Switching the district heating of Szeged to Geothermal

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

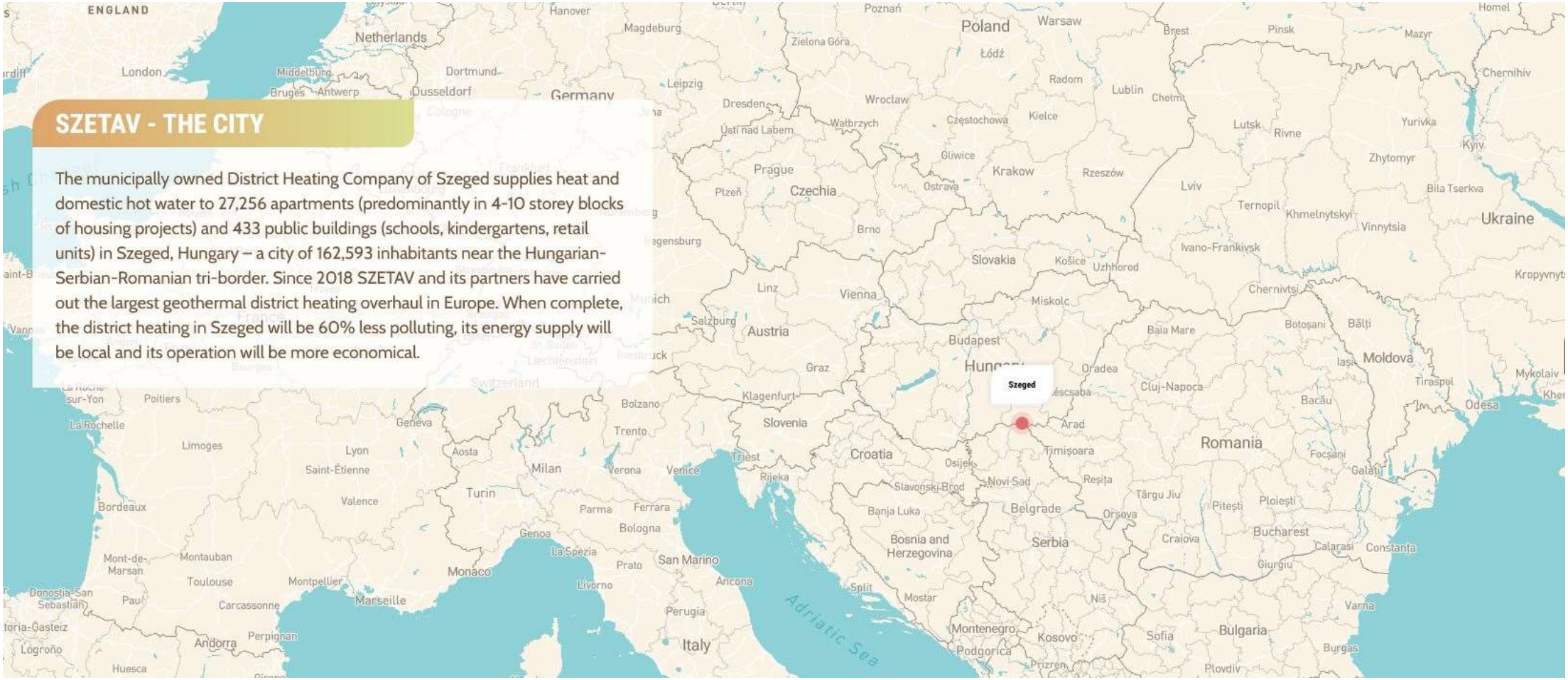
Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

SZETAV - THE CITY

The municipally owned District Heating Company of Szeged supplies heat and domestic hot water to 27,256 apartments (predominantly in 4-10 storey blocks of housing projects) and 433 public buildings (schools, kindergartens, retail units) in Szeged, Hungary – a city of 162,593 inhabitants near the Hungarian-Serbian-Romanian tri-border. Since 2018 SZETAV and its partners have carried out the largest geothermal district heating overhaul in Europe. When complete, the district heating in Szeged will be 60% less polluting, its energy supply will be local and its operation will be more economical.



MINISTRY OF
FOREIGN AFFAIRS AND TRADE
OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian
District Heating Enterprises

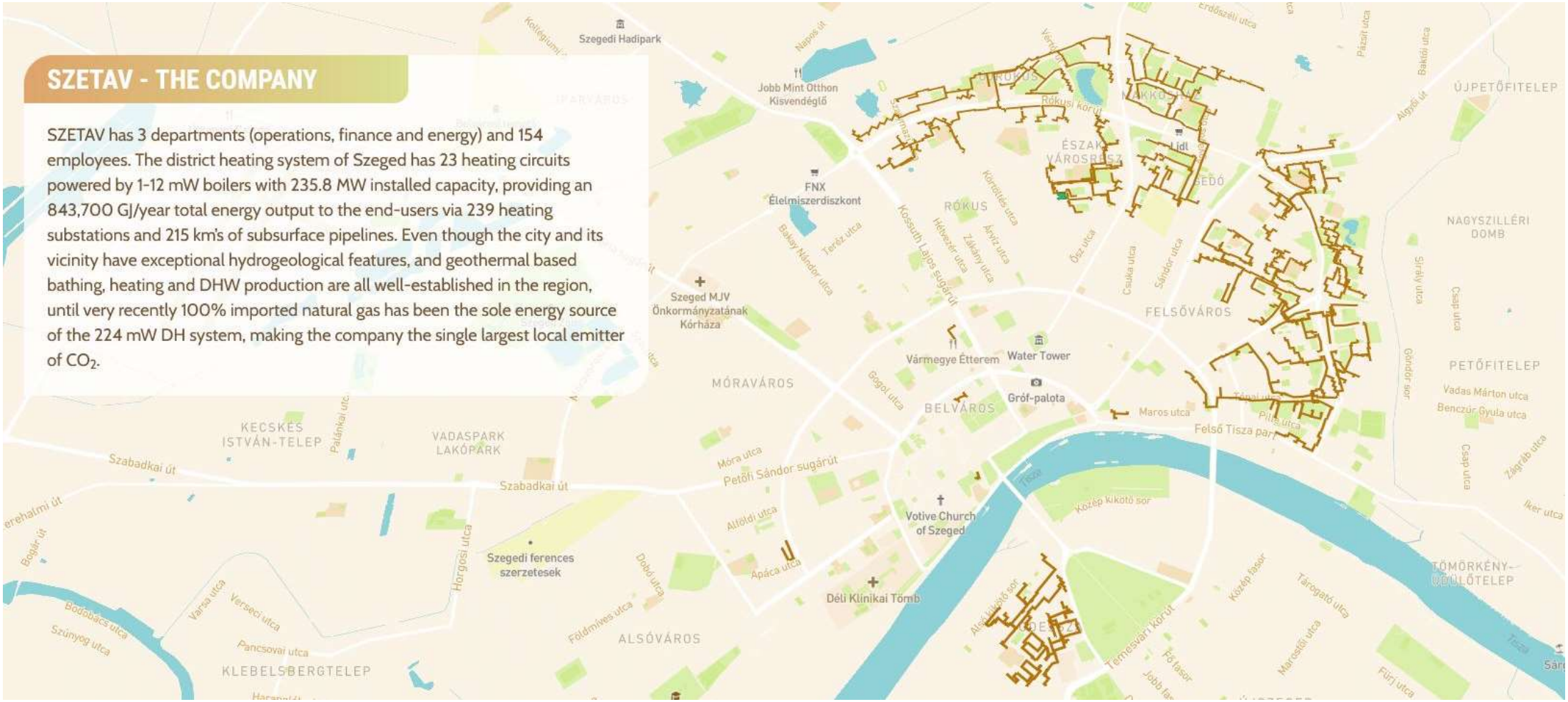
Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

