10-year network development plan

December 2021.

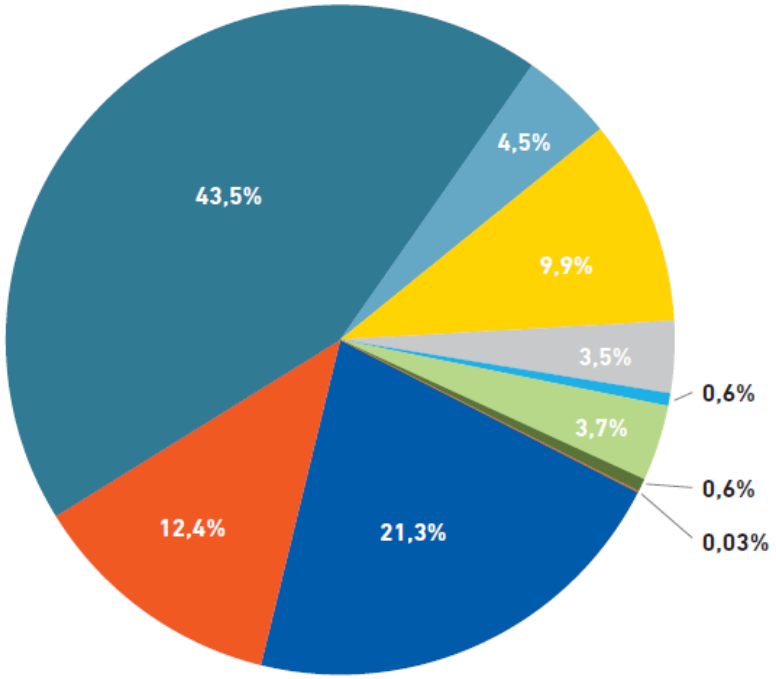
FGSZ

MEMBER OF MOL GROUP

10-year network development plan

- Pursuant to Article 96 (5) of the Implementation Decree of Act XL of 2008 on natural gas supply (Gas Supply Act), the transmission system operator sent the results of the coordinated capacity review pursuant to Article 82 (2) of the Gas Supply Act and the 10-year network development proposal to the Hungarian Energy and Public Utility Regulatory Authority (HEA) by 31 May 2021.
- In its letter dated 27/05/2021, the transmission system operator requested the HEA to submit the 10-year development proposal 2021 by 31/07/2021. HEA took note of the information provided by FGSZ Ltd.
- The transmission system operator submitted to HEA the 10-year network development proposal on 05/07/2021.
- HEA issued Decision No. H1670/2021 on 14/07/2021. In its Decision HEA partially approved the 10-year network development proposal of the cooperating natural gas system.
- In its Decision No. H2821/2021 of 30/11/2021, HEA completed its Decision No. H1670/2021.
- In its Decision No. H1670/2021 dated 30/11/2021, HEA approved the 10-year development proposal of the cooperating natural gas system, which is an annex to the Decision No. H2821/2021.

Domestic primer energy consumption and electricity generation



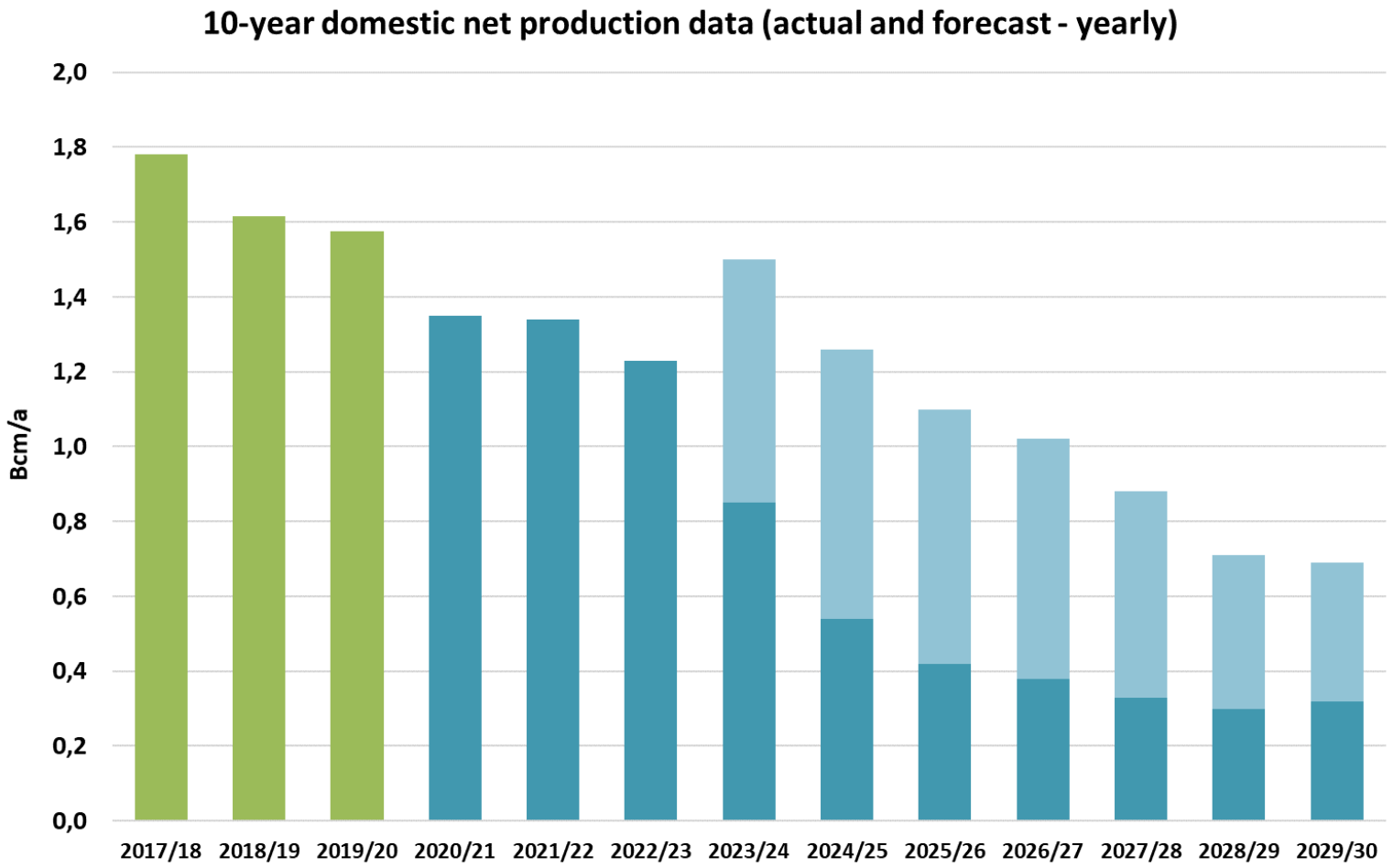
VER összesen (Primer források szerint) | Hungarian Electricity System, Total (Sources of total domestic PP)	NBP NTO [MW]	BT IC [MW]	BT SUM BT [%]	ÁH CL [MW]	Rtá ACC [MW]	Nettó BT NGC [MW]
Hagyományos erőművek összesen | Power plants – Conventional, Total						
Nukleáris | Nuclear	0,0	2012,8	21,3%	0,0	2012,8	1898,9
Szén, lignit, együtt-tüzelés Coal, Lignite, Mixed Fuel	0,0	1166,3	12,4%	270,0	896,3	1048,9
Szénhidrogén gáz Hydrocarbon Gas	0,0	4111,8	43,5%	1083,0	3028,8	4028,4
Szénhidrogén olaj, dízel Hydrocarbon Oil, Diesel	0,0	421,1	4,5%	0,0	421,1	421,1
Összesen | Total	**0,0**	**7712,0**	**81,7%**	**1353,0**	**6359,0**	**7397,2**
Megújuló erőművek összesen | Power plants – Renewables, Total						
Fotovoltaikus | Solar	0,0	936,3	9,9%	0,0	936,3	936,3
Szél | Wind	0,0	327,5	3,5%	0,0	327,5	327,5
Víz | Hydro	0,0	57,8	0,6%	0,0	57,8	57,8
Biomassza+egyéb Biomass +Other	0,0	346,1	3,7%	24,0	322,1	320,3
Hulladék | Waste	0,0	59,4	0,6%	22,1	37,3	59,4
Geotermikus | Geothermal	0,0	2,7	0,03%	0,0	2,7	2,7
Összesen | Total	**0,0**	**1729,8**	**18,3%**	**46,1**	**1683,7**	**1704,0**
Összesen | Total	**0,0**	**9441,8**	**100,0%**	**1399,1**	**8042,7**	**9101,2**

Nukleáris Nuclear
Szénhidrogén gáz Hydrocarbon Gas
Fotovoltaikus Solar
Víz Hydro
Hulladék Waste
Szén, lignit, együtt-tüzelés Coal, Lignite, Mixed Fuel
Szénhidrogén (olaj, dízel) \| Hydrocarbon Oil, Diesel
Szél Wind
Biomassza+egyéb Biomass+Other
Geotermikus Geothermal

Source: Data of Hungarian Electricity System 2019

Nuclear power and fossil fuels dominate domestic power production.

