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Regulation methods in the fifth regulatory period of 1 January 2024 – 31 December 2027 and the sixth regulatory period of 1 January 2028 – 31 December 2031

Natural gas transmission network activities

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1 REGULATION METHODS – SUMMARY

In this document, the Energy Authority (the Authority) sets out the methods for regulating the reasonableness in the pricing of natural gas network operations in the period 2024–2031. These guidelines concern natural gas transmission system operators (TSO).

The Authority will issue the final regulation methods to the TSO as an appendix to the confirmation decision by the end of 2023.

The guidelines and regulation methods have been drawn up by government officials in the Energy Authority. The principles governing the choices presented in this document are derived especially from the following legislation

- Act on the regulation of the electricity and natural gas market (590/2013, Regulation Act)
- Natural Gas Market Act (587/2017)
- Government proposal on the Natural Gas Market Act (HE 50/2017 vp)
- Government proposal on legislation concerning the electricity and natural gas market (HE 20/2013 vp)
- committee report by the Commerce Committee (TaVM 17/2013 vp)
- other legislation issued by virtue of the Natural Gas Market Act.

The Energy Authority has also taken into account the decisions of the Market Court and the Supreme Administrative Court on complaints concerning previous regulation methods.

In the development of regulation methods, the Authority has also drawn on the practical experience it has gained from regulation.

The Authority has also used expert reports and statements as background material in the preparation of the guidelines.

The Authority has consulted stakeholders in preparing the guidelines for the regulatory methods. At the beginning of 2022, the Energy Authority established a stakeholder advisory board to enhance the consultations. The stakeholder advisory board had the function of engaging in discussions and thus of assessing the effectiveness of the proposed changes. In 2022, the Energy Authority gave an introduction to the changes to the regulation methods in eight meetings of the advisory board. The Energy Authority prepared published memoranda on the discussions held at the

meetings of the stakeholder advisory board and a final report on taking the perspectives of the stakeholders highlighted in the discussion into account in reinforcing the regulation methods.

In addition, when developing the methods of electricity and natural gas network activities, particular attention is paid to the impact assessment of changes to the methods in order to increase transparency throughout the development process.

1.1 Summary of regulation methods

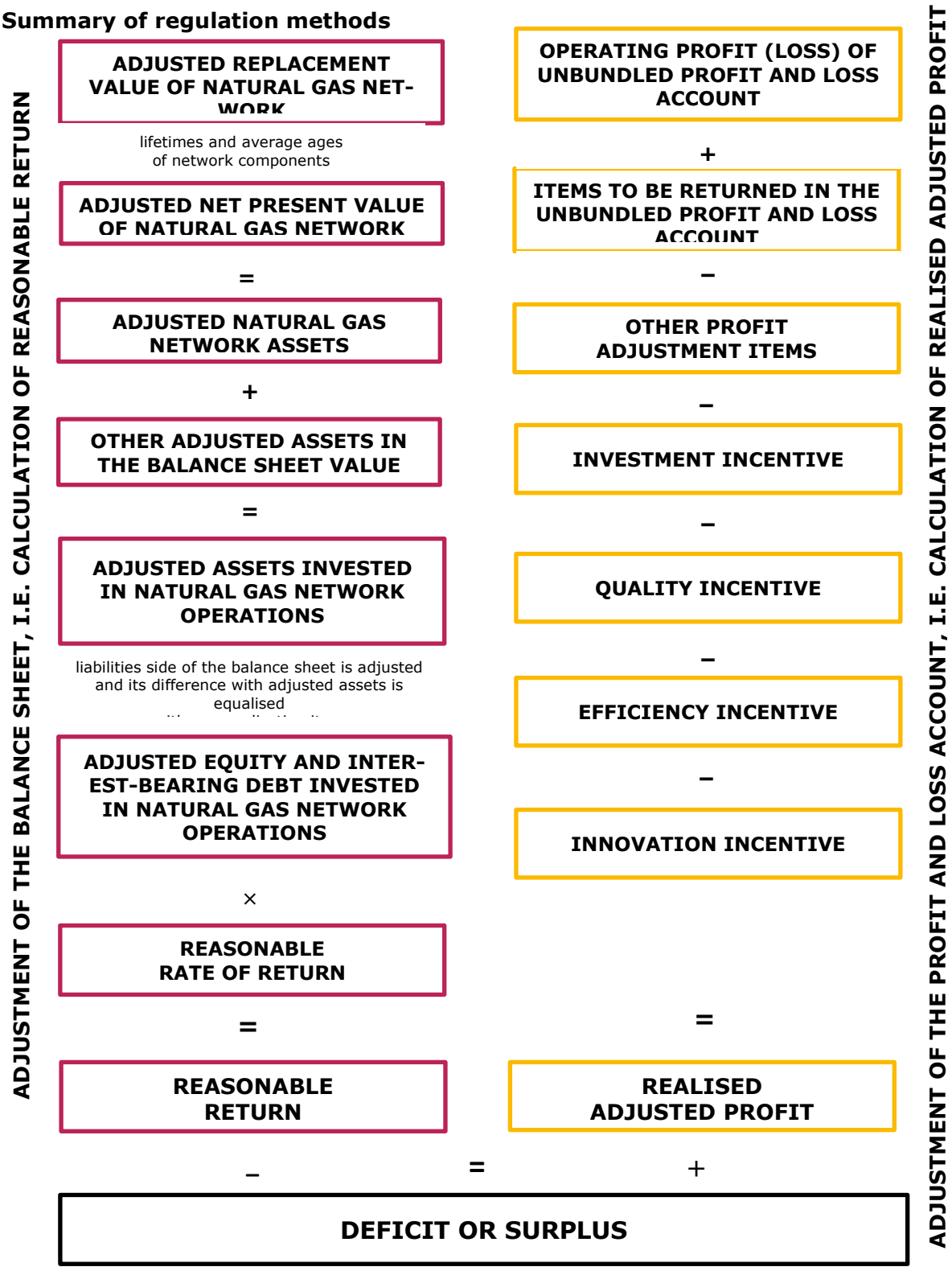

Figure 1. *Regulation methods for regulation periods 2024–2027 and 2028–2031*

The regulation methods include several different methods, which together form the entity shown in Figure 1. This entity is used for regulating the reasonableness of pricing in network operations. All individual methods are described in this document.

The methods of calculating the adjustment of the balance sheet, i.e. reasonable return, are presented on the left-hand side of Figure 1 (2, 3 and 4). The methods of calculating the adjustment of the profit and loss account, i.e. realised adjusted profit, are presented on the right-hand side of the figure (5, 6 and 7).

LEARNING ABOUT THE REGULATION METHODS

For an overview of the regulation methods, first read chapters 1, 4 and 7. For a more detailed description of the methods, see chapters 2, 3, 5 and 6.

1.1.1 Adjustment of the balance sheet, i.e. calculation of reasonable return

Adjusted assets invested in network operations consist of adjusted natural gas network assets in the non-current assets (2.1), other non-current assets (2.2) and current assets (2.3) in the unbundled balance sheet.

The adjusted capital invested in network operations is obtained by adding together adjusted equity (2.4.1), interest-bearing debt (2.4.2) and non-interest-bearing debt (2.4.2). An equalisation item (2.4.1) is also added to this to reconcile the different sides of the balance sheet.

A reasonable rate of return (3) is calculated on the basis of the weighted average cost of capital (WACC model).

Reasonable return is calculated by multiplying the adjusted capital invested in network operations (2.4) by the reasonable rate of return (3.4).

1.1.2 Adjustment of the profit and loss account, i.e. calculation of realised adjusted profit

The calculation of realised adjusted profit starts with the operating profit (loss) of the TSO’s profit and loss account in the unbundled profit and loss account.

In the calculation of the realised adjusted profit, the annual change in refundable connection fees (participation fees) according to the unbundled balance sheet, depreciations on goodwill according to the unbundled profit and loss account, planned depreciation in the unbundled profit and loss account and write-down of network assets, and the loss of sales resulting from the sale of a network section entered

under other operating expenses are returned (5.1). Meanwhile, the profit from the sale of a network section entered under other operating income is deducted (5.1) when calculating the realised adjusted profit.

After that, reasonable costs of financial assets (5.3) are deducted as profit adjustment items.

The impacts of incentives are also deducted. Incentives include investment incentive (6.1), quality incentive (6.2), efficiency incentive (6.3) and innovation incentive (6.4).

The sum total of the calculation is the realised adjusted profit.

1.1.3 Deficit and surplus

The deficit or surplus of the return is obtained by deducting the reasonable return from the realised adjusted profit.

The profit is in surplus if the result of the subtraction is positive. The profit is in deficit if the result of the subtraction is negative.

1.2 The entity formed by regulation methods

In this document, the Energy Authority describes the entity formed by the regulation methods. Reasonable pricing referred to in natural gas market legislation is determined based on this entity as a whole.

The regulation methods form a carefully considered entity. As the Market Court has noted in its decision (MAO:271-344/06), in addition to the fact that it must be possible to independently study and assess individual sections and parameters included in the methods, the confirmation decision represents a carefully considered entity. Moreover, the Market Court has stated in its decision (MAO:247/17) that the Energy Authority must, when considering the development of methods, assess the matter from the perspectives of the entire network operation in question and the functioning of its special regulation. Similarly, the Supreme Administrative Court has stated in its decision (KHO:2017:124) that TSO-specific contract arrangements or aspects related to tax legislation have no legal significance in the interpretation context of the confirmation decision. The above must be taken into account when developing the entity and individual methods because the methods and variables interact with one another.

When individual sections are assessed out of the context of the entity formed by the methods, a certain degree of caution should be exercised (precautionary principle). That way, for example, possible changes will not result in an internal conflict, illogicality, or taking the same factors into account several times over in the regulation methods. In addition, even fairly small deviations in the values selected for the parameters may result in differences that are considerable from the viewpoint of the entity of methods.

It is not possible in terms of clarity in the administrative decision, or even in practice, to draw up the regulation methods with a degree of accuracy where the treatment of every single factor is exhaustively justified.

If necessary, the Energy Authority will specify the contents of the regulation methods with written instructions. When issuing supplementary instructions, the Authority will apply the methods and principles of the confirmation decision in order to safeguard equal operating opportunities for TSOs.

OBJECTIVES OF REGULATION

According to natural gas market legislation, the main objectives of the special regulation of the natural monopoly are the reasonableness of pricing and a high quality of network services. Therefore, the Energy Authority seeks these with the entity formed by the regulation methods and with the practical steering impacts of the methods on the TSO's business operations.

In addition to the main targets of regulation, other key targets include equality and network development, as well as the sustainability, continuity, development and efficiency of business operations.

Equality means social income distribution between the owners of the regulated enterprises and the customers. The level of profits must not be too high, for example, in relation to investments that the owners could make in other business operations of a similar risk level.

Sustainability, continuity and development mean that regulation must ensure necessary investments and other network development in order to safeguard sufficient security of supply. Other appropriate development and vitality of business operations must also be safeguarded in the long term.

Efficiency means that the service desired by the customer is provided at the lowest cost possible. The pricing of network operations is not subject to market pressure,

which means that the TSO has no incentive to improve the efficiency of its operations. As a result, without regulation, higher prices could be used to compensate for any cost ineffectiveness. Therefore, the regulation of the reasonableness of monopoly pricing must be used to ensure that the TSO achieves a cost level that is actually achievable.

Consumer rights

According to the objective expressed in the Internal Market Directive for Natural Gas (2009/73/EC 48, introductory words), consumer interests are essential. In addition, the quality of service must also be an important area of responsibility for the TSO.

As the national regulatory authority, the Energy Authority has the task of making sure that consumer rights are enforced. Consumer rights must be strengthened, safeguarded and the associated transparency increased.

DEVELOPMENT OF REGULATION

For their key parts, the regulation methods have become established on the basis of decisions issued by the Energy Authority and those issued by the Market Court and the Supreme Administrative Court relating to them.

The Authority's task is to develop the regulation methods. According to the legislative history of the Act on Regulation (HE 20/2013 vp, detailed justification of section 10 of the Act on Regulation), the Energy Authority must prepare a new confirmation decision, in which the methods of the decision have been developed on the basis of experience, as necessary. The Authority must also ensure that the confirmation decision will be subject to sufficient public discussions at the draft stage.

When developing regulation, the Energy Authority must take into account the targets and principles of the special regulation of a natural monopoly expressed in natural gas market legislation and in case law. The Authority must also take these into consideration in applying regulation methods.

DISCRETION

The Energy Authority has ex-ante competence in key regulation issues. The objective of legislation (Directive 2003/55/EC 13 introductory part) in adopting ex-ante regulation was to reduce uncertainty and expensive and time-consuming disputes.

Natural gas market legislation leaves wide room for discretion to the Authority with regard to its application. This also applies to regulation methods and their development and application. Even if the regulation methods were drawn up with the utmost detail, there would still remain ambivalent issues, which the Energy Authority as an independent regulatory authority would have to resolve within the limits of its discretionary power.

The Supreme Administrative Court has also ruled (KHO 2010/86) that legislation provides the Energy Authority with a wide margin of discretion in the development of regulation methods.

When developing and applying the regulation methods and in regulation in general, the Authority takes into account the limits of the principles of good administration and fundamental rights in its use of discretion with respect to all parties subject to specific regulation.

EQUALITY AND REASONABLENESS FROM THE TSO'S POINT OF VIEW

The regulated TSOs must be treated equally.

However, the fact that the different elements of the methods produce different outcomes for different TSOs is no justification for the non-application of the method in question. The Supreme Administrative Court has stated in its decision (KHO:2017:124) that TSO-specific aspects have no legal significance in the interpretation context of the confirmation decision.

On the other hand, special obligations resulting from legislation have been accepted in case law as a ground for different treatment of transmission system operators and distribution system operators in the regulation methods (MAO:268/06).

When examining whether the regulation methods have, in reality, achieved a reasonable end result in accordance with their objectives from the TSO's point of view, certain aspects must be taken into account. Based on legislative history (HE 134/1999, detailed rationale of Chapter 2, section 8 of the Natural Gas Market Act), these include whether the TSO has been able to

- make sufficient investments in the network
- cope with its costs
- pay profits to its owners.

If the TSO has or could have achieved these, the TSO has met it obligations within the scope of the regulation methods.

1.3 Amending a confirmation decision

During the regulatory period, the Energy Authority may amend the confirmation decision with a new decision in situations prescribed in section 13 of the Act on Regulation.

UPDATING THE PARAMETERS OF THE CONFIRMATION DECISION FOR THE REGULATORY PERIOD

For the sixth regulatory period, the Authority will update the following parameters of the regulation methods during 2027

- the reasonable rate of return beta coefficient (3.2.3), the capital structure (3.2.6) and the debt premium (3.3.2), which are updated already during the fifth regulatory period every two years
- market risk premium relating to the reasonable rate of return (3.2.4)
- reference level of the quality incentive (6.2.2)
- reference level of efficiency costs (6.3.3)

During the period, unit prices will also be updated for the valuation of investments made in the period. The unit prices will be updated during the fifth regulatory period in 2027 and during the sixth regulatory period in 2031 in accordance with the principles set out in Appendix 1.

