

Crop-based biofuels – facts and figures about investments and jobs

July 2017

Summary

Crop-based biofuels were seen as a way to reduce the EU's dependence on fossil fuels and decarbonise the transport sector. But emerging evidence about negative environmental and climate impacts of these biofuels has led to the European Commission proposing to gradually phase-out the policy support in the EU. Industry stakeholders argue that this would adversely affect past investments and put jobs at risk.

This briefing shows most investments in conventional biofuels were made before 2010 and capital has already been paid back or is about to be. A full phase-out of policy support for [food-based biofuels](#) in the Renewable Energy Directive by the year 2030 therefore gives ample time for the industry to adapt and shift to advanced fuels and waste feedstocks. Public support is also available to support this shift to more sustainable advanced alternatives. Furthermore, the number of affected jobs is 20 times lower than industry claims. 40% of biofuel feedstock is imported and EU farmers can adapt to a change in biofuels demand by growing other food crops.

1. Context

National and EU policies¹ that support biofuels has led to a boom in their use in the last decade. However, the failure to establish robust sustainability criteria and particularly account for indirect land use change impacts (ILUC) in the relevant regulations has undermined support for and the credibility of biofuels, many of which deliver no or minimal greenhouse gas savings or cause environmental and social damage in other ways.

In late 2016, a recast of the Renewable Energy Directive (RED II) was proposed to regulate biofuels in the EU for the period 2021-2030. In this recast, the Commission proposes to phase-down the use of crop-based biofuels from 7%² in 2020 to 3.8% in 2030. The proposed phase-down is a step in the right direction, but the biofuels industry claims ongoing support is needed to protect the investments that have been made in the past, as well as existing jobs. This briefing questions these assertions and demonstrates why a progressive phase-out is a reasonable policy option, both for the environment and the economy.

¹ the Renewable Energy Directive of 2009 established that 10% of the total energy used in transport must come from renewable sources, which drove the rapid uptake of crop-based biofuels.

² Set by the 'ILUC' reform, finalised in 2015.

a briefing by:

2. Five facts about investments and jobs in conventional biofuels

2.1. Most of the investments are already paid-back

An ECOFYS study³ examined investments in conventional biofuels and found that plants have a typical payback period of between 5 to 10 years. The report concluded that 95% of the biodiesel plants built by 2012 would be already paid back by the end of 2017.

The report looked only at grandfathering biodiesel installations as they would have been impacted the most by the introduction of a proper carbon life-cycle accounting of biofuels emissions - including ILUC values. But looking at the typical payback time for bioethanol plants, the figure should be somehow similar.

2.2. Only a few new conventional biofuel plants since 2010

A report by the US Department of Agriculture Foreign Services (USDA FAS)⁴ found that only a few plants have been built in the EU in the period 2010-2015.

The number of FAME⁵ biodiesel plants decreased - from 250 plants in 2010 to 237 in 2015. In the case of conventional (crop-based) bioethanol plants, there has been a small increase in the number of plants built, from 68 plants in 2010 to 71 in 2015. There was an increase in HVO⁶ diesel plants, with 10 new plants built. Given the average pay-back periods of 5 to 10 years, even if all these few new plants had been built in 2015, they would be paid-back by 2025 at the latest.

	2010		2015	
	Plants	Capacity use	Plants	Capacity use
Biodiesel (FAME)	250	44%	237	45%
Biodiesel (HVO)	1	100%	11	82%
Bioethanol	68	65%	71	68%

The USDA report also highlighted most plant are operating at below capacity. Notably FAME biodiesel plants are typically running at less than half capacity and shows no new investments in crop-based biofuels installations are needed.

³ [Assessing grandfathering options under an EU ILUC policy](#), ECOFYS, 2012.

⁴ [Global Agricultural Information Network 'GAIN' report](#) 2016, US Department of Agriculture (USDA) Foreign agricultural service, 2016

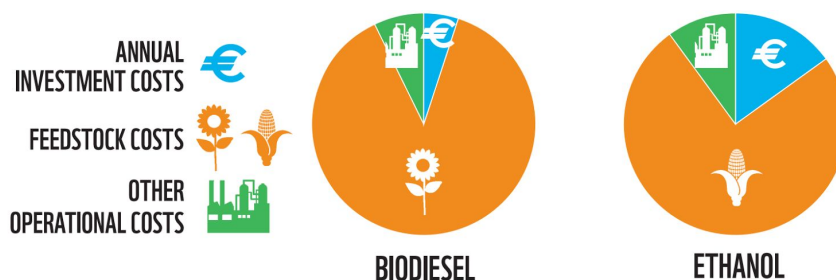
⁵ Fatty Acid Methyl Ester - the most common type of vegetable oil based biodiesel. It is considered an "old" and mature technology, compared to HVO. FAME has technical limitations regarding the amount that can be blended with the fossil diesel, when HVO doesn't have such limitation. Until now, FAME biodiesel plants have been using mainly crops as a biofuel feedstock but the use of more sustainable waste feedstocks such as Used Cooking Oil has increased. [More information here](#) (as of page 22)

