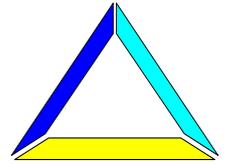




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**Comments on the Draft Law of Ukraine №3158
„On biological fuels production and consumption
development“**

Disclaimer:

This paper was prepared by the author using publicly available information and data from various sources including papers from the Institute for Economic Research and Policy Consulting as well as the German Advisory Group. All conclusions and recommendations included in this paper in no circumstances should be taken as the reflection of policy and views of the German Federal Ministry of Food, Agriculture and Consumer Protection.

Background

Biofuels are currently high on the political agenda in Ukraine. On April 4th the Draft Law №3158 'On biological fuels production and consumption development' was approved in the first reading in the Parliament¹. This short note aims at presenting a brief assessment of the economic impact of the law and rough-cut quantification of the economic costs and benefits if this draft law would be adopted.

1. Main points in the draft law

Major policy objectives

- Saving fossil fuels
- Decrease Ukraine's dependency from energy imports
- Decrease the negative impact on the environment

General major implementation mechanisms suggested

- Mandatory blending of biofuels to fossil fuels
- Guaranteed state support of biofuels production and consumption via tax breaks, reduced import duties and other privileges for a period of 10 years.
- Support of R&D in biofuels production
- Support of international cooperation in biofuels R&D
- Information campaign on biofuels benefits for consumers and producers
- EU harmonization of Ukraine's legislation

State regulation tools suggested

- Export codes to biofuels will be assigned according to their final use but not to their chemical composition;
- For bioethanol mandatory blending is required: in 2008 – 2% up to 10% in 2010;
- For biodiesel mandatory blending is recommended (remark: inconsistent formulation in the draft law): in 2008 –1% up to 8% in 2015;
- Introduction of zero excise-duty (mineral oil tax) for biofuels beginning from 2007 for 10 years ;
- In Kyiv and other cities with more than 500 thousand population as well as in recreation zones all vehicles have to use biofuels: in 2008 – 5% up to 100% in 2011.
- Harmful additives (MTBEs) have to be substituted by environmentally friendly substances (ETBEs): in 2008 – by 20% up to 100% in 2010;

Enforcement

Infringements of biofuels' law leads to disciplinary, administrative, civil or criminal actions according to Ukraine's legislation (not further specified).

Suggested changes to relevant legislation

- Excise duty for blended biofuels is decreased by 3.33% for every mass percentage of biofuels contained in fossil fuel, and for every two mass percentage of ETBE. (note: current excise duty for diesel and petrol is 60 Euro per ton)
- Biofuel plants are exempt from profit income tax for 10 years, if their biofuel production not less than 75% of the total production volume;
- Import of machinery, equipment for biofuels plant renovation and construction is exempt from import duty and VAT from 01.07.2007 till 01.01.2010 unless it is produced in Ukraine

¹ See the Verhovna Rada's Resolution № 921-V as of April 12, 2007

- Import of agricultural machinery, seeds, fertilizers, and pesticides is exempt from duty and VAT from 01.07.2007 till 01.01.2010 (conditioned it is produced in Ukraine and specified in investment project; also it has to be included in the agreement between an investor and government); Note: it remains unclear whether this is valid only for the production of raw materials for biofuels production.
- 50% interest rates compensation for domestic investors for purchase of machinery and equipment for biofuels plant construction and renovation;

2. Evaluation

In our economic assessment we consider bioethanol and biodiesel separately to answer three questions: i) what are the resource requirements to reach the objectives of the draft law? ii) what are the economic costs of reaching those objectives? iii) which groups of the society would have to bear the costs?

2.1 Bioethanol

Resource requirements. Considering first the resource requirements for bioethanol production we assume 10% mandatory blending requirement suggested in the draft law to be reached in 2010:

a) Assuming Ukraine annually consumes about 5 m tons of gasoline, gasoline density 0.74t/m^3 and energy content of ethanol of approx. 66% of gasoline we end up with $(5\text{m t})/(0.74\text{t/m}^3)/0.66 = 10.2\text{ m m}^3$ of ethanol equivalent.

b) To reach 10% mandatory blending Ukraine would need $(10.2\text{ m m}^3)*0.1 = 1.02\text{ m m}^3$ of bioethanol.

c) Since conversion factor of grain into bioethanol is 2.6t/m^3 , Ukraine would need $(1.02\text{ m m}^3)*(2.6\text{t/m}^3) = 2.66\text{ m tons}$ of grain for bioethanol production.