SZETAV - THE COMPANY

SZETAV has 3 departments (operations, finance and energy) and 154 employees. The district heating system of Szeged has 23 heating circuits powered by 1-12 mW boilers with 235.8 MW installed capacity, providing an 843,700 GJ/year total energy output to the end-users via 239 heating substations and 215 km's of subsurface pipelines. Even though the city and its vicinity have exceptional hydrogeological features, and geothermal based bathing, heating and DHW production are all well-established in the region, until very recently 100% imported natural gas has been the sole energy source of the 224 mW DH system, making the company the single largest local emitter of CO_2.



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

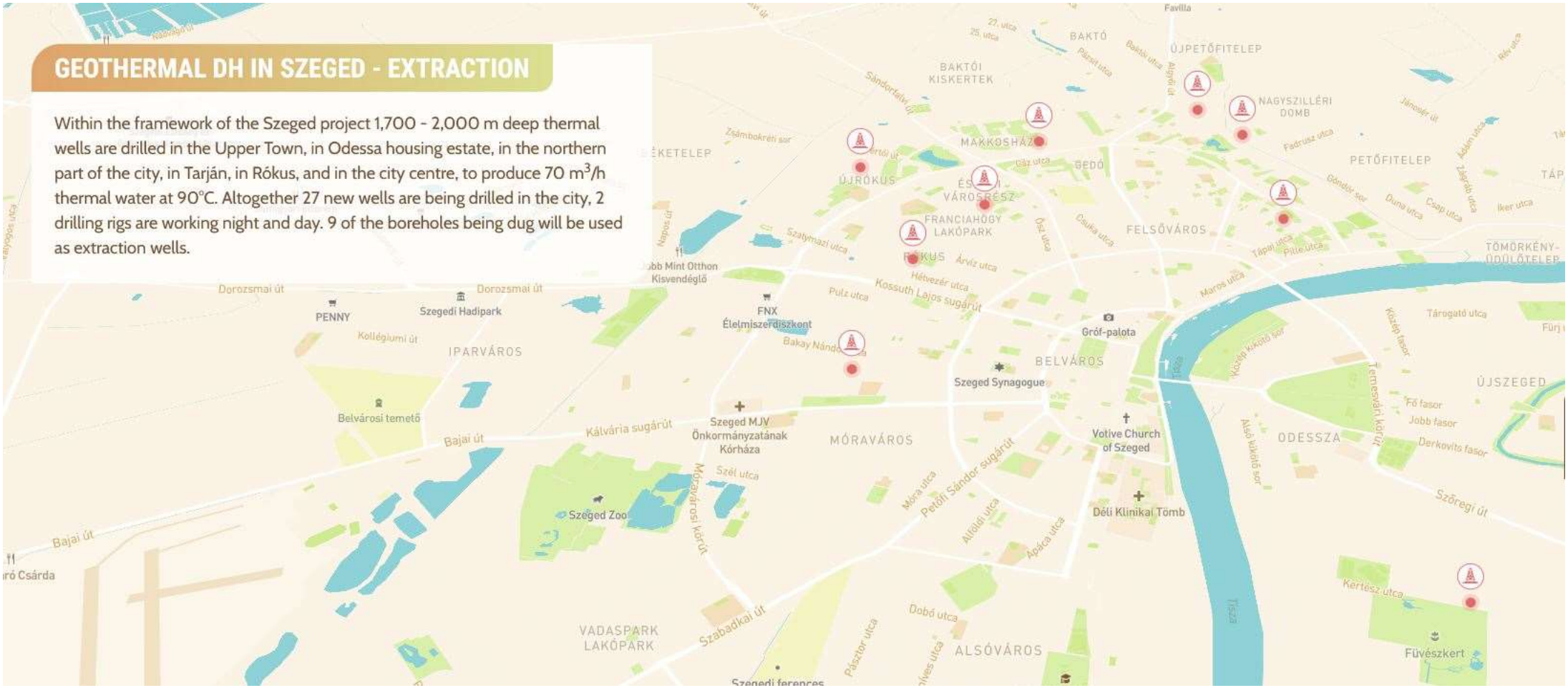
Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

GEOTHERMAL DH IN SZEGED - EXTRACTION

Within the framework of the Szeged project 1,700 - 2,000 m deep thermal wells are drilled in the Upper Town, in Odessa housing estate, in the northern part of the city, in Tarján, in Rókus, and in the city centre, to produce 70 m^3/h thermal water at 90°C. Altogether 27 new wells are being drilled in the city, 2 drilling rigs are working night and day. 9 of the boreholes being dug will be used as extraction wells.



