

# Russian potential of forest bioeconomy

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#### Lomonosov Moscow State University

- Established in 1755
- More than 40 000 students (graduate and postgraduate) and about 7 000 undergraduates study
- More than 6 000 professors and lecturers, and about 5 000 researchers
- Faculty of Economics
- Environmental Economics Division: celebrating 40 years anniversary in 2019



### Center for Bioeconomy and Eco-innovations at Lomonosov Moscow State University

- First research & education center in Russia in the field of bioeconomy
- Established in 2013 as a part of interdisciplinary collaboration between Faculty of Economics and Faculty of Biology at LMSU
- Some of the key activities
  - Development and promotion of "Management of Biotechnology" MSc program
  - Research in the areas of bioeconomy supported by Russian Foundation for Basic Research
  - Promotion of green& sustainable university agenda

#### Центр биоэкономики и эко-инноваций ЭФ МГУ



#### "Bioeconomy in Russia: prospects of development"the first monography on bioeconomy in Russia

- Bioeconomy in the context of sustainable development and green economy concepts
- Capabilities of universities in development of the bioeconomy research and curricula
- Bioenergy as one of the key sectors of bioeconomy in Russia
- Bioeconomy in Russia: prospects of development



#### "Management of Biotechnology" Master's program at Lomonosov Moscow State University

- First MSc program in Russia on the topic of biotechnology from the management& economics perspectives
- Launched in 2014 as interfaculty initiative between faculty of economics and faculty of biology
  - Focus on the commercialization of the biotech solutions developed at LMSU and promotion of bioeconomy
  - Strong cooperation with bioeconomy stakeholders, including Ministry of Economic Development, TechPlatform "Bio2030", private sector (Invitro, Sanofi, BioCad, Jonson&Jonson, Pfizer, Rostec, Abercade), etc.
  - One of the key drivers for the development of biotech&bioeconomy clusters in LMSU

## LMSU participation in the interuniversity sustainability festival "VuzEcoFest" ("UniEcoFest")

- The purpose integration of sustainability agenda in the development of universities
- Started in 2015 with 10 Moscow uni's
- More than 50 uni's in 2018 from 20 cities of Russia, Belarus and Kazakhstan, 500 sustainability events including workshops, lectures, games, etc.
- The topic of 2018 was EcoCareer, in 2019
   Sustainable Development Goals
- Among the partners WWF, Unilever, L`oreal, etc.



## Forest sector: green economy, bioeconomy, circular economy, low-carbon economy



## The concept of Bioeconomy program in Russia:

"Program of development of the biotechnologies in the Russian Federation", signed by Prime Minister (2012)

- **Bioeconomy** is defined as an economy based on the systemic use of biotechnology.
- BIO2020 main goals :
  - To initiate bioeconomy development in Russia
  - To support new economy segments associated with industrial biotechnology
  - Important changes in legislation and standards
  - To stimulate and develop already existing priority market segments for biotech products - agrobio, food

The strategic goal is the level of bioeconomy

~ 1 % of GDP by 2020

~3 % of GDP by 2030

State Coordination Program for the Development of Biotechnology in the Russian Federation until 2020 (BIO-2020)

approved by the Prime Minister of the Russian Federation on April 24, 2012



The plan of measures ("road map") "Development of biotechnologies and genetic engineering" in 2018-2020

The Russian government has approved a new plan of activities to promote the development of biotechnology (spring 2018):

- provides for the reduction by 2020 of imports of biotechnology products by 50%;
- export growth of Russian products 25 times by 2025

According to the Ministry of Industry and Trade of Russia, over the past five years, the production of **pharmaceuticals** in Russia has increased by 70% in monetary terms and by 32% in physical terms.

## Russian biological potential of bioeconomy

- Forest, 1180 mln ha
  - 20 % of world's forest resources
  - 50 % of coniferous forests
- Land (fertile, arable)
  - 10% of arable land, 195 mln ha
  - 60% of most productive world black soils are located in Russia and Ukraine
  - About 20 mln ha of arable land are temperately out of agricultural production
  - Grain harvest >100 mln.t, projected surplus up to 30 mln.t
- Water
  - water resources, 30,000 m3 per capita
  - irrigated land, 86,000 m2 per capita
- Biomass



Large virgin forest areas in Russia and the main forestry production (pulp and paper and woodworking) (Siberia and the Far East): 1) weak infrastructure, 2) competition in bioeconomy between timber and non-timber ecosystem services

Russian forests store one-third of the forest carbon balance worldwide, but fires, pests, and human activities severely impair their effectiveness as a carbon sink and may result in additional carbon emissions.

