NATIONAL TEN-YEAR NETWORK DEVELOPMENT PROPOSAL OF THE INTEGRATED NATURAL GAS SYSTEM

August 2024

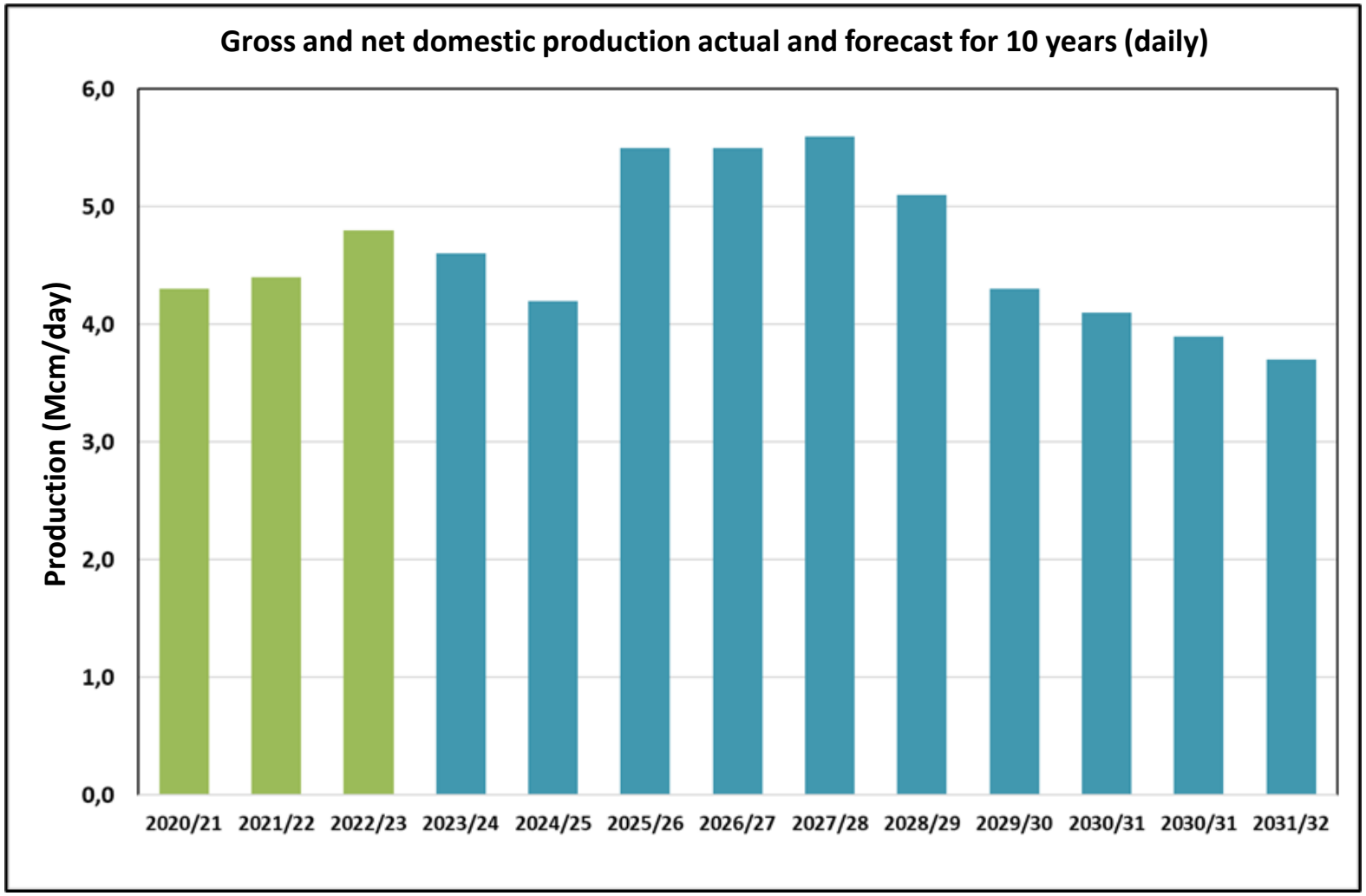
FGSZ

A MOL-CSOPORT TAGJA

Ten-year Network Development Proposal

- Pursuant to Article 96(5) of the Implementing Decree of Act XL of 2008 on Natural Gas Supply (Gas Act), the transmission system operator shall submit its application for approval of the results of the coordinated capacity review pursuant to Article 82(2) of the Gas Act and the 10-year development proposal to the Hungarian Energy and Public Utility Regulatory Authority (hereinafter referred to as the Authority) by 31 May 2024.
- In its letter dated 31 May 2024, the transmission system operator, in cooperation with the system operators connected to the high pressure natural gas transmission system, prepared the coordinated capacity review, which was submitted to the Office for approval.