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

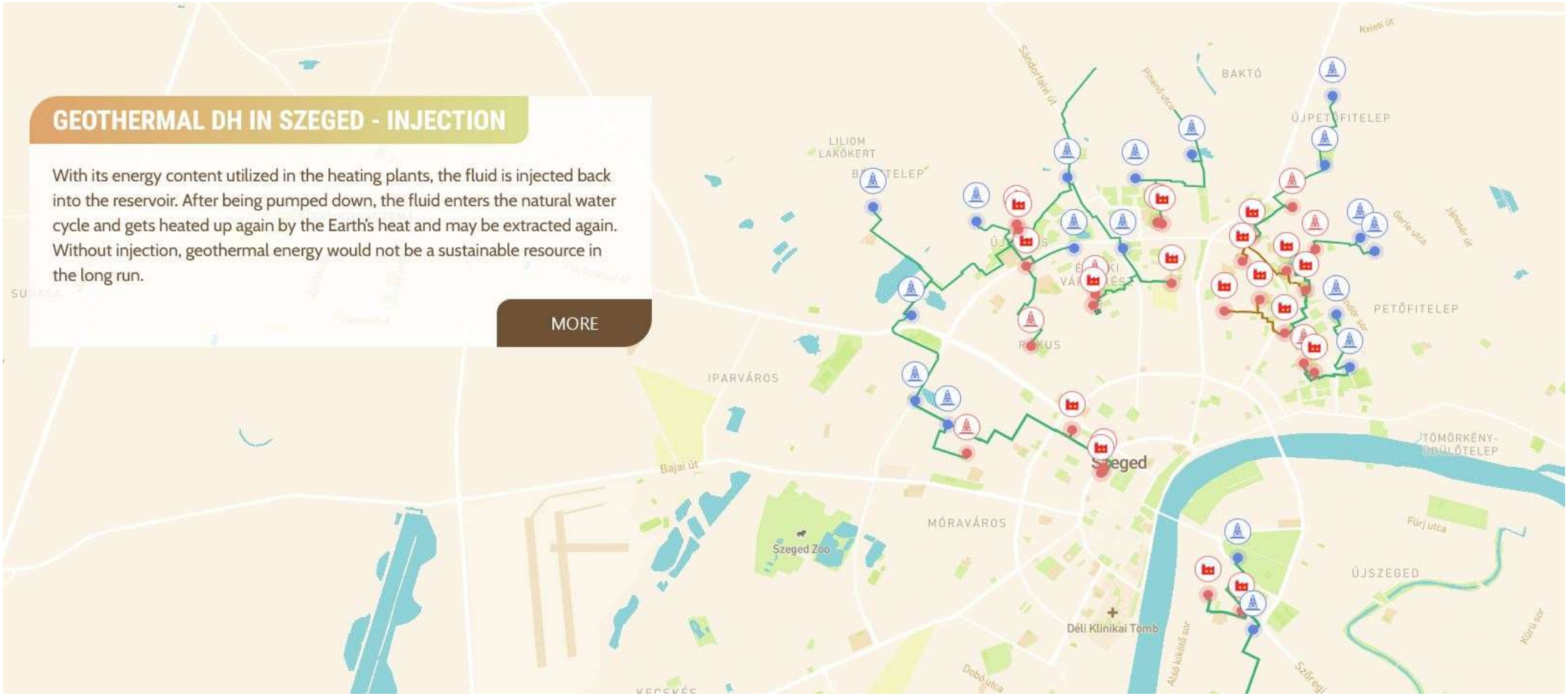
Co-funded by
the European Union

DANUBE REGION
strategy
Energy

GEOTHERMAL DH IN SZEGED - INJECTION

With its energy content utilized in the heating plants, the fluid is injected back into the reservoir. After being pumped down, the fluid enters the natural water cycle and gets heated up again by the Earth's heat and may be extracted again. Without injection, geothermal energy would not be a sustainable resource in the long run.

MORE



MINISTRY OF
FOREIGN AFFAIRS AND TRADE
OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian
District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by the European Union

DANUBE REGION strategy Energy

ROKUS

Basic data

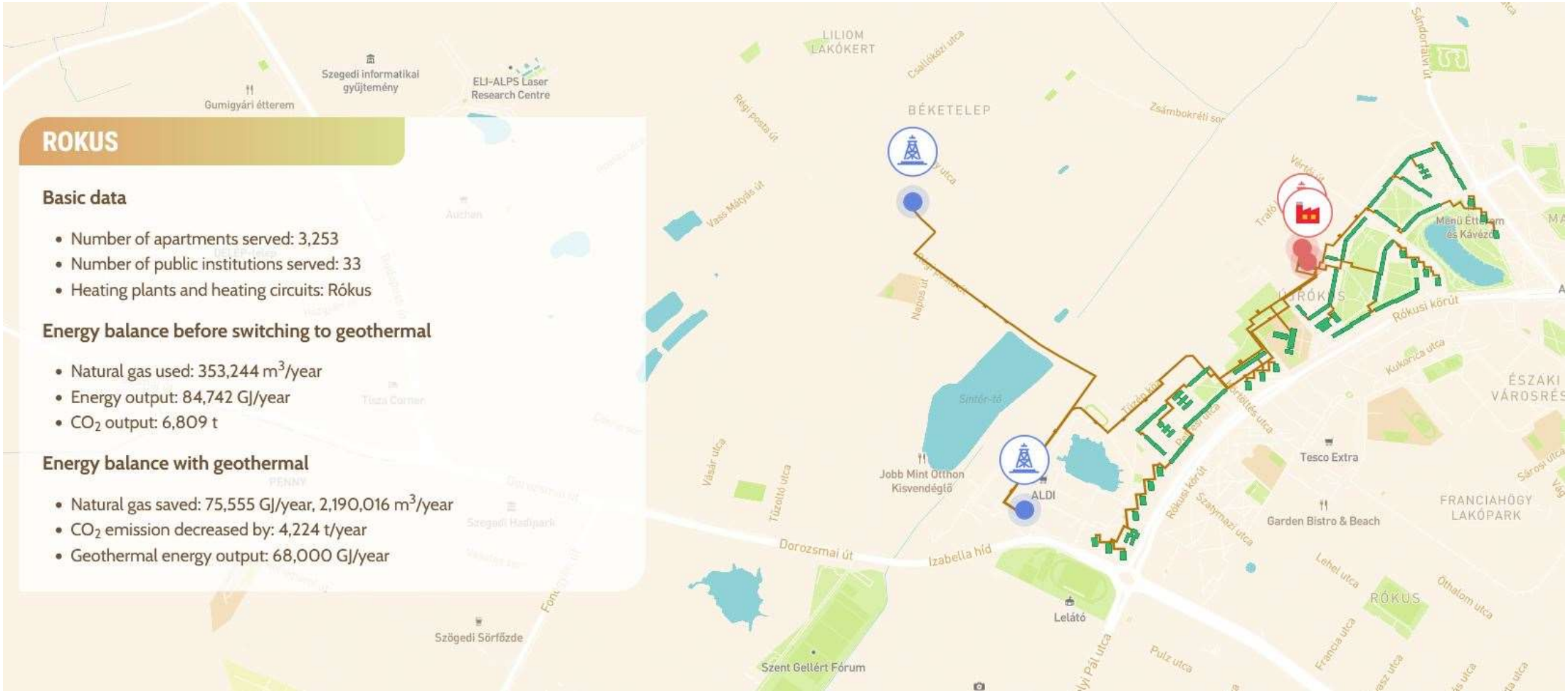
- Number of apartments served: 3,253
- Number of public institutions served: 33
- Heating plants and heating circuits: Rókus

Energy balance before switching to geothermal

- Natural gas used: 353,244 m^3/year
- Energy output: 84,742 GJ/year
- CO_2 output: 6,809 t

Energy balance with geothermal

- Natural gas saved: 75,555 GJ/year, 2,190,016 m^3/year
- CO_2 emission decreased by: 4,224 t/year
- Geothermal energy output: 68,000 GJ/year



