SWITCHING THE DISTRICT HEATING OF SZEGED TO GEOTHERMAL

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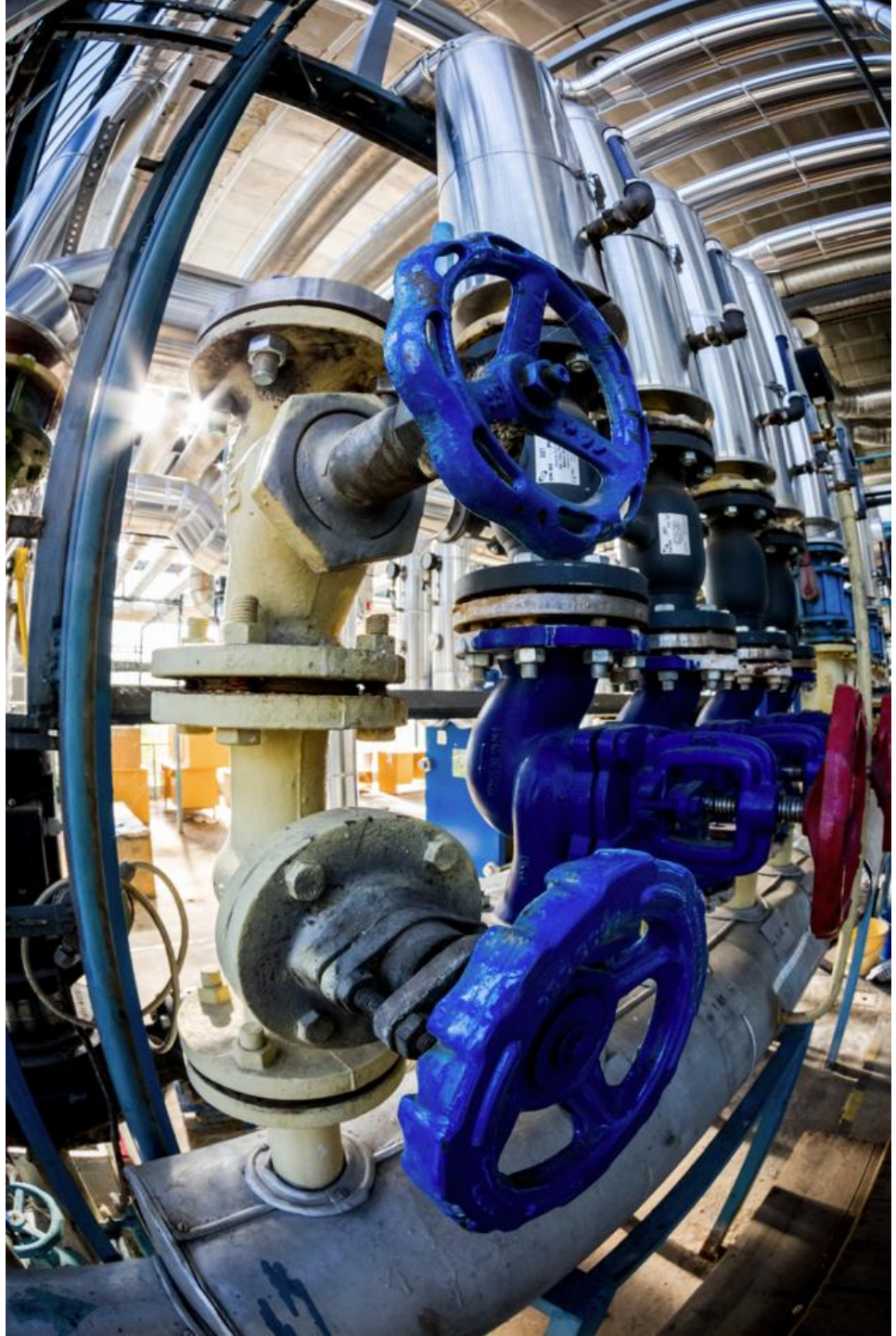
Chief Officer of Operations – DH Company of Szeged



