

#### PROMOTION OF RENEWABLE ENERGY SOURCES AND ENERGY EFFICIENCY, SERBIA (2011-2012)









5th December 2011



#### Promotion of Renewable Energy Sources and Energy Efficiency (2011-2012)

- Mapping of CHP and Geothermal potential in Serbia
- Selection of 3 sites for each
- Pre-feasibility studies conducted
- Project timeline from January 2011 until July 2012
- Project funded by EuropeAid
- Beneficiary is Ministry of Infrastructure and Energy
- Consortium lead by EPTISA including ESG and Mannvit





#### EuropeAid/129768/C/SER/RS







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#### **OVERALL PROJECT OBJECTIVE**

- Contribute to sustainable development in Serbia by enhancing capacities in the energy sector to use renewable energy sources and efficient usage of resources according to EU standards.
- To build the capacity in the energy sector which will lead to the implementation of the rational use of energy and increased use of renewable energy sources and CHP production.













#### **Study of Geothermal Potential in Serbia**

Collection and study of available data and studies on Geothermal Potentials in Serbia





Proposal of best options for use of geothermal resources in Serbia Report covering review of existing data and studies on Geothermal Potential in Serbia

Review of current policies in the energy sector in Serbia

Action plan with the set of measures and initiatives for enhancing Geothermal in Serbia has started

Developed options for different sectors (DH, agriculture, power industry, balneology and tourism) for use of available geothermal resources with the focus on district heating systems













#### **Geothermal Data Gathering**

- First Task included:
- –Report covering review of existing data and studies on Geothermal Potential in Serbia
- -Review of current policies in the energy sector in Serbia









#### **Geothermal Data Gathering**

Collection of available data and studies on Geothermal Potentials in Serbia from:



- Visits with other relevant institutions
- Internet search
- Local geothermal experts



**Existing Reports include:** 

- •Reports on Vojvodina
- Database on Vojvodina
- •Geothermal Atlas on Vojvodina
- Reports on Central Serbia

Other data:

•Comprehensive data on the internet (maps and other information)

•Well data on 176 wells in data base (excel document)











#### Data Bases

The consortium has the Vojvodina Access database with comprehensive information on 78 wells

At this time data on total of 176 wells and springs is available with the consortium, the data includes temperature and flow rate for many of the wells and springs

A GIS data base was made with maps found on the Internet and in reports or made by the consortium

Over 30 reports on geothermal utilization in Serbia and other relevant reports were collected











Energy Saving Group







The distribution of surface heat flow over Serbia shows that the westernmost and easternmost parts of Central Serbia are the least favorable for geothermal prospecting. There the heat flow is less than 90 mW/m<sup>2</sup> Most of Europe has less heat flow that.

Source Martinović and Milivojevic, 2010





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Geothermal map of Serbia shows:

Areas of interest depending on the geology

•Wells and springs with different use

•Wells and spring available to the project

Geothermal map Hungar Romania Bosnia and Bulgaria Montenear Alba Macedonia

Ref. Martinović and Milivojevic, 2010











Comparing the geothermal map with the heat flow map it is clear that;

- the Vojvodina province as a whole
- the region in Central Serbia, extending from Macva-Kolubara districts in the north to Pcinja district in the south,

can be the focus of future geothermal interest









#### **Existing Geothermal Potential**

#### Former estimates on existing geothermal potential

90.9 MW<sub>t</sub> (Martinović, and Milivojevic, 2010)
86 MW<sub>t</sub>. (Serbia Energy on the internet)
216 MW<sub>t</sub> (Decree on Amendments and Supplements to the Decree on Program for The Realization of the Energy Sector Development Strategy of The Republic of Serbia Until 2015 for the Period 2007 -2012)









# Conclusions for review of existing data and geothermal potential

- All publicly available data was collected on geothermal potential and research in Serbia
- There is evidence that there exists more data on wells and springs that is not publicly available
- There is a considerable difference in the estimate of the existing potential in the gathered reports. The range is from 91 - 216 MW<sub>t</sub>.
- and 330 MW<sub>t</sub> based on the theoretical potential of existing wells if the geothermal fluid was used by cascading solutions down to the average ambient temperature of Serbia (10.5°C).









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## Thank you for your attention!





