



Energetics developments of Miskolc City

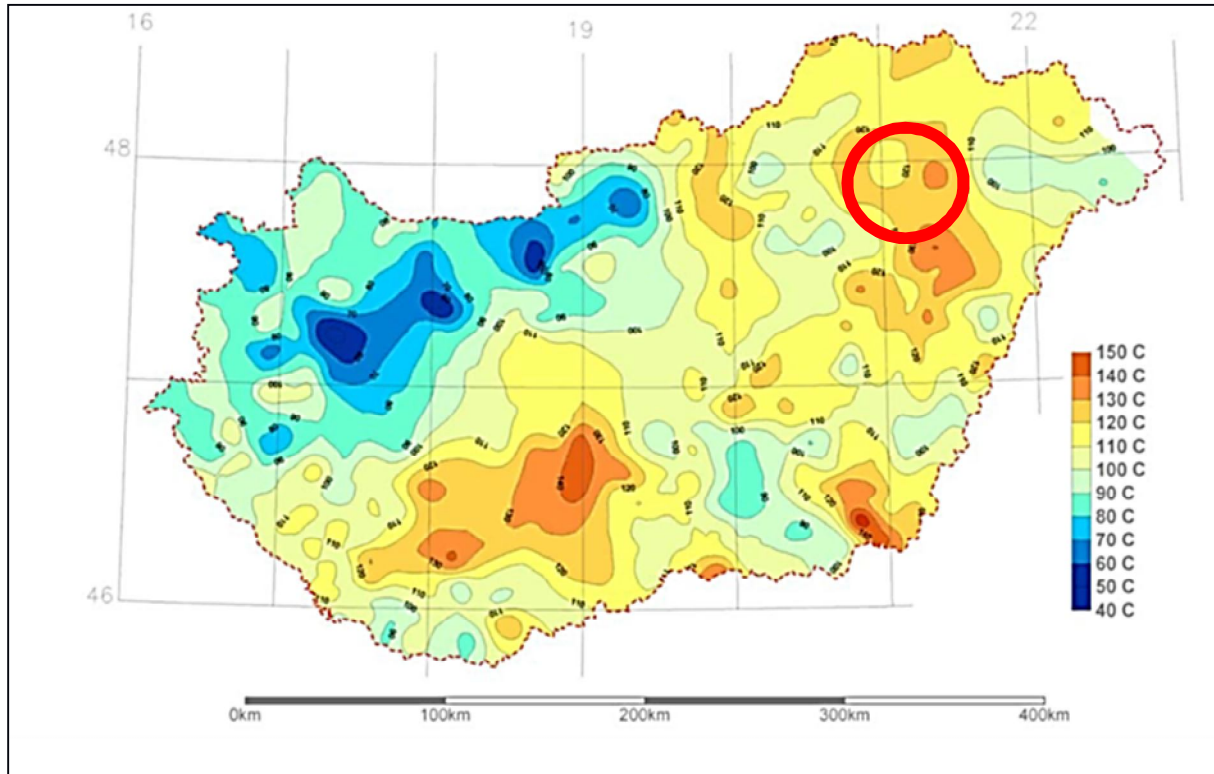


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Peter Kokai
Project manager



Miskolc City



- Population: ~165,000 (4th)
- 2nd largest district heating system in the country
- Earlier 100% fossil energy production
- Adverse smog situation
- Good geothermal and biomass potential
- Commitment for the change

Temperature distribution on Hungary's area 2000 meters deeply



Energy Strategy of Miskolc City

■ Goals

- Improve the **quality of air** in the city
- Utilisation of **local conditions and possibilities**
- Minimisation of **energy costs**
- Implementation of **modern technologies**
- **Utilisation of funding opportunities**
- **Cooperation with national and international enterprises**
- Promotion of **national and EU objectives** (increase of the proportion of renewable energy)
- Decrease of dependence from import, **natural gas replacement**
- Utilisation of the University's **intellectual potential**
- **Raising awareness** (energy- and environment-awareness raising)



Renewable energy utilisation – Geothermal energy

Well parameters

Production wells (2)

MAL-PE-01	depth: 2,305 m	water temperature: 105 °C	yield: 6,600-9,000 l/min.
MAL-PE-02	depth: 1,514 m	water temperature: 95°C	yield: 8,000 l/min.

