WHEN TRUST MATTERS

Future Regulation on Natural Gas Networks
Study conducted by DNV for ACER

Dr. Konstantin Petrov
Presentation for ERRA Natural Gas Markets and Economic Regulation Committee

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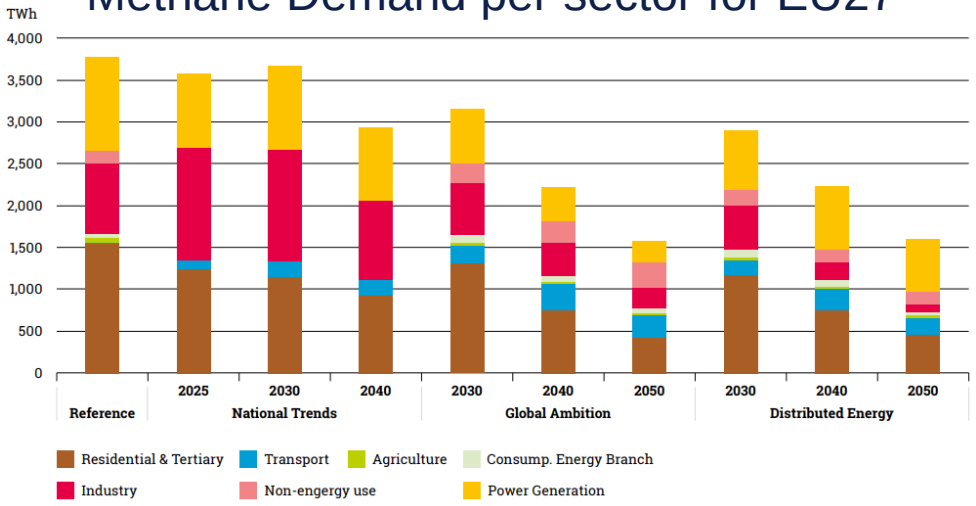
Background and Objectives

Decarbonisation and Energy Transition

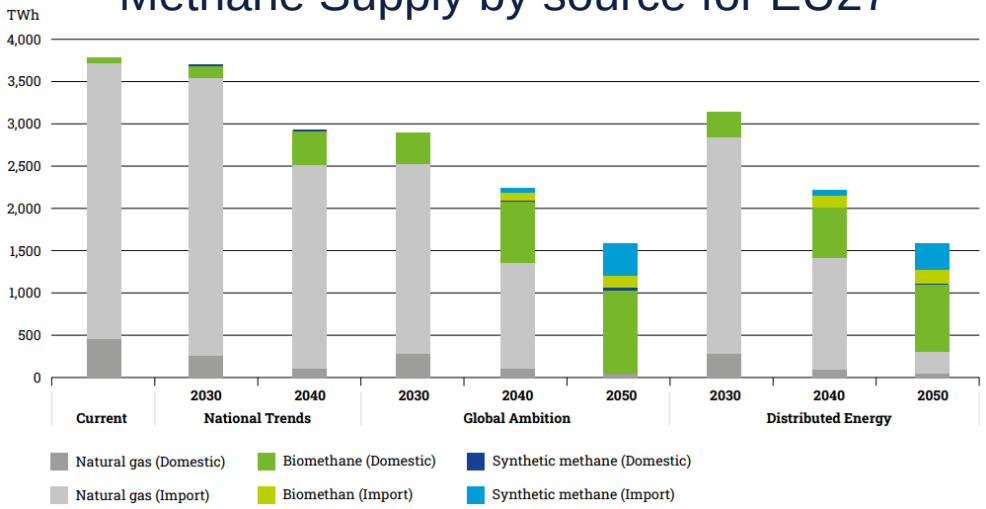
European and national decarbonisation plans point to permanent decline of natural gas demand.

Methane Demand per sector for EU27



Source: ENTSOG and ENTSOE, TYNDP 2022, Scenario Report, Version April 2022

Methane Supply by source for EU27



Source: ENTSOG and ENTSOE, TYNDP 2022, Scenario Report, Version April 2022

Decline of natural gas demand → Shift and decline of natural gas volumes transported via the TSO networks

Renewable Gases and Substitution

The future consumption of natural gas will be partially replaced by renewable gases (biomethane and hydrogen) and partially substituted by electrification and energy efficiency.

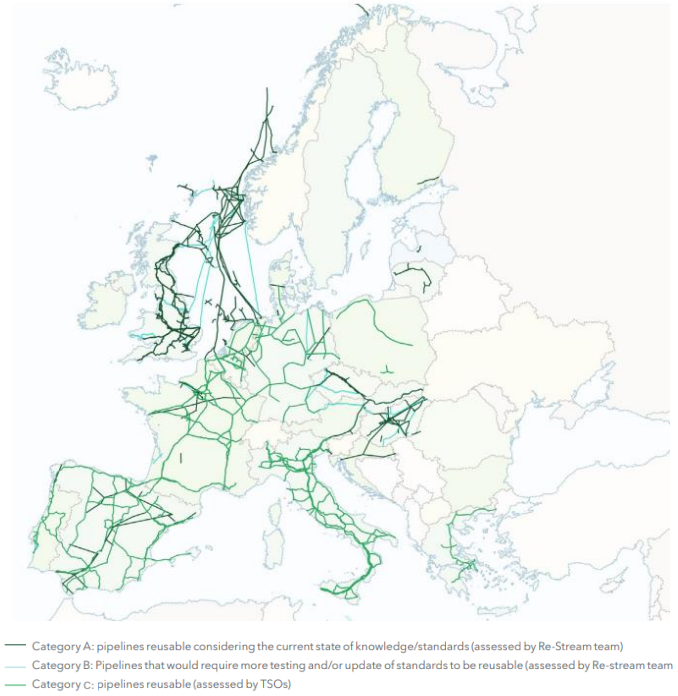
Future use of natural gas transmission network assets

Transport of hydrogen	Transport of (bio)methane	No further use
Repurposing	Reinvestment and extended use	Decommissioning

Uncertainty on when and how much each case becomes relevant

Regulation should address all three cases

Possible reuse of current pipeline network for transport of hydrogen



Source: Carbon Limits and DNV (2021), Re-Stream – Study on the reuse of oil and gas infrastructure for hydrogen and CCS in Europe

Objective and Approach

Objective	Analysis of the regulatory challenges and possible regulatory solutions of repurposing, decommissioning and reinvestments of natural gas transmission assets in the context of decarbonisation (decline of natural gas demand)

Structure

- Regulatory Challenges
- Status Quo
- Regulatory Concepts
- Recommendations

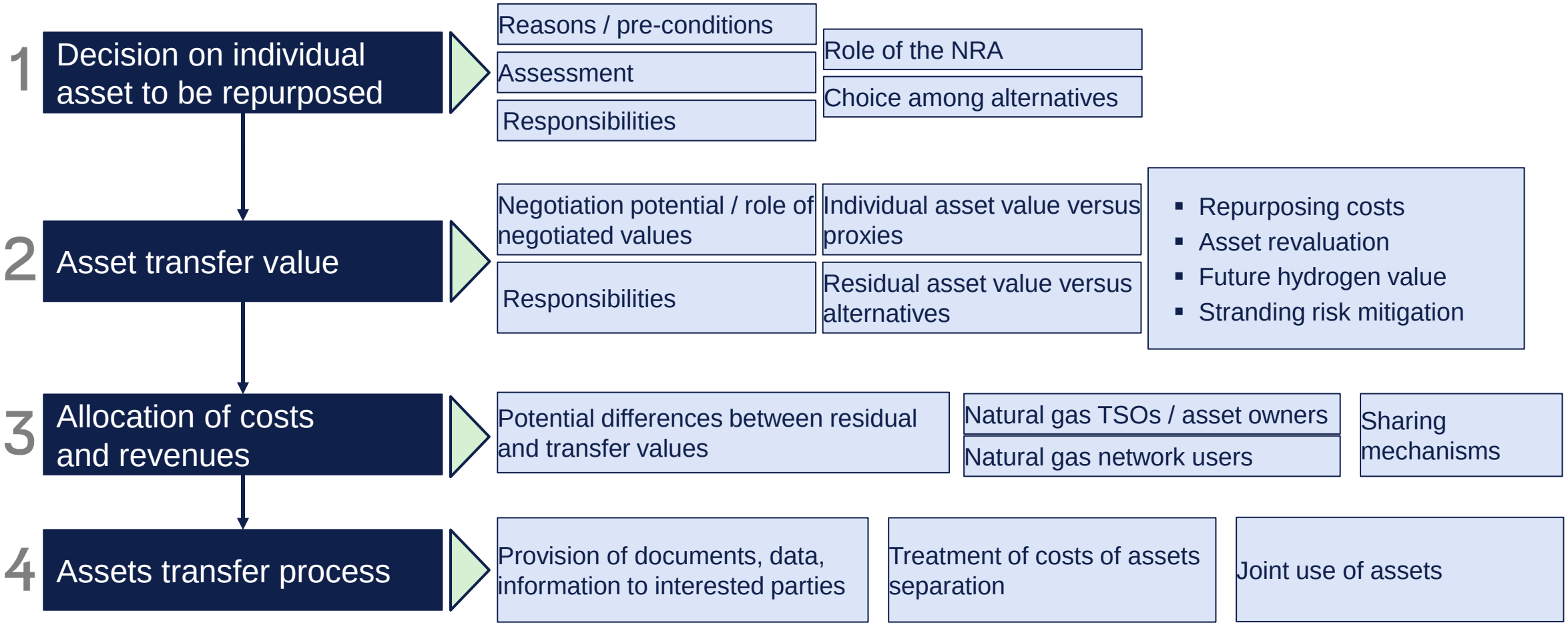
Main Components

- Literature Review
- Case Studies
- NRA / Stakeholder Surveys
- Bilateral Calls with NRAs / TSOs
- Data Collection
- Conceptual Analysis

Regulatory Policy on Repurposing

Assets Repurposing / Main Regulatory Questions

Repurposing is defined as conversion of individual natural gas network assets for transport of hydrogen and the transfer of these assets to the respective hydrogen network operator.



Assets Repurposing / Possible Solutions

Natural gas network assets should be repurposed when there is a need for hydrogen transport and the repurposing project is technically and operationally feasible.

Reasons / pre-conditions

Needed for transport of hydrogen ✚ Technically feasible ✚ Operationally feasible

- The use of individual network assets has been permanently discontinued.
- Any existing residual use can be shifted to other pipelines or routes.

Assessment

- Assessed by the TSOs according to regulatory guidelines
- Identification / definition of induvial repurposing projects
- Review by the NRAs as part of the review of the NDP

Adjust / expand the natural gas Network Development Plan (NDP)

- Scenarios on the regional demand and supply of natural gas
- Analysis of the expected future utilisation of individual assets
- Analysis of the possible shift of the residual utilisation
- Analyse of the potential impact of the repurposing project
- Close coordination with the NDPs for hydrogen and electricity

Assets Repurposing / Possible Solutions

Natural gas network assets may also be repurposed, when the repurposing project exhibits net economic benefits.

Reasons / pre-conditions

Needed for transport of hydrogen ✚ Technically feasible ✚ Very low residual use on an individual natural gas pipeline that cannot be shifted to other pipelines or routes

but

It could be more beneficial, when comparing costs and benefits, to stop the transport of natural gas on an individual pipeline and to repurpose this pipeline for the transport of hydrogen.

Assessment

Conduct Cost-Benefit Analysis (CBA)

- Impact on reliability of supply for the residual network users
- Compensation to the residual users (disconnection / reconnection)
- Depending on the specific case there may be conflicting areas with the obligation to connect.

- Comparison of the costs and benefits of the repurposing project with the construction of new hydrogen network infrastructure
- CBA can be conducted jointly by the natural gas and hydrogen operators (or initially by the natural gas TSOs)
- CBA methodology and parameters to be defined by regulation
- Review by the NRAs

Assets Transfer Value / Perspectives

Parameters affecting the price at which the natural gas TSO is willing to sell the assets

- Residual asset value of the individual asset in the network RAB
- Costs of feasibility studies and adaptation
- Costs of past investments to ensure that the assets can be used for hydrogen transport
- Costs to put and keep assets in a mothballed status when their use has been discontinued at an earlier point of time
- Cost associated with the separation and transfer of assets
- Costs of stranding and physical decommissioning and the recovery mechanism (by the natural gas TSOs, network users or by the state budget /taxpayers)
- Costs associated with assets that may stay in operation and eligible for inclusion in the allowed revenues
- The degree of competition in the transfer process (negotiations with a single or several parties interested to become hydrogen network operators)
- Expected value of the assets for the hydrogen network operator

Parameters affecting the price which the hydrogen network operator is willing to pay

- Current and expected future capacity needs for transport of hydrogen on the existing routes
- Expected residual technical and economic lifetime of the assets used to transport hydrogen
- Adaptation costs to enable transport of hydrogen
- Costs and time needed for the construction of new infrastructure to enable hydrogen transport
- Willingness of customers to pay for the use of hydrogen infrastructure
- Government support for the development of hydrogen infrastructure
- Specific location / role of the individual natural gas assets on the planned routes of the hydrogen network / possibility for the hydrogen network operator to choose among alternative natural gas assets
- The degree of competition in the transfer process
- Expected value of the assets for the natural gas TSO.

Assets Transfer Value / Possible Solutions

The asset transfer value should be established according to explicit regulatory guidelines whereas the residual asset value incorporated in the RAB would serve as a reference point.

Main Principles

- Preparation of regulatory guidelines to establish asset transfer value
- Application of the asset valuation methods used to establish the RAB of the natural gas network
- Use of the residual asset values incorporated in the RAB of the natural gas network as a reference value
- Consideration of the additional repurposing costs of the natural gas TSO

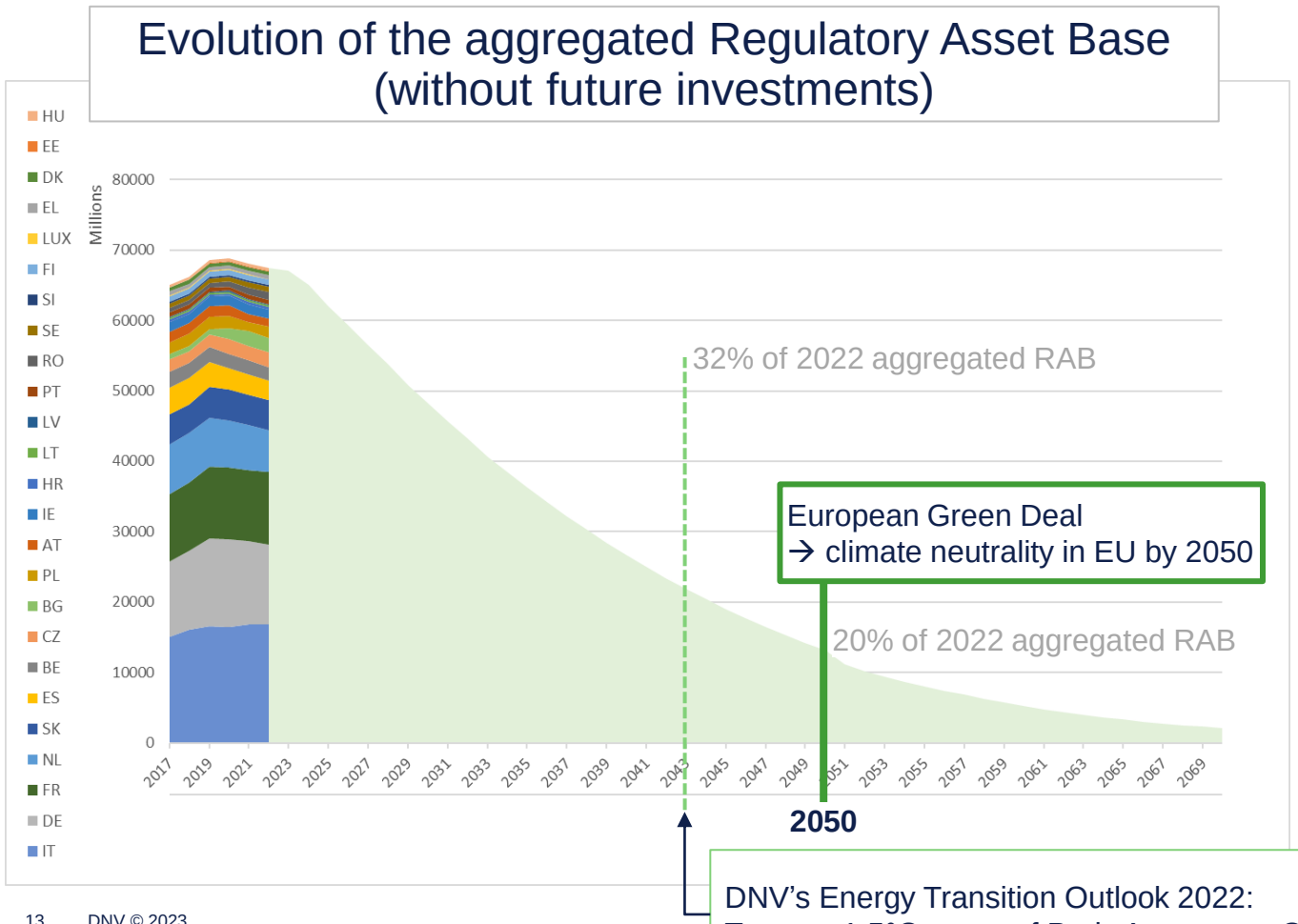
Specific Aspects

- The process may require significant data volumes and administrative effort to establish an exact value /application of proxies.
- The natural gas TSO and hydrogen network operator maybe interested to negotiate on the transfer value.
- The transfer may refer to specific parts of the assets, such as parts of pipeline or transfer stations, which requires a split of natural gas network assets.
- Treatment of the differences between transfer and residual values

Regulatory Policy on Decommissioning

RAB of the Gas TSOs in EU

There may be some potential risks of stranding for assets that would need to be taken out from operation before the end of their regulatory asset life.



Potential risk of asset stranding for an individual natural gas TSO depends on

- Average asset age
- Regulatory asset lives
- Future role of hydrogen (and biomethane)
- Speed of decarbonization

Source: ACER based on natural gas TSO data received from NRAs as part of study. Forecast based only on projected depreciation. Does not include future investments.

Decommissioning / Main Regulatory Questions

Decommissioning is associated with decisions to take out from operation gas network assets before the end of their regulatory asset life.

1. **Identification of assets to be decommissioned**
   - Competencies / responsibilities
   - Process
   - Treatment of residual demand
   - Regulatory review
2. **Regulatory treatment of stranded assets / costs**
   - Estimation of stranded cost
   - Regulatory treatment
   - Compensation schemes

   If asset is not repurposed, decommissioning before the end of its regulatory asset life would result in asset stranding.
3. **Decommissioning costs**
   - Cost related to assets removal (or assets left in the ground)
   - Recovery sources
   - Cost efficiency
4. **Regulatory measures to mitigate asset stranding**
   - Adjustment of revenue / tariff setting process
   - Implications on current and future customers

Decommissioning / Possible Solutions

Natural gas TSOs are best placed to identify the assets that need to be decommissioned.

Reasons for decommissioning

The utilisation of specific assets have been permanently discontinued.

Any residual use can be shifted to other pipelines or routes.

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Small-scale additional investments needed

In specific cases

Very low residual use on individual natural gas pipeline that cannot be shifted to other pipelines or routes

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(see also previous slides on the specific aspects)

Other factors (asset may not be used under normal conditions)

- Demand & supply seasonality
- Security and reliability of supply
- Future utilization of individual network assets
- Role of pipelines in enabling / fostering competition

How to assess

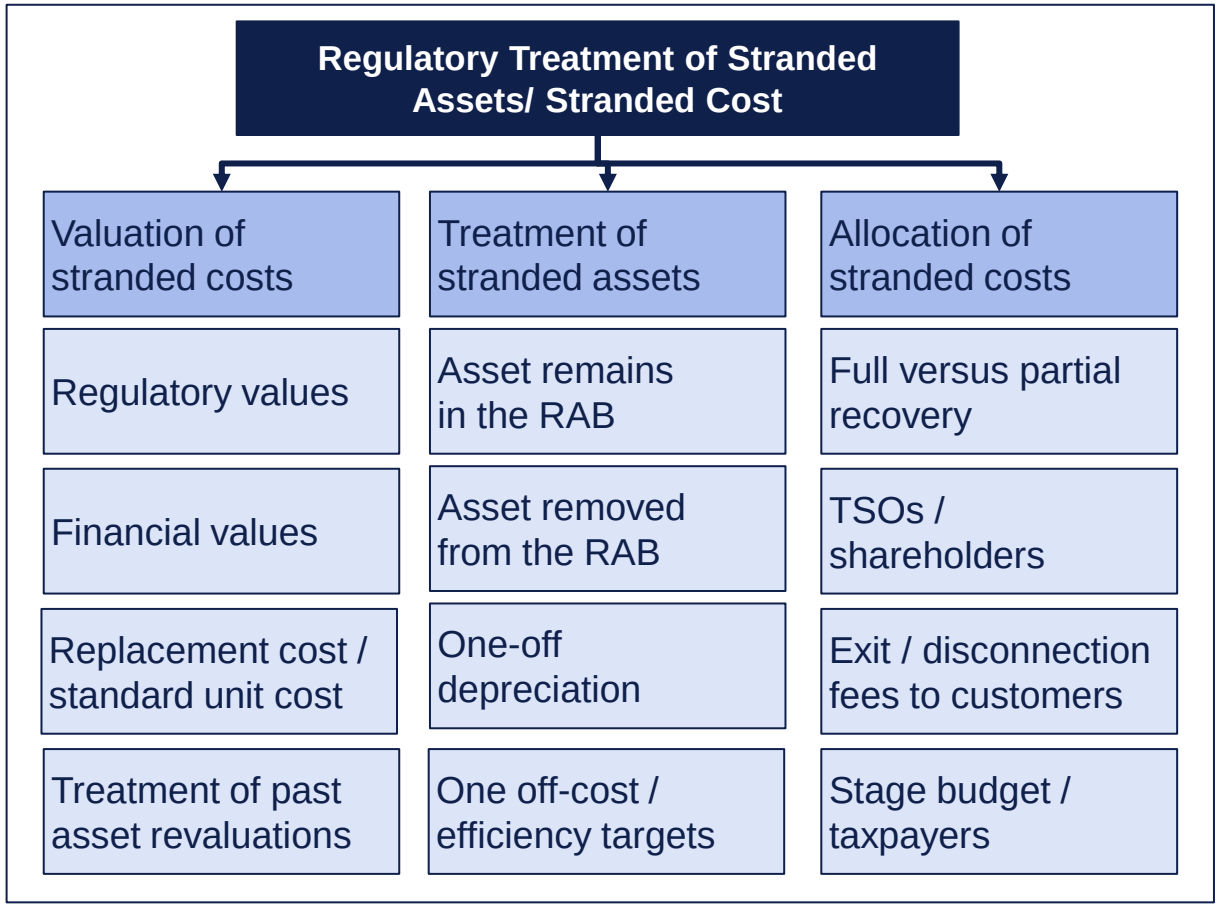
Dedicated analysis as part of the NDP

Regulatory review

Decommissioning addressed in the regulatory framework / regulatory review included in the NDP review

Stranded Assets / Cost Evaluation and Recovery

No uniform policy exists with respect to how stranded costs should be recovered.



- In the majority of the EU jurisdictions a stranded asset is removed from the RAB when decommissioned and no further return is earned on this asset.
- No uniform policy exists with respect to how the stranded costs should be recovered.
- Some jurisdictions allow their recovery through a specific (one-off) depreciation allowance
- In other cases, no cost recovery is allowed via the network tariffs and the write-off is taken by the TSO / shareholders.
- Several countries do not have explicit arrangements on treatment and recovery of stranded costs.

Stranded Assets / Cost Evaluation and Recovery

Regulatory framework should provide explicit arrangements addressing stranded assets and stranded cost.

Valuation of stranded cost

Residual asset value in the RAB appears reasonable practical indicator

It reflects the undepreciated value relevant for regulatory purposes and is available in the companies' submissions.

Treatment of stranded asset

Stranded assets removed from the RAB → Stranded assets no longer earn a rate of return and no longer receive a depreciation allowance.

One-off adjustment via depreciation / Opex → The financial impact of their removal depends on the asset age.

Stranded cost recovery

- Natural gas TSOs / shareholders
- Natural gas network users
- State budget / taxpayers

Sharing mechanisms → The decision depends on the specific provisions in the legal framework, the positions of the sector stakeholders and the outcome of the consultation process.

Mitigation Measures via the Revenue Setting Process

To reduce the risk of asset stranding regulators can consider adjusting depreciation policy or using non-indexed RAB.

Change in depreciation policy

- Change of regulatory asset life (shorter life / target dates)
- Front-loaded (accelerated) depreciation

Non-indexed RAB / Nominal WACC

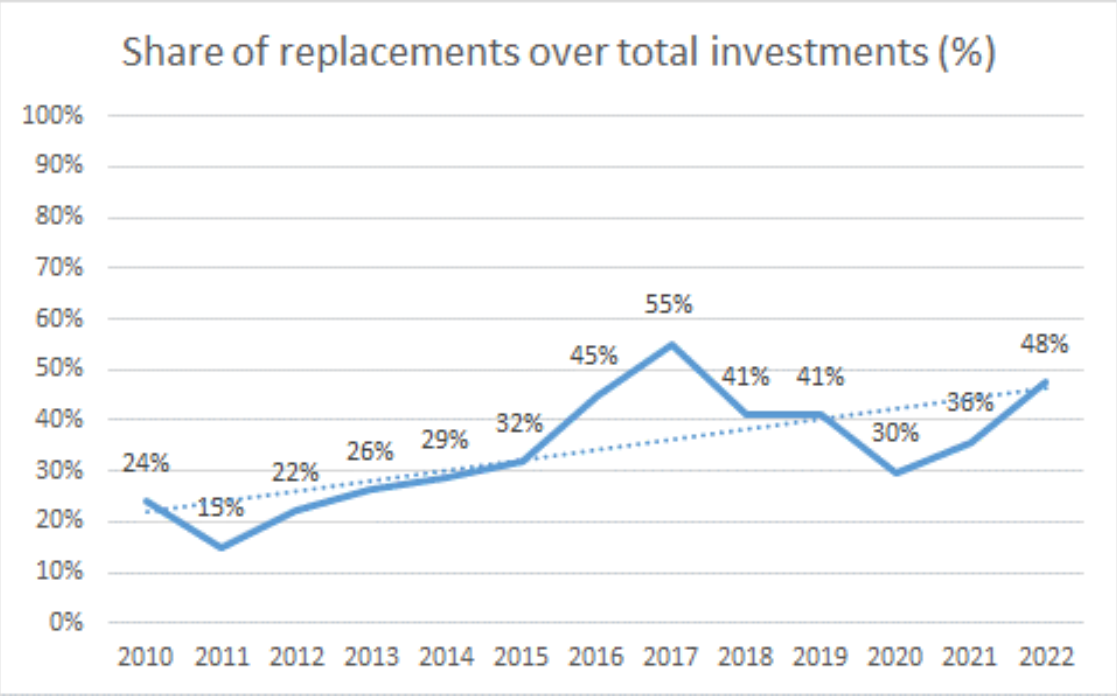
- Inflation reflected via the capital costs and charges to network users in that year.

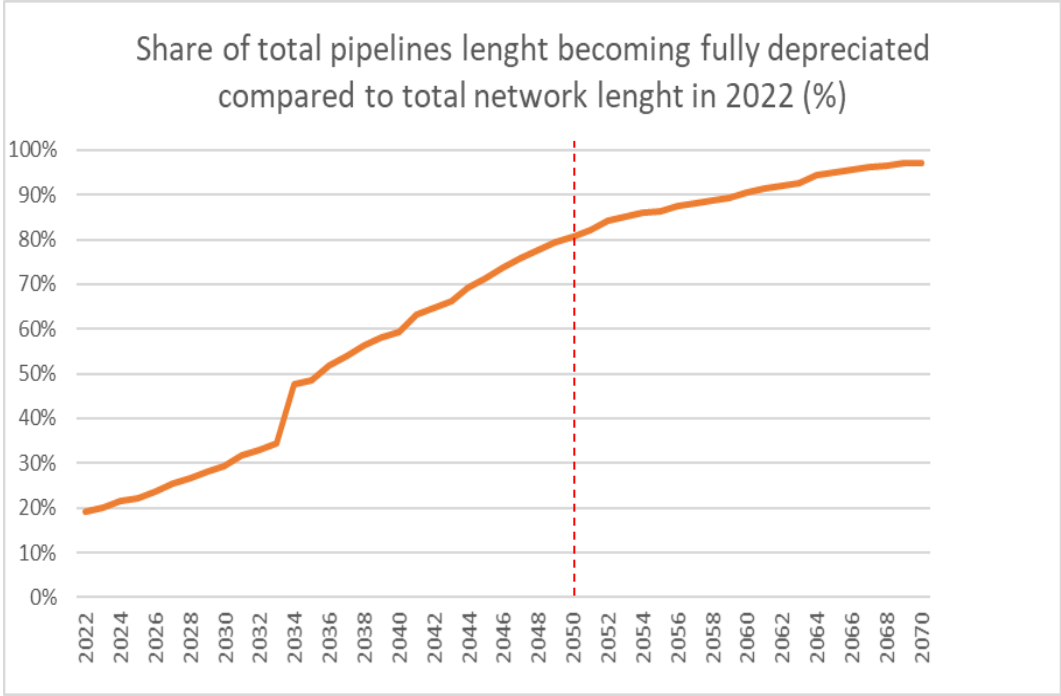
- Consideration of such adjustments in the revenue setting process would permit faster cost recovery over the short to medium term when user demand is more certain, and relieve the allowed revenue/tariffs on the longer term when user demand is less certain.
- Adjustments should be set in a way not leading to unbalanced tariff increases in the short to medium term that may discourage network users to book capacity.

Regulatory Policy on Reinvestments / Extended Use of Assets

Assets Replacement Need

In the next years the role of asset replacement investments will likely increase with the increasing share of assets that have reached the end of their regulatory asset life.





Source: NRAs (ACER)*

* Disclaimer: the data figures were put together by ACER based on the information received from the NRAs. The underlying data was only reviewed by ACER (and not DNV, only aggregated / anonymised data was in general made available to DNV).

Reinvestment and Extended Use of Assets / Regulatory Questions

With declining residual asset life regulators will need to assess and make decisions between replacing existing assets or keeping the assets in operation after the end of the regulatory asset life.

Assets replacement

- Same size versus smaller size
- Implications on repurposing and stranded assets

- Review of gas demand forecasting / network planning
- Regulatory assessment of reinvestments / application of CBA

Keeping assets in operation after the end of their regulatory life

- Could postpone/ avoid reinvestments
- Definition of asset life (regulatory, technical, economic)

- Review of regulatory asset life for new assets based on their expected use and technical life
- Adjustment of renumeration and use of explicit financial incentives for fully depreciated assets

Challenges

- Bias towards Capex intensive solutions
- Asymmetric information between TSOs and NRAs

- Enhancement of transparency requirements (indicators to monitor the evolution of assets age / reinvestments)
- Adjustment of the regulatory models

Reinvestment and Extended Use of Assets / Possible Solutions

NRAs could apply explicit financial incentives for keeping fully depreciated assets in operation.

Explicit financial incentive for keeping fully depreciated assets in operation

- Potentially higher operating and maintenance costs of the fully depreciated assets
- No return on assets for fully depreciated assets (only Opex, Capex bias)
- Financial incentive could be based for example on a premium to the Opex allowance

Regulatory review of reinvestments

- More powers for NRAs to approve investment plans (NDP) (not the case in all countries)
- Comprehensive CBA for larger reinvestments (comparing replacement and extended use of an asset)
- Simplified regulatory review process for smaller reinvestments

Thank you for your attention!

The study has been published on the ACER website: Report on Future Regulatory Decisions on Natural Gas Networks: Repurposing, Decommissioning and Reinvestments (europa.eu)

konstantin.petrov@dnv.com