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SOW-VU BRIEF

Biofuel mandates of the EU to be preserved by legislative deadlock?

The European Parliament's Amendment in an international perspective

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1. Introduction

Since 2004 most OECD countries have implemented regulations for mandatory use of biofuels as part of their policies to promote a transition to renewable energy and to curb greenhouse gas emissions, particularly from fossil fuels as agreed in the Kyoto Protocol. Ever since its introduction, the policy has been much criticized. The proponents concede that the present, first generation of biofuels from food crops may not be ideal but they point out that there are currently few other ways to meet the commitments of the Kyoto Protocol. In the United States the policy's implementation has been plagued by technical difficulties with rising blending percentage of bioethanol in gasoline that is nowadays referred to as the blend wall. In the EU that unlike the US imports most of its biofuels, the international impacts are mounting the opposition particularly after the food crises of 2008 and 2011 and the associated price volatility of agricultural commodities.

The present brief is published on the occasion of the adoption on 11 September of the amendment of Directive 98/70/EC and Directive 2009/28/EC in the European Parliament. In the original amendment a cap of 5.5% of food crops based biofuels in transport as percentage of total fuel use was to be implemented by 2020 as well as stronger conditions for qualification as non-food crop, of particular relevance for recently planted oil palms. The aim is to contain the planned expansion of the first generation biofuels in the EU. Regrettably, the amendment was eventually revised with the cap set at 6%, and postponement of the conditionality until 2020. Moreover, the Parliament opposed a shortcut with negotiations to seek compromise with the European Council on this amendment. Consequently, unless the Council agrees, a further cycle may follow and if dissent remains after a final conciliation attempt, the whole amendment will be cancelled. In short, the mandates and the rules for implementing them might eventually be left unchanged thanks to a political deadlock.

The present brief reviews latest developments in biofuel policies worldwide with special reference to the European situation.

2. Trends in biofuel use

Figure 1 confirms that use of biofuels has taken a great flight in both bioethanol and biodiesel, particularly with the United States and Brazil producing bioethanol from domestically produced maize and sugar cane, whereas the European Union produces both fuels,[1] relying on local production as well as on imports of maize, wheat and cane sugar for ethanol, and oilseeds and palm oil for biodiesel.

Most of this production consists of what is commonly referred to as "first generation" biofuels that compete with food crops as far as land use is concerned. Second generation or advanced biofuels include cellulosic biofuel from wood and biofuels from waste, residues and algae. Ethanol based on sugar cane is dealt with differently as it is in the US classified as advanced because it meets many of the sustainability standards (Sims et al., 2010).