These updates are not changes in methodology. This is an update of the parameters of the regulation methods, which is comparable to an annual update of the parameters, for example in the calculation of a reasonable rate of return.

The update to the parameters for the sixth regulatory period will be made in the same way as their determination for the fifth regulatory period, using the methods described in this document.

With respect to updates, the Authority will not submit a separate decision, but the TSO will be notified of them in a regulation letter.

1.4 Regulatory data

It is the requirement of regulation that the TSO delivers to the Authority actual copies of the necessary regulatory data in the correct format and on schedule.

By virtue of section 30 of the Act on Regulation, the TSO is obliged to deliver to the Energy Authority the information required in the regulation.

1.4.1 Regulatory data required in regulation

The regulatory data required in the application of the regulation methods is specified in the following documents

- Ministry of Economic Affairs and Employment Decree on the unbundling of natural gas network operations (TEMa 1306/2019, decree on unbundling)
- the Energy Authority's regulation on the key figures of natural gas network operations and their publication (EV Reg.No., regulation on key figures). The regulation on key figures will be updated during 2023 and published in conjunction with the adoption of confirmation decisions
- regulation methods (this document).

Key regulatory data includes unbundled financial statements, network structure data, financial and technical key figures. However, it should be noted that all information necessary for the Authority's regulatory task is regulatory data. Therefore, any separate additional information requested by the Authority from the TSO for regulation purposes is also regulatory data

DECREE ON UNBUNDLING

The TSO must provide the regulatory data of the unbundled financial statements (profit and loss accounts and balance sheets) confirmed in accordance with section 7 of the Decree on unbundling, including additional information and notes.

REGULATION ON KEY FIGURES

The TSO must deliver in the regulatory data the information and key figures referred to in the appendices of the Regulation on key figures.

REGULATION METHODS

The TSO must deliver in its network structure data the quantity and age data of the network's components that are in its possession and actually used by the TSO. The delivered data must be divided according to Appendix 1 and as values corresponding to the situation on the last day of December each year.

The TSO must report the quantity and age data of network components invested in and removed from the network during each year using the same division. If the TSO has purchased or sold sections of the network, the TSO must report the quantity data of network components purchased or sold, including age data, using the

same division. In addition, the TSO must report the quantity data of replacement investments using the same division. The lifetimes of network components must also be supplied, if necessary.

The TSO must also report other breakdowns required in the adjustment of the unbundled balance sheet and profit and loss account of network operations. These are referred to in sections 2.1, 2.2, 2.4.2, 5.1, 5.2, 5.3, 6.4.1 and 6.5.2. The TSO must be able to verify the validity of the breakdowns in a reliable way.

1.4.2 Delivering the regulatory data

The network structure data must be delivered to the Energy Authority by the end of March each year. Information about the financial statements and the technical key figures must be delivered to the Energy Authority by the end of May.

As a rule, the TSO must deliver the regulatory data via the online-based regulatory data system of the Energy Authority.

If the data must be provided by other means, the Agency will provide a separate notification of this in writing.

If the TSO neglects to deliver the regulatory data to the Energy Authority, the Authority may impose a penalty payment on it in accordance with paragraph 31 of the Act on Regulation.

1.4.3 Validity of the regulatory data

The regulatory data supplied by the TSO must be valid, i.e. genuine and reliable.

When determining and delivering the regulatory data, the TSO must comply with the written instructions, definitions and specifications set out in

- the Decree on unbundling
- the Regulation on key figures
- the regulation methods
- the regulatory data systems
- other instructions issued by the Authority.

In unclear cases, the TSO must ask the Authority for more detailed instructions.

The validity of regulatory data is mainly based on the trust that the Energy Authority has towards the TSO. The TSO calculates and delivers the data independently. The

Authority does not have the resources to systematically verify all data. For this reason, emphasis is placed on the TSO's own legal and moral responsibility for the correctness of the regulatory data.

The Energy Authority will correct any incorrect control data it has detected to comply with the regulation methods if the TSO does not do this.

The TSO must be able to verify the regulatory data it has delivered during regulation visits by the Energy Authority or when otherwise separately requested by the Authority.

1.5 Unbundling of operations

Under section 60 of the Natural Gas Market Act, a natural gas undertaking shall unbundle natural gas network operations, natural gas sales and storage operations from each other and from business activities not included in the natural gas sector.

In accordance with paragraph 4 of the decree on unbundling, the TSO must enter the income (5.1) and costs (5.2), as well as asset items (2.1, 2.2 and 2.3) and capital items (2.4), which directly pertain to the natural gas network operations, directly to the unbundled financial statements of the natural gas network operations.

Operations open to free competition by law cannot be unbundled to natural gas network operations. These kinds of operations are also not subject to the regulation methods.

The treatment of matters related to unbundling in the regulation methods is specified in the Energy Authority's recommendation[1] on the imputed unbundling of the electricity and natural gas business operations.

1.6 Leased networks

The TSO is in an equal position regardless of whether it owns the natural gas network under the network licence or whether it has otherwise acquired possession of it.

If the TSO has leased a natural gas network in its possession either in part or in whole, it operates in a leased network in that respect. The lease arrangement is

[1] Recommendation by the Energy Market Authority, Sähkö- ja maakaasuliiketoimintojen laskennallinen eriyttäminen (Imputed unbundling of electricity and natural gas business operations) (Reg.No. 2449/421/2015), 18 December 2025, the recommendation will be updated before the start of the 5th regulatory period

dissolved in the regulation methods when the unbundled balance sheet as well as the profit and loss account for the natural gas network operations are adjusted.

In accordance with the decree on unbundling, a TSO operating in a leased network must also enter the income and costs directly pertaining to the natural gas network operations and the asset items and capital items directly in the unbundled financial statements on natural gas network operations (1.5).

If the TSO has leased its natural gas network or a part thereof, it must provide in the regulatory data information concerning the business operations of the owner of the network. Information must be provided if it concerns the TSO's operations and the network of the area of responsibility determined in the network licence.

A TSO operating in a leased network must deliver, if necessary, an itemisation of the cost items included in the network lease.

1.7 Networks purchased and sold during the regulatory period

CALCULATING THE REPLACEMENT VALUE AND NET PRESENT VALUE

In the adjustment of the value of the buyer's natural gas network asset,

- the natural gas network to be purchased is added to the replacement value and net present value of the buyer's natural gas network on the basis of the number of network components and age data
- the lifetime of the network components to be purchased is determined according to the lifetime that has been previously selected for each network component by the buyer.

The sold natural gas network is deducted from the replacement value and net present value of the seller's natural gas network on the basis of the number of network components and age data.

1.8 Inflation

The annual change in the monetary value, i.e. the impact of inflation, is taken into account in the calculation of reasonable return and realised adjusted profit as presented below.

INFLATION ADJUSTMENT IN THE CALCULATION OF A REASONABLE RETURN

A reasonable rate of return (WACC %) is determined as a nominal value, i.e. the impact of inflation is not removed from it. To avoid taking inflation into account twice in the calculation of reasonable return, the value of network assets may not be revalued. This refers to an adjustment that resembles a valuation in accordance with accounting in principle, in which separate frozen unit prices reflecting the average acquisition value must be determined for each investment year and used only for the adjustment of investments in that year.

Inflation will be processed in the adjustment of network assets as follows. In the valuation of investments made before 2024, the unit prices in accordance with Appendix 1 will directly apply; in the valuation of investments made only after 2024, the unit prices specific to the given year of the fifth or sixth regulation period will apply in the valuation of investments.

In terms of other invested adjusted assets, the values according to the unbundled balance sheet for the year in question will be used.

Reasonable return is obtained by multiplying the adjusted capital invested annually in the natural gas network operations and the interest-bearing debt by the nominal reasonable rate of return (WACC %). The nominal reasonable rate of return used in the calculation of the year in question includes the inflation expectation, and therefore the impact of inflation will be taken into account once in the calculation of a reasonable return.

INFLATION ADJUSTMENT IN THE CALCULATION OF REALISED ADJUSTED PROFIT

When calculating realised adjusted profit, inflation adjustment is made on the efficiency incentive. The consumer price index is applied in the inflation adjustment.

In the efficiency incentive, inflation adjustment is made annually in the calculation of the reference level of efficiency costs.

A change in the total index of the total consumer price index (2005=100) is applied in the inflation adjustment.

The average of the index points of the consumer price index for April–September of the year in question shall be used as the index for each year. For example, the average of the index points of the consumer price index for April–September 2024 will be used for 2024.

The change in the consumer price index is presented in Formula 1.

$$\Delta CPI_y = \frac{CPI_y}{CPI_{y-1}} - 1 \qquad (1)$$

where

ΔCPI_y = the change in the consumer price index for year *y*

y = year under review

CPI_y = the average of the index points of the consumer price index (2005=100) for April–September in year *y*

CPI_{y-1} = the average of the index points of the consumer price index (2005=100) for April–September in year *y-1*

1.9 Calculations to be made during the regulatory period

During the regulatory period, the Energy Authority will calculate the following information for the TSO using the regulatory data system

- adjusted replacement value of the natural gas network assets
- adjusted net present value of the natural gas network assets
- adjusted straight-line depreciations of the natural gas network assets
- adjusted equity invested in natural gas network operations
- adjusted interest-bearing debt invested in natural gas network operations
- adjusted non-interest-bearing debt invested in natural gas network operations
- adjusted capital invested in natural gas network operations
- reasonable return
- realised adjusted profit
- deficit or surplus
- items of a profit-distribution nature.

The Authority will report this information to the TSO through the regulatory data system. In addition, the Authority will make it available to the public, for example, to the TSO's customers and the media.

The Energy Authority will carry out the calculation of the above-mentioned data by applying the regulation methods described in this document and the regulatory data provided by the TSO.

Once the TSO has received the annual calculation for information purposes, the TSO must inspect it and report any errors. If necessary, the Authority will provide a new calculation for information purposes.

Even if the TSO did not comment on the annual calculations immediately after receiving them, this does not prevent it from providing a statement at a later date. The final opportunity to comment is with respect to the regulatory decision draft. However, due to the predictability and efficiency of the regulation process, the Authority recommends that comments are forwarded primarily during the regulatory period immediately after the calculations have been received for information.

The annual calculations made by the Authority during the regulatory period do not include the obligations concerning the TSO and therefore they are not administrative decisions to which a right of appeal would apply. The Energy Authority will confirm the calculations concerning the entire regulatory period after the regulatory period by submitting a regulatory decision (1.9), which is appealable (1.10).

1.10 Regulatory decision issued after the regulatory period

After the end of the regulatory period, the Energy Authority will submit the regulatory decision to the TSO by virtue of section 14 of the Act on Regulation. With this decision, the Authority confirms the amount in euros by which the TSO's realised adjusted profit falls short of or exceeds the amount of reasonable return over the entire course of the regulatory period.

DEFICIT AND SURPLUS

In the regulatory decision, the Authority adds together the realised adjusted profits for different years in the regulatory period using the methods confirmed in the confirmation decision and the regulatory data provided by the TSO and deducts from this the sum of reasonable returns for the corresponding years. The sum total of the calculation is the deficit or surplus for the entire regulatory period.

If the realised adjusted profits accrued over the entire regulatory period fall short of the amount of reasonable returns for the regulatory period, the TSO will accrue a deficit.

If the realised adjusted profits accrued over the entire regulatory period exceed the amount of reasonable returns, the TSO will accrue a surplus.

INTEREST LIABILITY ON THE SURPLUS

If the realised adjusted profit during the regulatory period, from which the possible deficit of the previous regulatory period has been deduced or surplus has been added, has exceeded the amount of a reasonable return by at least five per cent, interest must be paid on the surplus. The interest rate is the average of the reasonable cost of equity (3.2) for the years of the regulatory period in question.

The interest liability on the surplus is taken into account in the regulatory decision when calculating the deficit or surplus transferred to the next regulatory period. Interest is calculated on the surplus of the regulatory period from which any deficit from the previous regulatory period has been deduced or to which any surplus from the previous period has been added (section 14 of the Regulation Act and MAO 484/15).

DEFICIT OR SURPLUS FOR THE PREVIOUS REGULATORY PERIOD

The regulatory decision takes into account the deficit or surplus accrued for the TSO during the regulatory period preceding the regulatory period in question. The Energy Authority has confirmed the deficit or surplus in the regulatory decision concerning the previous regulatory period.

CALCULATING DEFICIT OR SURPLUS TRANSFERRING FROM THE REGULATORY PERIOD

The calculation of deficit or surplus transferring from the regulatory period to the next regulatory period is presented in Table 1.

Table 1. *Calculation of deficit or surplus*

+	**Sum of realised adjusted profits for all years of the regulatory period**
-	**Sum of reasonable returns for all years of the regulatory period**
=	**Deficit (-) or surplus (+) accrued for the regulatory period**
+	**Possible interest liability on surplus accrued for the regulatory period**
=	**Deficit (-) or surplus (+) accrued for the regulatory period, including interest liability**
+	**Deficit (-) or surplus (+) in accordance with the regulatory decision accrued for the previous regulatory period***
	DEFICIT (-) OR SURPLUS (+) TRANSFERRING TO THE NEXT REGULATORY PERIOD

* *Deficit accrued from the regulatory period preceding the previous regulatory period is no longer taken into account even if the deficit or a part thereof has not been equalised during the previous regulatory period*

EQUALISATION OF DEFICIT AND SURPLUS

If on the basis of the calculation described in Table 1 the TSO has a deficit transferring to the next regulatory period, it cannot be equalised until during the following regulatory period.

If on the basis of the calculation described in Table 1 the TSO has a surplus transferring to the next regulatory period, it must be equalised during the next regulatory period.

However, it is possible to apply for extra time for the equalisation of deficits and surpluses from the Energy Authority on serious grounds.

Based on an application from the TSO, the Energy Authority must extend the deficit compensation period by a maximum of four years if the TSO has been unable to cover the deficit due to the increase ceiling regulation laid down in section 24 of the Natural Gas Market Act. In this case, the extension applies to the part of the deficit that the TSO could not cover due to the limitation of the increases in transmission and delivery fees laid down in section 24 of the Natural Gas Market Act. The application must be submitted before the end of the equalisation period.

1.11 Appealing against the confirmation and regulatory decisions

The confirmation decision issued by the Energy Authority before the start of the regulatory period and the regulatory decision issued by it after the end of the regulatory period are administrative decisions. The TSO may appeal against these decisions in accordance with section 36, paragraph 2 of the Act on Regulation.

The appeal is lodged with the Market Court. It is possible to appeal against the decision issued by the Market Court by appealing to the Supreme Administrative Court. The Authority may also appeal against the decision of the Market Court by appealing to the Supreme Administrative Court if the Market Court has by its decision amended the confirmation or regulatory decision.

According to section 38 of the Act on Regulation, the confirmation and regulatory decision must be complied with despite the appeal unless otherwise provided by the Authority in the decision. The court of appeal also has the right to give orders on the implementation of the decision as provided in the Administrative Judicial Procedure Act.

