



“Energy Systems of the East”, JSC

**Opportunities for the Energy Infrastructure
Development of the Sovetskaya Gavan
Transport Nodal Point**

**Power station construction project
in Sovetskaya Gavan**

Jean DIBROV

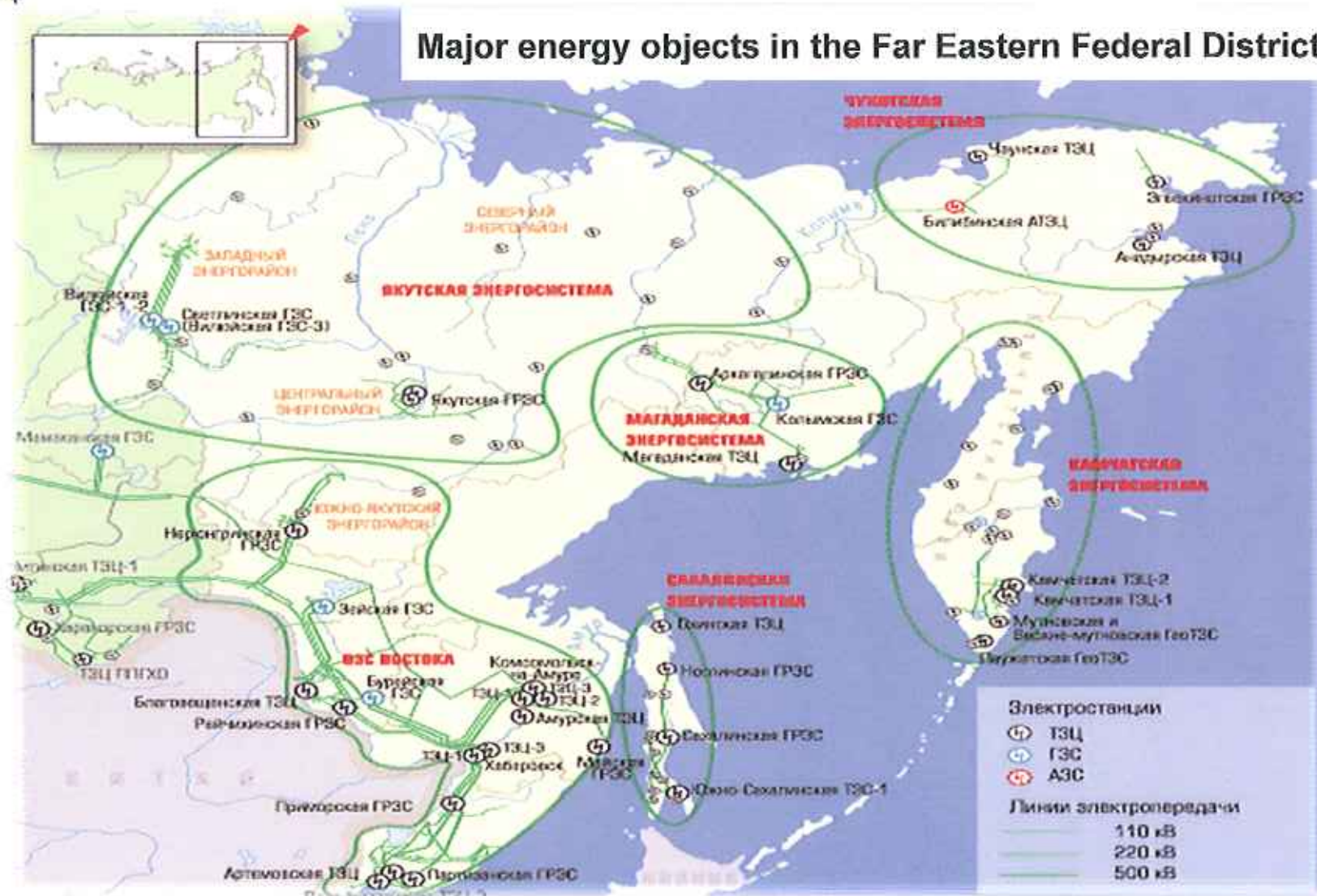
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Energy systems of the Far East