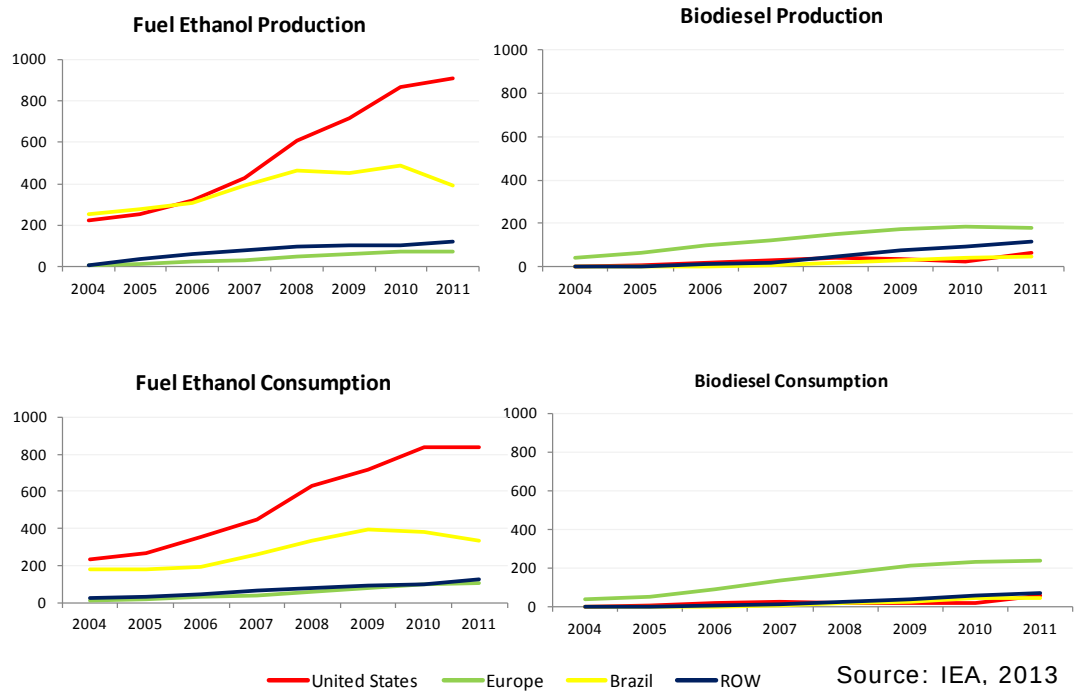

Figure 1: Biofuel production and consumption (in thousand barrels per day)[2]

After the food crises in 2008 and 2011, and the US drought in 2012, voices against biofuel policies have grown stronger, specifically, against the levels and modes of mandatory use.

3. Arguments for introducing biofuel mandates

A wide range of arguments has been advanced to motivate the introduction of biofuel mandates.

[1] Figure 1 shows that diesel consumption has been rising fast in Europe. This is due to favorable tax-regimes (Charles et al., 2013b). By 2013 around 35% of the car park consists of diesel cars, more than 55% of the car sales are diesel cars and close to 70% of fuels in transportation (including shipping) is diesel (ACEA, 2012; Petromatrix, 2013).

[2] Main players in the rest of the world include Canada, Argentina while India, Japan and Australia are potentially big players. The total daily oil consumption is around 89 million barrels.

First, the main presumed justification was reduction of greenhouse gas emissions (Rajagopal and Zilberman, 2007), under the intuitively appealing argumentation that net emissions should be zero for biofuels during the full life cycle as the release of carbon when burned equals the removal or carbon through photosynthesis as the crops are grown. However, several studies (Bailey, 2013, Charles et al., 2013a; EASAC, 2012; HLPE, 2013) have shown that this is too crude a representation of the process as such simple life-cycle analysis misses critical components: it abstracts from the emissions linked to inputs in biofuel production, from the negative impact of land use change (Induced Land Use Change, or ILUC) say, when land is planted to biofuel crops that previously was used for food crop cultivation (e.g. maize replacing wheat although wheat is used as well for biofuels but to a lesser extent), when surfaces are cleared for biofuel crop cultivation, from soil depletion, and from the CO_2 capture by vegetation that would have grown on the site otherwise. Most importantly, ILUC is particularly in the media increasingly linked to reports on so-called land grabbing, whereby large scale enterprises clear forests and chase local populations from their holdings or cut them from their connections to roads or water points. The EU has responded to these ILUC issues by requiring adequate certification from 2011 onwards but so far only 57% is certified (EurObeserv'ER, 2013) The more the components of the life-cycle analysis are being accounted for, the more negative the net impact.

Second, the contribution of biofuels as substitutes for fossil fuels that help reducing import dependence and slowing down stock depletion also played a role. Current proven oil reserves are sufficient for another 53 years of present day consumption (BP, 2013).[3] Clearly, solar, wind and hydropower, and more controversial sources such as shale gas and tar sands, not to forget nuclear energy are other potential candidates.

Third, as highly inflammable substances, ethanol and biodiesel can be used to enhance fuel combustion, substituting for methyl tertiary butyl ether (MTBE) - which is considered to be environmentally damaging and has been banned in some states of the US and blenders can be held liable for groundwater contamination.

Fourth, the associated additional demand for agricultural produce offers an additional source of income for farmers (Hazell and Pachauri 2006; Gohin et al., 2008). What is castigated as land grabbing can also be called the very needed (foreign) direct investment into rural areas (Fan et al., 2013). Furthermore, there is a positive employment effect in the chain as processing of biofuel crops in feedstock is more labor intensive than extraction and processing of fossil fuels (Rajagopal and Zilberman, 2007), albeit that cultivation of biofuel crops tends to be less labor intensive than food crops.