2 ADJUSTED ASSETS AND CAPITAL INVESTED IN NETWORK OPERATIONS

ADJUSTMENT OF ASSETS INVESTED IN NETWORK OPERATIONS

The adjustment of assets invested in network operations is based on the assets side of the TSO's unbundled balance sheet, which is adjusted in the ways presented in sections 2.1, 2.2 and 2.3.

Adjusting the assets side of an unbundled balance sheet gives the value of adjusted assets invested in network operations as the sum total of the adjusted balance sheet.

The adjusted assets invested in network operations consist of the following items

- adjusted natural gas network assets in non-current assets (2.1)
- adjusted other assets in non-current assets (2.2)
- adjusted assets in current assets (2.3).

ADJUSTMENT OF CAPITAL INVESTED IN NETWORK OPERATIONS

The adjustment of capital invested in network operations is based on the liabilities side of the TSO's unbundled balance sheet, which is adjusted in the ways presented in section 2.4.

Adjusting the liabilities side of an unbundled balance sheet gives the value of adjusted capital invested in network operations as the sum total of the adjusted balance sheet.

The adjusted capital invested in network operations consists of the following items

- adjusted equity (2.4.1)
- adjusted interest-bearing debt (2.4.2)
- adjusted non-interest-bearing debt (2.4.2)
- equalisation item (2.4.1).

2.1 Adjustment of natural gas network assets in non-current assets

Although comprised of several different components, the natural gas network forms the greatest individual part of the TSO's assets, i.e. the non-current assets in the unbundled balance sheet.

According to the Natural Gas Market Act, a natural gas network refers to an interconnected entity intended for the transmission or distribution of natural gas, consisting of

- natural gas pipes and pipelines
- all tanks, equipment and mechanisms associated with them containing natural gas.

The value of natural gas network assets is adjusted in regulation methods to correspond to its actual net value. The adjustment is carried out so that the value according to the unbundled balance sheet is not used in the calculation of a reasonable return. Instead, the adjusted net present value of the natural gas network (2.1.2) calculated based on the adjusted replacement value of the natural gas network (2.1.1) is used.

JUSTIFICATIONS FOR THE USE OF UNIT PRICES

The regulation of the reasonableness of pricing should be based on the actual net value of a company's natural gas network assets, which describes the market value per company, rather than, for example, on the commercial market value determined on the basis of mergers and acquisitions, which may include valuation or acquisition items not pertaining to natural gas network operations. The pricing of network operations is not subject to market pressure, which means that the TSO has no incentive to improve the efficiency of its operations. As higher prices can be used to compensate for any cost ineffectiveness, the assessment of monopoly pricing needs to include evaluating the cost level incurred by the company compared to the costs that the company might actually have to bear. The reasonableness of pricing includes an element that encourages economically efficient operations imposed through regulation, which can be used to ensure the realisation of the cost-effectiveness of the TSO's operations.[2]

The tasks of the Energy Authority include promoting the development of secure, reliable, efficient and non-discriminatory electricity and natural gas networks that meet customers' demands in cost-effective ways, and ensuring appropriate conditions for the efficient and reliable use of electricity and natural gas networks, taking

[2] Government proposal (HE 50/2017 vp, p 79-80)

into account long-term objectives. A decision to establish the methodology followed in pricing may be used to lay down the principles for valuing the capital bound to the network operations or service as well as the objectives used to encourage the improvement of the efficiency of the network operations and the methods used to define them as well as the methods employed to apply the objectives in the pricing.[3]

The objectives of special regulation of natural monopoly are equality, continuity and efficiency. Efficiency means that the service desired by the customer is provided at the lowest cost possible.[4]

Unit prices are used in the calculation of the adjustments of network assets to ensure that the objectives laid down in the legislation on the regulation of reasonable pricing and the cost-effectiveness of investments can be achieved as well as possible. The objectives set in legislation require a principle that promotes cost-efficiency, which can be used to comment on the extent to which a TSO could have achieved a reasonable level of cost in the investments on average. This objective can be achieved with an adjustment made through unit prices.

The TSO's network assets are adjusted annually with frozen unit prices set per investment year and monitoring data collected from TSOs to ensure that the network assets reflect, on average, their actual reasonable net value. However, it should be noted that the methodologies take inflation into account in determining the final net value.

The balance sheet values of the TSOs do not correspond to the actual value of the network due to different accounting practices and shorter depreciation periods. Unit prices are used to impose a requirement of improved efficiency on the investments and prevent artificial or unjustified increases in the value of network assets and to guide TSOs to operate cost-effectively.

Unit prices encourage TSOs to intensify their investments and prevent the higher costs of inefficient or poorly contracted investments from translating into higher customer prices. In addition, unit prices can be used to make sure through regulation that network assets do not include any irrelevant cost items. The purpose of unit prices is to encourage long-term efficiency gains in investments and to find more cost-effective ways to meet the needs for network construction.

Updating unit prices

[3] Section 4 of the Act on the supervision of the electricity and gas market
[4] Government proposal (HE 127/2004 vp 7)

Unit prices are average prices per component based on the costs of the actual network investments made by the TSOs. Unit prices are investigated and determined separately for each regulatory period so that they would reflect the reasonable acquisition costs of new network investments in a sufficiently cost-responsive manner on average.

Unit prices are updated every four years. A more frequent update interval is challenging to implement in practice due to the high workload this requires from both the TSOs and the Authority. So far, more frequent updates have not been considered to bring enough additional value that they would be justified.

The unit prices will be updated for investments made in the fifth regulatory period in 2027 during the fifth regulatory period and for investments made in the sixth regulatory period in 2031 during the sixth regulatory period. A unit price survey is used to determine the average unit cost for each network component during the two most recent years of investment. This means that, by default, the unit prices applicable for the period are based on the investment costs valid during the two middle years of the period.

The network components and unit prices and the principles used to determine them are presented in Appendix 1. Similar principles will be used in updating the unit prices for the periods.

ADJUSTMENT OF NETWORK ASSETS FOR COMPONENTS NOT INCLUDED IN APPENDIX 1

If a component belonging to regulated network assets is not included in the network components specified in Appendix 1, the component may be taken into account in its balance sheet value in accordance with the financial statements after a case-by-case examination. In other words, if this is a component for which no equivalent component can be found from the unit price list based on average definitions, the investment is not subject to a requirement of the improved efficiency of unit prices. If the cost item is related to a component included in the unit price list, then the cost item is, as a rule, considered to be already included in the unit prices on average, and there are no grounds for the consideration based on balance sheet values. Valuation through balance sheet values is only intended for those components that are not included in any of the entities contained by the components in the unit price list. For example, systems are like this.

The Energy Authority will collect a separate breakdown of the investments in network assets that will be taken into account based on their book value for the network structure data. Each year, the TSO must reconcile and modify this data to

ensure it reflects the accounting values and depreciations. In other words, all network components are taken into account through the reporting structure data, regardless of whether or not a unit price is available for a component. This means that all network components must be taken into account through tangible or intangible assets of the network, and the cost items of network components must not be reported as a part of other tangible or intangible assets. As a result, old cost items related to network components in other tangible or intangible assets must be transferred to the network assets side.

When submitting the regulatory data (structure data), the TSO must provide an adequate explanation and justifications which the Energy Authority will use as the basis for assessing whether or not the component is accepted in its balance sheet value. The explanation must indicate why this non-standard component or solution in question has been necessary or rational from the perspective of network operations and, if necessary, demonstrate the cost-effectiveness of the solution compared to other possible solutions.

When submitting regulatory data for 2025, the TSO must provide the Energy Authority with information on all cost items that have previously been, or continue to be, recorded in other tangible assets or other intangible assets and that have been taken into account in their book value. This procedure is used to check that the cost item is not taken into account twice. In the same breakdown, the costs on the balance sheet that are not related to network components must also be separated into specific entities.

Network data systems and the communication networks in the supervisory control and data acquisition

Unlike during previous regulatory periods, average unit prices can no longer be applied to systems and communication networks. This is due to the fact that, based on the unit price survey conducted by the Energy Authority, a large share of the costs of the systems are mainly incurred when the systems are acquired largely as services and with annual fees.

However, some TSOs continue to activate some cost items related to data systems. In addition, there are considerable differences in annual costs between companies in both costs and activations. In some companies, the costs of systems and communication networks are almost entirely costs, while in others, individual systems have been subject to a more major activation in some year and/or more minor activations in several years.

During the previous regulatory period, unit prices were still partly used for the systems. In this case, the system unit prices valid at the time were used to adjust the network assets of the TSOs by not allowing the declaring of cots as part of expenses. As a result, these costs or expenses are not necessarily included in the controllable operational costs contained by the efficiency incentive, at least not in all respects.

Referring to the above, systems and communication networks for which a unit price has previously been used will be processed so that in the fifth and sixth regulatory periods and as regards activations, the system solutions that are necessary and cost-effective for network operations will be taken into account in their balance sheet value in accordance with the financial statements. Similarly, costs will be taken into account as pass-through items in the fifth period, whereas in the sixth regulatory period, they will be taken into account as normal as costs controlled in the efficiency incentive. This enables collecting the actual costs of the systems from companies for the fifth regulatory period and these costs will be taken into account in the reference level of the efficiency incentive during the sixth regulatory period.

LIFETIMES

Lifetimes are used in the calculation of the adjusted net present value of the natural gas network assets and the adjusted straight-line depreciations.

The lifetimes for various network components are presented in Appendix 1. If no lifetime has been determined for a network component, its adjusted net present value will remain at default during the regulatory period.

The TSO must choose the lifetimes of its network components to correspond with actual average techno-economical lifetimes. This refers to the period of time for which the network components are in actual use on average before they are replaced. The TSO's maintenance and investment strategy is taken into account in the chosen lifetimes.

The TSO must include in the structure data of the regulatory data the average techno-economical lifetimes it has chosen for the network components by the end of March 2025 in connection with reporting the structure data for 2024. After that, the TSO may not change the lifetimes it has selected.

During the regulatory period, the Energy Authority will collect age data on the components removed from the network and use this data as the basis for regulating that the average lifetimes selected during the regulatory period do not differ significantly from the actual lifetimes. If the selected lifetimes differ significantly from

the actual average age data of the removed components, the Energy Authority will correct the lifetimes for the final regulatory decision so that they better correspond to the actual average lifetimes.

AGE DATA

Age data is used in the calculation of the adjusted net present value of the network assets as well as in determining the investment year and the applicable frozen unit price for the removed components in 2024 or later, and also in other calculations when there is a need to determine the applicable frozen unit price.

The TSO must report the actual age data for every component in the network at the end of every regulatory year. This information must also be reported for any removed components made during the year. This age data is used to adjust the network to the correct level as required by the principle of adjustment of the network assets.

Actual age data means the lifetime of a component, i.e. the age calculated from the first moment of use or year of manufacture.

When reporting an investment made in 2024 or later for the first time in the regulatory data, the age of the component is interpreted as 0 years in the case of a completely new investment introduced before the end of the year. The age of a component that was previously in the basis of return is determined as normal based on the time when the component was first included in the basis of return. For investments made before 2024, the actual detailed age of the component calculated from the date of introduction is used. If this is not known, 0.5 years is given as the age.

For components whose real age cannot be established by the TSO, the age used in the calculation for the component is the selected lifetime. In other words, only straight-line depreciation is calculated for these components with the assumption that the component’s age is the same as its lifetime.

COMPONENTS NOT PART OF NETWORK OPERATIONS

Components and assets that are not part of the network operations are not included in adjusted assets invested in network operations. These include land areas that are not used in actual network operations. No reasonable return is obtained on these items as they are not network operations.

Components are not part of network operations when they are not

- in the TSO's possession but instead used by the TSO with an arrangement under the law of property, where the possession of the network is not transferred from the owner of the network (so-called participation in another's fixed assets)
- subject to the TSO's development obligation
- TSO's network operations complying with the network licence
- necessary for network operation.

COMPONENTS NOT PART OF ADJUSTED NETWORK ASSETS

Components that are not part of the network operations also cannot be part of the network assets. In addition, components are not part of the adjusted network assets when they are not

- connected to the network
- in actual use, for example, stored equipment and materials
- a source of acquisition costs to the DS
- necessary for network operation.

Adjusted network assets do not include components that have not been fully activated as investments in accounting. For example, a component that is still partly included in unfinished investments in the accounting may not be reported in adjusted asset items in the structure data, as otherwise the assets will be taken into account twice. The corresponding components must only be reported in the structure data once all incomplete investments have been recorded as complete in accounting.

In addition, components whose expenditure has been recorded as costs may not be reported in adjusted network assets in the network structure data, as this would lead to taking the costs into account twice in the methods.

SUBSIDIES RECEIVED FOR THE CONSTRUCTION OF THE NETWORK

The TSO may receive subsidies or other compensation for investing in the network, for example, from the state of Finland or the European Union. Similarly, the transmission system operator of another EU or EEA country may also participate in investments in Finland on the basis of EU Regulation 869/2022. As a rule, a subsidy is always involved if a party directly contributes to the TSO's construction costs.

Components funded with the subsidies or compensation received for building the network are not included in the adjusted net present value of the natural gas network assets, i.e. no reasonable return is obtained on them.

Components funded with the subsidies or compensation received for building the network are not included in the adjusted replacement value and net present value of the network assets. Equivalent subsidies are eliminated from the calculation by indicating only the part of the network components for which no subsidy has been received. The subsidised section may not be reported in the adjusted structure data. However, the details of the subsidised network section are reported separately in the structure data in accordance with separately provided instructions. This applies to everyone, including older investments.

In connection with providing the network structure data, the TSO must provide an account of the amounts of any subsidies and other compensations it has received for the network components in actual use. This account must itemise the amount of subsidy allocated for each network component.

In the case of revenue generated by line transfers to the TSO at the request of and based on the needs of customers, the charges for line transfer costs will not be counted as subsidised received for the construction of the network. The compensation paid by the customer for network line transfers is not considered to be allocated to the actual investment as regards the methods but to the costs of transferring the network. In this case, these transfer costs should be itemised in the accounting and the compensation in question should be recorded in return for them, either in the profit and loss account or in the balance sheet. In the case of costs affecting the profit or loss, the subsidy would be recorded as income and in the case of items affecting the balance sheet, as a deduction of acquisition costs.

The Energy Authority provides further instructions with respect to reporting the subsidies, if necessary.

PARTICIPATION IN FOREIGN INVESTMENTS

Under EU Regulation 869/2022, the TSO may also have to participate in main grid investments in another EU or EEA country if the benefits arising from the investment are also targeted at Finland.

The TSO’s obligation to participate in investment in another EU or EEA country may be based on the following legally valid official decisions

- Decision by the Energy Authority on cost allocation (Article 16(5) of Regulation 869/2022)

- decision by the EU Agency for the Cooperation of Energy Regulators (ACER) on cost allocation (Article 16(7)).

When submitting the regulatory data, the TSO must provide information on the costs incurred by investments made in another EU or EEA country and the components for which they have been used.

Components owned by the TSO

If a component invested in another EU or EEA country is funded by the TSO and owned by and in the possession of the TSO, the procedure is the same as for investments owned and possessed in Finland (specified in sections 2.1.1, 2.1.2., 2.2., 5.1. and 6.1.1).