Decreasing trend characterizes domestic natural gas production

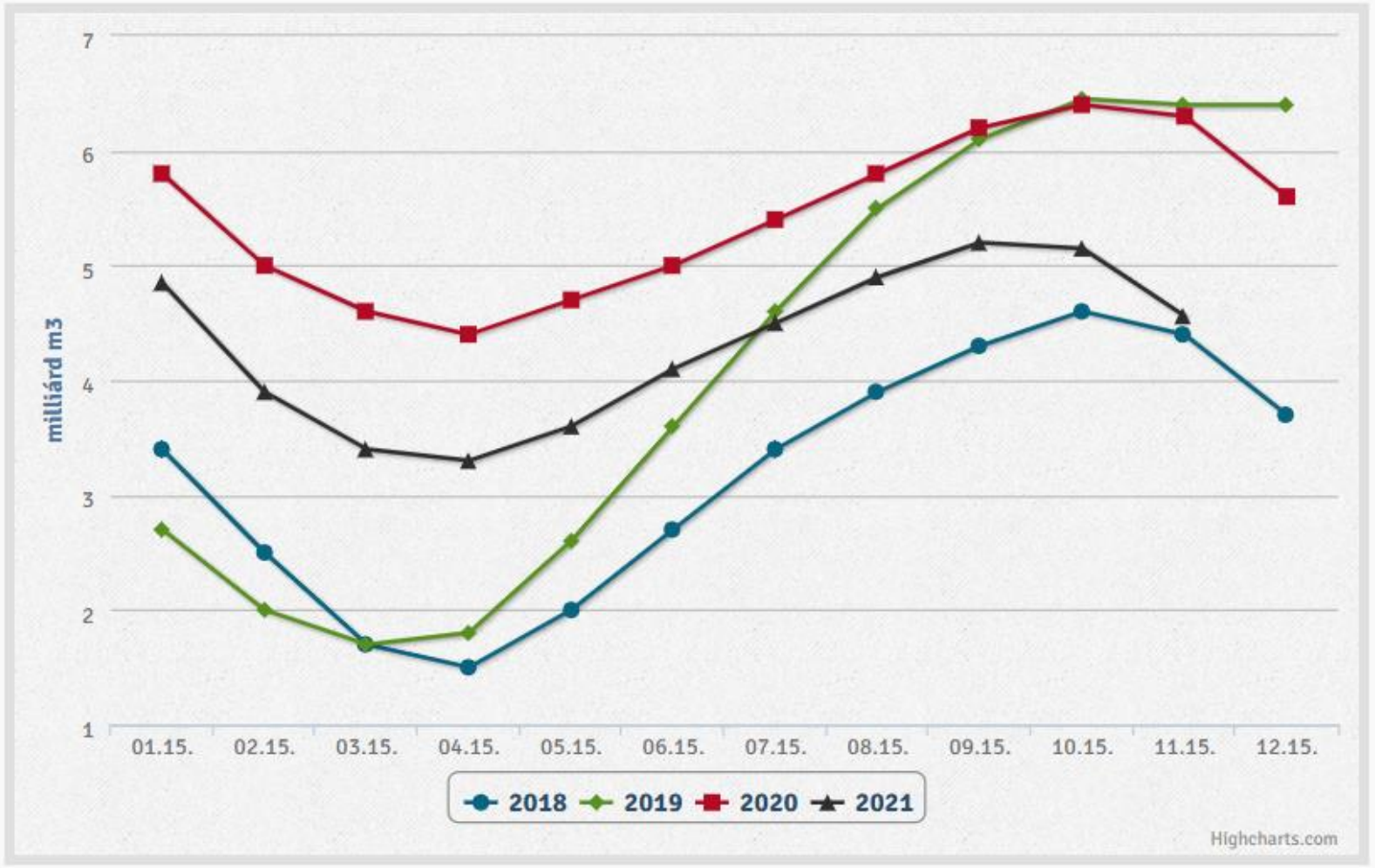


Legend:

- actual
- min. option
- max. option

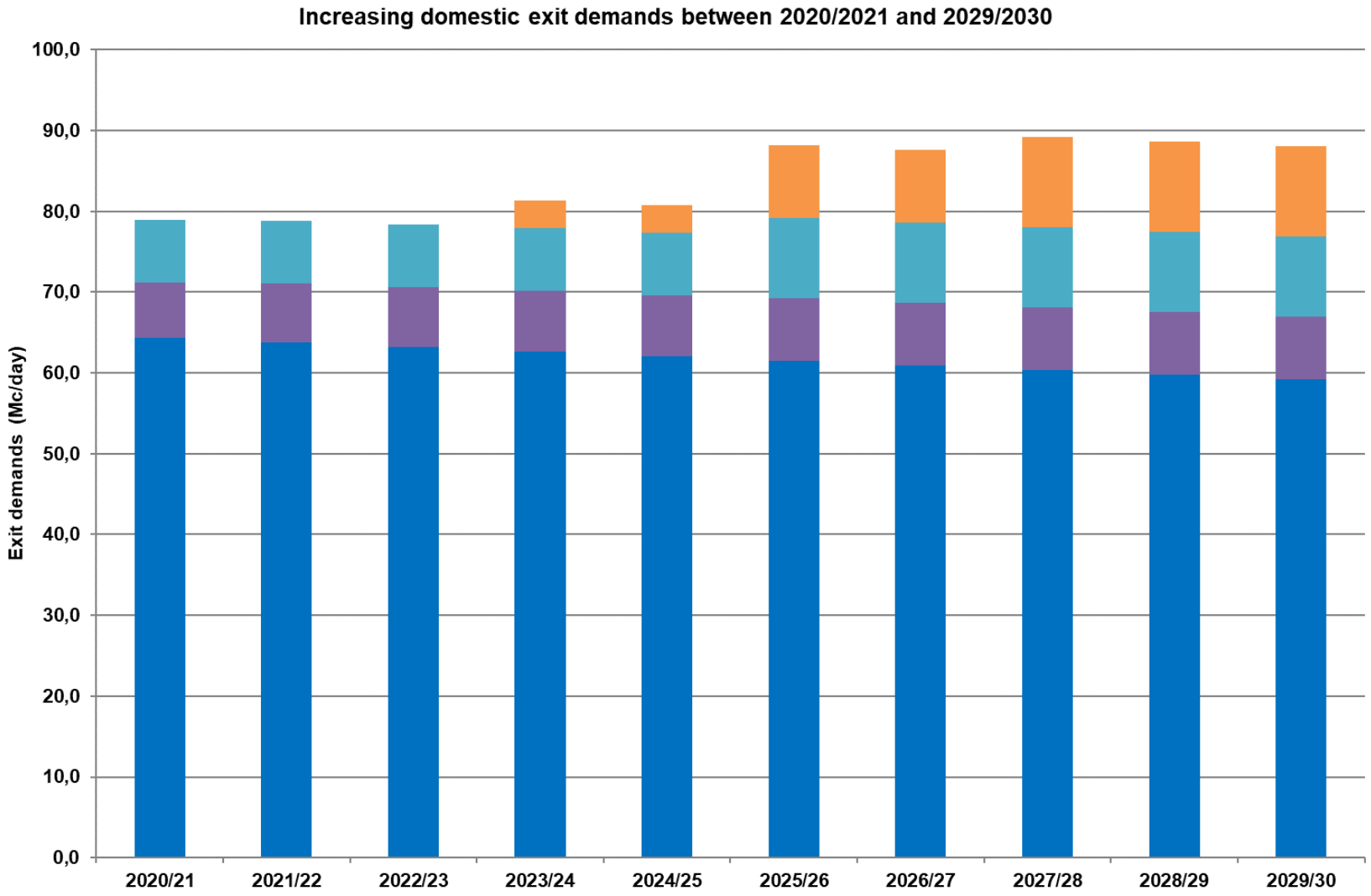
Source: Ten-Year Network Development Plan 2021