Fifth, a major argument often not presented very openly has been that the additional demand raises agricultural prices on world markets in the longer run, particularly because the mandates keep demand highly price inelastic while supply is limited by land and water availability, among others. Linked to this is - what from an economic perspective is the main drawback - that the mandates distort markets, with a high implicit subsidy to agriculture – around 5% of the EU budget in 2008 -, and also increase international price volatility sometimes directly through the inelasticity of demand, and sometimes indirectly by importing the fluctuations of oil markets into the international food markets (Keyzer et al., 2007), a distinction we return to below.

[3] Through discoveries and technological improvements this has gone up by five years in the last ten years.

Sixth, biofuel crops are more easily exported than food crops since they are not subject to phytosanitary regulations and are often also less protected on the import side.

Seventh, biofuels allow for easy adaptation in the prevailing infrastructure. They are liquids like gasoline and diesel, and are also chemically similar to fossil fuels. Hence adapting to a biofuel-based infrastructure could therefore be achieved more costs effectively than adaptation to other forms of energy (Ugarte, 2006). Supporters of the mandates often argue that the first generation in this way prepares the ground for later generations with less negative side effects. The fact that it is such a traditional technology and the far from spectacular profitability of the sector tell otherwise, however.

Finally, and most importantly, if one disregards the fundamental limitations mentioned under the first argument biofuels offer a relatively easy way that hardly can be dispensed off to meet the commitments of emission reduction in the Kyoto Protocol for 2020. This may be a strong argument in practical administrative terms but it can hardly provide a solid basis, particularly by comparison to using the resources and the transfers for investing in truly environmentally friendly technologies, over a time horizon beyond 2020, particularly since climate itself is not especially concerned about the situation in that very year.

4. Present biofuel policies by main users

Debates on biofuels center around the internal policies of Brazil, the United States and EU and their impact on developing countries. The present section takes a broader perspective by first discussing other players, because many of these are actually or potentially large players on the scene as producers of food crops for biofuels if not as biofuel producers or consumers.

Biofuel policies outside Brazil, United States and EU

Argentina has a mandate of 5% for ethanol and 7% for biodiesel most of which is being produced domestically. The main biofuel crop cultivation is soybeans from which cake is extracted as protein feed, jointly with oil. In recent years exports have been rising significantly largely in the form of protein cake, vegetable oil and biodiesel, while exports of unprocessed soybeans has been declining. In value terms of weight cake exports are about forty percent of cake value. The US, Europe and China are main importers of biodiesel and soy oil but Europe and China have imposed almost prohibitive import tariffs on biodiesel after accusations of dumping (Gain, 2013a; USDA, 2013).

Australia provides at federal level tax exemption for domestically produced biofuels, including a zero rate for the carbon tax that was recently introduced. There are also specific mandates imposed at state level. Consumption and production of biofuels are at balance, however, large quantities of canola are exported to Europe for biofuel production (Grain trade Australia, 2013).

Canada requires a 5% blend for gasoline and 2% for diesel since the end of 2010. Production more or less equals consumption, but is not meeting the targets. To meet targets and to benefit from biofuel trade, wheat is now being used for ethanol production and in parallel wheat is being replaced by maize (Gain, 2013b).

China initiated in 200 a pilot in 5 cities on the basis of ethanol made from aged grain from public stocks that was unsuitable for human consumption and for use as animal feed. From 2004 onwards this pilot was slowly expanded to nine provinces to sell blends with 10% ethanol. However, in 2006, government halted the expansion as it perceived negative impacts on national food security and ecological sustainability. By that time the stocks of aged grain had been depleted while international food prices had started rising and government faced a surge in applications for new biofuel production capacity intended to use fresh grains as feedstock. The current biofuel mandate (from 2 million tons of ethanol in 2010 to 10 million in 2020), therefore, is modest and stipulates that biofuel feedstocks should be from non-grain crops grown on marginal lands for bioethanol, while for biodiesel only waste oil can be used (Shiyan et al., 2012).

India currently is a small player on the biofuel market but it needs to be mentioned because of its size and because it has adopted high targets with a mandate of 20% by 2017 to be achieved without any use of food grains. Production of biofuel crops is promoted by a minimum support price for non-edible oil (Government of India, 2009). The current target of 5% for biodiesel seems unattainable, 5% for ethanol might be available but reaching it seems unlikely as most of the ethanol is currently being exported. Hence the target of achieving 20% by 2017 also seems unrealistic (Gain, 2012).