Components not owned by the TSO

If a component invested in another EU or EEA country is not owned by and in possession of the TSO, the following procedure is followed.

If the TSO has activated the cost in the unbundled balance sheet, it is taken into account in its value according to the unbundled balance sheet as specified in sections 2.1, 2.2 and 6.1.2.

If the TSO has recorded the component as an expense in the unbundled profit and loss account, no separate adjustment is made to it in the calculation of realised adjusted profit. The component recorded as an expense has already been taken into account in the operating profit (operating loss) in the unbundled profit and loss account.

Investments in another EU or EEA country other than those under Regulation 869/2022

In investments in another EU or EEA country other than those referred to in EU Regulation 869/2022, the TSO must submit a report on the project to the Energy Authority. As a rule, the report must lay out the investment in the same way as investments that are in accordance with the Regulation. However, the report must specifically address the benefits of the investment to Finland.

The Agency assesses the report and decides whether and to what extent the components to be invested in are taken into account in regulatory methods. To the extent that the components are taken into account in regulatory methods, the same applies as described above in investments falling under the Regulation.

LEASED NETWORKS

Components in a leased network are included in adjusted network assets invested in network operations. The leasing arrangement is dissolved according to the same principles with respect to individual components and a larger entity.

The TSO must be able to itemise all the components that are included in the network lease.

It is possible for the TSO to notify the component it has leased in the regulatory data only if the owner of the component has not notified it in its own network assets in accordance with the network licence.

2.1.1 Adjusted replacement value and straight-line depreciations

The correct and justified adjustment of network assets is linked to the determination of a reasonable rate of return.[5] The adjusted frozen replacement value and straight-line depreciations of network assets are determined for all years of the regulatory period based on the situation valid on the last day of December of each year.

The determination of the frozen replacement value is based on a principle simulating book values, in which the value of investments is determined based on the value valid during the year of acquisition using average unit prices. This is done to ensure that inflation is correctly taken into account, as a nominal rate of return will be used to determine a reasonable rate of return.

However, the principle will only be followed on a precise level for investments made from 2024 onwards. The valuation of investments made before 2024 and the determination of the frozen replacement value will be based on the network actually in operation at the end of 2023, which will be revalued using the unit price list and unit prices given in Appendix 1, without inflation adjustment. In other words, the value of the network invested before 2024 is determined directly based on the unit prices set out in Appendix 1, regardless of the years of investment. Similarly, for investments made since 2024, the frozen replacement value is determined based

[5] DFC Economics S.r.l., Rate-base adjustment for inflation in energy networks regulation: A report for Energiavirasto, 2 October 2023

on the unit prices set for each year of investment according to the fifth or sixth regulatory period, described in more detail in the section 'Application and index adjustment of unit prices'.

A dissolution of an investment made before 2024 is calculated on the basis of the unit prices in Appendix 1 and a dissolution of an investment made in or after 2024 is valued using the unit price valid in the year of investment.

The calculation principle of the frozen replacement cost value (hereinafter RCV) for the network component in year n is given in the formula below.

$$CRV_n = RCV_{<2024} + \sum_{2024}^{n}\left(INV_{quantity\_y} \times UP_y - Dissolutions_y\right) \quad (2)$$

$Dissolutions_y$	=	The replacement value calculated for dissolutions in year y using the unit prices of the years of investment during which the dissolutions occurred
$RCV_{<2024}$	=	The RCV of the components in actual use invested in before 2024 in year n
INV_y	=	Investment volume in year y
UP_y	=	Unit price in year y

The formula below shows how the old mass, i.e. the frozen replacement value of the components invested in before 2024 but still in use, is calculated for a network component in year n.

$$RCV_{<2024} = INV_{quantity<2024} \times UP_{appendix1} \quad (3)$$

$INV_{quantity<2024}$	=	The total quantity of the components in actual use invested in before 2024 in year n
$UP_{appendix1}$	=	Unit price in accordance with Appendix 1

This means that the TSO reports the information on the network components invested in before 2024 using the same principles as in the fourth regulatory period. Systems and communication networks are not taken into account in the calculation because they are taken into account in their balance sheet value.

Application and index adjustment of unit prices

For network mass invested in before 2024 but in actual use, unit prices in accordance with Appendix 1 are always used regardless of the year of investment. However, from 2024 onwards, a separate unit price specific to the year of investment will be determined for each year of investment. To make sure that the unit price would better reflect on average the cost level valid at the time of the investment in the adjustment of the components during the year of investment, i.e. the unit price would be better in line with the value at the time of the investment, the unit prices applied to investments during the regulatory periods will be adjusted by the change in the consumer price index for different years and the unit prices applicable to investments during the regulatory period will be determined separately for each period based on the investment costs of the period.

For the valuation of investments in the fifth regulatory period, unit prices adjusted for inflation in the year of investment based on the cost data of the fifth regulatory period will be applied during the fifth regulatory period (hereinafter the unit prices of the 5th period). Similarly, unit prices based on the costs of investments during the sixth regulatory period will be applied to the investments made during the sixth regulatory period (hereinafter the unit prices of the 6th period). As the final unit prices will only be determined at the end of the regulatory period, the most recent unit prices available for the period, i.e. unit prices updated at the end of the previous period, will be used to estimate the value of investments made during the period in the annual calculations of the annual reasonable return value prior to this. In other words, for the sixth regulatory period, index-adjusted unit prices as set out in Appendix 1 are used for determining the replacement value in calculations of the annual reasonable return value until more detailed and actual unit prices for that period have been established.

This is done in order to adjust the investments for the final calculations of the period at a more accurate level to better reflect the average cost level over the period before the final freezing of unit prices. For example, when the unit prices to be updated during the period are presumably mainly based on investments made in the period 2025–2026, and the unit price list is presented in the 2026 value, the unit price in question does not need to be adjusted using the consumer price index for more than at most a few years and the unit price will describe in more detail the average cost level realised during the sixth regulatory period.

The formula below describes the principle used for determining the unit price during the fifth regulatory period for investments made in the period 2024–2027.

$$UP_y = \frac{CPI_y}{CPI_n} \times UP_{5th\ period\_n} \quad (4)$$

UP_y = unit price for the investments of year *y*

CPI_y = the average of the index points of the consumer price index (2005=100) for April–September in year *y*

CPI_y = the average of the index points of the consumer price index (2005=100) for April–September in year y

$UP_{5th\ period\_n}$ = The unit price for the fifth regulatory period in the year n value

The formula below shows how unit prices will be applied during the sixth regulatory period for investments made in the period 2028–2031 during the sixth regulatory period.

$$UP_y = \frac{CPI_y}{CPI_n} \times UP_{6th\ period\_n} \quad (5)$$

UP_y = unit price for the investments of year *y*

CPI_y = the average of the index points of the consumer price index (2005=100) for April–September in year *y*

CPI_y = the average of the index points of the consumer price index (2005=100) for April–September in year y

$UP_{6th\ period\_n}$ = The unit price for the sixth regulatory period in the year n value

Based on this principle, the final freezing of unit prices takes into account any component-specific changes as well as other changes in costs in the valuation of investments that have occurred in the industry, when the applicable unit price is based as little as possible on index adjustments and more on actual cost data from the period.

In a situation where no applicable unit price for older investments has previously been found in the unit price list and the component has previously been valued in its book value, but where a unit price would be found for the component from the new unit prices, the available unit price is adjusted backwards to the value valid in the year of investment based on the change in the consumer price index and the

valuation made through accounting is replaced by a valuation based on unit prices. For years of investments pre-2024, this adjustment will only be made until 2022.

Calculation of straight-line depreciation

Frozen straight-line depreciation is calculated from the normally frozen replacement value by dividing the frozen replacement value by the lifetime of the network component. The straight-line depreciation of a network component consists of the sum of the frozen replacement values for the different years of investment of that network component on the basis of the components actually in use. In this case, the straight-line depreciation (hereinafter SD) calculated for the entire network is the sum of the straight-line depreciations of the network components in use.

Straight-line depreciation is not calculated for components that do not expire. The principle presented in the below formula is used to determine the straight-line depreciation for the whole network.

$$SD = \sum_i^n \frac{(RCV_i)}{lifetime_i} \quad (6)$$

RCV_i	=	Sum of frozen replacement values of network component i for different years of investment
$lifetime_i$	=	Lifetime of network component i

2.1.2 Adjusted net present value

The adjusted net present value of the network assets is calculated for all years of the regulatory period using the frozen replacement value valid on the last day of December in each year.

The adjusted net present value is calculated for each year of investment on the basis of replacement values frozen for each network component as well as age and lifetime replacement interval data. The net present value of the entire network consists of the sum of the current value of different network components. The calculation principle is summarised below for the adjusted net present value (NPV) of the network component in year n.

$$NPV_n = NPV_{<2024\_n} + \sum_{2024}^n NPV_{y\_n} \quad (10)$$

NPV_{y_n}	=	NPV of components invested in the year y in year n
$NPV_{<2024\_n}$	=	The NPV of the components in actual use invested in before 2024 in year n

The adjusted net present value of the old mass, i.e. components invested in before 2024, for the network component in year n, is presented in the formula below.

$$NPV_{<2024\_n} = \left(1 - \frac{average\ age_n}{Lifetime}\right) \times RCV_{<2024\_n} \quad (11)$$

$RCV_{<2024\_n}$	=	The total frozen replacement value of the components in actual use invested in before 2024 in year n
$average\ age_n$	=	Average age of the network component in year y
lifetime	=	The lifetime of the network component

The adjusted net present value of the newer mass, i.e. the investments made since 2024 for the network component, is based on the frozen replacement values per investment year and the sum of the net present values determined by age data. The adjusted net present value of the components invested in year y for the network component in year n is shown below.

$$NPV_{y\_n} = \left(1 - \frac{age\ data_n}{lifetime}\right) \times RCV_y \quad (12)$$

$age\ data_{y\_n}$	=	Age of components invested in year y in year n
RCV_y	=	The total frozen replacement value of the components in actual use invested in year y in year n
lifetime	=	The lifetime of the network component

The calculation is based on the number and age of components in the year under review similarly as previously, but the amount should be distributed over the completed years of investment so that the annual unit price is applied to all investments made as of 2024 and the same unit prices in accordance with the Appendix is applied to all investments made before 2024 regardless of the year of investment. When calculating the net present value, the current value may not be negative for specific components even if the actual age of the component was greater than the lifetime replacement interval.

2.2 Adjustment of other assets in non-current assets

In connection with the adjustment of assets invested in network operations, non-current assets other than natural gas network assets in the unbundled balance sheet are basically taken into account in their balance sheet value. These kinds of assets include, e.g. acquisitions in progress. However, in respect of such assets, goodwill and investments are adjusted by eliminating them.

OTHER ASSETS RECORDED IN NATURAL GAS NETWORK ASSETS

The TSO must notify as notes to the financial statements any items recorded in natural gas network assets that are not taken into account in the calculation of adjusted replacement value or net present value. These items are taken into account in adjusted assets invested in network operations in their value according to the unbundled balance sheet. Depreciation according to plan based on the unbundled profit and loss account is permitted for them as a reasonable level of depreciation. Such items are, for example, stored equipment and materials related to natural gas network operations.

Components included in these kinds of items are not taken into account in the calculation of adjusted replacement value of the natural gas network assets even if these components were included in the list of components in Appendix 1. These components are taken into account in their value according to the unbundled balance sheet.

NATURAL GAS NETWORK COMPONENTS RECORDED IN OTHER THAN NATURAL GAS NETWORK ASSETS

However, if natural gas network components are recorded under items other than the natural gas network assets in non-current assets, the balance sheet value of the components is eliminated from these items. Elimination is carried out with respect to components that are referred to in the list of network components in Appendix 1 and are in actual use in the natural gas network. These components are taken into account in adjusted assets invested in network operations in their adjusted net present value in accordance with section 2.1.2.

GOODWILL

Goodwill in the unbundled balance sheet is eliminated in connection with the adjustment of assets invested in network operations.

Legislative history (HE 20/2013 vp) takes a stand on acquisitions and other arrangements where the sum paid for natural gas network assets is higher than its actual net value.

Therefore, the regulation methods must be based on the actual net value of the TSO’s natural gas network assets and not, for example, on the commercial market value determined on the basis of mergers and acquisitions, which may include valuation or acquisition items not pertaining to natural gas network operations.

Natural gas network assets in accordance with the unbundled balance sheet are adjusted to the adjusted net present value as described in section 2.1. This describes the actual net value of the natural gas network assets in the regulation methods.

Based on this, the Energy Authority deems that the goodwill of the unbundled balance sheet arising in connection with an acquisition describes an intangible asset that it has not been possible to allocate to other assets.

Merger assets

The share of goodwill of the merger assets created in the merger is treated in the same way as goodwill.

INVESTMENTS

When adjusting assets invested in network operations, investments in non-current assets according to the unbundled balance sheet are eliminated.

Investments in non-current assets include, e.g. investments that seek profits other than those directly connected to network operations or the expansion of business operations. Such investments cannot be regarded as necessary in terms of network operations. Therefore, it is not justified to include them in any part of adjusted assets invested in network operations.

2.3 Adjustment of assets in current assets

FINANCIAL ASSETS

When calculating adjusted assets invested in network operations, financial assets recorded in the unbundled balance sheet are eliminated.

Financial assets to be eliminated include the following items on the assets side of the unbundled balance sheet

- short- and long-term receivables
- marketable securities
- cash and bank receivables and comparable items.

In accordance with the decision of the Supreme Administrative Court (KHO:2010:86), trade receivables are not eliminated.

The management of financial assets is not considered actual network operations even in financing theory. Therefore, it is not justified to include it in any part in adjusted assets invested in network operations.

The costs resulting from financial assets necessary to safeguard network operations are taken into account in the calculation of realised adjusted profit as detailed in section 5.3.

INVENTORIES

When calculating adjusted assets invested in network operations, the inventories recorded in the unbundled balance sheet are eliminated.

2.4 Adjustment of capital invested in network operations

The liabilities side of the adjusted balance sheet is determined by dividing the adjusted capital invested in network operations into

- adjusted equity
- adjusted interest-bearing debt
- adjusted non-interest-bearing debt.

2.4.1 Adjustment of equity

In the adjusted balance sheet, equity is regarded as the TSO's equity in accordance with the unbundled balance sheet.

In the adjusted balance sheet, equity is also considered to include voluntary provisions and the depreciation of assets deducted by deferred tax liability as well as refundable connection fees recorded on the unbundled balance sheet after 2005. Group contributions are also taken into account in the adjustment of equity.

Furthermore, an equalisation item is added to equity in the adjusted balance sheet.

GROUP CONTRIBUTION

The TSO is in an equal position regardless of whether or not it operates under a group structure.

Granted group contribution

In the adjustment of capital invested in network operations, the amount of group contribution deducted by the deferred tax liability is returned to equity.

This is done regardless of whether a decision has been made on the closing date to grant the group contribution and which either has or has not been paid yet.

Granted group contribution is an item of a profit distribution nature, and in the unbundled balance sheet of a TSO operating without a group structure, it would be entered under 'profit for the financial period' in the unbundled balance sheet.

