

Regulation methods during the third regulatory period from 1 January 2016 to 31 December 2019 and the fourth regulatory period from 1 January 2020 to 31 December 2023

Natural gas transmission system

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1 REGULATION METHODS – SUMMARY

In this document, the Energy Authority (“the Authority”) presents the regulation methods for regulating the reasonableness of the pricing of natural gas network operations in 2016–2023. These outlines apply to holders of natural gas transmission networks.

The Authority will provide network holders with the final regulation methods attached to the confirmation decision by the end of 2015.

These outlines and the regulation methods have been prepared as an official task within the Energy Authority. The Authority has prepared rationales for the selections presented in this document from the following legislation, in particular:

- Electricity and Gas Market Supervision Act (590/2013, Supervision Act)
- Natural Gas Market Act (508/2000)
- Government Proposal as the Natural Gas Market Act (HE 134/1999 vp)
- Government Proposal as the legislation on the electricity and gas markets (HE 20/2013 vp)
- Commerce Committee’s report (TaVM 17/2013 vp)
- Other regulations issued under the Natural Gas Market Act

The Energy Authority has considered the decisions of the Market Court and the Supreme Administrative Court on appeals concerning previous regulation methods.

The Authority has also used its practical experience in regulation in developing the regulation methods.

Furthermore, the Authority has prepared the outlines based on specialist surveys and statements that are listed in the references.

During the preparatory stage, the Authority has extensively heard different network holders. In 2014 and 2015, the Energy Authority held more than 50 hearings for network holders.