Japan presented its first biofuel plan in 2002 and revised it in 2006. The mandates are set at very low levels though: .5% in 2017 and 2% in 2020 mainly because the Japanese population objects to the use of food as fuel. In line with this Japan's biofuel research has been focusing on use of feedstocks that do not compete with food (Gain 2013c).

Overall, the countries considered have adopted modest to moderate biofuel targets for domestic consumption. Traditional exporters obviously sell to the highest bidder whatever the use the produce would be put to, but Brazil, the US and the EU continue to act as principal actors.

Brazil

Brazil is the frontrunner in biofuels. Its biofuel policies date back to the oil crisis in the 1970s when the country decided to diversify its energy mix and to reduce dependence on foreign oil by providing tax exemptions, low interest loans, mandatory purchases of ethanol from the state-owned oil company and indexation of alcohol consumer prices. After the second oil crisis in 1979 the government extended this program by far reaching support to the energy chain and the adaptation of transport equipment to ethanol blends. Several tax exemptions remain effective to date and the mandate currently requires a minimum of 25% ethanol and 5% for biodiesel (Growth Analysis, 2013; Wisner, 2013). Brazil is reconsidering its policies at present. International sugar prices have experienced several spikes since 2009 that made it difficult for ethanol to compete with sugar. The competitiveness was further harmed as the Brazilian government fixed gasoline prices to curb inflation while removing a tax on gasoline. Along the border with Venezuela competition is even more difficult as Venezuela has by far the cheapest gasoline worldwide which is available for smuggling. The discovery of recent oil fields off the coast of Brazil – that doubled their reserves (BBC, 2010) also shifts the focus away from ethanol. Furthermore, the sector as a whole has mainly benefitted large farmers in rich areas while large numbers of poor people lost access to fertile lands, food production had to be relocated, food prices increased and natural habitats were damaged (Halasz, 2011), of course all this notwithstanding many of the advantages mentioned above, where Brazil's technology had the special merit as

regards greenhouse gas emission, that it could run the process of bioethanol production with sugarcane rather than fossil fuel (Dias de Oliveira, 2005).

United States

The United States introduced its biofuel mandates in 2005, much later than Brazil, through the Renewable Fuel Standard (RFS), and expanded these in 2007. These mandates are expressed in absolute minimum quantities of biofuel – that need to comply with environmental standards[4] - to be blended in transportation fuel, largely bioethanol as biodiesel accounts for only 6% of the total biofuel mix, very much unlike in the EU where diesel has become the main fuel in transport. Fuel blenders are to establish their compliance to these mandates by handing in certificates (Renewable Identification Numbers or RINs) as for a virtual quantity of bioethanol computed as a fixed fraction of total fuel sales. This fraction is adjusted on an annual basis by the Environmental Protection Agency (EPA). The blenders acquire their RINs by their actual purchase of bioethanol from their suppliers who create RINs as a production certificate. A RIN has a validity of two years. A positive difference of actual from virtual mandatory quantity can be sold to other blenders who may want to blend less than the imposed fraction and in this way get the option to hand in a quantity of RINs exceeding the ethanol blended with fossil fuel.

In addition, the US also provides various financial incentives, such as the Volumetric Ethanol Excise Tax Credit (VEETC) that was introduced in 2004 and offered a 45-cent tax credit per gallon, while at the same time a 54-cent import tariff per gallon was set, as successor of the tax exemption given under the National Energy Act of 1978 (Growth Analysis, 2013). The VEETC has now expired, as well as the import tariff, but some financial incentives remain active at state level.

At the time the mandates were set, the United States Energy Information Administration (EIA) projected continued increases in gasoline demand of about one percent annually, whereas actual sales have declined by .7% annually since 2004 (EIA, 2013). Consequently, to achieve the mandatory volumes the virtual blending fraction had to be raised, soon to reach the blend wall for bioethanol,[5] where the amount that can be blended gets constrained by physical infrastructure. Hence blenders had to buy more RINs than they could use in biofuel, and the prices of the RINs skyrocketed (Figure 2).

