Subject matter:

Report

at the 2nd Energy Efficiency Package Solutions Forum

Esteemed colleagues!

SLIDE 1

I present you a brief report on **Development of bioenergetics based on rawwood processing and using biofuel in the Archangelsk Oblast housing and utilities sector.**

SLIDE 2.

Few words about the Arkhangelsk Oblast in general.

The Arkhangelsk Oblast is a northernmost territory of the European Russia. From the north, its 3,000-kilometer coast-line is washed by waters of the three Arctic seas - White, Barents and Kara. It borders the Republic of Karelia, in the west; the Vologda and Kirov Oblasts, in the south; the Komi Republic and the Tyumen Oblast, in the east. It neighbors - through the White Sea - the Murmansk Oblast.

Over a third of its territory is occupied with the islands of Franz Josef Land, Novaya Zenlya, Solovetsky, Kolguev, Vaigach, Kyi and others.

The Oblast's closeness to the seas of and the Arctic ocean itself causes a severe climate here. Winter is frosty, with the air temperature going down to the minus 40^0C complemented by strong winds. Summer is cool, in July, the average air temperature is 14 to 16^0C. The weather is specifically unstable.

Arkhangelsk Oblast, including the Nenets Autonomous Okrug and the Novaya Zemlya Archipelago, has an area of 587 thousand km². Population is 1,300 thousand. Archangelsk and Severodvinsk are rated as big cities.

There are 25 municipal entities in the Oblast. According to the Enumeration of the Far North Regions and Locations Equated to the Far North Regions, approved by the USSR Council of Ministers No. 1029 Decision of November 10th,1967, within the Arkhangelsk Oblast the municipal entities of "Severodvinsk", Mezensky, Leshukonsky and Pinezhsky are listed as the Far

North regions; the rest districts and territories are equated to the Far North regions.

The region is located in a zone of severe climatic conditions (prolonged winter season), so, the expenditure of energy to supply the industries and population with electrical and heat powers is high. Still, the power engineering is one of the weakest links in the Oblast's economy. Principally, the situation is caused by practically complete lack of local fuel industry and usage of expensive brought-in fuel. The excessive resources of surface waters are not a reliable energy source because of the flat-bottomed land. The consumers' centralized supply with electric and heat power is being done by means of thermal power stations, industrial and heating boiler houses. The main fuel material, power-generating coal, is being brought from the Komi Republic, the Kuznetsk Basin and, in part, from the Arctic (the Spitsbergen Archipelago). Black oil is being supplied from Russia's various regions, in main, from the Volga-river Basin and the city of Yaroslavl. The traditional fuel material, firewood, satisfies up to 20% of populace requirements.

Russia's Government has charged the regions with the task to utmost use the energy potential of their own.

The principal relevant document approved by the Arkhangelsk Oblast Government, is the Strategy of Development of Energy-saving in the Arkhangelsk Oblast, in which advancing the renewable energy sector is a priority.

Today, by expert estimates, the Arkhangelsk Oblast's energy-saving potential makes up 3.2 million tons of equivalent fuel a year. **By using the renewable energy sources, it is planned to actualize up to 35 percent of the existing energy-saving potential.**

In the Arkhangelsk Oblast, one of the most significant is **the project of usage the low-grade wood and wood-processing wastes for producing biofuel in the region**, which includes building and reconstructing regional and local boiler-houses using the technology based on biofuel combustion.

SLIDE 3.

The Project's objectives are

- to improve the energy efficiency of the regional fuel & energy complex
- to build and reconstruct boiler houses using technologies based on biofuel combustion in the Archangelsk Oblast
- to improve the efficacy of utilization of the Archangelsk Oblast forest resources.

SLIDE 4.

To meet these objectives the following tasks are to be solved

- to reconstruct and build anew boiler houses using technologies based on biofuel combustion; to build biofuel producing plants;
- to introduce innovative technologies into thermal energy production and transfer by means of the Oblast local boiler houses;
- to ensure rational all-including utilization of the forest resources and decrease harmful atmospheric emissions;
- to optimize the budget spending and limit energy tariff rising in the region.

It is worthwhile noting, this project has been endorsed by the Federal executive authorities, namely, by the First Vice-Chairman of the Russian Federation Government, Victor Alekseyevich Zubkov, and the project is planned to be implemented on the conditions of co-funding by the federal and Oblast's budgets and extrabudgetary sources.