Domestic use of natural gas storage



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

Demand of domestic exit points

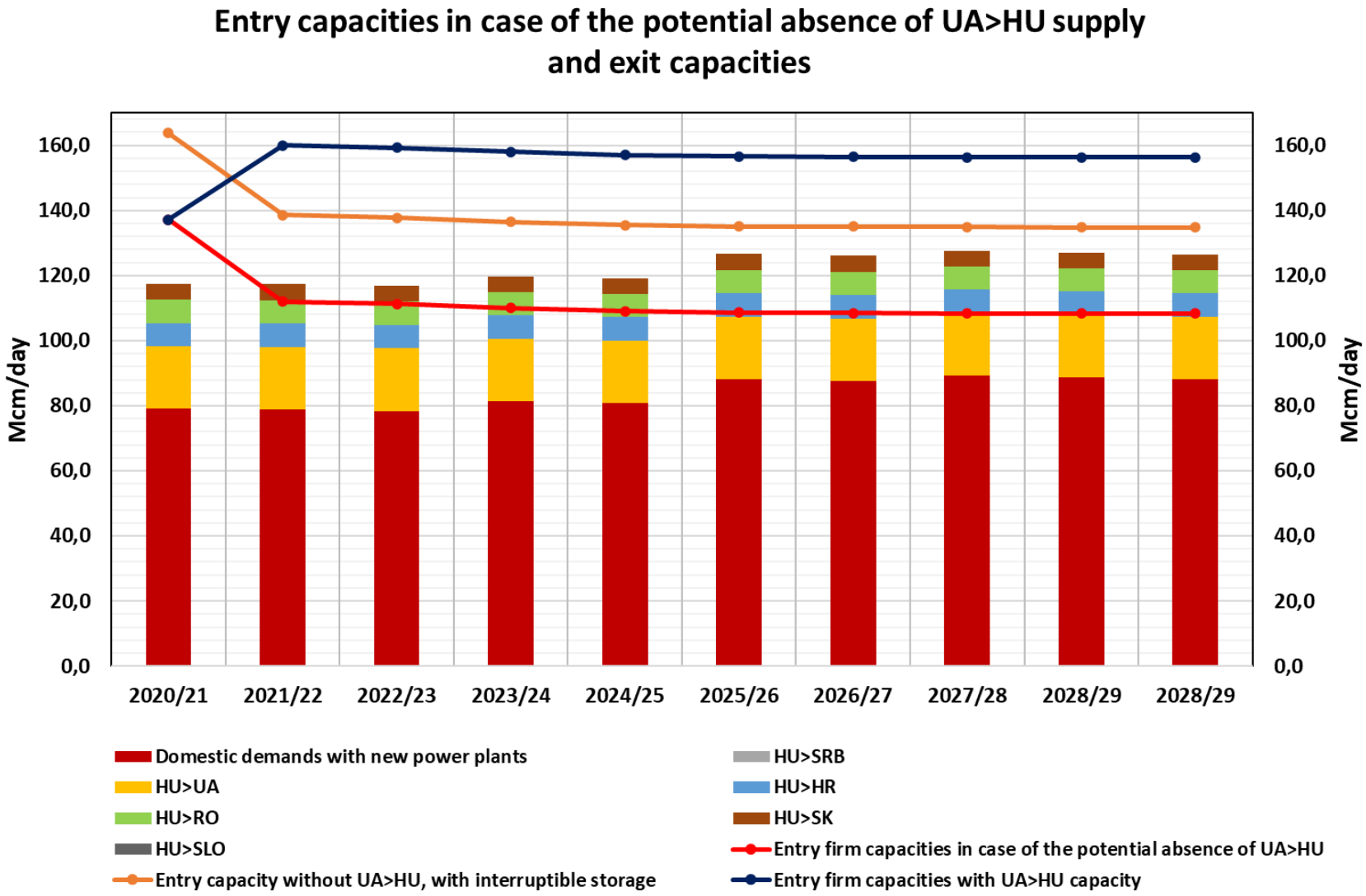


Legend:

- DSOs
- Industrial
- Power plants
- New power plants

Source: Ten-Year Network Development Plan 2021

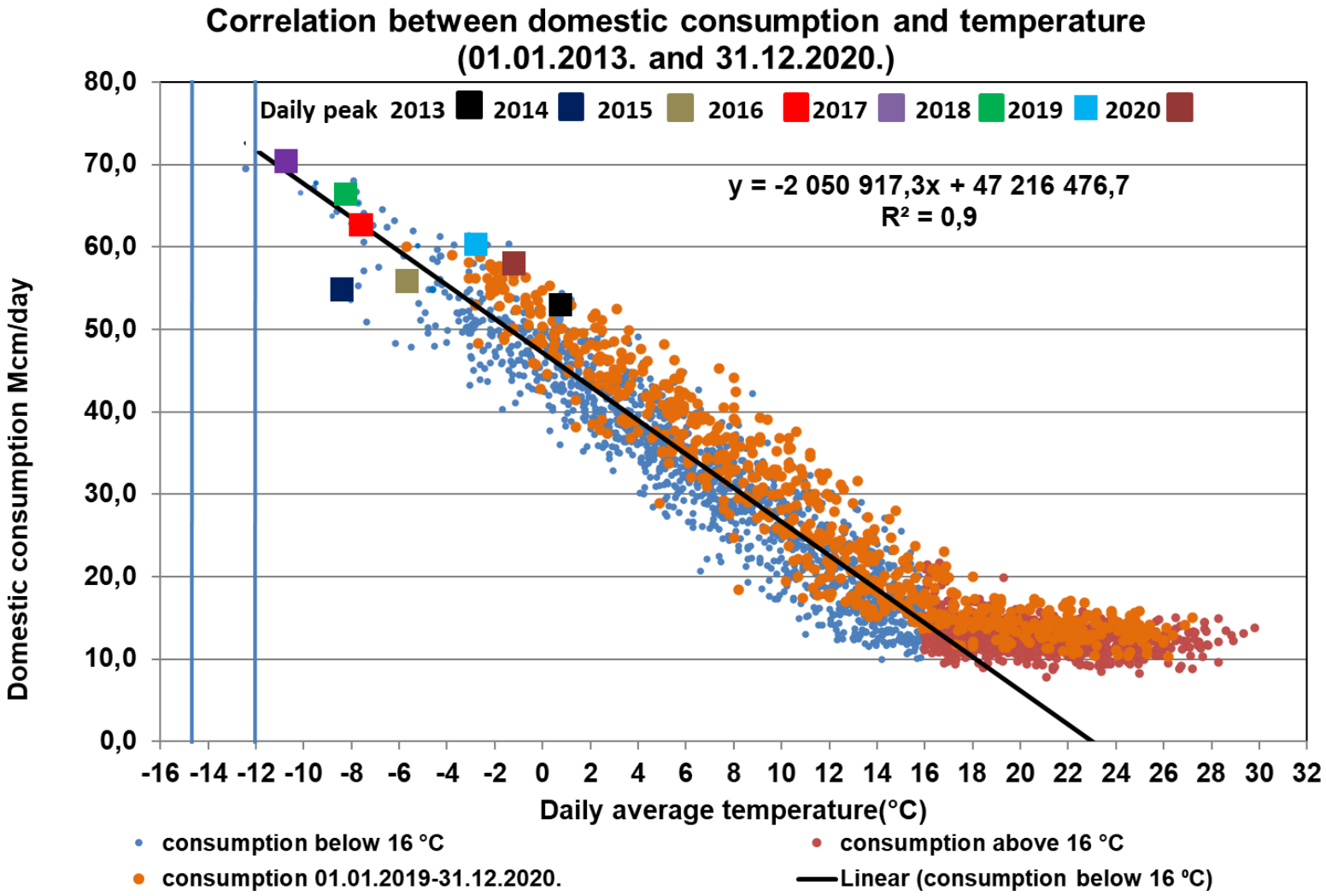
Hungarian entry and exit capacities with approved developments



Source: Ten-Year Network Development Plan 2021

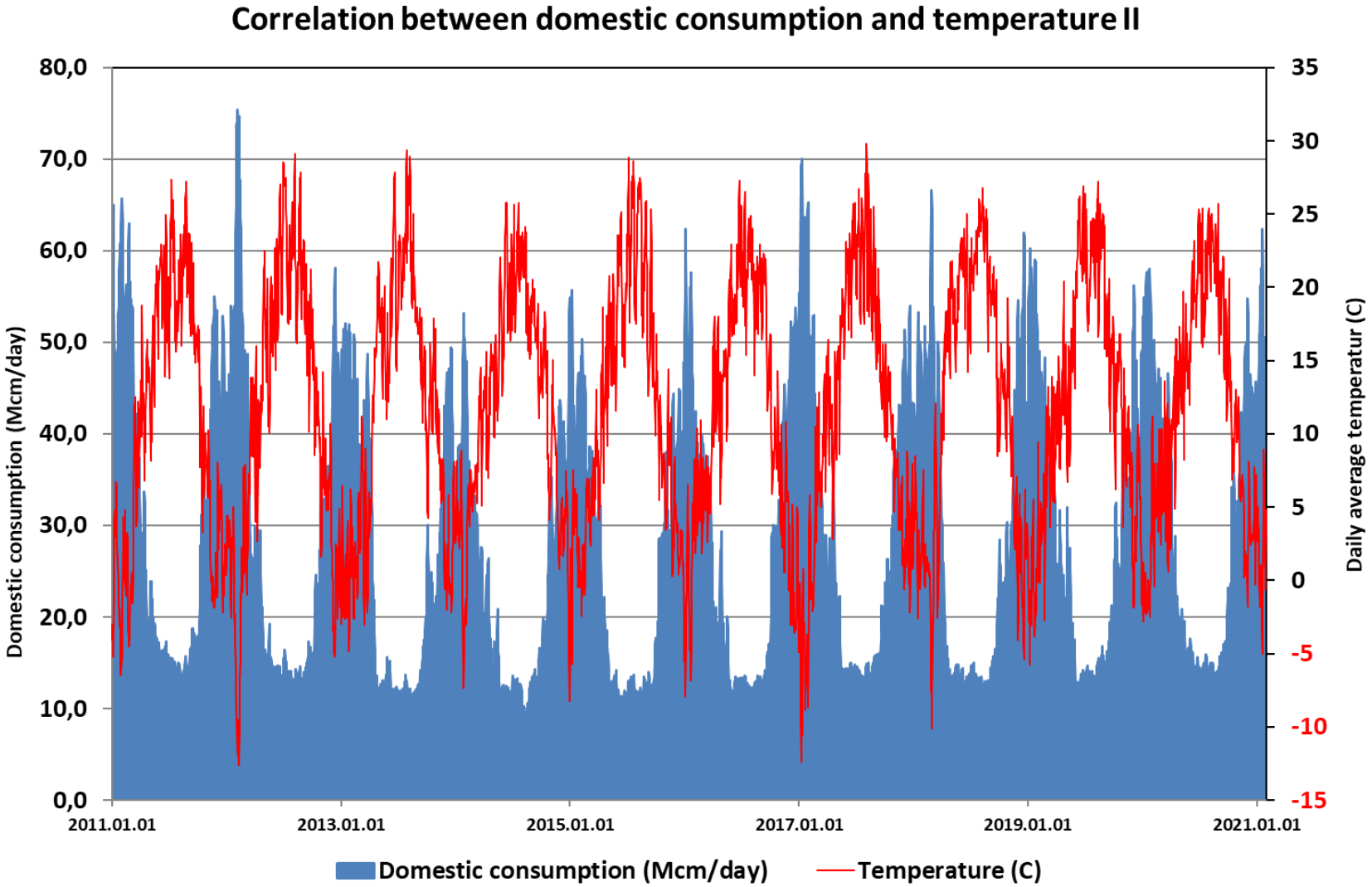
In case of the largest transmission demands, by interruptible entry capacities the domestic exit demands can be ensured even in the potential absence of UA>HU supply.