Major energy objects in the Far Eastern Federal District





"ES of the East", JSC profile

"ES of the East", JSC – the largest energy holding in the Far East

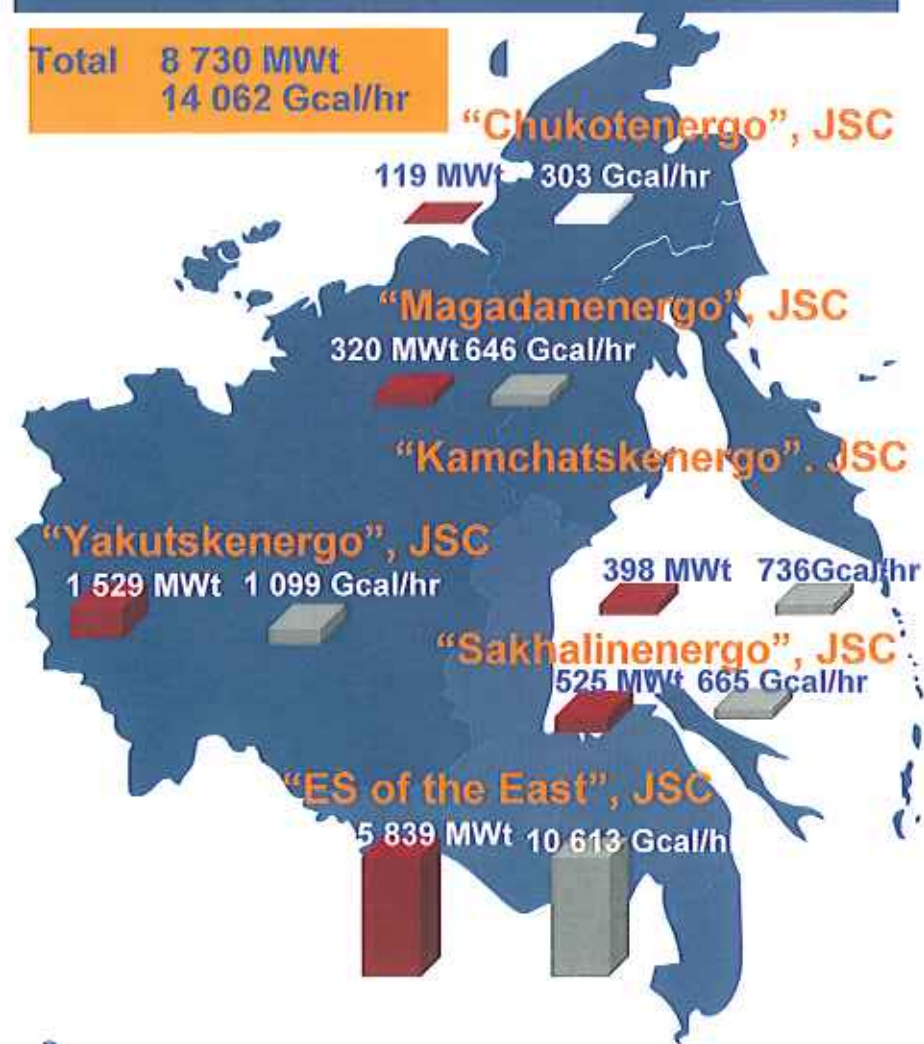
- 5th in Russia and 1st in the Far East by the cumulative power capacity (8,73 GWt)
- Electric power generation in 2007 reached 28 201 million kWt/hour (89% of the 31,6 million kWt/hour generated in the Far Eastern Federal District), heat energy – 22 226 thsd.Gcal.
- Share of domestic consumption exceeds average all-russian level in 2 times (19,6 % to 7,4%)

Electric power generation and heat energy production in the Far Eastern Federal District in 2007

ES of the East	19 845 mln. kWt/hr 16 517 thsd. Gcal
Yakutskenergo	4 718 mln. kWt/hr 2 182 thsd. Gcal
Sakhalinenergo	1 330 mln. kWt/hr 1 723 thsd. Gcal
Kamchatskenergo	985 mln. kWt/hr 993 thsd. Gcal
Magadanenergo	1 195 mln. kWt/hr 956 thsd. Gcal