Presently, there are **848 boiler houses used** for municipal heat supply (722 of them are municipal) in the Arkhangelsk Oblast. The majority of boiler-houses are of **low-power kind with small unitary heat productivity** (0.4 to 1.5 Gcal/h) and rather low efficiency (0.6 – 0.65). Average **physical depreciation of the heat supply capital assets makes up about 66%** (in 2009, thermal energy production made up about 22 million Gcal).

The principal fuel materials for our boiler-houses are **brought-in coal and furnace fuel oil**, natural gas, wood in a shape of wood-chips, firewood and, in part, wood wastes.

SLIDE 5.

The project to use low-grade wood and wood-processing wastes to produce biofuel in the Archangelsk Oblast suggests

1) to reconstruct/modernize 34 coal, firewood and pellet boiler houses with partial reconstruction of heat supply networks (the cost is 419 million roubles, including the equipment and civil & erection works [SEW]);

2) to install 26 new boiler houses for incineration of wood-processing wastes (420 million roubles, including the equipment and SEW);

3) to build 50 local boiler plants for municipal administrative buildings, health-care, education and culture facilities (631 million roubles, including the equipment and SEW);

4) to build firewood thermal mini-station (the heat power of 12 MW, electric power of 4.5 MW) at the village of Leshukonskoye, packaged with establishing a logging enterprise (1,056 million roubles, including the equipment and SEW);

5) to build 7 plants to produce firewood granules and pellets with the capacity of 35 thousand tons a year, packaged with establishing logging units to supply lacking volume of purchased wastes (2.1 billion roubles, including the equipment and SEW).

SLIDE 6.

The sources of bioresources are the forestry activity wastes (over 5 million m^3 of wastes are formed). More than 2 million m^3 of a wastes, including those in logging sites, are dispersed over the Oblast territory. Also, there is a potential resource for recycling in the form of 500 thousand m^3 of slob and lath and dead wood in the North Dvina and Pinega rivers interfluve, where 200 million m^3 of spruce forests are drying out at the area of 2 million hectares!

The project's total cost (including working out the business plan and design estimates) is 5 billion roubles; payback period is about 7 years.

SLIDE 7.

The project's ecological effect is signified by decreasing harmful emissions of pollutants into atmospheric air and production wastes

In the case of the Arkhangelsk Oblast**, it means the emission of CO_2 equivalent decreased by 270.6 thousand tons** (which is, at the price of 5 € per ton, about 60 million roubles a year in money terms), as well as **the greenhouse gases emission in carbon equivalent decreased by about 2 million tons for the 10 years.**

The St.-Petersburg Scientific Research Institute of Forestry, upon the Federal Agency order, has carried out the methodological substantiation study of the program of wood biomass usage to produce biofuel and develop bioenergetics by the example of the Arkhangelsk Oblast as a pilot region.

This study **identified 264 boiler houses in the Arkhangelsk Oblast not to be subjected to gasification and, in perspective, adapted to wood fuel.** In general, implementing the program of wood biomass usage to produce biofuel and develop bioenergetics in the Arkhangelsk Oblast is suggested to **create some 1.500 new jobs**.

Due to want of budget funding for the Program's actualization (applications for it were not satisfied by the Russian Federation Investment Fund) the Arkhangelsk Oblast **takes necessary steps to attract private investments to implement it**.

SLIDE 8.

Thus, in 2010, **upon the investor's funding,** three boiler houses are planned to be put into operation in the Primorsky District of the Archangelsk Oblast and two more in the city of Archangelsk, all using firewood pellets produced by the Archangelsk Timber Mill No. 25. At that, unprofitable boiler-houses using coal (4 units) and diesel oil (1unit) are to be closed.

To fulfill the task of large-scale reconstruction and modernization of the fuel and energy complex and housing and utilities sector systems the Archangelsk Oblast Government passed the decision to introduce mechanisms of the state-private partnership in the region within the frameworks of the White Sea Energy project, **the investment programs package had been worked out** aimed at developing every system in the municipal infrastructure of the region. One of the main area of the project's activity is constructing cogeneration plants

that combine production of electric and heat energy with usage of renewable energy sources and biofuel.

By the agreement on cooperation with the Mezhregionenergogaz Open Joint-Stock Company, now the draft program on building and reconstructing the power supply networks and wood-processing facilities in the Arkhangelsk Oblast for the years of 2010-14 has been worked out.