⁶ Hydrogenated vegetable oil - considered a more 'advanced' option of vegetable oil based biodiesel. As opposed to FAME, it doesn't have a blending limitation, and also it admits waste vegetable oils more easily. But it is impossible to say what type of feedstocks: food crops or waste - these new plants are currently using.

a briefing by:

2.3. Capital costs are a small proportion of total operating costs

A study done by the Global Subsidies Initiative (IISD)⁷ found that the cost of running all biofuel plants is about €10 billion per year compared to an initial investment to set up the EU biofuel industry of €6.5 billion - which is, on an annual basis, between 3 and 16% of the production cost⁸. The majority of production costs are for purchasing the feedstocks: 90% in the case of biodiesel, 70-80% in the case of bioethanol. This supports the assertion payback periods are relatively short and most plant have already covered their initial outlay.



9

2.4. Number of jobs at risk is modest – the agricultural sector will adapt

A recurrent and important concern that arises from the recommendation to phase-out the support to crop-based biofuels is the impact on jobs in the biorefineries and the agricultural sector. The biofuels industry claims that 220.000 jobs would be at risk¹⁰ - but no detailed breakdown is available for this claim. However a recent analysis from the European Commission's Joint Research Center, estimates the amount of jobs linked to the EU biofuels industry at around 12.000 in 2015¹¹, one of the smallest sector of the overall EU bioeconomy.

Some losses in agricultural revenues can be expected as biofuels policy has increased some biofuel crops prices upwards. But farmers are expected to rapidly adapt in particular switching back from rapeseed to cereals and other cash crops¹². Furthermore, the recently released EU agricultural outlook¹³ concluded that a decrease in rapeseed biodiesel consumption would be compensated by an increase in rapeseed exports and an increased use in the food market. Around 40% of the European biodiesel feedstock is imported¹⁴ and creates no jobs in EU farming.

Finally, the transition towards cleaner fuels would lead to job creation. In a recent research¹⁵, the International Council on Clean Transportation concluded that tens of thousands of permanent and construction jobs could potentially arise from the waste and residues based advanced biofuels production in the EU.

⁷ [Uneven Returns? The economics of biofuels policy](#), IISD, 2013.

⁸ The lower figure would typically apply to biodiesel plants while the higher figure would apply to bioethanol plants.

⁹ Source: [Uneven Returns? The economics of biofuels policy](#), IISD, 2013.

¹⁰ [EU biofuels policy: what is the impact on rural development?](#) Euractiv, 8 May 2017

¹¹ [The Bioeconomy in the European Union in numbers](#), Joint Research Centre, 2015

¹² [Assessing grandfathering options under an EU ILUC policy](#), ECOFYS, 2012.

¹³ [EU Agricultural Outlook. DG Agriculture and Rural Development](#), December 2016

¹⁴ [Renewable Energy Progress Report. European Commission](#), 1 February 2017

¹⁵ [Biofrontiers - Responsible innovation for tomorrow's liquid fuels](#), November 2016

a briefing by:

2.5. Public support can help shift to more sustainable options

In the State Aid Guidelines for the years 2014-2020¹⁶, the European Commission, considers that investment and operating aid isn't justified for food-based biofuels capacity after 2020. However, investment aid can be granted for advanced biofuels in two ways: either for the conversion of food-based biofuel plants into advanced biofuels plants, or for building new advanced biofuels capacity.

Whilst some industry stakeholders argue that policy support for crop-based biofuels is needed to continue production and use the revenues to finance the transition towards advanced biofuels capacity the evidence suggests the capital costs of crop-based biofuels will be paid off before any restrictions come into effect.

3. A full phase-out of policy support for crop-based biofuels by 2030 is a reasonable option

In the past years, increasing concerns have arisen about the climate, environmental and social impacts linked to crop-based biofuels, mostly linked to the impacts of indirect land use change. Correctly, EU legislators have called for moving the policy support away from these kinds of biofuels.

Based on the above information, it is recommended there is a full phase out of crop based biodiesel as soon as possible and a full phase out of crop based ethanol by 2030. This is justified since::

- Most investments in current biofuels installations have been paid back or will be very soon. Most biofuels installations have been built before 2010 and have a typical pay-back period of 5 to 10 years. There is also overcapacity as crop based biofuels plants are not running at full capacity.
- The industry has been and will remain heavily dependent on public support because most of the costs come from buying the feedstocks - the crops.
- The agriculture sector will be able to adapt to the switch in demand.
- Public support should now focus on the transition towards truly clean and sustainable alternatives, such as advanced biofuels based on wastes and residues or sustainable electrification of transport.

Further information

Cristina Mestre
Climate & biofuels officer
Transport & Environment
cristina.mestre@transportenvironment.org
Tel: +32(0)2 851 0206

¹⁶ [Guidelines on State Aid for environmental protection and energy 2014-2020](#)