WHEN TRUST MATTERS

Future Regulation on Natural Gas Networks

– Key Results of the Study conducted by DNV

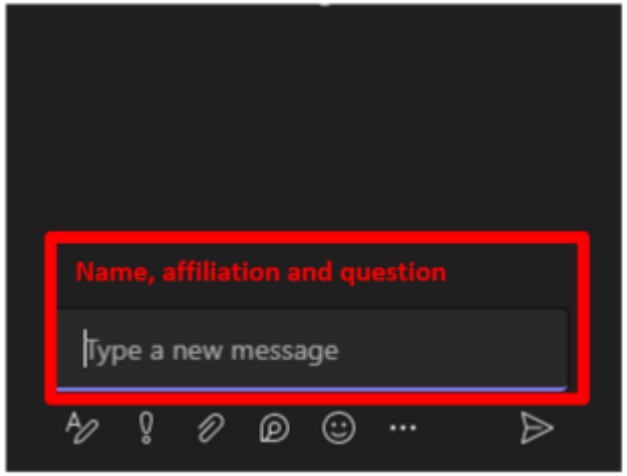
ACER – DNV Workshop

10 November 2022

ACER
European Union Agency for the Cooperation of Energy Regulators

Interactions during meeting

- Meeting will be recorded and posted on the event page together with the slides
- Participants are muted, except speakers
- Should you have any questions, please:
  1. Post your question in the **MS Teams chat**
  2. Include your **name** and **affiliation** in the question
  3. Questions will be answered in the Q&A sessions



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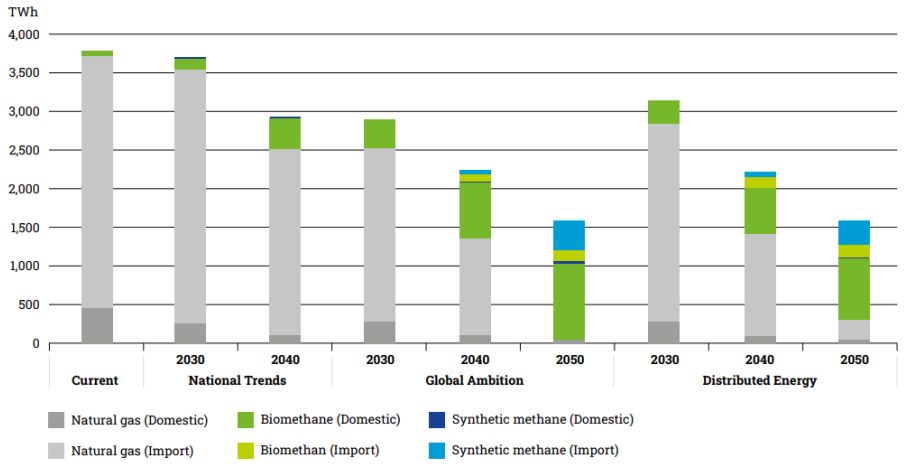
Agenda

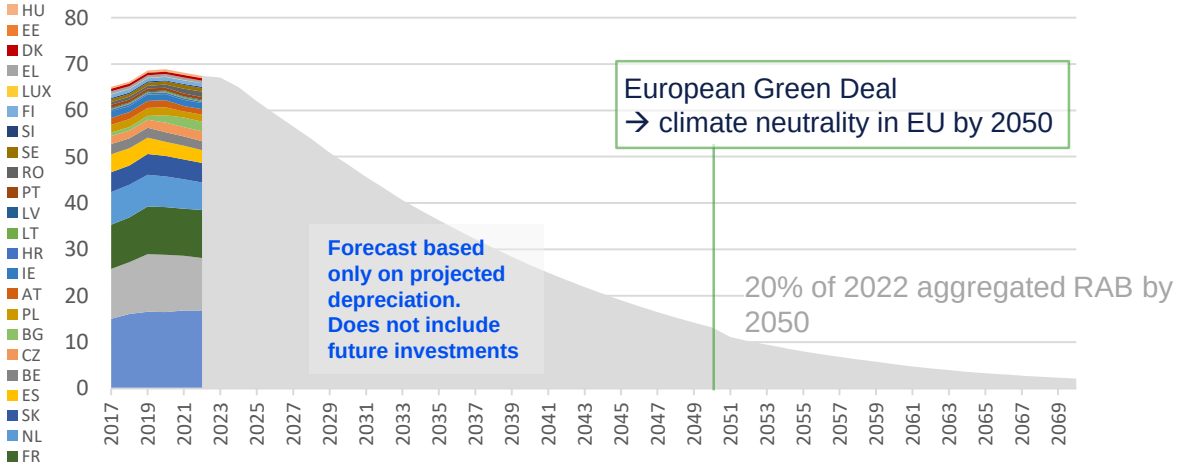
09:00 – 09:15	**Introduction** • ACER – Csilla Bartok, Miguel Martinez Rodriguez • EC – Benedikt Klauser, Markus Backes
09:15 – 10:00	**Repurposing** • DNV – Daniel Grote • ACM – Wietse Van Den Bos • Q&A
10:00 – 10:40	**Decommissioning** • DNV – Waisum Steinborn-Cheng • ENTSOG – Claude Mangin • Q&A
10:40 – 11.20	**Reinvestments** • DNV – Rosaria Nunes • ARERA – Caterina Miriello • Q&A
11:20 – 11:25	**Closing remarks** • ACER – Csilla Bartok

TSO assets in the context of decarbonisation

Methane supply to EU27. Source: ENTSOG and ENTSOE, TYNDP 2022, Scenario Report.



Evolution and forecast of TSO regulatory asset bases per MS 2017-2070 (€ bn)



- **Setting the scene**
  - Policy targets imply a decrease in natural gas demand
  - Asset removals from the TSO networks resulting from decommissioning & repurposing
  - Investments shift from new capacity to asset replacements
- **Hydrogen and Decarbonised Gas Market Package foresees:**
  - Repurposing of natural gas pipelines
  - Forecast of potential increases in natural gas transmission tariffs
  - TSO cost benchmarking
  - Transparency on TSO costs
- **How to manage assets / networks in the future?**
  - Repurposing
  - Decommissioning
  - Reinvestments
- **Objectives of the DNV study**
  - Expand discussion on the decarbonisation of natural gas
  - Assess current regulatory practices
  - Instruments addressing present and future challenges
  - Early implementation of the Hydrogen and Decarbonised Gas Market Package
  - Transparency on TSO costs
  - **Outside scope:** Demand scenarios 2030-2050

ACER Workshop on
“DNV report Repurposing, Decommissioning, Reinvestments”

DG ENER

10th November 2022

Hydrogen and gas markets decarbonisation package: 5 policy aims

I. Facilitate access of **renewable and low-carbon gases** to existing gas network

II. Enabling development of **dedicated hydrogen infrastructure** and market

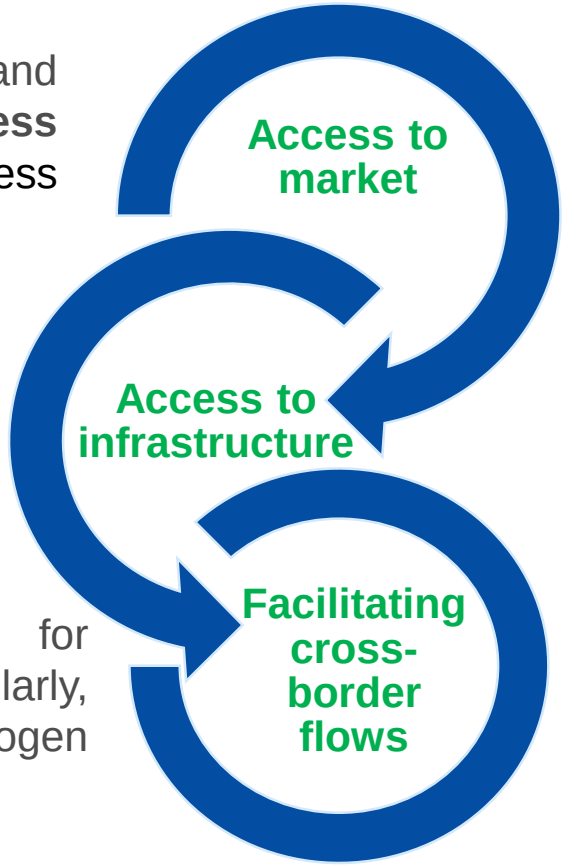
III. Fostering **network planning** electricity, gas and hydrogen

IV. Promote **consumer protection and engagement** in renewable and low-carbon gas markets

V. Improve **resilience and security of supply**

Facilitating access of renewable and low-carbon gases into the existing natural gas network

- ✓ Allowing and promoting renewable and low-carbon gases **full market access** including: wholesale market access physical flexibility - reverse flows.
- ✓ Measures to facilitate **gas storages and LNG terminals** to **receive** renewable and low-carbon gases
- ✓ **Removing cross-border tariffs** for renewable and low-carbon gases. Similarly, in the future for dedicated hydrogen network.



- ✓ More **transparency and better use** of free capacities at **LNG terminals and gas storages** allowing more flexible gas trade and use of the terminals and storages.
- ✓ **75% tariff discount** for the **injection** and connection of renewable and low-carbon gases.
- ✓ Introducing a **5% cap for hydrogen blends** at interconnection points between Member States to avoid cross-border flow restrictions due to differences in blending, which network operators must accept. No blending obligation; voluntary agreements for higher blends possible.

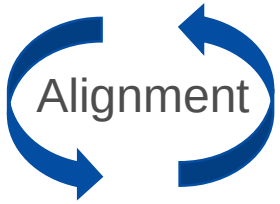
- ✓ **Ban for Long-Term Contracts for unabated fossil gas by the end of 2049.** Short term supply, with contracts below one year, important for security of supply and market liquidity reasons will still be allowed.

European Commission

Fostering integrated network planning

Articles 51-53 of the Directive

EU Ten-Year-Network-Development-Plans



National Network Development Plans

	EU-level	National level (current)	National level (proposed)
Scenarios	Joint scenarios (gas, electricity, poss. hydrogen)	Separate scenarios	Joint scenarios (gas, electricity, poss. hydrogen)
	Alignment with climate objectives		Alignment with climate objectives
	Involvement of relevant stakeholders		Involvement of relevant stakeholders (DSOs & others)
Network plans	Separate plans (gas, electricity, hydrogen)	Separate plans (gas, electricity, hydrogen)	Separate plans (gas, electricity, hydrogen)
	New Projects of Common Interest only for hydrogen	Investment in gas and possibly hydrogen infrastructure	**Investment & decommissioning of gas infrastructure**
			Location of power to gas assets
	All TSOs	Only ISO and ITO	All TSOs
	Every two years	Every year	Every two years

Facilitating hydrogen infrastructure development

- Grandfathering of national **permits and land-use rights for repurposed natural gas pipelines** (Article 7, paras 7 & 8 Directive proposal)
- Rules on **cross-financing between gas/electricity grids and hydrogen networks** (Article 4 Regulation proposal)
  - Default rule: separation of regulatory assets bases
  - Limited cross-financing possibility subject to approval by regulatory authority
  - Conditions: Collection via temporary, dedicated charge on domestic exit points

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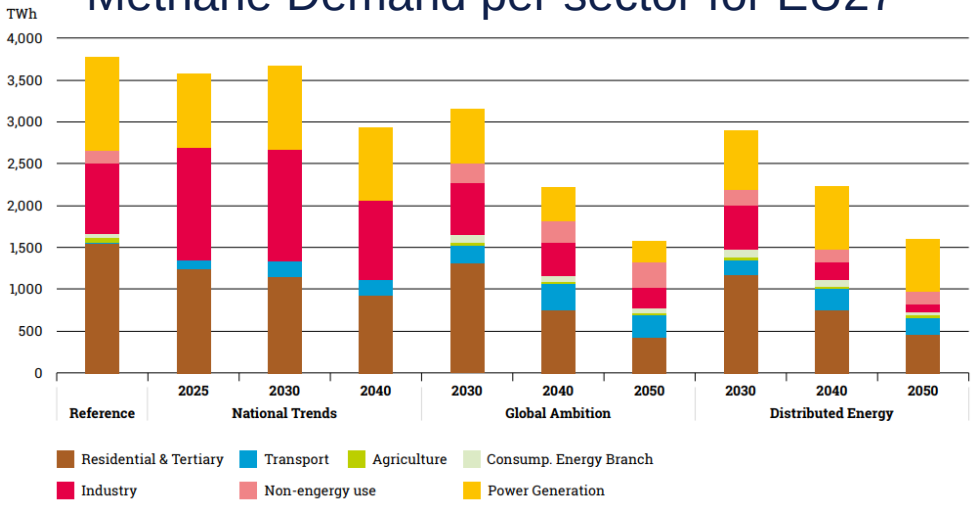
Background and Approach

Decarbonisation and Energy Transition

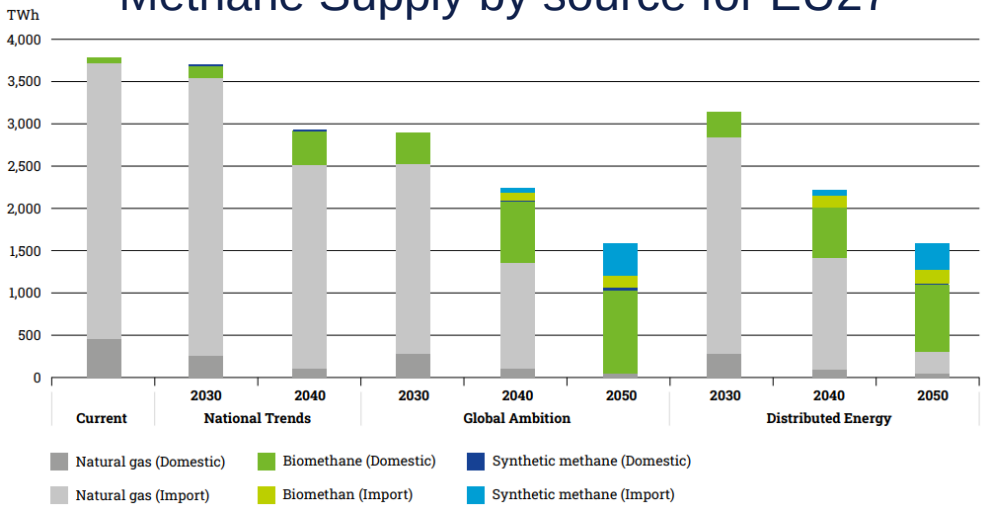
European and national decarbonisation targets point to permanent decline of natural gas demand

Methane Demand per sector for EU27



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

Methane Supply by source for EU27



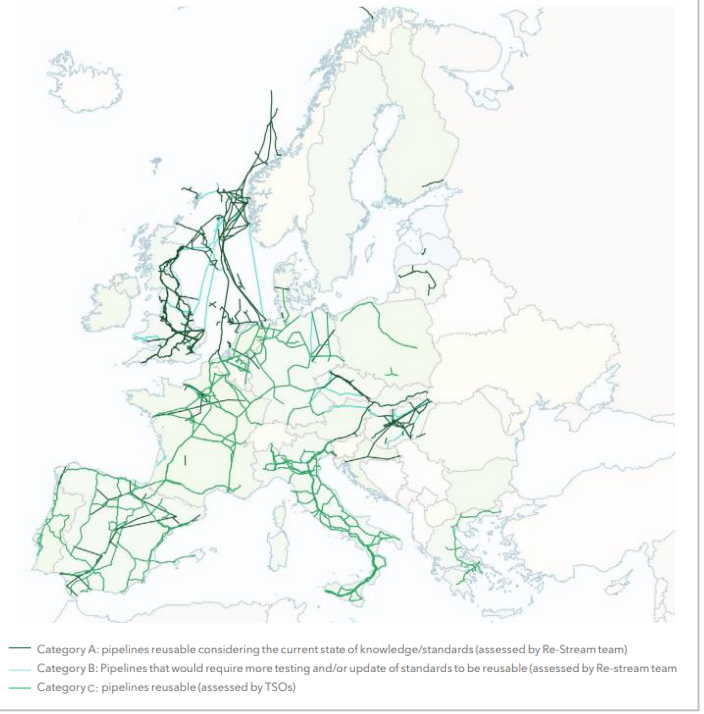
Source: ENTSOG and ENTSOE, TYNDP 2022, Scenario Report, Version April 2022

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

Renewable Gases and Substitution

Partial replacement of natural gas by renewable gases (biomethane and green hydrogen) and partial substitution by electrification and energy efficiency

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

Future use of natural gas transmission network assets

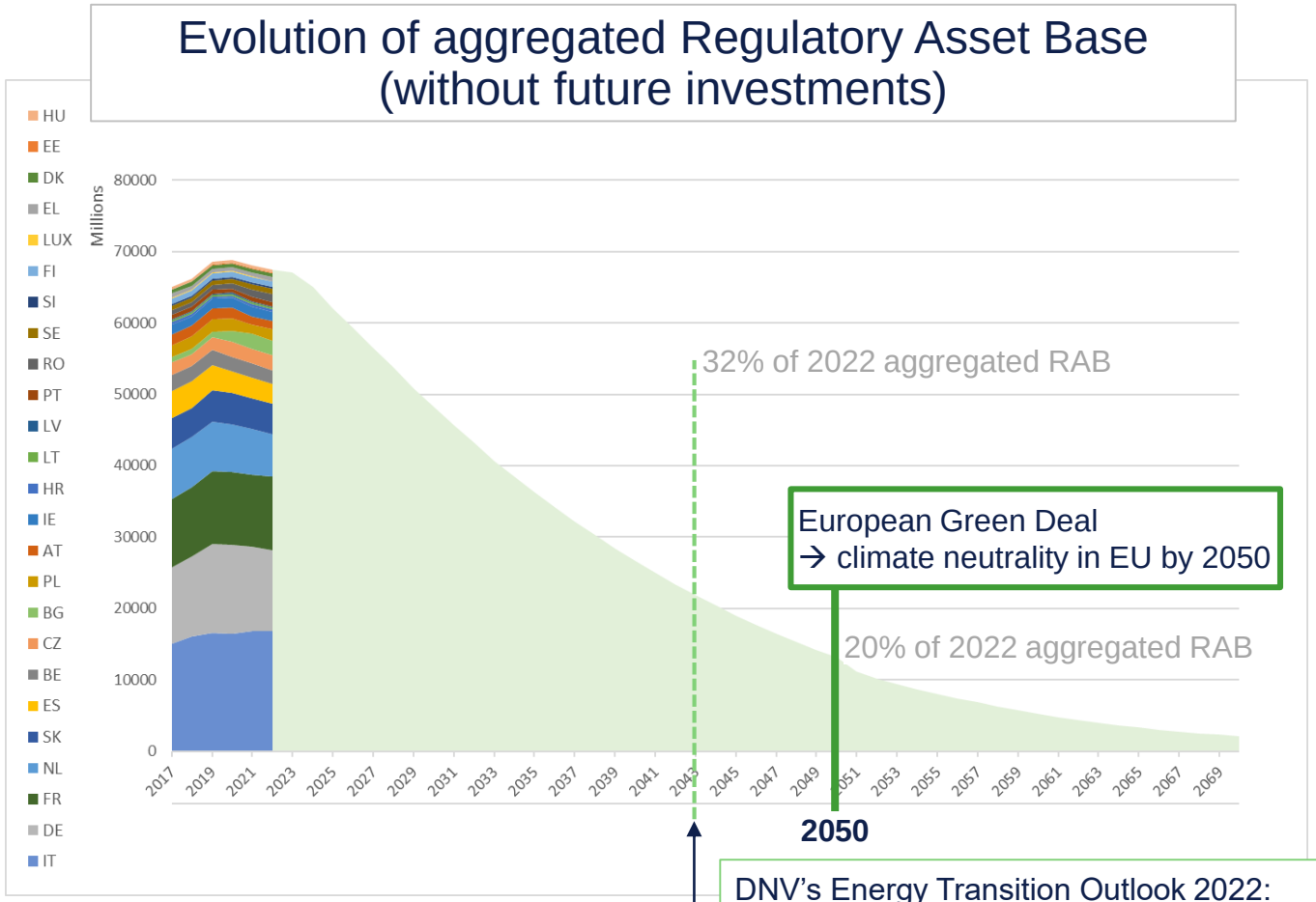
Transport of hydrogen	Transport of (bio)methane	No further use
Repurposing	Reinvestment and extended use	Decommissioning

Uncertainty on when and how much each case becomes relevant

Regulation to address all three cases

Asset Value at Stake

Potential risk of stranding for assets withdrawn from operation before end of regulatory asset life



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

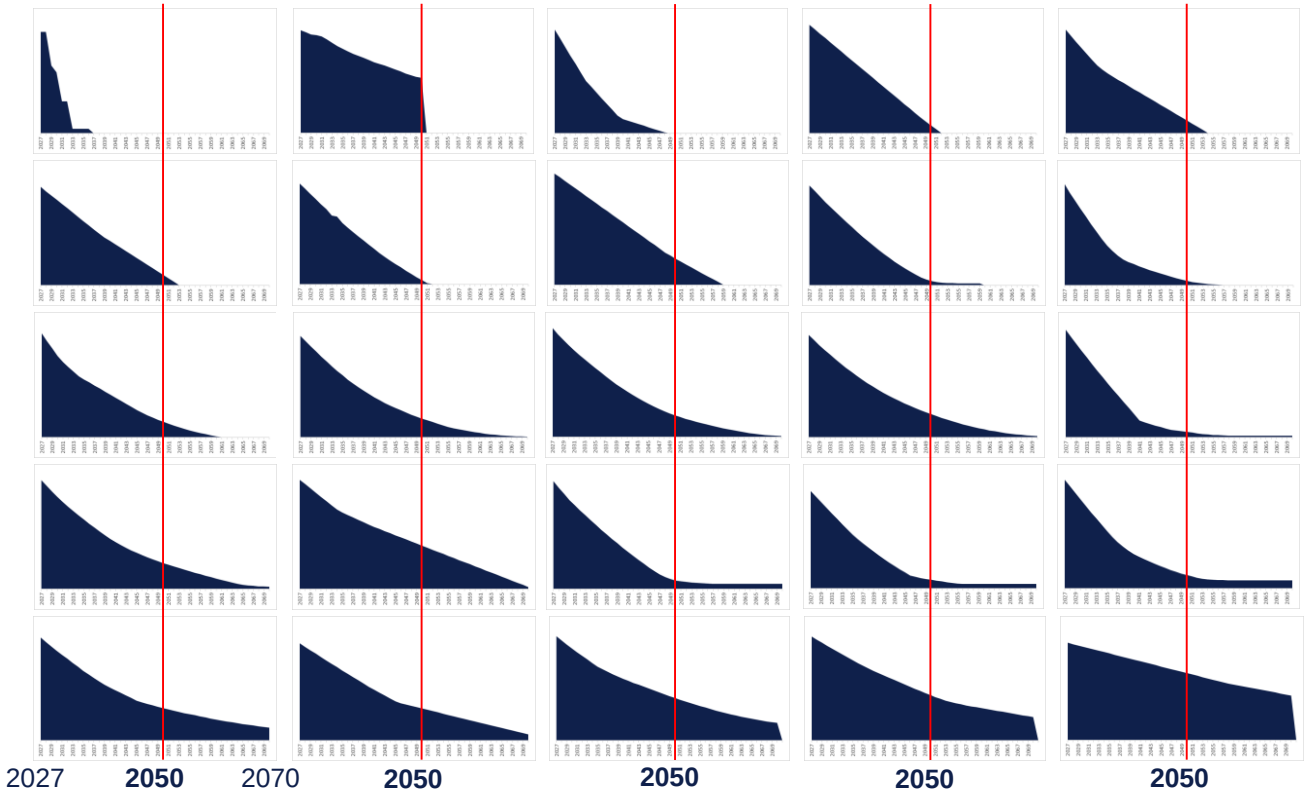
– average asset age
– regulatory asset lives
– future role of hydrogen (and biomethane)
– speed of decarbonization

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.

Asset Value at Stake (II)

For some countries: Significant share of current RAB will be depreciated after 2050

Evolution of aggregated Regulatory Asset Base per country (without future investments) – anonymized



Natural gas transmission increasingly characterised by decisions on

– replacement and extended use

– repurposing

– decommissioning

Source: ACER based on natural gas TSO data received from NRAs as part of study

Objective and Approach

Objective

Analyse **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 (for each topic)

- Regulatory Challenges
- Current Situation and Practices in EU
- Regulatory Options and Methodologies
- Recommendations

Main Inputs

- Literature Review
- Case Studies
- NRA and Stakeholder Surveys
- Bilateral calls with various NRAs and TSOs
- Collected TSO Data
- DNV Analysis

Regulatory Decisions on Repurposing

Regulatory Questions of Repurposing

Repurposing = Conversion of individual natural gas network asset for transport of hydrogen and transfer of asset to hydrogen network operator

1 **Decision on individual asset to be repurposed**
- When to repurpose?
- How to assess?
- Assessment by whom?
- Role of the NRA?
- Choice among alternatives?

2 **Asset transfer value**
- Outcome of negotiation or determined by regulation?
- Individual or average asset value?
- Determined by whom?
- Residual asset valuation or different methodology?
- Consideration of
  - repurposing costs?
  - asset re-valuations?
  - future hydrogen value?
  - reduced stranding risk?

3 **Allocation of costs and revenues**
- Potential differences between residual asset value and asset transfer value
- Natural gas TSO / asset owner?
- Natural gas network users?
- Both, via sharing mechanism?

4 **Procedure to transfer assets**
- Provision of documents, data, information to interested hydrogen network operators?
- Treatment of costs for separating assets and organisation?
- Treatment of joint use of assets and split of individual assets?

When to Repurpose and How to Assess It (I)?

Natural gas network assets should be repurposed when operationally possibly, if need for hydrogen transport and technical feasibility is given

Repurpose individual asset when

Needed for transport of hydrogen ✚ Technically feasible ✚ Operationally possible

- Operationally possible → Utilisation of individual network asset has dropped permanently to zero
- Operationally possible → Residual use can be shifted to other pipelines or routes

How to assess

Small repurposing projects

Assessed by natural gas TSO outside NDP according to regulatory guidelines

NRA to review repurposing projects as part of review and approval of NDP

Adjust / expand natural gas Network Development Plan (NDP)

- Detailed scenarios on regional distribution of natural gas demand and supply
- Analyse and detailed reporting on future utilisation of individual assets
- Analyse possible shift of residual utilisation
- Analyse possible impacts of repurposing
- Close coordination with NDPs for hydrogen and electricity

Provision of information on repurposing projects and timeline within NDP foreseen in proposed Directive on common rules for the internal markets in renewable and natural gases and in hydrogen (Article 51).

When to Repurpose and How to Assess It (II)?

Natural gas network assets may also be repurposed, when associated with economic net benefits

Repurpose individual asset when

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

but

- repurposing would provide economic net benefit

⇦ Otherwise repurposing would primarily limited to parallel pipelines or exit points served by alternative routes
(unless residual gas demand served by locally produced biomethane)

How to assess

- Conduct Cost-Benefit Analysis (CBA)
  - Comparison of costs and benefits of repurposing of individual natural gas network assets with construction of new hydrogen network infrastructure
  - CBA to be conducted jointly by natural gas and hydrogen TSOs (or initially by natural gas TSOs)
  - CBA methodology and parameters to be defined in regulatory framework / guidelines
  - NRA to review correct application of CBA methodology by natural gas TSOs

Compensation of residual natural gas network users, if repurposing causes disconnection or reconnection or has significant impact on reliability of supply

may conflict with obligation of network operator to connect

Repurposing of natural gas infrastructure also included in current version of TEN-E Regulation (Annex II (3) a) of Regulation (EU) 2022/869), expected to be included in future CBA methodology of ENTSOG.

Repurposing Costs of Natural Gas TSO

Efficient and necessary costs of natural gas TSO related to repurposing of assets should be considered in allowed revenues and asset transfer value

Cost categories

- Assessment of technical feasibility of repurposing and adaptation needs
- Put and keep an asset in mothballed status for later repurposing
- Additional costs for hydrogen-readiness of (re-)investments
- Separation of assets and organisation, and procedures related to actual transfer

When

Efficient + Necessary + Need for hydrogen transport been indicated + Not already covered by state aid or subsidies

How

Consideration in allowed revenues of natural gas TSO

When attributed to individual network asset or on a pro-rata basis

Consideration in asset transfer value

Determination of Asset Transfer Value

Asset transfer value should be determined based on regulatory guidelines, whereas residual asset value of natural gas RAB serves as a reference value

Determination of asset transfer value

- Adopt clear regulatory rules on determination
- Apply same asset valuation methodology as for determination of natural gas RAB
- Apply residual asset value of natural gas RAB as reference value
- Consider additional repurposing costs of natural gas TSO in value
- Natural gas and hydrogen network operator may, based on reference value, potentially agree on a higher or lower asset transfer value
- Consider application of average asset value as alternative
- Determination by natural gas TSO based on regulatory guidelines

Allocation of revenues and costs of an asset transfer

- Adopt Sharing mechanism for asset transfer values deviating from residual asset value

Asset transfer value will have to be set at residual asset value if proposed Regulation on internal markets for gas and hydrogen is adopted (Article 4).

Determination of general guiding principles for the determination of the asset transfer value within a dedicated Network Code set on European level are foreseen within proposed Regulation on internal markets for gas and hydrogen (Article 54.2.f).

Autoriteit
Consument & Markt

Hydrogen backbone

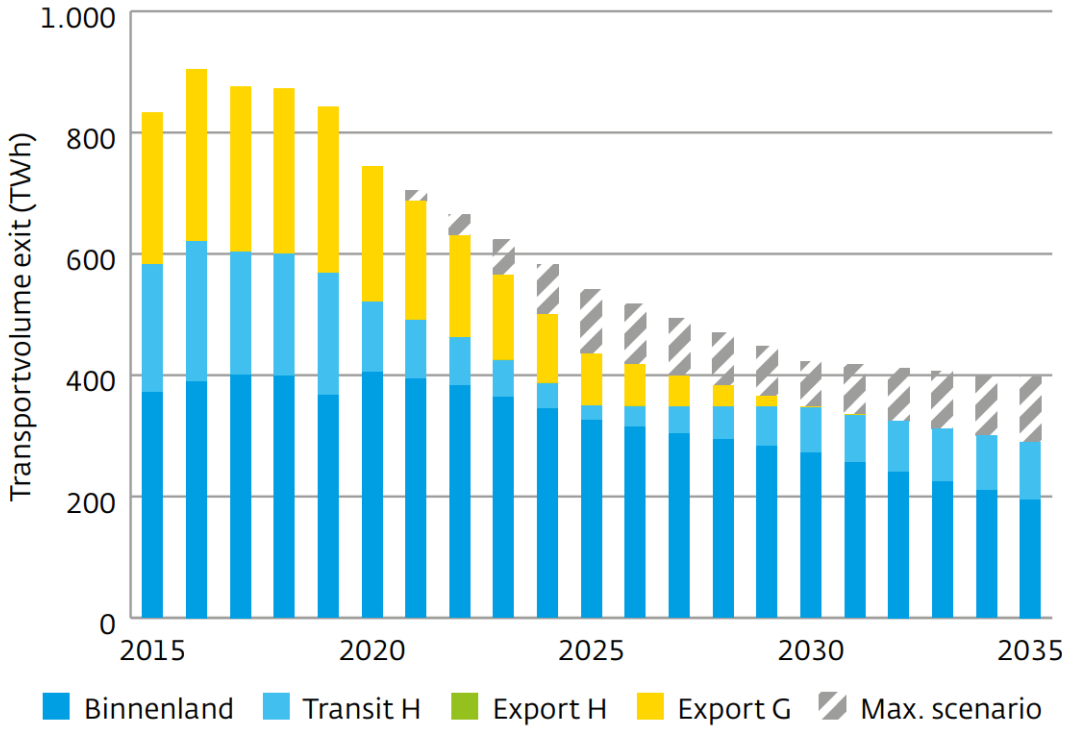
From a regulator’s perspective

Markten goed laten werken voor mensen en bedrijven

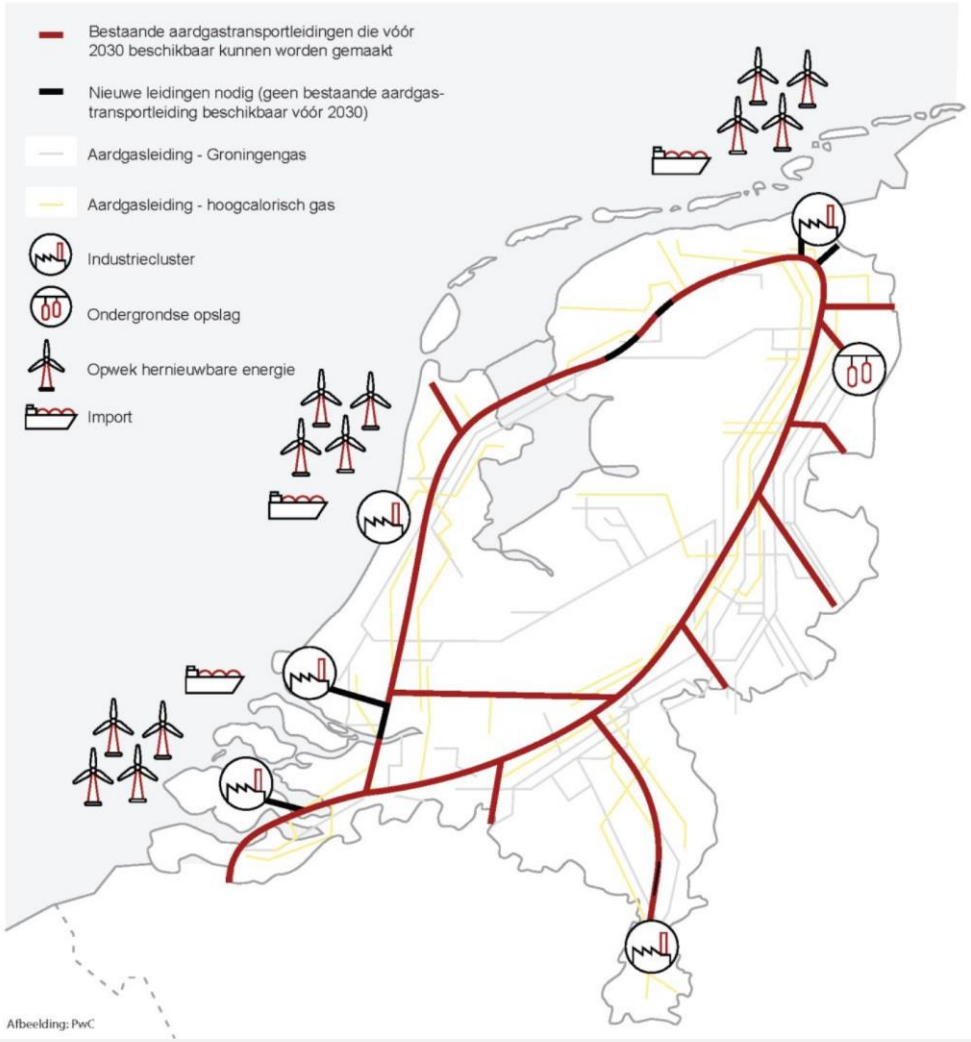
Opportunities

Dense & large methane network

Projected gasflow



Future hydrogen network



Role ACM

- Subsidy & regulation by ministry until +/- 2030
- Asset-transfer from natural gas TSO to hydrogen TSO
- Informal advice on transfer value

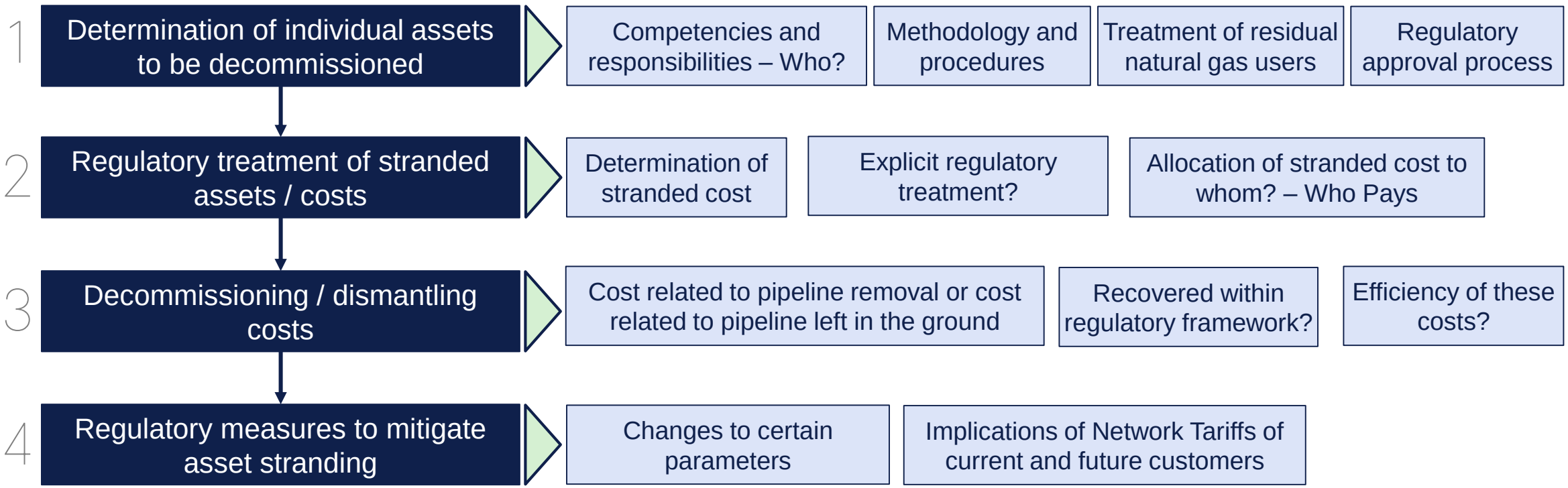
Vision ACM

- Based on consultations
- Price based on remaining RAB is desirable
- Average price not first choice, but acceptable
- Result to be seen

Discussion

Regulatory Decisions on Decommissioning

Regulatory Challenges for Decommissioning



Definitions of Decommissioning

Stranded Assets

Assets withdrawn from operation before end of their regulatory asset lifetime as a result of declining gas demand, technology, policy decisions (decarbonization) or other factors.

Decommissioning

Decision to withdraw a gas network asset from operation at or before end of its regulatory asset life.

As a result, decommissioning (dismantling) cost may be incurred.

Stranded Costs

Investments that a natural gas TSO has incurred with an expectation that these will be recovered under normal regulatory conditions, but which may no longer be fully recoverable due to (unanticipated) changes / circumstances

When to Decommission and Identification of Individual Assets?

Natural gas TSO best placed to perform analysis to identify assets expected to be stranded and decommissioned

Decommission individual asset when

- Utilisation of individual network asset has dropped permanently to zero
- Residual use can be shifted to other pipelines or routes
  - ⇩ Small additional investments needed

to be considered on a case-by-case basis

- Very low residual use on individual natural gas pipeline that cannot be shifted to other pipelines or routes
  - ⇩ Compensation of affected users? Compliance with obligation to connect?

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

- Demand & supply seasonality
- Security and reliability of supply (“insurance value”)
- Future utilization of individual network assets
- Role of pipelines in enabling / fostering competition

How to assess

Dedicated analysis as part of natural gas Network Development Plan

Regulatory approval process

Decommissioning defined in regulatory framework; approval as part of Network Development Plan

Identification of Stranded Costs and Recovery

Stranded assets valued at residual asset value, removed from RAB and consider options to recover within regulatory framework

Stranded Cost based on

- Residual Asset Base (best indicator)
- Past RAB re-valuations recognized by NRA and factored in current RAB

Treatment of Stranded Asset

Removed from the RAB	No longer earn a regulatory rate of return and no longer receive a depreciation allowance
One-off Adjustment e.g. Depreciation / Opex	depends on the age of the asset - impact will be smaller compared to a “newer/younger” asset

Allocation of Stranded Costs / Recovery – Who Pays?

- Natural gas TSO / asset owner?
- Natural gas network users?

→ Both, via sharing mechanism? → Additional analysis needed to explore these options further within respective regulatory regimes

Treatment of Physical Decommissioning and Dismantling Costs

Additional costs related to the physical decommissioning or dismantling of these assets, (even when the assets are left in the ground).

Separate NRA cost assessment and approval of efficient decommissioning and dismantling costs

- Not part of general efficiency assessment (if applied)
- Natural gas TSO to list and submit associated costs for each activity related to decommissioning
- Natural gas TSO may be required to conduct a public tender or get competing offers for decommissioning work

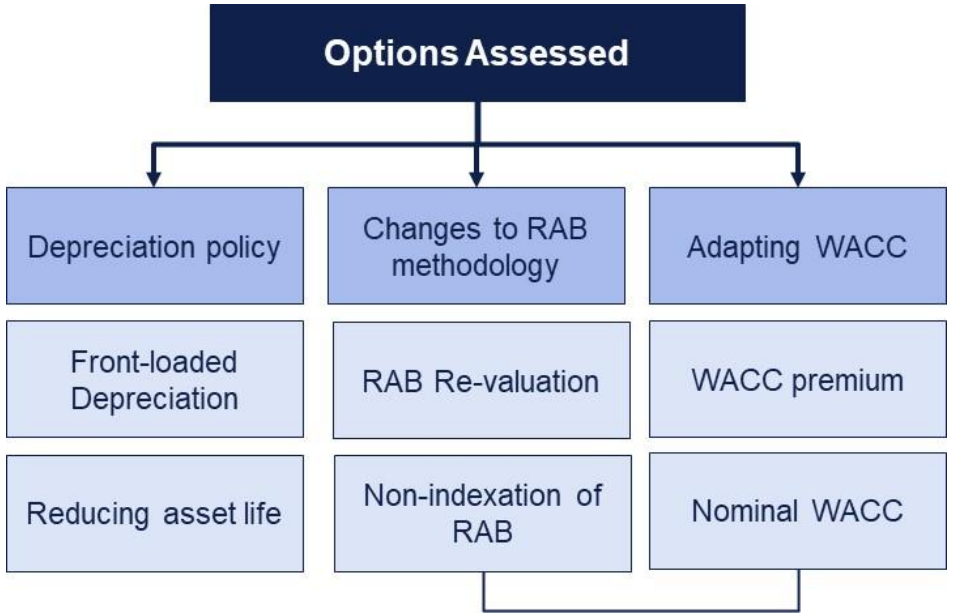
Who Pays?

- Natural gas TSO / asset owner?
- Natural gas network users?

→ Further investigate potential of sharing (allocation) between natural gas TSO and natural gas network users

Explore Mitigation of Stranded Assets within Regulatory Framework

Changing / adapting parameters within regulatory framework to ensure recovery of past investments



- **Depreciation Policy Options:**
  - Both options increase certainty in cost recovery for natural gas TSO in short- to medium-term: recovery shifted forward
    - Assumes current natural gas network users will use network more heavily than future natural gas users.
    - More natural gas users to distribute costs to than in the future
  - Targeted Depreciation (e.g. 2045, 2050, 2070)
- **RAB Re-valuation:**
  - Limited precedent in context to mitigate asset stranding
- **Non-indexation of the RAB / Nominal WACC**
  - Compensation for inflation is directly reflected via capital costs in respective year and charges to users of natural gas network in that year
- **WACC Premium:**
  - beta up-lift or an individual risk premium to cost of equity, may already be reflected in risk premiums above risk-free rate

09/11/2022

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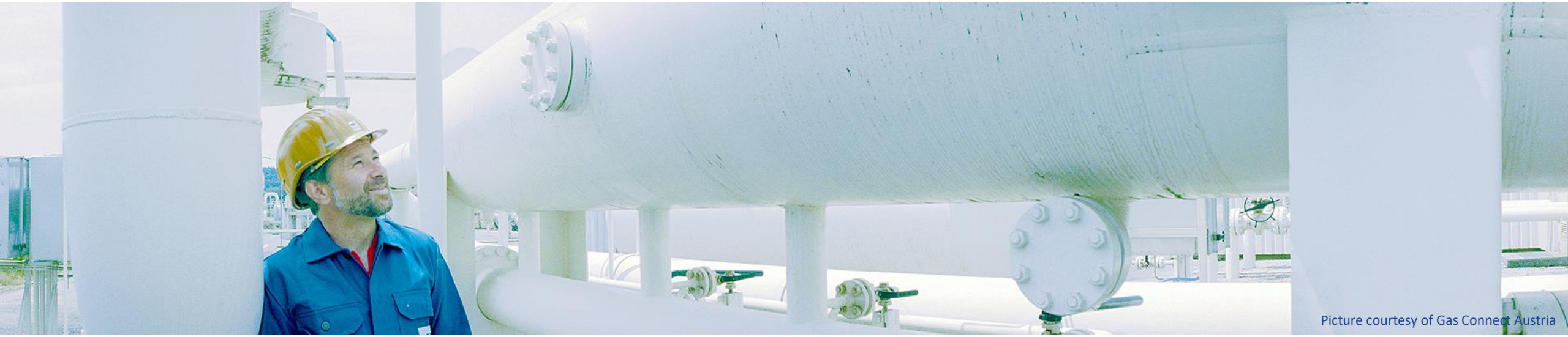


Picture courtesy of Gas Connect Austria

ACER workshop on future regulatory decisions on natural gas networks

ENTSOG presentation, 10 November 2022

Claude Mangin

Market Director

Online

Some preliminary remarks on stranded assets

Definition by DNV: *'Stranded assets are assets withdrawn from operation before the end of their regulatory asset lifetime as a result of permanently declining natural gas demand, changes in technology, policy decisions (decarbonisation) or other factors.'*

- More than 20 years of liberalization of gas market have led to investments in the European gas network to increase competition and security of supply.
- **What might look like stranded assets at one point may be in fact useful later** (e.g., post-Fukushima/low LNG share versus war in Ukraine/high LNG share; SoS drivers linked to climatic or political conditions; physical and commercial flexibility; potential for RES integration). **The potential future utilisation of the assets must be assessed adopting precautionary criteria.**
- The short and long-term effects of the war in Ukraine on gas consumption and flows in the EU are difficult to evaluate yet (e.g., pre-war consumption scenarios are under revision, need in new infrastructures - LNG terminal and pipes - for fostering the gas flows from West to East / across Europe, RePowerEU Communication has set huge hydrogen target).
- However, **gas infrastructure** shall be expected to play **a key role** also **in the future**: **gaseous fuels** share expected to stay **constant** (EC Impact Assessment - Gas&H2 Package). Thus, stranded assets risk should not be perceived as relevant since **low-carbon/renewable** molecules will **progressively increase**.
- **ENTSOG supports going for repurposing gas infrastructure to transport hydrogen as the most efficient solution for the overall energy system.**

Decommissioning in the DNV report

- **ENTSOG agrees with several points from DNV like:**
  - Gas TSOs are better placed than NRAs to define assets to decommission (NRA scrutiny by the way not opposed).
  - Residual value of asset (i.e., RAB) should be the reference.
  - Dismantling, removal, and land restoration to be assessed comparing costs and benefits.

- **However, ENTSOG would like to clearly state that TSOs should be protected against retroactive decisions and should recoup full investment costs, including potential decommissioning and dismantling costs for stranded assets, as regulated infrastructure operators do not have a remuneration including stranded assets risk.**

- **Adjusting depreciation policy** (accelerated, shorter regulatory lives) **is an approach we can discuss but any capital shortfall** (full or even partial write-off by changes in the RAB valuation methodology and/or adaptations of the WACC**) is a no-go, as it retrospectively modifies the regulatory framework.**

Thank you for your attention

Claude Mangin
Market Director

Location: Online Date: 10.11.22

www.entsog.eu | info@entsog.eu

Discussion

Regulatory Decisions on Reinvestments and Extended Use of Assets

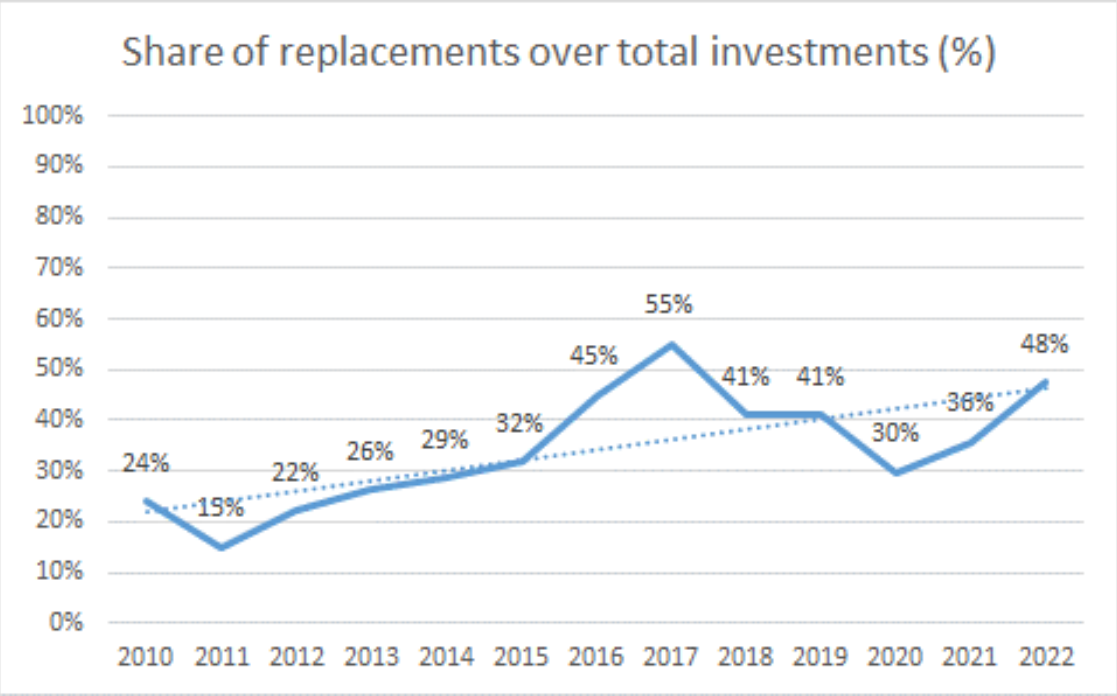
Regulatory Questions for Reinvestment and Extended Use of Assets

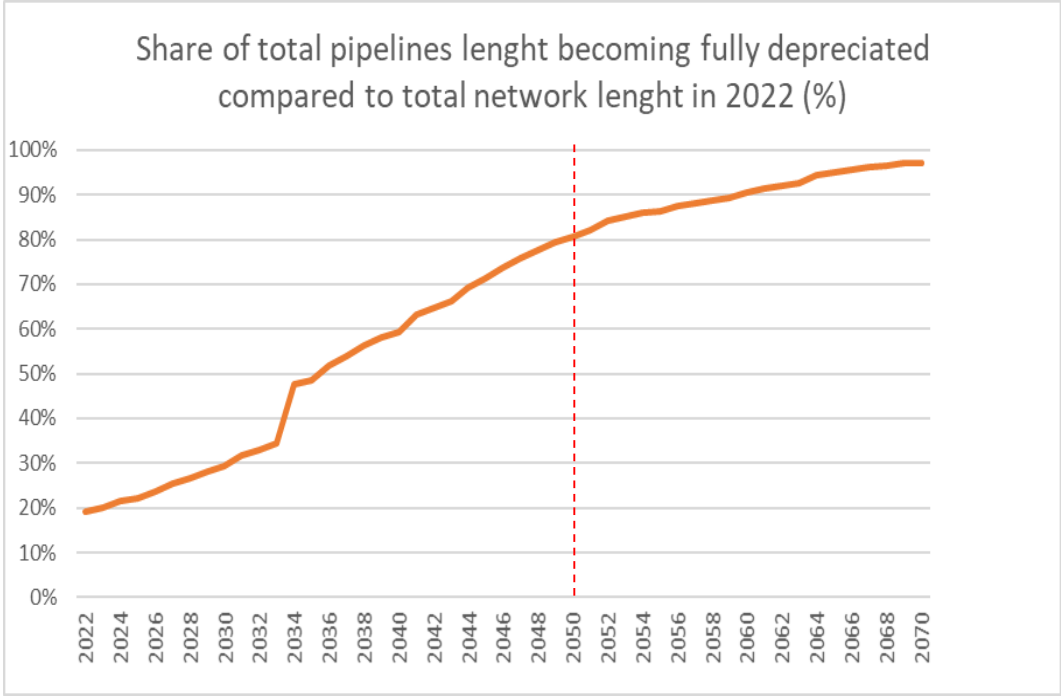
Choice between replacing existing assets (reinvestments) or keeping the assets in operation after the end of the regulatory asset life (when technically feasible and safe)

		Regulatory Tools	Regulatory Areas
Replacing existing assets	Same size	Forecast of Natural Gas Demand and Network Planning	Changes to regulatory assessment and remuneration of reinvestments
	Smaller size		
	Implications on repurposing and stranded assets		
Keeping fully depreciated assets in operation after the end of regulatory life	Regulatory asset life	Asset maintenance	Adaptation of regulatory asset lifetimes
	Technical asset life		
	Economic asset life		Changes to regulatory treatment of assets whose use is extended
	Could postpone/ avoid reinvestments		
Issues /challenges	Bias towards Capex intensive solutions	Transparency requirements	Changes to regulatory models
	Asymmetric information between TSOs and NRAs		

Replacement Needs

Increasing role of asset replacement as part of TSO investments. This trend will likely increase soon because of assets becoming fully depreciated





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).

Adaptation of Regulatory Asset Lifetimes (Regulatory Depreciation)

The regulatory depreciation should reflect the costs of investments and be related to the use of natural gas transmission asset

- Depreciation allowance based as close as possible to technical life
- Existing assets: changing to a new (longer) depreciation lives is possible but not recommended (regulatory certainty and predictability + increased risk asset stranding)
- New assets (used and useful for the whole of its technical life): regulatory depreciation = expected technical life → current regulatory asset lives could be adjusted (if deemed appropriate by NRAs)
- New assets (operational for longer than it will be used and useful): further consideration whether to purchase / replace this asset → alternative ways of supplying respective natural gas transmission users

Changes to Regulatory Assessment and Remuneration of Reinvestments

Additional regulatory scrutiny may be applied by NRAs for reinvestments, possibly only be allowed to be included in RAB, if natural gas TSO can provide convincing evidence on their need

- In some EU countries this requires a change to the national legislation to give NRAs more powers for the approval of investment plans
- Large reinvestments: NRAs can request comprehensive CBA to compare a set of options (replacement vs. keeping the asset in operation at the end of the regulatory life) + detailed explanations of the need for a replacement
- Smaller reinvestments: NRAs should consider developing a simplified CBA process
  - Exact format and details of a simplified CBA for smaller investments would need to be developed in future work

Changes to Regulatory Treatment of Assets Whose Use is Extended

NRAs could apply explicit financial incentives for keeping fully depreciated assets in operation (when totex approach is not feasible)

Provide an opex allowance (only) for keeping fully depreciated assets in operation

- If asset is kept in operation after the end of the regulatory lifetime, it would still require operating and maintenance costs
- Solutions associated with higher opex seem unattractive compared to more capex intensive solutions
- Natural gas TSO might decide to replace asset and could justify decision with risks and potential failures of network

Provide an explicit financial incentive for maintaining fully depreciated assets in operation (in addition to opex allowance)

- CBA could be a pre-requisite to make sure the best decision has been taken
- Amount of financial incentive: could consist of a premium on opex value (i.e., increased opex allowance) or part of the capital costs
- Should be re-assessed over time (e.g., at the end of each regulatory period) and its application should be limited in time
- NRAs should consult on details of design of financial incentive

Changes to Regulatory Models

When feasible, NRAs may apply a totex approach to mitigate asymmetric information between natural gas TSO and NRAs

- Information asymmetries: it may be difficult for NRA to not approve a replacement investment when a risk on security of supply and reliability is involved
- One option for NRA would be to adopt some form of totex approach, instead of dealing separately with capital and operational expenditure
- Conducting economic benchmarking on total cost (including capital cost) is difficult due to data limitations, different accounting conventions in the treatment of capital costs, etc.
- Adoption of a totex approach would represent a change from current regulatory practice and would require further work from NRAs

Regulatory Tools

Application of regulatory tools to facilitate efficient choice between reinvestments and extended use of assets

1. Forecast of Natural Gas Demand and Network Planning

- Accurate forecasting is a pre-requisite to determine future (re)investment requirements
- Decarbonisation policies and respective timings shall be clearly defined at a national level
- More integrated network planning and operation of entire EU energy system, across multiple energy carriers, infrastructures and consumption sectors

2. Asset Maintenance

- One way to defer capital replacement and reinvestment expenditures is to improve maintenance
- Natural gas TSOs could prepare and publish an asset management plan
- When feasible, condition-based assessments could be adopted rather than age-based replacement programmes
- Natural gas TSOs could also apply monetised risk assessments

3. Transparency Requirements

- Important to define and publish indicators to monitor evolution of reinvestments and assets fully depreciated (in operation)
- Information requirements could be either included at EU level or at a national level defined by NRAs

ARERA: measures for asset substitution vs reinvestment

ACER TAR TF
10 November 2022

Caterina Miriello
Gas Infrastructure Officer (ARERA)

Main themes on asset replacement vs reinvestment

- In Italy: regulatory asset life for pipelines is **50 years**; several pipelines are (almost) fully depreciated although still fit to be maintained in operation

- TSO perspective: maintaining fully depreciated assets into operation is not economically profitable (increased OPEX but price cap, no CAPEX allowance) → *but* substituting a large part of the network might prove critical
- NRA perspective: avoiding inefficiencies, by inducing TSO to keep in exercise fully depreciated assets when technically feasible, and postponing/avoiding their substitution → *but* in the context of decarbonisation, how to deal with the risk of assets no longer being needed before the end of their technical life?

Arera's findings: in general, postponing the substitution brings a benefit to the system, even in the case of substitution of assets no longer needed before the end of their technical life

Arera's regulatory measures

1. Increased **oversight** on TSO investments:
   - inclusion of substitution investments in NDPs
   - introduction of an Asset Health Methodology to evaluate the need for substitution or the possibility of reinvestment
2. Introducing an **incentive to postpone** a substitution investment based on the benefit for the system of avoided remuneration:
   - 1% of re-evaluated investment cost (*still under consultation*), computed as a share of the estimated benefit for the system of avoided remuneration, under different decarbonisation scenarios
   - the benefit is computed as a function of years of postponement, amount of remuneration, discount factor
3. Possibility to capitalise extraordinary maintenance expenses (up to a certain threshold) with a **regulatory life shorter** than pipelines (15/20 years) – *still under consultation*

ARERA
Autorità di Regolazione per Energia Reti e Ambiente

THANKS

Caterina Miriello
Gas Infrastructure Officer (ARERA)
cmiriello@arera.it

Discussion

ACER
European Union Agency for the Cooperation of Energy Regulators

Closing remarks

Csilla Bartok

Our vision

A trusted voice to tackle global transformations

Dr. Daniel Grote
Team Lead Energy Markets and Strategy

DNV Energy Systems Germany GmbH
Rabinstr. 1, 53111 Bonn
Germany

Daniel.Grote@dnv.com

+49 172 2899162

www.dnv.com