

Public consultation on the ACER efficiency comparison for natural gas TSOs

Fields marked with * are mandatory.

Introduction

Objective

The objective of this consultation is to gather views and information from stakeholders on the objectives and design of the ACER efficiency comparison (AEC) for natural gas TSOs. The design to be used to complete this task will be finalised by 4 October 2025. Two additional phases of the project will follow to request and validate the TSO data (phase II) and to complete the modelling work (phase III). The input from the consultation will be used by the Agency's when completing the design phase.

The Agency is consulting on two documents providing the objectives and design of the AEC:

- **D02: AEC Objectives and Criteria**
- **D03: AEC Method, Data and Process.**

Stakeholders are invited to read this material. Complementary to these two files, the Agency provides in this consultation document several questions requesting input on specific topics discussed under D02 and D03. Stakeholders who wish to submit input can provide it via the EU Survey tool displays input fields for each of these questions.

Target group

This consultation is addressed to stakeholders, including end consumers (household, industrial, power generation), shippers, environmental and consumer associations, academics and TSOs.

Contact and deadline

Replies to this consultation should be sent using the EU Survey tool:

https://ec.europa.eu/eusurvey/runner/ACER_efficiency_comparison

In addition, stakeholders can provide input related to the consultation documents D02 and D03 that is not covered in the questions. For this purpose, they can submit their input as pdf or word file in a dedicated section of the survey.

Stakeholders can contact ACER in relation to the public consultation using the email: AEC@acer.europa.eu. The maximum size for submitting files using the EU Survey tool is 1 MB. Larger files can be submitted to this functional mailbox.

The deadline for providing input to the public consultation is **17 July 2025, 23:59 hrs (CET)**.

For more information please consult ACER website: [Link](#)

Download more information:

[AEC_Public_consultation_document.docx](#)

Introductory questions

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* Name of organisation / company

FNB Gas e.V.

Type of organisation

- Government,
- NRAs,
- TSO,
- DSO,
- financial institution (banks, funds etc),
- industry, environmental and consumer associations,
- academia,
- shipper, supplier,
- other (please specify)
- individual person

*** Please specify "other"**

Association of Transmission System Operators for Gas in Germany

*** Country**

- EU-27
- Other

*** Please specify the country**

- AT - Austria
- BE - Belgium
- BG - Bulgaria
- HR - Croatia
- CY - Cyprus
- CZ - Czechia
- DK - Denmark
- EE - Estonia
- EU - European Union, for associations covering all EU
- FI - Finland
- FR - France
- DE - Germany
- EL - Greece
- HU - Hungary
- IE - Ireland
- IT - Italy
- LV - Latvia
- LT - Lithuania
- LU - Luxembourg
- MT - Malta
- NL - Netherlands
- PL - Poland
- PT - Portugal
- RO - Romania
- SK - Slovak Republic
- SI - Slovenia
- ES - Spain
- SE - Sweden

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ACER will not publish personal data.

Consent to the processing of personal data

Your personal data may be processed by the Agency.

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Confidentiality

Following this consultation, ACER will make public:

- the number of responses received;
- company names, unless they should be considered as confidential;
- all non-confidential responses; and
- ACER's evaluation of responses. In the evaluation, ACER may link responses to specific respondents or groups of respondents.

You may request that the name of your company or any information provided in your response is treated as confidential. To this aim, you need to explicitly indicate whether your response contains confidential information. **You will be asked this question at the end of the survey.**

I have read the information on data protection and confidentiality provided in this section.

Consultation Topics and Questions

Topic 1: Transparency and publication requirements

The Agency will promote transparency on the AEC to ensure access to the TSO data used in the modelling, transparency on NRA decisions and availability of the data to stakeholders.

