



Co-funded by
the European Union

WECOM



EU4Energy Governance

Improvement of the commercial attractiveness of the Trans-Balkan pipeline system

Analytical and Recommendations Report¹ (final)

***Prepared by:
WECOM***

Date: 19 September 2024

¹ The Analytical and Recommendation Report is a single document containing the three elements as distinct parts (as agreed):
Part I: Status Quo Description → Deliverable 1 “An overview of the capacity products implemented along the Trans Balkan route and on all interconnection points between Ukraine and Moldova”;
Part II: Issues Description → Deliverable 2 “An analysis of the cross-border bottlenecks, regulatory and commercial issues preventing high usage of capacities on all interconnection points within the scope of Deliverable 1”;
Part III: Recommendations → Deliverable 3 “A proposal of solutions, in line with the EU best practices and regulatory framework of the Energy Community, which would remove existing obstacles to high usage of border gas transmission capacities and enable transit flows, imports from available sources to Moldova and Ukraine”



Co-funded by
the European Union

WECOM



This Report was produced with the financial support of the European Union. Its contents are the sole responsibility of the Energy Community Secretariat and do not necessarily reflect the views of the European Union



Table of Contents

Part I: Status Quo Description	5
1 TBP Overview	5
2 Technical situation	7
3 UA Situation	9
3.1 Commercial capacity conditions	9
3.1.1 Conditional products according to the GTS Code	10
3.2 Transmission tariffs	12
3.3 TBP products proposed by GTSOU	14
4 MD situation	19
4.1 Commercial capacity conditions	19
4.2 Transmission tariffs	20
4.3 TBP product proposed	21
5 Use Cases for TBP reverse flow	23
Part II: Issues Description	25
6 Issues overview	25
7 Issue type 1: Technical constraints	26
8 Issue type 2: High (combined) tariffs	27
9 Issue type 3: Non-compliance of proposed products	30
10 Issue type 4: Alignment mismatches	31
Part III: Recommendations	32
11 Recommendations overview	32
12 Category COM: Develop an attractive and compliant commercial model for TBP reverse flows	32
13 Category TAR: Develop competitive and cost-reflective tariffs	33
14 Category TEC: Unlock technical potential of the TBP	34
15 Other recommendations	34
16 Details on the recommendations for the TBP Commercial Model	35
16.1 Capacity quality definition	35
16.2 Commercial points for the TBP	36
16.3 Introduction of the VIP on Northern UA/MD border	37
16.4 Capacity quality offering per commercial point	38
16.5 Bundled capacities	40
16.6 Tariff principles for the TBP capacity products	41
16.7 Comfort booking option	42
Annex 1: Detailed MD Transmission Network Map	45
Annex 2: Mapping between use cases and capacity products used	46
Annex 3: List of Abbreviations	49



About this document

The purpose of this document is to outline the status quo regarding the capacity situation on the TBP and UA/MD IPs, identify issues and collect solution approaches envisioned by relevant stakeholders, as well as provide recommendations:

- Part I: status quo of the capacity products implemented
- Part II: analysis of the cross-border bottlenecks, regulatory and commercial issues preventing high usage of capacities
- Part III: proposal of solutions to remove existing obstacles



Part I: Status Quo Description

1 TBP Overview

Historical background

The Trans-Balkan pipeline (TBP) system was designed and built during the former Soviet Union era. It was completed in 1988. Historically its primary purpose was to transport Russian gas through Ukraine (using the ATI, RI and ShDKRI pipeline systems) to supply Moldova, Romania, Bulgaria and Turkey with natural gas (“forward flow”).

Over the years the importance of the TBP reduced, particularly due to diversification of supply routes for Turkey and the ramp-up of domestic natural gas production in Romania. At the beginning of 2020 TurkStream - another subsea pipeline from Russia to Turkey - was commissioned, directly supplying Turkey (line 1) and creating a new Russian supply route to central Europe (line 2) via Bulgaria and Serbia towards Hungary.

Currently the TBP is mainly used to cover Moldovan natural gas consumption (roughly 2-3 bcm/a²) and some supplies to Ukrainian final consumers in the Căușeni-Orlivka section (below 0,5 bcm/a).

Route description

Please note that different variants of the precise TBP system scope definition exist. A core element for the Ukraine/Moldova area is the system of three large-diameter pipelines (ATI, RI, ShDKRI)³ between Grebenyky (UA/MD border) and Orlivka (UA/RO border; the corresponding Romanian IP is Isaccea). Total forward flow capacity of this system is ~35,9 bcm/a.

In the setting of this project the route between gas storages in Western Ukraine and Grebenyky needs to be included. This route is composed by the ACB pipeline⁴ (which involves a MD section between Oleksiivka and Ananiv) and the connection to Grebenyky via the ATI part. Total forward flow (UA gas storage to Moldova) capacity of this system is ~16 bcm/a.

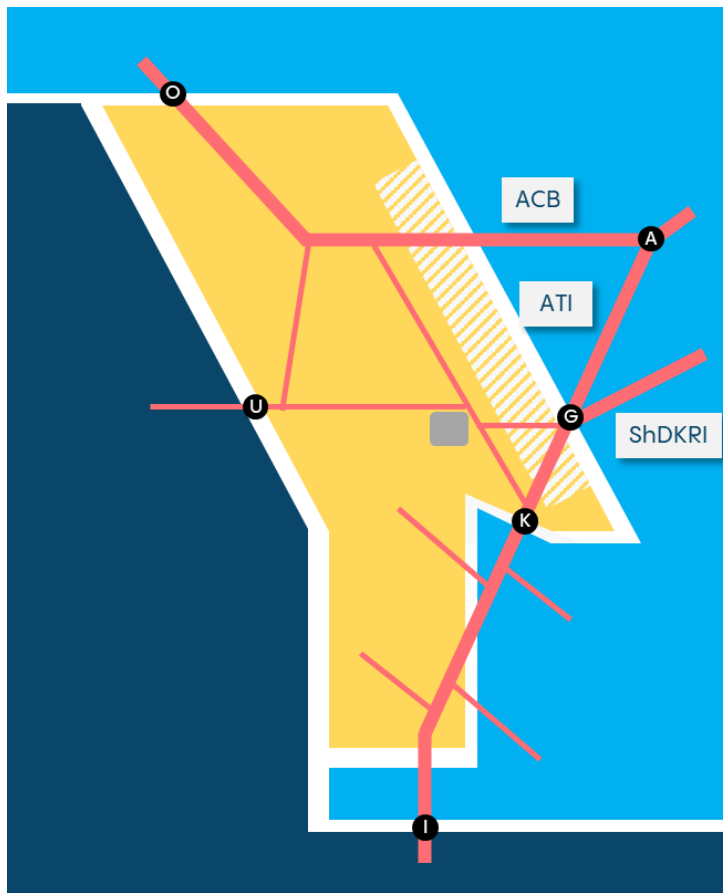
While historical usage was in forward flow direction only, the whole system can be operated bidirectionally. However, physical reverse flow is only possible in a limited amount – increasing the potential would require several investment projects, including the construction of additional compressor stations and/or reconstruction of the existing ones. Such an expansion could make available up to 25 bcm/a in reverse flow, i.e. from Romania northwards.



² 2021 consumption: ~1,3 bcm “right bank” (2023: ~0,7 bcm) and ~1,6 bcm left bank (Transnistria)

³ Ananiv-Tiraspol-Izmail, Rozdilna-Izmail, Shebelynka-Dnipro-Kryvyi Rih-Izmail

⁴ Ananiv-Chernivtsi-Bohorodchany



Abbrev.	Description
A	Ananiv
O	Oleksiivka
G	Grebenyky
K	Kaushany
I	Isaccea 1 / Orlivka
U	Ungheni
Key	
	Ukraine
	Moldova
	Transnistria
	Romania

Schematic infrastructure (for a detailed map see Annex 1)

Transmission system operators

TBP parts lying in Ukraine are managed by GTSOU, the Ukrainian gas transmission system operator certified in line with the EnCS Acquis.

TBP parts in Moldova are managed by VMTG, which was recently appointed by ANRE to fulfil the TSO tasks for the Moldovan gas transmission system after long delays in the certification of Moldovatransgaz. For further details see EnCS opinion on the preliminary certification decision⁵.

Future potential

Trans-Balkan infrastructure provides access for Ukraine and Moldova to

- global LNG market via Greek and Turkish LNG terminals
- EU gas markets (RO, BG, GR)
- Azerbaijan through Southern Corridor

Furthermore, it connects the vast potential of Ukrainian gas storages (~31 bcm) to the region: Bulgaria and Romania together have ~3,8 bcm of working gas volume, Greece doesn't have gas storages at all.

⁵ <https://www.energy-community.org/news/Energy-Community-News/2024/07/01.html>



2 Technical situation

Romanian/Ukrainian border

The gas quality requirements in Romania are different from the gas quality requirements in Ukraine, a common agreement on a gas quality specification that would work on both sides of the RO/UA border has not yet been reached. For the Isaccea 1 / Orlivka cross-border interconnection point this means that physical entry flows from Romania into the UA/MD TBP system might violate legally defined Ukrainian gas quality requirements and eventually create problems with final customers and transit flows (to e.g. Slovakia), although so far this has not yet been the case.⁶

Ukrainian/Moldovan border at Kaushany (Căușeni)

Gas entering Moldova from the South via Kaushany can be fully transported to Exit Grebenyky. Such gas can also be used to reach MD domestic customers and, to a certain extent, also to exit Ungheni. However, due to pressure constraints this gas cannot be transported directly within the Moldovan gas transmission system to Oleksiivka (or Ananiv), but has to take a detour via the Ukrainian GTS (Grebenyky to Ananiv).

Ukrainian/Moldovan border at Grebenyky

Prerequisite for any physical gas flows at Grebenyky from MD to UA is that the according gas quantity is physically provided at Isaccea 1 / Orlivka, additional to any exits in between (i.e. DSOs, final consumers, compressor stations along the TBP). In Moldova it is not possible to transport gas physically from any entry point other than Căușeni to exit Grebenyky due to pressure reasons. In any case, as long as there is physical forward flow, system users can transport gas in virtual reverse flow (up to the extent of the forward flow).

Even if the above condition is satisfied, the physical reverse flow potential with entry into the “main part” of the Ukrainian GTS in Grebenyky was limited up to now* to two use cases due to the fact that gas entering UA in Grebenyky cannot be physically distributed over the whole Ukrainian GTS:

- Use case A covers gas to be consumed directly in Odesa region⁷: Depending on regional consumption levels firm transport possibilities are lower in the summer period and higher in winter.
- Use case B concerns transports onwards to Western Ukrainian gas storages: These transports, however, technically require a constant physical flow over a longer time period:
 - The minimum flow requirement comes from the downstream compressor station which needs a certain minimum flow to be able to compress gas further into GTSOU’s network.
 - There is no strict maximum flow, however upstream restrictions effectively limit the amount of gas that can reach Oleksiivka (as the final point in the product chain): Isaccea/Orlivka is limited to ~11 mcm/d and some part of the physical flow (historically up to 5 mcm/d) is consumed in Moldova (Căușeni-Grebenyky section), the remaining 6 mcm/d is then transported towards Oleksiivka via Grebenyky and Ananiv. In principle, this figure can be higher (up to 7 mcm/d).
 - It is also not possible to “re-circulate” flows in the compressor station to obtain the minimum flows/pressures required (which would allow to drop the minimum flow requirement).

* Since 1 September 2024 it will be possible to physically transport 1 mcm/d from Moldova to Ukraine on a firm and unconditional basis. In the long-term GTSOU aims to further increase the firm capacity that can be offered at entry Grebenyky by implementing network development projects, however long-term commitment of system users (and thus, financing) has not yet been secured for such investments.

⁶ For more details please refer to section 7.

⁷ Note that relevant regional consumption is not constrained to Odesa region, but to illustrate the general direction without exhaustively defining the area the denotation “Odesa region” was chosen for the purposes of this report.



Ukrainian/Moldovan border at Ananiv and Oleksiivka

Oleksiivka was traditionally used in Winter to cover additional domestic consumption of Moldova via gas storages in Ukraine, as there are no gas storages in Moldova itself. The ACB pipeline can only be used to export gas to Ukraine that enters either from Oleksiivka or from Ananiv. It is not technically possible to export gas to Ukraine that was imported into Moldova at entries Kaushany, Grebenyky or Ungheni.