Decreasing indigenous gas production trend

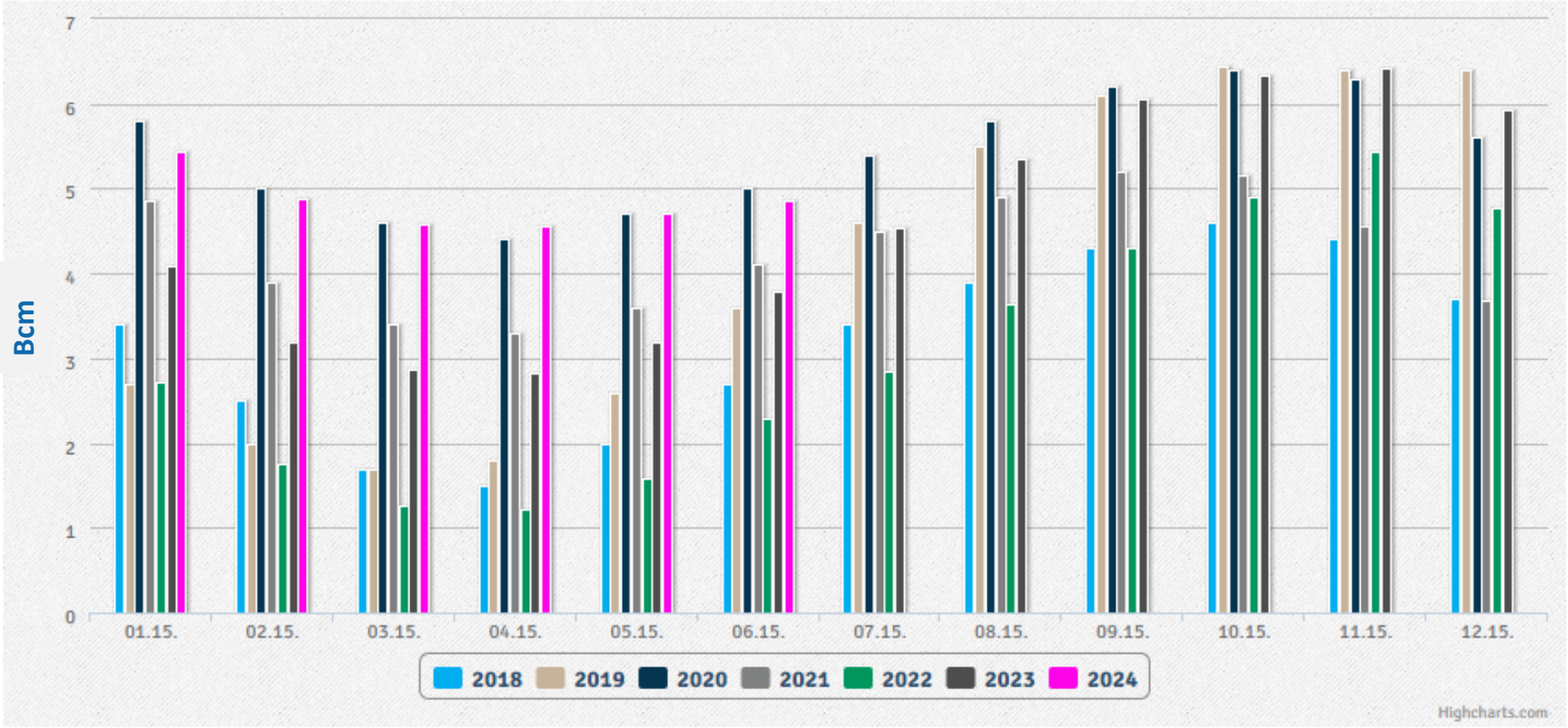


Source: Ten-year Network Development proposal 2024

Legend:

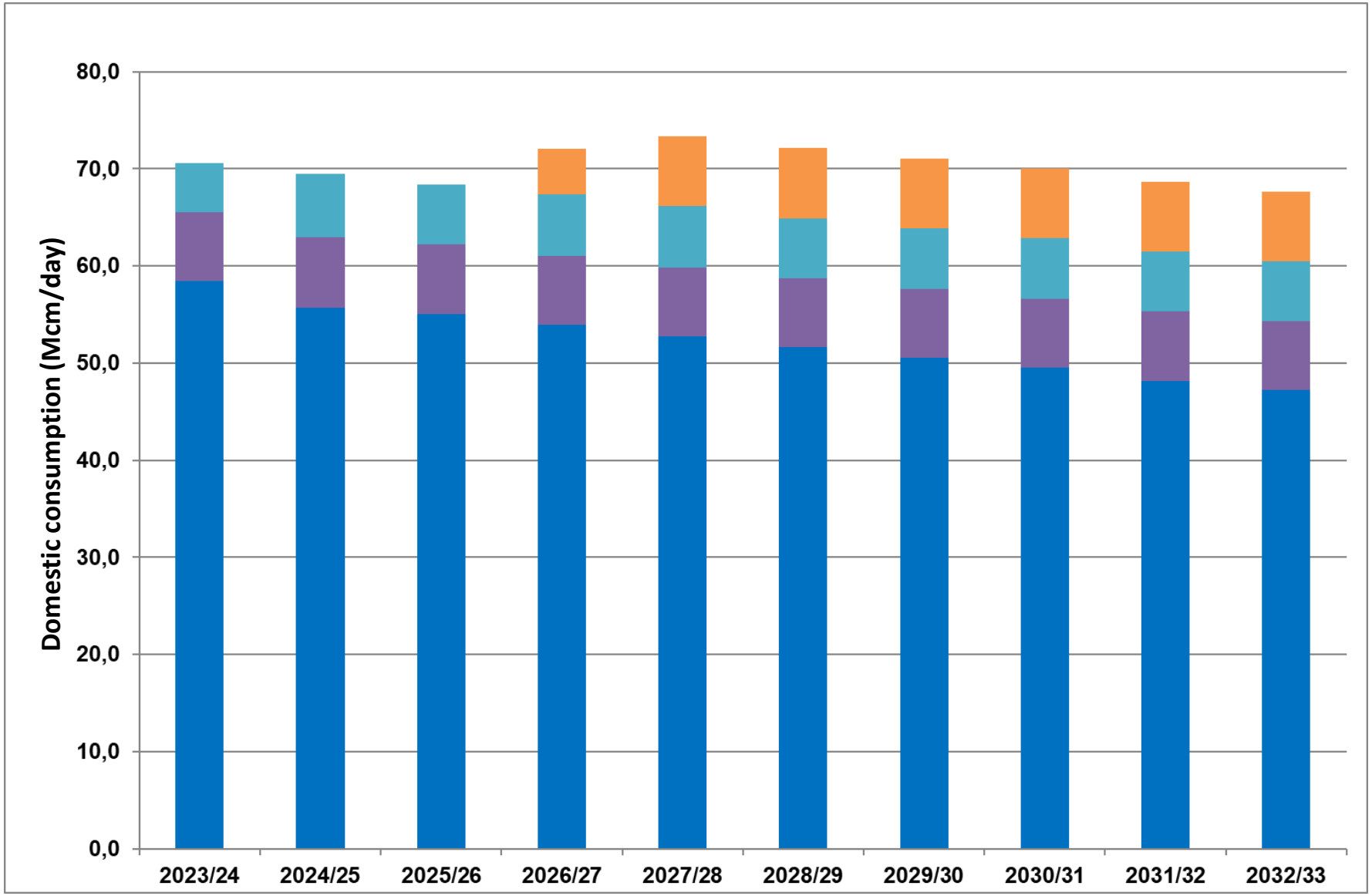
- actual
- forecast

Stock levels in the natural gas storages in Hungary



Source: http://www.mekh.hu/magyarorszag-foldgaztaroloinak-keszletszint-alakulasa

Daily peak demands at the domestic exit points

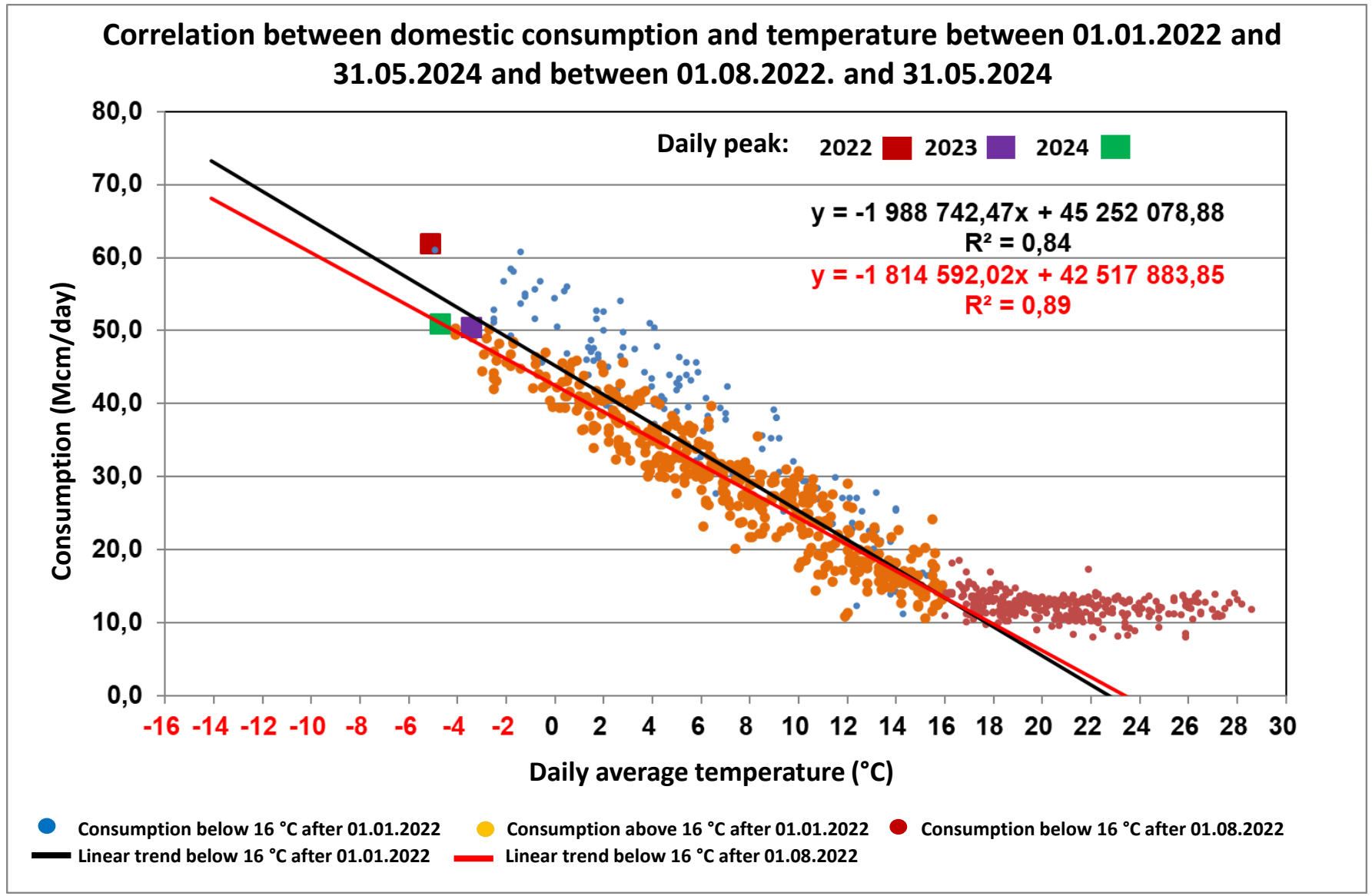


Legend:

- DSOs
- industry
- Power Plant
- New Power Plants

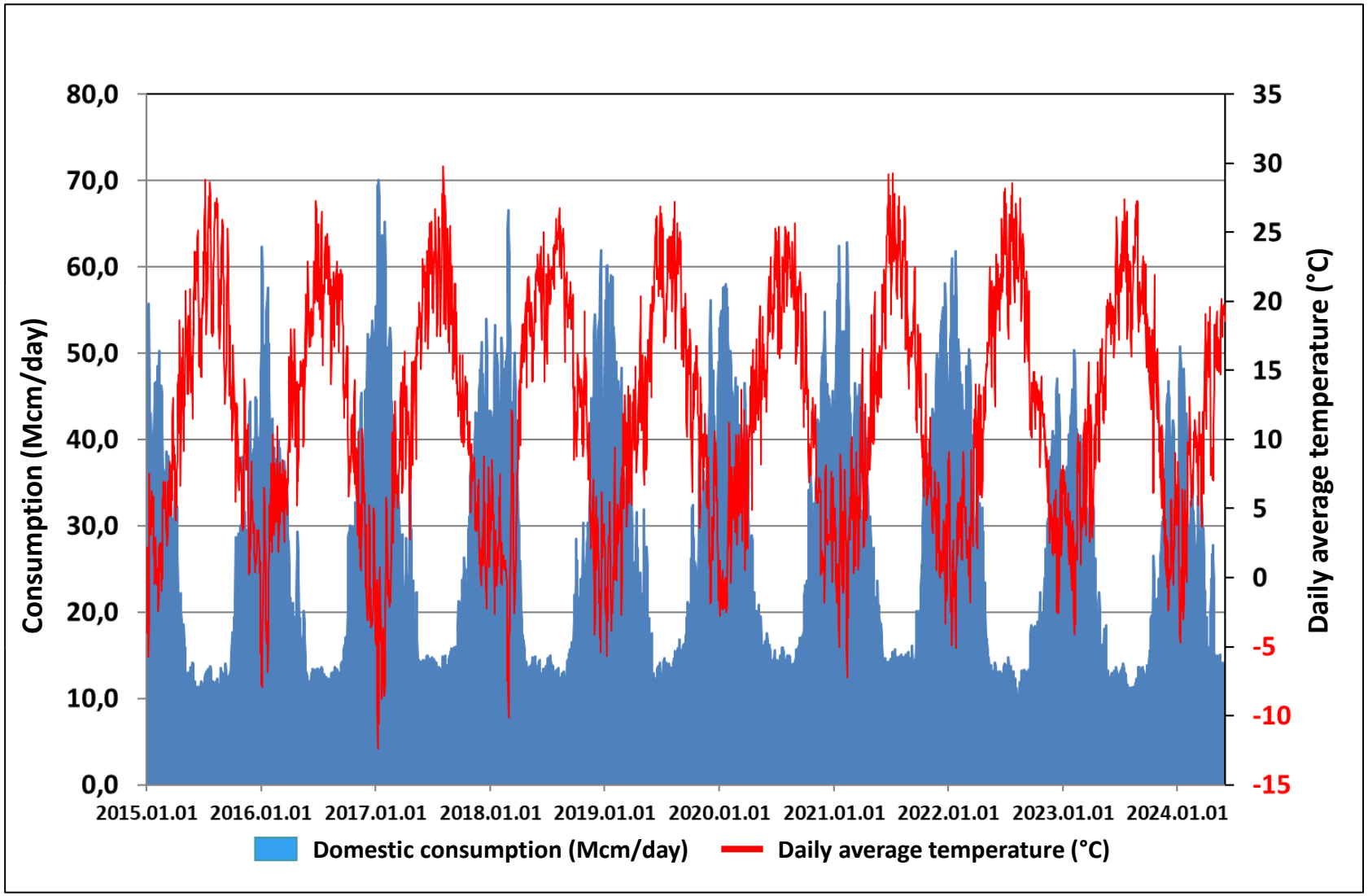
Source: Ten-year Network Development proposal 2024

