'better regulation' by maintaining investment stability for the low carbon fuels sector.

2. In line with the 12-14% RES-T needed in transport Member States should be encouraged to establish (higher) targets for the minimum incorporation of renewables in transport and must ensure that at least 10% of the energy in road and rail transport comes from renewable sources, single counted, on a constant basis beyond 2020 in order to maintain the baseline agreed in the Renewable Energy Directive and ensure that progress to replace oil use with 10% RES-T is not lost.

Both measures would enable the contribution of sustainable biofuels to help meet the 12-14% RES-T and 12-20% emissions reductions in transport that are required and expected from the Commission's 2030 Impact Assessment.

An obligation to lower the carbon intensity of transport fuels would be a cost effective and technology neutral driver for the EU to deliver on its 2030 ambitions and would therefore fit well with the mandate given to the Commission by the Council in 2014.

12. This could be delivered by biofuels based on the following assumptions:
- In 2020: 8% biofuels in energy content, with advanced biofuels delivering 80% savings and conventional biofuels delivering 70% savings, against a fossil comparator of 94.1 gCO_2eq/MJ
- In 2030: 15% biofuels in energy content, out of which 3.5% advanced biofuels in energy content delivering 90% savings, and the rest conventional biofuels delivering 80% savings, against a fossil comparator of 94.1 gCO_2eq/MJ

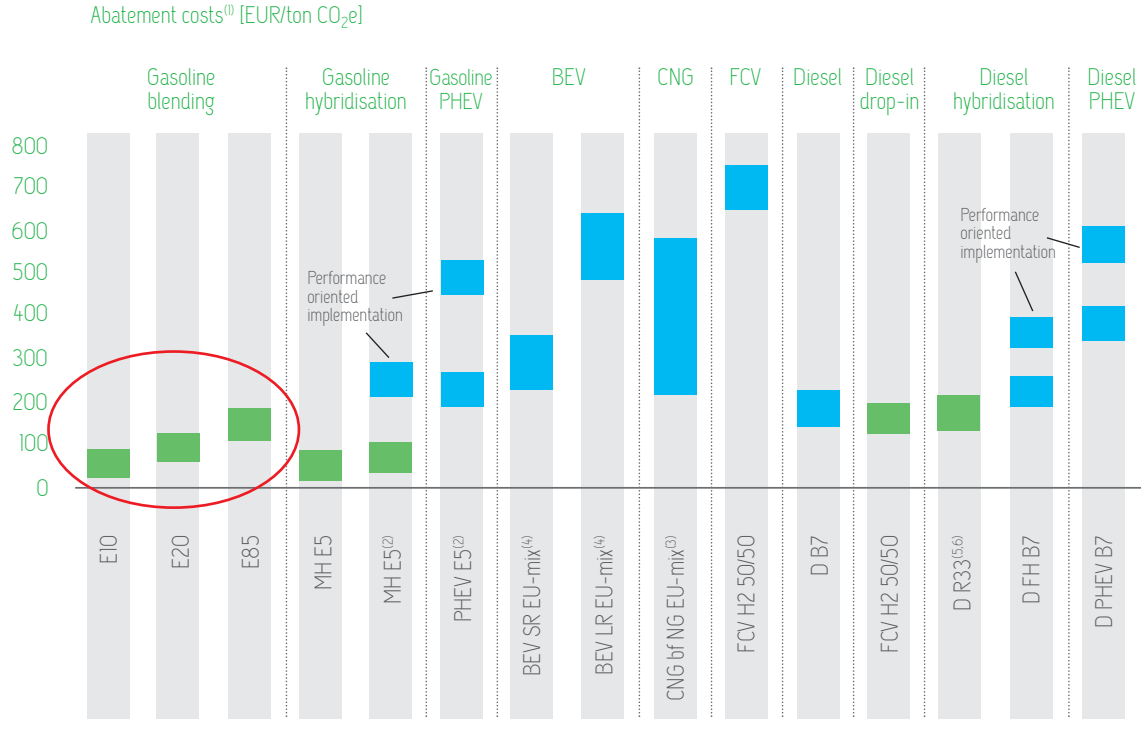
Ethanol is a cost-effective way to reduce transport emissions to meet the targets

European renewable ethanol is well placed to make a cost effective contribution to decarbonising the transport sector as it has the lowest GHG abatement cost among several tools to decarbonise transport, even negative carbon abatement costs:

- The recent integrated "Fuels and Vehicles – Roadmap to 2030+" developed by a consortium of vehicles manufacturers[13] and fuels suppliers finds that to ensure passenger cars deliver further GHG emissions reductions up to 2030 *"it is cost-efficient for society to promote the uptake of higher ethanol blends, such as E10, E20 for gasoline and E85"*.
- Ethanol may even have negative carbon abatement costs when considering that it is a technology that reduces GHG emissions, costs less than the fossil fuel it substitutes[14] and creates employment[15].