Reinjection wells (3)

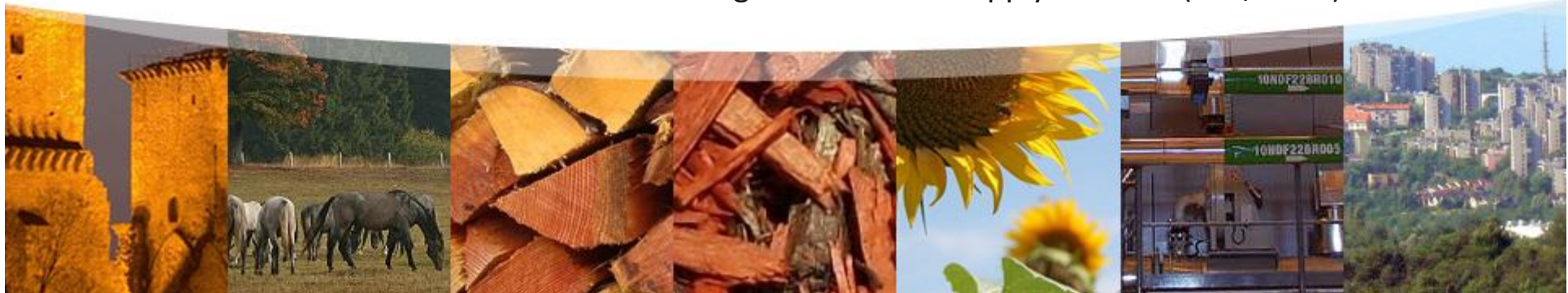
KIS-PE-01	depth: 1,737 m	absorbing capacity: 1,600 l/min.
KIS-PE-01B	depth: 1,093 m	absorbing capacity: 5,600 l/min.
KIS-PE-02	depth: 1,058 m	absorbing capacity: 7,000 l/min.

Output:

- Primary utilisation:
- Secondary utilisation

2 x 30 MW; ~800,000 GJ/year

District Heating System	(~95/55 °C)
Industrial Park heating	(~80/45 °C)
Agricultural heat supply	(~55/30 °C)



Renewable energy utilisation – Geothermal energy

- **Project data:**

- Project companies: members of the PannErgy Group

Miskolc Geotermia Plc. (90 % - PannErgy Plc., 10 % MIHŐ Ltd.)

KUALA Ltd. (90 % - PannErgy Plc., 10 % MIHŐ Ltd.)

- Long-term heat supply contract → **25 years**

- Heat service launch date:

Phase I. : 4 May 2013 – AVAS District Area (12,167 homes)

Phase II.: 1 September 2014 – Downtown (14,559 homes)

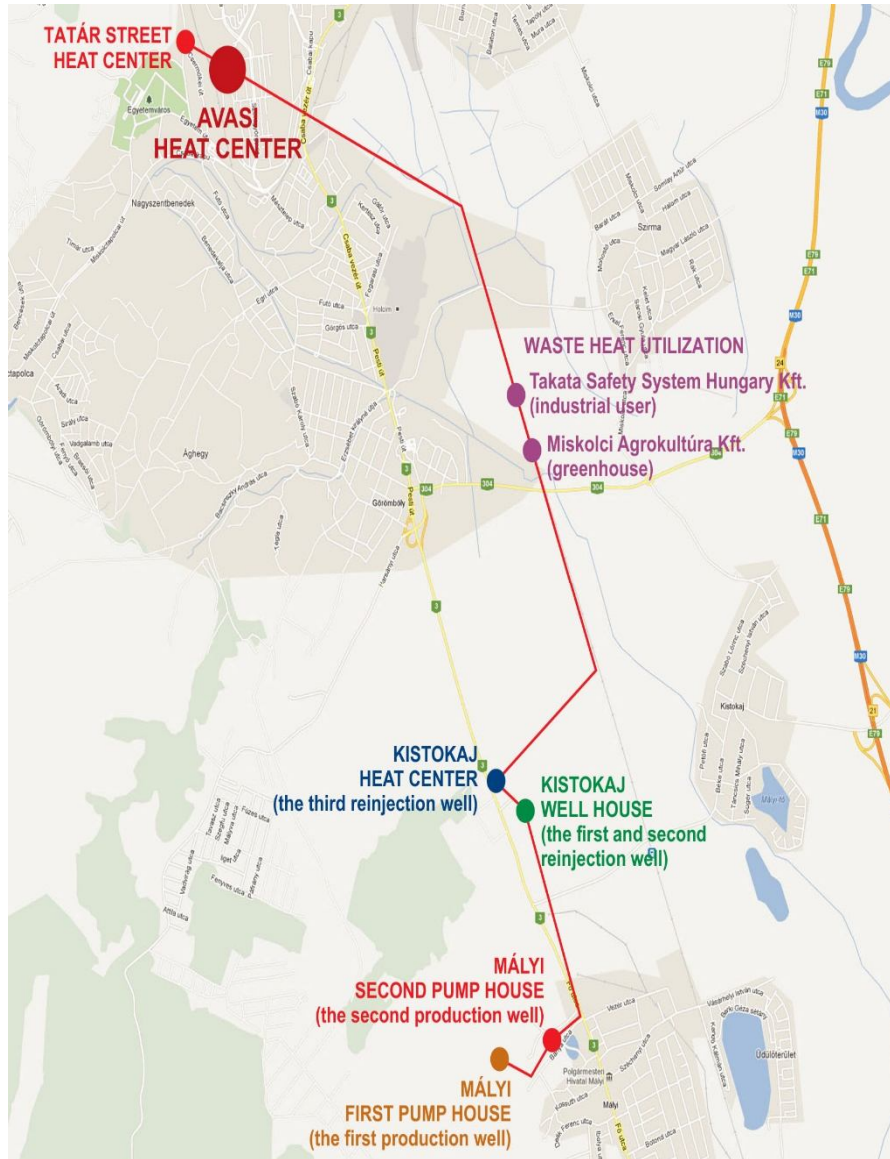
Phase III.: 1 November 2014 – Industrial consumers