Romanian/Moldovan border

Flows from Romania via Moldova to Ukraine (e.g. via Oleksiivka or Grebenyky) are not possible due to the low pressure in the Transgaz network in the Northern region. Thus, any gas quantities entering via Ungheni have to be consumed on the Moldovan domestic gas market.

Additional Notes:

- IP Lymanske: Near Grebenyky there is also the additional cross-border interconnection point Lymanske. This point can be used to transport gas from the TBP system within Moldova (pipeline branches near Tiraspol) towards a limited amount of Ukrainian final consumers. The connection is only used in special circumstances, mostly following TSO operational considerations (it cannot be booked by network users).
- Gas transmission in the Transnistrian region: Parts of the TBP system are located in Transnistria and are managed by Tiraspoltransgaz (TTG), a non-certified network operator ultimately governed by Gazprom. While operational cooperation of VMTG with TTG is well-established and has been executed on a daily basis in the past, the situation is effectively associated with a range of legal, commercial and operational risks.



3 UA Situation

3.1 Commercial capacity conditions

Taking into account technical constraints, GTSOU currently offers the following capacity:

Point	Technical capacity [mcm/d]					
	Direction	Reverse flow		Direction	Forward flow	
		Firm	Interrupt.		Firm	Interrupt.
Isaccea 1 / Orlivka	Entry	11,50*	-	Exit	19,10	-
MD near-border	Exit	0,85	-	Exit	0,85	-
Kaushany	Exit	11,50*	-	Entry	36,00	62,40
Grebenyky	Entry	1,0*	4,50**	Exit	36,00	62,40
Ananiv	Exit	-	-	Entry	-	-
Oleksiiivka	Entry	-	-	Exit	7,90	2,20

* from 1 September 2024** offered as backhaul

The gas transmission capacities marketing for the Ukrainian parts of the TBP mainly follows the guidelines of EU gas network codes, in particular CAM NC:

- Capacity product types: GTSOU offers the following capacity product types:
 - firm capacity
 - interruptible capacity
 - conditional capacity (“capacity with restrictions”, see separate section below)
- Capacity product durations: All periods as stipulated by CAM NC are offered by GTSOU, i.e. yearly/quarterly/monthly/day-ahead/within-day capacity product durations. However, capacity with restrictions (shorthaul) are only offered under M/DA/WD product durations.
- Capacity allocation at TBP cross-border interconnection points:
 - Y/Q/M product durations are booked on RBP* platform subject to the ascending-clock auction algorithm as defined in CAM NC
 - DA/WD product durations are booked on RBP* platform subject to the uniform price auction algorithm as defined in CAM NC
 - interruptible WD capacities are booked by over-nomination on GTSOU’s IPlatform as defined in CAM NC
 - capacity with restrictions (shorthaul) M product duration is booked by submitting an application on GTSOU’s IPlatform
 - capacity with restrictions (shorthaul) DA/WD product durations are booked by submitting nominations under a separate shipper code
- Capacity allocation at TBP domestic exit points: Booking of Y/Q/M product durations is made by submitting an application to GTSOU, daily capacity is booked by submitting a nomination.

* GTSOU offers transmission capacity at cross-border interconnection points either on RBP (operated by FGSZ Ltd.) or on GSA (operated by GAZ-SYSTEM S.A.), depending on the interconnection point. All TBP interconnection points are offered on RBP.



3.1.1 Conditional products according to the GTS Code

The currently applicable GTS Code⁸ in Section IX, Chapter 8 contains a conditional product for system users, that effectively enables point-to-point transports at a discounted tariff, but subject to a balanced nomination requirement and an increased possibility for interruption (compared to firm/interruptible capacity).

The conditional capacity product currently does not apply to the TBP interconnection points. However, as ANRE's proposal for a conditional product in Moldova contains certain almost identical formulations, the relevant excerpt of the Ukrainian GTS Code provisions is provided below for reference.

Ref.	GTS Code text (Section IX, Chapter 8)	Remarks
1.	<p><i>The GTSOU provides the following types of capacity with restrictions:</i></p> <ul style="list-style-type: none"> ■ 1) <i>the right to simultaneously use the capacity at entry and exit cross-border points, taking into account the restrictions established by this chapter;</i> ■ 2) <i>the right to simultaneously use the capacity of an entry/exit point with a cross-border point and an exit/entry point to/from a gas storage facility or a group of gas storage facilities, taking into account the restrictions established by this chapter. The right to simultaneously use the capacity of the exit point on the cross-border point and the entry point from the gas storage or gas storage group can be granted to the system user exclusively for the volumes of natural gas that were delivered to the exit point to the gas storage or gas storage group under the conditions of capacity use with restrictions.</i> <p><i>Access to capacity with restrictions is offered on an interruptible basis for a monthly period or for a period of one gas day, depending on the technical capabilities of the GTSOU.</i></p>	<ul style="list-style-type: none"> ■ 1) is for conditional products between IPs ■ 2) is for conditional products between IP and gas storage ■ The product is interruptible (also see 6. below)
2.	<p><i>The GTSOU provides access to capacity with restrictions at all cross-border entry/exit points, for which the Regulator has approved coefficients for capacity with restrictions in accordance with the Methodology for determining and calculating tariffs for natural gas transportation services for entry and exit points on the basis of multi-year stimulating regulation. The list of such entry/exit points and the sizes of the coefficients is published by the GTSOU on its website.</i></p>	-
3.	<p><i>The cost of access to capacity is calculated using the coefficients and tariffs for entry points and exit points to/from the gas transportation system established by the Regulator. The terms of payment for access to capacity with restrictions are defined in the natural gas transportation contract and this Code.</i></p>	-
4.	<ul style="list-style-type: none"> ■ <i>For the use of capacity with restrictions, the system user submits a separate nomination/renomination to the GTSOU, in which it is noted that such nomination/renomination is submitted for the use of capacity with restrictions.</i> ■ <i>The system user who intends to use capacity with restrictions, must first obtain from the GTSOU an additional identification code – a shipper code, which is used by the system user when submitting nominations/renominations and by the GTSOU during the matching procedure with the adjacent TSO.</i> ■ <i>In the case of using capacity with restrictions, the system user submits a separate nomination/renomination indicating this identification code – the shipper code.</i> 	-
5.	<p><i>Volumes of natural gas transported under the conditions of using capacity with restrictions are not recorded by the GTSOU in the balancing portfolio of the system user and are not taken into account in the calculation of his daily imbalance.</i></p>	<ul style="list-style-type: none"> ■ The conditional product is exempt from balancing rules, as only balanced nominations are admitted.

⁸ NEURC Decision № 2493 of 30.09.2015 (last amended 23.4.2024): <https://zakon.rada.gov.ua/laws/show/z1378-15#n2392>



Ref.	GTS Code text (Section IX, Chapter 8)	Remarks
6.	<p><i>The power with limitations specified in subparagraph 1 of paragraph 1 of this chapter provides for the following additional conditions (restrictions):</i></p> <ul style="list-style-type: none"> ■ 1) <i>capacity with restrictions of specified cross-border entry/exit points may be used by the customer exclusively for the transportation of natural gas between these points and may not be used for transportation of natural gas from/to other entry/exit points;</i> ■ 2) <i>no access to the virtual trading point;</i> ■ 3) <i>the volume of natural gas supplied to the gas transportation system at the specified cross-border entry point must be equal to the volume of natural gas taken from the gas transportation system at the specified cross-border exit point during each gas day;</i> ■ 4) <i>nominations/renominations when using such capacities are confirmed after confirmation of nominations/renominations of system users who are granted the right to use firm and/or interruptible capacity. Natural gas transportation volumes specified in confirmed nominations/renominations of system users, who are granted the right to use capacity with restrictions, may be unilaterally reduced by the GTSOU in the event that there is no free capacity for the provision of such services and/or there is a need execution of renominations of system users, who have been granted the right to use firm and/or interruptible capacity, or in order to prevent the occurrence of an imbalance among such system users;</i> ■ 5) <i>the volume of natural gas specified in the nomination/renomination for the cross-border entry point must correspond to the volume of natural gas specified for the cross-border exit point, otherwise the GTSOU rejects such nomination/renomination;</i> ■ 6) <i>natural gas is transported under the customs regime of transit in accordance with the requirements of the Customs Code of Ukraine .</i> <p><i>If, as a result of the matching process with adjacent TSOs it turns out that the confirmed volumes of natural gas for capacity with restrictions at the entry point differ from the confirmed volumes at the exit point, the GTSOU, in order to avoid a daily imbalance at the customer, unilaterally reduces the confirmed volumes volumes to the smallest of the confirmed volumes of natural gas and informs the affected system users and the relevant adjacent TSO.</i></p>	<ul style="list-style-type: none"> ■ The conditional product is effectively interruptible of the lowest quality, as all firm & interruptible nominations are prioritized by the TSO. ■ In case an imbalance in product usage would arise from matching with adjacent TSOs, the GTSOU can unilaterally reduce the nominations to obtain balanced use again.
...	(Additional provisions, e.g. regarding usage in combination with gas storages)	-



3.2 Transmission tariffs

Notes on the upcoming tariffs from 1.1.2025

Currently the tariff setting procedure (methodology/scenario definition, proposal and negotiation) between GTSOU and NEURC is in progress. The proposal from GTSOU is based on continuation of the currently allowed revenue methodology and the current reference price methodology, subject to reduced volumes due to expiration of the Gazprom/Naftogaz transit contract with 31.12.2024. It is anticipated that the procedure will be finished in the next months, when tariffs are going to be published. Apart from the expected strong increase of the general tariff level due to the reduced transit volume forecast some changes are planned for the UA/MD border points (e.g. non-zero tariff at border, Lymanske will be deleted).

Status quo of tariffs

As defined in NEURC Resolution No. 3013 of 24.12.2019 and published on GTSOU website⁹ the following tariffs are applied for the regulatory period 2020-2024:

Interconnection point	Entry tariff [USD/1000m ³ per day]	Exit tariff [USD/1000m ³ per day]
IPs to PL (Hermanowice, Drozdovychi, Ustyluh)	4,45	9,04
IPs to SK (Budince, Uzhgorod/Velke Kapusany)	4,45	9,68
IPs to HU (Beregdaroc, Beregove)	4,45	9,25
MD: Ananiv	–	8,17
MD: Grebenyky*	0	8,17
MD: Kaushany	0	1,13
MD: Lymanske	4,45	8,17
MD: Oleksiivka	4,45	9,71
MD: Virtual point	–	0,56
RO: Orlivka/Isaccea	4,45	1,13
RO: Tekove/Mediesu Aurit	4,45	8,78
RF: Sokhranovka	16,01	–
RF: Sudzha	16,01	–

*Access to entry point Grebenyky requires no less amount of capacity at entry point Isaccea 1 / Orlivka and exit point Kaushany in the respective period.

Multipliers applying for capacity durations below a full year:

- Quarterly product: 1,1
- Monthly product: 1,2
- Daily product: 1,45
- Within-day product: 1,595 (1,1 * daily multiplier)

⁹ <https://TSOUA.com/en/business-services/tariffs/transmission-tariffs/>



For the conditional capacity product, the following coefficients¹⁰ are applied to transmission tariffs for cross-border entry and exit points to/from the gas transmission system:

IP name	Coefficient for conditional capacity	
	Entry capacity	Exit capacity
Virtual or physical IPs with Poland (Hermanowice, Drozdovychi, Ustylug)	0,66	0,49
Virtual or physical IPs with Slovakia (Uzhgorod/Velke Kapusany)	0,66	0,36
Virtual or physical IPs with Hungary (Beregdarots, Beregove)	0,66	0,44
Tekove/Mediesu Aurit (currently unavailable)	0,66	0,41
Grebenyky*	0,01	–
Ananiv*	–	0,01

* In order to accommodate the constant flow product from Isaccea to Oleksiivka, NEURC has created an additional discount in an amendment¹¹ to Annex 3 of decision no. 3013 of 24.12.2019. These coefficients would only apply to capacity nominated in identical amounts for all Ukrainian points (Isaccea/Orlivka→Kaushany→Grebenyky→Ananiv→Oleksiivka).