[4] Palm oil from Malaysia and Indonesia does not qualify as a renewable fuel as it does not meet the minimum 20% lifecycle greenhouse gas reduction (EPA, 2011), there are not many other biofuels known to be prohibitive.

[5] Biodiesel is constrained by a blend wall as well as the EPA only allows blends up to 5% but as mentioned, the volume is relatively small in the US.

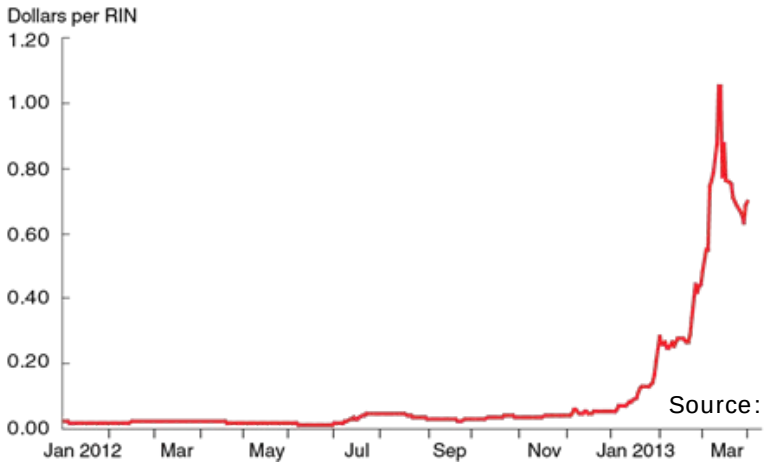

Figure 2: RIN prices of conventional ethanol

The blend wall also has significant distortive effects, as it leads to sugarcane based ethanol being shipped from Brazil to the US against maize based ethanol moving the other way around as the former is considered an advanced fuel that earns more RINs per gallon. Similarly, aviation that does not have any blending mandate is now using surplus bioethanol at reduced prices.

To lift the blend wall somewhat, the EPA in 2010 approved blends up to 15 percent ethanol (E-15) for cars built after 2000. The sale of E-15 never really took off though, because car manufacturers have warned against its use that voids any warranty on their cars. This does not apply to flex-fuel cars that can run on up to E-85. To address this blending constraint and to let the RIN-price cool down the EPA has declared its intention to lower the mandates for 2014 (EPA, 2013).

This lowering is, however, for purely technical reasons. It is not meant to address the deeper environmental and economic objections raised internationally (Chatham House, 2013; EASAC, 2012; HLPE, 2013; IISD, 2013).

European Union

In May 2003, the European Commission's biofuels directive entered into force, fixing mandates of biofuel use in transport at a minimum of 2% by 2005 and 5.75% by 2010. The Renewable Energy Directive of 2009 expanded these mandates and requires that by 2020 10% of the energy used in transportation is renewable – besides biofuels other renewable sources thereby also qualify. The latest directive also sets sustainability standards including savings on greenhouse gas emissions and the type of land that may be converted for biofuel crop cultivation. Furthermore, the latest directive also approves the use of blends up to 10% alcohol (E-10) while blends with a maximum of 5% must remain available as well. For biodiesel blends up to 7% (B-7) is to be permitted with an option for higher levels provided consumers are provided with sufficient information.

In addition, several EU member states, like the US, have introduced tax exemptions and reductions reaching up to 0.65 euro per liter in Germany for ethanol and 0.45 euro per liter in the Czech Republic for biodiesel (Charles et al., 2013b).

Compliance with the mandates is much like the RINs in the US, implemented through certificates (also known as biotickets). However, unlike the US every member state issues a certificate of its own independently audited at national level. The certificates are not tradable among member states unless they have been validated through bilateral agreements. In addition, biofuel producing firms can apply for general certificates that are tradable throughout the EU (European Commission, 2011).

In July 2013, the Environmental Committee of the European Parliament, proposed an amendment of Directive 98/70/EC and Directive 2009/28/EC[6] to impose national caps of 5.5% on biofuels produced from food crops or from crops grown on land that was previously occupied by other vegetation (other crops, meadows or forests). On 11 September the European Parliament adopted such a cap, raising it, however, to 6%, furthermore, the Parliament also voted in favor of accounting for ILUC but postponed the measure until after 2020.[7] To meet the commitment of 10% use by 2020 as stipulated in the EU Directive of 2003, the remaining 4% has to be filled from other sources of renewable energy such as advanced biofuels (e.g. from waste, residues or algae) and electricity from solar panels and wind turbines (European Parliament, 2013).