Correlation between domestic consumption and temperature I.



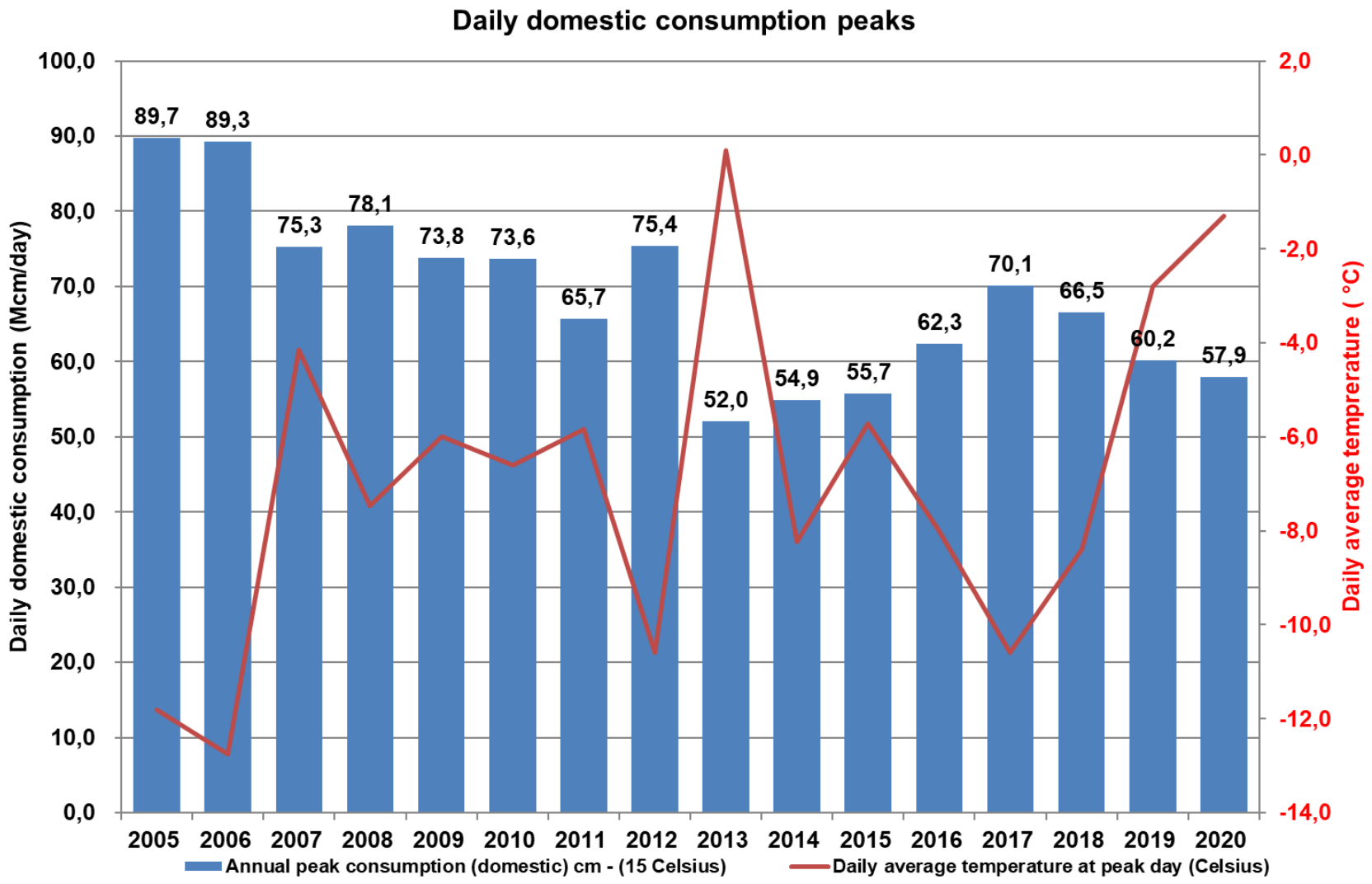
Source: Ten-Year Network Development Plan 2021

Correlation between domestic consumption and temperature II.



Source: Ten-Year Network Development Plan 2021

Daily domestic peak consumption



Source: Ten-Year Network Development Plan 2021

Projects

Pursuant to Decisions No. H1670/2021 and H2821/2021 of HEA, the proposed projects are included in the 10-year development plan as follows:

Projects approved by HEA

- Establishment of Serbian–Hungarian entry capacity with 6 bcm/year (at 20 °C) max. capacity.
- Increasing Serbian–Hungarian entry capacity up to 8.5 bcm/year (at 20 °C) max. capacity without pipeline development.

Project examined but not recommended for implementation by HEA

- Increasing Serbian–Hungarian entry capacity up to 8.5 bcm/year (at 20 °C) with pipeline development.

HEA did not approve the following proposals, and requires further examination in case of these

- Development of Balassagyarmat measuring station capacity, capacity increasing of SK>HU up to 800,000 cm/h.
- Development of Gödöllő junction point with technological measuring.
- Development of Szada compressor station.
- Ensuring firm capacity from Hungary to Ukraine

Projects

HEA has not approved the following proposals and supports their further examination

- Development of compressor station and measuring system at Csanádpalota.
- Slovenian–Hungarian interconnector 20,000 or 190,000 cm/h capacities - depending on the demand.
- Slovenian–Hungarian interconnector with 50,000, 230,000 or 362,000 cm/h capacity.
- Ensuring capacity demands in the direction of Hungary–Austria with 100,000 or 120,000 cm/h capacity.
- Eastring.
- Connecting FGSZ’s system to the European Hydrogen Backbone, preparation of the provision of the expected transport demand of the domestic hydrogen producers and hydrogen users.
- Development of FGSZ's gas-turbine-driven compressors with electric-driven compressors.

Projects approved by HEA

PROJECT DESCRIPTION

Establishment of Serbian-Hungarian entry capacity up to 6 bcm/y (at 20 °C) max. capacity

The project ensures transmission of natural gas from Serbia up to 6 bcma/year.

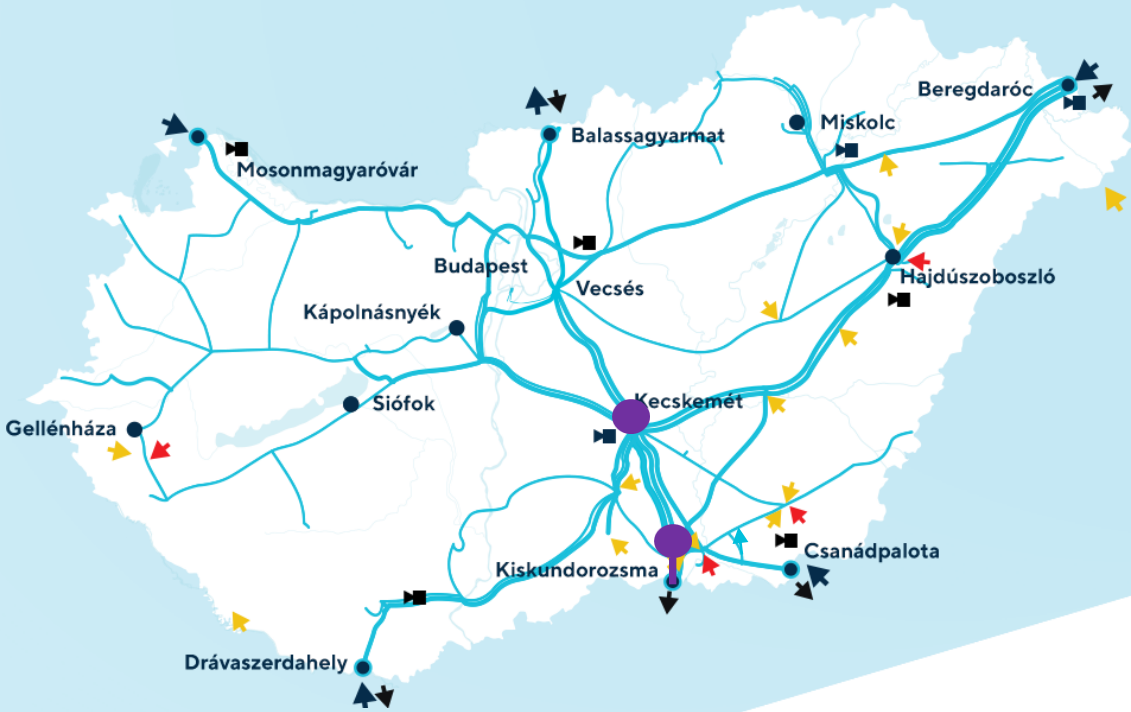
- The project:
- SRB/HU border-Kiskundorozsma pipeline, DN1200, PN75, 15 km;
  - Kiskundorozsma metering station + new connection at the node,
  - New pipeline connections at Városföld node,
  - Modification of Városföld node.

- The first two elements of the project were completed, the expected completion of the „New pipeline connections at Városföld node” and „Modification of Városföld node” projects is 1 October 2022.

DECISION OF HEA

According to the Decision No. H1670/2021 point, I.1 HEA approved the development proposal regarding the project.