Received group contribution

In the adjustment of capital invested in network operations, the amount of group contribution deducted by the deferred tax liability is deducted from equity. Received group contribution is also an item of a profit distribution nature, and it increases the profit for the financial period.

Receivables are eliminated in the calculation of reasonable return in the way presented in section 2.3 of this document. The amount of received group contributions is taken into account in the elimination.

EQUALISATION ITEM

The equalisation item describes the difference in value between the adjusted assets invested in network operations and the assets side of the balance sheet.

The equalisation item is used to balance the assets and liabilities in the adjusted balance sheet. It is recorded under equity in the liabilities side of the adjusted balance sheet.

The value of the equalisation item is calculated as the difference of the assets and liabilities sides of the adjusted balance sheet.

The equalisation item may also be negative if the value of adjusted assets invested in network operations is lower than the assets side of the unbundled balance sheet.

2.4.2 Adjustment of debt

In the adjustment of capital invested in network operations, debt is divided into interest-bearing and non-interest-bearing debt.

ADJUSTED INTEREST-BEARING DEBT

Interest-bearing debt in the unbundled balance sheet is taken into account as such in adjusted interest-bearing debt. However, the share of equity in the interest-bearing group subsidy liability will be eliminated.

Items in interest-bearing debt include bank, pension and other loans in the non-current liabilities in the unbundled balance sheet, as well as the instalments of the above-mentioned loans in the current liabilities in the unbundled balance sheet.

In the adjustment of capital invested in network operations, any capital loans and other interest-bearing loans granted by the owners of the TSO are treated as interest-bearing debt.

ADJUSTED NON-INTEREST-BEARING DEBT

Non-interest-bearing debt in the unbundled balance sheet is taken into account as such in adjusted non-interest-bearing debt. These items include accounts payable, accruals and other short-term debt. However, the share of equity in the non-interest-bearing group subsidy liability will be eliminated. The share of the non-interest-bearing group subsidy liability and the depreciation of assets deducted by deferred tax liability is considered non-interest-bearing debt.

Mandatory provisions entered in the unbundled balance sheet are treated in full as non-interest-bearing debt.

NEGATIVE FINANCIAL ASSET ACCOUNT BALANCE

When the account for current assets allocated to network operations is negative, the nature of the item is network operations liability. The negative balance of the financial assets item allocated to network operations is added to the adjusted non-interest-bearing debt.

Here, the financial assets item refers to:

- short- and long-term receivables carried forward
- other short- and long-term receivables
- marketable securities
- cash and bank receivables and comparable items.

Negative financial asset items taken into account in non-interest-bearing debt are not taken into account when calculating the reasonable costs of financial assets in accordance with section 5.3.

CONNECTION FEES I.E. PARTICIPATION FEES

Components funded by connection fees are included in adjusted assets invested in network operations.

The TSO is in an equal position regardless of whether it uses refundable or non-refundable connection fees (participation fee).

Refundable connection fees (participation fees)

Although refunds are rarely made, even a formal refunding condition gives the connection fee the character of a debt. As distinct from other long-term debts, connection fees involve no interest liabilities, i.e. they are a non-interest-bearing debt by nature. Refundable connection fees cannot be entered under equity in the unbundled balance sheet by virtue of the statement[6] by the Accounting Board.

In the adjustment of capital invested in network operations, refundable connection fees entered in the unbundled balance sheet by the end of 2005 are treated as non-interest-bearing equity.

Refundable connection fees recorded in the unbundled balance sheet after 2005 do not increase non-interest-bearing debt in the adjusted balance sheet.

The net change in connection fees is returned in the calculation of realised adjusted profit in accordance with chapter 5.1.

The TSO must itemise as a separate item the annual amount of refundable connection fees entered in the balance sheets of the owner or its other companies as notes to the unbundled financial statements.

Non-refundable connection fees (participation fees)

Non-refundable connection fees are income from network operations in accordance with section 5.1.

[6] Kirjanpitolautakunnan lausunto sähköliittymismaksujen kirjaamisesta (Decision of the Accounting Board on the recording of electricity connection fees) (1650/2001)

3 REASONABLE RATE OF RETURN

3.1 Model for weighted average cost of capital

The method used when determining a reasonable rate of return approved for adjusted capital invested in network operations is the Weighted Average Cost of Capital, or the WACC model.

3.2 Reasonable cost of equity

When determining a reasonable rate of return, the reasonable cost of equity is calculated with the Capital Asset Pricing Model, or the CAP model.

The calculation of the model is presented in Formula 9.

$$C_E = R_r + \beta_{equity} \times MRP + LP + CRP\text{-}LRP \quad (9)$$

where

C_E = reasonable cost of equity

R_r = risk-free rate

β_{equity} = equity beta coefficient

MRP = market risk premium

LP = premium for lack of liquidity

CRP = country risk premium

LRP = additional risk premium for natural gas transmission network operations

3.2.1 Risk-free rate of equity

When determining a reasonable rate of return, the interest of ten-year government bonds of the state of Germany is used as the risk-free rate of interest, which acts as a basis for a reasonable cost of equity. The value is updated annually using the average of the actual daily values of the interest of ten-year government bonds of the state of Germany from April to September of the previous year. For example, for 2024, the value is determined based on the averages of actual daily values from April–September 2023 and is 2.48%.

The actual daily values have been published by the Deutsche Bundesbank[7].

The value of the above-described risk-free interest rate is also used as risk-free rate, which acts as a basis of the reasonable cost of debt (3.3.1).

3.2.2 Country risk premium

The value used as the country risk premium is the average of the daily values of the interest of the ten-year bonds of the state of Finland in the period from April to September of the previous year, minus the average of the interest of the ten-year bonds of the state of Germany from the same period. The country risk premium is 0.59% in 2024 and will be updated annually.

The actual daily values reflecting Finland's interest rates are published by the Bank of Finland.

The value of the above-described country risk premium rate is also used as the country risk premium to be taken into consideration in the reasonable cost of debt (3.3.1).

3.2.3 Beta coefficient

In the first half of the fifth regulatory period (2024–2025), the value of equity beta is 0.59 when determining a reasonable rate of return.

During the methodological period, the equity beta will be updated once every two years by the end of 2025, 2027 and 2029, based on the same calculation method as for the asset beta and capital structure as the one applied during the first half of the fifth regulatory period.

The value used for the asset beta is the median of the range of a reference group defined for the natural gas distribution network industry. In the first half of the fifth regulatory period (2024–2025), the value 0.35 will be applied[8].

The asset beta coefficient is adjusted as equity beta coefficient using the Hamada formula. The calculation of this adjustment where the debt ratio and the rate of corporate tax are taken into account is presented in Formula 10.

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7 https://www.bundesbank.de/en/statistics/money-and-capital-markets/interest-rates-and-yields/daily-yields-of-current-federal-securities-772220

8 The asset beta coefficients have been calculated by dividing the covariance of the control company and the comparable index returns by the variance of return using weekly returns from a two-year period on the date of valuation. Each asset beta has been ultimately adjusted using the Blume method (the so-called adjusted beta), in which the raw beta value is adjusted by emphasising one third of the average market risk: $\beta_{oikaistu} = \frac{2}{3} \times \beta_{oikaisematon} + \frac{1}{3} \times 1$

$$\beta_{equity} = \beta_{asset} \times \left(1 + (1 - yvk) \times \frac{g}{1-g}\right) \quad (10)$$

where

β_{equity} = equity beta coefficient

β_{asset} = asset beta coefficient

yvk = the rate of corporate tax

g = share of interest-bearing debt in the optimal capital structure

$1 - g$ = share of equity in the optimal capital structure

The reference group used for the update must include several companies that have natural gas distribution network operations at the time the beta coefficient is updated. Otherwise, the Authority will apply the latest confirmed beta coefficient value.

3.2.4 Market risk premium

In the fifth regulatory period (2024–2027), a market risk premium value based on an implicit equity market risk premium in an AAA-rated country is used to determine a reasonable rate of return[9].

For the sixth regulatory period (2028–2031), the market risk premium will be updated by the end of 2027 based on a corresponding calculation method.

The value to be applied for each regulatory period will be based on the average of the most recent April–September period available at the time of the update. Therefore, in the fifth regulatory period, the market risk premium is based on April–September 2023, and is 4.61%.

If the database is not available at the time of the update, the Authority will apply a market risk premium of 5% in the sixth regulatory period.

3.2.5 Premium for lack of liquidity

The value of the premium for lack of liquidity is 0.6% when determining a reasonable rate of return.

[9] The used source is the implicit market risk premium ”ERP (T12 m with sustainable payout)” published monthly by Professor Damodaran based on the results, dividends and repurchases in the previous 12 months.

3.2.6 Capital structure

The median of the capital structure range derived from the control companies is used to determine the reasonable rate of return. In the first half of the fifth regulatory period (2024–2025), the weighting of interest-bearing debt is 46% according to the median of the range and the weight of equity is 54%.

The capital structure will be updated every two years during the methodological period by the end of 2025, 2027 and 2029 using a similar method.

The reference group used for the update must include several companies that have natural gas distribution network operations at the time the capital structure is updated. Otherwise, the Authority will apply the latest confirmed capital structure.

3.2.7 Additional risk premium for natural gas transmission network operations

In determining the reasonable rate of return, the additional risk premium for natural gas transmission network operations is 0.9%, which describes the special features of the Finnish natural gas market in relation to the business environment of the reference companies.

3.3 Reasonable cost of debt

The calculation of the model describing the reasonable cost of debt is presented in Formula 11.

$$C_D = R_r + DP + CRP \qquad (11)$$

where

C_D = reasonable cost of debt

R_r = risk-free rate

DP = debt premium

CRP = country risk premium

3.3.1 Risk-free rate of debt and country risk premium

When determining a reasonable rate of return, the value of a risk-free rate and country risk ratio, which are the basis for the reasonable cost of debt, is calculated in the same way as with equity (3.2.1 and 3.2.2).

3.3.2 Debt premium

The median of the range derived from control companies is used as the debt premium value when determining a reasonable rate of return. In the first half of the fifth regulatory period (2024–2025), the value 1.73% will be applied.

The debt premium will be updated every two years during the methodological period by the end of 2025, 2027 and 2029 using a similar method.

The reference group mentioned above must include several companies at the time the risk premium is updated. Otherwise, the Authority will apply the latest confirmed value as the debt premium.

3.4 Calculation of a reasonable rate of return

The weighted average costs of adjusted capital invested in network operations are used as the reasonable rate of return (WACC %) in the regulation methods.

A reasonable pre-tax rate of return is used in the regulation methods.

A reasonable rate of return is first calculated post-tax in the way presented in Formula 12.

$$WACC_{post-tax} = C_E \times (1 - g) + C_D \times (1 - yvk) \times g \qquad (12)$$

where

$WACC_{post\text{-}tax}$ = reasonable rate of return after corporate tax

C_E = reasonable cost of equity

C_D = reasonable cost of interest-bearing debt

E = adjusted equity invested in network operations

D = adjusted interest-bearing debt invested in network operations

yvk = current rate of corporate tax

After that, the post-tax reasonable rate of return will be adjusted with the current rate of corporate tax. This will give the pre-tax reasonable rate of return, the calculation of which is presented in Formula 13.

$$WACC_{pre-tax} = \frac{WACC_{post-tax}}{(1 - yvk)} \quad (13)$$

where

$WACC_{pre\text{-}tax}$ = reasonable rate of return before corporate tax

A fixed capital structure where the interest-bearing debt and equity are derived from the control companies is applied to the TSO. That way, the calculation of pre-tax reasonable rate of return before corporate tax is carried out in accordance with Formula 14.

$$WACC_{pre-tax} = \frac{C_E \times (1 - g)}{(1 - yvk)} + C_D \times g \quad (14)$$

3.5 Reference group used for determining and updating parameters for a reasonable rate of return

An industry-specific beta value used in calculating the reasonable cost of equity, debt premium as well as the optimal equity structure used in calculating weighted average cost are derived based on an industry-specific reference group. The reference group used during the methodology period for natural gas transmission network operations is shown in the table below.

Table 2. *Natural gas transmission network reference group*

Table: Natural gas transmission network reference group
Enagas SA
Fluxys Belgium NV
Snam SpA
TC Energy Corp

If there are significant changes in the reference group during the methodology period and a significant proportion of the control companies no longer engage in network business, the last confirmed value determined for each parameter will be applied.

4 REASONABLE RETURN

The TSO's reasonable return is calculated by multiplying the adjusted capital invested in network operations (2.4) by the reasonable rate of return (3.4).

Therefore, the TSO receives a reasonable return on

- adjusted equity invested in network operations
- interest-bearing debt invested in network operations.

No reasonable return is obtained on non-interest-bearing debt invested in network operations as its returns requirement is zero.

The calculation of pre-tax reasonable return before corporate tax is presented in Formula 15.

$$R_{k,\,pre\text{-}tax} = WACC_{pre\text{-}tax} \times (E + D) \qquad (15)$$

where

$R_{k,\,pre\text{-}tax}$ = reasonable return before corporate tax, EUR

$WACC_{pre\text{-}tax}$ = reasonable rate of return, per cent

E = adjusted equity invested in network operations, EUR

D = adjusted interest-bearing debt invested in network operations, EUR

$E + D$ = adjusted capital invested in network operations, EUR

4.1 Adjusted assets and capital invested in network operations

ADJUSTED ASSETS INVESTED IN NETWORK OPERATIONS

Adjusted assets invested in network operations consist of adjusted natural gas network assets in the unbundled balance sheet (2.1), other non-current assets (2.2) and current assets (2.3).

Natural gas network assets in non-current assets of the unbundled balance sheet, which constitute the most important asset item of natural gas network operations, are replaced with adjusted natural gas network assets (2.1). They consist of adjusted net present value of the natural gas network (2.1.2), which is calculated from the adjusted replacement value of the natural gas network (2.1.1).

Other assets invested in natural gas network operations are adjusted next (2.2 and 2.3).

Table 3 shows the adjustment of the assets side of the balance sheet in the calculation of the adjusted assets invested in network operations in the form of a balance sheet calculation.

Table 3. *The principle of adjusting the assets side of the balance sheet*

ASSETS

UNBUNDLED BALANCE SHEET	**ADJUSTED BALANCE SHEE**
Non-current assets	**Adjusted non-current assets**
Natural gas network	Natural gas network in the adjusted net present value
Goodwill	
Investments	
Other non-current assets	Other non-current assets in the balance sheet value
Current assets	**Adjusted current assets**
Inventories	
Trade receivables	Trade receivables in the balance sheet value
Financial assets	
TOTAL ASSETS	**ADJUSTED BALANCE SHEET TOTAL**

ADJUSTED CAPITAL INVESTED IN NETWORK OPERATIONS

The adjusted capital invested in network operations is obtained by adding together adjusted equity (2.4.1), adjusted interest-bearing debt (2.4.2) and adjusted non-interest-bearing debt (2.4.2). An equalisation item (2.4.1) is also added to this to reconcile the different sides of the balance sheet.

Table 4 shows the adjustment of the assets side of the balance sheet in the calculation of the adjusted capital invested in network operations in the form of a balance sheet calculation.