SZEGED

- 155,000 inhabitants
- To become the greenest city in Hungary
- 100% municipally owned district heating
- Heating and domestic hot water: 27,856 apartments and 433 other users
- One of Europe's largest geothermal district heating system developments





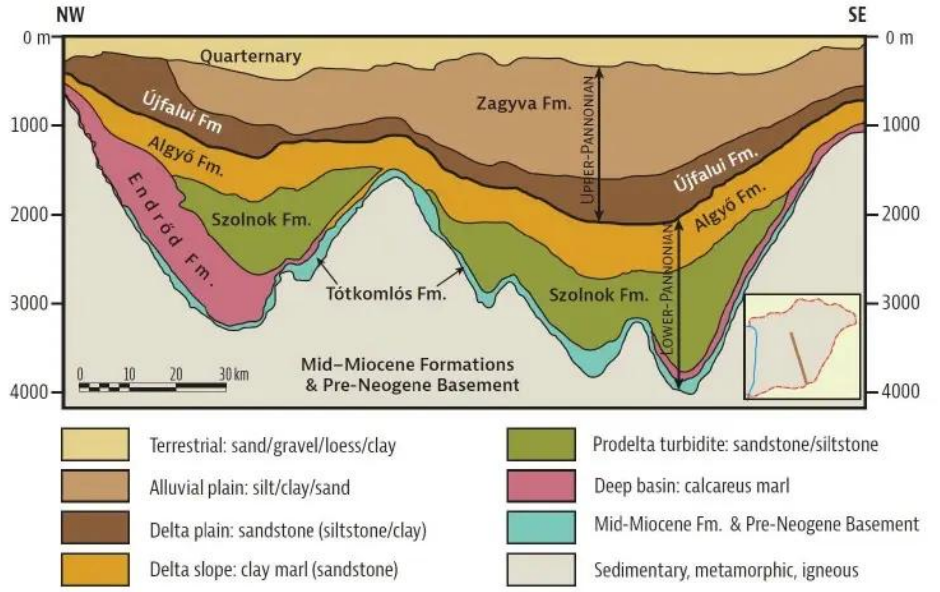
SZETAV (THE DH COMPANY OF SZEGED)

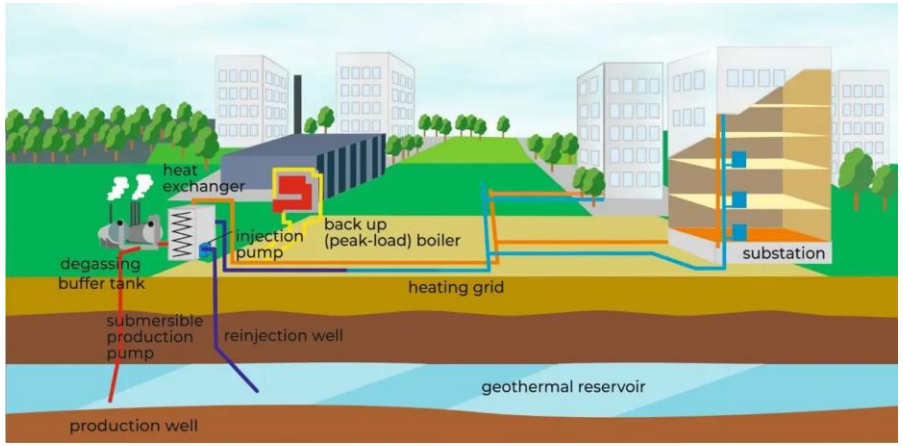
- 3 departments: operations, finance, energy
- 150 employees
- 23 heating circuits
- 254 heat substations
- 250 km of district heating pipelines
- 208 MW installed gas based capacity
- 794,202 GJ energy production (2025)
- The city's largest CO2 emitter