Correlation between domestic consumption and temperature I.



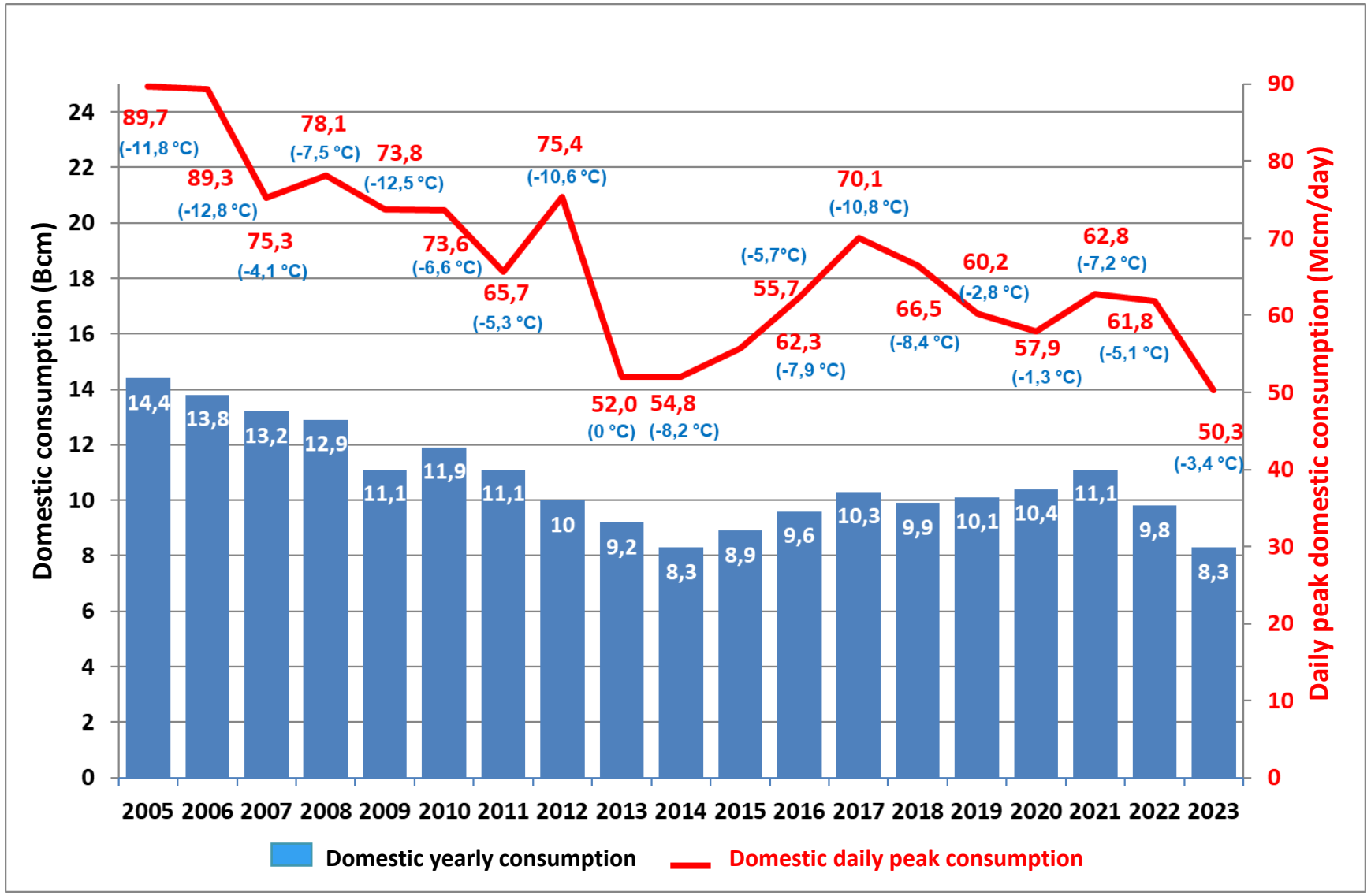
Source: Ten-year Network Development proposal 2024

Correlation between domestic consumption and temperature II.



Source: Ten-year Network Development proposal 2024

Domestic annual consumption and peak daily consumption



Source: Ten-year Network Development proposal 2024

Capacity demand assessment for cross border interconnection points I.

In the non-binding capacity demand assessment procedure launched on a mandatory basis in July 2023 under the provisions of the CAM NC, network users did not indicate any capacity demand for the Hungarian/Austrian, the Hungarian/Croatian and the Hungarian/Slovenian cross border interconnection points (IP).

Incremental capacity to be provided for the directions of Hungary>Romania and Romania>Hungary:

- In the Market Demand Assessment Report (DAR), the adjacent transmission system operators have concluded that the sum of the booked capacity and the total value of the received aggregated non-binding capacity requests at the Csanádpalota IP from GY 2028/2029 to GY 2037/2038 (i.e. 10 consecutive gas years) exceeds the current technical capacity in the flow direction RO>HU, and therefore an incremental procedure needs to be launched.
- The Market Demand Assessment concluded that the maximum demanded firm capacity at Csanádpalota IP in the direction RO>HU is 4.214.612 kWh/h/year (from GY 2028/29 to GY 2033/34). In the direction HU>RO there was no demand submitted. Based on the booked capacity and the DAR from 2023, this value exceeds the technical capacity by 28% of the available technical capacity from GY 2028/29 to GY 2033/34.

Capacity demand assessment for cross border interconnection points II.