1.1 SUMMARY OF REGULATION METHODS

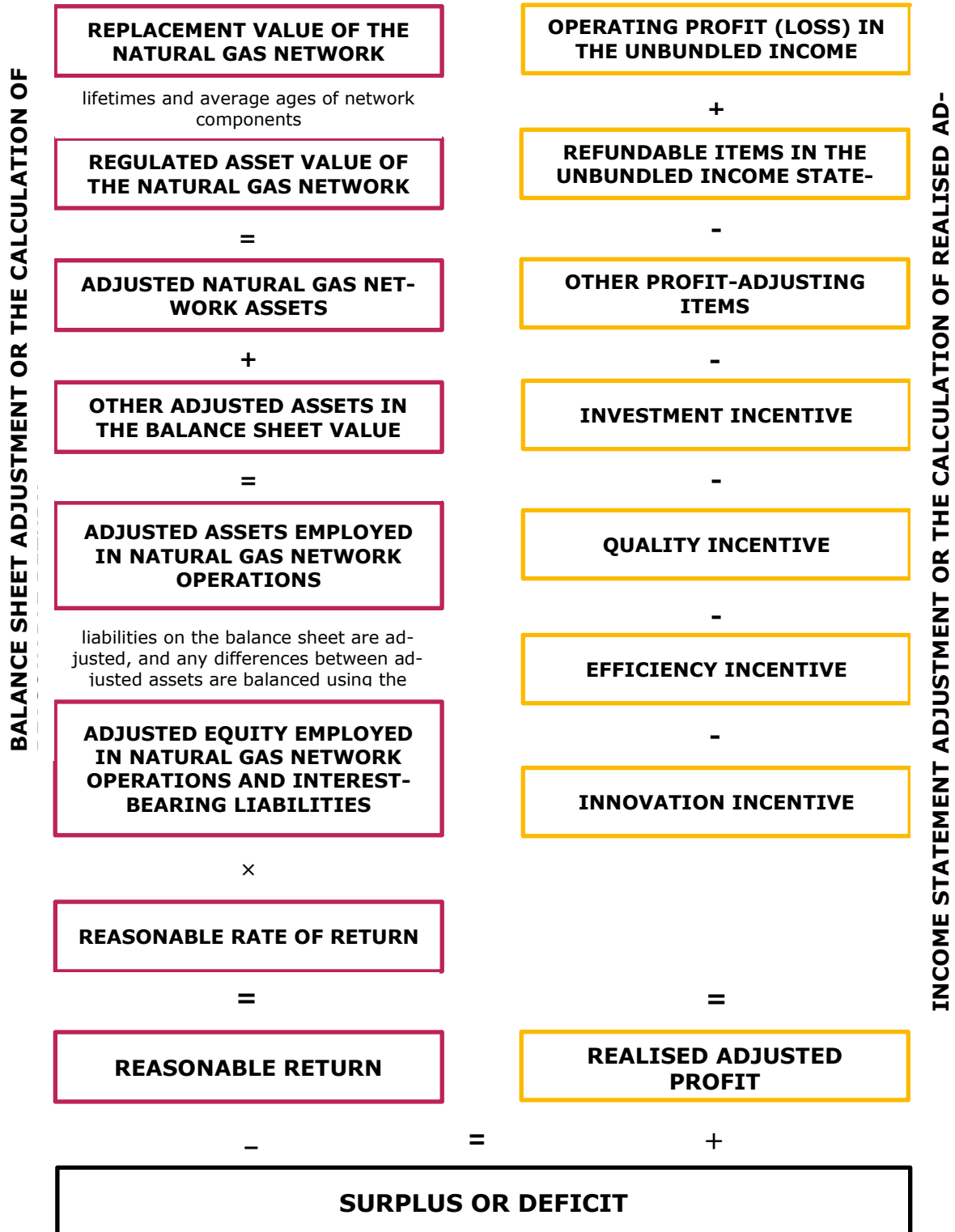


Figure 1. Regulation methods during regulatory periods of 2016–2019 and 2020–2023



The regulation methods consists of several different methods, which form the system illustrated in Figure 1. This system serves to monitor the reasonableness of the pricing of network operations. All individual methods are described in this document.

The left-hand side of Figure 1 presents methods for adjusting the balance sheet, i.e. calculating a reasonable rate of return (2, 3 and 4). The right-hand side of the figure presents methods for adjusting the income statement, i.e. calculating the realised adjusted profit (5, 6 and 7).

DETAILED INFORMATION ABOUT REGULATION METHODS

A general description of the regulation methods is presented in Sections 1, 4 and 7. More detailed information is presented in Sections 2, 3, 5 and 6.

1.1.1 Balance sheet adjustment or the calculation of reasonable return

Adjusted assets employed in network operations consist of the natural gas assets in adjusted fixed assets on the balance sheet (2.1), other assets recognised in fixed assets (2.2), and assets recognised in current assets (2.3).

Adjusted capital employed in network operations is calculated by adding adjusted equity (2.4.1), interest-bearing debt (2.4.2) and non-interest-bearing debt (2.4.2). The balancing item (2.4.1) used to balance both sides of the balance sheet is added to this result.

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

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

1.1.2 Income statement adjustment or the calculation of realised adjusted profit

Realised adjusted profit is calculated based on the operating profit (loss) pertaining to the network holder's unbundled income statement.

In the calculation of realised adjusted profit, the annual change in refundable connection fees pertaining to the unbundled balance sheet, depreciation on goodwill pertaining to the unbundled income statement, depreciation according to plan pertaining to the unbundled income statement, impairment of natural gas network assets and sales losses caused by the sale of a network section recognised in other



expenses are returned (5.1). Instead, sales gains from a network section recognised in other income are deducted (5.1) in the calculation of realised adjusted profit.

Next, reasonable costs of financial assets are deducted as a profit-adjusting item (5.3).

In addition, the impact of incentives is deducted. Incentives include the investment (6.1), quality (6.2), efficiency (6.3) and innovation incentive (6.4).

This calculation produces realised adjusted profit as the result.

1.1.3 Surplus and deficit

Any surplus or deficit can be calculated by deducting the reasonable return from the realised adjusted profit.

There is a surplus if the result is positive. There is a deficit if the result is negative.

1.2 ENTITY FORMED BY REGULATION METHODS

In this document, the Energy Authority has presented the system formed by a regulation methods. Based on this system, an estimate of reasonable pricing referred to in the Natural Gas Market Act is defined.

The regulation methods form a thoroughly considered system. As stated by the Market Court in its decision (MAO:271-344/06), in addition to being able to independently interpret and evaluate individual parts of the decision and different parameters included in the methodology, the confirmation decision depicts a comprehensively considered system. This must be taken into consideration when developing the system and individual methods because the methods and variables interact with one another.

When evaluating separate parts independent of the whole system, certain caution must be observed (precautionary principle). As a result, any changes must not cause any conflict within regulation methods, illogicality or the multiple consideration of single factors. Even fairly small variations in the values selected for different parameters may also result in significant differences in methodology.