The additional multipliers/coefficients used in the calculation of the tariff, which take into account the booked capacity period and the booked capacity season are not applicable to the conditional product.

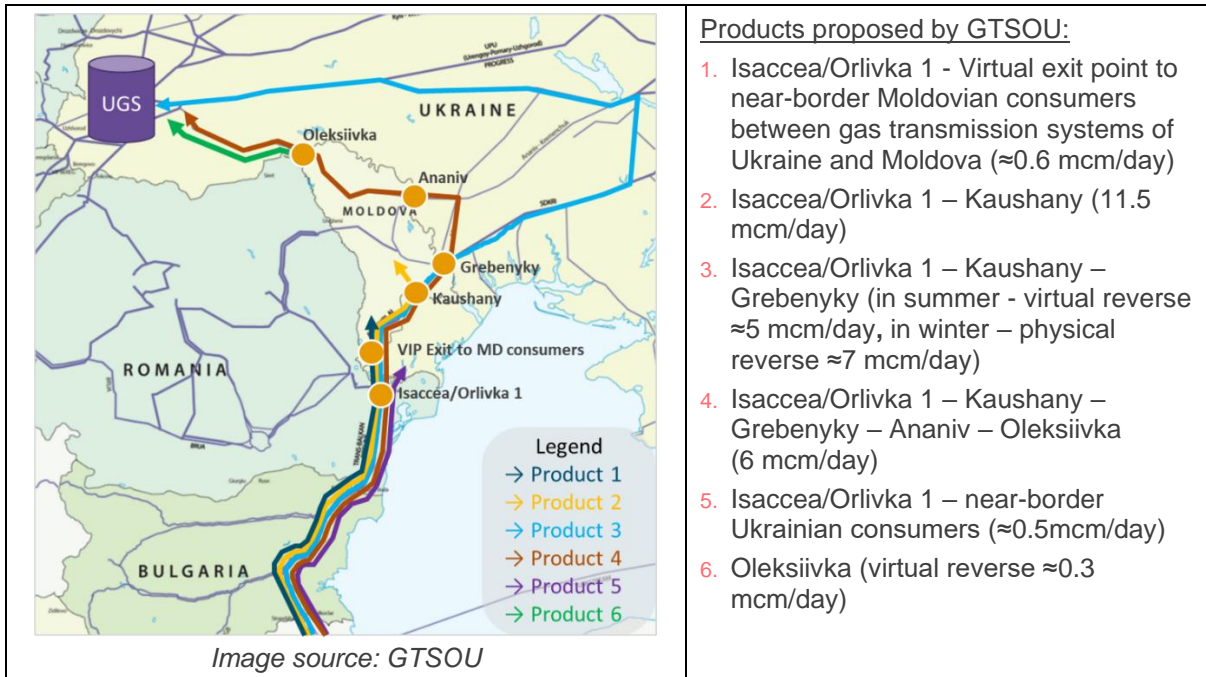
¹⁰ Annex 3 to NEURC Resolution No. 3013 of 24.12.2019

¹¹ NEURC Resolution No. 1855 of 9.10.2023 <https://www.nerc.gov.ua/acts/pro-vnesennya-zmin-do-dodatka-3-do-postanovinkrekp-vid-24-grudnya-2019-roku-3013>



3.3 TBP products proposed by GTSOU

To increase attractiveness of the TBP in reverse flow, GTSOU developed the following products:



GTSOU proposed to offer each product on a separate interconnection point (see “booking IP” in the tables below), while the capacities of other interconnection points included into the product are booked automatically.

Within-day capacity can be booked by network users on the Ukrainian side using the overnomination process. VMTG currently does not offer WD products on the UA-MD border.

In principle all of these products (excl. product 6) compete for the technical entry capacity of IP Isaccea 1 / Orlivka (products planned to be allocated in parallel).

Please note that the products described below are provided in the early summer development stage and thus do not reflect e.g. the adjustments to technical capacities (in particular the possibility of 1 mcm/d firm entry capacity at IP Grebenyky MD>UA).



Product 1:

Main purpose	Supply of MD near-border customers from South				
Route	<ul style="list-style-type: none"> ■ Isaccea/Orlivka 1 ■ Virtual exit point to near-border Moldovan consumers 				
Booking IP*	Virtual exit point to near-border Moldovan consumers				
Available capacity	0,85 mcm/d				
Usage restrictions	None				
Product durations	Y	Q	M	DA	WD
	X	X	X	X	–
Capacity allocation mechanism	<ul style="list-style-type: none"> ■ NC CAM auction under ENTSOG calendar ■ * Capacity of the product includes capacities of all route IPs (no booking of separate IPs is required) 				
Nomination details	Single nomination for whole route (separate nominations for each route IP not required)				
Tariff	Sum of UA tariffs of respective IPs				
Other information	<ul style="list-style-type: none"> ■ MD customers IP's capacity is offered as cross-border IP from UA side – exit from Ukrainian GTS, so there is tariff introduced by NEURC. ■ The daily booked capacity corresponds to consumption of MD near-border customers (taking into account adjustments). IA determines the technical capacity of IP MD near-border customers. If consumption of MD near-border customers deviates from the nominations, the difference between physical flow and allocation is transferred to the OBA between GTSOU and VMTG. ■ On the contrary, exit point to UA customers is not determined as separate IP currently. The transportation of gas there is conducted by GTSOU that has a transport contract with VMTG as a network user. 				

Product 2:

Main purpose	MD imports from South				
Route	<ul style="list-style-type: none"> ■ Isaccea/Orlivka 1 ■ Kaushany 				
Booking IP*	Kaushany				
Available capacity	11,5 mcm/d				
Usage restrictions	None				
Product durations	Y	Q	M	DA	WD
	X	X	X	X	–
Capacity allocation mechanism	<ul style="list-style-type: none"> ■ NC CAM auction under ENTSOG calendar ■ * Capacity of the product includes capacities of all route IPs (no booking of separate IPs is required) 				
Nomination details	Single nomination for whole route (separate nominations for each route IP not required)				



Tariff	Sum of UA tariffs of respective IPs
--------	-------------------------------------

Product 3:

Main purpose	UA main network imports from South				
Route	<ul style="list-style-type: none"> ■ Isaccea/Orlivka 1 ■ Kaushany ■ Grebenyky 				
Booking IP*	Grebenyky				
Available capacity	<ul style="list-style-type: none"> ■ April-October: ~5,0 mcm/d ■ November-March: ~7,0 mcm/d 				
Usage restrictions	<ul style="list-style-type: none"> ■ counter physical flow via IP Grebenyky (April – October), ■ daily consumption in the corresponding region (November – March) 				
Product durations	Y	Q	M	DA	WD
	X	X	X	X	–
Capacity allocation mechanism	<ul style="list-style-type: none"> ■ NC CAM auction under ENTSOG calendar ■ * Capacity of the product includes capacities of all route IPs (no booking of separate IPs is required) 				
Nomination details	Single nomination for whole route (separate nominations for each route IP not required)				
Tariff	Sum of UA tariffs of respective IPs				
Other information	<ul style="list-style-type: none"> ■ Additional flows N→S for MD import needs may exist even after the cessation of transit. The logic of summer/winter constraints associates with the amount of consumption of the UA region downstream IP Grebenyky that is predicted higher in winter season. ■ Thus, summer constraints are based only on the virtual reverse flow limitations. ■ Winter constraints include consumption in the adjacent region in UA and virtual reverse. 				

Product 4:

Main purpose	Injection into UA UGS from South				
Route	<ul style="list-style-type: none"> ■ Isaccea/Orlivka 1 ■ Kaushany ■ Grebenyky ■ Ananiv ■ Oleksiivka 				
Booking IP*	Ananiv				
Available capacity	<ul style="list-style-type: none"> ■ April-October: ≥6,0 mcm/d ■ November-March: 0 mcm/d 				
Usage restrictions	Minimum flow of 6 mcm/d, constantly for at least 1 month				
Product durations	Y	Q	M	DA	WD
	–	X	X	–	–



Capacity allocation mechanism	<ul style="list-style-type: none"> ■ NC CAM auction under ENTSOG calendar ■ * Capacity of the product includes capacities of all route IPs (no booking of separate IPs is required)
Nomination details	Single nomination for whole route (separate nominations for each route IP not required)
Tariff	Sum of UA tariffs of respective IPs
Other information	<ul style="list-style-type: none"> ■ The minimum flow requirement comes from the downstream compressor station (no strict maximum flow). ■ The product is limited to the storage injection season because when consumption of gas increases in Ukraine, there will be technical limitations to transport this 6 mcm/d to Ananiv and Oleksiivka. ■ Thus, this product is available for April-October only. During this period it is also possible to transport gas to PL/SK/HU using P4. ■ Such a product is currently not foreseen in the GTS code and would require amendments to the regulatory and contractual framework, e.g. to define usage constraints.

Product 5:

Main purpose	Supply of UA near-border customers from South				
Route	<ul style="list-style-type: none"> ■ Isaccea/Orlivka 1 ■ near-border Ukrainian consumers 				
Booking IP	Isaccea/Orlivka 1				
Available capacity	~0,5 mcm/d				
Usage restrictions	Daily consumption in the corresponding region				
Product durations	Y	Q	M	DA	WD
	X	X	X	X	–
Capacity allocation mechanism	<ul style="list-style-type: none"> ■ NC CAM auction under ENTSOG calendar ■ Exit capacity to UA consumers has to be booked separately 				
Nomination details	Standard				
Tariff	<ul style="list-style-type: none"> ■ UA tariff of entry IP Oleksiivka ■ Exit tariff to UA consumers applies separately 				
Other information	–				



Product 6:

Main purpose	Injection into UA UGS from MD				
Route	Oleksiivka				
Booking IP	Oleksiivka				
Available capacity	~0,3 mcm/d				
Usage restrictions	Counter physical flow via IP Oleksiivka				
Product durations	Y	Q	M	DA	WD
	–	–	–	–	X
Capacity allocation mechanism	Implicitely allocated not via booking (booking platform) but directly with GTSOU through overnomination				
Nomination details	Standard				
Tariff	UA tariff of entry IP Oleksiivka				
Other information	<ul style="list-style-type: none"> ■ This product is virtual reverse flow capacity: The capacity is available only on an interruptible basis and not higher than counter physical flow via this IP. The amount of the counter physical flow is known only after the daily nominations are submitted. ■ It is the only proposed product that is a network code compliant capacity product. 				



4 MD situation

4.1 Commercial capacity conditions

Taking into account technical constraints, VMTG currently offers¹² the following capacity:

Point	Direction	Technical Capacity [m ³ /d (20°C)]	Technical Capacity [MWh/day]	Capacity type
Ungheni	RO-MD	5 250 725	55 658	Firm
	MD-RO	2 040 159	21 626	Firm
Grebenyky	UA-MD	36 000 000	381 600	Firm
	MD-UA	3 960 000	41 976	Interruptible*
Kaushany	UA-MD	11 500 000	121 900	Interruptible**
	MD-UA	36 000 000	381 600	Firm
Oleksiivka	UA-MD	7 900 000	83 740	Firm
	MD-UA	12 000 000	127 200	Interruptible*
Ananiv	UA-MD	7 900 000	83 740	Not offered
	MD-UA	14 000	148	Not offered
Limanskoe	UA-MD	0	0	-
	MD-UA	0	0	-

* Interruptible capacity is available as “backhaul”, depending on entry capacity.

** Starting with 1.1.2021, technical capacities for entry Kaushany were reduced to 10 mcm/d, down from 12 mcm/d. In a VMTG/GTSOU meeting on 13.6.2024 it was agreed to increase the figure to 11,5 mcm/d from 1 September 2024, in order to match technical entry capacity Isaccea (RO>UA).

The gas transmission capacities marketing for the Moldovan parts of the TBP mainly follows the guidelines of EU gas network codes, in particular CAM NC:

- **Capacity product types:** VMTG offers the following capacity product types:
 - firm capacity
 - interruptible capacity
- **Capacity product durations:** Almost all periods as stipulated by CAM NC are offered by VMTG, i.e. yearly/quarterly/monthly/day-ahead but no within-day capacity product duration.
- **Capacity allocation at TBP cross-border interconnection points:**
 - Y/Q/M product durations are booked on RBP platform subject to the ascending-clock auction algorithm as defined in CAM NC
 - DA product duration is booked on RBP platform subject to the uniform price auction algorithm as defined in CAM NC
- **Capacity allocation at TBP domestic exit points:** Booking is made by submitting an application to VMTG.