- With regard to the assessment of the capacity demand submitted for the Hungarian/Slovak IP, FGSZ Ltd. and eustream jointly concluded the following:
    - The capacity demands submitted for the direction HU>SK would have justified to launch an incremental capacity process; however, the TSOs have in the meantime successfully agreed to increase the capacity of the IP by 1,060,063 kWh/h, i.e. by 50%, without any additional investment needs, but by increasing the operational efficiency, thus the incremental capacity process has been closed. In line with the auction calendar, the allocation of the increased capacity has already started in February 2024, first as a short-term product and then as an annual product on 1 July 2024.
- Between 25 July and 15 September 2023, FGSZ Ltd. ran a non-binding market demand survey to assess future hydrogen transport needs for domestic entry and exit network points and future IPs.
    - Results of the FGSZ non-binding firm hydrogen capacity demand assessment (GCV reference parameter 25°C/0°C)
        - Aggregated domestic consumer exit demand: 874 382 kWh/h/year; 7.6 TWh/year
        - Aggregated domestic producer entry demand: 43 704 kWh/h/year; 0.33 TWh/year
        - Aggregated Balassagyarmat SK>HU entry demand: 695 478 kWh/h/year; 6.1 TWh/year
        - 2023_10_31_dar_2023_fgsz_summary.pdf

Projects I.

The project proposals submitted by FGSZ Ltd. are the following :

A) Developments already implemented under previous decision :

- Compressor unit replacement with an electric driven one in Mosonmagyaróvár(M3 unit);
- Installation of small household-size solar power plants;

B) Ongoing development further to the previous decision :

- Introduction of LDAR processes, Part 1

C) New project proposed for implementation in the next 3 years:

- Introduction of LDAR processes, Part 2

D) New projects proposed for conditional implementation in the next 3 years:

- Ensuring firm capacity from Hungary to Ukraine

Projects II.

E) New projects proposed for conditional implementation in the next 4-10 years:

- Expansion of the compressor station and (conditional) developments at the metering station in Csanádpalota
- Construction of the pipeline Algyő-Városföld (DN1000, PN75, 70 km) (conditional)
- Replacement of 1 or more existing units (max. half of the installed units) at the compressor station in Városföld up to a total installed capacity of 10-12 MW/compressor station;
- Construction of the pipeline Városföld-Vecsés (DN800, PN75, 78 km);
- Construction of the Slovenian-Hungarian interconnector with the capacity of 50,000 cm/h (0.4 bcma);
- Hydrogen corridors (HU/SK; HU/RO; HU/UA; HU/SI).

F) Project aiming to improve the optimization of the integrated natural gas infrastructure system

- Distribution system development related to the abandonment of the Budaörs-Budatétény gas transmission line

Introduction of LDAR processes

PROJECT DESCRIPTION

The **LDAR (Leak Detection & Repair)** project aims to reduce methane emissions through state-of-the-art technology and to comply with the European Union's methane emission reduction strategy and the proposed methane regulation.

Part of the project is an **ongoing development based on the previous NRA decision**, while the **other part is a new investment proposed to be implemented in the next three years.**

PROJECT

Equipment needed for the implementation:

A. Acquisition of manual leak detectors and emission rate measuring instruments for the testing of above ground technology.

B. Acquisition of measuring instruments and analysis software together with a transport drone for site level measurement.

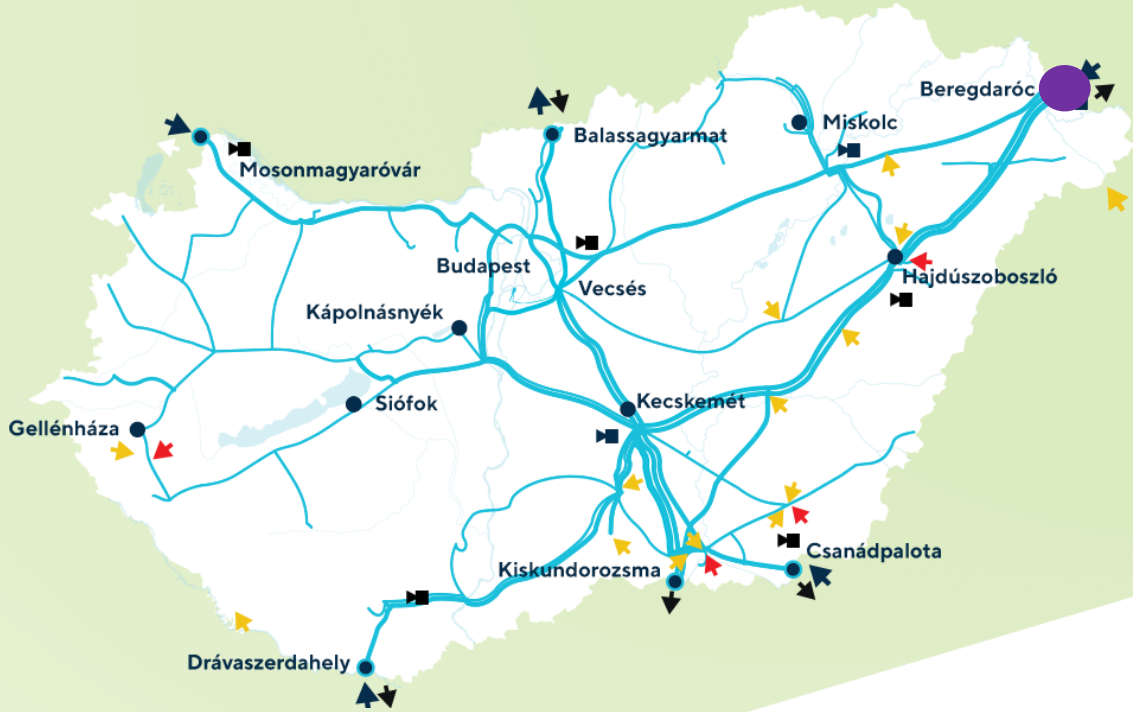
New projects proposed for conditional implementation in the next 3 years I.

PROJECT DESCRIPTION

Ensuring firm capacity from Hungary to Ukraine

- As a result of negotiations between FGSZ and the Ukrainian transmission system operator, Gas TSO of Ukraine (GTSOU), 327,000 cm/h of firm capacity at the Hungarian-Ukrainian IP in the direction HU>UA was offered for a pilot period between 01/01/2022 and 30/06/2024, 400,000 cm/h of firm capacity for the period between 01/07/2024 and 30/09/2024 and 327,000 cm/h of firm capacity for the period between 01/10/2024 and 31/12/2024.
- There have been ongoing discussions between FGSZ and GTSOU on the long-term development options to guarantee firm capacity in the direction HU>UA.
- Technical solutions discussed, but not finalized are the following:
  - Establishment of an international metering station in Beregdaróc, on the Hungarian side of the IP;
  - Modifications to Beregszász metering station enabling bi-directional measurement on the Ukrainian side of the IP;
  - The shut-off valves currently installed at the Beregdaróc node will be inspected and replaced, if necessary, should the measurement be either on the Hungarian or the Ukrainian side of the IP.

