



Possibilities of using petrothermal energy in Riga city

**EEA grants Programme “National Climate Policy” Partner search forum
August 29, 2013, Riga**

Juris Golunovs, Latvian National Geothermal Association, Latvia

Driving forces of increase of geothermal energy use in Baltic states

- Baltic States have quite limited own energy resources.
- Promotion of use of renewable energy sources are among the priorities of energy policy in Baltic States.
- More wide use of renewable energy (incl. geothermal energy) can make a valuable contribution to diversification of energy supply and increase of reliability of energy supply and to meeting GHG emission reduction targets.
- Renewable Energy Laws (drafts) are submitted to the parliaments and - it is suggested - will be accepted before 2011.

Research activities in Baltic states

- In 1992-94 the Government of Denmark financed the Baltic Geothermal Energy Project (covering Lithuania and Latvia). The geothermal aquifer zones within the Devonian and Cambrian strata were studied in detail.
- Twelve urban areas (Klaipeda, Palanga, Siauliai, Silale, Silute, Gargzdai, Radviliskis and Joniskis in Lithuania, and Liepaja, Riga, Jurmala and Jelgava in Latvia) were selected with a view to a ranking of preference with regard to a geothermal pilot project.
- On the basis of this study and other investigations the Klaipeda Geothermal Demonstration Plant (KGDP) was engineered in 2001 - with total installed capacity of 41 MWt: 18 MWt of geothermal and 23 MWt from boilers (the drive for the absorption heat pumps)