#### Forest bioeconomy: comparison of benefits



Selection of the option of using forest land with maximizing value added and benefit flow

#### + Climate benefits of Russian forests:

(1) Renewable, forest-based sources
(including wood pellets) instead of
fossil fuels to produce energy
(2) Renewable, innovative forestbased materials could be used in
construction instead of other
materials, such as aluminum, steel,
and concrete, which require very
large volumes of fossil fuels to
produce

### Bioeconomy: to log or not to log the forests?



Tomsk region:

- Forest area about 28,680 thousand ha, which occupies more than 60% of the region's territory (more than area of forests of Finland)
- In terms of total volume of standing forest, it ranks the 3rd among the regions of Siberia and the 8th in Russia
- The economic value of timber is 1.32 billion rubles

Tomsk region case (1)

### The economic value of non-timber forest resources is 3 billion rubles

- **cedar pine nut** resources in years with an average yield are 58.5 thousand tons
- the total reserves of mushrooms are 50.4 thousand tons
- the fruit reserves of all types of **berries** reach 58.7 thousand tons
- the stocks of medical and technical raw materials exceed 12 thousand tons per year



# Bioeconomy: Tomsk region case (2)

- Powerful infrastructure for the purchase of wild non-timber forest products:
  - 250 stationary harvesting points
  - 150 mobile harvesting points
  - 500 dryers and cooking plants
  - number of permanent staff more than 2 thousand people.
- Green jobs. On the territory of the Tomsk region, up to 170 thousand people were involved in the harvesting of wild plants. A family of 3 people gets money for a new car per season. New jobs help to solve the problem of rural poverty
- Legislation. Locals people collect for free, firms and people from other regions - for a fee (payment for ecosystem services)

### Bioeconomy: bioenergy from waste

- **Total** energy **production** 1000 ml t of conditional fuel
- Organic fraction
  - forest waste about 200 mln t
  - agricultural waste 250 mln t
  - municipal waste 60 mln t



#### Bioeconomy: forest and bioenergy

The main advantage of bioenergy is the ability of waste disposal and carbon dioxide emissions.



Wood pellets are one of the rapidly developing types of renewable biofuels in many countries, including Russia.





The main markets for Russian pellet - European countries and South Korea. Five countries - Denmark, South Korea, Belgium, Sweden and Italy - in 2017 accounted for more than 1 million of all Russian wood pellets.

#### Production of solid biofuels in Russia (pellets, briquettes)

- Russian *biofuels* are for export, domestic consumption is limited
- In 2017: a strong increase in the production of pellets (+ 29.6%) and briquettes (+ 35.9%) = but gave a total of only 1.42 million t
- By 2030, UN FAO predicts an increase in the production of wood pellets and briquettes to 8.5 million t
- The Development Strategy draft of the Forest Industry Complex of Russia until 2030 assumes an increase in the production of pellets (only fuel pellets are considered) to 5 million tons, depending on market conditions
- State support compensation for a number of regions in 80% of export costs



#### Climate and waste

Russia has not ratified yet the Paris Agreement (2015) without taking into account the absorption of greenhouse gases by forests

- CO2 reduction
- wood raw material are stuffing settlements
- decomposable waste wood is a source of carbon emissions and water pollution
- creating a fire and hazard
- decomposable waste wood is a source of carbon emissions and water pollution
- waste wood dumps change landscapes, reduce the development of agriculture, recreation and eco-tourism
- lack of marketing and processing of wood waste has a negative impact on the profitability of wood processing industries



### Conclusion

- The Russian biological potential of bioeconomy is one of the largest in the world
- The Russian government supports the development of a bioeconomy, however, the stagnation of the entire economy and the lack of investment hamper this process
- Potential of non-timber ecosystem services are not fully recognized for forest-based bioeconomy development
- Forest-based bioeconomy can be an important growth factor for the pharmaceutical, food and cosmetic industries
- Bioenergy becomes one of the key sectors of bioeconomy in Russia







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