PROJECT



New projects proposed for conditional implementation in the next 4-10 years I.

PROJECT DESCRIPTION

Capacity expansion at Csanádpalota IP in the direction RO>HU

According to the established procedure of the incremental capacity procedure, the Romanian TSO, Transgaz and FGSZ published the results of the assessment and bilaterally developed a coordinated project proposal for the feasibility of the capacity demands received, which was approved by the coordinated decision of MEKH and the Romanian regulatory authority (ANRE). The project proposal identified three capacity levels, the feasibility of which was subject to the outcome of a binding capacity auction to be carried out in the framework of the incremental capacity procedure and the subsequent economic analysis.

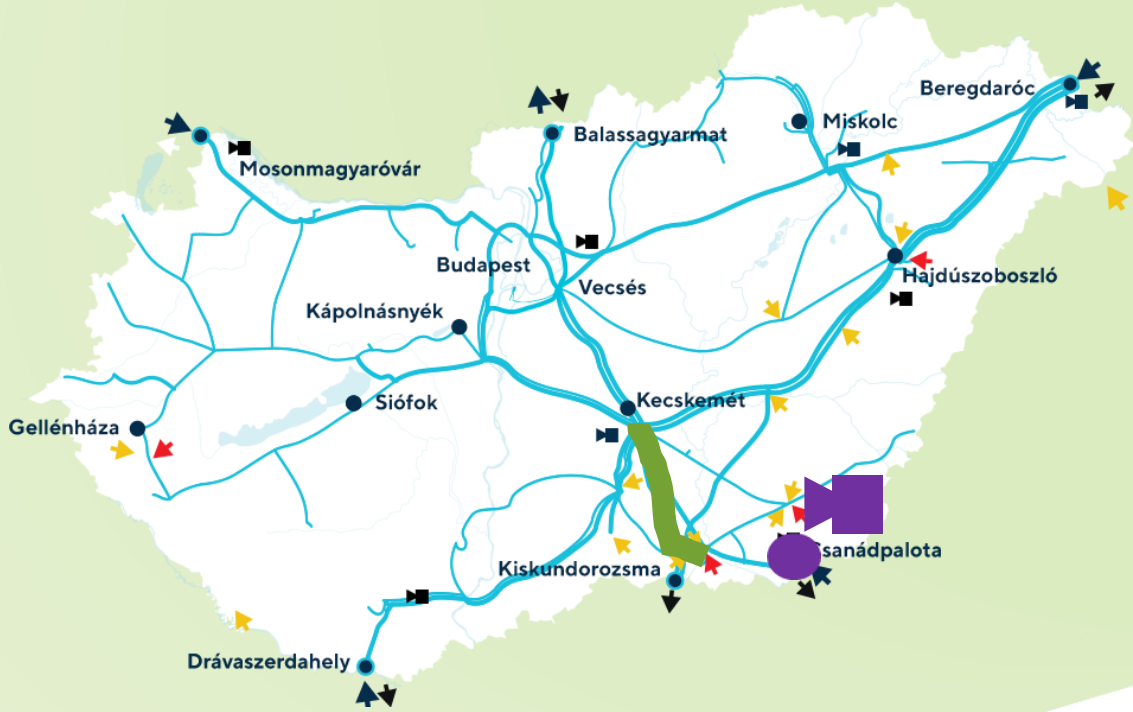
The results of the economic test show that the level of bids submitted in the auctions do not meet the pre-defined success criteria for any of the incremental capacity levels (level 1, level 2, level 3), accordingly, the incremental capacity procedure was unsuccessful.

Project elements:

I. level:

- Expansion of the compressor station in Csanádpalota by 1 x 4.5 MW;
- Reconstruction of the metering station in Csanádpalota

PROJECT



II. level: (exceeding the development of I. level)

- Expansion of the metering station in Csanádpalota with the 4th filter-meter-control run.
- Construction of the Algyő-Városföld pipeline (DN1000, PN63, 70 km); construction of the connection facility at Algyő node and connection of Algyő node

III. level: (exceeding the development of I. and II. levels)

- Expansion of the metering station in Csanádpalota with the 5th filter-meter-control run.

New projects proposed for conditional implementation in the next 4-10 years II.

PROJECT DESCRIPTION

Replacement of 1 or more existing units (max. half of the installed units) at the compressor station in Városföld up to a total installed capacity of 10-12 MW/compressor station

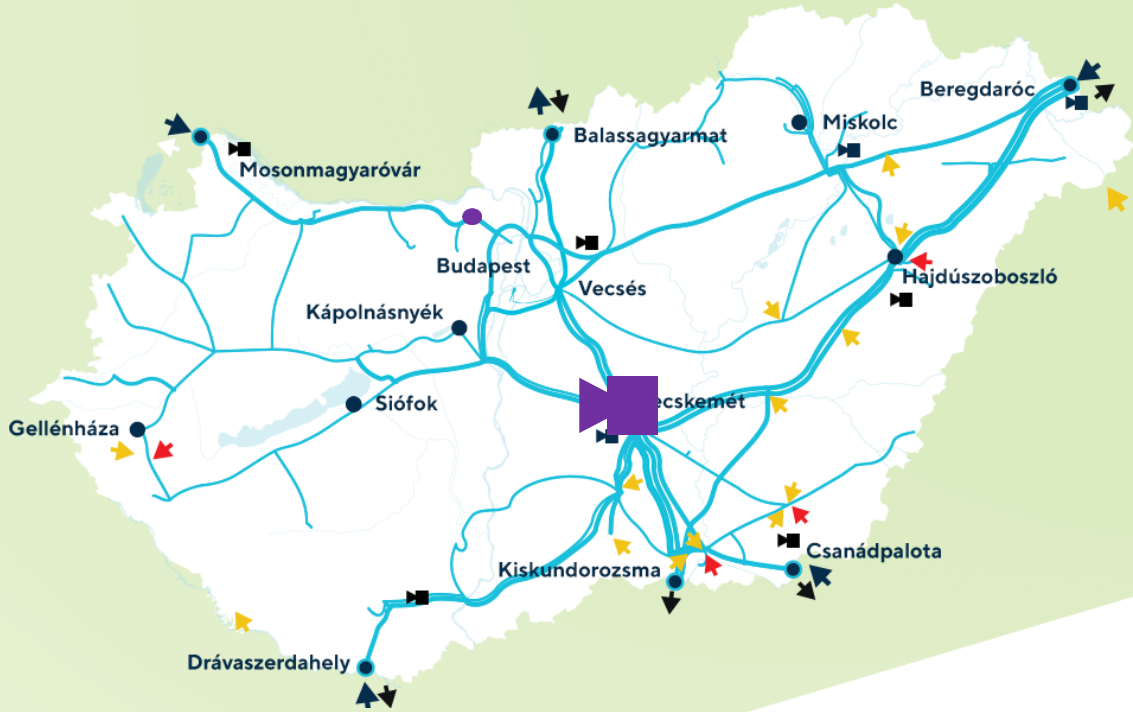
The existing compressor units VB1 and VB2 at the station B in Városföld are to be dismantled and replaced by a new compressor unit with an electric motor of approximately 5 MW and 7 MW of useful shaft power, capable of delivering 100% H2. The equipment and its auxiliary systems shall be located in a building.