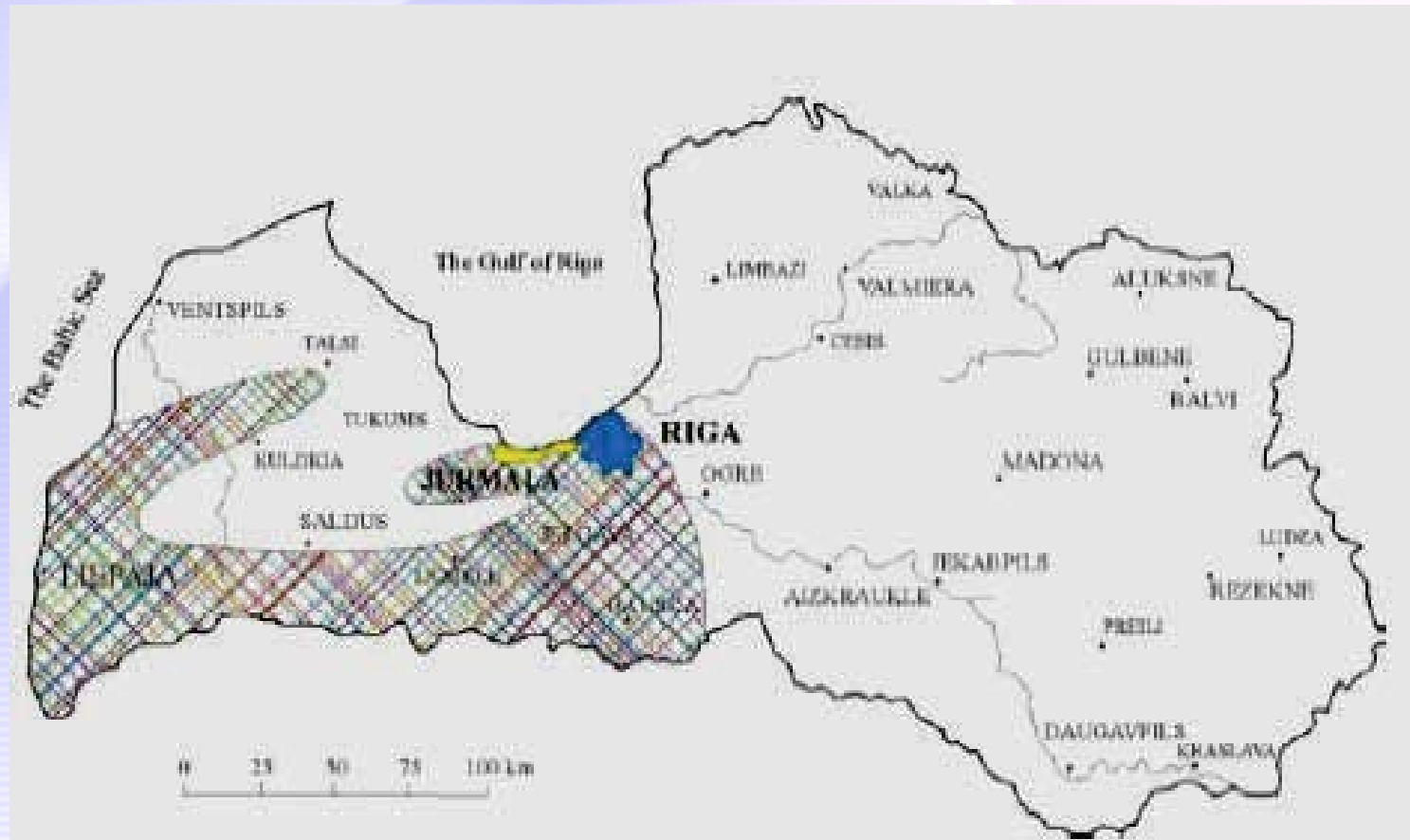
Geothermal energy DH plants



Evaluations of geothermal energy status in Latvia

- The Institute of Sea Geology and Geophysics from the year 1970 - to 1990 performed 23 drillings, the results of which can be interesting for geothermal evaluation : **Eleja, Penkule, Vircava, Jelgava, Iecava (Lāči), Kaigi, Dobele, Nidasciems, Jūrmalciems, Bārta, Liepāja(3 drillings), Bernāti, Pāvilosta, Aistere, Vaiņode, Ragaciems, Olaine, Jūrmala (2 drillings), Grobiņa, Priekule.**
- The data later has been used in the several reports:
 - 1) 1990.g. – The Institute of Sea Geology and Geophysics (ВНИИМоргео) performed the evaluation on the order of Ministry of Economics (the topic Nr.8-89):
“Гидрогеологическое обоснование подземного аккумуляирования тепла и предварительная оценка возможностей использования петротермальной энергии Латвийской ССР (III.1989-XII.1990).
 - 2) 1991.g. – The report of the project of Baltic geothermal energy in cooperation with the Denmark company “Petroleum Geology Investigators”: was determined the preliminary potential of geothermal energy for DH (65.000 PJ or 1,6 billion toe)

Map of the area of geological anomalies of Latvia



Geothermal conditions in Riga city

- Riga is situated in the area of geological anomalies of Latvia where a considerable part of energy potential is deposited in minerals of the land's crystalline foundation rocks.
- The Marine Geology and Geophysics Institute (ВНИИМорпро), which was located in Riga during the Soviet times and conducted research of oil deposits in the Baltic States and the shelf of the Baltic Sea, based on the order by the Ministry of Energy of Latvia in 1989–1990 performed an evaluation of the layout of isotherm surfaces in the territory of Latvia with temperature of 100, 125 and 150°C.
- Riga is situated in the relatively hot zone, where the absolute locations of surfaces of isotherms with temperature of 100°C are at a depth of 2.75 km or less calculated according to the sea level.

Energy policy of Riga City

- At 2009 Mayor of Riga signed a Covenant of Mayors with the aim to increase energy efficiency in Riga by at least 20% and to involve at least 20% of renewable energy resources till 2020
- According to this pact a development of “Sustainable Energy Action Plan for 2010-2020” (SEAP) for Riga was carried out during 2009 – 2010 and was accepted by Riga City Council on the 7th of July, 2010
- Riga SEAP has been elaborated within the framework of an international Central Baltic Interreg IVA programme 2007 - 2013 project "Covenant of Mayors in the Central Baltic Capitals" (COMBAT) through cooperation in consortium between 4 Central Baltic Capitals – Stockholm (Sweden) – lead partner, Riga (Latvia), Helsinki (Finland) and Tallinn (Estonia).
- Among RES introduction support measures of Riga SEAP is also improvement of geothermal energy use – both enhanced geothermal system and shallow HP systems

City of Riga

City of Riga:

- area 307km²;
- population 659 thous.;
- population density 2 367 residents/km².



Heat supply in Riga

- The main type of heating in Riga – district heating which covers 76 % of the consumed volume of heat, using natural gas as fuel, in small amounts also wood-chips.
- Over 90 % of the volume of heat consumed in a centralised way in Riga are produced in cogeneration mode.

Riga Energy Agency:

- Established at 2007 with 50% EU financial support of Intelligent Energy programme;
- The main tasks include:
 - management and coordination of energy supply and energy efficiency issues in the administrative territory of Riga City,
 - providing information on EE improvements and RES use for residents.

EGS in Riga SEAP

- “...Taking into account the potential volumes of hot dry rock resources in Latvia and Riga ensuring the possibility to establish in future cogeneration plants using hot dry rock energy in the area of geological anomalies in Riga or its vicinity and other areas in Latvia, development and implementation of a pilot project for establishment of such station is necessary.”
- “It is proposed to implement the pilot project with electrical capacity of 3–4 MWe_{el} and heat capacity of 30–40 MW_{th} in Riga by attracting funding from international funds.”

Latvian National Geothermal Association

- In recent years, evaluating renewable energy options for Latvia, also raised the question of geothermal resources which potential - particularly petrothermal energy potential - seems to be very high.
- The growing interest promoted establishment of Latvian National Geothermal Association (LNGA). Riga Energy Agency recognized enthusiasts of geothermy in Latvia and LNGA was founded on the 13th of August, 2010.
- LNGA seeks to promote geothermal energy resource exploration and exploitation development in Latvia, geothermal specialists professional growth and development of their creative abilities, also to promote geothermal energy activities, increase the prestige and valuable experience.
- There were recognized several ideas of geothermal energy projects during information exchange between LNGA members (possible geothermal CHP plant at Liepaja city and CHP or DH plant in the region between Bauska and Eleja towns).

Main barriers for EGS implementation

- The main barrier for EGS implementation is lack of deeper geological research and lack of funding.
- Next step should be a pilot research project including creating deep drillhole and developing prefeasibility study

Thank you for attention!

Juris.Golunovs@riga.lv