Since on average about 11 m t of grain is available for exports, it may be concluded that 10% target is achievable with domestic resources. However, from an economic point of view it is relevant to ask: what are the costs of reaching this objective? To answer this question we consider the expected impact of the measures suggested in the draft law on three groups of the national economy:

Producers. The outcome for producers of biofuels is not certain. On the one hand they are expected to benefit from compulsory blending and tax breaks simultaneously. On the other hand it is likely that they fight for resource supplies with traders (if the government does not intervene with export quotas or export taxes), food and feed industry (livestock, brewery and bakery sector) and foreign biofuel producers. This would lead to an upward pressure on prices of domestic resource supplies (grain) and with growing competition on the world grain markets with upward grain price trends, it would result in squeezing biofuel producers' profits. This situation is currently observed in Germany where 25% of biodiesel plants finished 2006 with losses. Table 1 gives approximate estimates to the expected bioethanol producers' margins². Our calculations show that biofuel producers would run losses without government support under the current market prices and efficient production. If we account for government support transfers (mandatory blending and excise duty exemption discussed below) producers would have higher, still negative margins. The magnitude of margins would depend on bioethanol plant efficiency, its capacity, market opportunities for by-product sale and grain prices. World grain prices have never been so high over the last decade and there are reasons to expect their further upward trend due to the growing world food demand and biofuel demand on top of the former. Thus our chosen corn price of USD150/t basically drives producers margins down. Our estimated margins might be taken as ceiling margins, since costs are calculated for rather big and efficient biofuel plant.

² see IER policy paper #7 "The World Biofuel Boom and Ukraine – How to Reap the Benefits" for detailed background figures

1 Table

Biofuel producers' margins

A) Current gasoline wholesale price, UAH/l	3.3
Aa) Total production cost w/o corn costs and minus by product (DDGS) revenues in US\$/m ³ (for 200,000 m ³ bioethanol plant)	145.4
Ab) Corn US\$/t	150.0
Ac) Corn US\$/m ³ (US\$/t*2.56t/m ³)	384.0
Ad) Total production cost in US\$/m ³ : Ad = Ac + Aa	529.4
Ae) Wholesale price of ethanol adjusted for energy content in US\$/m ³ : Ae = Ad/0.66	802.1
Af) Wholesale price of ethanol adjusted for energy content in US\$/l: Af = Ae/1000	0.8
Ag) Wholesale price of ethanol adjusted for energy content in UAH/l: Ag = Af*5.05UAH/US\$	4.05
Margin w/o government support: = A/Ag*100	-18.5%
B) With government support:	
Ba) Price increase due to blending ³ , in UAH/l	0.2
Bb) Tax benefits from excise duty exemption, in UAH/l: 0.047Euro/l*10*0.033*6.8UAH/Euro	0.11
Bc) Whole price of ethanol plus support in UAH/l: Bc = Ag- Ba- Bb	3.7
Margin with government support	-12%

Source: Own calculations based on IER Biofuel paper (2007);

Note on conversion factors used: bioethanol density – 0.79t/m³; bioethanol energy content compared to gasoline: 0.66; corn into bioethanol conversion: 2.56t/m³; 1 m³ = 1000 l;

The increasing demand for grain would also squeeze profits for producers in other sectors processing or using grain (bakeries, breweries, livestock sector) due to a significantly increasing demand for domestic grain. Depending on the elasticity of the demand for commodities processed by these sectors the raw material price increases might be passed further on to the end consumers. It would thus lead to higher inflation.

Agro-producers. Due to international trends in world grain prices Ukrainian biofuel producers might suffer from insufficient raw material supply. Therefore, if this draft law would be adopted, there would be a high risk that lobby groups representing the biofuels industry interests would ask the government to adopt measures ensuring sufficient raw material supply. This could be done in different ways, e.g. by introducing grain export taxes or quotas (as it happened with sunflower seed exports in 1999). Such a step would have a huge negative impact on Ukrainian agriculture. It would lead to lower farm-gate prices, reduced farm revenues, reduced investments, distorted markets etc. But even more important would be the dynamic losses: Farmers' incentive to increase production would be severely diminished, and Ukraine would need even longer to reach its ambitious goals to increase agricultural production and become an important player on agricultural world markets.