Phase IV.: on process – new local district heating area - Kistokaj

- Investment cost: ~28 million €
- Built transmission line length : 3,1 km + 9,2 km
- Green house gas emission reduction : ~35,000 tons/year



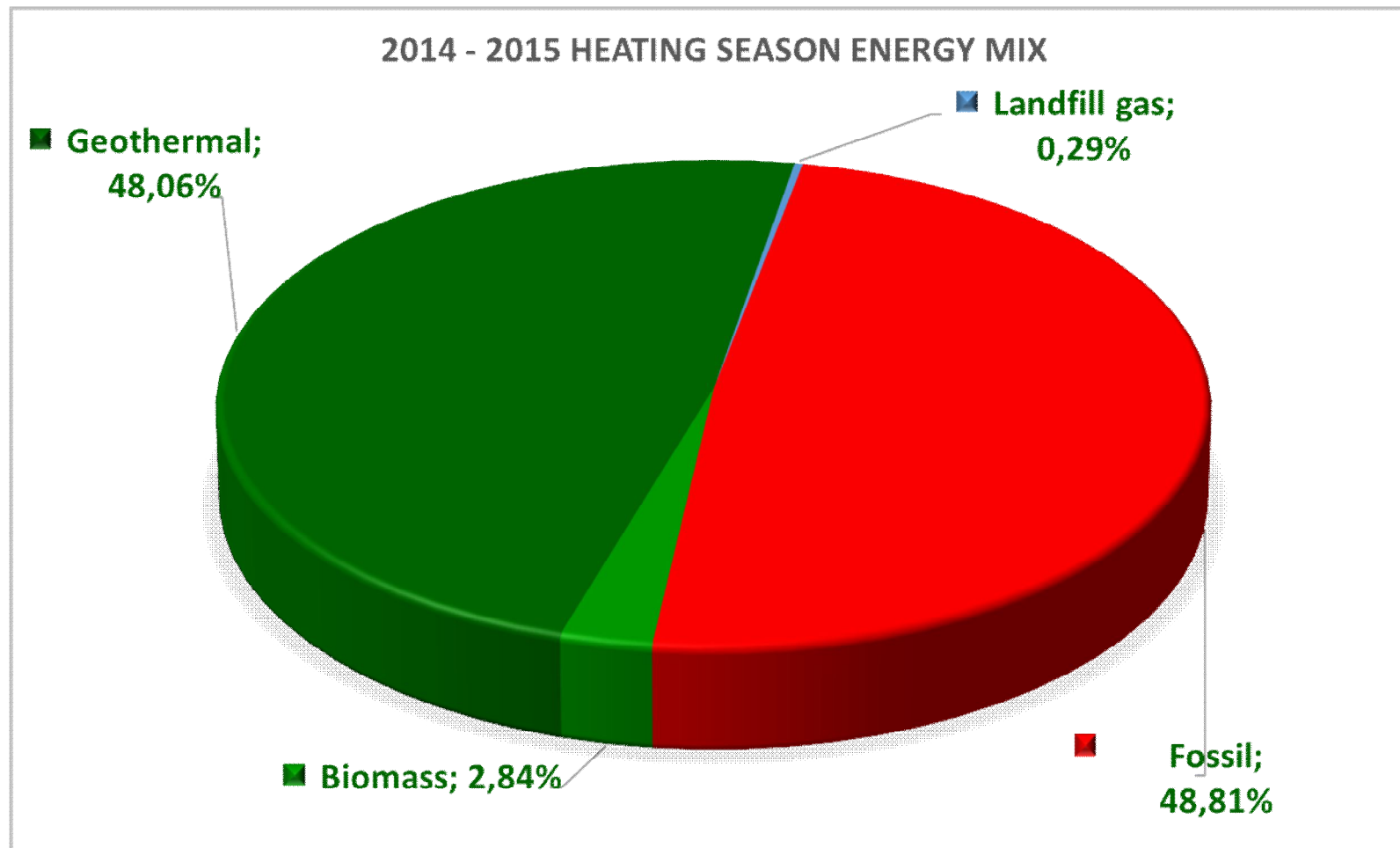
Renewable energy utilisation – Geothermal energy