Higher ethanol fuel blends are a cost-effective GHG abatement tool

Well-to-Wheel GHG abatement costs



Recommended until 2030

Not cost efficient until 2030

1) Compared to optimised Gasoline powertrain 2030 using E5, all technologies with 250,000 km lifetime mileage

2) 30% e-driving, higher e-driving share reduces abatement costs

3) Large range between scenarios driven by decoupling effect of natural gas price

4) Risk of higher abatement costs due to need of second battery over lifetime. SR – short range with 35kWh battery capacity, LR – long range with 65 kWh battery capacity, both using 2030 EU mix electricity

5) Diesel fuel with 7% FAME and 25% HVO

6) Abatement cost in existing vehicle: -67 EUR/ton CO_2 (high oil price), -7 EUR/ton CO_2 (low oil price)

Source: Roland Berger (2016)

13. Integrated Fuels and Vehicles Roadmap to 2030+, Roland Berger (2016). The Auto Fuel Coalition comprises BMW, Daimler, Honda, NEOT/St1, Neste, OMV, Shell, Toyota and Volkswagen
14. In 2014, T2 ethanol (free of circulation within the internal market) was cheaper than petrol, F.O. LICHT
15. Evaluating the macroeconomic impacts of bio-based applications in the EU, Institute for Prospective Technological Studies, Joint Research Centre (2014)

ADVANCED BIOFUELS

Advanced biofuels require a ramping up, long-term mandate to deploy

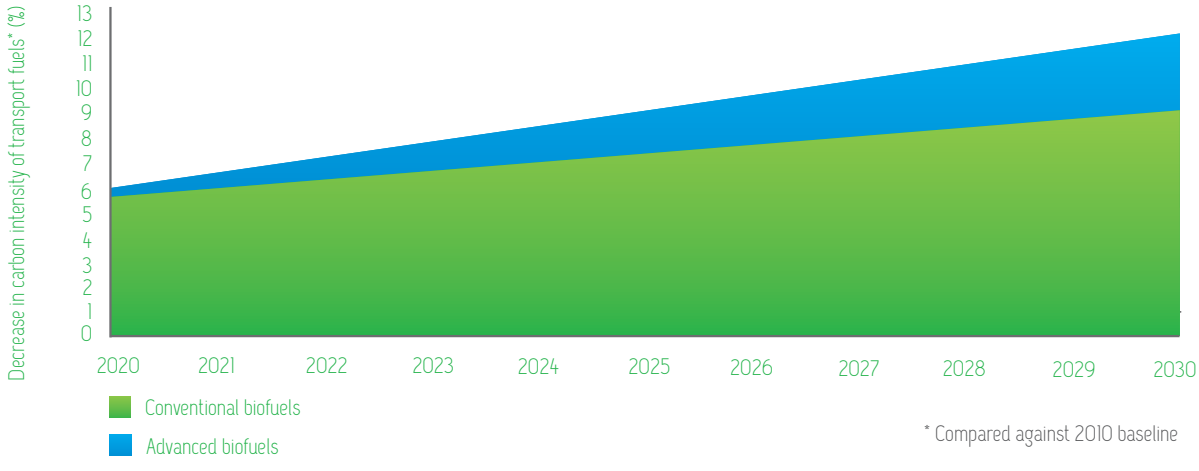
The Commission already has the stated aim of supporting the take-up and growth of advanced biofuels. EU policies to encourage the deployment of advanced biofuels before 2020 should therefore not only be maintained but improved.

Mandating the consumption of advanced biofuels within a defined regulatory framework that would make new investments in advanced biofuels technology and production bankable and feasible.

POLICY RECOMMENDATIONS

1. A binding target of at least 3% of the 12% reduction of the carbon intensity of transport fuels must come from advanced biofuels in 2030[16].
2. Within 5 years of the adoption of the 2030 Climate and Energy package, the EU should establish a binding target for at least 2% of the reduction of the carbon intensity of transport fuels to come from advanced biofuels. The EU should then take stock of progress made in meeting this minimum target and if reached then confirm the 2030 mandate and at the same time define a 2035 mandate.

The role of an advanced biofuels mandate in meeting a 12% fuels carbon intensity reduction target



* Compared against 2010 baseline

3. Clarify the definitions of advanced biofuels, which today are based on a list of feedstocks contained in RED Annex IX-A, precluding grandfathering, defining both waste and residues.
4. The 'waste hierarchy' is an important guideline to reduce and manage waste. Departing from the hierarchy can be justified by life-cycle thinking on the overall impacts of the generation and management of such waste. The use of waste to refine biofuels should be considered similar to "Recycling" according to the "Waste Hierarchy" on the basis of life cycle analysis and no longer automatically considered at the same level as 'recovery' of energy from waste incineration.