BACKGROUND

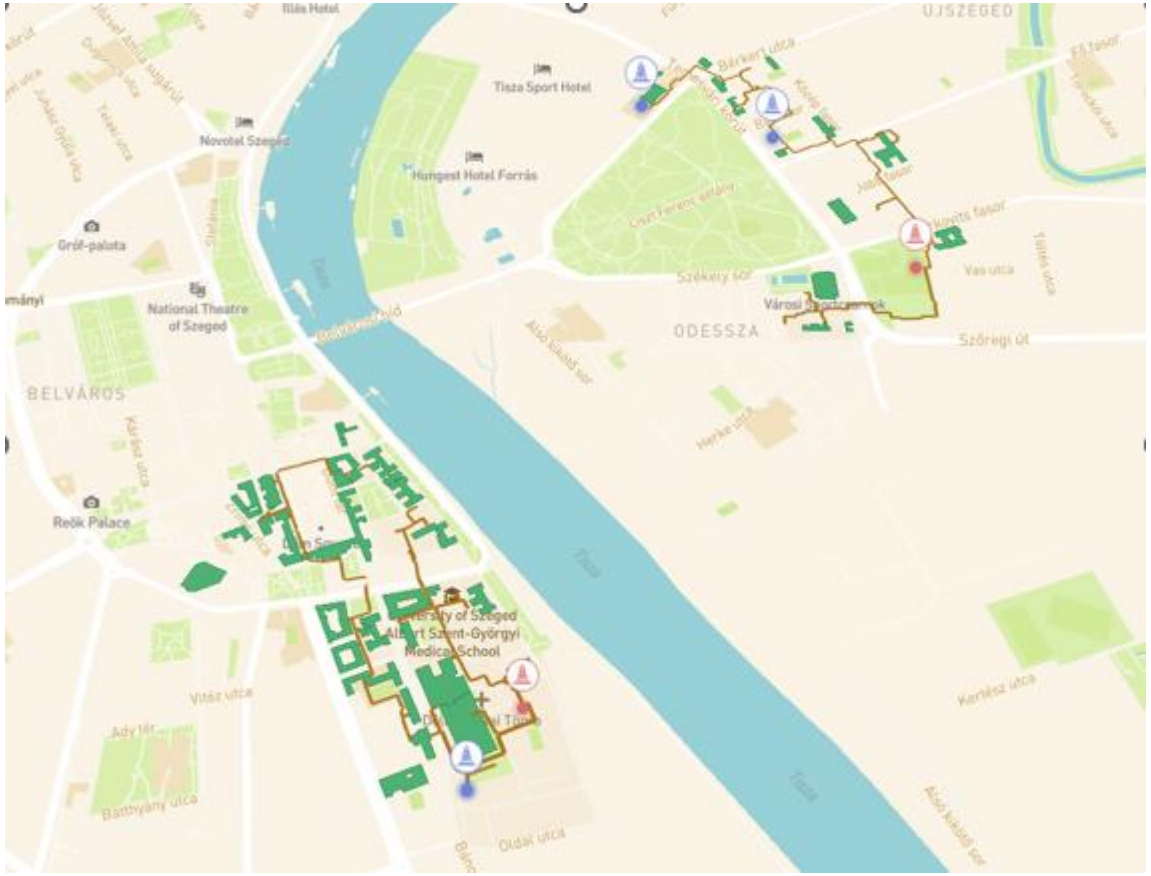
- Excellent conditions in the Southern Great Plain
- 9 settlements within a 50 km radius
- Upper-Pannonian reservoir
- existing DH infrastructure
- Value-chain
- ERDF funding + private investment