Table 4. *The principle of adjusting the liabilities side of the balance sheet*

LIABILITIES

UNBUNDLED BALANCE SHEET	**ADJUSTED BALANCE SHEE**
Equity	**Adjusted equity**
Equity	Equity in the balance sheet value
	Granted group contributions, deducted by deferred tax liability
	Depreciation difference of assets deducted by deferred tax liability, and voluntary provisions
	Net change in accumulated connection fees since 2005
	Received group contributions, deducted by deferred tax liability
	Equalisation item of adjusted balance sheet
Accumulated appropriations	
Depreciation difference and provisions	
Mandatory provisions	
Mandatory provisions	

Debt	Adjusted debt
Interest-bearing	**Interest-bearing**
Interest-bearing debt	Interest-bearing debt in the balance sheet value
Capital loans	Capital loans in the balance sheet value
	- Share of equity in interest-bearing group contribution that is granted but not paid
Non-interest-bearing	**Non-interest-bearing**
Non-interest-bearing debt	Non-interest-bearing debt in the balance sheet value
	- Share of equity in non-interest-bearing group contribution that is granted but not paid
	- Net change in accumulated connection fees since 2005 Mandatory provisions in the balance sheet value
	Share of deferred tax liability
	Negative balance of financial assets accounts
TOTAL LIABILITIES	**ADJUSTED BALANCE SHEET TOTAL**

4.2 Reasonable rate of return

Reasonable rate of return is calculated on the basis of the weighted average cost of capital (WACC model).

When the definition of a reasonable rate of return in accordance with Formula 15 is entered in Formula 14, the calculation of a reasonable rate of return after corporate tax on adjusted capital invested in network operations (pre-tax) will comply with Formula 16.

$$R_{k,pre-tax} = \left(\frac{C_e \times (1-g)}{(1-yvk)} + C_D \times g\right) \times (E+D) \qquad (16)$$

The reasonable cost of adjusted equity invested in network operations in Formula 13 is calculated in accordance with Formula 17.

$$C_E = R_r + \beta_{asset} \times \left(1 + (1-yvk) \times \frac{g}{1-g}\right) \times MRP + LP + CRP + LRP \qquad (17)$$

The reasonable cost of adjusted interest-bearing debt invested in network operations in Formula 16 is calculated in accordance with Formula 18.

$$C_D = R_r + DP + CRP \quad (18)$$

in formulae 16, 17 and 18

$R_{k,\,pre\text{-}tax}$ = reasonable return before corporate tax

C_E = reasonable cost of equity

C_D = reasonable cost of interest-bearing debt

yvk = the rate of corporate tax

E = adjusted equity invested in network operations

D = adjusted interest-bearing debt invested in network operations

g = share of interest-bearing debt in the optimal capital structure

$1 - g$ = share of equity in the optimal capital structure

R_r = risk-free rate

β_{asset} = asset beta coefficient

MRP = market risk premium

LP = premium for lack of liquidity

LRP = additional risk premium for natural gas transmission network operations

DP = debt premium

CRP = country risk premium

Table 5 shows the parameters for a reasonable rate of return applied in the fifth and sixth regulatory periods.

Table 5. *Parameters of a reasonable rate of return in the fifth and sixth regulatory period*

PARAMETER	VALUE APPLIED	UPDATE FREQUENCY

RISK-FREE RATE	2.48% in 2024, the average of daily values of 10-year government bond interest rates in the state of Germany between April and September of the previous year	Annually
COUNTRY RISK PREMIUM	0.59% in 2024, the difference in the average of daily values of 10-year government bond interest rates in the state of Germany between April and September of the previous year	Annually
ASSET BETA	0.35, updated using weekly returns from a two-year period on the date of valuation	Once every two years
EQUITY BETA	0.59, updated in the same context as the asset beta and capital structure	Once every two years
MARKET RISK PREMIUM	4.61%, average for April–September preceding the update of the Damodaran database (in 2023 and 2027)	Once every four years
PREMIUM FOR LACK OF LIQUIDITY	0.6%	
CAPITAL STRUCTURE (liabilities/equity)	46% / 54%, updated using the value on the date of valuation	Once every two years
ADDITIONAL RISK PREMIUM FOR NATURAL GAS	0.9%	

DEBT PREMIUM	1.73%, updated using the average of the returns of the week preceding the date of valuation (Mid Yield)	Once every two years
CORPORATE TAX RATE	20%	

UPDATING THE PARAMETERS OF A REASONABLE RATE OF RETURN

The Energy Authority updates:

- the risk-free interest rate and the value of the country risk premium each year
- the rate of corporate tax to correspond with the current value, if necessary
- the debt premium, asset and equity beta and the capital structure once every two years
- the market risk premium for each regulatory period (once every four years).

The values of the premium for lack of liquidity and the additional risk premium for natural gas transmission network operations remain the same throughout the eight-year methodology period.

5 INCOME AND COSTS OF NETWORK OPERATIONS

The basis for calculating realised adjusted profit is the operating profit (loss) in accordance with the unbundled profit and loss account of the network operations. This is adjusted with the profit adjustment items described in this chapter. After that, the impact of incentives will be deducted in the calculation of realised adjusted profit (6).

5.1 Income from network operation

Income entered before the operating profit (loss) in the unbundled profit and loss account are used as returns on network operations in the calculation of realised adjusted profits.

Income from network operations include

- income from network service fees
- income from system services
- income from balancing services
- non-refundable connection fees (participation fees)
- income from other services related to network operations.

The following adjustment items are returned in the calculation of realised adjusted profit

- annual net change in refundable connection fees
- planned depreciation and reduction in value of natural gas network assets in non-current assets
- planned amortisation of goodwill
- sales loss resulting from the sale of a network section.

The profit from the sale of a network section entered under other operating income is deducted when calculating the realised adjusted profit.

CONNECTION FEES I.E. PARTICIPATION FEES

In the calculation of the realised adjusted profit, the annual net change in refundable connection fees (participation fees) entered in the unbundled balance sheet is returned.

The annual net change in connection fees is obtained by deducting the amount of connection fees in the unbundled balance sheet of the previous accounting period from the amount of connection fees in the unbundled balance sheet in the accounting period.

Non-refundable connection fees are treated as returns on network operations.

The way of treating connection fees in balance sheet adjustment is described in section 2.4.2.

Connection fees (participation fees) are not deferred

The Authority has considered an alternative method of treating connection fees in order to defer their high accruals. This matter has also been dealt with in TSO public hearings and in a previously commissioned study, as well as in n the court of law based on complaints by TSOs (MAO:13/10 and MAO:427–501/12).

No such alternative method of treating connection fees has been presented that would safeguard the equal treatment of TSOs.

As a result, connection fees are not deferred, but they are instead treated as returns on network operations in the accounting period during which they have been entered into the financial statements.

DEPRECIATION OF NATURAL GAS NETWORK ASSETS IN NON-CURRENT ASSETS

In the unbundled profit and loss account, planned depreciations of natural gas network assets are returned in the calculation of realised adjusted profit.

PLANNED AMORTISATION OF GOODWILL

Planned amortisation of goodwill on the unbundled profit and loss account is returned in the calculation of realised adjusted profit.

SALES PROFIT AND LOSS RESULTING FROM THE SALE OF A NETWORK SECTION

If the profit from the sale of a network section is entered under other operating income in an unbundled profit and loss account, the amount of sales profit is deducted when calculating the realised adjusted profit.

If, on the other hand, a sales loss has been recorded under other operating expenses in the unbundled profit and loss account, the sales loss is returned in the calculation of realised adjusted profit.

5.2 Costs of network operations

In the calculation of realised adjusted profit, the costs entered in the unbundled profit and loss account are used as the costs of network operations. These are adjusted with the adjustment items described in this section.

According to Chapter 1, section 3, paragraph 8 of the Natural Gas Market Act, natural gas network operations refer to business activities in which the TSO carries out natural gas transport operations in the natural gas transmission or distribution network and produces and provides other services that the TSO is responsible for in accordance with the legislation on the natural gas market.

Natural gas network operations include

- design, construction, maintenance and operation of the natural gas network
- connecting customers' electrical devices to the network
- measuring natural gas
- other measures required in the transmission or distribution of natural gas that are necessary for the transmission or distribution of natural gas and other network services.

The costs related to these functions constitute the costs of network operations.

The costs of network operations also include

- costs of system services
- costs of balancing services
- compensation on outages paid by the TSO to its customers.

In accounting, the costs must be allocated to business operations in accordance with the matching principle.

EQUAL TREATMENT OF INVESTMENTS AND EXPENSES IN ACCOUNTING

The TSO is in an equal position regardless of whether it capitalises its costs pertaining to investment or records them as expenses.

The cost of components is not taken into account twice in the regulation method.

If the investment of a component is recorded in operational costs, the component in question is not included in the adjusted replacement value and net present value. No separate adjustment is made on the component in the calculation of realised adjusted profit. A component recorded as an expense in its entirety has already been taken into account in the operating profit (operating loss) in the unbundled profit and loss account.

The TSO must itemise the capitalised costs of investments as their own cost items as notes to the unbundled financial statements.

Demolition costs of replacement investments in network assets

The demolition costs of replacement investments in network assets are treated as costs.

The capitalised demolition costs of replacement investments in network assets are adjusted on the calculation of reasonable return as if they had been recorded as expenses. Costs capitalised in the balance sheet are adjusted from the adjusted balance sheet along with the network assets in non-current assets (Chapter 2.1). The demolition costs of replacement investments are not included in the adjusted replacement value or adjusted net present value of network assets.

Depreciations related to the demolition costs of replacement investments in network assets are returned to the adjusted profit as a part of the planned depreciation and reduction in the value of network assets in non-current assets.

The demolition costs of replacement investments in network assets capitalised during the financial period are deduced from the profits and controllable operational costs (KOPEX) and the general efficiency target reference level (SKOPEX).

During the fifth (2024–2027) and sixth (2028–2031) regulatory period, 1/8 of the capitalised demolition costs of replacement investments in network assets in accordance with the 2023 financial statements will be deducted from the operating profit. These demolition costs capitalised before 2024 will be considered as controllable operational costs.

COSTS NOT PART OF NETWORK OPERATIONS

In the calculation of actual adjusted profit, only costs for which the TSO receives compensation are accepted as costs of network operations.

Uncompensated costs are treated as items of profit distribution nature and they are returned in the calculation of realised adjusted profit. These uncompensated costs include component placing compensations.

If the TSO wishes that these costs are accepted as costs of network operations, the TSO must provide an account of the matter in connection of delivering the regulatory data. The actual compensation received against the TSO's costs must be verified in the account. The Authority will assess the account and decide on the handling of these costs on its basis.

COMPENSATION ON OUTAGES PAID TO CUSTOMERS

Compensation paid by the TSO for outages to its customers is a cost of network operations. Compensations treated as sales adjustment are also costs of network operations.

The TSO must specify the compensations on outages paid to the customers as their own cost items as notes to the unbundled financial statements.

DEPRECIATION OF OTHER ASSETS IN NON-CURRENT ASSETS

The calculation of the TSO's realised adjusted profit uses depreciation according to the plan based on the unbundled profit and loss account with respect to the depreciation of non-current assets other than natural gas network assets. These items have already been taken into account in the operating profit (operating loss) in the unbundled profit and loss account. Therefore, no separate adjustment is made on them in the calculation of realised adjusted profit.

However, if natural gas network components are recorded under items other than the natural gas network assets in non-current assets, depreciations made from these components are eliminated from depreciations made on other assets in non-current assets. This is carried out because natural gas network components are taken into account in adjusted straight-line depreciations in accordance with chapter 6.1.1.

CONTROLLABLE AND NON-CONTROLLABLE OPERATIONAL COSTS

The costs arising from natural gas network operations incurred by the TSO, entered through profit and loss, are divided in the calculation of actual adjusted profit into controllable and non-controllable operational costs. Controllable operational costs are subject to an efficiency target in accordance with the efficiency incentive (6.3).

The definition of controllable operational costs (KOPEX) is presented in Table 6.

Table 6. *Controllable operational costs*

KOPEX	=	Materials, supplies and goods and energy costs
	+	Increase or decrease in stocks (unless included in Materials, supplies and goods)
	+	Personnel expenses
	+	Cost of leasing
	+	Other external services
	+	Other operating expenses
	+	Standard compensation paid to customers (unless included in other costs)
	+	Demolition costs of replacement investments in network assets capitalised during the financial year
	+	Costs of components recorded as expenses (unless included in unit prices or other items above)
	–	Production for own use
	–	Costs of balancing services
	–	Compressor gases and additional pressure purchased from Russia
	–	Maintenance fees for the European marketplace in accordance with EU regulation
	–	Import fuel taxes and security of supply fee
	–	Emissions allowances
	–	Cost/income related to the steering of gas consumption

When necessary, the TSO must provide the Energy Authority with a report on the efficiency and impact of the maintenance fees for the European marketplace. The Authority will assess the account and, if necessary, decide on the handling of these costs on its basis.

Costs of network operations other than those referred to in Table 6 are non-controllable operational costs.

Capitalised demolition costs of replacement investments in network assets

The demolition costs of replacement investments in network assets are added to the controllable operational costs by means of the calculation of reasonable return.

In the fifth (2024–2027) and sixth (2028–2031) regulatory period, 1/8 of the capitalised demolition costs of replacement investments in network assets in accordance with the 2023 financial statements will be included in the controllable operational costs.

5.3 Financing costs of network operations

Reasonable costs of financial assets are taken into account as financing costs when calculating the realised adjusted profit.

REASONABLE COSTS OF FINANCIAL ASSETS

Running network operations requires certain financial assets. They are needed to make regular payments because the payment transactions of the TSO take place at somewhat different times from cash payments. They are also needed to make provisions for unexpected expenses.

For this reason, the reasonable costs arising from financial assets necessary to safeguard network operations are taken into account in the calculation of realised adjusted profit. This is carried out using a method of calculation, on the basis of which the costs of financial assets are not unreasonably small or insufficient from the TSO's point of view by virtue of a decision by the Supreme Administrative Court (KHO:2010:86).

The following are taken into account in the financial assets recorded in the unbundled balance sheet

- short- and long-term receivables with the exception of trade receivables
- marketable securities
- cash and bank receivables and comparable items.

The following are not taken into account in the financial assets recorded in the unbundled balance sheet

- trade receivables
- the financial asset accounts listed above with a negative balance.

When calculating realised adjusted profit, the amount taken into account with respect to financial assets shall correspond to a maximum of 10% of the turnover of network operations.

The reasonable costs of financial assets can be calculated by multiplying the maximum amount of financial assets by the reasonable cost of debt used in the calculation of a reasonable rate of return (3.3).

This gives the reasonable costs of financial assets required for safeguarding network operations, and they are deducted when calculating the realised adjusted profit.

6 INCENTIVES

6.1 Investment incentive

The investment incentive encourages the TSO to make its investments cost-effectively on average and to enable the collection of reasonable investment costs from customers for investments made.

The investment incentive consists of the incentive impact of unit prices and the straight-line depreciation calculated from the adjusted replacement value.