¹² These figures were provided by VMTG directly and do not correspond to the website publication, as VMTG currently does not publish offered capacity for the future, but only up to the current month (and with varying amounts per point/month).



4.2 Transmission tariffs

Status quo of tariffs

The following tariffs were defined¹³ in ANRE Resolution No. 517 of 23 August 2024, after consultations in March 2024¹⁴ and on 1.8.2024¹⁵:

No.	Point type	Cost base share [mio. MDL]	Forecasted capacity [m ³ /h]	Applicable tariff [MDL/MWh/h/a]
1.	Group of cross-border entry points into the natural gas transmission network of MD	443,53	156 418	268 771
2.	Group of cross-border exit points from the natural gas transmission network of MD	101,91	31 083	310 787
3.	Group of domestic exit points from the natural gas transmission network of MD to the natural gas distribution networks and/or natural gas installations of end consumers connected to the gas transmission network	341,61	125 335	258 351

So the new tariffs increased by ~47% compared to the previous tariff situation (see below).

Notes on the previously applicable tariffs before 1 September 2024

During the project, the following tariffs were still in force, defined¹⁶ in ANRE Resolution No. 625 of 27.10.2023:

No.	Point type	Cost base share [mio. MDL]	Forecasted capacity [m ³ /h]	Previous tariff [MDL/MWh/h/a]
1.	Group of cross-border entry points into the natural gas transmission network of MD	171,11	88 560	183 141
2.	Group of cross-border exit points from the natural gas transmission network of MD	73,85	35 833	195 343
3.	Group of domestic exit points from the natural gas transmission network of MD to the natural gas distribution networks and/or natural gas installations of end consumers connected to the gas transmission network	97,26	52 727	174 849

For more converted figures and details on the cost base changes please refer to section 8.

¹³ https://www.vmtg.md/images/Tarife/H_ANRE_nr._04-01-4201_din_23.08.24.pdf

¹⁴ <https://www.anre.md/anre-informeaza-despre-initier-3-473>

¹⁵ <https://www.anre.md/storage/upload/projects/announcements/tmp/phpHaF2MJ/Proiect%20tarif%20transport%202024%20.pdf>

¹⁶ <https://www.anre.md/anre-a-aprobat-tarifele-reglementate-de-intrareiesire-pentru-serviciul-de-transport-al-gazelor-naturale-prestat-de-catre-srl-vestmoldtransgaz-3-765>



Notes:

- The GCV conversion factor applied by ANRE is 10,60 kWh/m³.
- ANRE applies a capacity-weighted distance (CWD) reference price methodology (RPM) with equalization applying to all points per point group listed above.
- A flow-based charge is not applied, all costs shall be recovered by capacity-based tariffs.
- Currently there are no long-term capacity bookings at the main interconnection points.
- No multipliers are applied (as long as the uncertainty of capacity reservations is high) in order to ensure the highest level of flexibility for suppliers/traders to bring natural gas to the market of MD from any possible direction at any time of the year.

4.3 TBP product proposed

Additional to the consultation of the upcoming tariffs for firm and interruptible capacity products, ANRE consulted the introduction of a conditional capacity product into the network code:

Main purpose	Unlock additional volumes by attracting traders that want to use TBP reverse flow to store gas in Ukraine
Capacity type	Route-based product that does not include the Ukrainian section (Grebenyky-Ananiv)
Route	<ul style="list-style-type: none"> ■ MD entry Kaushany ■ MD exit Grebenyky ■ MD entry Ananiv ■ MD exit Oleksiivka
Booking constraints	Product only available when firm capacities sold out
Available capacity	6 mcm/d for the storage injection season (April-October)
Usage restrictions	<ul style="list-style-type: none"> ■ No VTP usage allowed ■ Nominations at all 4 points have to match ■ Even then, TSO may interrupt and curtail nominations <p>→ See specific conditions below</p>
Consulted tariff	353,91 MDL/1000m ³ → This tariff covers the whole product

The tariff is determined by taking a share of VMTG's cost base, adding incremental OPEX (Vulcanesti compressor station) and TTG costs for the additional transports:

$$TC_{cond_n} = \frac{CI_n \times \left(\frac{C_{cond_n}}{C_{total_n} + C_{cond_n}} \right) + CEE_n + COP_n}{C_{cond_n}}$$

- TC_{cond_n} : Tariff for the conditional product
- C_{cond_n} : Forecasted capacity for the conditional product
- C_{total_n} : Total forecasted capacity excl. the conditional product
- CI_n : VMTG infrastructure cost share (412,4 mio. MDL)
- CEE_n : Expenses for electricity and other incremental expenses
- COP_n : TTG network operating expenses

Notably, the costs and forecasted volumes for the firm capacity RPM would not be adjusted, so any revenues from the conditional product would lead to a certain amount of over-recovery. The reasoning was that to ANRE it was uncertain to which extent this product would be booked and they wanted to avoid a tariff revenue shortfall. The product was not yet introduced.



Specific conditions

The conditions are very similar to the ones of the “capacity with restrictions” product contained in Section IX, Chapter 8 of the GTS Code of Ukraine (see above).

No.	Condition	Remarks
1.	<i>The conditional capacity can be offered exclusively for pre-identified cross-border entry/exit points</i>	This refers to: <ul style="list-style-type: none"> ■ MD entry Kaushany ■ MD exit Grebenyky ■ MD entry Ananiv ■ MD exit Oleksiivka
2.	<i>The conditional firm capacity products shall be booked on monthly basis and at least equal to 6 mcm/day</i>	This reflects the physical constraints of UA GTS, however not necessary to mirror the constant flow requirement in MD.
3.	<i>The gas quantities injected in the transmission system at the designated cross-border entry points must be equal to the quantities extracted from the designated cross-border exit points during each gas day</i>	Standard restricted usage condition (though should refer to nominations, not quantities)
4.	<i>No access to the VTP</i>	Full VTP exclusion shall be avoided
5.	<i>The nominations/renominations for the use of the conditional capacity are confirmed by the TSO, after the confirmation of the nominations/renominations of the system users to whom the right to use the firm and interruptible capacity is contracted</i>	This makes the product interruptible of the highest degree, as even interruptible capacity nominations get prioritized fulfilment.
6.	<i>The gas quantities specified in the confirmed nominations/renominations may be unilaterally reduced by the TSO</i> <ul style="list-style-type: none"> ■ if there is no free capacity for the provision of such services ■ and/or it is necessary to perform renominations of system users who booked firm and/or interruptible capacity, ■ or to prevent an imbalance between these system users 	This condition makes the product interruptible of the highest degree.
7.	<i>TSO has the right to reject a nomination/renomination if the gas quantities specified in the nomination/renomination for the cross-border entry point do not correspond to the gas quantity specified for the cross-border exit point for using the conditional capacity. TSO has the right to interrupt, totally or partially, the transmission service if the conditions for allocating the conditional firm capacity are not met.</i>	Standard restricted usage condition (last sentence should refer to confirmation, not allocation of capacity)
8.	<i>The natural gas is transported under customs transit regime, in accordance with the requirements of the Moldovan Customs Code approved by Law no. 95/2021</i>	This condition is not necessary from a product definition perspective.
9.	<i>Conditional capacity can be used only when the adjacent TSOs from neighboring countries offer capacity under the same conditions</i>	This condition is not necessary from a product definition perspective.



5 Use Cases for TBP reverse flow

Based on stakeholder input (and respective product proposals) the following primary use cases were identified for TBP reverse flow usage. Additional use cases are not excluded and may be investigated at a later stage. Use cases will be referenced in subsequent sections of the report.

No.	Use case	Description	Capacity potential*
1	MD imports from South	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Physical import of gas quantities for the MD gas market ■ <u>Route</u>: Isaccea → Kaushany ■ <u>Constraints</u>: Currently constrained by gas quality specification mismatch at RO/UA border 	~10-11,5 mcm/d
2	UA imports from South: VRF	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Virtual reverse flow import of gas for the UA gas market in general ■ <u>Route</u>: Isaccea → Kaushany → Grebenyky ■ <u>Constraints</u>: Can only be used during times and to the extent of forward flow on the TBP 	~6 mcm/d (1 mcm/d can be transported firm)
3	UA imports from South: regional consumption	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Physical import of gas quantities to UA relying on regional gas consumption ■ <u>Route</u>: Isaccea → Kaushany → Grebenyky ■ <u>Constraints</u>: Limited by regional UA consumption as the gas quantities can not be transported further in other parts of the GTS 	~7 mcm/d (winter)
4	Injection into UA UGS from South	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Physical transport of gas from South via Isaccea and MD to UA gas storages ■ <u>Route</u>: Isaccea → Kaushany → Grebenyky → Ananiv → Oleksiivka ■ <u>Constraints</u>: 1 mcm/d can be transported on a firm basis, additionally there is a potential for ≥6 mcm/d that requires constant monthly physical flow 	>6-7 mcm/d
5	VRF injection into UA UGS via MD	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Virtual reverse flow import of gas from MD to UA gas storages ■ <u>Route</u>: Oleksiivka ■ <u>Constraints</u>: Can only be used during times and to the extent of forward flow on ACB (i.e. when MD is using UA storage) 	~0,3 mcm/d
6	Supply of MD near-border customers from South	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Physical supply of MD customers in Isaccea-Kaushany section from South ■ <u>Route</u>: Isaccea → Virtual exit point to near-border MD consumers ■ <u>Constraints</u>: Limited by consumption of near-border MD consumers 	~0,6 mcm/d
7	Supply of UA near-border customers from South	<ul style="list-style-type: none"> ■ <u>Main purpose</u>: Physical supply of UA customers in Isaccea-Kaushany section from South ■ <u>Route</u>: Isaccea → UA exit to DSOs ■ <u>Constraints</u>: Limited by consumption of near-border UA consumers 	~0,5 mcm/d



Co-funded by
the European Union

WECOM



* Please note that capacity potential is not additive, as many use cases compete for the same parts of the infrastructure.



Part II: Issues Description

6 Issues overview

Following the expert meetings, clarification requests and analysis of published materials (regulations, website information, presentations, ...) the following key issues were identified:

No.	Issue type	Issue summary
1.	Technical constraints	<ul style="list-style-type: none"> ■ Physical reverse flow possibilities very limited in general ■ Difficulty to fit technical constraints into simple commercial products in line with EnCS Acquis ■ Attractiveness of capacity products limited by conditions ■ Different gas quality specifications at Isaccea 1 / Orlivka for UA and RO side ■ Different use cases competing for technical capacity
2.	High combined tariffs	<ul style="list-style-type: none"> ■ Due to multiple border crossings for most use cases, entry/exit tariffs are applied several times. ■ Lack of long-term bookings (in particular to recover MD transmission system costs) ■ Regulatory framework (TAR NC) does not provide straight-forward tools to handle such a situation.
3.	Non-compliance of products initially developed by UA and MD	<ul style="list-style-type: none"> ■ Point-to-point products are in contradiction to the obligations of legally defined entry/exit-system-principles ■ Ex-ante capacity allocation of technical capacities to certain use cases is in contradiction to the legally defined capacity maximization principle and competing capacity allocation mechanisms.
4.	Alignment shortcomings	<ul style="list-style-type: none"> ■ UA GTS restrictions are incorporated into MD capacity offer without need. ■ The conditional product consulted for Moldova is based on the “capacity with restrictions” product in Ukraine, which is interruptible. ■ UA provides a discounted tariff (and supply option) for MD near-border consumers whereas vice versa this is not the case. ■ The amount of capacity offered in auctions for the TBP points was not fully aligned between TSOs.



7 Issue type 1: Technical constraints

The technical situation is outlined in section 2 and shows that there are severe technical constraints for reverse flows along the TBP, since it was not designed for this flow direction. The large-diameter pipelines are there, but the location and configuration of compressor stations puts strict limits on how much and how far gas can be transported, especially within Ukraine.