PROJECT



Projects approved by HEA

PROJECT DESCRIPTION

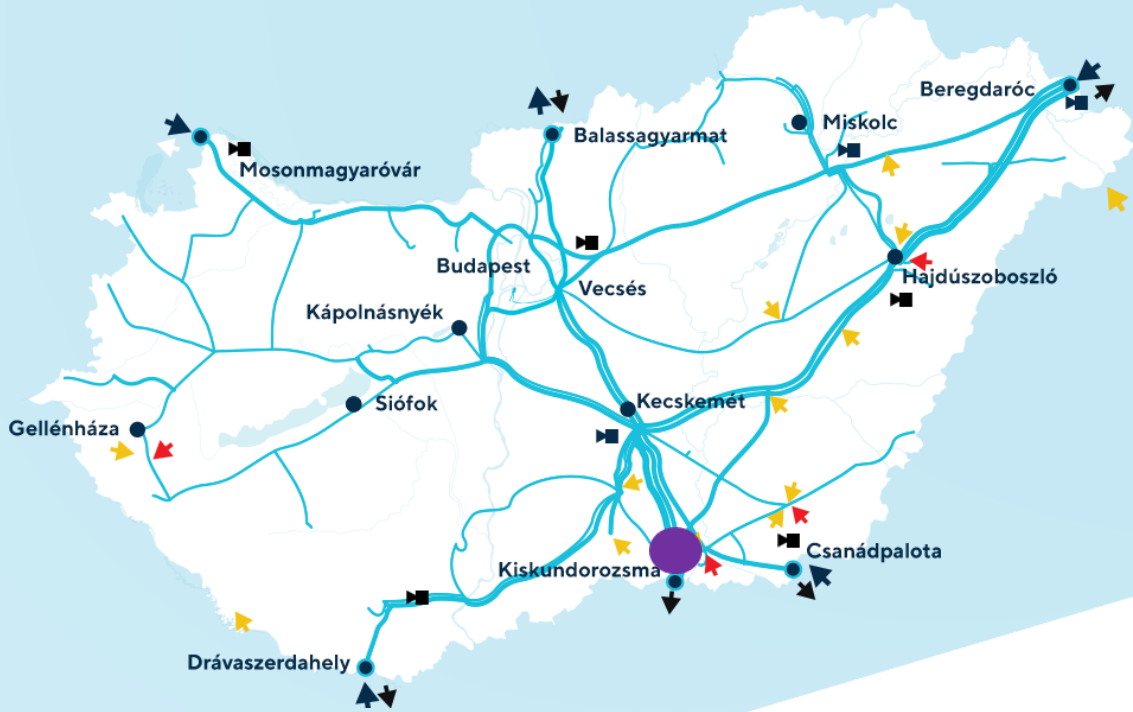
Increasing the Serbian-Hungarian capacity up to max. 8.5 bcm/y (at 20 °C) capacity without pipeline development

With the availability of the infrastructure related to the Serbian-Hungarian entry capacity up to 6 bcm/y, 8.5 bcm/y, entry capacity can be ensured from 1 October 2021 by optimizing the existing infrastructure assets, including other elements of the interconnected natural gas system.

DECISION OF HEA

According to Decision No. H1670/2021 point I.1, HEA approved the development proposal regarding the project and according to Decision No. H1670/2021 points I.1.2. and I.1.3, HEA required further investigations. The results of the studies and the agreed proposal should be included in the current 10-year development proposal.

PROJECT



Project analysed, but not recommended for implementation by HEA

PROJECT DESCRIPTION

Increasing Serbian-Hungarian entry capacity up to 8.5 bcm/y (at 20 °C) max. capacity with pipeline development

The project allows the supply of natural gas from Serbia up to 8.5 bcm/y by managing internal bottlenecks.

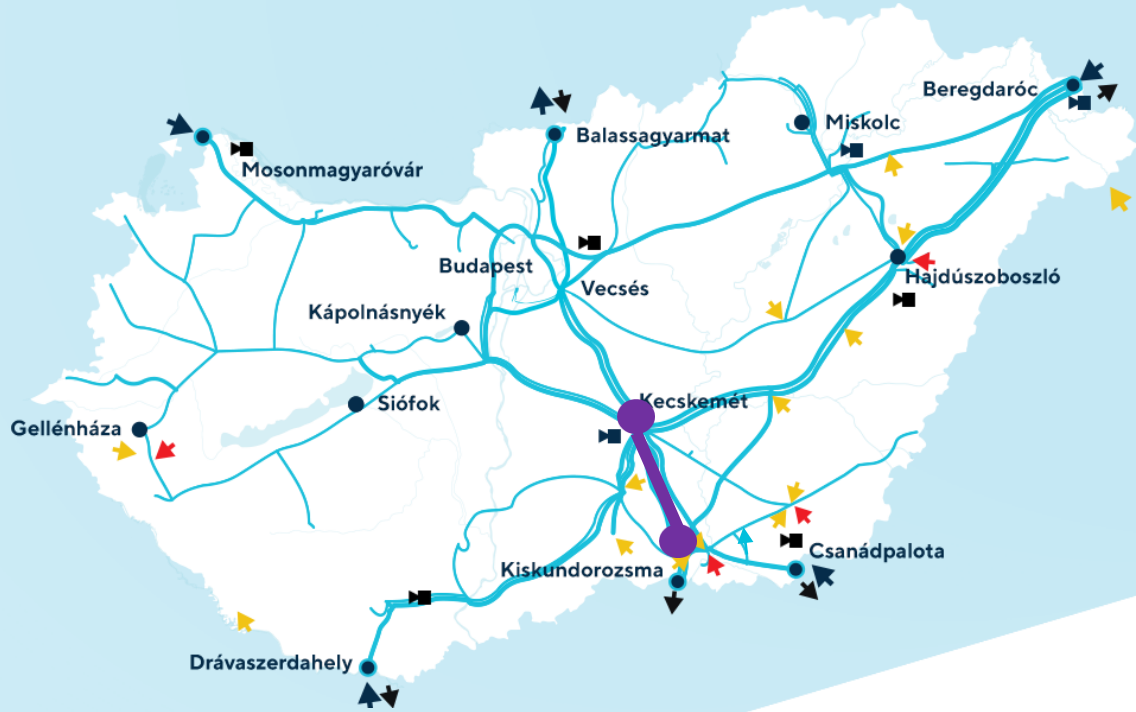
The project:

- Kiskundorozsma 2 measuring station + pipeline connections at Városföld;
- Kiskundorozsma-Városföld pipeline, 67 km, DN1000, PN75.

DECISION OF HEA

The proposal of the transmission system operator that the project is to be included among the projects analysed but not recommended for implementation, was approved by HEA according to Decision No. H1670/2021 point I.3.

PROJECT



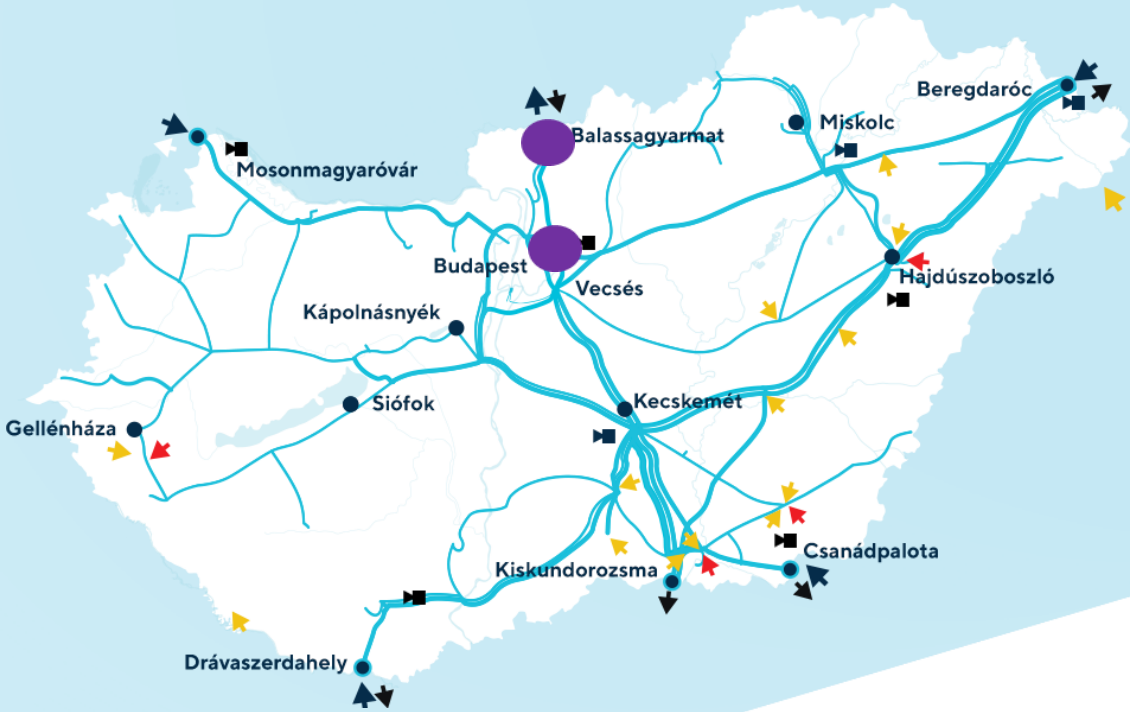
Projects not approved by HEA, but further examination required

PROJECT DESCRIPTION

Expansion of the capacity of Balassagyarmat measuring station, increasing the capacity in the direction of SK>HU up to 800,000 cm/h (1), and development of Gödöllő junction point with technological measuring (2):

- Transits through Ukraine did not cease completely after 1 January 2020, as Ukrainian and Russian parties signed a new 5-year agreement at the end of 2019.
- The projects are currently not recommended for implementation (as a result of the reconstruction of the measuring equipment currently installed at the Balassagyarmat measuring station. After the installation of the new metering equipment, the measuring station will be able to authentically measure the delivered quantity up to 800,000 cm/h in the direction SK>HU, thus ensuring delivery).

