

Government of the Sakha Republic (Yakutia)



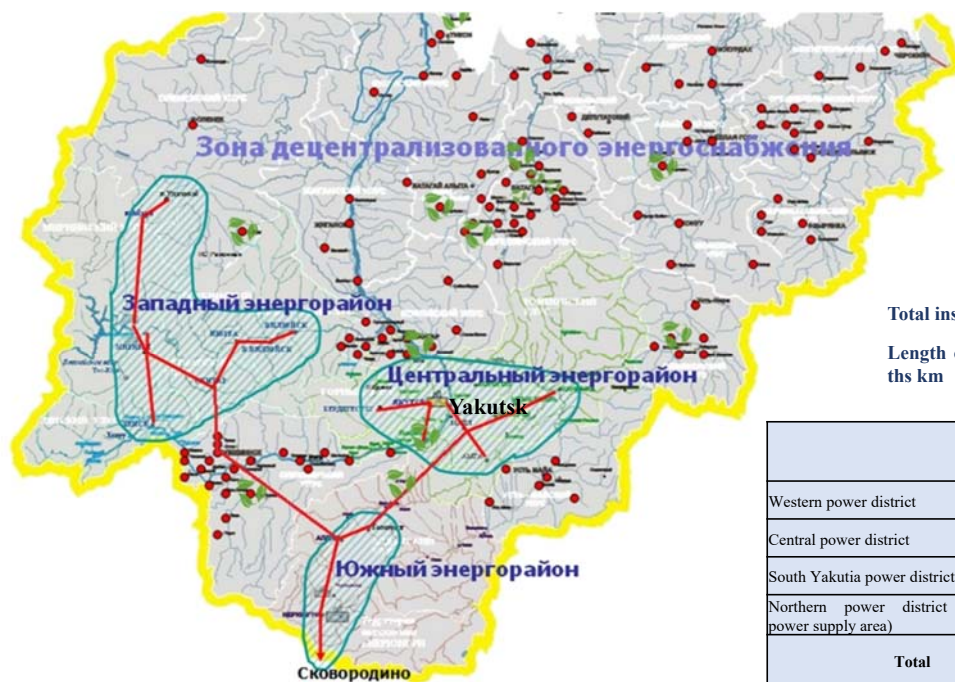
On the cooperation of the Government of the Sakha Republic (Yakutia) with Japanese companies in the power generating industry

Speaker:

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of the Sakha Republic (Yakutia)
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Description of the power system of the Sakha Republic (Yakutia)



Total installed capacity of power stations in Yakutia: 2 853,3 MW.

Length of power transmission lines of all voltage types is over 25 ths km

	Installed capacity, MW	Energy production, kWh bln	Lines' length, km
Western power district	1127,6	3	8731
Central power district	468,1	1,6	12814
South Yakutia power district	618	3,2	1734
Northern power district (decentralized power supply area)	188,2	0,26	1969
Total	2853,3	9	25248

Optimization program for the local power industry of the Sakha Republic (Yakutia)



Basis for development: Instruction of the President of Russia Vladimir Putin dated November 03, 2015 № Pr-2288

Two positions for the most viable scenario of the Program's implementation

RF Ministry of Energy, RF Ministry of Economic Development, System Operator of the Unified Power System JSC, Nonprofit Partnership Council of the Market

Government of the Sakha Republic (Yakutia), RAO Energy Systems of the East, Yakutskenergo PJSC, Sakhaenergo JSC

Scenario 2 (Moderate reserve)

Scenario 5 (Grids + RES)