As a consequence, the TBP reverse flow potential strongly depends on usage patterns:

- Transports in forward flow enable TBP usage via virtual reverse flow (VRF). However, network users can renominate with effect taking place after 2 hours already, thus VRF can not be used reliably, especially for implementing larger supply contracts.
- Seasonal consumption in Odesa region creates limited additional import possibilities, since the gas does not have to be transported further along the Ukrainian GTS.
- Additional transport potential towards UA gas storages would be possible if the TBP is operated under a very specific physical flow pattern, i.e. a physical flow via Grebenyky-Ananiv-Oleksivka of at least 6 mcm/d for an extended period of time (at least a full month). Implementation of such a flow would exclude all physical MD imports from UA, except via Kaushany on top of the 6 mcm/d TBP reverse flow.

Note: In the course of this project new technical capabilities were developed by GTSOU and aligned with VMTG that allow for firm imports MD>UA of up to 1 mcm/d in reverse flow mode, starting from 1 September 2024 already.

Another technical constraint is the deviation between Ukrainian and Romanian gas quality requirements:

- Romania: National gas quality standards of Romania were influenced by the typical gas composition of natural gas produced domestically, notably by its lower methane content (<85%) while larger shares of higher hydrocarbons (e.g. ethane and propane) are present. The domestic gas production of Romania is connected to the transmission grid and can influence gas composition and physical/technical parameters (which already happened in the past) at interconnection points to other TSOs, thus Transgaz has to consider this in interconnection agreements and for the time being only offers interruptible capacity at exit Isaccea 1 / Orlivka.
- Ukraine: On the other hand, gas composition in the GTS of Ukraine has to be in line with requirements at the SK/UA border, thus a minimum of 90% methane content is required in the GTS Code. This would not be ensured if “low-methane” gas from Romania would be directed towards Slovakia. If the TBP gas at RO/UA border is coming from BG/RO border only (i.e. without Romanian domestic production gas blended into the exports to UA), there are in general no issues for GTSOU. In the past no interruptions of physical reverse flows were required by GTSOU.
- Historically, while in 2019 a methane content of 90% was agreed between Transgaz and GTSOU (mostly from the forward-flow perspective), at a later stage Transgaz decided that they can not offer firm capacity in reverse flow direction at this level. The issue is subject to continuous intermediation efforts via the CESEC platform and the European Commission, a solution is still to be found.
- The current GTSOU proposal is to exclude certain hydrocarbons component limits (e.g. methane, ethane, propane) in regulations and the interconnection agreement while keeping the GCV boundaries. This approach is already applied at the borders to Hungary and Poland.



8 Issue type 2: High (combined) tariffs

Based on current tariffs as provided in sections 3.2 and 4.2 above (and converted to common units €/MWh/d/a) it can be seen that transports are relatively expensive:

Point	Dir.	Ukraine		Moldova	
		Tariff* [€/MWh/d/a]	Eff. transport costs** [€/MWh]	Tariff [€/MWh/d/a]	Eff. transport costs** [€/MWh]
Ananiv	Entry	–	–	582,3	1,44
	Exit	263,0	0,65	673,3	1,66
Grebenyky	Entry	0,0	0,00	582,3	1,44
	Exit	263,0	0,65	673,3	1,66
Kaushany	Entry	0,0	0,00	582,3	1,44
	Exit	36,4	0,09	673,3	1,66
Oleksiiivka	Entry	143,3	0,35	582,3	1,44
	Exit	312,6	0,77	673,3	1,66
Isaccea / Orlivka	Entry	143,3	0,35		
	Exit	36,4	0,09		
VP near border MD	Exit	18,0	0,04		

* For “capacity with restrictions”, shorthaul coefficients for Grebenyky and Ananiv apply on top

** Assuming annual booking and 90% load

When analysing selected TBP reverse flow use cases, the high tariffs become even more visible:

Use case	Transport route	Tariff discounts	[€/MWh/d/a]		
			Tariff UA	Tariff MD	Total tariff
1	<u>to MD via:</u> ■ Isaccea ■ Kaushany	None	179,7	582,3	762,0 (1,9 €/MWh)
3	<u>to UA* via:</u> ■ Isaccea ■ Kaushany ■ Grebenyky	None	179,7	1255,7	1435,3 (3,5 €/MWh)
4	<u>to UA (UGS) via:</u> ■ Isaccea ■ Kaushany ■ Grebenyky ■ Ananiv ■ Oleksiivka	None	586,0	2511,4	3097,4 (7,6 €/MWh)
		a) UA shorthaul Grebenyky-Ananiv	325,6		2836,9 (7,0 €/MWh)
		b) UA shorthaul and MD cond. product		633,7	959,2 (2,4 €/MWh)

* up to 1 mcm/d can be used on a firm basis from 1 September 2024, additional imports depend on regional consumption and/or virtual reverse flow.



Explanation for the tariff discount variants:

- No discounts, i.e. the total tariff is determined by simply adding up the individual tariffs published.
- variant a) For Ukraine the shorthaul coefficients (0,01) according to NEURC Resolution No. 1855 of 9.10.2023 are applied to Grebenyky and Ananiv.
- variant b) Additionally, for MD the reduced tariff consulted for the conditional product is applied.

In summary, from the Ukrainian side already extensive discounts are applied in an attempt to alleviate the effect of multiple border crossings. Uncertainty remains concerning tariffs increases after the Russian gas transit contract ends on 31.12.2024.

Tariffs for the Moldovan transmission system are generally much higher than tariffs in the UA GTS. While historically tariffs along the TBP were low due to the age of transmission assets, the following factors contributed to the tariff development in the past years:¹⁷

- Merger of regulated revenues from MTG and VMTG:
 - Previously there were two TSOs, Moldovatrangaz (MTG) for the relatively old main transmission system (incl. TBP) and Vestmoldtrangaz (VMTG) for the relatively new Ungheni-Chisinau-Pipeline. As MTG failed unbundling, in 2023 VMTG was appointed as TSO for both transmission systems. In the according tariff decision of 27.10.2023 for VMTG, ANRE already combined regulated revenues of both TSOs, but MTG regulated revenues only concerned the time period 19.9.2023 - 31.12.2023.
 - In more detail, from VMTG regulated revenues of 342 mio. MDL (~18 mio. €), around 36% are associated to:
 - Cost of MTG lease agreement (remuneration for depreciation and regulated profit)
 - Cost of MTG maintenance contract
 - Cost for using Transnistria's gas networks (TTG)
 - From 2024 onwards, VMTG regulated revenues will fully include costs for MTG (~510 mio. MDL incl. TTG).
- General cost increase:
 - In comparison to 2022, where the combined regulated revenues of MTG (~377 mio. MDL) and VMTG (~226 mio. MDL) amounted to ~603 mio. MDL, in the August 2024 consultation combined regulated revenues (before underrecovery corrections) are ~779 mio. MDL, an increase of more than 29%.
 - While the merger should not significantly increase costs per se, specifically the MTG part increased by 35%.
- Compensation for previous underrecovery:
 - Since TSOs shall not lose or gain from under-/overrecovery, lower than expected revenues (due to low capacity bookings) in previous years are rolled-up and considered in future tariffs.
 - In the current tariff consultation this correction amounts to an increase of the regulated revenues by ca. 105 mio. MDL (~5,5 mio. €).
- Volume drop: Since the beginning of the Russian invasion of Ukraine, transport volume on the TBP dropped significantly, from ~20 bcm in 2021 to ~0,8 bcm (mostly domestic supply) in 2023. Due to

¹⁷ In combination, tariffs consulted for 2025 are more than 15x tariffs of 2018 (~58 €/MWh/h/a E+X)



this the booking forecast applied in the tariff consultation is mainly based on domestic supply and limited (but progressive) transit expectations due to absence of long-term bookings.

On the other hand ANRE attempts to avoid cross-subsidization of transit customers at the expense of domestic customers, i.e. by introducing discounts for transit that would lead to an even higher burden of domestic tariffs.

However, due to the single tariff for entry and exit point groups each (effectively almost a postage stamp RPM), distances of various entry/exit combinations do not seem to be reflected appropriately though, as the same transport cost apply to:

- Grebenyky-Kaushany → very low distance of roughly 80 km
- Ungheni-Grebenyky → around double the distance (roughly 160 km)
- Oleksiivka-Ananiv → more than double the distance (roughly 180 km)
- Oleksiivka-Grebenyky → around 3-4 times the distance (roughly 280 km)



9 Issue type 3: Non-compliance of proposed products

Point-to-point products are in contradiction to the Third Energy Package

A key component of EU gas markets under the Third Energy Package from 2009 was the introduction of entry/exit capacities which ensures the possibility for network users to acquire entry and exit capacity at interconnection points independently from each other. This principle was further refined in the network codes as transposed in the EnC Acquis, notably the rules on capacity allocation (CAM NC) and tariff methodologies (TAR NC) always refer to entry/exit capacities.

The following approaches shall be avoided in particular:

- Products that do not have a separate & independent entry or exit tariff, as would be the case for point-to-point products
- Products that comprise joint capacity allocation for multiple entry/exit points:
 - → Capacity at each interconnection point should be auctioned independently of every other auction process (except for competing capacity auctions).
 - → If several standard capacity products are offered during an auction, the respective allocation algorithm shall be applied separately for each standard capacity product when it is being allocated (i.e. no “competition” between products).
- Products that apply a “pay-as-used” tariff only (commodity tariff in e.g. EUR/MWh and a capacity tariff of zero)
- Product conditions/constraints that are not necessary from a technical point (e.g. unnecessary mirroring of constraints on both sides of the border)
- Conditional firm products where the extent of firm capacity usable is not clear ex-ante to the network user (i.e. curtailment possible after the renomination deadline for a certain hour)
- Introducing non-standard capacity allocation events:
 - Conducting auctions outside the standard calendar (e.g. allocating a certain product quality before/after auctions for entry/exit capacities take place).
 - Making the offer of a certain firm product conditional on the previous complete allocation of other firm capacities.¹⁸
- Full exclusion of VTP access shall be avoided, as this is a barrier to gas market development.

Note: In order to still be able to offer the maximum amount of firm transport possibilities for network users and at the same time appropriately reflect technical transmission system constraints, affected EU gas TSOs resorted to a different approach: They developed firm entry/exit capacities subject to certain conditions. This made it possible to offer and allocate such capacities as entry/exit products with VTP access to a varying degree, while network users would be in full control to ensure their firm usage.

¹⁸ This does not apply to the offer of standard products for interruptible capacity, see Art. 32 (1) CAM NC.



10 Issue type 4: Alignment mismatches

In general, over the past months involved parties (regulators and TSOs) held multiple meetings in order to jointly increase attractiveness of the TBP for potential transmission system users, where it was decided inter alia to make identical decisions on certain topics (tariffs, products, amounts). Nonetheless in some areas still further cooperation and alignment will be necessary.

Different legal approaches for conditional products

The Moldovan Gas Law enables the TSO to offer “conditional firm capacity” (*capacitate fermă condiționată*)¹⁹, while the current Ukrainian GTS Code enables the TSO to offer “capacity with restrictions” (*потужність з обмеженнями*)²⁰ which by nature is interruptible of the highest degree (compared to firm/interruptible capacity products).

In an attempt to mirror the Ukrainian capacity with restrictions approach, in the proposed modification to the Moldovan gas network code to introduce a conditional capacity product, ANRE more or less applied the provisions from the Ukrainian GTS Code. This created regulatory uncertainty, as the product would not be conditionally firm, as required by the Gas Law.

Furthermore, both UA and MD product definitions would not have covered the constant flow requirement to a sufficient extent.

Unnecessary mirroring of usage constraints

The main technical constraints (constant flow requirement, regional consumption) for TBP reverse flows along the transport route from Isaccea 1 / Orlivka to UA gas storages are associated to the Ukrainian GTS and thus should be reflected in the capacity products offered by GTSOU.

From VMTG’s operation perspective it is not necessary to have an integrated product spanning all 4 points (Kaushany, Grebenyky, Ananiv and Oleksiivka), as any nominations that can not be transported by GTSOU in full would be curtailed and via the “lesser rule” at the interconnection point matchings would automatically create lower confirmed nominations for the respective network user in the MD transmission system.