The actual nominal shaft power of the electric motors, the design of the compressors (number of stages, tandem configuration) is determined by the capacity to be delivered.

Both compressor units must be integrated into the existing gas technology, control system and electrical system, with the necessary modifications and extensions. The station header system shall be provided with a blind flange sealed connection to the future hydrogen pipeline.

A bidirectional, independent electrical network connection capable of meeting the power requirements of the electrically driven compressor units is to be provided.

PROJECT



New projects proposed for conditional implementation in the next 4-10 years III.

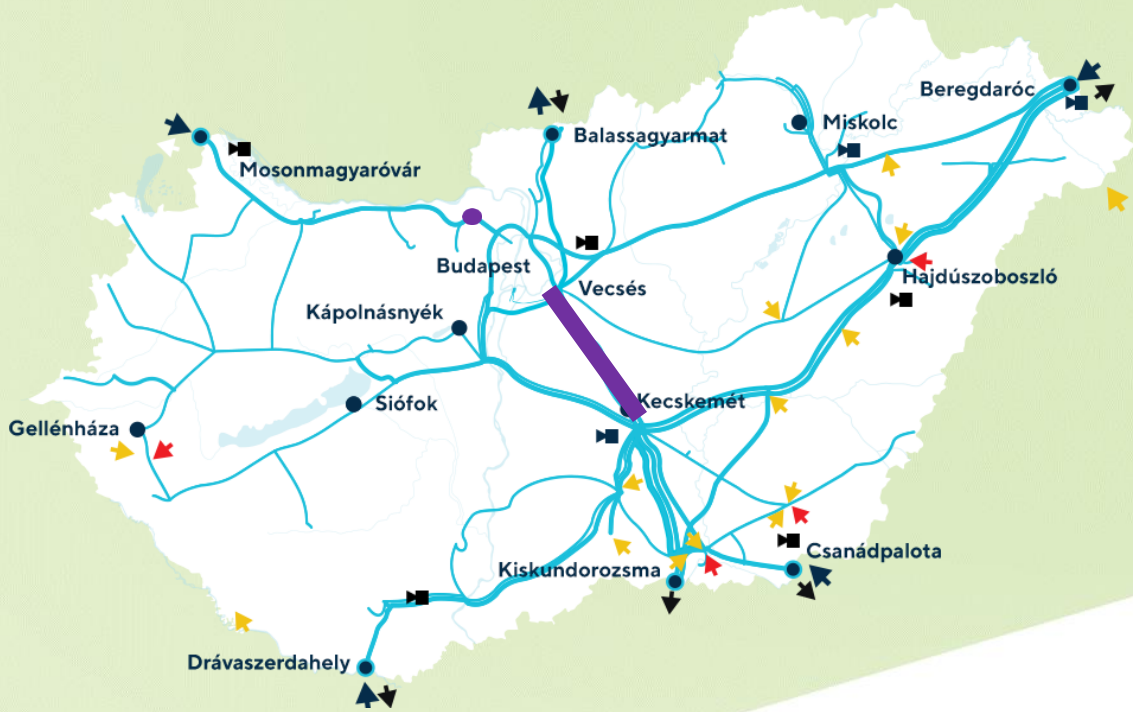
PROJECT DESCRIPTION

Construction of the pipeline Városföld-Vecsés (DN800, PN75, 78 km);

As a result of the project, the maximum volumes arriving from the South to the node in Városföld (i.e. from Kiskundorozsma, Csanádpalota, Szőreg, Zsana and Drávaszerdahely entry supplies) will be simultaneously transferred to the node in Vecsés. From 2030, the planned pipeline can also be repurposed to transport 100% green hydrogen, which will be used for (1) the production in the electrolyzers in the Algyő area to be installed along the pipeline and (2) imports to Hungary from Romania and further deliveries towards Slovakia, thus complying with the Renewable Energy Directive (RED II) requirement of a minimum of 50,000 – 100,000 tonnes/year of 100% green hydrogen.

A bi-directional natural gas transmission pipeline (DN800, PN75, 78 km) is to be constructed between the compressor station and node in Városföld and the pig launcher and receiver located in Vecsés.

PROJECT



New projects proposed for conditional implementation in the next 4-10 years IV.