The originally proposed cap would more or less have halted expansion since the current percentage of biofuel use (average of 4.5% ethanol and 6.5% biodiesel over the period 2010-2012; OECD-FAO, 2013; recall that 70% of fuel used in transportation is biodiesel) is already hovering around this level. However, the 6% level still leaves some room for expansion.

Clearly, avoiding unnecessary additional distortions beyond those created by the mandates themselves calls for standardization of certificates– across the EU, leading to a RINs market as in the US.

The concerns about environmental damages from biofuel crops have focused around the induced land use change, particularly for soy and palm oil. Indeed, the fraction of EU palm oil imports for biodiesel has dramatically increased in recent years (Gerasimchuk and Koh, 2013). To contain this trend, the current amendment stipulates that biodiesel from palm oil can only escape falling under the quota of the cap if it has a certified origin from planted area already planted to oil palms before.

Finally, while the cap on biofuel use may limit demand it may not contribute much to the reduction of price volatility on food markets since in parallel with it some EU member engage vigorously in supplying E-10 next to blends with a maximum of 5% ethanol (E-5). Offering E-5 and E-10 at the same gas station establishes a strong arbitrage on price between both[8] and consequently equates the price of bioethanol in a fixed gasoline equivalent, thereby reinforcing the price transmission and associated volatility from the much larger gasoline (fossil fuel) market to bioethanol and through this link to food markets.

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[6] This vote is in what is called the first reading of an ordinary legislative procedure of co-decision that might still be opposed to by the European Council. The cap still needs approval by the Council (by qualified majority vote as described under the Treaty of Nice), which may revise the proposal and return it for a second reading, again with the possibility of amendment, and return to the Council. If the Council after a second reading keeps on disagreeing a conciliation procedure is initiated. It that procedure fails, the new amendment is rejected.

[7] The European Parliament did not give a mandate to start a negotiation with the Council implying that the Council either has to agree with the proposal from the Parliament or comment on it and return it for a second reading.

[8] The obligation to keep E-5 also creates a burden as an additional pump costs something of around 150.000Euros. In the Netherlands alone an extra pump at every gas station would amount to an investment of in the range of 500 to 700 million Euros.

5. Prospects

Broad coalitions of academics and NGOs including Oxfam, ActionAid and Friends of the Earth have relentlessly expressed their scientifically or ethically based objections to the biofuel mandates. After the food crises of 2008 and 2011, and the US drought of 2012, voices against biofuel policies have grown stronger. Various international summits including the G8 and G20 repeatedly put international food security on their agenda and called for caution.

Although good harvests of 2013 combined with the unrest on oil markets in the Middle East reduced the immediate pressure for cutting biofuel mandates to avoid price hikes, there still is a possibility that the expansion will soon be halted at last.

We have seen that the US mandates are likely to be lowered for 2014, in response to technological limitations imposed by the blend wall. In the EU the danger of the deadlock mentioned in the introduction is real if the Council refuses to follow the Parliament on this issue. Indeed, such a deadlock exemplifies the weakness of the European integration process, whereby a parliamentary majority at EU-level, unlike at member state level, can be sidelined by the national votes in the Council, even for subjects that are primarily being regulated by the EU and do not fall under the subsidiarity principle.

It may be hard to explain a lasting stalemate on this issue to the European voters who are asked to turn up for elections in May 2014. Hence, if the biofuel issue succeeds in attracting sufficient attention during the campaign of the coming month, there might be a chance that the Council more or less accepts the cap at the proposed level despite the various lobbies opposing it (Tran, 2013).

Be this as it may, in the short term the changes in the mandates of the US and the EU obviously have only very limited effect and a revival cannot be excluded. Yet, jointly with the moderation in other parts of the world, they signal that a change in course may be possible and that whatever the potential merits of biofuel crops, particularly as source of revenue for employment in rural areas, the current mandatory regulations eventually will be abandoned because of the distortions they create on agricultural markets, and at the very least questionable contribution they make to reduction of greenhouse gas emissions.

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