Ministry of Foreign Affairs and Trade of Hungary

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by the European Union

DANUBE REGION strategy Energy

ROKUS 2

Basic data

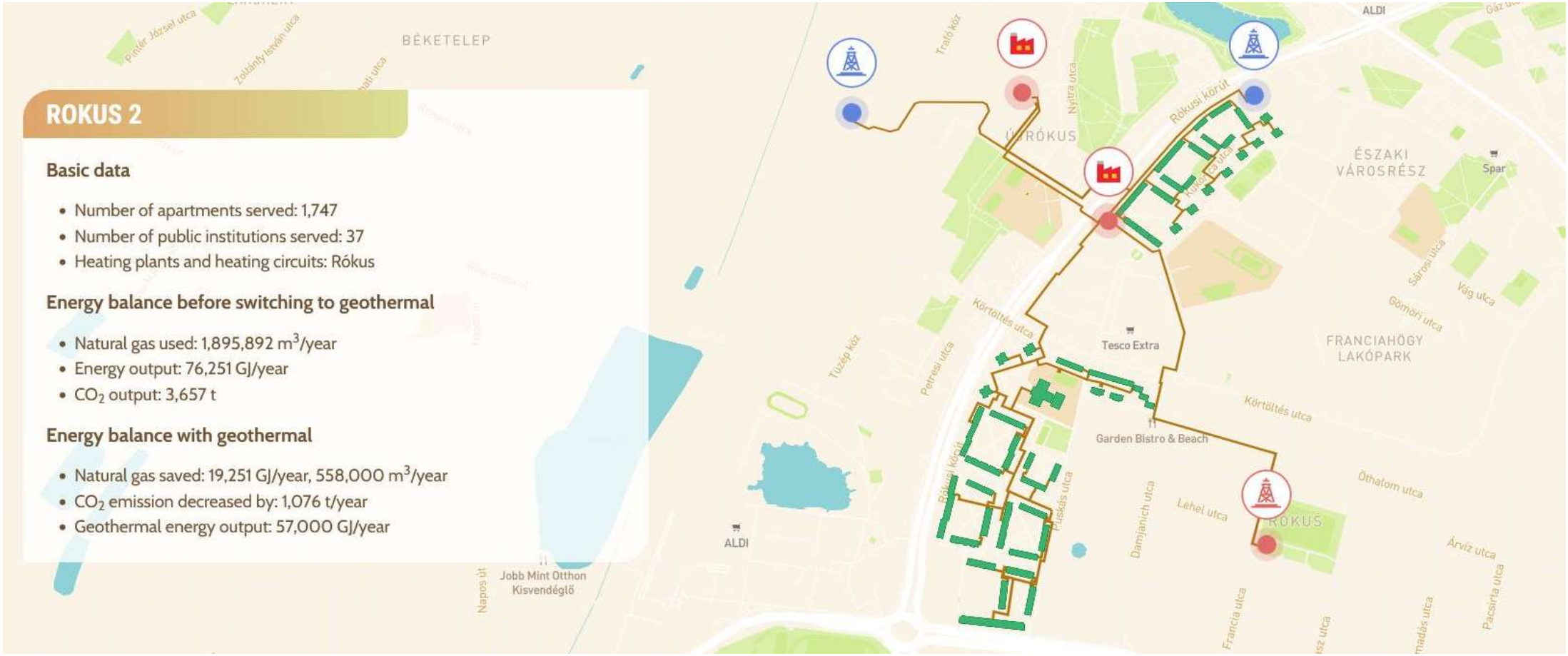
- Number of apartments served: 1,747
- Number of public institutions served: 37
- Heating plants and heating circuits: Rókus

Energy balance before switching to geothermal

- Natural gas used: 1,895,892 m^3/year
- Energy output: 76,251 GJ/year
- CO_2 output: 3,657 t

Energy balance with geothermal

- Natural gas saved: 19,251 GJ/year, 558,000 m^3/year
- CO_2 emission decreased by: 1,076 t/year
- Geothermal energy output: 57,000 GJ/year



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

ODESSA

Basic data

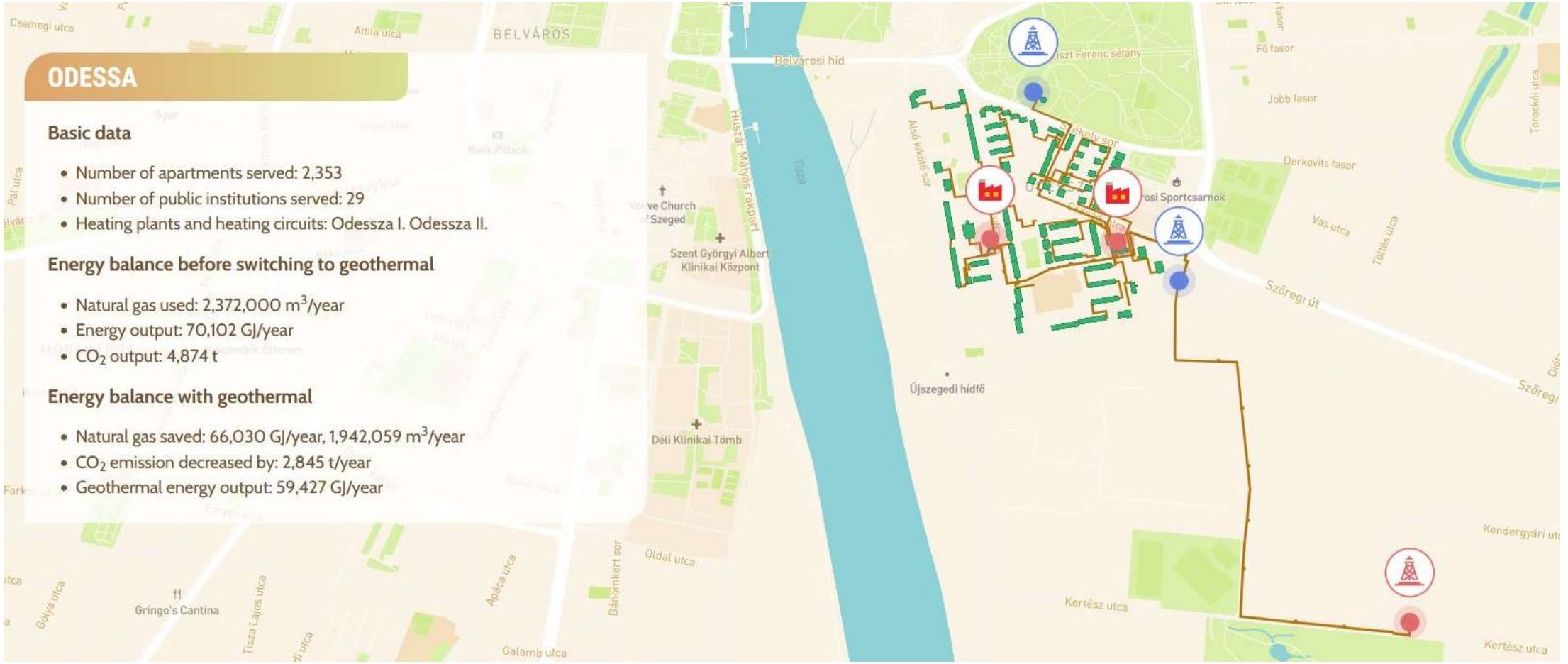
- Number of apartments served: 2,353
- Number of public institutions served: 29
- Heating plants and heating circuits: Odessza I. Odessza II.