Preparing regulation methods on a level where there are exhaustive reasons for handling each individual factor is not possible considering the clarity of the administrative decision or in practice.



If required, the Energy Authority will specify the content of the regulation methods with written guidelines. When issuing supplementary guidelines, the Authority will apply the methodology and principles of the confirmation decision to secure equal operating capacities for network holders.

OBJECTIVES OF REGULATION

According to the Natural Gas Market Act, the primary objectives of special regulation on a natural monopoly include the reasonableness of the pricing of network operations and a high level of quality. The Energy Authority aims to fulfil these objectives through the entity formed by regulation methods and the practical guiding impact of the methodology directed at the business operations of network holders.

In addition to the primary objectives of regulation, other key objectives include equality and network development, as well as business persistency, continuity, development and efficiency.

Equality refers to the distribution of profit within society between the shareholders of regulated companies and their customers. The rate of return cannot be excessively high in relation to investments that shareholders would be able to make in business operations at a similar risk level.

Persistency, continuity and development mean that regulation must secure the required investment and other network development to secure a sufficient delivery reliability. Furthermore, the proper long-term development and vitality of business operations must be secured.

Efficiency refers to the production of a service demanded by customers at costs that are as low as possible. As the pricing of network operations does not face any market pressure, network holders do not have any incentive to improve the efficiency of their operations. In this case, any inefficiency in terms of costs could be compensated with higher prices if there was no regulation. Therefore, regulation on the reasonableness of any monopoly pricing must ensure that network holders achieve a cost level which is feasible in practice.

Rights of consumers

According to the objective stated in the Directive on the internal market in natural gas (2009/73/EC 48 introduction), consumers' benefits are of utmost importance. Service quality must also be an important area of responsibility for network holders.



As a national regulatory authority, the purpose of the Energy Authority is to ensure that the rights of consumers are fulfilled. The rights of consumers must be strengthened and secured and related openness must be increased.

DEVELOPMENT OF REGULATION

Key parts of the regulation methods have been stabilised based on decisions issued by the Energy Authority and their governing decisions issued by the Market Court and the Supreme Administrative Court.

The purpose of the Authority is to develop regulation methods. According to preparatory work for the Supervision Act (HE 20/2013 vp, detailed justification of section 10 of the Supervision Act), the Energy Authority is to prepare a new confirmation decision whose methods it refers to have been developed based on regulatory experience. The Authority must also place the draft of the confirmation decision available for sufficient public discussion.

When developing regulation, the Energy Authority must consider any objectives and principles of special regulation on a natural monopoly referred to in the Natural Gas Market Act and legal practices. The Authority must also consider these when applying the regulation methods.

DISCRETIONARY POWER

The Energy Authority exercises advance competence in regulatory matters. The objective of the legislation (Directive 2003/55/EC 13 introduction) for the transition to advance regulation was to reduce uncertainty and expensive and time-consuming disputes.

The Natural Gas Market Act provides the Authority with an extensive discretionary power over its application. This also applies to regulation methods and its development and application. However detailed the regulation methods, there is inevitably room for interpretation, which the Energy Authority, as an independent regulatory authority, must be able to resolve within the scope of its discretionary power.

Furthermore, the Supreme Administrative Court has stated (KHO 2010/86) that the legislation provides the Energy Authority with an extensive discretionary power concerning the development of regulation methods.

When developing, applying and monitoring regulation methods, the Authority considers the principles of good governance and any limits set by basic rights on the exercise of its discretionary power for all parties subject to special regulation.



EQUALITY AND REASONABLENESS CONSIDERING NETWORK HOLDERS

All regulated network holders must be treated equally.

The mere fact that partial factors of the methodology produce a different result for different network holders is insufficient reason for the non-application of the specific method.

However, special obligations set in legislation have been approved, in legal practices, as justification for the different treatment of main grid holders and distribution network holders in regulation methods (MAO:268/06).

When considering, from the point of view of network holders, whether or not regulation methods have, in practice, led to a reasonable result in line with its purpose, certain factors need to be taken into account. Based on preparatory work for the legislation (HE 134/1999 vp, detailed justification of section 8, chapter 2 of the Natural Gas Market Act), these include whether it has been possible for the network holder

- to make sufficient investments in the network,
- to cover its expenses,
- to pay a return to its shareholders.