PROJECT



DECISION OF HEA

According to Decision No. H1670/2021 points II.1 and II.2 HEA has not approved the development proposal of the projects (1) and (2) and considers the provisions of Decision No. H1596/2021 points III.2 and III.3 to be valid and in force, i.e.: the necessity of developments should be reviewed in each 10-year network development proposals to be submitted until 2026.

Projects not approved by HEA, but further examination required

PROJECT DESCRIPTION

Increasing HU/SK capacity

Increasing capacity in both directions up to 600,000 cm/h.

Expansion of Szada compressor station

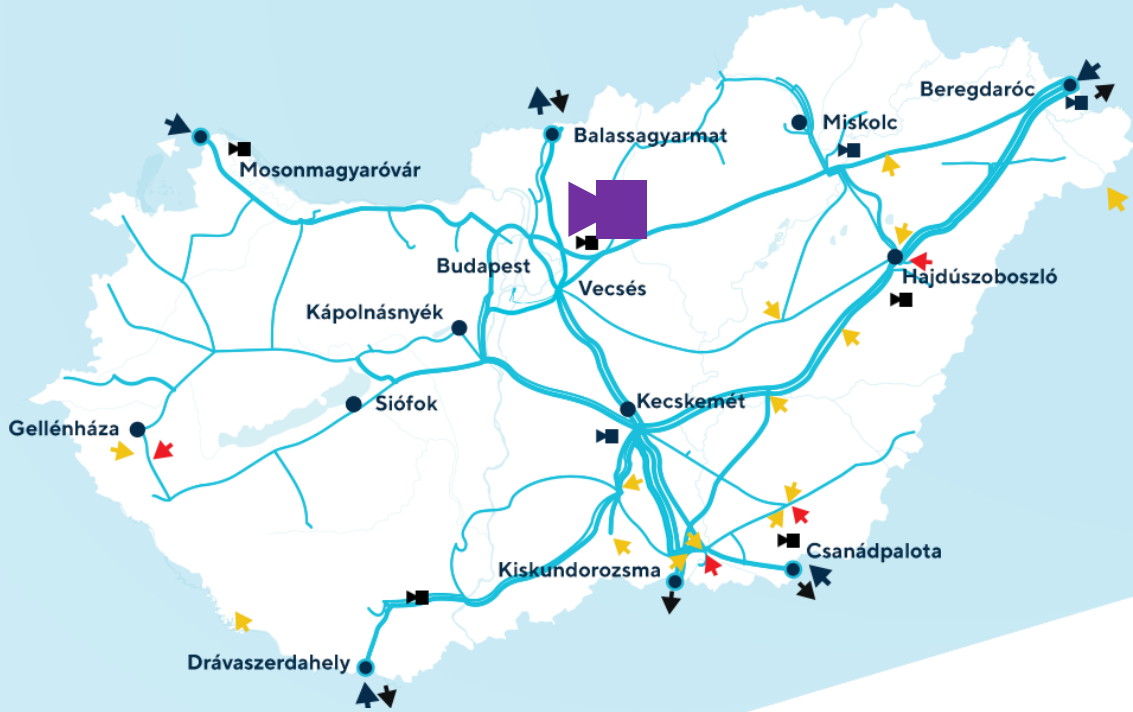
In case within the framework of the next non-binding capacity demand survey there will be a need to increase the capacity of the HUSK interconnection point again, then the following developments are needed in order to ensure the compression needs at Szada compressor station.

- Projects: [redacted]
  - Expansion of CS Szada with a 2 x 8 MW electric compressor + modification of existing units.
  - Development of Gödöllő junction point with technological measuring
- Expected date of commissioning: to be determined.

DECISION OF HEA

According to Decision No. H1670/2021 point II.3, HEA has not approved the development proposal regarding the project and required further examination.

PROJECT



Projects not approved by HEA, but further examination required

PROJECT DESCRIPTION

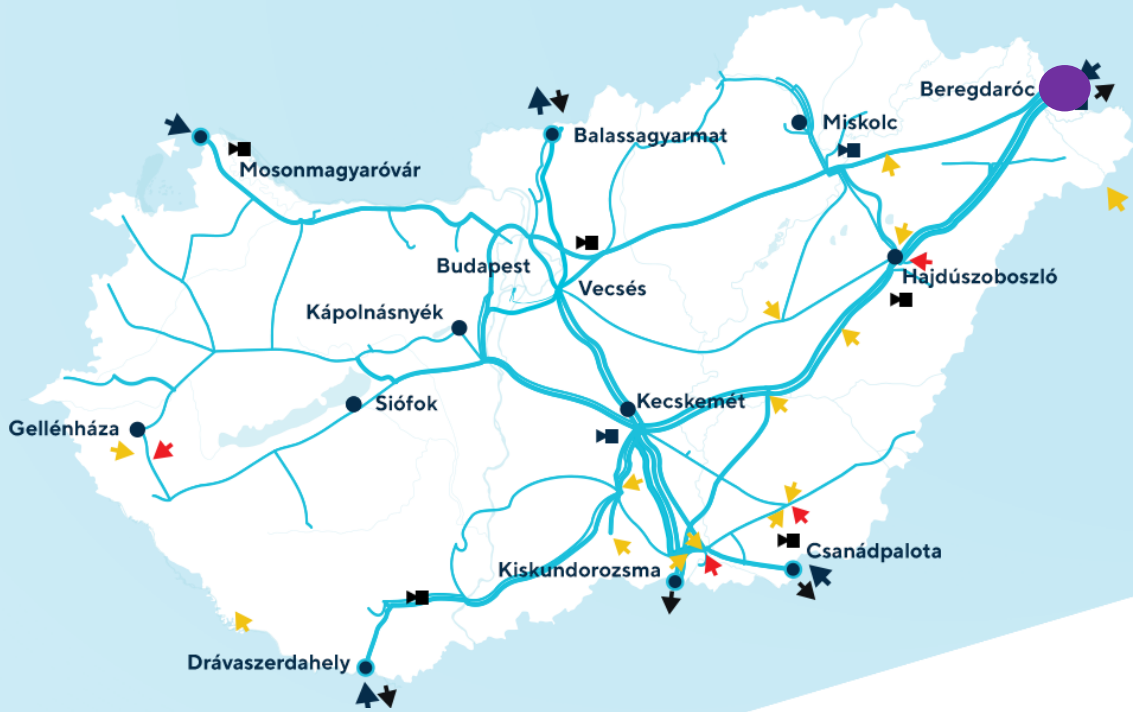
Ensuring firm capacity from Hungary to Ukraine

- The project ensures 800,000 cm/h firm capacity towards Ukraine.
- The project:
  - Construction of a metering station in Beregdaróc suitable for settlement measurement in accordance with international conditions, which is connected to the DN1400 line.
- Expected date of commissioning: within 24 months after the final investment decision.

DECISION OF HEA

According to the Decision No. H1670/2021 point II.4, HEA has not approved the development proposal regarding the project and required further examinations and negotiations.

PROJECT



Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

Expansion of Csanádpalota compressor station and developments of the measuring station

In case within the framework of the next non-binding capacity demand survey there will be a need to increase the capacity of the ROHU interconnection point again, then it will be necessary to expand the two units currently being built-in at Csanádpalota with an additional unit in order to ensure the compression needs at Csanádpalota compressor station, and it is also necessary to enhance the measuring station in accordance with the transmission demands.

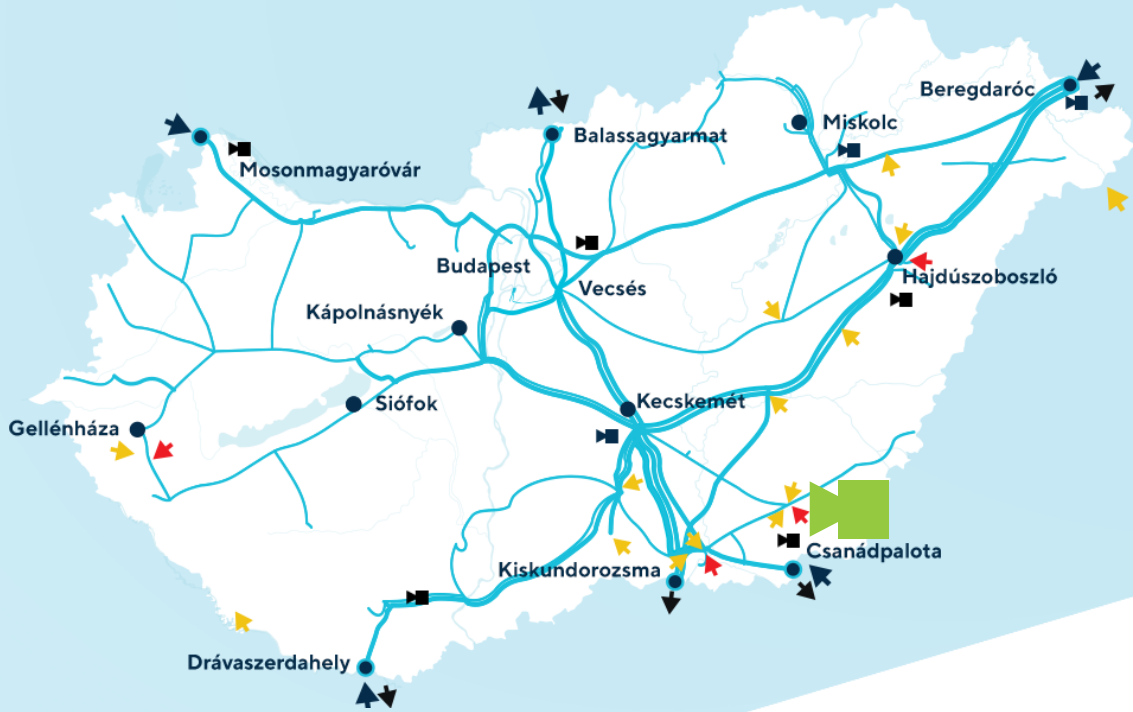
Current elements of the projects:

- Expansion of CS Csanádpalota with a 1 x 4.5 MW unit;
- Modification of Csanádpalota measuring station.

DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports further examination.

PROJECT



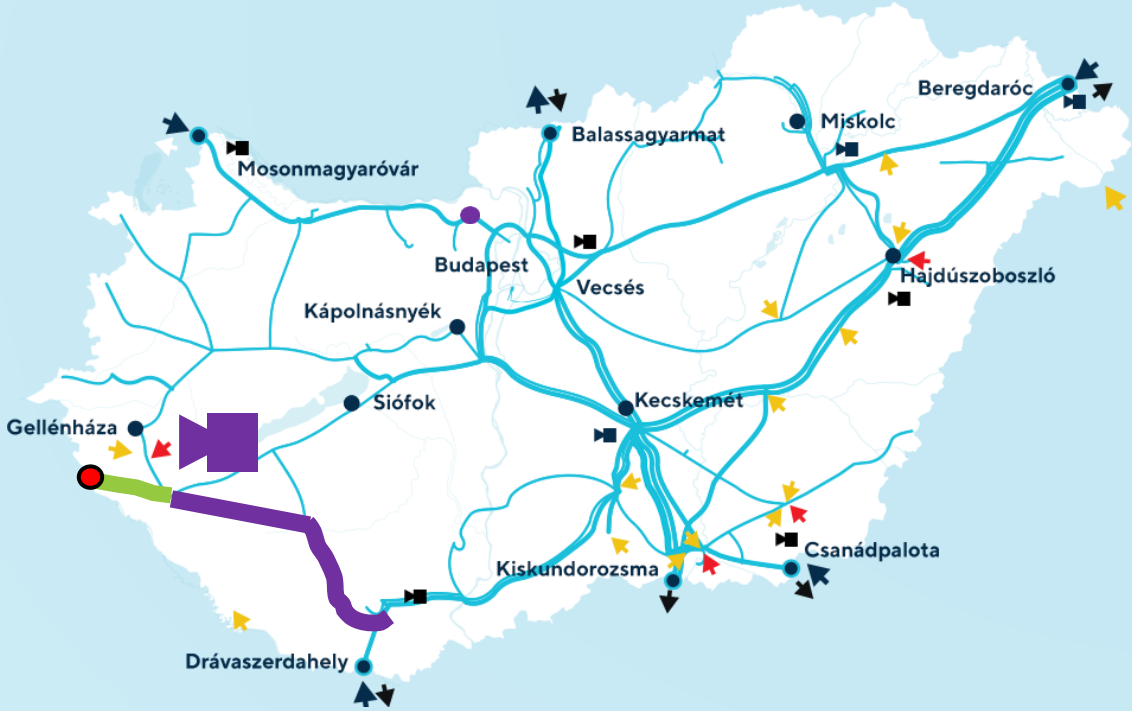
Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

Slovenian-Hungarian interconnection pipeline

- The project ensures HU-SI bidirectional deliveries.
- Projects *(the commonly agreed technical content is currently being consulted with the related TSO, so the required projects may change):*
  - Variant 1: Capacity HU>SI and SI>HU direction 20,000 cm/h; border pressure HU>SI 28 bar SI>HU 35 bar: SI/HU border-Tornyiszentmiklós-Nagykanizsa 41 km, DN600, PN75; Tornyiszentmiklós measuring station;
  - Variant 2: Capacity HU>SI 190,000 cm/h, SI>HU direction 50,000 cm/h; border pressure HU>SI 64 bar SI>HU 35 bar: Variant 1. + new Nagykanizsa C.S. + Nagykanizsa-Kaposvár-Kozármisleny 158km, DN600, PN75 pipeline;
  - Variant 3: Capacity HU>SI 190,000 cm/h, SI>HU direction 50,000 cm/h; border pressure HU>SI 45 bar SI>HU 45 bar: Variant 1. + new Nagykanizsa C.S. + Nagykanizsa-Kaposvár-Kozármisleny 158km, DN600, PN75 pipeline;
  - Expected date of commissioning: Variant 1: 1 October 2024.; Variant 2: 1 October 2025.; Variant 3: 1 October 2029.

PROJECT



DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports their further examination.

Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

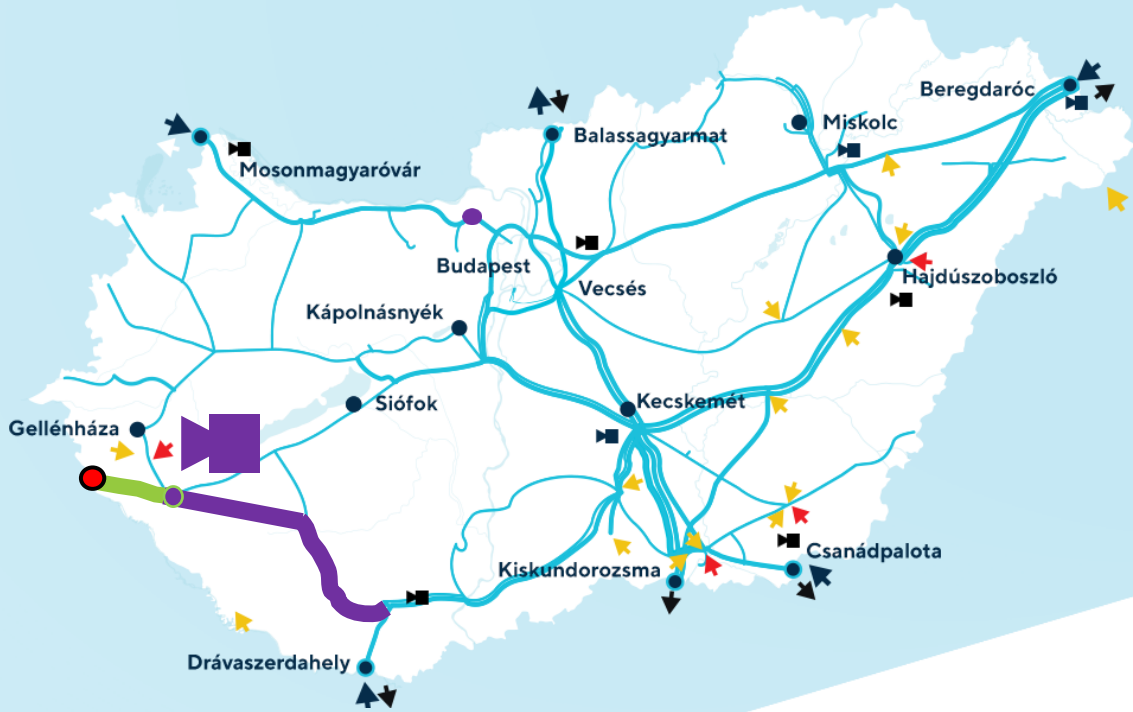
Slovenian-Hungarian interconnection pipeline +

The feasibility of the Slovenian-Hungarian interconnector was tested at 5 different capacity levels (20,000/50,000/190,000/230,000/362,000 cm/h), of which 50,000; 230,000 and 362,000 cm/h versions are not recommended for implementation. Given that the 50,000 cm/h version would require a compressor station in Nagykanizsa and Dorog as well, and the implementation of the 230,000 and 362,000 cm/h versions by Plinovodi is currently not supported because the Slovenian TSO would only be able to make the necessary improvements by 2029 .

DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports further examination.