Energy balance before switching to geothermal

- Natural gas used: 2,372,000 m^3/year
- Energy output: 70,102 GJ/year
- CO_2 output: 4,874 t

Energy balance with geothermal

- Natural gas saved: 66,030 GJ/year, 1,942,059 m^3/year
- CO_2 emission decreased by: 2,845 t/year
- Geothermal energy output: 59,427 GJ/year



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by the European Union

DANUBE REGION strategy
Energy

NORTH TOWN

Basic data

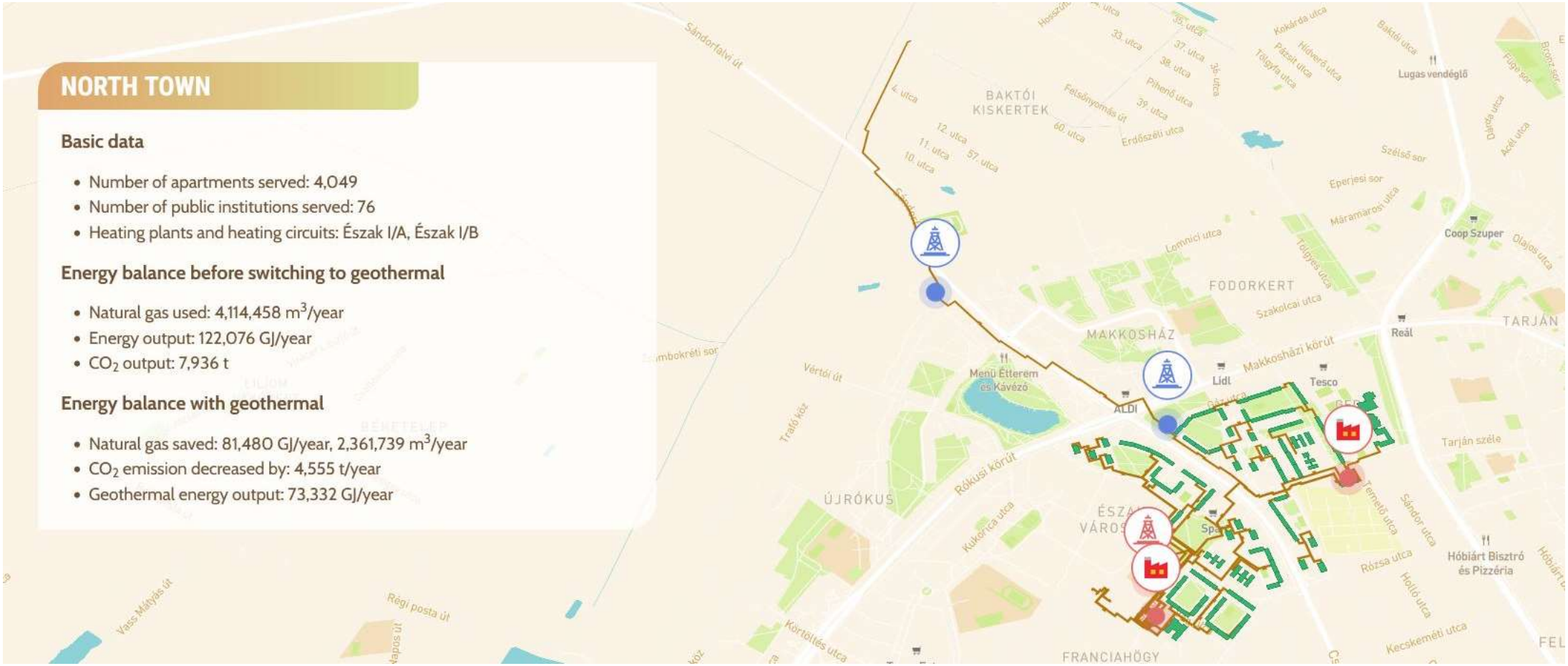
- Number of apartments served: 4,049
- Number of public institutions served: 76
- Heating plants and heating circuits: Észak I/A, Észak I/B

Energy balance before switching to geothermal

- Natural gas used: 4,114,458 m^3/year
- Energy output: 122,076 GJ/year
- CO_2 output: 7,936 t

Energy balance with geothermal

- Natural gas saved: 81,480 GJ/year, 2,361,739 m^3/year
- CO_2 emission decreased by: 4,555 t/year
- Geothermal energy output: 73,332 GJ/year



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by the European Union

DANUBE REGION strategy Energy

MAKKOSHAZA

Basic data

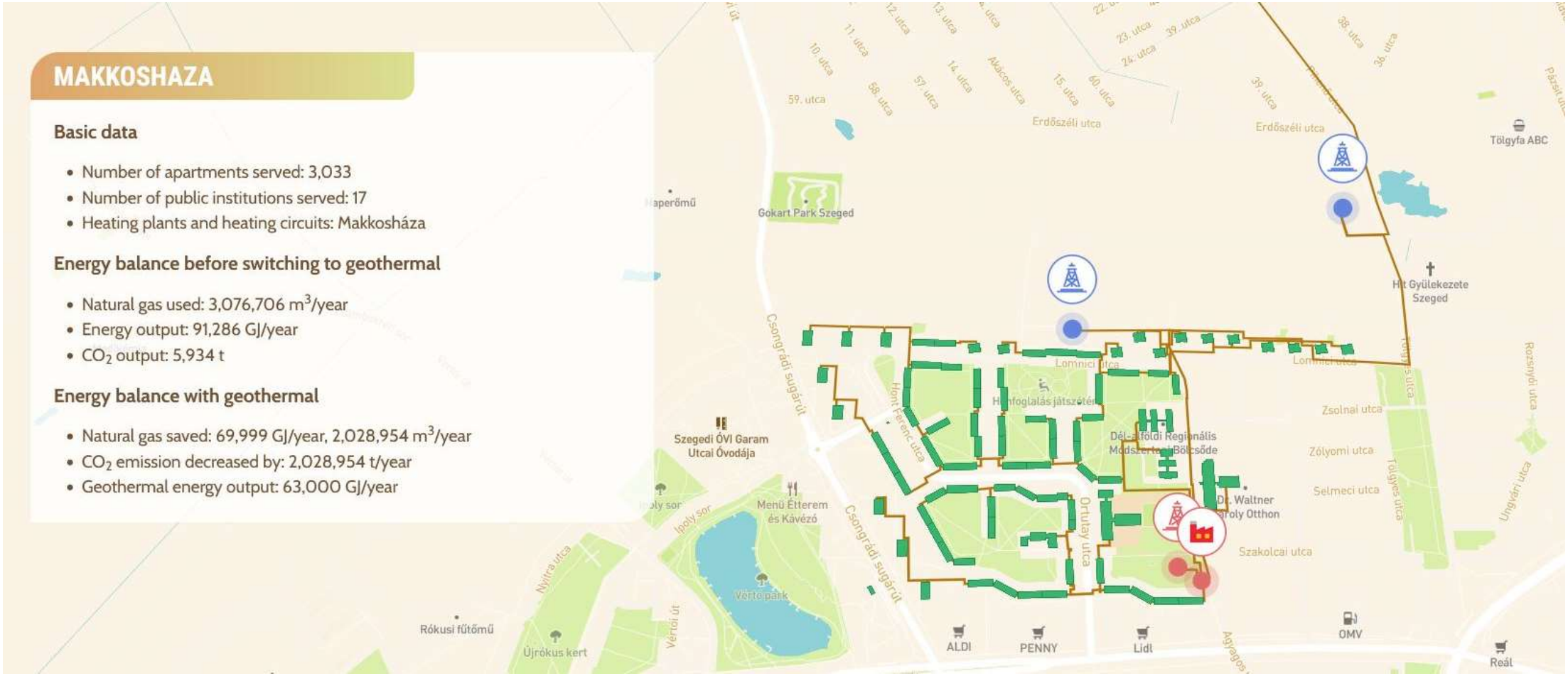
- Number of apartments served: 3,033
- Number of public institutions served: 17
- Heating plants and heating circuits: Makkosháza