1. Installed capacity of the new generating facilities	81,4 MW	+ 126,6 MW
2. Total capital investment in the 2016 prices, no VAT	+ RUB 11,95 bln (RUB 18,88 bln in the money of the day, VAT included)	RUB bln 36,98 (RUB 55,85 bln in the money of the day, VAT included)
3. Integrated effect for 2017-2040 (reduced cross-subsidization of the local power industry) from the Program's implementation in the 2016 prices	RUB 22,5 bln	+ RUB 38,9 bln
4. Ratio of the integrated effect for 2017-2040 to the capital investment in the 2016 prices, no VAT	+ 1,88	+ 1,05
5. Reduction of the economically justified tariff of Sakhaenergo JSC for electrical energy at implementing the Program	14,4% 58,9 RUB/kWh – without the Program 50,4 RUB/kWh – with the Program	+ 18,8% 58,9 RUB/kWh – without the Program 47,8 RUB/kWh – with the Program +10% of consumers to connect to the grids of Yakutskenergo and Magadanenergo
6. Total volume of cross-subsidization of the local power industry in 2016-2040 in the 2016 prices	RUB 147,3 bln	+ RUB 130,8 bln
7. Total volume of investment and cross-subsidization in 2016-2040 in the 2016 prices	+ RUB 159,2 bln	RUB 167,8 bln +RUB 27,08 bln additional tariff load of Yakutskenergo PJSC consumers
8. Efficiency factor for power production on Sakhaenergo facilities after the Program's implementation	34% 30% without the Program	+ 39% +load of large TPS and HPS of Yakutskenergo and Magadanenergo
9. Reduced annual volume of the delivered fuel for the local power industry facilities	44% 100 ths tons of standard fuel – with the Program 56 ths tons of standard fuel – with the Program	+ 63% 100 ths tons of standard fuel – with the Program 37 ths tons of standard fuel – with the Program

Ветровая энергетика в Республике Саха (Якутия)



Operating experience of the wind turbine in Tiksi settlement of Bulun District

Project of construction of the wind turbine park in Tiksi settlement of Bulun District



Operating period: 2007-2015
Electricity production: 486,62 ths kWh
Fuel saving: 96 tons

2015: The Sakha Republic (Yakutia), RAO Energy Systems of the East PJSC and KOMAIHALTEC Inc. (Japan) sign the Memorandum on Cooperation to result in the construction of the 1 MW wind turbine park in Tiksi settlement of Bulun District.

2016: The Sakha Republic (Yakutia), RusHydro PJSC and NEDO sign the Joint Declaration of Intent for cooperation in the filed of renewable energy sources.

2017: The Sakha Republic (Yakutia), RusHydro PJSC and NEDO sign the Joint Declaration of Intent



The capacity of the operating diesel power station – 10 MW;
Winter peak load – 4 MW.

Installed capacity	250 kWh
Voltage type	400 B
Rated revolution of the wind turbine	42 rpm
Automation degree	3
Diameter of the wind turbine	26 m
Tower height	30 m
Operating range of the wind speed	3-25 m/s

Project on the combined heat and power production with Kawasaki Heavy Industries, Ltd., Sojitz Corporation



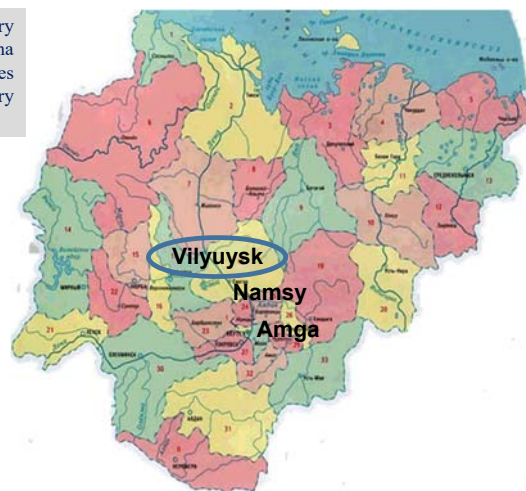
2016: Agreement on cooperation in the power industry between RAO Energy Systems of the East PJSC, Government of the Sakha Republic (Yakutia) and Kawasaki Heavy Industries Ltd. of intent for project implementation in heat and power production using gas turbine plants

2016: MOU in developing a detailed feasibility study in the field of the Russian Far East's power industry between the Government of the Sakha Republic (Yakutia) and Ernst & Young Advisory Co., Ltd.

2016: Agreement on cooperation in power industry between YATEK JSC, Government of the Sakha Republic (Yakutia), Kawasaki Heavy Industries Ltd., Sojitz Corporation, Ernst & Young Advisory Co., Ltd.



Japanese delegation visited the potential sites for the installment of the gas turbine plants in Yakutsk (Saisary District), Vilyuisk town of Vilyui District, Amga village of Amga District and Namtsy village of Namtsy District.



THANK YOU FOR YOUR ATTENTION!