Power capacity of "ES of the East", JSC holding

Total 8 730 MWt
14 062 Gcal/hr





Winter maximum of electricity demand - 76 MWt

Sources of energy saving

- 2. Power line (220 кВт) Komsomolsk - Vanino**
Overall power capacity – 75 MWt
Share in the consumption coverage – 46 MWt





Perspective energy consumption demand in the Sovetskaya Gavan energy region

New declared facilities - 80 MWt

Including (major):

- ❖ Vanino bulker terminal (Muchke bay, "SUEK", JSC, 2nd stage:
2016-2020 - 5,0 MWt, 25,0 million kWt/hr per year
- ❖ Stevedore complex consisting of 4 moorings in the Yuzhniy cape
"Rosmorport", Federal Unitary Company 2008- 2012 - 18,0 MWt, 90 million kWt/hr per year
- ❖ Construction of Kuznetsov tunnel
"Russian Rail Roads", JSC - 7,2 MWt, 40 million kWt/hr per year
- ❖ Transshipping facilities for iron-ore concentrate
"Sovetskaya Gavan Sea Port" 2008-2010 - 13 MWt, 60 million kWt/hr per year
- ❖ Stevedore complex of "Mechel-trans"
2010-2020 г. 35 MWt, 150 million Kwt/hr per year

Total energy demand

- 600 million kWt/hr per year



Arguments in support of Power Station Construction in Sovetskaya Gavan

- Necessity of a new power station is provided by construction of new and expanding existing sea port facilities due to the cooperation development with Asia-Pacific countries; and by demand of providing Sovetskaya Gavan with centralized heat supply.
- Power capacity of Mayskay Hydroelectric station is not enough for power supply of the region.
- Low equipment reliability of Mayskaya station. Actual workout of steam turbine and boilers in 2 times exceed its working capacity.
- Low efficiency of Mayskaya station – discharge fuel intensity is 749,8 G/kWt per hour.
- Weak network of power transmission lines.
- Consumption increase for 80 MWt till 2012, and incapacity of existing facilities to cover new demand.
- Necessity of creating centralized heat supply for Sovetskaya Gavan with a population of 46 thousand people and replacement of 27 boilers that operate from mazut fuel.



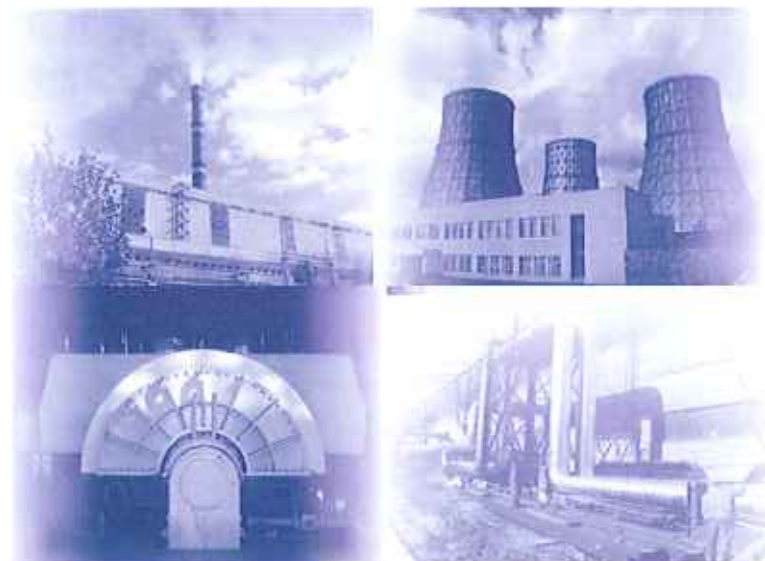
Main characteristics of the Sovetskaya Gavan Power Station

Capacity: 120 MWt (2 blocks, 60 MWt each),
200 Gcal/hr

Planning fuel:

- Urgal coal
- Kuznetsk coal

Date of opening - 2012- 2013



Goals of the project

1. Ensuring energy consumption increase in the Sovetskaya Gavan region. Elimination of electric power deficit in the north-eastern territories of the Khabarovski Kray;
2. Ensuring reliable energy supply for Sovetskaya Gavan region consumers and sea port infrastructure (perspective demand – 80 MWt);
3. Ensuring substitution of inefficient facilities of Mayskaya Hydroelectric plant.