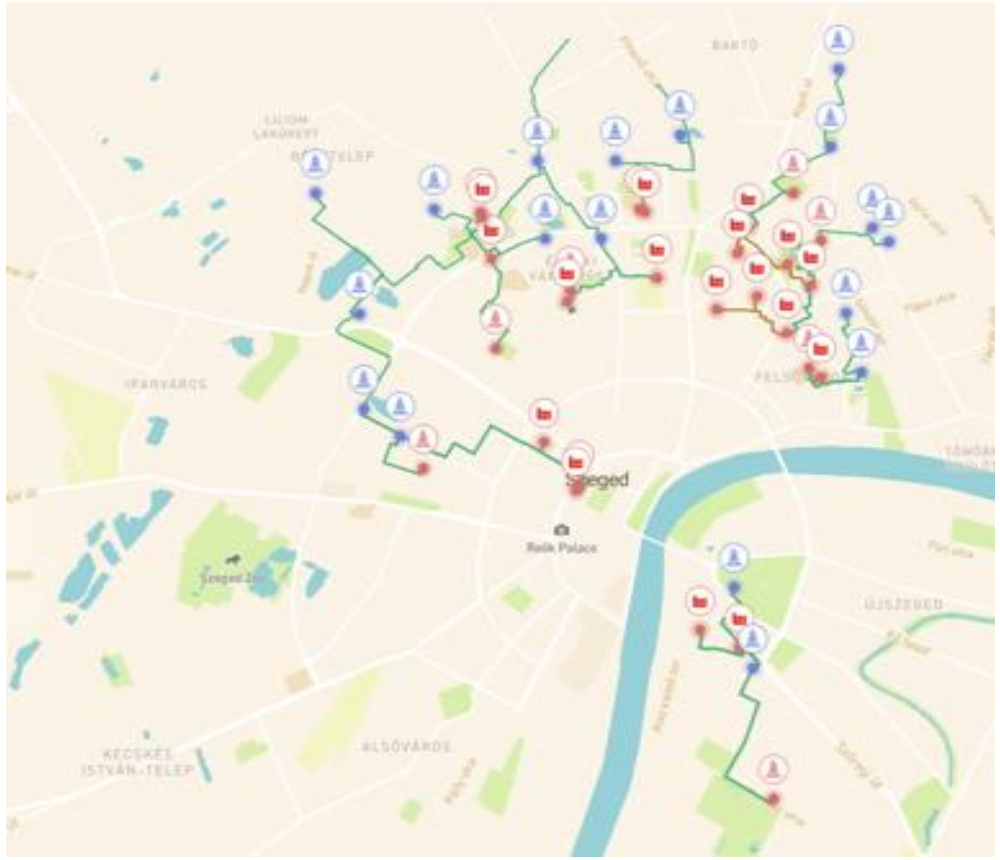
FIRST STEPS

- Pioneering Odessa System
- PHARE Project in Uptown
- InnoGeo Ltd., GEOSZ Ltd. (2013): University Systems



SWITCHING THE DH TO GEOTHERMAL

- Thermal wells with a depth of 1,700–2,000 m
- 94 °C, capacity of 70 m³/h (2025: 426 m³/h)
- 9 production wells, 18 reinjection wells
- 30 km of pipeline
- 304,063 GJ (2025) / 340,000+ (2026) of thermal energy from 9 wells + 6000 GJ from 9 boilers each 500kW utilizing 40-50m3/h CH4