Renewable energy utilisation – Geothermal energy



Results

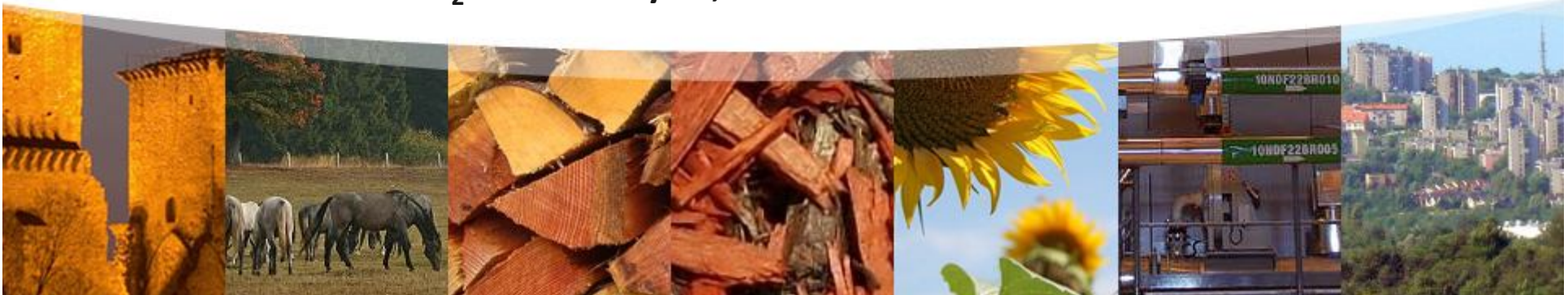


Landfill gas	3,542	GJ	0.29%
Natural gas	600,454	GJ	48.81%
Biomass	34,995	GJ	2.84%
Geothermal	591,194	GJ	48.06%
Total	1,230,185	GJ	100.00%

Natural gas redemption	20,810,681	m ³
	707,563	GJ
CO ₂ savings	39,496	tons

Summary

- **Our goal is**
 - To provide competitive energy and district heating service to the consumers of the city of Miskolc
- **Means for implementation**
 - Utilisation of landfill gas, biomass and **geothermal energy sources**
 - Exploiting tendering opportunities
- **Achievements**
 - Utilisation of **three different renewable energy sources**
 - In Miskolc **51.19% of the consumers** (~32,000 houses and ~1,000 other consumers) have been supplied with **renewable energy for heating in 2014 – 2015 heating season**, resulting in triggering **20,810,681 m³ natural gas** and the reduction of **CO₂ emission by 39,496 tons**.



Miskolci Geotermia Zrt.

Member of **PANENERGY** Group

**MISKOLC
HOLDING**

ÖNKORMÁNYZATI VAGYONKEZELŐ ZRT.

KUALA

Member of **PANENERGY** Group



Thank you for your kind attention!

www.miskolc.hu

www.miho.hu

www.pannergy.com