Energy balance before switching to geothermal

- Natural gas used: 3,076,706 m^3/year
- Energy output: 91,286 GJ/year
- CO_2 output: 5,934 t

Energy balance with geothermal

- Natural gas saved: 69,999 GJ/year, 2,028,954 m^3/year
- CO_2 emission decreased by: 2,028,954 t/year
- Geothermal energy output: 63,000 GJ/year



Ministry of Foreign Affairs and Trade of Hungary

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

UPTOWN

Basic data

- Number of apartments served: 3,353
- Number of public institutions served: 26
- Heating plants and heating circuits: Felsőváros II.

Energy balance before switching to geothermal

- Natural gas used: 3,355,000 m^3/year
- Energy output: 93,775 GJ/year
- CO_2 output: 6,755 t

Energy balance with geothermal

- Natural gas saved: 75,781 GJ/year, 2,228,853 m^3/year
- CO_2 emission decreased by: 4,413 t/year
- Geothermal energy output: 68,203 GJ/year

MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

TARJAN

Basic data

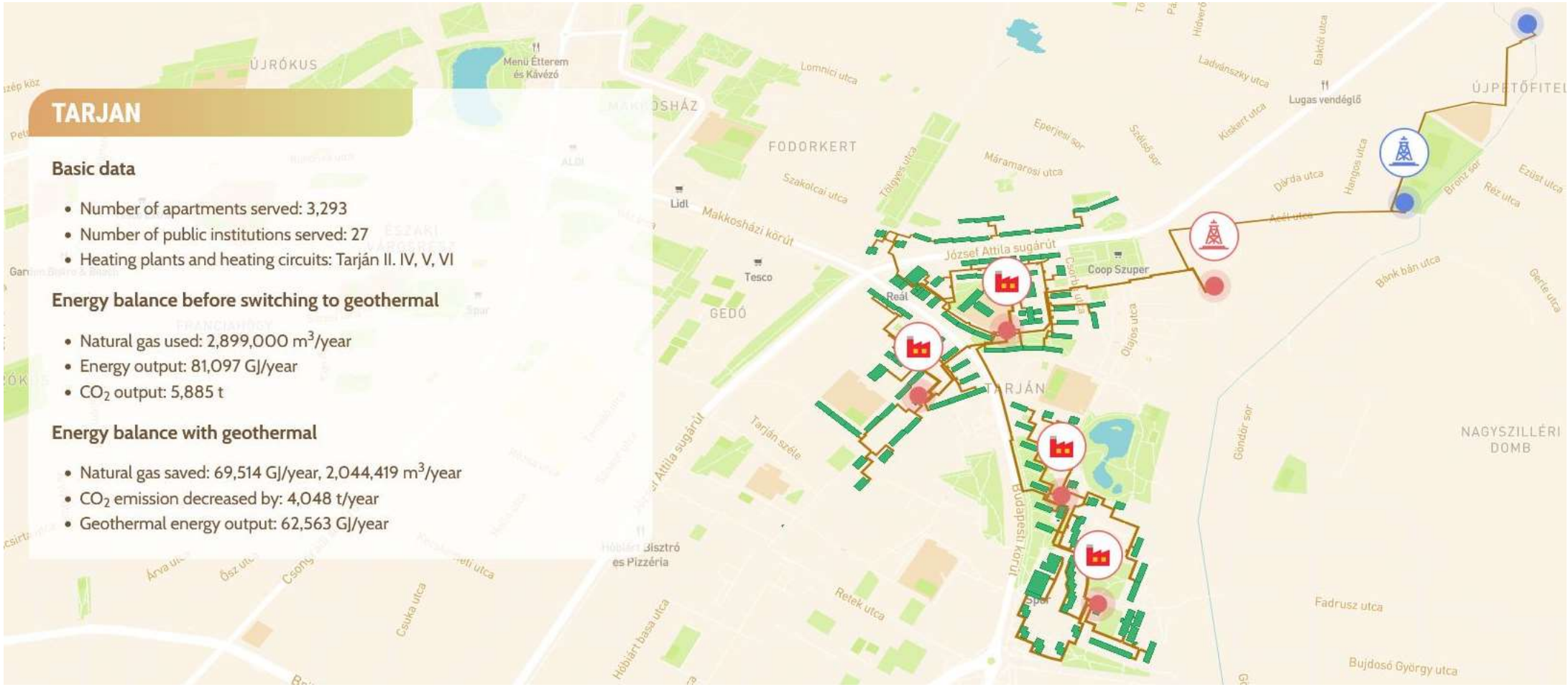
- Number of apartments served: 3,293
- Number of public institutions served: 27
- Heating plants and heating circuits: Tarján II. IV, V, VI

Energy balance before switching to geothermal

- Natural gas used: 2,899,000 m^3/year
- Energy output: 81,097 GJ/year
- CO_2 output: 5,885 t

Energy balance with geothermal

- Natural gas saved: 69,514 GJ/year, 2,044,419 m^3/year
- CO_2 emission decreased by: 4,048 t/year
- Geothermal energy output: 62,563 GJ/year