Without a transparent process for data collection, methodology, calculations and reporting, the process value for NRA would be low. To ensure transparency, AEC should maintain the following principles:

1. Clear established data definitions and data specifications prior to the data collection.
2. Independent audits of financial and asset data for each TSO
3. Open access to all T1 data (non-commercially sensitive)
4. Full references and access to any non-TSO reported parameters (T0 data)

5. The methodology should be documented in a reference document that is independently validated by experts prior to calculations
6. Calculations and reporting of results should be independently audited by third party.
7. The individual reporting should specify each step in the process as to enable each NRA to reproduce the input data.

By combining a sound method and model selection, adequate choice of efficiency metrics, regulatory alignment, transparency, due process, and adaptations to new tasks, NRAs can trust the AEC as a legally robust, fair, and enforceable source of information about the economic, quality and capacity performance of their TSO. This strengthens the credibility and acceptance of efficiency targets while minimizing legal risks.

At the same time, the Agency will ensure that the information published is not commercially sensitive for TSOs.

Transparency is discussed in reports D02: section 7.2 and D03: section 5.1. Annex A of D03 contains a list of variables and parameters that would likely be made public as part of the T1 dataset.

1. How do you value transparency across the different stages and results of the AEC? Please elaborate.

Transparency in the methodology, the process (methodology steps, including treatment of data prior to modelling), and data validation are very important. Full transparency on the methodology of the ACER Efficiency comparison is needed in order for TSOs to understand the approach and the outcome of the comparison. In this sense, apart from transparency, representativity, and stability of results, reproducibility is equally important. TSOs need to be able to understand the whole benchmarking exercise to be able to recalculate their score. For this purpose, it is essential that ACER publishes the aggregated data set (in particular T1) as planned. The programming code (R code) used by the consultants should also be published in order to ensure the reproducibility of the calculations. This also applies to the NormGrid (please see question 18 on this). It is crucial that the assumptions made within the quantitative analysis, the analysis' scope and limitations are transparent to all stakeholders. It should be highlighted that estimates resulting from the analysis must be interpreted with caution. Using them as a term within the national regulation of revenues would be in violation of good scientific practice, regulatory reason and responsibility (see answer to question 12). With respect to the data used, it is imperative to maintain asset-specific data confidentiality. Due to security reasons, TSOs should not be obliged to share locational data with any entity other than their respective NRA. Data should only be shared via secured channels.

2. What are the elements of a TSO benchmark where transparency is most important? Please elaborate.

Transparency regarding the methodological approach, methodological assumptions and limitations is of particular importance. TSOs must be able to retrace, understand and interpret their individual scores. They must receive information on their final scores as well as their scores from sensitivity analyses, and on their peers. We do not agree that the latter information can be omitted from individual reports (compare consultation document D02, chapter 7.5). Without information on their peers' identities, TSOs cannot interpret their score. Peer analysis is an essential feature of benchmarking by means of DEA.

3. What other approaches to transparency should ACER consider when designing and publishing the AEC? Please elaborate.

All TSOs should get information at the same time and with equal access.

Topic 2: Challenges for natural gas transmission networks in the context of decarbonisation

The synthesis document D02, establishing the objectives of the AEC, identifies the key challenges that natural gas transmission networks will face in the future (see sections 2.1 –2.3). These include (1) the likely decrease in natural gas transported volumes; (2) the CAPEX additions resulting from new forms of gas, biogas and LNG connections; (3) the removal of assets for repurposing and, potentially, decommissioning; and (4) the extension or replacement of assets reaching the end of their technical operating life.

4. What are the key features that the ACER should consider when designing a methodology to measure the efficiency of natural gas TSO infrastructure? Please elaborate.

European TSOs operate under different topological, ecological and economic context conditions. They have to comply with different legal and regulatory requirements and technical standards and face different regulatory incentives (as described in more detail in ENTSOG’s response to this question). They have different structures and supply obligations. All these differences need to be considered to achieve unbiased results which, however, cannot be achieved by any of the proposed benchmarking methodologies due to the small size of the TSO sample. Therefore, we fully support ENTSOG’s conclusion that AEC results can at best serve illustrative purposes. Using the resulting point estimates within a formula for revenue regulation would be in violation of good scientific practice, regulatory reason and responsibility. We want to add the following remarks: In the context of decarbonization, TSO business is changing. National policies prescribe different decarbonization targets and national network development plans lay out different decarbonization pathways. Network transformation is a complex process, where the measures taken by TSOs (e.g., decommissioning, repurposing, CH4 replacement measures) need to be closely coordinated with each other as well as with other infrastructure measures (e.g., municipal heat planning, construction of electrolyzers, re-equipment of industrial plants etc.). When evaluating the efficiency of a TSOs in the context of decarbonization, it does not suffice to simply compare cost-output measures. Political mandates, risks, regulatory and environmental constraints, time constraints arising from interdependence with other infrastructure projects, TSOs’ contributions to technological innovation, and the efficiency and resilience of the whole energy system also need to be taken into account.

5. How should the decrease in network utilisation be taken into account when measuring the efficiency of TSOs. Please elaborate.

Network utilisation depends on external factors (demand, supply, gas flows) that are outside the TSOs control. Network utilisation can also change quickly – as we see with the Russian invasion of Ukraine. It is not a factor that is controlled by the TSO but by shippers and the market. In the context of decarbonization and decommissioning, TSOs are legally obliged to serve their remaining customers and – to a varying degree – are obliged to maintain additional infrastructure for crisis situations. Network utilisation, therefore, should be excluded from the scope of the AEC. It should be noted that network utilization is assessed within multiannual network planning. The resulting network development planning (national NDP and the TYNDP) are subject to stakeholder review. They are approved by NRAs or ACER. In the context of decarbonization, network plans gain importance as they synchronize interdependent infrastructure projects. They have the purpose of

guaranteeing the stability and reliability of the whole energy throughout the process of network transformation. Obligations resulting from network plans should not have a negative impact on a TSO's efficiency evaluation. In particular, CAPEX resulting from multiannual network planning should be excluded from AEC, because TSOs face constraints in infrastructure planning.

Topic 3: Legacy investments

The efficiency of natural gas TSOs is largely impacted by legacy investments carried out prior to the liberalisation of the EU gas natural gas sector. Past investments, prior to deregulation, were not always undertaken with an efficiency focus. For instance, pre-deregulation decisions may have been prompted by other owners and for national or non-economic reasons. Furthermore, investments in transition states prior to EU-membership are in some cases subject to hyperinflation or non-market prices for labour or equipment.

These observations, which are valid for gas TSOs and important for incentive regulation of future investments and operations, call for a periodised analysis of the past capex. The relevance of determining the exact investment efficiency for assets that date more than 30 years ago (i.e. prior to the First Directive) and to assure the comparability of their market conditions are likely less important than the comparability of recent investments and new assets. The Agency considers informative to analyse the impact of **legacy investments** in the AEC by providing results with and without legacy investments. For the latter, the Agency proposes to control for these costs using standardized values to, as discussed in section 6.6 of document D02. The Agency proposes the entering into force of Directive 98/30/EC (First Gas Directive) as the cut-off date to identify legacy investments.

The AEC will include all the legacy investments and, as a sensitivity analysis, the AEC will calculate the same model but with legacy investments neutralized to standardized values to understand the impact on efficiency. When legacy investments are included in the modelling, their value should be reassessed for the purpose of comparison (see 6.5). Opex is not affected by this sensitivity analysis as all assets in use are part of the physical output.

The AEC results calculated with and without legacy investments should be considered by the NRAs when taking a decision on the allowed or target revenue of the TSOs.

6. Is the proposal to address the comparability problem of legacy investments acceptable and effective for the purposes of the AEC? Please elaborate.

The documents do not contain a precise description of the neutralization procedure. It remains unclear which standard prices will be used for neutralization. This renders a proper evaluation difficult. Generally speaking, the neutralization of legacy investments is associated with methodological advantages and disadvantages: On the one hand, Sumicsid states that the quality of data on legacy investments and opening balances is poor and biased, i.a. due to past support schemes in certain member states. Neutralization can mitigate these biases. On the other hand, past investment decisions and conditions are associated with lock-in effects that affect today's investment policies and OPEX. The "neutralization" of legacy investments leads to the omission of these lock-in effects, and hence, introduces a different type of bias in AEC. Since the two approaches - no neutralization and neutralization of legacy investments - are associated with different advantages and disadvantages, they should be considered as complementary and should both be used within the efficiency analysis. NRAs should be aware of the approaches' respective weaknesses when interpreting the results. Sumicsid's considerations on

legacy investments point to two more general problems of AEC: First, limited data quality and comparability cannot be solved through data validation and standardization. Second, standardization introduces new biases that reduce the validity of results.

7. Do you consider the entry into force of the First Gas Directive in 1998 to be an adequate cut-off point for identifying legacy investments? Please elaborate.

Since we have no access to disaggregated data on legacy investments of all TSOs, we cannot provide a definitive answer to this question. We assume that some of the problems Sumicsid aims to address through neutralization are also pertinent to certain observations in more recent years, but we cannot evaluate the scope of this problem. This illustrates that standardization necessitates simplifying assumptions. Sensitivity analyses are crucial to evaluate the type and size of uncertainties resulting from these assumptions. Estimates cannot be interpreted in isolation and should not be used for regulatory purposes.

8. How should different efficiency levels pre- and post- liberalisation be considered in the TSO allowed revenue methodologies? Please elaborate.

Any methodology for TSO efficiency comparison is highly theoretical. The liberalisation of the gas market is not the only structural change that should be considered. Besides, there have been regional impacts that do not affect all countries equally. Estimates resulting from a quantitative analysis like AEC with a small, non-random, heterogeneous set of observations should not be used within a formula for setting the allowed or target revenues of TSOs. This approach violates good scientific practice, regulatory reason and responsibility. Estimates are associated with substantial uncertainties and, hence, can at most serve as a starting point for further analysis. If a regulatory authority, nonetheless, chooses to use point estimates for regulatory purposes, it must respect safety measures such as sensitivity analyses combined with best-of-accounting (e.g. between methods, model specifications, and variable specifications), corrections for specific structural challenges and top-ups for specific contributions to system stability and sustainability. The need for best-of-accounting is also highlighted in a recent scientific study for the Bundesnetzagentur (compare Swiss economics, ConGas, iFG: Zukunft des Effizienzvergleichs der Gasnetzbetreiber, 20 May 2025).

Topic 4: Comparability of TSO costs

The AEC proposes a series of measures to enable the comparability of TSOs costs and performance, which are described in sections 6.1-6.7, 7.3 of document D02.

The AEC is proposed to ensure comparability through means of defining a strict functional and asset scope, controlling for joint ownership or operation of assets, structural and organizational differences, standardizing asset depreciation, asset ages for used installations, standardizing capital costs, labour cost corrections, controlling for overhead cost allocation, inflation adjustments, opening balances, price and currency differences, environmental heterogeneity with respect to land use and cover, slope, soil properties, wetness based on spatial asset locations, as well as excluding costs and investments that relate to out-of-scope or exceptional events.

9. Are the comparability measures proposed in the documentation effective and necessary? Is there redundancy or inadequate measure among the instruments?

Any methodology for TSO efficiency comparison is highly theoretical. These measures are welcome, but do not account for the totality of heterogeneity, or even for the main part of it. As highlighted in our answer to question 6, standardization cannot solve problems of data quality and can, at best, mitigate heterogeneity. It often introduces new types of bias. Therefore, sensitivity analyses are necessary. They constitute a minimum safety standard.

10. Are there some comparability measures in the documentation that are too inappropriate or ineffective in the adjustments? Please elaborate.

As the German Government aims to achieve Net Zero by 2045, the existing natural gas network will face a diminishing user base, reducing the need for natural gas pipelines. Therefore, the gas pipelines will need to be safely decommissioned (or repurposed). In addition to the implications of the nationally varying Net Zero goals, there are also decommissioning liabilities in place, which are principally connected to the life-times of gas assets. In many cases, the TSOs are even obliged to build decommissioning provisions on a yearly basis to fulfill their contractual obligations towards the landowners. However, the degree of affection by these obligations is distributed not equally among the TSOs and depends on their individual risk assessment, geographical location of their networks, and the diameter of their pipelines. The decommissioning of a pipeline may lead to (1) either the necessity of its principal dismantling or (2) to backfilling of the pipeline to prevent any damage to the soil and land use. The costs accrued by this may be significant. As a result, the affected TSOs need to assess their potential financial burden and to build associated provisions. Up to today, these provisions were treated as part of the “normal”, controllable cost in the TSO’s cost base and, therefore, subject to the efficiency comparison. In light of the latest developments, the German regulator (the BNetzA, “RAMEN Gas” GBK-25-01-2#1, 18.06.2025) rightly identified that decommissioning liabilities fulfill the requirements for being treated as non-controllable cost. As a result of this re-qualification, these costs need to be deducted from the expenditure parameters of any efficiency comparison. With regards to the ongoing AEC-Process, we suggest ACER treats decommissioning liabilities as non-controllable cost and deducts them from the “cost-in-scope” (similar to fuel cost). Including the decommissioning liabilities into the benchmark would lead to further distortions in the results and severe, unjustified penalizing of the respective TSOs.

Topic 5: Static efficiency

The proposed efficiency metrics are described in chapter 4 of document D02 and the choice of efficiency analysis methods is discussed in chapter 2 of document D03. The main result of the AEC is a static modelling carried out with DEA. SFA will provide secondary results used for validation.

A static deterministic model is focusing on a single year and uses variables that are not subject to random effects, primarily execution-based outputs and services directly derived from installed assets. The analysis is not sensitive to cost changes over time across Europe. DEA is a method that uses a minimal set of assumptions and delivers scores also for smaller sample of operators.

The use of DEA for benchmarking TSOs is well established and has been used in TCB (TCB18, TCB21 and E2GAS) and also in the German benchmark for natural gas TSOs (Reference: Swiss Economics, Sumicsid, 4Management (2018) Kostentreiberanalyse und Effizienzvergleich der Gasfernleitungsnetzbetreiber EFG3, Final report for Bundesnetzagentur).

11. Do you consider the proposed approach to provide the primary efficiency measure of the AEC adequate? Please elaborate.

The methods proposed by the consultants for efficiency analysis (both, DEA and SFA) are associated with severe weaknesses: The extreme heterogeneity of European TSOs (e.g., different topological, ecological and economic context conditions; different regulatory requirements; different administrative rules regarding revenues and capital costs; different technical standards; different structures; different service portfolios) cannot be captured by an econometric model, neither can the complexities of network transformation that increasingly characterize TSO business (see answers to questions 4 and 13). Even if all these factors could be measured, they could not all be integrated into the analysis due to the limited size of the sample. Standardization can reduce certain types of bias in raw data, but in most cases introduces new types of bias (see our answers to questions 6 and 7). Given the non-random nature of the sample, standard statistics cannot be used to estimate error probabilities. The high interdependence of observations leads to a high susceptibility of individual results, to data errors, and, potentially, to systematic biases in results. In a nutshell: the benchmark cannot lead to valid and robust estimates. Therefore, the benchmark should not be used within a formula for revenue regulation. If regulators nonetheless decide to use these estimates, a best-of between methods, models and variants of variable specification (standardized/non-standardized), corrections for specific structural challenges and top-ups for contributions to system stability and sustainability should be put in place (see also question 8).

12. Do you agree that a static model could provide useful input for NRA regulatory rulings? If not, what other options you would propose? Please elaborate.

The weaknesses listed in our answer to question 11 also apply to other econometric approaches. Therefore, we doubt that any benchmarking model (static or dynamic) can provide useful input for NRA regulatory ruling. We oppose, in particular, the application of point estimates as terms within revenue regulation (see also answer to question 8). Creating uncertainty and (potentially excessive) cost-pressure for TSOs, it endangers the well-functioning of the European energy system and hampers or impedes investments into network transformation.

Topic 6: Dynamic efficiency

The energy transition is expected to result in lower demand for natural gas. The evolution of demand and entry points depend on many factors, most of them being uncontrollable by the TSO which networks are sized to match the peak network use.

In this context, TSOs with older assets are likely to have over-capacity in a context of decreasing demand while TSO with more recent assets can dimension the assets to the actual demand. In an efficiency analysis, the use of actual demand (gas volume or entry point) used as an output would lead to TSOs with more recent assets appearing as more efficient, as their asset capacity more closely match the actual output.

In an environment of decreasing use of infrastructure having utilisation metrics in a benchmark implies that TSOs are rewarded (or penalized) for bringing the size/capacity of the network in line with decreasing demand.

For that reason, the static (one-year) efficiency model in AEC will use only asset-based outputs instead of utilization-based outputs to compare like with like.

However, to provide information on, and incentives for, the correct asset intensity facing fuel substitutions, AEC will also incorporate a dynamic efficiency model, covering several years of operations. In this case, to monitor the volume transported and peak load development in the natural gas sector and the adaptation of assets to outputs, usage-based outputs will also be used. The inclusion of usage-based outputs in the dynamic model will capture how TSO can adapt to changing circumstances.

For this calculation, the Agency proposes to use SFA as a primary method and DEA as a secondary method for confirmation.

The use of dynamic modelling considering network utilisation is discussed in sections 3.3 and 4.7 of document D02 and in section 2.5 of document D03.

SFA is not only the academically most used dynamic method, but also and foremost the relevant tool to explore and address random variables or data errors in the AEC, thereby providing a valuable validation of the correctness of the static model results.

13. Do you consider appropriate to provide additional efficiency scores taking into account network utilisation? Why? Please elaborate.

No, see response to question 5. The objectives of the dynamic analysis as mentioned in the consultation documents (“provide information, and incentives for, the correct asset intensity facing fuel substitutions”) is out of scope of the legal mandate given to ACER under Article 19, 2 Gas Directive. The correct asset intensity facing fuel substitutions is determined and achieved through multiannual and annual network development planning. An efficiency benchmark focusing on cost-output-relationships cannot contribute to this task because it cannot capture the complex interrelationships between decommissioning, repurposing and replacement investments, which are necessary to guarantee supply throughout the transition process. Neither can it take into account the risks associated with this process, or the time constraints which arise from interdependencies with other infrastructure projects (e.g., the construction of electrolyzers and the technical re-equipment of industrial plants), funding contracts or planning approval procedures (on which TSOs have little influence). On the contrary, creating new risks for TSOs it is likely to hamper or impede necessary investments in network transformation. During the ACER stakeholder workshop on 9 and 10 July, ACER’s consultants repeatedly compared TSOs with bus companies that can adapt the size of their buses to demand as demographics in their service are change. This comparison is obviously wrong. In most cases it would be extremely inefficient if TSOs replaced pipes having a large diameter with pipes having a smaller diameter even though capacity bookings decrease. The comparison demonstrates that the consultants have a very limited understanding of TSO operating. It also illustrates that AEC in general (see also answer to question 24), and the proposed dynamic analysis in particular, are based on unrealistic assumptions.

14. Do you consider the proposed method design appropriate (SFA as primary method and DEA and secondary method)? Why? Please elaborate.

Neither SFA nor DEA can capture the complexities outlined within our answer to the previous question.

15. Is the use of two methods a strength for the analysis or a source of ambiguity in the interpretations? Why? Please elaborate.

We strongly oppose the notion that the utilisation of two methods can be a source of ambiguity in interpretation. It is good scientific practice to check the robustness of results using different methods of analysis. The reasoning provided by the consultant in Synthesis Report D03 (chapters 2.3 and 2.4) does not sufficiently justify the proposed restriction to SFA and DEA, nor the exclusion of the discussed methodologies (e.g. COLS, MOLS, UC, EngM, StoNED). In order to ensure the robustness of the efficiency benchmark, it would be advisable to incorporate all proposed methods within a best-of approach.

Topic 7: Data quality

For the purpose of ensuring data quality, the Agency proposes several layers of validation, including:

- Asset system and audited financial statements.
- Clear guidelines and templates.
- NRA check of the data submitted by TSOs Cross-validation of all TSO datasets, including technical engineering validation.
- Data analysis by the consultant.

The processes for the validation of the data to ensure the quality of the dataset are described in chapter 4 of document D03.

The AEC proposes an integrated data validation strategy in six steps involving TSOs, NRAs, ACER, consultants and auditors to ensure maximum data quality.

16. Do you agree with the data validation approach outlined? What other alternative measures should ACER consider ensuring the quality of the data? Please elaborate.

As illustrated by the example of legacy investments, not all data issues can be solved through validation and standardization. Moreover, regardless of the consistency of data submitted by TSOs and NRAs, the interpretations that can be drawn from the AEC are limited as we already noted in previous answers.

Topic 8: Technical input on benchmarking

The AEC is an empirical assessment of total cost, actual and efficient levels, related to services performed by structurally comparable operators. Intrinsicly, the mission is a methodological challenge requiring the mobilization of the best possible statistical, operations research and econometric methods that are relevant to the problem at hand.

In chapter 7 of document D02 and chapters 2 and 3 of document D03 with references, some of the methods and techniques used are described and discussed. However, the documents do not purport to provide a full technical description, for this the underlying documents and the references to this note could be consulted.

Some of the techniques have been discussed in past projects, we list some of the relevant aspects as consultation questions, without claim of exhaustiveness.

17. The criteria in section 7.7 of document D02 list ‘relevance’ as a criterion for the model specification. However, data mining techniques such as principal component analysis or machine learning may derive good predictions of total cost without an explicit cost function. Do you agree that this criterion is sound and necessary for the AEC purposes? What measures can be taken to assure relevance of the results? Please elaborate.

Given the high number of variables and the small number of observations, it is unrealistic that data mining techniques can lead to the definition of a valid and robust model. Relevance and continuity in regulation therefore are relevant criteria for model selection. However, their inclusion cannot solve the more severe problem that the number of observations is too small and the number of cost drivers too high for proper econometric analysis. Hence, valid and robust results cannot be achieved.

18. The comparison of assets with different dimensions and material is partially based on a normalized grid metric (NormGrid). Is the use of such normalization acceptable and robust for the AEC? Please elaborate.

The estimation of the NormGrid has been a black box for many TSOs and NRAs. Therefore, there should be a fully detailed transparency level for the NormGrid (including variables, assumptions, and methodology). This would enable more detailed comments from our side. It is important to be more detailed in this aspect, since this element of the methodology is likely to be very decisive for results. It should also be noted that NormGrid is a generic parameter with many components. For each component, there is a probability of measurement error, which implies that the probability for measurement error of the generic parameter is very high (see, e.g., Oxera (2020): A critical assessment of TCB18 gas).

19. Service quality is not explicitly modelled among the parameters in chapter 3 of document D03. Should service *quality* be part of the benchmarked outputs? If so, how can it be measured?

This is a relevant question, and it should be approached by the consultant with some alternative method proposals. Whether these methods are fit for purpose and representative should be assessed when these methods are presented. We would like to highlight the challenge to approach service quality with any technique of measurement that (even if it is quantitatively supported) is not qualitative. The aim of the efficiency benchmark is set to be quantitative, scientific, and objective. Yet qualitative aspects (like this one) cannot be left outside, as other specificities that we have mentioned in prior replies.

20. Do you agree with the output variable selection methods in section 3.2 of document D03? What improvements can be made? Please elaborate.

See answer to question 17. At the same time, the principle of "non-determinability" must be taken into account, i. e., parameters that can be set by TSOs in terms of their magnitude and optimized relative to the benchmark without any actual efficiency gains must not be included into the final model.

21. Do you agree that the environmental correction factors listed in section 3.3 of document D03 are relevant and important for the AEC? What improvements can be made? Please elaborate.

TSO business is influenced by a variety of environmental factors, including those listed in 3.3. The core problem, however, is that not all relevant factors can be included in the AEC models. In past benchmarks, the selection of variables and the weighting of inputs were highly subjective. In addition, TSO businesses and the European gas network have dimensions that cannot be captured in simple statistical models (e.g., it is impossible to find a proper measure of the impact of altitude or slope in terrain for every asset type).

22. Do you consider it useful, in the analysis of the dynamic efficiency of TOTEX, to take national capital cost differences—particularly the WACC—into account when assessing the evolution of the optimal cost structure, especially the balance between OPEX and CAPEX? Please elaborate.

For the reasons given in our answer to question 13, AEC should not include a dynamic efficiency analysis as suggested by ACER and the consultants. With regard to the more general question of CAPEX standardization, we refer to our answer to question 9.

23. Are there missing structural or environmental factors that should be included in the analysis? Please elaborate.

see answer to question 21

24. Please provide any other view relevant to the topic of the consultation.

1800 character(s) maximum

Backward-looking approach: assumptions on cost-saving potential: ACER's consultants misunderstand historical (efficient) decisions, which are now identified as alleged inefficiencies, as cost savings potentials, ignoring that TSO's cost-saving potential is very limited. Unlike electricity networks, gas networks will expand only selectively (e.g. connection of new gas power plants). Planned investments and reinvestments are limited and focus on guaranteeing supply during the energy transition. This implies that the alleged inefficiencies identified by AEC (doubts regarding the validity of results arise from the many methodological limitations mentioned in our answer to Q11) can only be reduced by cutting OPEX. As a result, the efficiency targets coming from AEC (if applied in national legislation) risk undermining the maintenance of the gas network, and thus the reliability and stability of gas supply. Rather than strengthening the competitiveness of European industry, AEC risks convulsing one of its most important pillars. Also, it creates unnecessary risks that make it hard or impossible for TSOs to acquire the capital needed for investments into the energy transition (e.g. rerouting as specific pipes are transferred into H2 networks) Outlier detection: The consultation documents contain little information on the topic of outlier detection. It is only mentioned in the section on data verification and validation, not in section 5.5 on modelling. Given the importance of outlier handling for ensuring the robustness and credibility of benchmarking outcomes, clarification on this aspect would be appreciated. The inclusion of a transparent and well-documented approach seems essential. It is an important step of the analysis and should be subject to public consultation

25. Please upload your file(s) in case you would find it necessary to provide any additional information from your side.

Maximum file size is 1 MB. If your file is bigger, please use the functional mailbox: AEC@acer.europa.eu.

Question on confidentiality

*** ACER evaluates and may publish the received input. Do you consent that the submitted input is published?**

- Yes, ACER may publish the submitted replies.
- Yes, ACER may publish the submitted replies **anonymously**.
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*** Does your submission contain confidential information?**

- Yes
- No

Contact

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