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## Prerequisites of Bio- fuels market evolution in Ukraine

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### Outline

1. World tendencies of bio-fuel production
2. Factors that determine development of bio-fuels industry in Ukraine
3. Factors that resist the production of bio-fuels
4. Competitiveness of production of bio-fuels in Ukraine
5. Conclusions

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*Biofuel* can be broadly defined as solid, liquid, or gas fuel consisting of, or derived from biomass.

Biomass is material derived from recently living organisms. It includes plants, animals and their by-products.

Agricultural products specifically grown for biofuel production include corn and soybeans primarily in the United States; rapeseed, wheat, maize and sugar beet primarily in Europe; sugar cane in Brazil; palm oil in South-East Asia; jatropha in India.

Biodegradable outputs from industry, agriculture, forestry and households can be used for biofuel production, either using anaerobic digestion to produce biogas, or using second generation biofuel processes; examples include straw, timber, manure, rice husks, sewage, and food waste.

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### World of bio-fuel market trends:

- High prices, increasing dependence on energy sources, and climate change are the factors of increase of the interest to the renewable energy sources, in particular, bio-energy;
- At an oil price 90-100 dol. the \$/barrel, some types of bio-fuels become relatively competitive;
- The production of bio-fuels can bring influence for rural territories development, but at the same time it lead to the foodstuff prices growth and to the environmental harm

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### The world production of bio-fuels depends on the following factors:

- Prices for mineral fuel;
- Food safety;
- Ecological problems;
- Long-term support of governments' policy of countries related to biofuel industry;
- Introduction of new technologies;
- Competitiveness of biofuels production.

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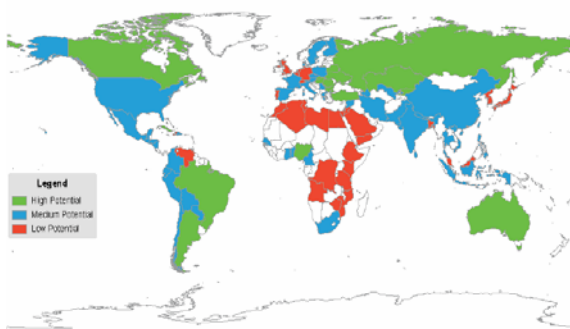
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### Biofuel potential of the World



Source: Braun, Rosengrant, Ringler, A policy is against hunger. Bioenergy and safe of feed conduct, Berlin on December, 16-19, 2007.

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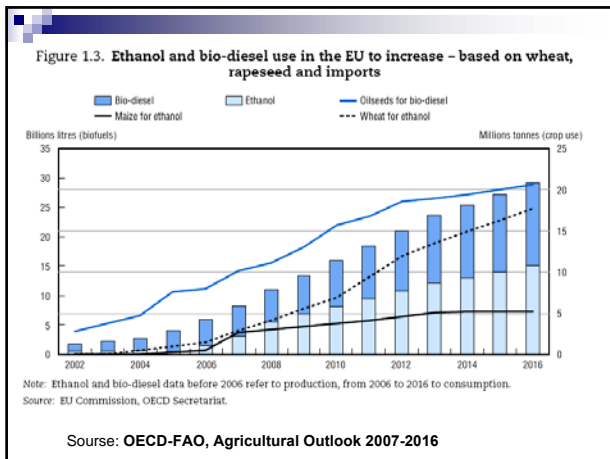
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**Basic indexes of development of RSE usage according to the main directions of use (million tons of F.Eq./year)**

| Renewable energy sources         | The level of development of renewable energy sources by years |              |              |              |
|----------------------------------|---|--------------|--------------|--------------|
|                                  | 2005  | 2010         | 2020         | 2030         |
| Bioenergy                        | 1,3   | 2,7          | 6,3          | 9,2          |
| Outside source of energy         | 13,8  | 15           | 15,7         | 16,4         |
| Solar energy                     | 0,003   | 0,032        | 0,284        | 1,1          |
| Small hydro-electric engineering | 0,12  | 0,52         | 0,85         | 1,13         |
| Geothermal energy                | 0,02  | 0,08         | 0,19         | 0,7          |
| Mine methan                      | 0,05  | 0,96         | 2,8          | 5,8          |
| Wind-power engineering           | 0,018   | 0,21         | 0,53         | 0,7          |
| Environment energy               | 0   | 0,03         | 0,98         | 7,6          |
| <b>Sum total</b>                 | <b>15,31</b>  | <b>19,53</b> | <b>27,63</b> | <b>42,63</b> |

Source: Power strategy of Ukraine on a period till 2030 year

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**Factors that determine the bio-fuels production development in Ukraine:**

1) Energy dependence

Ukraine is the net-importer of oil. Its own oil production compensates only 16-20% of crude oil consumption.