Commercial efficiency indicators

Profitability	17%
Payback period	14 years
Discount Payback period	16 years

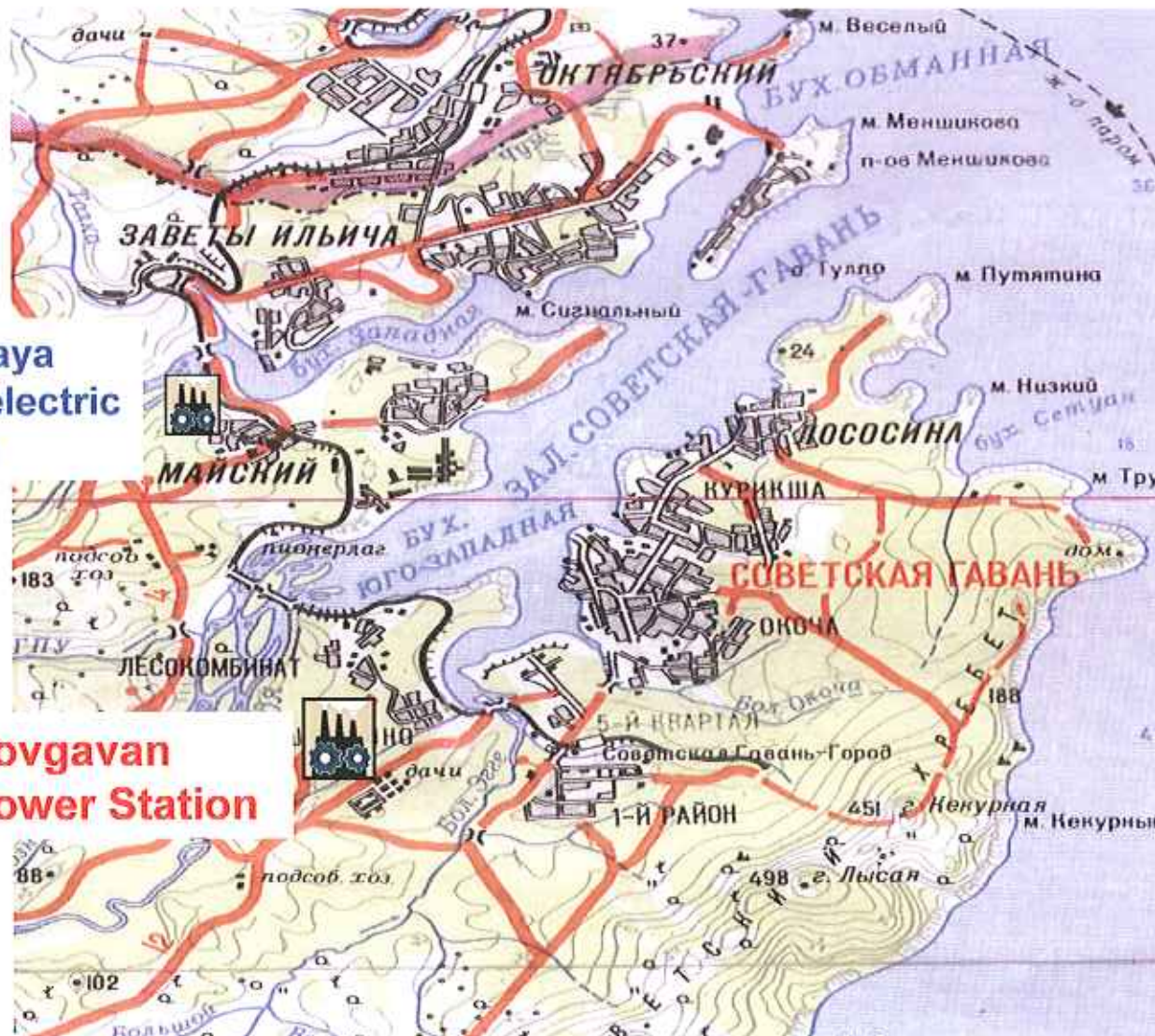


Proposing location of Power Station in Sovetskaya Gavan

Alternative for
Power Station
location

Mayskaya
Hydroelectric
station

Sovgavan
Power Station





Equipment

Main energy equipment:

- 2 boilers E-320-140 type;
- 2 turbines T-60/65-130 type;
- 2 turbogenerators TF-63-2UZ type;

Use of thermal power equipment for boilers and turbines for subcritical steam parameters with a pressure of 140 kgs/sm², temperature - 560°C and a possibility of generating of heat energy will provide:

- use of thermal clamping blocks

Unit power capacity 60 MWt

For covering electric and heat demand;

- increase of fuel efficiency

from 33% in the condensation regime

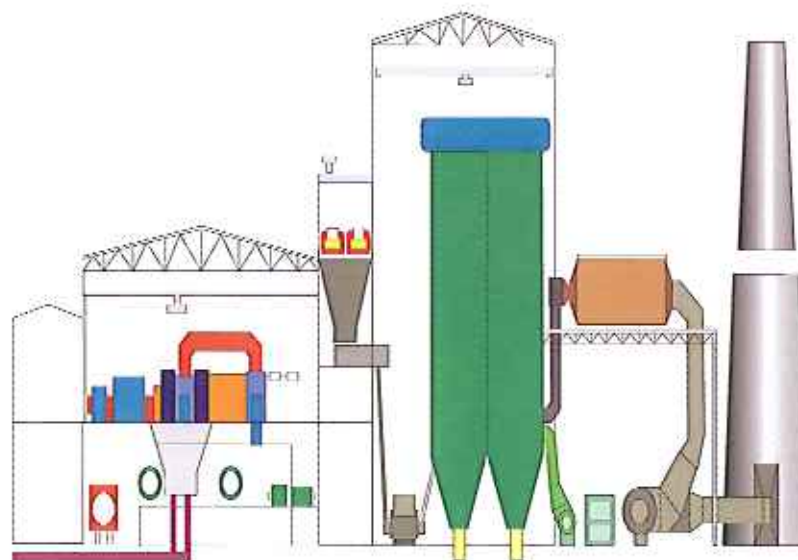
to 40-45 % in the cogeneration regime

- use of modern and highly efficient equipment and technologies:

- ✓ Cogeneration turbine T-60/65-12,8;
- ✓ Boiler unit E-320-140;
- ✓ Combined electric filter with

Sulfur cleaning of "Alstom" with ash filtering efficiency over 99,5% and SO₂ concentration

In smoke gas in the amount of 250 mg/m³





Technical characteristics of the project

Electric power capacity, MWt	120
Hours of electric capacity use, hours/year	5434
Electric energy demand for own needs, %	9
Annual energy generation, million KWh/yr	0.6
Fuel demand G/KWh per hour	335
Heat capacity, Gcal/hour	200
Hours of heat power use, Hours/year	1983
Annual heat energy generation, million Gcal	0.39

Construction expenses: 12 115 million rubles

including:

Federal Budget – 2 204 million rubles.

Investments – 9 711 million rubles.



Resume

- Project of Power Station construction in Sovetskaya Gavan is included in the Federal Target Program “Economic and social development of Far East and Transbaikalie till 2013”. Construction necessity is confirmed by “System operator of Unified Energy System”, JSC, Ministry of Energy of Russia, Khabarovsky Krai Government;
- “ES of East”, JSC is holding preparatory work for projecting of the Power Station and attracting financial resources.
- Alternatives for loans should be tight with compensation for debt interest guarantees by rate regulations or other mechanisms;
- Apparel to the attracting financial resources from the Federal Budget or Russian Federation Investment Fund, opportunities for other investments, Including foreign, are discussed.



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Thank you for your attention!