16. This could be delivered by biofuels based on the following assumptions:
- In 2020: 8% biofuels in energy content, with advanced biofuels delivering 80% savings and conventional biofuels delivering 70% savings, against a fossil comparator of 94.1 gCO_2eq/MJ
- In 2030: 15% biofuels in energy content, out of which 3.5% advanced biofuels in energy content delivering 90% savings, and the rest conventional biofuels delivering 80% savings, against a fossil comparator of 94.1 gCO_2eq/MJ

FUEL SPECIFICATIONS

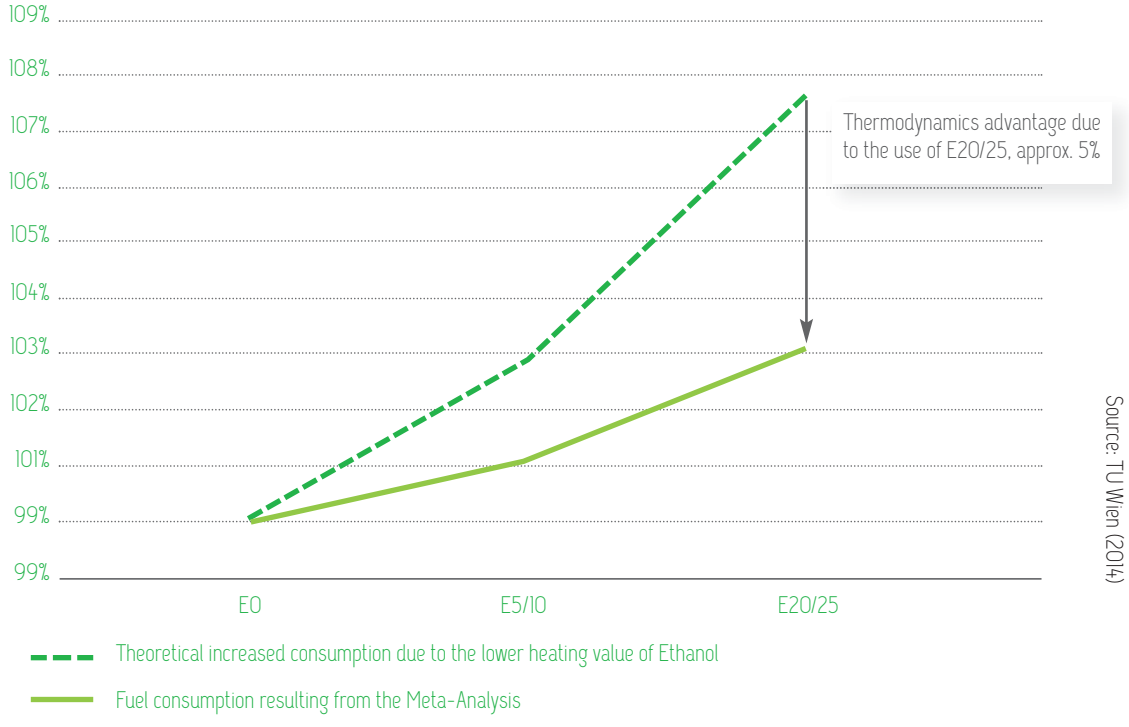
Introduce incentives and fuel specifications for higher biofuel blends to enable higher GHG reductions

Ethanol is not just a fuel with direct climate savings but it also makes petrol burn more cleanly and efficiently due to its higher-octane content. The scientific literature on ethanol's efficiency benefits is extensive and a meta-study by the University of Vienna, conducted under a framework contract for the European Commission Directorate General for Energy[17] was conducted in 2014. When ethanol is mixed into petrol, two things happen:

- First, energy from the combustion of the ethanol itself is used to power the vehicle and this direct impact is at the center of current GHG accounting methodology for biofuels.
- Secondly, the nature of the combustion in the engine changes for the entire fuel mix, and that physical change in the nature of the combustion increases the conversion efficiency of petrol, in effect adding extra energy to the transport sector.

This indirect benefit means that, for E5/E10 blends, efficiency gains are in the order of 30%.