PROJECT DESCRIPTION

Slovenian-Hungarian interconnector

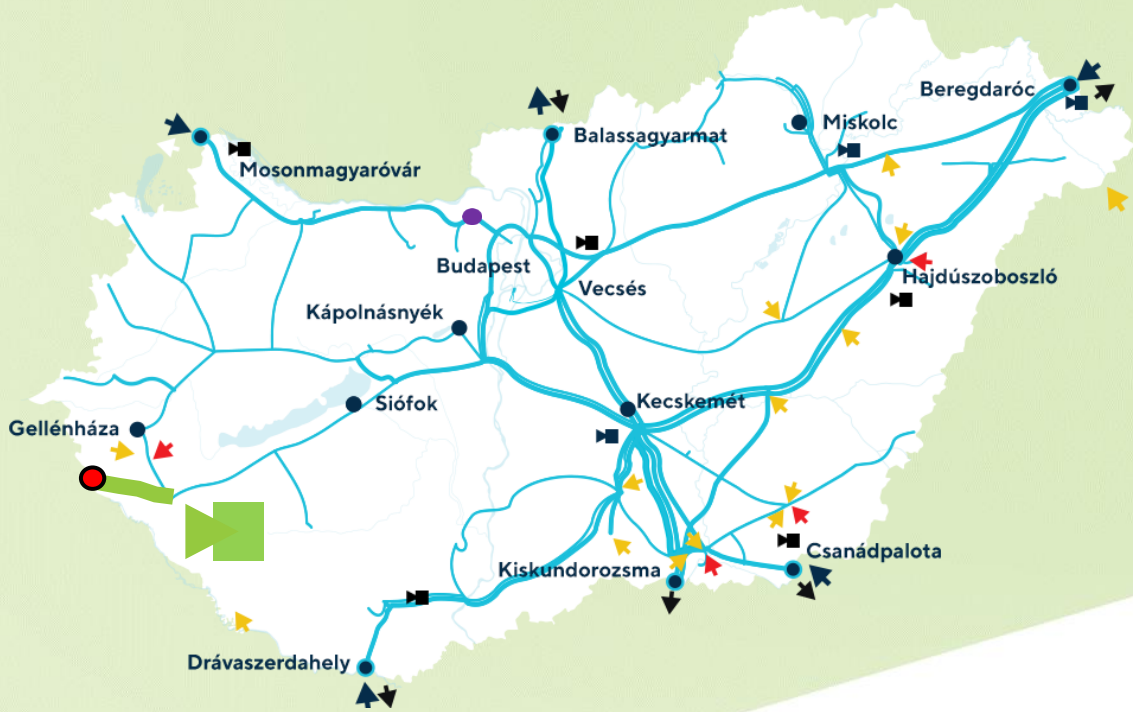
- The project ensures Hungarian-Slovenian bidirectional deliveries.
- During the consultations with Plinovodi, the adjacent TSO, in 2023 and spring 2024, the Slovenian-Hungarian interconnector was mainly considered with a capacity of 50,000 cm/h (0.4 bcma).

Planned developments*:

- SI/HU border - Tornyiszentmiklós pipeline 1 km, DN500, PN75;
- Tornyiszentmiklós metering station;
- Tornyiszentmiklós - Nagykanizsa pipeline 40.7 km, DN600, PN75;
- Nagykanizsa compressor station 1 x 1.2 MW

**The discussions are ongoing between the adjacent transmission system operators on mutually acceptable technical parameters, so the project elements required may vary.*

PROJECT



New projects proposed for conditional implementation in the next 4-10 years V.

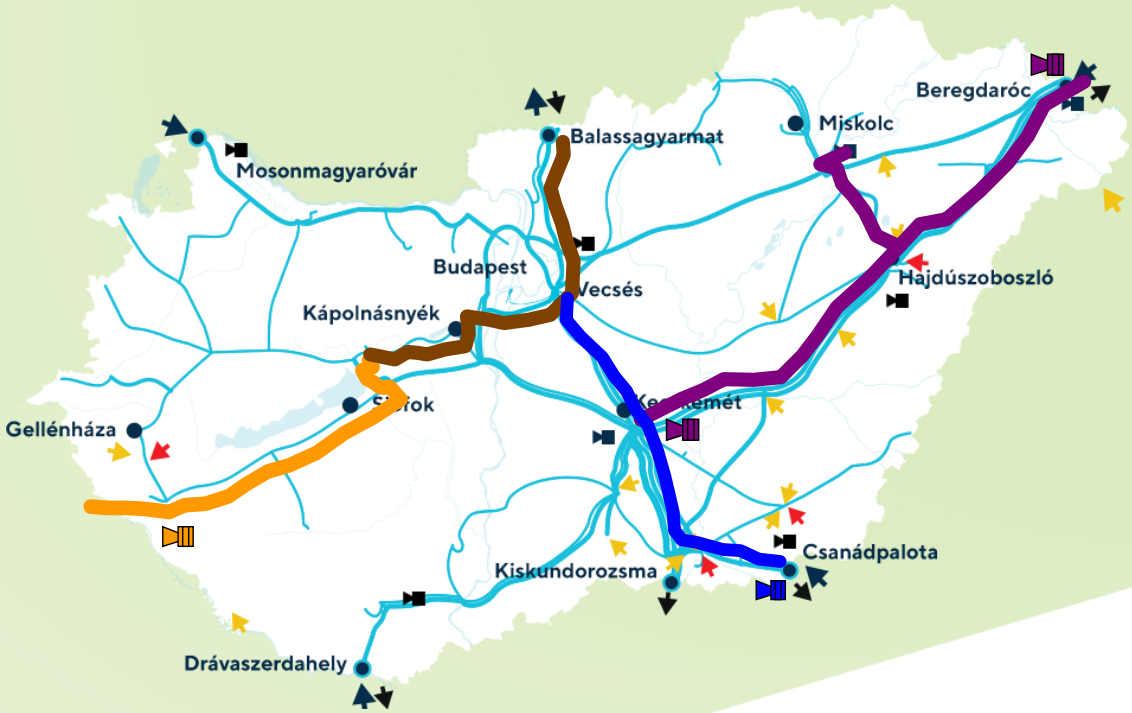
PROJECT DESCRIPTION

Connecting FGSZ's system to the European Hydrogen Backbone and getting prepared to meet the expected supply needs of domestic hydrogen producers and users

Based on the evolution of domestic and transit (import/export) hydrogen consumption needs and the domestic hydrogen producers' injection needs, 4 hydrogen corridors are proposed.

- HU/SK hydrogen corridor, 2030 new pipeline
- HU/RO hydrogen corridor, 2030 new pipeline
- HU/UA hydrogen corridor, 2030 repurposed pipeline
- HU/SI hydrogen corridor, 2035 new pipeline

PROJECT



Climate Protection Chapter

PROJECT DESCRIPTION

At the request of the NRA, the transmission system operator has collected the planned projects of the Hungarian system operators related to climate protection, which are expected at the following locations:

- FGSZ Zrt.
- Magyar Földgáztároló Zrt.
- E.ON Dél-Dunántúli Gázhálózati Zrt.
- E.ON Közép-Dunántúli Gázhálózati Zrt.
- MVM Égáz-Dégáz Földgázhálózati Zrt.
- MVM Földgázhálózati Kft.

If the development submitted in the climate protection chapter also affects the core assets of system operators, it should be **identified in the Network Development Proposal as a climate protection investment submitted for approval**, including the relating impact assessment. Once approved in the Development Plan and the FID is taken, in order to have the respective costs recognized in the system usage fees, an amendment to the operating license to modify the essential asset should be submitted to the NRA, showing the detailed parameters, cost and climate benefits of the given investment.

PROJECT