The incentive impact of unit prices directs the TSO to invest more effectively than on average and to find more cost-effective methods of implementation than before. At the same time, unit prices limit inefficiency and ensure that TSOs have no interest in increasing their own investment costs when unit prices prevent transferring the cost inefficiency of investments to customer prices.

The incentive impact arises from the difference between investments calculated with unit prices and the cost of realised investments. When investing cost-effectively on average, the TSO reaps benefits from the adjustment of network assets; similarly, when a TSO invests ineffectively, unit prices cut off overheads in the adjustment of network assets.

The incentive impact of the straight-line depreciation arises from the fact that the methods allow for the TSO an annual depreciation level based on average adjusted straight-line depreciation on the basis of the lifetimes selected by the TSO. Imputed straight-line depreciations are always allowed in full as far as the component is in actual use. Therefore, imputed straight-line depreciation is calculated for the component even after the end of the lifetime if the component is still in actual use. Together with the net present value, the incentive impact of the straight-line depreciation calculated from the TSO's adjusted replacement value directs the TSO to maintain its network in accordance with the lifetimes it has selected in actual use for as long as possible. This, in turn, leads to proactive maintenance and longer component lifecycles.

When the lifetime has been correctly selected and the TSO has invested on average at a reasonable cost level in line with unit prices, the straight-line depreciation of the investment incentive covers on average all necessary component investment costs during their lifetimes. In other words, the investment incentive enables full depreciation of network components. Straight-line depreciation is permitted for components that have exceeded their lifetime in the same relation as the depreciated cost of the components that have correspondingly been demolished before

reaching the end of their lifetime. Therefore, the incentive also takes into account any premature replacement investments.

6.1.1 Adjusted straight-line depreciations

The adjusted straight-line depreciations on the network assets are calculated per network component from the adjusted replacement value of the network assets (2.1.1). Adjusted straight-line depreciations are calculated for all years of the regulatory period in the situation on the last day of December in the year in question.

The calculation of adjusted straight-line depreciation of the individual component *i* for the fifth and sixth regulatory period is presented in the formula below.

$$SD_i = \frac{RCV_i}{lifetime_i} \quad (20)$$

Adjusted straight-line depreciations for the entire network is calculated as a sum of adjusted straight-line depreciations of the network components as presented in the formula below.

$$SD = \sum_{i=1}^{n} \left(\frac{RCV_i}{lifetime_i} \right) \quad (21)$$

in formulae 16 and 17

SD_i = adjusted straight-line depreciation of network component *i*

SD = adjusted straight-line depreciations of total network assets

RCV_i = adjusted replacement value of network component *i*

$lifetime_i$ = techno-economical lifetime of network component *i*

6.1.2 Investment incentive in the calculation of the realised adjusted profit

The calculation takes into account any cost-efficiency benefits when calculating annual straight-line depreciation for customers within the regulatory period.

During the regulatory periods, 15% of the cost benefit of straight-line depreciation obtained by the TSO is deducted from the sum of straight-line depreciation in relation to unit prices if the TSO has been able to make investments in that year at a

cost lower than the unit prices. Therefore, 15% of the benefits brought by cost-effectiveness to the TSO are directly allocated to customers and 85% remain with the TSO.

The Energy Authority has estimated that by leaving the TSO with a cost-benefit achieved through the investment efficiency obtained from the straight-line depreciation of 85% during the component life cycle, this incentive will continue to direct the TSO to invest cost-effectively, which will create benefits for customers in the valuation of future investments in connection with the unit price update.

For example, if the TSO's investments total EUR one million at a lower cost than unit prices in the year under review, then EUR 150,000 will be reduced from the sum of the straight-line depreciations. As a result, the TSO will benefit from the unit prices through depreciations by EUR 850,000 in the price margin during the component lifetime, and customers will be able to benefit from the TSO's price margin which is EUR 150,000 lower immediately during the regulatory period.

Based on the above, the impact of investment incentives on the realised adjusted profits is calculated annually in accordance with the formula below, if the TSO has been able to invest at prices lower than average unit prices.

$$III = SD - \left(investments_{up} - investnents_{bs}\right) \times 15\% \qquad (22)$$

where

III = the impact of the investment incentive in the adjusted profits

SD = network straight-line depreciation calculated based on the frozen replacement value

$investments_{up}$ = investments calculated with unit prices

$investments_{bs}$ = investments based on the balance sheet

For TSOs that have failed to invest cost-effectively at prices lower than the unit prices given in the unit price list, the impact of the investment incentive on the actual adjusted profits is calculated directly in accordance with the normal straight-line depreciation. In other words, the impact is the sum of the straight-line depreciation of the network components in actual use.

The above principle is used to improve the cost-equivalence of pricing, as in efficiently operating companies a part of the benefit will be inevitably allocated to customer pricing and the apparent efficiency of potentially lagging accounts does not lead to unjustified profits.

6.2 Quality incentive

The purpose of the quality incentive is to encourage the TSO to develop the quality of natural gas transmission.

6.2.1 Quality bonus method

The determination of the quality incentive has been examined in a study commissioned by the Energy Authority from Gaia Consulting Oy[10]. Based on the study, a decision was made to use a quality bonus method in the TSO's quality incentive since the 3rd regulatory period.

The quality bonus method is a target interval model whose sanctions and bonuses are defined in fixed steps. The method has three levels

- when the quality indicator is within the target range, the TSO is not sanctioned and does not receive a bonus from the incentive
- when the quality indicator is below the target range, the TSO receives a bonus
- when the quality indicator exceeds the target range, the TSO is sanctioned.

The quality indicator describes the quality of the TSO's operations and is used to determine the impact of the incentive in the calculation of realised adjusted profit.

The quality indicator is unsupplied energy. Unsupplied energy is calculated based on actual customer consumption in relation to customers' ordering capacity at the time of a delivery interruption. Any part exceeding customer ordering capacity is not taken into account in unsupplied energy.

The reference level of the quality incentive is the TSO's unsupplied energy over the span of eight years. The reference level is used to determine the target range of the quality incentive and the upper and lower quartiles.

If the actual annual amount of unsupplied energy is in the least optimal quartile of the reference level, the TSO is sanctioned by the quality incentive. Similarly, when

[10] Gaia Consulting Oy, Karttunen Ville, Vanhanen Juha, Partanen Jarmo, Matschoss Kaisa, Bröckl Marika, Haakana Juha, Hagström Markku, Lassila Jukka, Pesola Aki and Vehviläinen Iivo, Selvitys laatukannustimen toimivuudesta ja kehitystarpeista vuosille 2016–2023 (Report on the functioning and development needs of the quality incentive for the period 2016–2023), 27 October 2014

the annual unsupplied energy in the most optimal quartile on the reference level, the TSO receives a bonus from the incentive.

When the unsupplied energy is between the top and bottom quartiles of the reference level, i.e. in the target interval, the quality incentive does not affect the calculation of the realised adjusted profit.

6.2.2 Reference level for the fifth and sixth regulatory period

In the fifth regulatory period, the unsupplied energy from 2016–2023 is used as the reference level.

In the sixth regulatory period, the unsupplied energy from 2020–2027 is used as the reference level.

6.2.3 Annual outturn in the fifth and sixth regulatory period

In the fifth and sixth regulatory periods, the annual outturn of the quality incentive is based on the unsupplied energy for each year.

6.2.4 Quality incentive in the calculation of the realised adjusted profit

The impact of the quality incentive is deducted when calculating realised adjusted profit.

The impact of the quality incentive is calculated by comparing annual outturn with the reference level.

The greatest deviations in realised unsupplied energy are accounted for by limiting the impact of the quality incentive to a maximum of 2% of the TSO's reasonable return for the year in question. This means that the size of the incentive does not depend on how much the unsupplied energy exceeds or falls below the set limit values.

When the unsupplied energy used as the quality indicator is in the target interval of the reference level, the impact of the incentive is 0%.

When the unsupplied energy is in the bottom quartile of the reference level, the bonus effect of the quality incentive is 2% of the TSO's reasonable return for the year in question.

When the unsupplied energy reaches the top quartile of the reference level, the sanction effect of the quality incentive is 2% of the TSO's reasonable return for the year in question.

6.3 Efficiency incentive

The purpose of the efficiency incentive is to encourage the TSO to operate in a cost-effective way.

The operation of a TSO is cost-effective when the input, or costs, used in its operations are as small as possible in relation to the return received from the operation.

ON THE CALCULATION OF THE EFFICIENCY INCENTIVE

The calculation of the TSO's efficiency incentive consists of six factors

- general efficiency target (6.3.1)
- company-specific efficiency target (6.3.2)
- reference level of company-specific efficiency costs (6.3.3)
- company-specific realised efficiency costs (6.3.4)
- efficiency report of European network operators (6.3.5)
- efficiency incentive in the calculation of realised adjusted profit (6.3.6).

6.3.1 General efficiency target

The purpose of the general efficiency target is to encourage TSOs, including those found to be efficient in the efficiency measurement, to improve the efficiency of their operations in accordance with the general productivity development. The general efficiency target, i.e. the dynamic component of the efficiency incentive, strives to take into account the potential for improving efficiency created by the technical development of the sector.

In the regulation of monopoly operations, it is natural to set a general efficiency target for enterprises.

PRODUCTIVITY DEVELOPMENT IN THE NETWORK INDUSTRY

A study[11] commissioned by the Energy Authority has assessed the level of the general efficiency target by examining productivity development in various network activities.

[11] ECKTA Oy / Kuosmanen, T. Yleinen tehostamistavoite sähkön ja maakaasun verkkotoiminnoissa 6. ja 7. valvontajaksoilla 2024–2031 (General efficiency target for electricity and natural gas network operations in the 6th and 7th regulatory periods 2024–2031), 15 November 2022

The productivity figures vary depending on the network operations and the period under review. The study recommends maintaining a general efficiency target of 0% for natural gas network operations similarly to the third and fourth regulatory period, taking into account the energy crisis and the future outlook of the natural gas market.

THE LEVEL TO BE APPLIED

In the fifth and sixth regulatory period, the general efficiency target is zero per cent (0%) as recommended in the study.

6.3.2 Company-specific efficiency target

The purpose of the company-specific efficiency target is to encourage TSOs found to be inefficient in the efficiency measurement to achieve a level that is in accordance with efficient operation.

POTENTIAL FOR ENHANCED EFFICIENCY

The efficiency target is based on the observed potential of a TSO to enhance its efficiency.

The efficiency potential is for example observed when comparing the actual cost and output data of the TSO with the cost and output data of all TSOs.

METHOD TO BE USED

As the general efficiency target for the fifth and sixth regulatory period is 0%, measuring the efficiency of a TSO is only based on comparing the TSO's cost level with its own past cost level.

The premise of calculating the potential for enhanced efficiency is the TSO's actual controllable operational costs (KOPEX). These are compared with the reference level calculated on the basis of the actual costs of previous years, i.e. the reasonable controllable operational costs (SKOPEX).

6.3.3 Reference level of efficiency costs

The reasonable controllable operations costs (SKOPEX) are used as the reference level of efficiency costs. The reference level is calculated annually, and it takes the impact of inflation into account.

In the first year of the regulatory period, the reference level of the efficiency incentive is determined by using the average of the TSO's realised controllable operational costs of the previous regulatory period, i.e. the previous four years.

In the following years of the regulatory period, the reasonable, controllable operational costs for the previous year will be used as the reference level for the efficiency costs.

REFERENCE LEVEL OF EFFICIENCY COSTS IN THE FIFTH REGULATORY PERIOD

The calculation of the reference level in 2024 is presented in Formula 22.

$$SKOPEX_{2024} = \frac{1}{4} \sum_{y=2020}^{2023} ((1 + \Delta CPI_{2024}) \times KOPEX_y) \qquad (22)$$

where

$SKOPEX_{2024}$ = reference level for efficiency costs i.e. reasonable controllable operational costs for year 2024

ΔCPI_{2024} = change in the consumer price index from year *t* to year 2024

$KOPEX_y$ = realised controllable operational costs in year *y*

y = year 2020, 2021, 2022 or 2023

The calculation of the reference level for the following years 2025–2027 of the regulatory period is presented in formula 23.

$$SKOPEX_y = (1 + \Delta CPI_y) \times SKOPEX_{y-1} \qquad (23)$$

where

$SKOPEX_y$ = reference level for efficiency costs i.e. reasonable controllable operational costs for year *t*

$SKOPEX_{y-1}$ = reference level for efficiency costs i.e. reasonable controllable operational costs for year *y-1*

ΔCPI_y = change in the consumer price index from year *y-1* to year *y*

y = year 2025, 2026 or 2027

REFERENCE LEVEL OF EFFICIENCY COSTS IN THE SIXTH REGULATORY PERIOD

The calculation of the reference level in 2028 is presented in Formula 24.

$$SKOPEX_{2028} = \frac{1}{4} \sum_{y=2024}^{2027} ((1 + \Delta KHI_{2028}) \times KOPEX_y) \quad (24)$$

where

$SKOPEX_{2028}$ = reference level for efficiency costs i.e. reasonable controllable operational costs for year 2028

ΔCPI_{2028} = change in the consumer price index from year *t* to year 2028

$KOPEX_y$ = realised controllable operational costs in year *y*

The calculation of the reference level for the following years 2029–2031 of the regulatory period is presented in formula 25.

$$SKOPEX_t = (1 + \Delta KHI_t) \times SKOPEX_{t-1} \quad (25)$$

where

$SKOPEX_y$ = reference level for efficiency costs i.e. reasonable controllable operational costs for year *t*

$SKOPEX_{y-1}$ = reference level for efficiency costs i.e. reasonable controllable operational costs for year *y-1*

ΔCPI_y = change in the consumer price index from year *y-1* to year *y*

y = year 2029, 2030 or 2031

6.3.4 Realised efficiency costs

Controllable operational costs are used as realised efficiency costs. Realised efficiency costs are calculated annually.

Cost items according to the unbundled profit and loss account for each year are used as controllable operational costs. The items included in controllable operational costs are presented in Table 6 in chapter 5.2.

In the fifth and sixth regulatory periods, demolition costs of replacement investments in network assets capitalised on the balance sheet will be considered as part of the controllable operational costs for the year in question and they are therefore also included in the efficiency incentive. To ensure that the demolition costs would also be taken into account in the determination of the reference level of the efficiency incentive, the Energy Authority will collect data on the activated demolition costs for 2020–2023 by means of a separate request for information, and the corresponding costs will be added to the actual operative costs used in calculating the reference level. The treatment of demolition costs during the fifth and sixth regulatory periods has been examined in section 5.2.

The costs of the network data systems and the communication networks in the supervisory control and data acquisition will also be fully included in the controllable operational costs, also for the parts that have not been previously considered, if the costs have been previously recorded in network rents. In the fifth regulatory period, the costs in question, which were previously reported in network rents and partly taken into account through unit prices, are processed as pass-through items, and in the sixth regulatory period, the costs are included as a part of the controllable operational costs under the efficiency incentive. To ensure that the costs will also be taken into account in the calculation of the reference level during the sixth regulatory period, the Energy Authority will collect data on similar costs by means of a separate request for information for 2020–2023. The treatment of the costs of the network data systems and the communication networks in the supervisory control and data acquisition during the fifth and sixth regulatory period are examined in section 2.1.