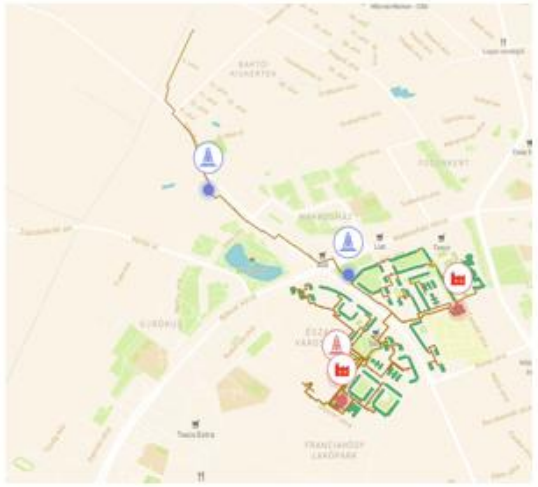


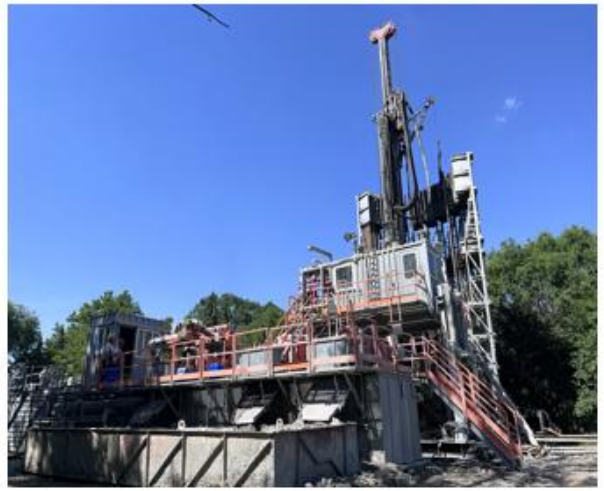
NORTH TOWN

- No. of residential units: 4,049
- Non-residential users: 76
- Gas consumption: 4,114,458 m³/year
- Energy production: 122,076 GJ/year
- CO_2 emissions: 7,936 t/year

<u>Energy balance with geothermal (planned / 2025)</u>

- Natural gas saved: 81,480 GJ 2,361,739 m³ / 38,282 GJ 1,109,623 m³
- Reduction in CO_2 emissions: 4,748 t / 2,225 t
- Geothermal energy production: 73,332 GJ / 34,802 GJ
- Adsorption cooling based on summer geothermal waste heat









UPTOWN

- Number of residential units: 3,353
- Non-residential users: 26
- Gas consumption: 3,355,000 m³/year
- Energy production: 93,775 GJ/year
- CO_2 emissions: 6,755 t/year

<u>Energy balance with geothermal (planned / 2025)</u>

- Natural gas saved: 75,781 GJ 2,228,853 m³ / 59,946 GJ 1,737,565 m³
- Reduction in CO_2 emissions: 4,416 t / 3,533 t
- Geothermal energy production: 68,203 GJ / 55,116 GJ







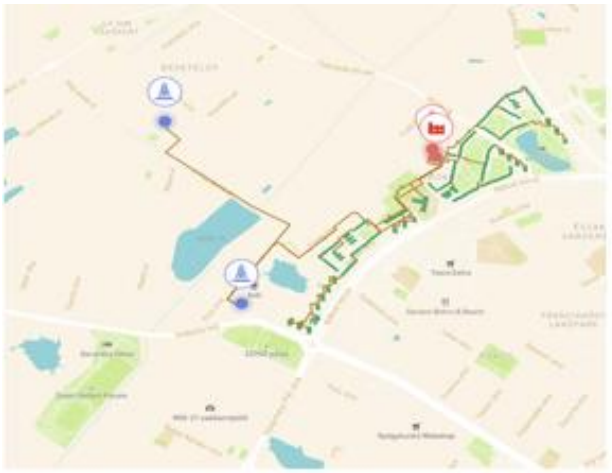


ROKUS 1

- No. of residential units: 3,253
- Non-residential users: 33
- Gas consumption: 3,353,244 m³/year
- Energy production: 84,742 GJ/year
- CO_2 emissions: 6,809 t/year

<u>Energy balance with geothermal (planned / 2025)</u>

- Natural gas saved: 75,555 GJ 2,190,016 m³ / 75,649 GJ 2,192,725 m³
- Reduction in CO_2 emissions: 4,392 t / 4,408 t
- Geothermal energy production: 67,838 GJ / 68,772 GJ







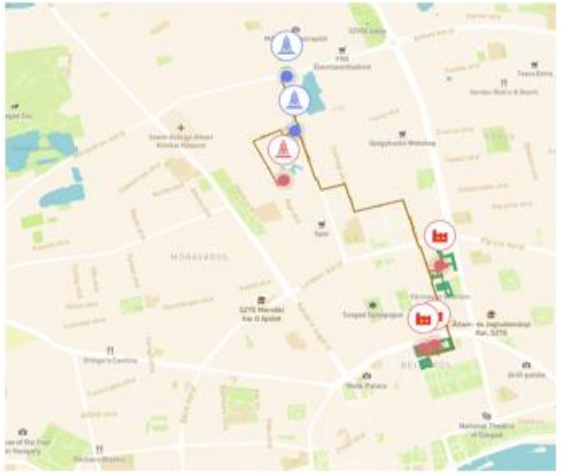


CITY CENTRE

- No. of residential units: 312
- Non-residential users: 32
- Gas consumption: 435,894 m³/year
- Energy production: 13,301 GJ/year
- CO_2 emissions: 977 t/year