Consumers: The draft law offers mandatory blending, which would directly increase energy costs for consumers (car drivers, transport services, farmers etc). The quantification of mandatory blending impact on fuel blends in retail is possible. Table 2 outlines such an exercise. Shares of gasoline and bioethanol in fuel blend are assumed according to the draft law for 2010 target. Current wholesale gasoline price (A-95 type) is about 3.3UAH/l. If

³ see detailed calculation in paragraph for “Consumers”

bioethanol were produced in Ukraine its wholesale price would be about 4.45UAH/l (assuming break-even price of UAH4.05/l and current gasoline producer margins of about 10%). So the retail fuel blend price would be the weighted average of two product (pure gasoline and bioethanol) prices multiplied by wholesale-to-retail margins. As the Table 2 shows 10% mandatory blending drives fuel blend prices up by about UAH0.14/l. As Ukraine uses approx. 5 m t of gasoline a year or 6.3 m m³, assuming additional expenses of 14 kopecks per litre, Ukrainian consumers would pay an additional 0.88 bln UAH per year for gasoline use.

Table 2

Calculation of price for blended gasoline

	Gasoline (g)	Bioethanol (b)
A) Blend's shares	0.9	0.1
B) Wholesale price, UAH/l	3.3	4.45
C) Assumed retail margin	0.17	0.17
Retail price, UAH/l:		
Blended gasoline: = (Ag*Bg + Ab*Bb)*(1+C)	3.99	
Pure gasoline: = Bg*(1+C)	3.86	

Source: Own calculations

State budget: The net budget position is expected to be negative since it will forgo its potential revenues due to profit tax, import duty, import VAT, excise duty privileges and interest rate compensation. Assuming 10% mandatory blending for bioethanol, approximately 5 m tons of annual bioethanol consumption and suggested 3.33% decrease of excise duty for every mass percentage of biofuels contained in fossil fuel will decrease annual government tax revenues by (5m t)*10*(60Euro/t)*0.0333 = 100 m⁴ Euros or 680 m UAH. Furthermore, the budget is expected to compensate 50% of interest rates on credits taken by domestic investors for purchase of machinery and equipment for biofuels plant construction and renovation. Assuming a domestic investor would take a bank credit to finance a green-field biofuels plant. Investment costs of a modern 200,000 m³ bioethanol plant are approximately USD86 m. Assuming current approx. 12% interest rates for credits in foreign currency and 50% compensation of that interest rate by the government, we may approximately estimate expected budget expenditures of about 86 m*0.12*0.5 = USD5m. To reach 10% mandatory blending requirement (or 1.02 m m³ of bioethanol) Ukraine would need 5 such plants, meaning additional annual USD25 m or UAH125 m for the budget of Ukraine. Additional revenue inflows from agriculture due to expected higher volumes of production are not likely, since agriculture already enjoys a lot of tax privileges. Even if the agriculture sector were fully taxed, increased demand from domestic biofuels' industry would not increase tax revenues. Trading with resources at world market prices gives maximum tax revenues, so in this case it does not matter for the budget whether resource suppliers export or supply it to domestic producers at world prices.

Thus based on simple and approximate analysis and calculations that may be done by any interested party we come to the conclusion that promoting biofuels use in Ukraine would only partly reach its objectives, would be expensive and would likely cause adverse effects for certain groups of the society. The higher the share of biofuels in the country the higher would be the economic costs

2.2 Biodiesel

The same set of arguments and calculations applies to biodiesel.

⁴ current excise duty is 60 euro/t

Resource requirements. Considering first resource requirements for biodiesel production assuming 8% mandatory blending requirement suggested in the draft law (to be reached in 2015):

a) Assuming Ukraine annually consumes about 5 m tons of diesel, diesel density 0.84t/m³ and energy content of biodiesel of approx. 91% of diesel we end up with (5m t)/(0.84t/m³)/0.91 = 6.54 m m³ of biodiesel equivalent.

b) To reach 8% mandatory blending Ukraine would need (6.54 m m³)*0.08 = 0.52 m m³ of biodiesel.

c) Since conversion factor of rapeseed into biodiesel is about 2.5t/m³, Ukraine would need (0.52 m m³)*(2.5t/m³) = 1.3 m tons of rapeseed. In 2006 Ukraine produced 0.65 m tons of rapeseed. In 2007 Ukraine will most likely produce more than 1.5 m tons of rapeseed. Due to the growing demand on the world markets Ukraine is expected to produce about 4 m tons of rapeseed in 2010.