PROJECT



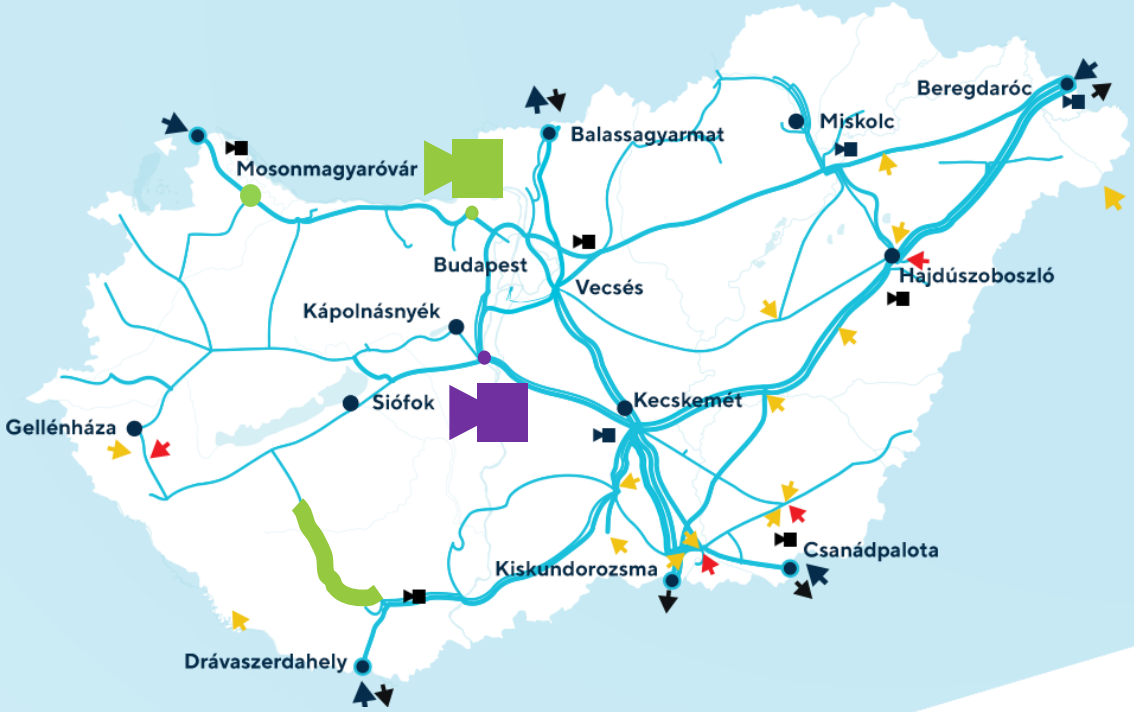
Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

Ensuring capacity demands in direction HU>AT

- The project ensures transmission in the direction of HU>AT.
- Previously examined projects:
  - Variant I.: 0.9 bcm/y (100,000 cm/h):
  - Variant II.: 1.1 bcm/y (120,000 cm/h): +
- FGSZ Ltd. and Gas Connect Austria are launching a new investigation as follows:
  - If market participants do not submit non-binding capacity demands, transmission system operators will prepare new technical solutions and project proposals for the capacity demands determined based on the non-binding capacity demand surveys of 2019.
  - If market participants submit new non-binding capacity requirements next time, transmission system operators will, where possible, seek to address the new capacity demands by further developing those technical solutions and project proposals.
  - Expected date of commissioning: to be determined.

PROJECT



DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports their further examination.

Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

EASTRING

The project enables the transmission in the direction of RO>HU>SK

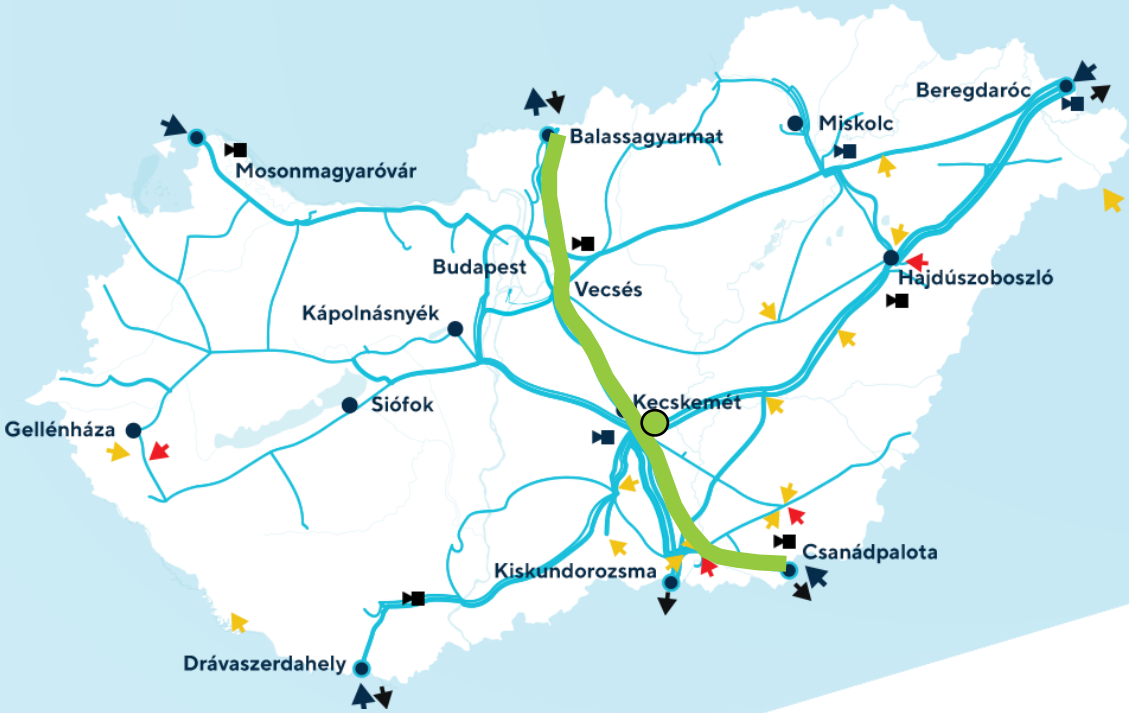
(10-20-40 bcm/y).

- Project:
  - RO/HU border-Csanádpalota-Városföld-Vecsés-HU/SK border 282 km, DN1400, PN100 pipeline.
  - Exit capacity at Városföld: 5 bcm/y, 600,000 cm/h.
- Expected commissioning date: to be defined later

DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports further examination.

PROJECT



Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

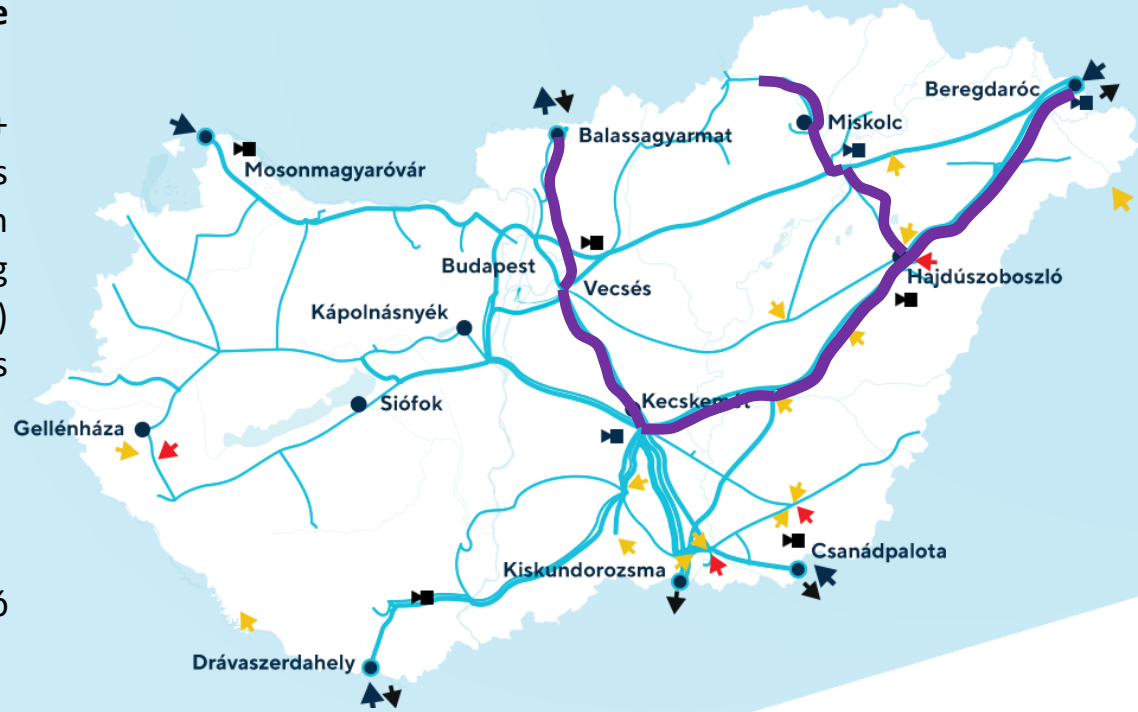
Connecting FGSZ's system to the European Hydrogen Backbone, preparing the provision of the expected transport demand of the domestic hydrogen producers and hydrogen users

According to the hydrogen strategy, first the presence of natural gas + hydrogen mixtures can be forecasted on the existing natural gas transmission system, then the presence of pure hydrogen transmission lines can be expected by modifying the existing pipelines and building new ones according to the domestic and transit (import/export) hydrogen consumption needs and the development of the supply needs of hydrogen producers.

Project: investigating the modification of the following pipelines

- UA/HU border-Beregdaróc DN800; Beregdaróc-Hajdúszoboszló DN800,
- Hajdúszoboszló-Endrőd DN800; Endrőd-Városföld DN800/DN600,
- Városföld-Vecsés DN700/DN600; Vecsés-HU/SK border DN800,
- Hajdúszoboszló-Nemesbikk DN600,
- Nemesbikk-Kistokaj-Kazincbarcika DN400/DN300.

PROJECT



DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports further examination.

Projects not approved by HEA, but further examination supported

PROJECT DESCRIPTION

Development of FGSZ gas-turbine-driven compressors with electric-driven compressors or complete machine replacement.

In the framework of this project, FGSZ is currently investigating in case of which gas-turbine-powered compressors the development could be implemented; some of the units of the following compressor stations have emerged as opportunities

- Mosonmagyaróvár
- Városföld
- Nemesbikk
- Beregdaróc

DECISION OF HEA

According to Decision No. H1670/2021 point III., HEA has not approved the development proposal regarding the project but supports further examination.

PROJECT