<u>Energy balance using geothermal energy (planned / 2025)</u>

- Natural gas saved: 16,635 GJ 489,264 m³ / 22,807 GJ 661,072 m³
- Reduction in CO_2 emissions: 457 t / 1,328 t
- Geothermal energy production: 14,968 GJ / 20,734 GJ









HIGHLIGHTS AND PITFALLS

- Well drilling and maintenance in populated areas - SLO
- Scaling
- System integration
- Pricing
- Heat-pumps
- 7/9 (system integration): 45%

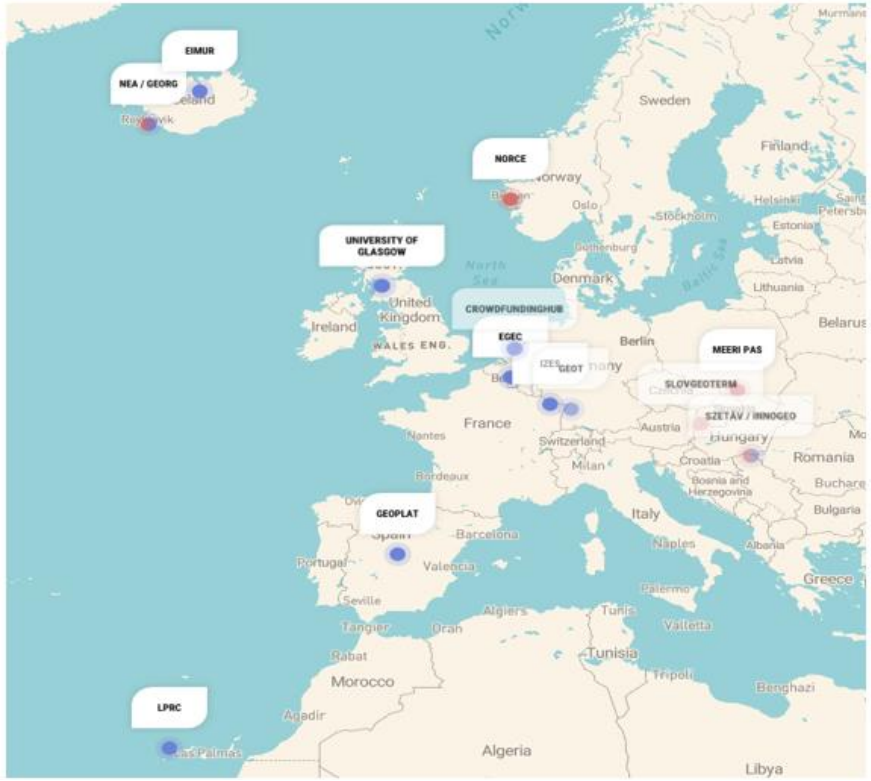








BLUEPRINT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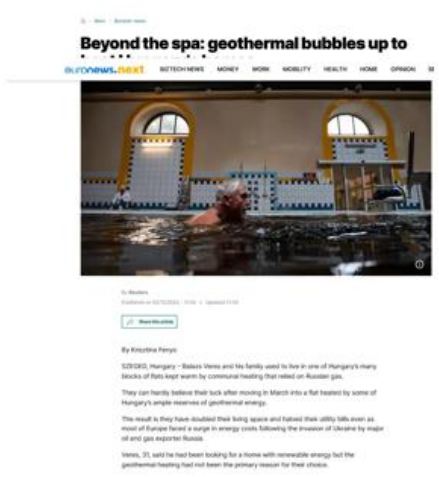
TAIPEI TIMES
Hungary's hot springs fuel switch from Russian gas


European Commission
@EU_Commission
Renewable and affordable energy for to diversify from the Russian gas import ↓
Szeged just inaugurated the largest EU geothermal heating system, benefitting over 28,000 households and 400 public buildings.
A replicable model for EU cities to help reach the EU climate goals.
Hot water comes from 2 km below to heat
28,000
households