So 8% target for biodiesel is quite achievable with domestic resources. What are the costs of reaching this objective?

Consequences for producers and consumers from promotion of biodiesel production and consumption are similar to bioethanol. There is empirical evidence, e.g. in Germany, that 5% mandatory blending of biofuels into fossil fuels increases prices of the blended product by approx. 2 to 3 €cents per liter compared to non-compulsory blending. This does not sound much, but as Germany uses more than 33 bln liters of biodiesel per year this accounts for about 0.8 to 1 bln €. The effects of a mandatory blending policy for Ukraine should be quite similar. As Ukraine uses approx. 5 m t of diesel a year or 5.95 m m³, assuming additional expenses of 3 €cents per litre, Ukrainian consumers would pay an additional 1.2 bln UAH per year for diesel use. For the State budget the net budget position is also expected to be negative. Assuming 8% mandatory blending for biodiesel, approximately 5 m tons of annual diesel consumption and suggested 3.33% decrease of excise duty for every mass percentage of biofuels contained in fossil fuel would decrease annual government tax revenues by (5m t)*8*(60Euro/t)*0.0333 = 80 m⁵ Euros or 544 m UAH.

Budget expenses for 50% interest rate compensation are expected the following. Assuming a domestic investor would take a bank credit to finance a green-field biofuels plant. Investment costs of a modern 200,000 t biodiesel plant are approximately USD 30 m. Assuming current approx. 12% interest rates for credits in foreign currency and 50% compensation of that interest rate by the government, we may approximately estimate expected budget expenditures of about 30 m*0.12*0.5 = USD1.8m. To reach 8% mandatory blending requirement (0.52 m m³ or 0.45 m t of biodiesel⁶) Ukraine would need about 3 such plants, meaning additional USD 5.4 m or UAH 27.3 m for the budget of Ukraine. Additional revenue inflows from agriculture due to expected higher volumes of production are not likely.

Table 3 below summarises all the costs if the draft law were adopted and implemented.

Table 3

Summary of costs and benefits, UAH bln

	Bioethanol (10% mandatory blending)	Biodiesel (8% mandatory blending)
Producers	High risk of negative margins even with government support	High risk of negative margins even with government support
Consumers	0.88	1.2
Budget:		
Tax revenue loss	0.68	0.544

⁵ current excise duty is 60 euro/t

⁶ biodiesel density is 0.88t/m³

Source: Own calculations

2.3 Other issues to be considered

Apart from the above analyzed costs and benefits there are further issues in the draft law worth reflecting:

- The draft law suggests that all vehicles in Kyiv and other cities with more than 500 thousand population as well as in recreation zones have to use biofuels: in 2008 – 5% up to 100% in 2011. Although the objective is completely legitimate, however, there are questions to be raised. First, why 500 thousand people population is chosen as a threshold? Is there a big difference in CO₂ emissions between cities with 450 and 500 thousand people population? Second, how to enforce this regulation? Implementation costs might be prohibitively high.
- The idea to exempt import of agricultural machinery, seeds, fertilizers, and pesticides from duty and VAT is considered as a very positive measure. However, for the purpose of non-discrimination it is better not to condition it on whether it is produced in Ukraine or not. Moreover, tariff lines have no differentiation between domestic and foreign commodities, making this regulation difficult to implement without further specifications.

Conclusions

The objectives of the law are legitimate. However, whether promotion of biofuels production and consumption is the best way to reduce energy dependency from Russian imports is questionable. Economic reasoning and some rough-cut estimations of the economic impact demonstrate that reducing the energy dependency of Ukraine by using more biofuels is rather expensive. This does not mean that the goal is impossible to reach. However, there might be more efficient options to reduce this energy dependency. It is well known that Ukraine is still among the countries in the world with the highest energy use per unit of GDP in the world. Thus, saving energy is most likely the best way to reduce the energy dependency of Ukraine. Using biofuels and wasting them with very fuel inefficient cars, trucks and tractors is not the best possible way to reach the policy objective.

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