The above project, besides transferring ineffective boiler-houses using liquid fuel and coal onto usage of natural gas, **stipulates to build three boiler houses, a cogeneration plant and a timber mill in connection with actualizing the concept of development of biofuel usage in the Plesetsk District of the Arkhangelsk Oblast , in 2011**.

Besides, the Agreement on Cooperation with the VPK "Svyaz" Closed Joint-Stock Company has been signed, which provides for building an electric power plant using wood waste generator gas combustion at the township of Kamenka in the Mezensky District.

Implementing this project would make it possible to close diesel oil power station, at which the cost value of the electric energy produced is about 21 roubles per 1 kWh.

There is the business plan worked to build thermal wood waste mini-station for the Oblast's Leshukonsky District, legally rated as a Far North region. **The mini-station would allow to considerably reduce the diesel fuel delivery for the local diesel oil power plants**, to lower the electric power cost for businessmen from 36 to 4 roubles per kWh, and, eventually, to increase logging and wood processing in the District, and to lower the Oblast budget spending on deliveries of goods to the Northern Territories, the so called Severny Zavoz. The project's budget is 700 million roubles, economic and budgetary benefits up to 140 million roubles a year. Pay back period is 5 years.

The SLIDE 9. Thus, introducing biofuel into the region's municipal energy engineering is still the Arkhangelsk Oblast Government's priority, today.

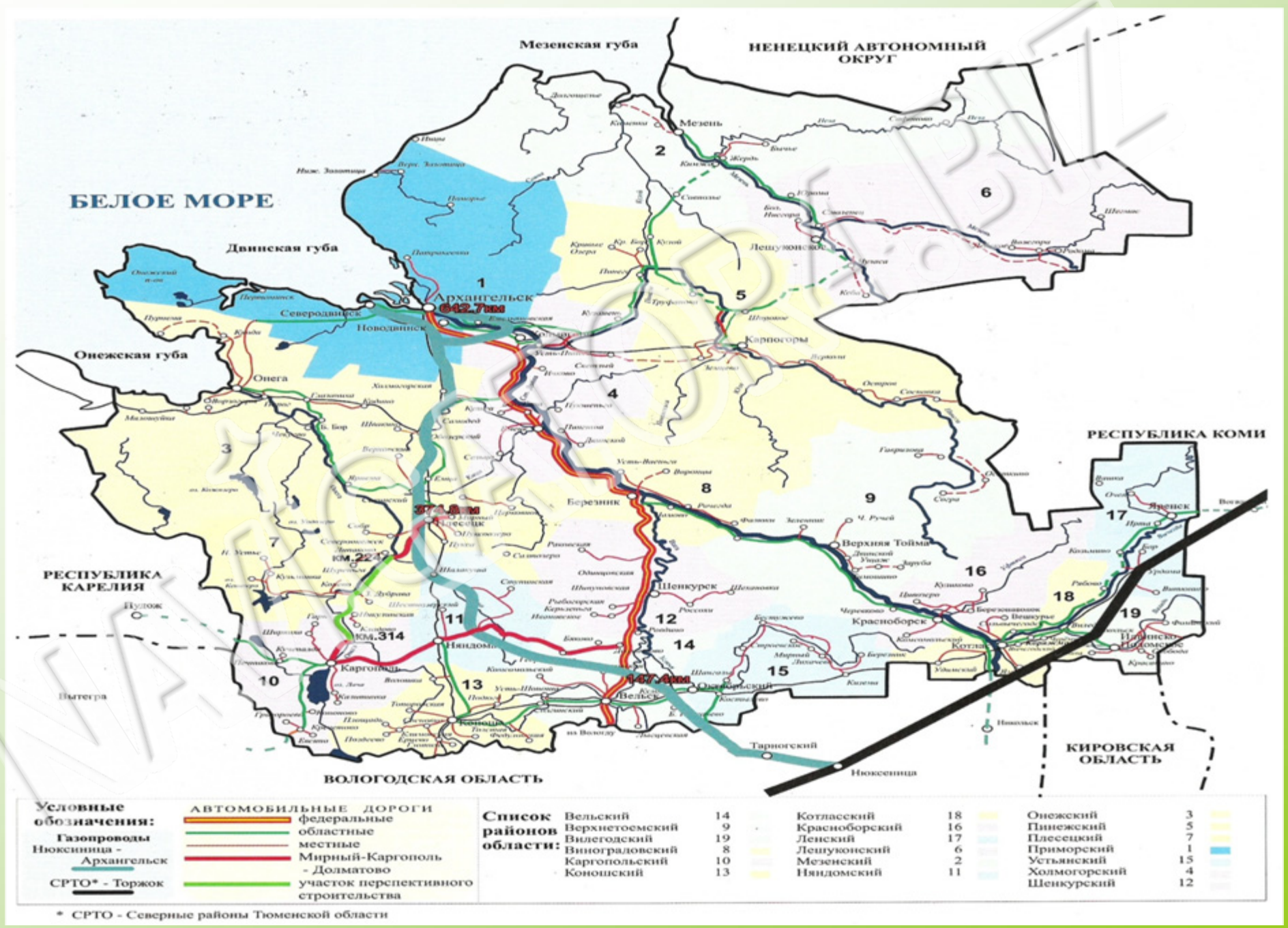
My offer is to cooperate, and I thank you for your attention!

