

# REGIONAL ENERGY STRATEGIES UNDER SPECIFIC GEO-POLITICAL CONDITIONS: THE CASE OF THE KALININGRAD REGION

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## 1. Introduction

The presentation is related to results, gained from a project, financed by the European Commission in the frame of the European Expertise Service.

The project “Kaliningrad Energy Study” was carried out from August 2001 to January 2002 by the German Consulting Company DECON Deutsche Energie-Consult, Ingenieurgesellschaft mbH.

## 2. Policy Context

### *International aspects*

The European Council noted that “ significant differences in development opportunities and living standards existing in the northern regions bordering the EU, increasing interdependence between the enlarging European Union and Russia, the strategic importance and economic potential of these northern regions, as well as the environmental conditions, pose important challenges for the EU policies.

*Partnership and Co-operation Agreement (PCA)* between Russia and the EU states that energy co-operation shall take place through the EU-Russia Energy Dialogue, against a background of progressive integration of energy markets within Europe. The Common Strategy for Russia – adopted by the Council in June 1999 – specifically mentions the Northern Dimension as a forum in which cross border and regional co-operation can be strengthened.

### *The Energy Sector in Kaliningrad*

Kaliningrad is almost totally dependent on imported energy from Russia and produces only 20% of its own needs. Gas comes from Russia through a pipeline that transits Belarus and Lithuania. In general, energy costs are much higher and supply

less reliable than elsewhere in Russia. Electricity imports are met through Belarus and.

The Kaliningrad Administration is of the opinion that supplies to Kaliningrad may become insufficient in the future and plans have been developed to construct a new large power plant including extension of gas supply.

### **3. Objectives**

In order to establish a proper basis for *strategic* decisions on future investment in the sector, a study was worked out, in which the consultant analyzed Kaliningrad's energy needs and its energy potential on the basis of energy supply scenarios.

The objectives were: (1) to identify and develop strategic energy options for the Kaliningrad region; (2) to prepare pre-feasibility studies on the technical and economic aspects of the main energy supply options currently under discussion or deemed feasible, including import and export issues, which are (a) construction of a new gas fired Combined Heat and Power plant (CHP plant) with a total installed capacity of 900MW in two units of 450 MW each; (b) to extent the capacity of the existing gas pipeline and to built a second gas pipeline through Belarus and Lithuania.

### **4. Scenarios of Kaliningrad's future Energy Demand**

Unfortunately, there exist no official energy balance for the Kaliningrad region.

To overcome this obstacle, the consultant decided: (1) To assess the energy demand for 2000 by updating the results of the afore mentioned Tacis project and (2) To characterize the energy demand situation with the Final energy demand for the economic sector and the household sector.

**In 2000** the final energy consumption became about 91550 TJ. This amount is nearly the same as 1995.

But the structure changed. It represents a strong orientation towards an international usual structure.

To develop future energy scenarios for the **economic sector** (2005, 2010), the following main objectives of the energy sector development are defined: (1) to ensure power and fuel supply safety for the Kaliningrad Oblast, (2) to increase the efficiency of fuel and energy use, (3) to arrange long-term agreements with neighbouring countries for transit of energy sources to the Kaliningrad Oblast and for access to the international power market.

Four different scenarios of macro-economic development for the Kaliningrad region were developed. For these four economic scenarios also the respective final energy demand scenarios were calculated.

The future development of energy demand in **the household sector** is characterized by change of living style, socio-economic aspects and economic forces, which will occur under market economic conditions.

These aspects together are reflected by respective indicators for the energy demand.

**For 2005 and 2010**, it could be stated that the margin of Final Energy demand (in TJ) between the low and the max scenario is rather wide. This wide margins for the Final Energy demand result from a rather uncertainty of the economic and social development of the Kaliningrad region.

For Final Electricity Demand the four scenarios provide only two different “decision situations” regarding extension of the power generation capacity in the region.

The medium, the high and the max scenarios result to a demand level, for which a rather extended power supply capacity could be taken into consideration.

In case, that the economic development of the region would follow the low scenario, a strong extension of the power supply capacity (TEC-2) is not.

## **5. Energy Supply Options for the Kaliningrad Region**

### *Option for completion of TEC 2*

Since years, the construction of a large CHP plant is underway, designed for 2x450 MW power capacity.

From the technical point of view, the consultant's investigation results in the conclusion that for Kaliningrad Oblast, the 2 x 230 MW unit single shaft design, will give a optimum in power production, heat production, security of power and heat supply and also maximum in efficiency during the year. Also for export production, the 230 MW unit will give more flexibility as the 450 MW units.

### *Options for gas supply*

According to the actual project schedule of the existing gas duct Minsk-Kaliningrad (issued by local institutions) well defined measures shall be implemented to increase the transport capacity.

The construction of a second new gas pipeline to Kaliningrad was investigated by “Gas Oil”- JSC together with DAOA “Giprospezgas”. Of several routes investigated, a new route in parallel to the existing gas pipeline will be the optimum solution.

### *Options for electrical grid interconnection*

As a consequence of the EU enlargement to the East, Kaliningrad Oblast will be surrounded by EU countries.

But, we have to take into consideration, that the integration of a country to the EU does not oblige the country to incorporate its network to UCTE grid.

Therefore, the switching of Kaliningrad broader region, i.e. Kaliningrad Oblast, Lithuania, Belarus, in UCTE grid in the framework of EU enlargement, is a long term option.

In case export of electricity is planned, from a technical point of view the consultant proposes a high voltage – 400 kV – AC transmission line between Kaliningrad and Olsztyn-Matki in Poland and an AC/DC back-to-back converter 500 MW in Kaliningrad.

## **6. About economic Feasibility of Energy Supply Options**

Economic pre-feasibility analyses were directed to the evaluation of the investments efficiency for the main energy supply option in the Kaliningrad region: (1) Tec-2 and (2) Rehabilitation of the existing gas duct and construction of a new gas pipeline, taking into consideration several “conditions” which the investment project could be faced.

The “conditions” mainly characterize combination of tariffs, electricity could be sold in the region and abroad with prices for gas, taking into consideration also whether the generated head value could be used completely or only partly.

There exist both, “conditions” under which the completion of TEC 2 is economic feasible, and consequently also a additional gas pipeline, but also such one for with the project is in-feasibly, especially in the case, the investor has to pay gas foe world market prices, can not sell the generated heat, and has to sell electricity for a low tariff.