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

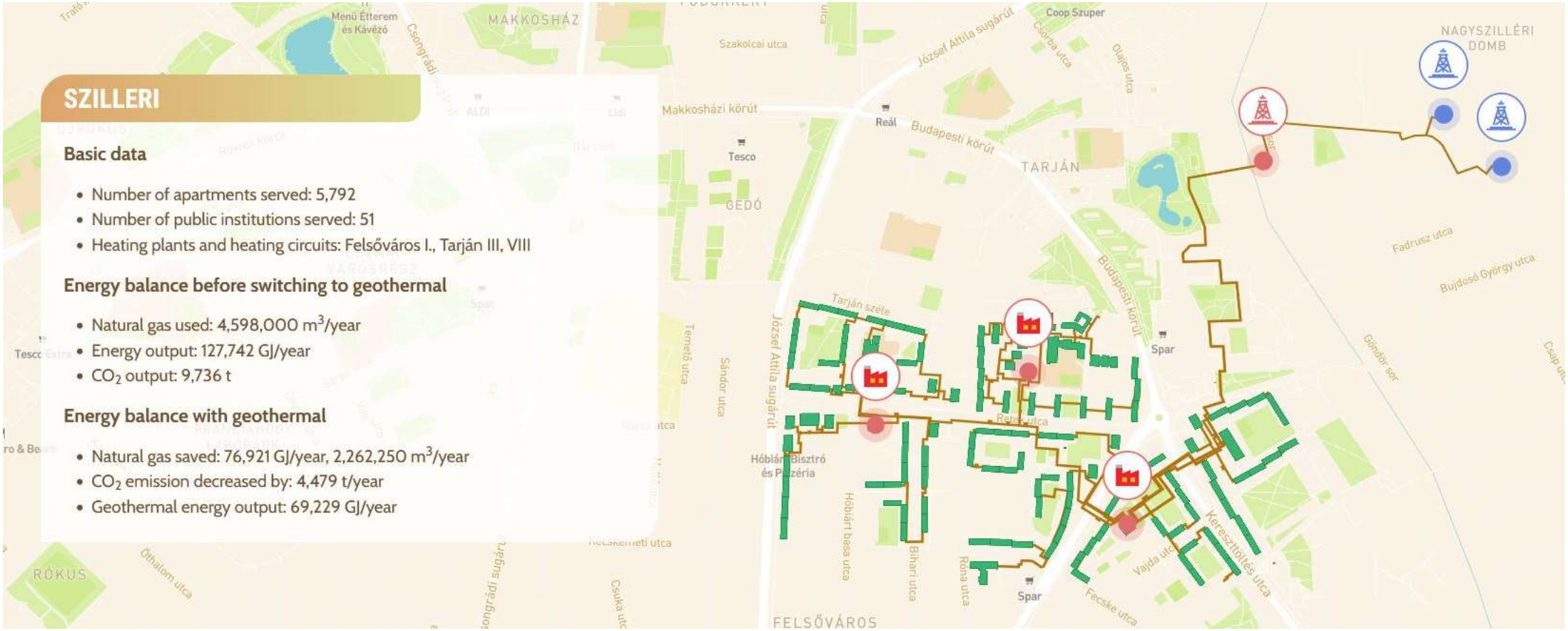
This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by the European Union

DANUBE REGION strategy Energy



MINISTRY OF FOREIGN AFFAIRS AND TRADE OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by the European Union

DANUBE REGION strategy Energy

CITY CENTRE

Basic data

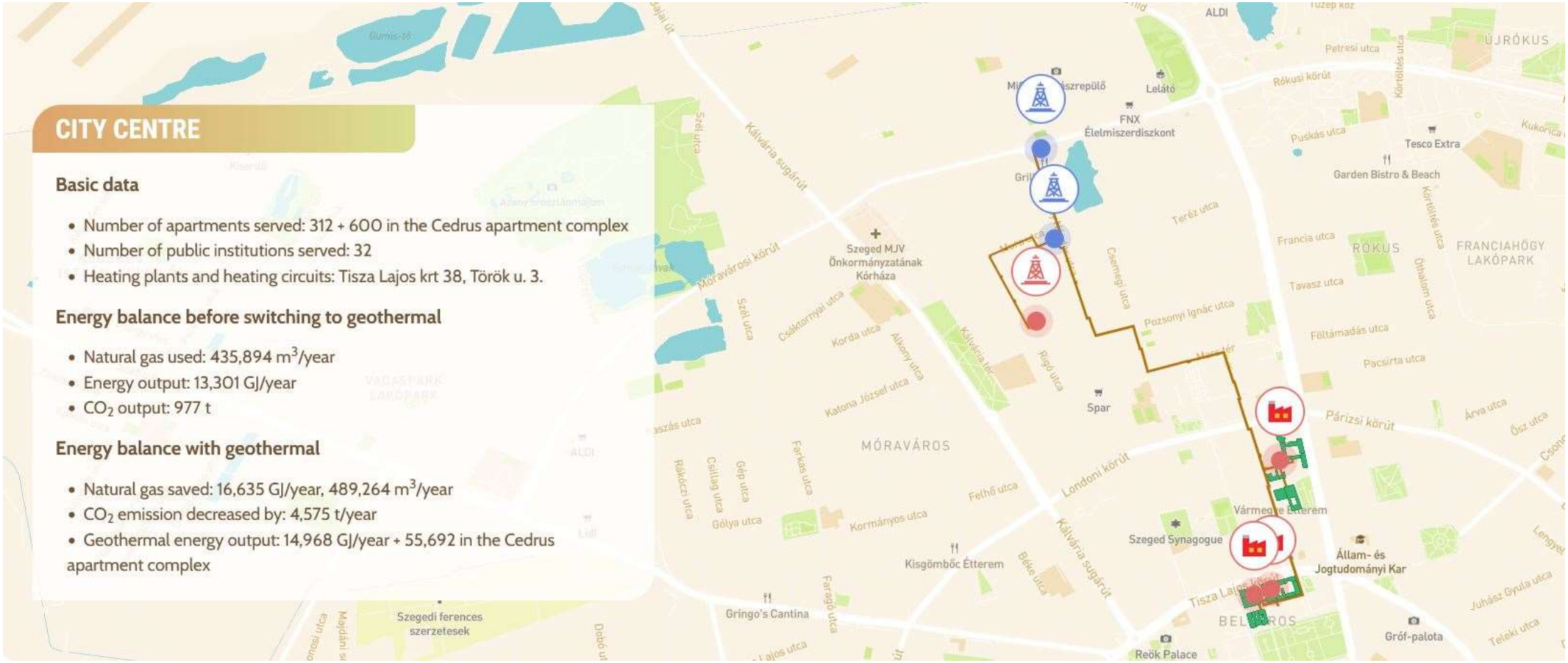
- Number of apartments served: 312 + 600 in the Cedrus apartment complex
- Number of public institutions served: 32
- Heating plants and heating circuits: Tisza Lajos krt 38, Török u. 3.

