A Regional Approach to a Global Biobased Economy: Russia

Plenary Session
June 17, 2013

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Russian Biofuels Association
Russian Biofuels Association promotes bioeconomy in Russia.

Our main forums:

Graintek, The forum focused on grain processing, green chemicals and bioeconomy, November 19-20, 2013, Moscow

Biomass: Fuel & Power
April 16-17, 2014
Russian Biotechnology Today

**Biopharma, 65%**

**Agri biotech, 20%**

**Industrial, Food and Forest biotech, 15%**

**Total market - $1.6 bln**

**Annual growth rate - 11%**

**Imports - 85%, including:**
- biopharmaceuticals - 89%
- agri biotech - 93%
- enzymes - 89%
- live cultures - 88%
- ecobiotech - 82%

**Russia's share in the global market of biotechnology:**

- 1980: 5%
- 1990: 3.4%
- 2000: 0.2%
- 2010: 0.7%

Source: Russian Biofuels Association, Abercadi, Ernst & Young, Rosstat

More info: www.biofuels.org
What Are Russia’s Drivers for Bioeconomy?
Russia Drivers for Biofuels

- Feedstock pressure (food and cellulosic)
- Needs of rural development
- Heritage of scientific excellence in R&D
Driver: Arable Land...

Arable Land, ha per capita

- Russia: 0.86
- USA: 0.56
- Brazil: 0.36
- Germany: 0.15
- India: 0.14
- China: 0.11

Source: CIA World Factbook
Russia: Fertile Triangle
Growth of Grain Harvest in Russia

Source: RBA, Rosstat
Growth of Sugar Beet Harvest

Mln MT


10.8 15.2 14.1 14.6 15.7 19.4 21.8 21.3 30.7 28.8 29.0 24.9 22.3 47.6

More info: www.biofuels.org
Russia Will Have Enough Cheap Glucose

**Current Russian capacity for grain production** - 150 mln MT /year

**Domestic consumption** - 80 mln MT/year

**Starch will be available** - 35 mln MT/year

35 mln MT of starch = 39 mln MT of glucose @ 15-18 $/lb

39 mln MT of glucose @ 15 $/lb = opportunity for bioproducts

Source: NPK Ecologia

More info: www.biofuels.org
Industrial Biotech Program “Biotech 2020” Signed by President

Targets:

- **Biofuel**
  - 2015: 3%
  - 2020: 10%

- **Renewable chemicals**
  - 2015: 2%
  - 2020: 5%

- **Biodegradable polymers**
  - 2015: 3%
  - 2020: 10%

- **Biodegradable packaging**
  - 2015: 10%
  - 2020: 30%

More info: www.biofuels.org
Government Support for Biotech

DEMAND SUPPORT
- Creation of domestic markets for biotechnology products
- Export support
- Standards

PRODUCTION SUPPORT
- Encourage the development of biotechnological industry
- Transfer of key technologies
- Development of feedstock base

INNOVATION SUPPORT
- Education and training
- R&D funding
- Cluster formation and support

More info: www.biofuels.org
Some Industrial Biotech Plants Under Construction

Russia is planning to invest $3.0 bln in industrial biotech next 7 years

<table>
<thead>
<tr>
<th>Company</th>
<th>Main product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rusbiotec, Evonik</td>
<td>Lysine</td>
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<tr>
<td>Renova</td>
<td>PLA</td>
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<tr>
<td>Prioskolie</td>
<td>Lysine</td>
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<tr>
<td>Krasnodar Biocenter</td>
<td>Propylene Glucol</td>
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<tr>
<td>Kaluga</td>
<td>B2, sorbitol</td>
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<tr>
<td>Citrobel</td>
<td>Citric acid</td>
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<td>Agroferment</td>
<td>Enzymes</td>
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<td>Titan</td>
<td>ETBE</td>
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<tr>
<td>Carbonik</td>
<td>Ascorbic acid</td>
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</tbody>
</table>

Projects with investment more than $100 mln are shown

More info: www.biofuels.org
Heritage of Scientific Excellence in R&D

Research Institute for Genetics and Selection of Industrial Microorganisms, Moscow, Russia

- >200 scientists, >100 PhDs
- 20,000+ industrial strains collection
- Portfolio of research projects
- Aminoacids technology
- Organic acids production technologies
- Enzymatic conversion of nitriles and amides
THANK YOU

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