Beyond the spa: geothermal bubbles up to

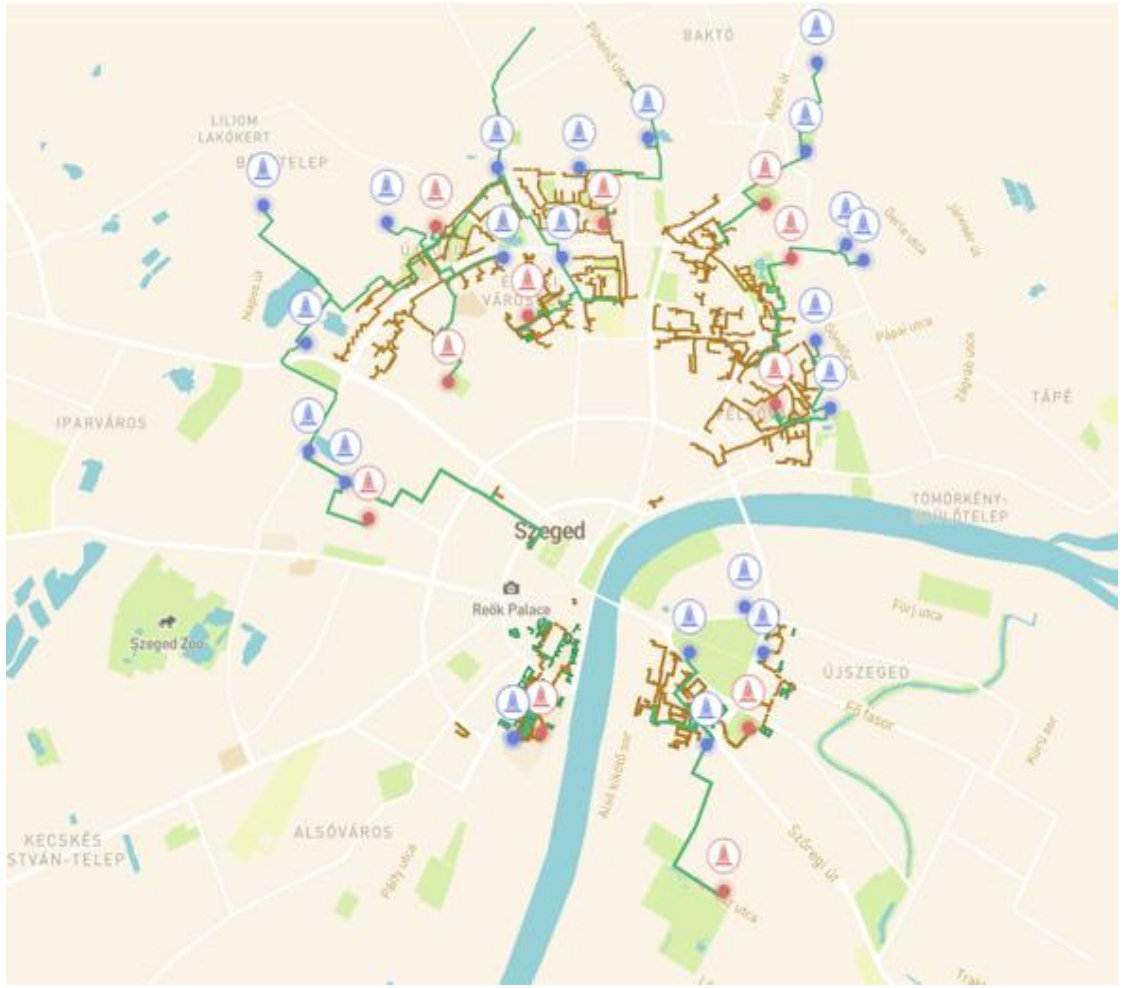






CONCLUSIONS

- €80M in ERDF funding and private investment
- 27 wells, 30 km of transmission pipelines
- 25-year service contract
- Environmental protection – security of supply
- 50%+ reduction in fossil energy consumption and pollutant emissions
- Side projects and development opportunities/requirements



THANK YOU