As long as gas is delivered by GTSOU at entry Kaushany to VMTG with the required pressure, VMTG should be able to transport and provide the gas at exit Grebenyky to GTSOU with the required pressure. The same holds for Ananiv-Oleksiivka.

Unexpected tariff increase for UA near-border customers

NEURC and ANRE in general aimed at aligning decisions to establish tariffs for a number of interconnection points for transmission system users.

However, in October 2023 ANRE increased transmission tariffs for VMTG²¹, thus total costs of gas transmission services through Moldova exceeded its previous level by more than 5 times, resulting also in increased costs to transport gas through Moldova for Ukrainian near-border customers. Since the required capacities are booked by the GTSOU, its costs increased but it could not adjust its own tariffs at this stage.

Reverse flow products

The implementation of TBP reverse flow products was discussed, but no common approach was notified before finalization of the project report.

¹⁹ Art. 72 (3) Law no. 108/2016 on Natural Gas

²⁰ Section IX, Chapter 8 (1) of the GTS Code

²¹ <https://www.anre.md/anre-a-aprobat-tarifele-reglementate-de-intrareiesire-pentru-serviciul-de-transport-al-gazelor-naturale-prestat-de-catre-srl-vestmoldtransgaz-3-765>



Part III: Recommendations

11 Recommendations overview

Based on the discussions with stakeholders (EnCS, ANRE, NEURC, GTSOU and VMTG) the recommendations for increasing the attractiveness of the TBP are structured in the following areas:



The following sections contain an overview of the recommendations for these areas, while the primary recommendation area is treated in more detail in section 16.

12 Category COM: Develop an attractive and compliant commercial model for TBP reverse flows

No.	Recommendation
Com1	<p>Implement conditional firm entry/exit capacity products that...</p> <ul style="list-style-type: none"> ■ ...reflect the technical constraints... ■ ...of the respective transmission system (only)... ■ ...in a transparent way for network users... ■ ...and maximize firm usage possibilities for the use cases identified. <p>Remark: Additional development is required in order to be able to potentially set up a constant flow product that is useful to network users and at the same time technically feasible for the TSOs while not excluding other transport use cases.</p>
Com2	<p>Create a VIP at Northern UA/MD border, thus:</p> <ul style="list-style-type: none"> ■ creating flexibility for network users and TSOs alike ■ simplifying tariffs ■ reducing booking complexity <p>The VIP would include Grebenyky, Ananiv and Oleksiivka, furthermore an inclusion of Lymanske could be beneficial.</p>
Com2a	<p><u>Interim measure:</u></p> <p>Optimize tariff discount possibilities available for conditional firm products to increase effective route tariff attractiveness compared to alternative routes (combined with introduction of the Northern VIP).</p>
Com3	<p>Introduce bundled capacity to simplify capacity auctions.</p>



No.	Recommendation
Com4	Develop and implement a comfort booking option on the booking platform that allows automated bidding for the same capacity amount per period for multiple interconnection points on a transport route. Such a mechanism could be implemented relatively quickly, thus reducing booking complexity already before introduction of VIP and bundling of capacity.

13 Category TAR: Develop competitive and cost-reflective tariffs

No.	Recommendation
Tar1	<p>Perform a route transport cost benchmarking that reflects the full transport costs for different use cases (based on their typical capacity product durations), i.e. covering:</p> <ul style="list-style-type: none"> ■ capacity tariffs ■ commodity tariffs (flow-based charges) ■ multipliers for products with a runtime shorter than a full year ■ seasonal factors ■ other transport-related costs (charges/levies, if any) <p>The objective of this benchmarking is to identify competing routes, their transport costs and the level of TBP tariffs required to offer a competitive transport alternative.</p>
Tar2	<p>Explain the cause for the overall high regulated revenues of VMTG and evaluate compliance of the cost increases with Regulation (EU) 2017/460 (TAR NC) and Regulation (EC) No 715/2009, in particular regarding the following principles:</p> <ul style="list-style-type: none"> ■ Network users should be able to understand the costs underlying transmission tariffs and to forecast transmission tariffs to a reasonable extent ■ Tariffs shall reflect the actual costs incurred, insofar as such costs correspond to those of an efficient and structurally comparable network operator ■ Tariffs for network access shall neither restrict market liquidity nor distort trade across borders of different transmission systems
Tar3	<p>Increase alignment for the near-border consumer tariffs, in order to avoid asymmetrical tariff effects and cost base recovery problems for TSOs due to abrupt and unharmonized tariff changes.</p> <p>Note: Creation of a VIP for the Southern border (Kaushany, DSO networks and direct consumers) could be investigated additionally in order to improve the near-border customer tariff situation.</p>
Tar4	<p>Discuss amendments to the tariff methodologies of TSOs/NRAs in the region to create more cost-reflective tariffs for transports from the Bulgarian to Romanian border compared to other transit routes through Romania.</p> <p>Background: Currently the same total transport costs apply for transport from Negru Voda (entry from Bulgaria) to:</p> <ul style="list-style-type: none"> ■ Isaccea (<200km) ■ Iasi/Ungheni (>400km) ■ Csanadpalota (>800km)



14 Category TEC: Unlock technical potential of the TBP

No.	Recommendation
Tec1	Implement no-regret investment projects already approved in the network development plan that enhance the capacity situation through increased gas flow dispatching options, e.g. by ensuring improved flexibility for usage of the different TBP lines (metering, valves, cross-connections,...)
Tec2	Continue investigation of technical capabilities of the gas transmission system in order to identify no-regret approaches that could lead to an increased offering of firm capacity or a relaxation of usage constraints for the use cases identified. → The development of a dynamic capacity calculation model could help in this regard so that the gas TSOs can calculate, at least for the day-ahead auction, additional (conditional) firm capacities to be offered.
Tec3	Follow up on the process to solve the gas quality issue with Transgaz, e.g. by: <ul style="list-style-type: none"> ■ removing gas composition limits for elements where those limits are not critical from a safety, technical or asset lifetime perspective (e.g. methane, ethane, propane – as long as the energy content (GCV) is in line with the required specifications) ■ investigating technical options for conditioning to improve compliance of gas quality ■ investigating the impact of importing Romanian gas quality (lower methane content) on local/regional consumers ■ adjustment of legal/regulatory prerequisites accordingly

15 Other recommendations

No.	Recommendation
O1	Increase operational alignment and capabilities (IT systems and organisational) for capacity allocation and nomination/renomination management between VMTG and GTSOU in particular regarding: <ul style="list-style-type: none"> ■ INT NC nomination/matching processes and data exchange ■ automated (near-realtime) verification of product condition fulfilment, including determination of interruptible parts and automated curtailment processes <p>These capabilities are crucial for marketing of short-term firm capacity and conditional capacity products.</p>
O2	Discussions with gas logistics companies should be continued to find a potential product/market fit for the constant flow capabilities in the future. <ul style="list-style-type: none"> ■ → In the event of an improved tariff situation large network users may take on the operational complexity and risks of the constant flow requirement to conduct its transports and realize gas market spreads between the Black Sea region and CEE. They could also offer a special logistics service (“chartered product” to collect sufficient transport demands or simply a swap) to other network users like new market entrants, smaller market participants and gas traders. This could attract new volumes while decoupling operational complexity & risks for the other network users. ■ → Another option could be for UTG to create a virtual storage injection possibility at the Romanian border and manage the transports as network user through the MD & UA gas transmission systems.



16 Details on the recommendations for the TBP Commercial Model

The high-level commercial model combines recommendations for:

- Capacity quality definitions
- Commercial points, in particular the introduction of a VIP at the Northern MD/UA-border
- Capacity quality offering per commercial point
- Bundling of the capacity offer
- Tariff principles for the capacity products
- Comfort booking option

16.1 Capacity quality definition

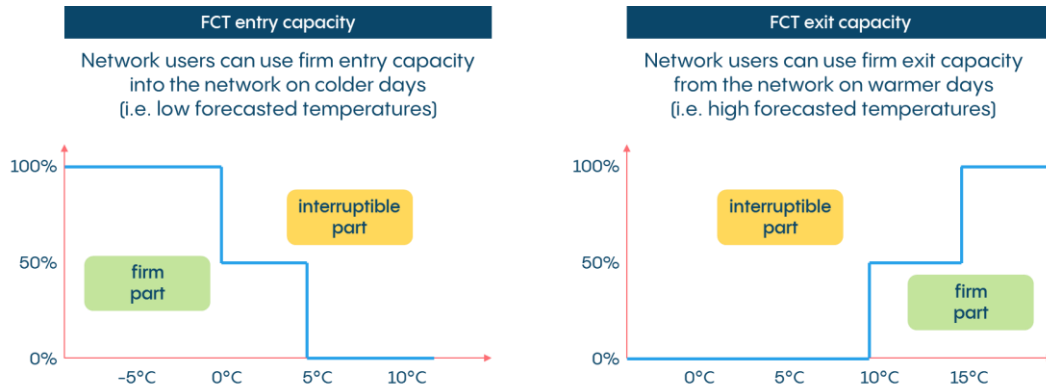
Abbrev.	Quality	Conditions	Short description
FC	firm	None (standard firm)	<ul style="list-style-type: none"> ■ Unrestricted, unconditional and firm entry/exit capacity (can only be interrupted in emergency) ■ Can be used for all purposes within the market area, including transferring/receiving the gas at the VTP
IC	interruptible	None (standard interruptible)	<ul style="list-style-type: none"> ■ Unrestricted, unconditional entry/exit capacity that can be interrupted at any time (following a specified lead time) by the TSO ■ Can be used for all purposes within the market area (including transferring/receiving the gas at the VTP), but carries risk of interruption
FCR	conditional firm	Combination restriction	<ul style="list-style-type: none"> ■ Can be used firm in combination with one or more predefined entry/exit points in the market area ■ Tbd.: Interruptible access to the remaining points (incl. the VTP)*
FCT	conditional firm	Temperature condition	<ul style="list-style-type: none"> ■ Combines a temperature-based FC part and a complementary IC part ■ The determination of the FC-part is finalised day-ahead (sufficiently in advance of the nomination deadline) ■ The IC part is the remainder of the booked capacity after subtracting the FC part. ■ Temperature condition can be any formula in principle, but should be dependent on a publicly accessible (day-ahead) temperature forecast.
VRF	interruptible	Virtual reverse flow	<ul style="list-style-type: none"> ■ Interruptible capacity that can be used conditional on the forward flow. ■ Can be used for all purposes within the market area (including transferring/receiving the gas at the VTP), but carries risk of interruption.

* Interruptible access to the remaining points (incl. the VTP) can be granted, however this entails higher initial implementation complexity.



Note: The constant flow product currently cannot be created as a firm (conditional) product, since the required constant physical flow for at least one month cannot be 100% ensured in conjunction with other network users' nominations, as the net physical flow would have to stay above the minimum required flow of 6 mcm/d.

Example for a FCT temperature condition:



There are multiple advantages of the FCT product compared to seasonal marketing (i.e. firm capacity in winter, interruptible capacity in summer):

- FCT can be booked as an annual product, thus reducing risk of gas suppliers to obtain sufficient capacity for the supply of their final customers.
- Seasonal marketing of a firm product needs to take into account a worst-case approach, i.e. if there would be a warm week during winter with low consumption, the TSO can not curtail firm entry nominations. Vice versa the summer product would be fully interruptible while on some days there could be firm potential.

16.2 Commercial points for the TBP

Abbrev.	Points covered	Direction	Short description
Isaccea 1 / Orlivka	■ Isaccea 1 / Orlivka	■ Entry ■ Exit	■ As currently (Romania/Ukraine South border)
Kaushany	■ Kaushany	■ Entry ■ Exit	■ As currently (MD/UA border South of Chisinau)
VIP UA/MD North → new!	■ Grebenyky ■ Ananiv ■ Oleksiivka	■ Entry ■ Exit	■ Covers both directions for the MD/UA northern border
UA virtual point for MD near border consumers	For example: ■ SP Cahul ■ SP Cimislia ■ SP Comrat ■ SP Taraclia ■ SP Tohatin	■ Exit	■ Distribution networks & final consumers of Moldova in the Kaushany-Orlivka section that are directly connected to the Ukrainian parts of the TBP

Note: Network access for exits to Ukrainian near-border customers (e.g. CS Tarutino, SP Bolgrad, SP Izmail, SP Reny,...) is currently not distinguishing between “main network” and “Kaushany-Orlivka section” from the perspective of suppliers:

- Suppliers book at GTSOU the virtual DSO exit point of the respective DSO and don't have to bother with the transport regime of the TBP. They supply their customers via the virtual DSO exits.



- GTSOU makes this possible by booking the required capacities from VMTG (entry Grebenyky and exit Kaushany), forecasting the DSO consumption in this section and nominating the required gas quantities at VMTG entry Grebenyky and VMTG exit Kaushany.

16.3 Introduction of the VIP on Northern UA/MD border

The main purpose for creating this VIP is to simplify booking, tariffs and usage of the 3 physical points involved:

- Grebenyky
- Ananiv
- Oleksiivka

Additionally the point Lymanske could be included in this VIP.

Since there are no long-term bookings at the physical points, transition to a VIP is much simpler than in a case where physical points have to be continued in parallel for usage of legacy capacity contracts.

Main advantages

- Network users don't have to worry about booking and nomination complexity between the 3 points
- Network users have usage flexibility
- TSOs can operate the infrastructure (ATI & ACB) in the most efficient way
- Infrastructure costs of the short transit paths are covered in the general cost base and tariffs of the respective TSO – just like any other intra-country transmission system section!

For entry from Romania at Isaccea 1 / Orlivka to exit at Ukrainian gas storages (→ use case 4) this would reduce the number bookings from previously 10 unbundled capacity bookings to 6 in the case of the VIP.

Overview of capacity products at VIP North

Gas market	TBP reverse flow	TBP forward flow
Ukraine	<ul style="list-style-type: none"> ■ entry FC: firm entry capacity (1 mcm/d from 1 September 2024) ■ entry FCR*: shorthaul to UA gas storages and/or international exits PL/HU/SK <ul style="list-style-type: none"> ■ → <i>effectively physical entry Oleksiivka</i> ■ entry FCT: supply of UA consumption in the Odesa region <ul style="list-style-type: none"> ■ → <i>effectively physical entry Grebenyky</i> ■ entry VRF: selling gas in Ukraine on interruptible basis 	<ul style="list-style-type: none"> ■ exit FC: can be used from all UA entries (imports, storage withdrawal, production, VTP) <ul style="list-style-type: none"> ■ → <i>effectively physical exit Grebenyky</i> ■ exit FCR: shorthaul from UA gas storages and/or international exits PL/HU/SK <ul style="list-style-type: none"> ■ → <i>effectively physical exit Oleksiivka</i>
Moldova	<ul style="list-style-type: none"> ■ exit FCR: from entry Kaushany ■ exit VRF: additional exit potential based on VIP entry 	<ul style="list-style-type: none"> ■ entry FC: can be used for all MD exits (domestic demand, exit Kaushany, exit Ungheni, VTP)

* This product can no be offered currently (constant physical flow for at least one month required).

VIP Interconnection Agreement

In order to implement the VIP an IA is required between GTSOU and VMTG that regulates in particular:

- offering of capacities at VIP



- usage of physical points depending on nominated products and coordination between TSOs to implement border-to-border flows “within VIP”
- allocations for network users

16.4 Capacity quality offering per commercial point

Note: Interruptible capacity can be offered at any point and is not included below for simplicity.

In the reverse flow direction, the following point/quality matrix is proposed:

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North UA/MD border	Entry		all UA points (incl. VTP)	shorthaul* to UGS etc.	Odesa reg. consumption	forward flow FCR exit I/O
		Exit	no	from Kaushany	no	forward flow FCR exit I/O
Kaushany		Entry	all MD points (incl. VTP)	no	no	forward flow FCR exit I/O
	Exit		no	from I/O	no	forward flow FCR exit I/O
VP MD (from UA)	Exit		no	from K or I/O	no	no
Isaccea 1 / Orlivka	Entry		no	to Kaushany	to VP MD	forward flow FCR exit I/O

Notes:

- * This product can not be offered currently (constant physical flow for at least one month required).
- For FCT the temperature-dependence of the corresponding regional consumption has to be determined, in order to offer a sufficiently large entry capacity that the TSO can transport also on a firm basis in all cases.
- The confirmation of VRF capacity usage has to safeguard consumption in the Kaushany-Isaccea section as well as internal consumption in Moldova, thus should be capped to confirmed FCR forward flow nominations for exit I/O. In VMTG’s case this requires the respective data from GTSOU.



In the forward flow direction, the following point/quality matrix is proposed:

Forward flow ↓	UA	MD	FC firm capacity	FCR usage restrictions	FCT temperature condition	VRF* interruptible virtual reverse flow
VIP North UA/MD border	Exit		all UA points (incl. VTP)	shorthaul from UGS etc.	no	no
		Entry	all MD points (incl. VTP)	no	no	no
Kaushany		Exit	no	from Grebenyky	no	no
	Entry		no	to I/O or VP MD**	no	no
VP MD (from UA)	Exit		no	from K or I/O	no	no
Isaccea 1 / Orlivka	Exit		no	from Kaushany	no	no

Notes:

- * An offer of virtual reverse flow is not relevant for the TBP forward flow direction, as there is firm capacity available in forward flow.
- ** These could also be two different FCR products (with separate tariffs).
- As an approach to handle supply of MD near-border customers (VP MD) internally, VMTG could book the respective capacity (UA entry Kaushany + UA exit VP MD) and nominate it according to forecasted consumption, analogous to GTSOU management of UA near-border customers. Costs incurred for booking this capacity shall be approved in the TSO cost base.



16.5 Bundled capacities

To further streamline the booking process, capacity can be bundled and marketed in competing auctions. The following bundles are proposed:

Point	Bundle	TBP reverse flow	TBP forward flow
VIP North UA/MD border	Competing firm bundle	Bundle 1 (<u>competing</u>): ■ <u>MD exit FCR</u> ■ UA entry FC Bundle 2 (<u>competing</u>): ■ <u>MD exit FCR</u> ■ UA entry FCR Bundle 3 (<u>competing</u>): ■ <u>MD exit FCR</u> ■ UA entry FCT	Bundle 1 (<u>competing</u>): ■ UA exit FC ■ <u>MD entry FC</u> Bundle 2 (<u>competing</u>): ■ UA exit FCR ■ <u>MD entry FC</u>
	VRF bundle	■ MD exit VRF ■ UA entry VRF	n.a.
Kaushany	Firm bundle	■ UA exit FCR (from I/O) ■ MD entry FC	■ MD exit FCR (from VIP)* ■ UA entry FCR (to I/O)*
	VRF bundle	■ UA exit VRF ■ MD entry VRF	n.a.
	Supply bundle	n.a.	■ MD exit FCR (from VIP) ■ UA entry FCR (to near-border exit VP)

Notes:

- * The amount of capacity offered in this firm bundle shall be reduced by the capacity set aside for the Kaushany supply bundle, if two different FCR products would be introduced (see above).
- Bundling of different capacity qualities is admissible, e.g. bundling of firm exit capacity with conditional firm entry capacity.
- Marketing as bundled capacity still entails separate contracts with each TSO, subject to the respective terms and conditions (UA and MD network codes).
- This means that capacity product descriptions may be different theoretically, however to increase attractiveness for market participants they should be aligned as much as possible.
- Capacity can only be bundled per (physical or virtual) interconnection point, not across different interconnection points.



16.6 Tariff principles for the TBP capacity products

EU regulation in general does not specify guidelines/requirements for determination of conditional firm product tariffs (apart from the general requirements of cost-reflectivity, non-discrimination and transparency). Art. 4 (2.) TAR NC simply states that “Transmission tariffs may be set in a manner as to take into account the conditions for firm capacity products.” so regulatory authorities and TSOs are quite free to determine tariff principles for these products, considering stakeholder input and attractiveness of the routes.

Capacity product	General tariff principles
FC	Tariffs for firm capacity are determined in line with the RPM (e.g. CWD approach). This includes application of benchmarking tariffs in line with TAR NC Art. 6 (4)a to enable competitive tariffs (see below).
FCR	Tariffs for firm capacity with combination restrictions shall be based on the FC tariff, applying a discount that reflects the generally lower amount of infrastructure used, but at least 10%.
FCT	For these capacities a fixed discount factor (e.g. -20%) to the FC tariff could be introduced. Further analysis is required for the definition of the temperature function, which can be a factor in deciding the overall level of the discount.
VRF	There is no specific calculation methodology predefined by TAR NC and no harmonized approach of EU TSOs exists to calculate these tariffs ²² . <ul style="list-style-type: none"> ■ The tariff should be lower than the lowest firm tariff at same point. ■ The historical and/or forecasted level of forward flows could be taken into consideration when defining the VRF tariff discount. In the current situation the discount is expected to be relatively high.
IC	Tariffs for interruptible capacity are determined in line with the RPM, i.e. <ul style="list-style-type: none"> ■ a) based on an ex-ante discount that reflects interruption probability ■ b) based on an ex-post discount in case no historical interruptions occurred

Application of benchmarking tariffs:

According to TAR NC Art. 6 (4)a, adjustments to the RPM tariffs may be made based on benchmarking, whereby reference prices at a given entry or exit point are adjusted so that the resulting values meet the competitive level of reference prices. Benchmarking is applied by multiple TSOs in the EU in order to increase route attractiveness and as the ultimate goal, overall booking revenues. In order to determine the competitive level of reference prices, the following general steps have to be taken:

- selection of competing routes to consider
 - different routes and variants may have to be investigated
- determination of full transport costs along the route:
 - capacity tariffs reflecting multipliers for products with a runtime shorter than a full year and seasonal factors according to the use case
 - commodity tariffs reflecting usage assumption (load percentage of booked capacity)
 - other transport-related costs (charges/levies, if any)
- implications on TBP tariffs (points, reserve prices, multipliers and seasonal factors)

²² E.g. Fluxys Belgium applies a tariff of ~89% for VRF at entry Blaregnies L compared to other entries



16.7 Comfort booking option

The introduction of the VIP North (section 0) including bundling (section 16.5) will already greatly simplify the complexity for network users, as it integrates three physical interconnection points into one virtual interconnection point. In use case 4 the number of required bookings would be reduced from 9 unbundled entry/exit capacity bookings down to 3 entry/exit capacity bookings.²³ Before these steps have been fully implemented (but also afterwards), a comfort booking option can quickly contribute to better accessibility of the TBP route for network users.

The general idea of a comfort booking mechanism is to reduce booking complexity and ideally minimize risks of stranded bookings for network users. However, regulatory compliance must be maintained – in particular, results from the auction algorithms as defined in CAM NC must not be altered for this purpose. CAM NC Art. 17 (20) explicitly states: *All network users who have placed valid volume bids at the clearing price shall be allocated the capacity according to their volume bids at the clearing price.* → This means that “coupled approaches” where network users would like to book an identical capacity quantity along a transport route spanning multiple interconnection points can not be guaranteed by a comfort booking mechanism, because it would require reducing their allocated quantities at all selected points to the same (minimum allocation of all involved auctions) value, even for auctions where allocation had already been performed before. Thus the risk for each network user that one (or multiple) of its auctions involved result in a quantity below its other allocation results (thus creating excess capacity for the affected network user at these points) can not be fully excluded. It would also not be compliant with CAM NC to perform “route auctions”, i.e. where a single auction procedure covers multiple interconnection points.

What remains is the possibility for a selection-based but decoupled comfort booking option:

- When participating in a capacity auction at an interconnection point, the network user may select a set of additional points (according to the intended transport route), for which the platform will duplicate the bid quantity across all selected points for the network user.
- For the ascending clock auctions this would also apply to any subsequent auction rounds (if any): After a round has ended, the network user will determine the adjusted capacity bid for all desired points that are subject to an additional round.
- All auctions will run decoupled (independently from each other), so the network user may be left with excess capacity at some points, depending on success in other points' auctions.

The following auction algorithms should be considered for application of comfort booking:

- Ascending clock algorithm: (potentially) multiple rounds for allocation of yearly, quarterly and monthly capacity products
- Uniform price algorithm: single round for allocation of day-ahead and (firm) within-day capacity products

In combination the following four components would significantly enhance comfort for network users and increase route attractiveness:

- virtual interconnection point
- bundled capacities
- comfort booking option

²³ unbundled entry Isaccea + bundled entry/exit Kaushany + bundled exit/entry VIP North



- automated bid option²⁴

Notes on IT implementation of the comfort booking option

Such a mechanism may be implemented in IT systems relatively quickly and at low costs. The specific IT implementation requirements have to be developed first and could follow the following guidelines:

- The user experience could comprise a context-based list of auction IDs, i.e. all suitable auctions potentially involved in a transport path (including alternative capacity qualities) based on a selected auction point and product period. Alternatively, as a first step, there could simply be an option to manually enter auction ID(s) to simultaneously apply the bid quantity to.
- For this comfort booking mechanism it is not relevant to choose a specific point or participate in an auction for a specific route. For the example of use case 4 (injection into UA UGS from South), the option to apply the bid quantity across multiple auctions could be selected in any of the route point auctions: Isaccea, Kaushany and VIP (or in its absence, the individual points Grebenyky, Ananiv and Oleksiivka).
- Before a bid with the comfort option is accepted, additional checks may be required (e.g. bid quantity should not exceed offered capacity at any of the auctions).
- After submitting an auction bid with comfort booking enabled, both from the user perspective and the auction algorithm it should look like a “normal” bid was submitted for all the additional auctions selected. This also applies to the single-round uniform-price algorithm, where a network user may submit up to 10 bids per auction.
- In case of additional auction rounds (i.e. if demand exceeded availability) the network user may be given the option to apply the new bid quantity to all other previously selected auctions that are subject to an additional round.

Example:

For use case 4, a network user currently would have to participate in 9 auctions to acquire the capacity for the full transport route. With the comfort booking option a single bid is sufficient to participate in all initial auction rounds at the same time:

²⁴ general requirement of CAM NC Art. 7 (6): TSOs shall provide network users with the option to enter bids automatically against any price step



	Point:	Product:	from / quality:	to / quality:
Auction ID 1	Isaccad1 / Orlivka	Dec '24 (unbundled)	Transgas	GTSO / FCR
Auction ID 2	Kaushany	Dec '24 (unbundled)	GTSO / FCR	VMTG
Auction ID 3	Kaushany	Dec '24 (unbundled)	GTSO	VMTG / FC
Auction ID 4	Grėbenyky	Dec '24 (unbundled)	VMTG / FCR	GTSO
Auction ID 5	Grėbenyky	Dec '24 (unbundled)	VMTG	GTSO / FCR
Auction ID 6	Ananiv	Dec '24 (unbundled)	GTSO / FCR	VMTG
Auction ID 7	Ananiv	Dec '24 (unbundled)	GTSO	VMTG / FCR
Auction ID 8	Oleksiivka	Dec '24 (unbundled)	VMTG / FCR	GTSO
Auction ID 9	Oleksiivka	Dec '24 (unbundled)	VMTG	GTSO / FCR

...offering TSO

Auction ID 1

Bid quantity: 100 MWh/h

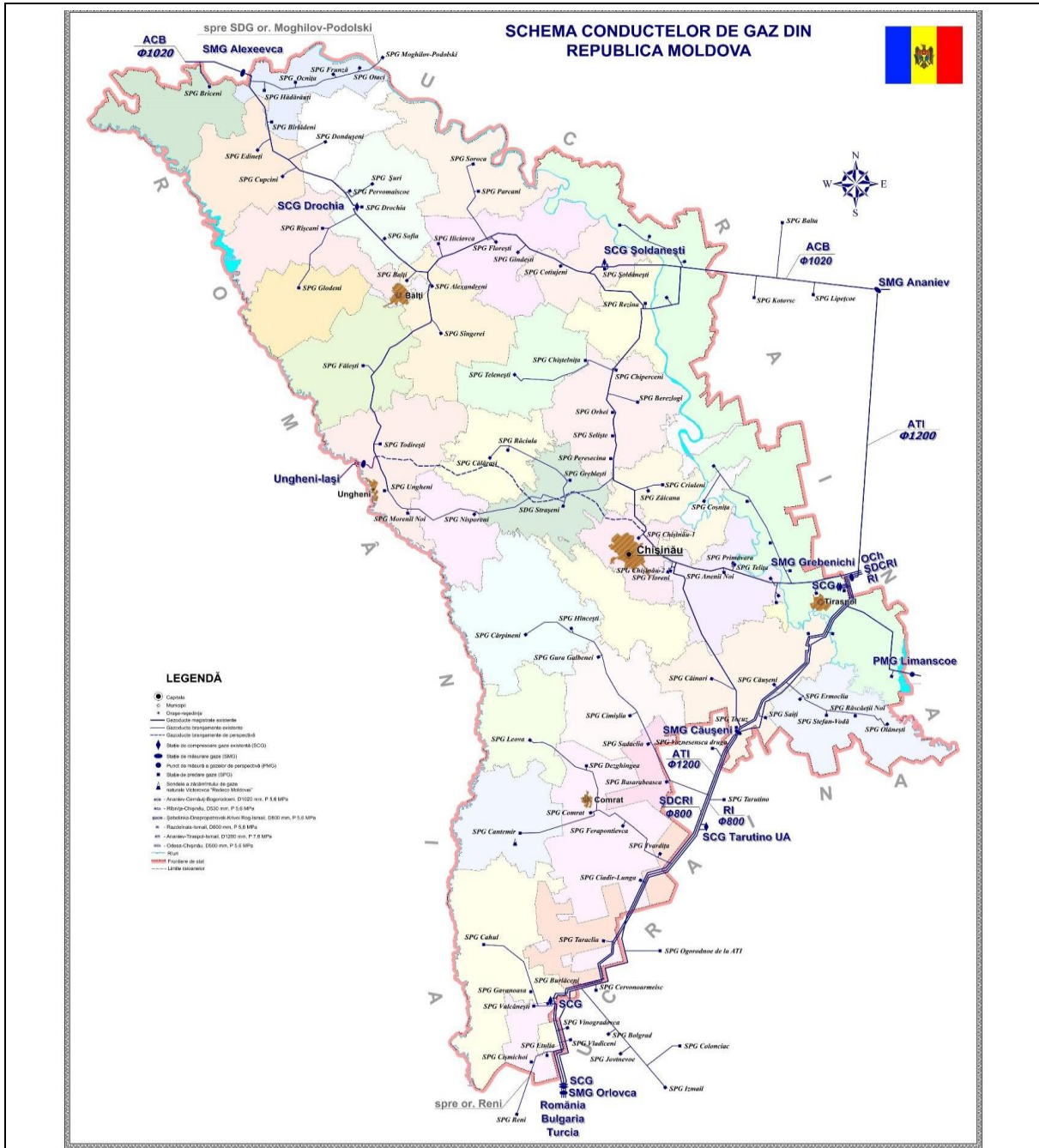
Apply bid to additional auctions for the same product:

Auction ID 2	<input checked="" type="checkbox"/>
Auction ID 3	<input checked="" type="checkbox"/>
Auction ID 4	<input checked="" type="checkbox"/>
Auction ID 5	<input checked="" type="checkbox"/>
Auction ID 6	<input checked="" type="checkbox"/>
Auction ID 7	<input checked="" type="checkbox"/>
Auction ID 8	<input checked="" type="checkbox"/>
Auction ID 9	<input checked="" type="checkbox"/>

Submit bid



Annex 1: Detailed MD Transmission Network Map



Interconnection points MD/UA:

- Grebenyky (ATI, RI/ŞDKRI)
- Kaushany (ATI, RI/ŞDKRI)
- Lymanske (Tiraspol-Odesa-3)
- Ananiv (ACB)
- Oleksiivka (ACB)
- Virtual exit point to UA consumers (17 points, for the full list see nr. 13 in Annex 1 of ANRE decision nr. 624 of 27.10.2023)

Interconnection points to Romania:

- Ungheni (MD-RO)
- Isaccea 1 / Orlivka (UA-RO)

Domestic exit points in MD:

- 96 exit points to distribution systems (for the full list see Annex 2 of ANRE decision nr. 624 of 27.10.2023)
- 11 exit points to directly connected final consumers (for the full list see Annex 3 of ANRE decision nr. 624 of 27.10.2023)



Annex 2: Mapping between use cases and capacity products used

The following tables outline the application of the capacity products in the use cases defined (see section 5 above) in order to provide more clarity about their purpose. All tables are based on TBP reverse flow and only contain the capacity products involved in the respective use case.

Note that these tables were based on the status quo before the introduction of the new possibility of 1 mcm/d firm entry from MD>UA.

Use Case 1: MD imports from South

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry					
		Exit				
Kaushany		Entry	all MD points (incl. VTP)			
	Exit			from I/O		
Isaccea 1 / Orlivka	Entry			to Kaushany		

Use Case 2: UA imports from South: summer VRF

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry					forward flow FCR exit I/O
		Exit				forward flow FCR exit I/O
Kaushany		Entry				forward flow FCR exit I/O
	Exit					forward flow FCR exit I/O
Isaccea 1 / Orlivka	Entry					forward flow FCR exit I/O



Use Case 3: UA imports from South: winter consumption

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry				Odesa reg. consumption	
		Exit		from Kaushany		
Kaushany		Entry	all MD points (incl. VTP)			
	Exit			from I/O		
Isaccea 1 / Orlivka	Entry			to Kaushany		

Use Case 4: Injection into UA UGS from South

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry			shorthaul to UGS etc.		
		Exit		from Kaushany		
Kaushany		Entry	all MD points (incl. VTP)			
	Exit			from I/O		
Isaccea 1 / Orlivka	Entry			to Kaushany		

Use Case 5: VRF injection into UA UGS via MD

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry			shorthaul to UGS etc.		
		Exit				forward flow FCR exit I/O
Kaushany						
Isaccea 1 / Orlivka						



Use Case 6: Supply of MD near-border customers from South

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry					
		Exit				
Kaushany		Entry				
	Exit					
VP MD (from UA)	Exit			from K or I/O		
Isacceca 1 / Orlivka	Entry				to near-bor- der exit VPs	

Use Case 7: Supply of UA near-border customers from South

Reverse flow ↑	UA	MD	FC firm capacity	FCR combination restriction	FCT temperature condition	VRF interruptible virtual reverse flow
VIP North	Entry					
		Exit				
Kaushany		Entry				
	Exit					
Isacceca 1 / Orlivka	Entry				to near-bor- der exit VPs	

Example for implementation of VIP in the use case “UA UGS injection from South”

→ In analogy to GTSOU’s product 4 proposal. Nomination & gas flow management in this case has to consider:

- exit MD: FCR restricted to Entry K → automatically associated to exit G
- entry UA: FCR restricted to Exits UGS++ → automatically associated with entry O
- VMTG and GTSOU thus know the flow requirement $G > A > O$ and steer accordingly (maybe even create “ghost” nominations at respective physical points)



Annex 3: List of Abbreviations

Abbrev.	Explanation
ACB	Ananiv-Cernauti-Bohorodchany pipeline
ANRE	National regulatory authority of Moldova
ATI	Ananiv-Tiraspol-Izmail pipeline
DSO	Distribution network operator
FC	Firm capacity
FCR	Firm capacity with combination restrictions
FCT	Firm capacity with temperature condition
GTS	Gas transmission system of Ukraine
I/O	Issacea 1 / Orlivka interconnection point (UA/RO)
IC	Interruptible capacity
LNG	Liquefied natural gas
NEURC	National regulatory authority of Ukraine
RBP	Regional booking platform
RI/ShDKRI	Rozdilna-Izmail, Shebelynka-Dnipro-Kryvyi Rih-Izmail
RPM	Reference price methodology
TBP	Trans Balkan Pipeline system (in the project context)
TSO	Transmission system operator
GTSOU	Gas transmission system operator of Ukraine
VIP	Virtual interconnection point
VMTG	Vestmoldtransgaz
VP	Virtual exit point to distribution networks & direct consumers
VRF	Virtual reverse flow
VTP	Virtual trading point
CAM NC	Network code on capacity allocation mechanisms
TAR NC	Network code on tariff setting methodologies