6.3.5 Efficiency report of European natural gas transmission system operators

In the sixth regulatory period, the incentive effect of the efficiency incentive will take into account the transmission system operator's performance in an European cost efficiency benchmarking study.

The Council of European Energy Regulators (CEER) regularly carries out a benchmarking project on the cost efficiency of natural gas transmission system operators, describing the overall efficiency of European transmission system operators with the help of the equalisation of investment and cost data. The latest benchmarking process[12] was launched in summer 2021, and the report will be published by the

[12] CEER: The Transmission System Operator Cost Efficiency Benchmark 2021 (TCB21)

end of 2023. The results of the report include an efficiency score for each transmission system operator included in the report, describing the cost-efficiency of the operator in relation to the reference group.

TAKING THE EUROPEAN EFFICIENCY STUDY INTO ACCOUNT IN THE 5TH REGULATORY PERIOD

Gasgrid Finland Oy participated in the latest efficiency study published in 2023 (CEER TCB21). However, Gasgrid only started operations at the beginning of 2020, when the Finnish natural gas market was opened to competition and natural gas transmission network operations were separated from Gasum Oy. As the cost data used in the latest efficiency study is largely based on the period before 2020, the company-specific result of the report will not be applied yet in the fifth regulatory period due to the discontinuity of the data.

TAKING THE EUROPEAN EFFICIENCY BENCHMARK INTO ACCOUNT IN THE 6TH REGULATORY PERIOD

CEER's European efficiency benchmarking study is expected to be carried out every 3–4 years from now on. The next study[13] following the TCB21 project will probably be launched in 2024, and the report will likely be published in 2026. Thus, for the sixth regulatory period, the results and efficiency score of the TCB24 study (or an equivalent report) will be applied. The company-specific efficiency score of the report is applied to the impact calculation of the efficiency incentive for each year of the regulatory period.

Gasgrid Finland Oy's ranking in the study and its efficiency score (ES_{TCB}) are taken into account in the efficiency incentive as follows:

- ES_{TCB} = 100% = Efficiency bonus +2% of reasonable return
- 100% > ES_{TCB} >= 95% = Efficiency sanction -1% of reasonable return
- ES_{TCB} = 95% = Efficiency sanction -2% of reasonable return

If Gasgrid's efficiency score is 100% in the report, meaning that the company is among the most efficient companies in the reference group, an efficiency bonus equal to 2% of the TSO's reasonable return for the year in question is allowed for the company. On the other hand, if the efficiency score is 95% or more but less than 100%, this results in an efficiency sanction corresponding to 1% of the reasonable return for the year in question. Then again, if the efficiency score is less

[13] CEER: The Transmission System Operator Cost Efficiency Benchmark 2024 (TCB24)

than 95%, this results in an efficiency sanction corresponding to 2% of the reasonable return for the year in question.

If the next European efficiency benchmarking study is not carried out or the results of the study have not been published before the beginning of the seventh regulatory period, the above-mentioned TCB bonus/sanction procedure will be abandoned. In this case, the efficiency incentive is formed in the same way during the sixth regulatory period as during the fifth regulatory period, i.e. only applying a company-specific efficiency target with the 10% incentive impact thresholds.

6.3.6 Efficiency incentive in the calculation of the realised adjusted profit

The impact of the efficiency incentive is added to the realised adjusted profit.

The impact of the efficiency incentive is calculated so that the costs according to the reference level for the realised efficiency costs of the same year are deducted from the realised efficiency costs.

The maximum impact of the efficiency incentive in the calculation of realised adjusted profit is made reasonable. The greatest deviations in the annual controllable operational costs are taken into account by setting limit values, i.e. floor and ceiling levels, for the efficiency incentive. This means that the difference between the reference level of the efficiency costs and the realised efficiency costs that is higher than the set limit value will have no impact on the calculation of the TSO's realised adjusted profit.

The impact of the efficiency incentive taken into account in the calculation of adjusted profit in the fifth and sixth regulatory period may not be higher than 10% of the TSO's reasonable return in the year in question. This applies to the efficiency bonus received from the calculation of costs and the efficiency sanction resulting from increased costs.

The impact of the efficiency incentive is calculated on the basis of the difference between the total costs realised during the fifth regulatory period and the reference level of the efficiency costs presented in section 6.3.3, in which case the 10% floor and ceiling values are applied.

During the sixth regulatory period, the impact of the efficiency incentive is calculated so that a maximum of 8% of the incentive effect consists of the difference between the actual costs and the reference level. In addition, the calculation of the realised adjusted profit takes into account the efficiency score in accordance with the efficiency report of European transmission system operators, the impact of

which may not exceed 2% of the TSO's reasonable return. During the sixth regulatory period, the overall impact of the efficiency incentive on the calculation of realised adjusted profit is determined as follows:

$$Efficiency\ incentive\ impact = KOPEX_y - SKOPEX_y \pm TCB\ bonus/sanction \quad (26)$$

If the next European efficiency study is not carried out or the results of the study have not been published before the beginning of the sixth regulatory period, the above-mentioned TCB bonus/sanction procedure will be abandoned. In this case, the efficiency incentive procedure will be implemented in accordance with the fifth regulatory period.

6.4 Innovation incentive

The purpose of the innovation incentive is to encourage the TSO to develop and use innovative technical and functional solutions in its network operations.

A report[14] commissioned by the Agency from Gaia Consulting Oy assessed the functionality of the innovation incentive and gave development proposals for it.

6.4.1 Research and development costs

In network operations, the key objectives of research and development activities are the development and introduction of smart natural gas networks and other new technologies and methods of operation. This may entail research and development costs for the TSO even before the new technologies and operating methods are fully in use and usable.

The Authority encourages the TSO to make active efforts in research and development by deducting reasonable research and development costs in the calculation of realised adjusted profit.

Acceptable research and development costs must be directly related to the creation of new knowledge, technology, products or methods of operation in network operations for the sector. They can also be related to the planning of such a project.

The results of projects whose costs have been accepted in the innovation incentive must be public and, for example, available to the utilisation of other TSOs in their network operations. However, it is not necessary to publish confidential information

[14] Gaia Consulting Oy / Vehviläinen Iivo; Ryynänen Erkka; Hjelt Mari; Descombes Laura; Vanhanen Juha: Energiaviraston valvontamenetelmissä sovellettavan innovaatiokannustimen arviointi (Assessment of the innovation incentive applied in the Energy Authority's regulation methods), 18 September 2014

concerning customers. Results protected by industrial property rights need not be published, either. The results to be published must be delivered to the Energy Authority, which will publish them on its website.

Acceptable research and development costs must be recorded in the unbundled profit and loss account as expense. Capitalised research and development costs are not accepted to be included in the calculation of the innovation incentive.

The TSO must itemise non-capitalised research and development costs as their own cost items as notes to the unbundled financial statements.

6.4.2 Innovation incentive in the calculation of realised adjusted profit

The impact of the innovation incentive is deducted when calculating realised adjusted profit.

The impact of the innovation incentive is calculated so that a share corresponding to a maximum of 1% of the TSO's total turnover from network operations in the unbundled profit and loss accounts in the regulatory period are treated as reasonable research and development costs.

Therefore, the amount of acceptable research and development costs in a single year may exceed or fall below the share corresponding to one per cent of the turnover from network operations in the year in question.

7 REALISED ADJUSTED PROFIT

The calculation of realised adjusted profit is started from the operating profit (loss) of the unbundled profit and loss account.

When calculating the realised adjusted profit, the annual change in refundable connection fees (participation fees) according to the unbundled balance sheet, and, in line with the unbundled profit and loss account, planned depreciations and value reductions from natural gas network assets, amortisation of goodwill, and the loss of sales resulting from the sale of a network section are returned first (5.1). Meanwhile, the profit from the sale of a network section entered under other operating income is deducted (5.1) when calculating the realised adjusted profit.

After that, reasonable costs of financial assets (5.3) and capitalised demolition costs of replacement investments in network assets (5.2) are deducted as profit adjustment items.

The impacts of incentives are also deducted in the calculation of realised adjusted profit. Incentives include investment incentive (6.1), quality incentive (6.2), efficiency incentive (6.3) and innovation incentive (6.4).

The impact of the investment incentive is calculated by deducting the adjusted straight-line depreciation of the natural gas network assets.

The impact of the quality incentive is calculated on the basis of the quality sanction or quality bonus. The impact of the incentive is added to the operating profit.

The impact of the efficiency incentive is calculated by deducting costs in line with the reference level of efficiency costs from the efficiency costs. The impact of the efficiency incentive is added to the operating profit.

The impact of the innovation incentive is calculated from the TSO’s reasonable research and development costs. The impact of the incentive is deducted from operating profit.

The sum total of the calculation is the realised adjusted profit.

The above-described calculations are presented in Table 7.

Table 7. *The calculation of realised adjusted profit*

OPERATING PROFIT (LOSS) OF THE UNBUNDLED PROFIT AND LOSS ACCOUNT OF NETWORK OPERATIONS

+ Refundable items in the unbundled profit and loss account
  + Net change in refundable connection fees (participation fees)
  + Planned amortisation of goodwill
  + Loss of sales of the network section recorded in other expenses
  - Profit on sales of the network section recorded in other income
  + Planned depreciations and value reductions from natural gas network assets

- Profit adjustment items
  - Reasonable costs of financial assets
  - Demolition costs of replacement investments in network assets capitalised during the financial year
  - 1/8 of the balance sheet value of the demolition costs of replacement investments in network assets in accordance with the 2023 financial statements
- Investment incentive
  - Adjusted straight-line depreciations of the natural gas network assets
- Quality incentive
  + Quality bonus
  - Quality sanction
- Efficiency incentive
  + Realised efficiency costs
  - Reference level of efficiency costs
- Innovation incentive
  - Reasonable costs of research and development activities

= REALISED ADJUSTED PROFIT

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11 Gaia Consulting Oy / Vehviläinen Iivo; Ryynänen Erkka; Hjelt Mari; Descombes Laura; Vanhanen Juha: Energiaviraston valvontamenetelmissä sovellettavan innovaatiokannustimen arviointi (Assessment of the innovation incentive applied in the Energy Authority's regulation methods), 18 September 2014

APPENDIX 1. NETWORK COMPONENTS, UNIT PRICES AND LIFE-TIMES

The breakdown of network components, lifetimes and unit prices in the appendix have been determined on the basis of a unit price report prepared by the transmission system company in 2023. The unit prices in the Appendix are applied as such to adjust investments made before 2024.

The unit prices will be updated separately for the investments of the fifth and sixth regulatory periods.

DETERMINING UNIT PRICES

The unit prices in the appendix are based on the TSO's most recent realised average costs, and they are presented at the 2022 price level. To the extent that no recent cost information was available, the unit price is based on the old unit price.

The unit price survey carried out during the period investigates the unit cost for the TSO for each network component on the basis of the most recent two investment years. Unit prices are always determined at the value of the same year on the basis of the consumer price index preceding the process of determining the unit price.

Unit prices are mainly based on the average weighted by investment volumes. To the extent that reliable cost information is not available for the recent few years, the unit price is calculated using the unit prices of other similar network components. If this is not possible either, the unit price is based on index-adjusted unit prices in accordance with the previous regulatory period.

UNIT PRICE LIST

The content specifications and interpretation instructions for reporting different components will be available in the Energy Authority's regulatory data system. If necessary, the Energy Authority provides clarifications on the specifications and reporting of network components.

Network component	Unit	€/unit	Lifetime replacement interval
TRANSMISSION NETWORK PIPE SYSTEM			
PIPE SIZE, 54bar(g)			
DN 80 or lower	km	**420,000**	50 - 65
DN 100	km	**450,000**	50 - 65

DN 150	km	**540,000**	50 - 65
DN 200	km	**580,000**	50 - 65
DN 250	km	**630,000**	50 - 65
DN 300	km	**630,000**	50 - 65
DN 400	km	**780,000**	50 - 65
DN 500	km	**1,000,000**	50 - 65
DN 700	km	**1,220,000**	50 - 65
DN 800	km	**1,680,000**	50 - 65
DN 900	km	**1,760,000**	50 - 65
DN 1000	km	**3,790,000**	50 - 65
PIPE SIZE, 54bar(g)			
DN 100	km	**980,000**	50 - 65
DN 500	km	**980,000**	50 - 65
PIPE SIZE, 8 bar(g), LOW PRESSURE PIPE, PEH PLASTIC			
PEH 315	km	**380,000**	65
PEH 200	km	**330,000**	65
below PEH 200	km	**310,000**	65
Fjusö-Paldiski marine pipeline, Finland's share			
Fjusö-Paldiski marine pipeline, Finland's share	km	**519,800**	65
Ground pipeline Inkoo - Fjusö			
Ground pipeline Inkoo - Fjusö	km	**287,000**	65
Ground pipeline Pölans-Inkoo			
Ground pipeline Pölans-Inkoo	km	**348,000**	65
TRANSMISSION NETWORK STA-TIONS			
PRESSURE CONTROL STATIONS			
Pressure reduction station 500 – 1000 MW without boiler	pcs	**1,880,000**	65
Pressure reduction station 500 – 1000 MW / Boiler	pcs	**150,000**	20
Pressure reduction station 500 – 1000 MW	pcs	**2,030,000**	65
Pressure reduction station 250 – 500 MW without boiler	pcs	**1,380,000**	65
Pressure reduction station 250 – 500 MW / Boiler	pcs	**150,000**	20
Pressure reduction station 250 – 500 MW	pcs	**1,530,000**	65
Pressure reduction station 100 – 250 MW without boiler	pcs	**1,050,000**	65
Pressure reduction station 100 – 250 MW / Boiler	pcs	**150,000**	20
Pressure reduction station 100 – 250 MW	pcs	**1,200,000**	65
Pressure reduction station 50 – 100 MW without boiler	pcs	**520,000**	65
Pressure reduction station 50 – 100 MW / Boiler	pcs	**150,000**	20

Pressure reduction station 50 – 100 MW	pcs	**670,000**	65
Pressure reduction station less than 50 MW without boiler	pcs	**300,000**	65
Pressure reduction station less than 50 MW / Boiler	pcs	**150,000**	20
Pressure reduction station less than 50 MW	pcs	**450,000**	65
Quality management equipment, per station	pcs	**170,000**	20
RECEPTION MEASUREMENT AND COMPRESSOR STATIONS			
Reception measurement. Imatra	pcs	**8,750,000**	60
Reception measurement. Inkoo	pcs	**8,750,000**	60
Compressor station piping and equipment	pcs	**7,770,000**	60
Compressor unit 4.7 MW	pcs	**6,830,000**	60
Compressor unit 5.0 MW	pcs	**6,920,000**	60
Compressor unit Inkoo	pcs	**12,449,000**	60
Compressor unit 6.5 MW	pcs	**7,070,000**	60
Compressor unit 10.0 MW	pcs	**10,590,000**	60
Compressor station automation equipment, per station	pcs	**2,000,000**	20
Compressor hall	m2	**2,808**	60
Inkoo LNG terminal interface / Gas extraction arm	pcs	**1,886,000**	60