

Ukraine – Unbundling options for gas transmission and storage¹



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This task is implemented by Economic Consulting Associates Ltd

Executive summary

Unbundling options and key implementation steps

The aim of this assignment is to support the Government of Ukraine and NJSC 'Naftogaz of Ukraine' (NAK) with assessing a few suitable restructuring options for the transmission, storage and production business lines of NAK and developing a feasible and reasonable implementation plan for the restructuring model that the Government will choose based on the assessment. This report deals with the unbundling of the transmission system operator (TSO) and the storage system operator (SSO). The assignment is supported as part of the European Commission-World Bank Gas Trust Fund and under the World Bank managed Energy Sector Management Assistance Program.

This note summarizes the first part of the assignment covering transmission unbundling and linkages to storage unbundling, and an outline implementation plan; a second stage of the work will cover the analysis of restructuring options for production and storage (as further related to production). The note is supported by draft reports (in power point format) covering the unbundling options and proposed approach for the TSO, the SSO and linkages between transmission and storage unbundling.

Unbundling options for gas transmission

Conformity with the European Union's (EU) Third Energy Package (3EP) requires transmission unbundling and recognises three main models: ownership unbundling (OU), independent system operator (ISO) and independent transmission operator (ITO) options. The Ukraine Gas Market Law (GML) only allows the OU and ISO (not ITO) options, but for completeness all three models are assessed as part of this assignment.

¹ This work is being done as Task 1 of the joint EC-WB Facility to support the Ministry of Energy and Coal Industry of Ukraine and NJSC 'Naftogaz of Ukraine' on advisory services and technical assistance for the reform and modernization of the natural gas sector.

The views in this report constitute the consultant's views and do not necessarily reflect those of the World Bank or the European Commission.

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There are a number of factors that could be constraints on the choice of the model and need to be taken into account in any unbundling option. A key feature of the transmission system is that Ukraine's domestic gas consumption and Gazprom transit volumes to the EU are of roughly similar sizes and use the same transmission assets. The transit activity is governed by a transit agreement between Gazprom and NAK and can probably not be directly assigned to any new TSO². Another factor is that the transmission and transit infrastructure is not separated. Finally, the Ukrainian legislation prohibits privatization of the main gas transportation pipelines; they must be owned by a state entity.

The key differences of the three unbundling models are that, in the OU model, system operation and transmission assets are under common ownership and control (as well as being fully separated from production and supply), whereas in the ISO model the ownership of transmission assets (and hence investment) are separate from the system operator. In the ITO model the system operation and assets remain in the vertically integrated company but must be effectively ring-fenced from supply; this is difficult to achieve. Whichever model is adopted, good corporate governance is needed to ensure effective implementation and transparent operation.

NAK itself had originally considered both the ISO model and the OU model but more recently has proposed the OU model, with the aim to establish a new company under a separate owner which could ultimately attract a private partner. There is broad consensus among other stakeholders for the OU model but with different views on ownership (e.g. locating the management of shares at the Ministry of Energy and Coal Industry (MECI), the Ministry of Economic Development and Trade (MEDT), or the State Property Fund of Ukraine (SPFU), which currently acts as owner of the transmission assets). Another area of discussion is whether to establish a new transmission company or retain the Ukrtransgaz (UTG) structure, which includes storage.

Comparison with nearby EU countries has shown that a mixture of models have been adopted. However, many of the operators in the larger and more mature EU markets have implemented the OU model, which is more compatible with efficient and effective market competition – a direction in which Ukraine seeks to go. Several others have implemented the ITO model but this is not permitted under the GML.

This study, after carrying out a further assessment against a range of criteria, continues to recommend the OU model. The assessment and comparison of the three unbundling models has been carried out against six criteria. These include compliance with 3EP (including the facilitation of transparency of operation and decision-making), consistency with EU practice for relevant comparators, efficiency with respect to operation and future investment, and ease of implementation. The six factors (see table below) have been used to evaluate each of the unbundling options (ITO is included in the comparison for completeness though, as noted above, is not an allowed option under the GML). The resulting assessments are shown in the table below, indicating support for the overall preference for OU.

² An alternative would be to maintain the transit contract between NAK and Gazprom, with NAK then having a back-to-back agreement with the TSO. This would avoid the need for obtaining Gazprom consent for assigning the contract (or avoiding arbitration), but could limit the possibility of introducing changes, for example, to the tariff setting regime from distance and volume based tariffs to entry-exit tariffs.

Rating against each assessment criterion						
Unbundling options	1. Compliance with 3EP	2. EU practice	3. Efficiency of operation and investment	4. Ease of implementation	5. Facilitation of further NAK restructuring	6. Attracting future JV/ equity partner
OU						
ISO						
ITO						

Although it is not superior on all criteria, the balance of assessment is in favour of OU. Specifically, the OU model is the preferred 3EP model as it maximises the potential for greater independence and non-discrimination in system operation and investment; it fully integrates investment, long run planning and short run operation of the system and provides incentives to make capacity available to facilitate more trading; it is likely to be more robust to the future evolution of the gas industry (greater competition and interconnection with EU markets); and it is more conducive to attracting investment compared to an ‘asset-light’ ISO model.

The ISO model, on the other hand, requires additional and robust regulation especially of transmission investment; it is not commonly adopted in the EU especially among large TSOs; it creates interface problems between asset ownership and operation; and it is generally perceived to risk under-investment in the transmission system. Finally, the ITO model, although it is adopted in several other countries, is the least consistent with the principles of independence, non-discrimination and transparency; it may result in limiting investments which would benefit competitors; it is unlikely to further the reform and transformation of the gas sector in Ukraine as it is inconsistent with the reform objectives of the stakeholders (including NAK and MECI); it may stifle the development of competition; and it does not encourage private sector participation. Moreover, its implementation would require amending the Ukrainian Gas Market Law which could have adverse consequences in the current political situation.

The prevalence of the OU model among countries that have structures and markets to which Ukraine aspires, indicates the longer term benefits of the approach, even though the ITO (not permitted under the GML) and ISO models may be simpler to implement in the short term. Notably, countries with larger and mature gas markets (such as the Netherlands, Spain and the UK) have adopted the OU model, while some other EU countries that started with ITO have since (at least partly) moved to the OU model: e.g. France (one out of two TSOs), Germany (the largest TSO) and Italy.

Nevertheless, implementing the OU model will pose a number of practical implementation challenges for Ukraine. These include whether to set up the model by spinning UTG out of NAK or setting up a new company, the transfer or other arrangements for the transit contract, entitlement to the transit revenues, which public bodies will own the unbundled parts of NAK, and how to ensure effective separation of exercising the ownership function for transmission from the ownership function for production and supply in the sector by the respective public bodies.

Unbundling options for storage

The 3EP is less prescriptive in terms of unbundling options for storage compared with transmission though it does require that storage facilities are able to provide access to all users on a transparent and non-discriminatory basis. This can be achieved within a variety of ownership and structural options (including being part of a group that owns either transmission or supply activities) but the essence of the requirements are that SSOs are legally separate from production and supply and have operational independence³ from other affiliates (including, especially in this context, transmission).

In the context of considering the various restructuring options for the gas sector in Ukraine, the study examined unbundling options for storage. The current analysis is partial (linkages with production have not yet been specifically considered) as it is mostly focused on linkages of storage with transmission, which should be considered when selecting the appropriate unbundling model for the TSO. The key linkages are the need to coordinate in a transparent way the provision of information on transmission and storage, available capacities and the instructions for dispatch of those capacities, including cross-border capacities where relevant.

Key factors for the effective operation and use of storage relate to the type of storage facilities, the opportunities and demand for storage in the current and expected market conditions, the pricing and value of storage, and its regulation. The main drivers for considering storage unbundling relate to the unique factors in Ukraine; the exceptionally large amount of storage, the role it plays in both domestic and transit support, promoting its more effective use within Ukraine's developing market but also the potential opportunities arising from integrating with the EU markets.

Ukraine has nearly 31 billion cubic meters (Bcm) of gas storage capacity, the largest working volume in Europe, although its usefulness is limited by the type of storage (mainly depleted gas fields and some aquifers, which have low deliverability and is therefore of more use for long term seasonal storage than short term trading), the limited connectivity with EU markets and the current narrow spread of gas prices in Europe. Key areas where Ukraine needs to introduce change or strengthen storage within its gas sector is transparency in terms of pricing and information availability, accessing the available storage and associated transmission and cross-border capacity, ensuring withdrawal, coordination with the TSO for transmission and cross-border trade, and offering low prices to compete. This has to be considered against the background of the current 'virtual storage' arrangements whereby users have insufficient visibility of where their gas is stored or what constraints might apply to its withdrawal and delivery.

Of Ukraine's 31 Bcm of storage, only about one quarter (7 Bcm) has relatively high withdrawal rates. The latter capacity is potentially attractive as a trading asset; though this has to be offset against the difficulties of switching between injection and withdrawal that the nature of the facilities – all either depleted fields or aquifers –

³ Operational independence is not unambiguously defined in the EU directive or the relevant interpretive note issued by the European Commission. Our understanding is that operational independence would require separate management and accounts (i.e. functional and accounting unbundling). This facilitates transparent and non-discriminatory third party access (as required by 3EP) and charging for storage services independently of other gas market activities and functions (again, as also required by 3EP).

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dictates. In practice, the facilities will primarily perform a seasonal storage role, unlike salt caverns that exist elsewhere in Europe and which are much more suited to rapid switching. Nevertheless, there may be significant potential for the volume of relatively faster storage to support commercial activity and trading, especially given the large number of facilities. However, for this potential to be realised, there needs to be a significant improvement in transparency and commercial security of operations. Discussions with traders from nearby countries indicate that there is very little confidence that gas put into store in Ukraine can be tracked with a level of transparency that gives undisputed title whilst being stored and ultimately withdrawn on time, including access to the needed transmission and cross-border capacity.

Nearby countries provide contrasting examples of how to manage their systems: storage operations in Hungary have lacked transparency and hindered commercial use of storage, with a major facility initially being privatised but then bought back. Uncertainty over levels of state mandated strategic storage have further undermined confidence. Nearby Slovakia, on the other hand, has two operating storage facilities providing transparent and secure commercial services to traders, efficiently coordinated between transmission and storage operations.

Storage in Ukraine is also very important for the transit activity, with gas from Russia being put into the system at the Eastern border and taken out from transmission or storage at the Western border. This integration between transit and domestic use of transmission and storage has been an important feature of the integrated use of the system; for the time being, facilitating transit activity through coordination of transmission and storage may still be a role that is required and could have a significant influence on the future use and operation of the system. Some interlinkage between the storage necessary for transit (if defined) and the TSO would therefore seem logical.

If storage stays within the NAK group, it will be closely associated with the production and supply functions of NAK. Ensuring transparent and non-discriminatory use of storage by competing suppliers in Ukraine may be difficult and there will be concerns over information confidentiality. Furthermore, leaving storage within NAK while the TSO is unbundled would imply an early restructuring of UTG, together with the associated issues of ensuring coordinated operation of transmission, transit and storage.

The study has identified 4 main options for unbundling storage; together with sub-options, there are 7 main combinations of ownership and structure that can be evaluated. In all cases, and consistent with the preceding analysis for transmission, it is assumed that the TSO will be ownership unbundled from the NAK group. The storage restructuring options assessed are the following:

- Option 1 NAK owns and operates the storage system operator (SSO) as a legally and operationally separate entity
- Option 2 Storage is transferred to be in a structure with the ownership unbundled TSO, with three structural variants:

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- Option 2a SSO is a division in a joint company with the TSO; the joint company is ownership unbundled from NAK. It could be an ownership unbundled UTG or a new holding company⁴
- Option 2b SSO is a division of a holding company which is ownership unbundled from NAK and which owns the legally unbundled TSO
- Option 2c HoldCo owns the SSO and TSO as two separate subsidiaries, legally and operationally unbundled from holding company, which is ownership unbundled from NAK
- Option 3 The SSO is a separate OU entity owned by a private company or state entity⁵ independent of the owner of NAK
- Option 4 Storage is split into one or more ownership unbundled SSOs; with dedicated capacity for the TSO's use
- Option 4a Storage is split into two (or more) ownership unbundled SSOs; one is dedicated to use by, and owned by, the TSO
- Option 4b One ownership unbundled SSO, but with a minimum amount (say 2 BCM⁶) of gas storage capacity dedicated to the TSO.

These options have been evaluated against two sets of criteria: General ease of implementation and support to the market; and storage specific factors:

- The **general criteria** are:
 - Meeting the requirements for compliance with 3EP and national legislation
 - Ease of implementation, the extent to which costly and time-consuming corporate restructuring is required
 - Support to development of a competitive market, through non-discriminatory access to storage and promoting investment in capacity to support trading
 - Transparency; timely availability of accurate information, open access to capacity and execution of instructions
- The **storage specific criteria** are:
 - Security of supply to the domestic market, assurance of storage and withdrawal capacity to meet seasonal and peak demand
 - Facilitating cross-border trade
 - Improving efficiency of storage operation/use, monetising the value of storage

⁴ In each of variants of option 2 the holding company could be a new special purpose company or UTG separated from NAK. The choice will depend on the practicalities of separating UTG from NAK, i.e. whether there are complications with such issues as other assets or activities not directly related to the TSO and SSO, contracts, liabilities etc

⁵ In each of the models in option 3 and the variants of option 4 the State Investor could be a new company separate from production and supply or ownership unbundled UTG.

⁶ The TSO requires an amount of storage for priority operational purposes; it could be a little more or less than around 2 Bcm – this figure is for illustrative purposes only.

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- Attracting investors in storage facilities

Using these criteria, we have assessed the 4 options and variants, below:

Options	Medium scoring options				Higher scoring options		
	1 NAK subsidiary owns and operates storage	2A SSO and TSO are divisions of a combined company	2B SSO is division of a holding company (TSO is indep.)	2C SSO and TSO separately owned by a holding company	3 Independent SSO	4A Two SSOs (one with TSO)	4B One SSO with dedicated volume for TSO
Compliance with 3EP and national legislation							
Ease of implementation							
Development of a competitive market							
Transparency							
Security of supply							
Facilitating trade							
Improving efficiency of storage operation/use							
Attracting investors in storage facilities							

Green = positive impact, red = negative impact, circle size = size of impact

The suitability of each option for Ukraine depends also on the relative importance of each criterion; they are not all of equal relevance and value. Nevertheless, based on a simple ‘addition’ of the evaluations in the above analysis, the higher scoring options are option 2c (Holding company owns both TSO and SSO, in effect an unbundling of main parts of UTG), or option 3 (independent SSO); these are indicated with the highest evaluations.

The medium scoring options are 2a, where the TSO and SSO are both divisions in a combined or holding company (this could of course be UTG) which is ownership unbundled from NAK, and option 2b (SSO is a division of a holding company, TSO is legally separate from it). These options are ones without a potentially conflicted owner (either NAK in option 1), or the complication of two (or more) SSOs or dedicated storage (options 4a and 4b).

Another consideration is the potential for synergies from the coordination of transmission and storage in promoting efficient trade and use of storage, such as ensuring that the system remains sufficiently stable and secure, and that shipper and consumer actions do not impede the efficient functioning of the system or result in pressure reductions or supply interruptions. These benefits are more likely in the options that retain storage and transmission under common ownership (Options 2a, 2b, 2c and 4a), although these same synergies could theoretically be achieved through contracts under the other options.

A constraint for the first step of unbundling is that currently storage and transmission operate together in UTG. The distraction of needing to (rapidly) unbundle from UTG both the storage and transmission operations simultaneously could jeopardise timely

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3EP compliance for the TSO. Therefore, it may be relevant to consider as a first step an option that is easy to implement and enables further unbundling of the storage operations later on.

Options 2a or 2b could be a practical first step for the unbundling of storage operations. Based on the evaluation, it supports the development of the gas market fairly well and it also has a path to further restructuring, i.e. full separation of the TSO and SSO into separate companies, potentially attracting private JV or equity partners to each in the future. In this scenario, the other more highly evaluated options - 2c (Holding Company) and 3 (Independent SSO) – could be adopted in the second stage..

There are still many practical and unresolved issues to deal with to reach a fully unbundled system. These include regulatory issues such as transition to alternative tariff regimes, the treatment of shared costs, the relationship between transmission and storage tariffs, assessment of the real asset base including non-core (storage) assets. There are also valuation and ownership issues for some assets, and issues of identifying and separating activities within UTG. All of these indicate that there are likely to be considerable implementation costs.

An approach which reflected the need to deal with the number and nature of unresolved issues, and spread the cost and effort of unbundling over a reasonable period, could have some merit. The overall unbundling process could then be viewed as a two-step approach, with a **transition to full unbundling** being accomplished in two steps, such as: adoption of option 2b for TSO unbundling in the first instance, followed by transition to one of options 2c or 3 (say after 3-5 years). This approach is examined more fully in the next section.

Recommended transitional structure for the gas sector

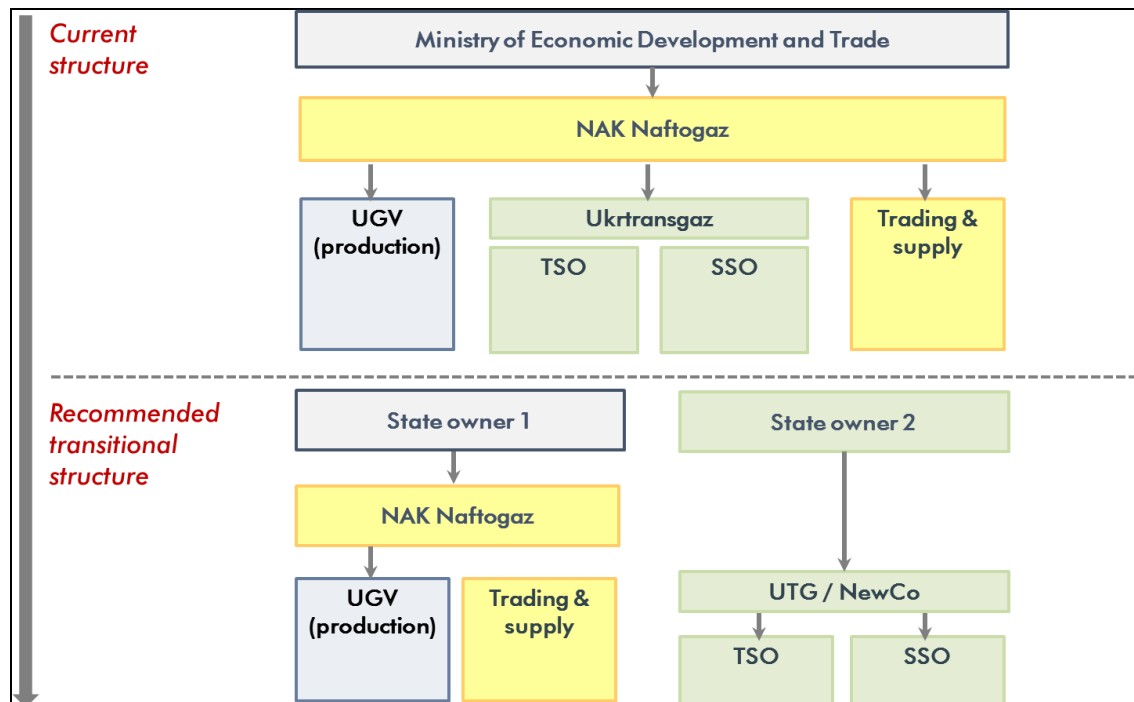
The long term aim of the reforms embarked upon in Ukraine's gas sector is to establish a fully competitive market. Fulfilling this objective requires the implementation of a large number of measures, some of which have already been planned and/or executed, including the adoption of new enabling legislation (the Gas Market Law) in conformity with the EU's 3EP, the adoption of phased pricing reforms to eventually establish cost-recovery across the entire value chain and greater integration with the EU market.

The restructuring and unbundling of gas transmission and storage should be viewed in the same context, that is, as **an important step in removing barriers to (or, conversely, enabling) future market development, competition and private sector participation**. While there is currently no agreed and shared vision among key stakeholders of the preferred structure for Ukraine's gas sector in future, it is important that the immediate unbundling decision for transmission and storage is consistent with the overall objective of introducing competition and that it does not preclude the possibility of further industry restructuring in keeping with this aim.

In light of this, and the evaluation of the unbundling options for both transmission and storage discussed above, the proposed transitional structure for the gas sector is depicted in the figure below. The top panel shows the current structure, an integrated monopoly (of key gas market activities) under the Naftogaz group, while the bottom panel shows the recommended transitional structure. The arrow running along the left-

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hand side of the figure demonstrates that this is part of an evolutionary process toward a more competitive market structure (yet to be defined).



As shown in the figure, **the recommendation is that the transmission and storage functions are contained as separate divisions or legal entities in a corporate entity that is separate from the production and supply functions of Naftogaz.** This entity can be the existing Ukrtransgaz (but legally separated from NAK) or a new company ('NewCo'), but in either case the shareholder ('State owner 2') and management of this company must be separate from and independent of the owner of Naftogaz ('State owner 1'). The proposed structure:

- Is **consistent with the evaluation of the unbundling options** against the agreed criteria eg it adopts ownership unbundling for transmission and ensures storage is operated independently of both trading activities and system operation
- **Recognises practical constraints and imperatives** such as the need to:
 - complete the unbundling by June 2016 in accordance with the 'Gas Sector Reform Implementation Plan'
 - minimise the unnecessary duplication of ownership and operating arrangements (at least in the short term)
 - ensure the continued and stable operation of the gas system during a period of large structural change
 - in the case of storage, make a more informed decision when the current financial and technical status of the facilities is better understood

- **Does not preclude the possibility of further restructuring** in the future such as entirely separating transmission and (some or all) storage and/or ‘unbundling’ production from supply, if this is perceived or assessed to create improved preconditions for efficient operation, market development and the attraction of private investment.

Key implementation steps

Implementation of the recommended structure requires careful planning and entails a number of actions and prerequisites, the most important of which are listed in the table below. These would necessarily follow a decision of the Cabinet of Ministers of Ukraine to adopt the proposed industry structure and which would, we assume, clarify:

- the identity of the owners of the two corporate entities (Naftogaz and the combined TSO-SSO company, respectively)
- whether UTG would be retained (albeit as a company that is ownership unbundled from Naftogaz) or whether the TSO and SSO functions would be undertaken by a newly established company.

We note that the table below should be treated as a high level guide – there is significantly more detail required to fill out the implementation plan, while some steps (eg development of network and storage codes) may have already been completed. The actions also focus on those needed for the establishment of the proposed transitional structure. Once this phase is completed, and after a period of integrated operation of transmission and storage, further work will be required to determine and implement additional restructuring and the adoption of the ‘final’ target structure for the gas sector.

Implementation area	Rationale/comments
Legislation	
Prepare and submit to the Energy Community Secretariat (ECS) a proposed plan for effective unbundling, compliant with the Gas Market Law	ECS is the relevant authority for confirming that the unbundling model conforms to 3EP requirements. Early approval will ensure timely implementation, that unbundling is undertaken with certainty and the provision of a positive opinion as part of the formal certification process (see further below under 'Regulation')
Amend any laws (eg Law on Pipeline Transport, Law on the Management of State Property Assets) and prepare or finalise secondary legislation (network and storage codes, tariff methodologies) that is required to ensure unbundling is effectively implemented	Various legal amendments will or might be required to ensure (i) the unbundling complies with the requirements of the Gas Market Law (including for the effective separation of public ‘bodies’ exercising control over the different companies), and (ii) the operating framework of the regulated companies and the conditions for accessing transmission and storage infrastructure are in place
Regulation	
Design and implement a programme for building regulatory capacity	An independent and authoritative regulator is critical to certify the unbundling process, set cost-reflective tariffs, provide ongoing incentives for efficient operation and investment and ensure that only efficient costs are charged to users. The objective of the capacity

Implementation area	Rationale/comments
	building would be to ensure that the regulator can competently and effectively undertake these critical tasks
Certify the unbundling model and submit to ECS for approval	Under 3EP and the Gas Market Law, the TSO must apply for certification with the national energy regulator, which in turn must submit its certification decision to the ECS to provide its opinion on the certification procedure
Assess and set allowed revenues for transmission and storage	If not already undertaken, the regulator must determine the allowed revenues and approve the regulated tariffs for transmission and storage. This is important for both transparency purposes and for ensuring the financial independence of the regulated entities (as required by 3EP)
Commercial and organisational	
Establish TSO-SSO company with clear management structure and operating procedures	Irrespective of whether UTG is unbundled or a NewCo is formed, the TSO-SSO company must be self-standing ie it must have the managerial, administrative, financial and staff capacity to operate independently and at arms-length of Naftogaz or other entities, and employ effective operating and management procedures
Establish a corporate governance framework for UTG or 'NewCo' in accordance with OECD Corporate Governance Principles	This is being developed with EBRD support and is important for both the empowerment of the board and management of the TSO-SSO company and for the effective governance of the chosen ownership entity
Transfer pipeline and storage assets	The ownership of the underlying assets must be unambiguous and clearly be vested in the transmission and storage company (UTG or NewCo) or the underlying shareholder entity (relevant Ministry or other public body such as the SPFU)
Undertake due diligence of UTG contracts and assets	This is more important in the event of a NewCo being established, but must be undertaken in any case to clarify the current condition of the assets, to ensure that all contracts required for operation of the assets are in place and that contracts and assets associated with non-TSO and SSO activities are identified and separated
Undertake technical and commercial due diligence of storage assets and operations	The current status, marketability and hence value of storage is highly uncertain. Further decisions regarding the pricing and restructuring of storage (including the possibility of decommissioning some assets) require a detailed technical and commercial audit
Allocate transit revenues	Transit revenues are currently earned by Naftogaz as party to the contract with Gazprom that expires in 2019. A mechanism is needed to ensure that some or a portion of these revenues flow to the TSO-SSO company, consistent with the new tariff methodology for transmission services
Separate TSO and SSO (and other activities)	While TSO and SSO services are proposed under the transitional structure to remain in a single company, operational independence is necessary and any shared costs must be transparently allocated. Also, the costs of other regulated or unregulated activities undertaken by the TSO-SSO company must be clearly identified and not recovered through transmission and/or storage tariffs

As mentioned above, the unbundling of the integrated TSO-SSO company is likely to be an initial (although significant) step in gradually moving from a monopolistic to competitive gas market with increased participation of the private sector. Hence, the completion of this unbundling phase is likely to be followed by:

- A period (say, one year) of **integrated operation of transmission and storage**, in order to ensure system stability, strengthen the capacity of the regulator, establish the independence of storage operations and to clarify the respective costs of transmission, storage and other non-core activities (if any) of the combined TSO-SSO company
- **Preparation for the separation of (some or all) storage from transmission** – this can be undertaken in parallel with the period of integrated operation and would be informed by the suggested technical and commercial audit (see table above). The preliminary view is that most (or possibly all) storage can be unbundled from gas transportation (although some storage could remain with the TSO if essential for system stability and subject to 3EP conditions), while current storage operations are likely to require significant rationalisation
- **Establishment of new companies** – subject to the outcome of the preceding preparation phase, the new TSO and SSO companies would be established with their own management and operating procedures (in practice, this is likely to apply just to storage while the TSO should be able to operate and be organised as before). This step could be implemented within 3-6 months after the initial one-year period of integrated operation
- **Invitation for private sector participation** – the final step would entail preparing the companies for private sector participation, and inviting and selecting appropriate joint venture partners (additional 6 months).