Energy balance before switching to geothermal

- Natural gas used: 435,894 m^3/year
- Energy output: 13,301 GJ/year
- CO_2 output: 977 t

Energy balance with geothermal

- Natural gas saved: 16,635 GJ/year, 489,264 m^3/year
- CO_2 emission decreased by: 4,575 t/year
- Geothermal energy output: 14,968 GJ/year + 55,692 in the Cedrus apartment complex



Ministry of Foreign Affairs and Trade of Hungary

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

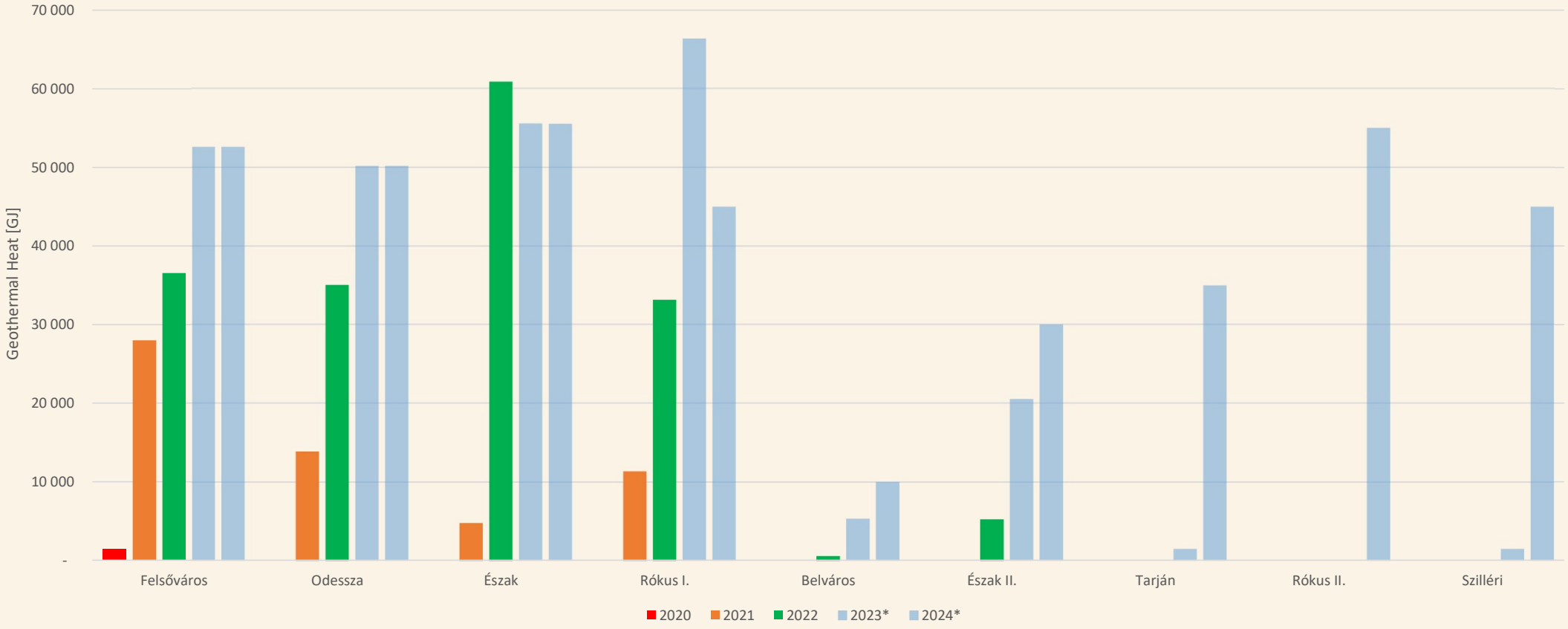
matászsz Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

Geothermal heat utilization



Ministry of Foreign Affairs and Trade of Hungary

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

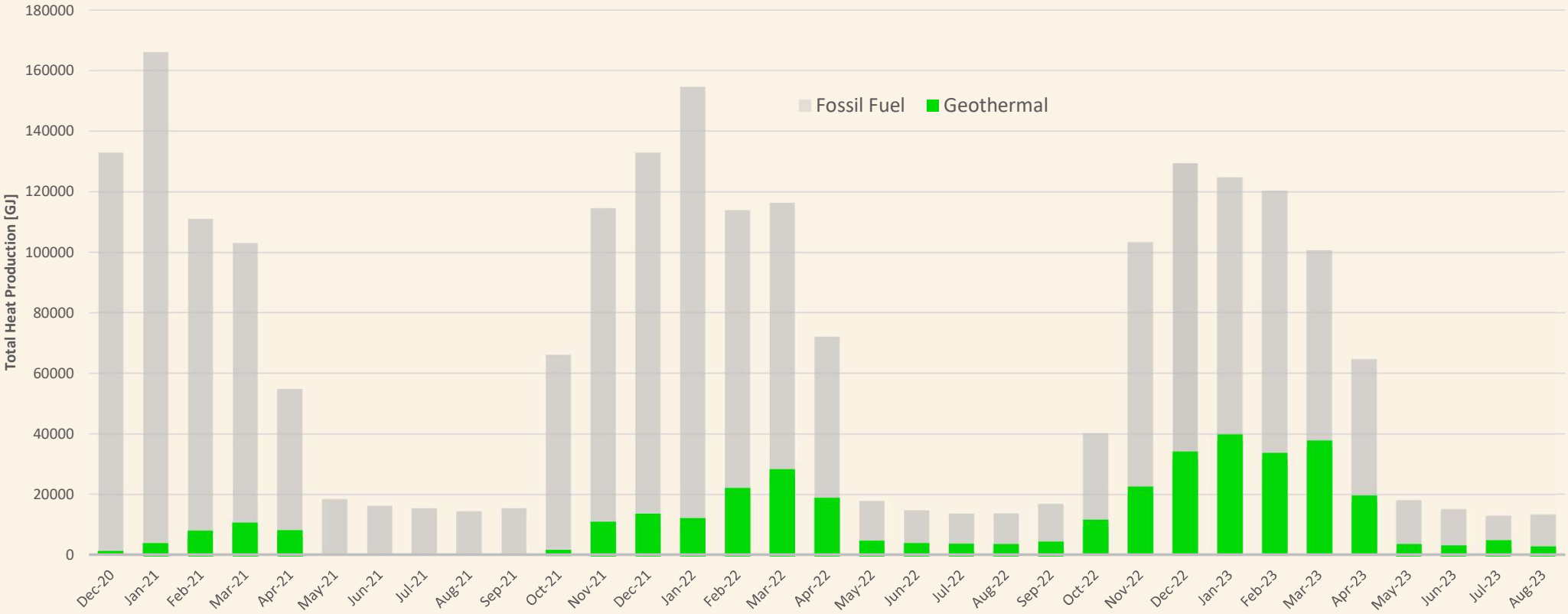
matászsz
Association of Hungarian District Heating Enterprises

Interreg Programme
Danube Region

Co-funded by
the European Union

DANUBE REGION
strategy
Energy

HEAT PRODUCTION PORTFOLIO OF DISTRICT HEATING OF SZEGED



MINISTRY OF
FOREIGN AFFAIRS AND TRADE
OF HUNGARY

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.

matászsz
Association of Hungarian
District Heating Enterprises

Thank you for your attention!

More about the geothermal project of Szeged: https://geotherm.szetav.hu/

This project was supported as part of Sustainable Energy, an Interreg Danube Region Programme project co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions.