

SUMMARY

REGULATION OF TARIFFS AND CONDITIONS FOR THIRD-PARTY ACCESS IN NATURAL GAS DISTRIBUTION SYSTEMS



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Preface

On behalf of RME, Menon and AFRY have assessed the most appropriate way to structure the regulatory model related to third-party access to infrastructure for the distribution of natural gas in Norway.

Even Winje from Menon has been the responsible partner and led the project. Piotr Śpiewanowski (Menon), Odin Dager Moe (Menon), Erika Karttinen (Menon), and Lucy Field (AFRY) have been project team members. Quality assurance has been provided by Kristoffer Midttømme (Menon), Stian B. Hackett (AFRY), and Kathrine S. Bakke (AFRY).

We would like to thank RME for an exciting assignment.

This is the English summary from the published report *“Regulering av tariffer og vilkår for tredjepartsadgang i distribusjonssystemer for naturgass”*. The entire report is available in Norwegian on our website www.menon.no

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Even Winje
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Summary

In the study, we have assessed how it is most appropriate to structure the regulatory model related to third-party access to infrastructure for the distribution of natural gas in Norway. The analysis is based on current practice and the regulatory model that is being developed. The purpose is to provide input for potential improvements to ensure that:

- The natural gas operations are conducted in an economically rational manner.
- There is real competition through third-party access for natural gas enterprises.
- The tariff established is rational, objective, and non-discriminatory.

As of today, only Gasnor AS is subject to the requirement to provide third party actors access to the distribution network. For Lyse, adjustments were made so that they are currently not subject to the regulation requirement¹. Although the primary focus of the proposed regulatory model has been on the regulation of Gasnor, we take into account that in the future it may also be relevant to regulate the distribution network of Lyse.

Today's proposed tariff seems good, but has potential for improvement

Our review of the current tariff proposal shows that RME's proposal is in line with the objective of ensuring a rational development of natural gas operations. According to the natural gas regulations, it is Gasnor itself that proposes the tariff model, tariff structure, and price level. Regarding the maintenance of the current infrastructure and its utilization, we consider such an approach to be advantageous. Competition from alternative energy supplies increases the benefit of a soft regulation because it allows the distributor to consider different willingness to pay among customers and ensure that the price is not set too high. Strict regulation poses the risk of customers disconnecting, and requires high precision from the regulator's side, who has less insight into the actors' willingness to pay. These are strengths we will build upon in our proposal. However, we must point out that rational development of the gas infrastructure implies that the enterprises achieve a productivity growth that is comparable with other parts of the economy. The proposal on the table has no explicit mechanisms to ensure this. Hence, whether it is appropriate to incorporate such mechanisms, is an important consideration in the analysis.

The tariff structure itself, in RME's proposed decision, is based on total costs allocated to the total volume of gas delivered in the network. Such a tariff is clearly both reasonable and objective. However, the non-discrimination principle is more complex to assess and will largely depend on what the main cost drivers are for the distribution business. The design of the tariff was also highlighted regarding the competitive situation in the retail market in the interviews we have conducted, but views on the functionality of the proposed structure varied greatly. Some interview subjects point out that real competition can only develop when distribution prices reflect the real costs for the gas distributor and indicate that the distribution key does not ensure this. The latter is closely related to the distributor also operating as a retailer in the market. Other stakeholders, on the other hand, point out that the size of the Norwegian gas market, and the lack of large customers apart from Hydro Aluminum, is the main obstacle for the development of competition in the gas market, not the regulation. The latter can only to a small extent be influenced by regulation. However, an assessment of cost drivers remains central in the further analyses. The interview subjects otherwise had no objections to the conditions for third-party access.

¹ [Naturgassforskriften § 5-1](#) (Norwegian regulation)

Another key element of the regulation is how the balance responsibility is to be allocated. Balance responsibility refers to the responsibility of ensuring that there is a balance between the amount of gas injected into the network and the amount of gas extracted from the network. In the interviews, we have identified a broad consensus in favor of the current system being appropriate. According to the interviewees, it is most natural and efficient for the DSOs to have technical responsibility for balancing in a network that is not connected to a transmission network. The interviewees also highlight that it is important that the balancing responsibility is limited to technical responsibility, while economic responsibility is shared between the third-party actor and gas wholesaler (shipper). Based on this feedback, we have not considered any potential changes to the balance responsibility in this analysis.

An income regulation has qualities that make it preferable

To design an access regulation, it is prudent to start by assessing which regulatory model should be the foundation. This choice will set the framework for which parameters need to be defined to implement the regulation. We recommend that a regulation of the gas distribution market should be based on a revenue cap regulation. Revenue cap regulation is the most common regulatory model for gas distributors in the EEA today. Furthermore, revenue cap regulation is used as a regulatory model in both the Finnish and the Swedish gas markets, in addition to the Norwegian electricity market. By using a well-established model, administrative costs are reduced, while the functionality can be benchmarked against other Nordic DSOs. It is also easier to carry out oversight if one only needs to verify the total revenue base versus the pricing of individual customers. A revenue cap regulation further allows greater freedom for the regulated entity to set prices within the framework that the revenue cap imposes. This means that the regulated entity can adapt its pricing depending on the customers' willingness to pay, which can contribute to ensuring efficient utilization of the pipeline network. With a price ceiling, this possibility is reduced. Finally, we would also point out that in our assessment, a revenue cap regulation provides more flexibility in terms of which cost components are emphasized in the tariff base, which can be important to ensure that the regulation is non-discriminatory.

Further, we recommend that the permitted revenue is determined based on the regulated party being covered for their distribution costs including depreciation, and a reasonable return on invested capital. We also advise including mechanisms to manage situations when the regulated party has earned less or more than the revenue cap allows. The primary objective of these mechanisms is to balance out volume variation between regulatory periods. We do, however, recommend that the distributor can only adjust for earnings *lower* than allowed by the revenue cap in the subsequent regulatory period. In this way, the distributor is prevented from "accumulating" several periods of earning less than the revenue cap. Regarding situations where the distributor earns more than the revenue cap, we recommend that no specific requirements are set for the period over which the distributor must compensate the end-user for previous over-earnings.

A high and variable cost level indicates a need for efficiency incentives and that the tariff should be based on average costs over time

The cost basis is central to ensuring rational development of infrastructure businesses that are regulated through a revenue cap. The cost basis affects the prices end users must pay for natural gas distribution, as well as the competitive situation with third-party actors. If the cost basis is set too high, one might find oneself in a situation that makes it unprofitable for end users to establish themselves in the market, even if they initially have sufficient willingness to pay. If the cost basis exceeds actual costs, it also becomes challenging for third-party actors to enter the market if the DSO is both distributor and retailer. The latter is because the retailer themselves chooses the price at which they sell the gas.

Our analysis shows that Gasnor has a relatively high cost-level compared to Swedish and Finnish DSOs. We believe that these are the most comparable operators in Europe as of today. It is specifically with respect to costs per pipeline length and offtake points that Gasnor stands out. Pipeline length is identified as the most important driver of distribution costs both in the literature and in interviews we have conducted. In terms of delivered energy, we find that Gasnor is approximately on par with the DSOs we have compared with. However, Gasnor's costs per unit of energy delivered are greatly influenced by the fact that Hydro's demand contributes to a high volume per kilometer of pipe, compared with the other Nordic DSOs. It is particularly Gasnor's operating costs that seem especially high. We have not had the opportunity to assess the operating costs in detail, but our analyses indicate that there is potential for increased efficiency in the operation of the distribution business.

We recommend including an efficiency requirement in the regulatory model, as is done in Sweden. Furthermore, our analysis of Gasnor's accounting data for 2021 and 2022 (budget) shows there is significant variation in costs from year to year. Therefore, we advise basing the cost foundation on average historical costs from the last four to five years before the regulatory period, rather than just one year as currently proposed by RME and Gasnor. Such amortization is long enough to provide incentives for efficiency but short enough to adapt to structural and technological changes in the industry.

We propose an allowed return on capital that is somewhat higher than the return on capital allowed for grid companies

Establishing a reasonable allowed return on capital in the regulatory model is important to provide the correct incentives for investment in gas distribution infrastructure. In addition, the allowed return on capital is crucial to ensure that users of the gas network do not pay disproportionately for the use of the network, as a high allowed return on capital will result in a higher tariff. Our analyses suggest that the allowed return on capital for Norwegian gas distributors should be set between 8.94 and 9.43 percent if we are only to change the gas-specific parameters in the WACC model². In other words, the proposal assumes that the risk-free rate in the regulation is the same as the one used in the regulation of Norwegian grid companies. The reason we have chosen to recommend a range for the allowed return on capital rather than a specific estimate is due to the difficulty in quantifying concrete values for equity beta and credit premium. We have also recommended a range for the allowed return on capital if the risk-free interest rate in the regulation is allowed to differ from the one in the regulation of the Norwegian grid companies. However, such a change in the risk-free rate would require the same change to be done in the regulation of grid companies. Should there be willingness to make this change, we recommend that the allowed return on capital should be set somewhere between 7.32 and 8.7 percent. Which exact value within the proposed interval RME choose, depends on whether RME considers the downside risk to be largest by incentivizing to under-investments or over-investments in gas distribution. Our further review suggests that the risk of malinvestment due to a too *high* allowed return on capital is less than the risk of underinvestment due to a too *low* allowed return on capital. This is because third-party competition and access to alternative energy sources will limit the distributors potential for gaining a too high return on capital.

Our recommendations are based on a comprehensive mapping of the allowed return on capital for grid companies and gas distributors in Europe, and how the risk profile for such infrastructure differs from the risk profile of Norwegian gas infrastructure. Additionally, we have compared this with the regulation of Norwegian grid companies. We find that the risk profile is higher for Norwegian gas distributors compared to both Norwegian grid companies, and European gas and electricity distributors. This results in both a higher equity beta

² This is a proposal for the required rate of return for 2023.

and credit premium for Norwegian gas distributors, compared to Norwegian grid companies and other European gas distributors. However, our proposal is more aligned with the allowed return on capital in the gas regulations in Finland and Sweden, which are the countries where the gas market is most similar to the Norwegian one. Based on the analyses, we believe there is also a basis for adjusting down some of the parameters in the allowed return on capital that are not dependent on the risk profile of the investment. However, this issue must be assessed in a holistic perspective that also takes into account Norwegian grid companies. In this context, it is important to clarify that it is the method behind the proposal, and not necessarily the specific sizes themselves, that should be the main focus when comparing our estimates with those proposed by Gasnor and RME. This is because several of the financial parameters will vary over time. In the actual decision, we therefore recommend that RME itself updates with the latest estimates for the sizes that vary with the development in financial markets. As the financial parameters in the WACC model will vary over time, we also recommend that these are frequently updated, to ensure predictable frameworks for end users, wholesalers, and retailers. We see no reason here to deviate from the practice that exists in the regulation of Norwegian grid companies. This entails that the following parameters are adjusted frequently throughout the regulatory period:

- Inflation
- Risk-free interest rate to the cost of debt (swap rate or 3M NIBOR).
- Industry-specific credit spread

We recommend that the remaining parameters should be updated prior to each regulatory period.

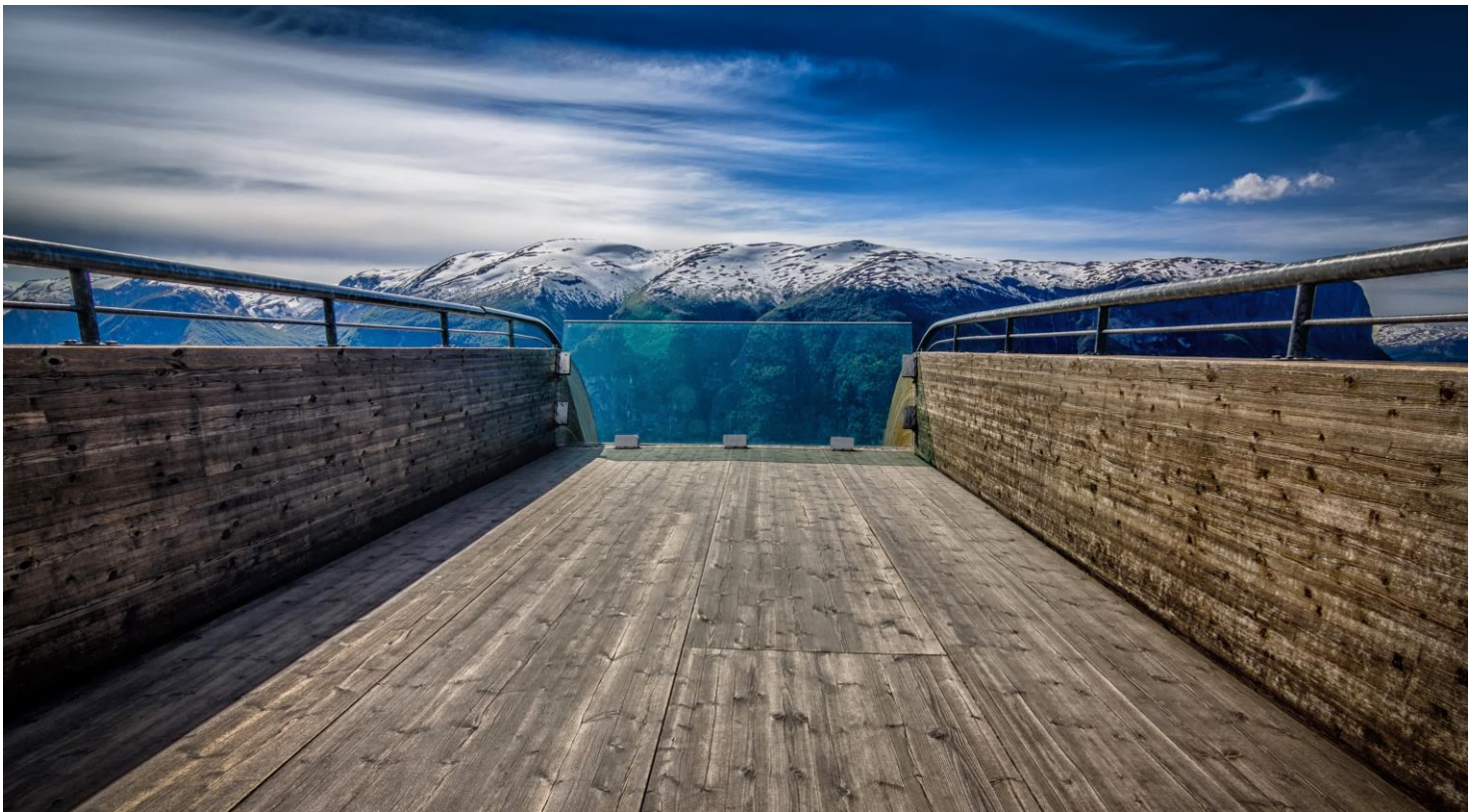
The current arrangement, where the distributor has significant freedom concerning tariff structuring, should be continued, but we recommend including a distance element to ensure that the tariffs are more cost reflective

We recommend maintaining the approach whereby the gas distributor is allowed to decide the tariff structure, given the overarching revenue cap set by the regulatory model. Competition from alternative energy supplies increases the benefit of a soft regulation as it allows the distributor to consider varying willingness to pay and ensure that prices are not set too high. Although we argue that such an arrangement poses the least regulatory risk regarding the rational development of network operations, we see that a distance element would have made the tariffs more cost reflective. A distance element would strengthen the regulation in terms of being non-discriminatory and transparent, as well as potentially increasing competition in the retail market. In this context, distance could have been included either based on power distance or additional distance and could have been part of the fixed component, as is the case with power within the electricity market. However, additional distance may be administratively more demanding and less transparent for the end user. Whether to introduce an upper or lower bound regarding the distance parameter has not been explicitly considered by us. Such an assessment would depend on how one weighs the cost of limiting degrees of freedom against the potential gains linked to cost reflection of the tariffs and the competitive situation. Such an arrangement might also require changes to the current regulation, which, as we interpret it, allows the distributor complete freedom in the tariff design. To ensure that the tariffs are clear and transparent, it is important to maintain the current requirement for publication and that all customers can access their own basis of calculation upon request.

In the table below, we summarize the recommendations from the thematic analyses we have described above. We believe the totality of these recommendations should form the basis for RME's further regulatory work.

Table A: Recommendations for the future regulatory regime for gas distribution in Norway

Parameter	Proposal
Regulatory model	<ul style="list-style-type: none"> • Revenue cap with efficiency requirements. • Lower or higher realized revenue than allowed by the revenue cap: <ul style="list-style-type: none"> ○ Should be calculated per regulatory period, not within the regulatory period. ○ Distributors can only adjust for lower-than-allowed revenues in the subsequent regulatory period. ○ There are no directives on when the distributor must compensate the end user for excess revenue. However, it is recommended that "owed excess revenue" should accrue interest at the rate of the allowed return on capital.
Basis for income limitation	<ul style="list-style-type: none"> • Allowed revenue should cover distribution costs (including depreciation) plus a reasonable return on invested capital. <ul style="list-style-type: none"> ○ Distribution costs are calculated as an average of historical costs (last 4-5 years), adjusted for expected inflation and an efficiency requirement of 1% annually. • We recommend using a regulatory period of 4-5 years.
Allowed return on capital	<ul style="list-style-type: none"> • Recommended range for allowed return on capital: 8.94% - 9.43%. <ul style="list-style-type: none"> ○ If one allows for changes to the estimates of the risk-free rate in the regulation of both gas distribution and grid companies, we recommend that this range for gas distribution should be adjusted down to [7.32 – 8.7%]. • We recommend that the updating of the parameters in the allowed return on capital follows the practice in the regulation of Norwegian grid companies.
Capital base	<ul style="list-style-type: none"> • The capital base is valued as it is today.
Depreciation period	<ul style="list-style-type: none"> • Economic life should be the basis. Gasnor's proposed delivery time of 50 years is in line with current practice in mainland Europe
Tariff structure	<ul style="list-style-type: none"> • The tariff is set by the system operator. However, the system operator must establish a formula that displays the tariff structure for all their customers. • It should be considered to introduce a requirement that the formula should include a fixed component/distance element to reflect that the system operator's costs are primarily driven by pipeline length.
Balancing responsibility	<ul style="list-style-type: none"> • Retain the wording as proposed in RME's tariff proposal for system balancing.



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