An average annual consumption of petrol is 4,5 million tons

An average annual consumption of diesel is 5,0 million tons

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## Factors that determine the bio-fuels production development in Ukraine:

### 2) Ecology

- CO<sub>2</sub> emission (25% of which are produced by transport);
- Agricultural technologies maintenance.

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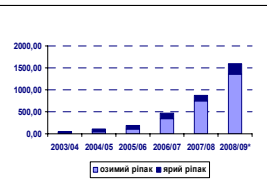
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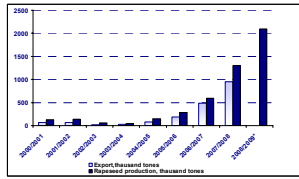
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## 3) Development of agricultural production

Areas under rapeseed in Ukraine, (thousand of hectares)



Production and export of rapeseed, (thousand of tones)



Ukraine so far comes forward a raw material appendage for biopower industry. In 2007 909,9 thousands t rapeseed were exported to the amount of 378055 thousands of US Dollar  
Forecast, that commodity capitalization of market rapeseed in a season 2008-2009 MR can make 980-1,1 milliards of US Dollar

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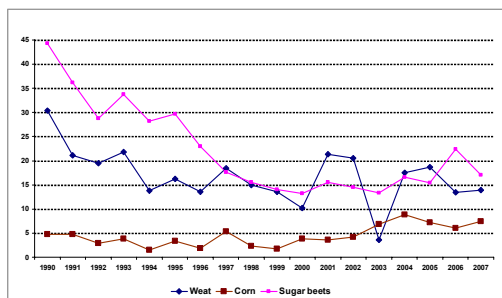
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Production of wheat, corn, sugar beets in Ukraine, 1990-2007, mln.t




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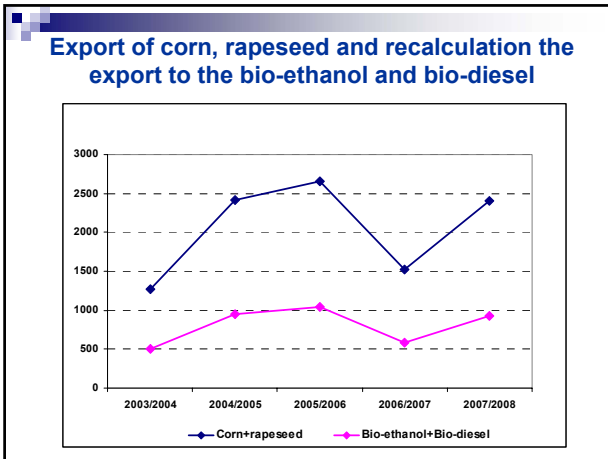
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- ### Factors that resist the production of bio-fuels in Ukraine:
- 1) The legislative base is undeveloped;
  - 2) Raw materials production and exports is more attractive for investors, than bio-fuels production;
  - 3) Low level of readiness of market and consumers for usage of bio-fuels;
  - 4) Ukraine does not exceed the CO<sub>2</sub> emission quota according to the Kioto protocol mechanisms, that is why there is no motivation regarding to develop the production of bio-fuels in order to decrease the CO<sub>2</sub> emission.

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### A law of Ukraine “On development of biological kinds of fuel” (December 2007)

*Positive issues that will appear in the case of passing the law:*

- permission of bio-ethanol production at the private-owned enterprises;
- a decline of excise duties for each percent of bio-fuel in a mineral fuel;
- granting of subsidies, grants, tax, custom and other deductions, for stimulation of development and introduction of new technologies, equipment, materials, in the process of production and consumption of bio-fuels.

*However the draft law has some drawbacks:*

- concerning the organizational moments in relation to forming of internal market of bio-fuels, obligatory norm of implementation.

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## **Conclusions for the global market**

- The world production of bio-fuels growth, that is defined by the energy dependence and environmental problems;
- The bio-fuels production boom in the world causes a disturbance regarding to food prices increase and harm caused for the environment. First of all the investments should come to innovations and technologies, and after that for increasing the productivity of agriculture and in this way to supply bio-fuels industry with the raw materials;
- New possibilities of gaining the profits for developing countries, in particular, in providing raw material for the global bio-fuels market;

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## **Conclusions for Ukraine**

- Ukraine has large agricultural potential, to supply with not only raw materials but also to develop its own strategy of development of bio-fuels industry, to become a producer-country, with a subsequent consumption, or export of the processed products, to the world markets. So far Ukraine stays to be a producer of raw materials for export;
- Ukraine has undeveloped legislative base;
- While mineral fuels prices constantly growth, production of biological fuels in Ukraine may be competitive (calculations show that the prime price of ethanol is already lower comparing to petrol price).

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**Thanks for your attention!**

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