The ARCHANGELSK OBLAST MINISTRY OF THE FEC AND HUS

«Development of bioenergetics based on rawwood processing and using biofuel in the housing and utilities sector»

The Archangelsk Oblast Minister of the Fuel & Energy Complex and Housing & Utilities Sector, Petr Petrovich Orlov

THE ARCHANGELSK OBLAST



The Project's Objectives

- To improve the energy efficiency of the regional fuel & energy complex
- To build and reconstruct boiler houses using technologies based on biofuel combustion in the Archangelsk Oblast
- To improve the efficacy of utilization of the Archangelsk Oblast forest resources

The Project's Tasks

- To reconstruct and build anew boiler houses using technologies based on biofuel combustion; to build biofuel producing plants;
- To introduce innovative technologies into thermal energy production and transfer by means of the Oblast local boiler houses;
- To ensure rational all-including utilization of the forest resources and decrease harmful atmospheric emissions;
- To optimize the budget spending and limit energy tariff rising in the region

The Project's Concept

Measure Name	Cost, including civil and erection works (in million roubles)
To reconstruct/modernize 34 coal and firewood boiler houses with partial reconstruction of heat supply networks	419
To install 26 new boiler houses for incineration of wood-processing wastes	420
To build 50 local boiler plants for municipal administrative buildings, health-care, education and culture facilities.	631
To build firewood thermal mini-station with heat power of 12 MW and electric power of 4.5 MW at the village of Leshukonskoye, packaged with establishing a logging enterprise	1.056
To work out business plan and design estimates	378
To build 7 plants to produce firewood granules and pellets with the capacity of 35 thousand tons a year, packaged with establishing logging units	2.100
PROJECT'S TOTAL COST	5.020

Panorama of Drying-out Coniferous Forests in the North Dvina and Pinega Rivers Interfluve Area

the total area of drying-out forests is 2.1 mln ha with the aggregate reserves of about 200 mln m³

The Ecological Effect

In the Archangelsk Oblast, the ecological effect is signified by decreasing harmful emissions of pollutants into atmospheric air and production wastes

- **In the Archangelsk Oblast, the emission of CO_2 equivalent decreased by 270.6 thousand tons (at the price of 5 € per ton, it is about 60 mln roubles a year)**
- **For the 10 years, the greenhouse gases emission in carbon equivalent decreased by about 2 million tons**

The Investment Projects

- **In 2010, three boiler houses are planned to be put into operation in the Primorsky District of the Archangelsk Oblast and two more in the city of Archangelsk, all using firewood pellets produced by the Archangelsk Timber Mill No. 25;**
- **Construction of cogeneration plants within the frameworks of the *White Sea Energy* Project;**
- **Agreement on cooperation with the *Mezhregionenergogaz* JS Company to build and reconstruct energy supply systems and wood-processing facilities in the Archangelsk Oblast for the years of 2010-14;**
- **Agreement on cooperation with the *VPK "Svyaz"* Closed JS Company to build an electric power plant using wood waste generator gas combustion**
- **Working out business plan to build thermal wood waste mini-station for the Oblast's Leshukonsky District, legally rated as a Far North region.**

NAVIGATOR FOR BUSINESS
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THANK YOU for your attention