> Theoretical fuel consumption due to the lower heating value of ethanol compared to the fuel consumption observed



Source: TU Wien (2014)

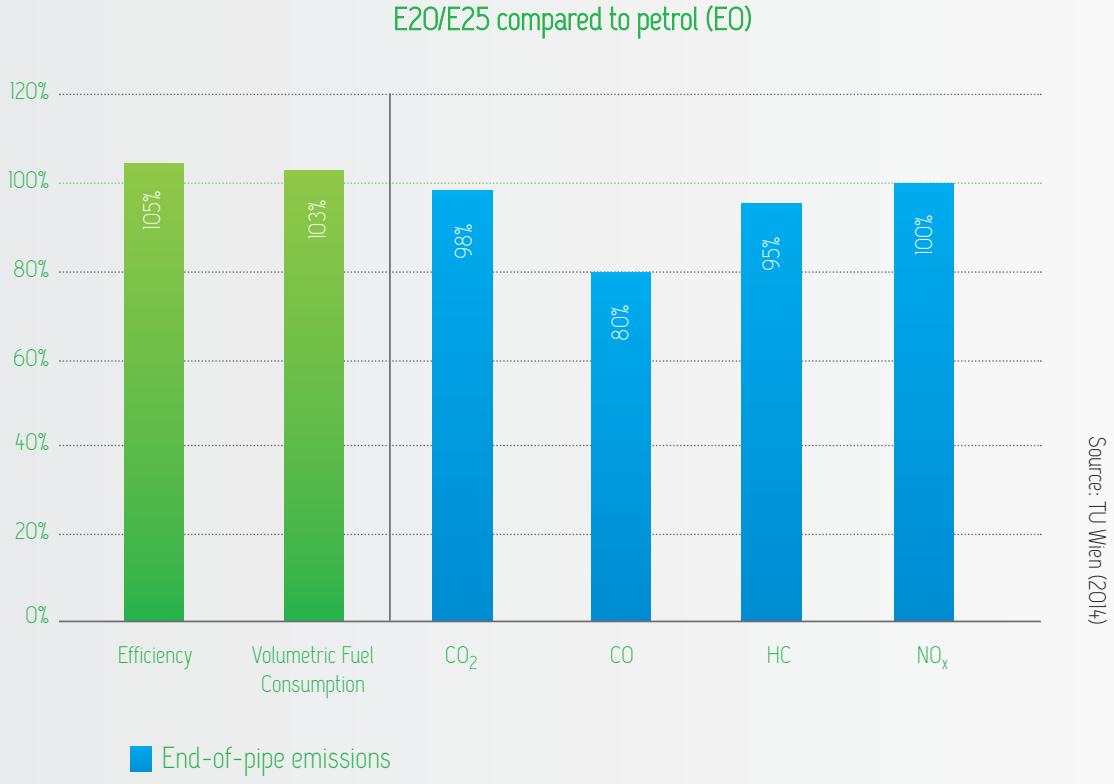
17. Meta-analysis for an E20/25 technical development study - Task 2: Meta-analysis of E20/25 trial reports and associated data", TU Wien, Institute for Powertrains and Automotive Technology, May 2014

Higher blends maximise ethanol's benefits in terms of energy efficiency and reduction of CO_2 and air pollutants

The meta-analysis confirms the efficiency gains triggered by E10, and shows that engine efficiency increases significantly when higher ethanol blends such as E20/25 (containing up to 20/25% ethanol respectively) are used, thereby improving the effect of these higher blends on fuel consumption.

It also shows that E20/25 reduce significantly other emissions.

> Higher ethanol blends mean less harmful tailpipe emissions than petrol



Source: TU Wien (2014)

POLICY RECOMMENDATIONS

1. The inclusion of 5% in volume in the petrol protection grade of E5, the full roll-out of E10 (petrol containing 10% ethanol in volume), and the introduction (at the latest by 2023) of a higher-octane petrol ethanol blend (min. E20) are imperative to achieve reductions in both CO_2 and other air pollutants even further. The higher the ethanol content, the higher the climate and air quality benefits.

2. Higher-octane petrol blends are crucial in order to exploit the energy efficiency potential by, for example, facilitating the realization of downsizing concepts. Ethanol as a high octane fuel additive is a cost effective basis to exploit this potential and higher blends should be incentivised towards all market players including:

   - **Fuel suppliers:** a higher minimum octane requirement for fuels and a minimum octane requirement for the blendstock would encourage fuel suppliers to use ethanol to provide the octane needed, and ensure that base fuel quality is maintained when ethanol is blended.
   - **Vehicle Manufacturers:**
     - Incentivising vehicle manufacturers to produce E20-approved vehicles through a credit towards car CO_2 targets once E20 is made available. The integrated "Fuels and Vehicles – Roadmap to 2030+" recommends to set tailpipe emissions to zero for the renewable part of the fuel that the vehicle is compatible with, above 2020 levels (e.g. E10 for petrol).
     - Incentivising vehicle manufacturers to declare their vehicles tolerant to E20 by the retrospective application of fuel labelling rules showing vehicle compatibility with different fuels (Fuel Labelling Directive), applied at technical check.
   - **Member States:** should also acknowledge the importance of E20 in public procurement.

3. As part of the implementation of the Alternative Fuels Infrastructure Directive, it would be most effective for Member States to enable access to infrastructure for high ethanol blends such as E85 for dedicated flex-fuel vehicles, and ED95 for buses and trucks.

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