If the network holder has fulfilled these conditions or been able to do so, the network holder is deemed to have fulfilled its obligations within the scope of the regulation methods.

1.3 AMENDING THE CONFIRMATION DECISION

During the regulatory period, the Energy Authority may amend the confirmation decision by issuing a new decision in situations referred to in section 13 of the Supervision Act.



REVISING THE CONFIRMATION DECISION'S PARAMETERS FOR THE FOURTH REGULATORY PERIOD

For the fourth regulatory period, the Authority will revise the following regulatory parameters during 2019:

- risk premium for debt regarding the reasonable rate of return (4.2)
- reference level for the quality incentive (6.2.2)
- reference level for the efficiency incentive (6.2.3)

These revisions do not constitute changes in methodology; they are revisions to regulatory method parameters equal to the annual revision of parameters, for example, in the calculation of a reasonable rate of return.

The parameters are revised for the fourth regulatory period as they are defined for the third regulatory period using the methodology described in this document.

The Authority will not issue any separate decision on revisions; instead, they are delivered to network holders as information via a regulatory letter.

1.4 REGULATORY INFORMATION

A precondition for regulation is that network holders provide the Authority with the correct regulatory information required in correct format and on schedule.

Based on section 30 of the Supervision Act, network holders are obligated to provide the Energy Authority with the information needed in regulation.

1.4.1 Regulatory information needed in regulation

The regulatory information required in the application of regulation methods is defined in the following documents:

- Decree of the Ministry of Trade and Industry on the unbundling of natural gas operations (KTMa 222/2005, unbundling decree)
- The Energy Authority's regulation on key indicators of natural gas operations and their publication (EMV 1346/001/2005, key indicator regulation). The key indicator regulation will be revised during 2015 and published in connection with the issuance of the validation regulation.
- regulation methods (this document).

Central regulatory information includes unbundled financial statement information, structural network information, and financial and technical key indicators.

UNBUNDLING DECREE

According to section 8 of the unbundling decree, network holders must accompany unbundled financial statements (income statements and balance sheets) and their notes and additional information with the regulatory information.

KEY INDICATOR REGULATION

Network holders must accompany the information and key indicators referred to in the appendices of the key indicator regulation with the regulatory information.

REGULATION METHODS

In their regulatory information, network holders must list the number and average age of natural gas network components under their control and in their actual operations. The information is to be delivered itemised according to Appendix 1, corresponding with the situation valid on the last day of December each year.

In addition, the number of network components employed in the natural gas network and removed from the network during each year must be provided, following the same itemisation. If the network holder has purchased or sold parts of its natural gas network, it must provide similarly itemised information about the number and average age of the purchased or sold network components. The network holder must also report, itemised similarly, the number of replacement investments. Furthermore, information about the lifetime of network components must be provided, if required.

Network holders must also provide other itemisations required in the adjustment of the unbundled balance sheet and income statement. These are stated in Sections 2.1, 2.2, 2.4.2, 5.2, 5.3 and 6.4.1. Network holders must be able to reliably verify the correctness of the itemisations.

1.4.2 Delivery of regulatory information

Structural network information must be delivered to the Energy Authority by the end of March every year. Information about financial statements and technical key indicators must be delivered to the Energy Authority by the end of May.



Network holders must deliver regulatory information primarily through the Energy Authority's online regulatory information system.

If the information is to be delivered by other means, the Authority will issue a separate written notification.

If a network holder fails to deliver the regulatory information to the Energy Authority, the Authority may impose a conditional fine according to section 31 of the Supervision Act.

1.4.3 Correctness of regulatory information

The regulatory information provided by network holders must be correct, i.e. actual and reliable.

Network holders must comply with the regulatory information when defining and delivering written instructions, definitions and specifications presented in:

- the unbundling decree
- the key indicator regulation
- regulation methods
- the regulatory information system
- other guidelines issued by the Authority.

In unclear cases, network holders must request specific information from the Authority.

The correctness of regulatory information is mainly based on the trust shown by the Energy Authority towards network holders. Network holders calculate and deliver the information independently. Within the scope of its resources, the Authority is unable to review all information exhaustively. The legal and moral responsibility of each network holder for the correctness of the regulatory information is therefore emphasised.

The Energy Authority corrects any incorrect regulatory information identified in line with the regulation methods, unless such information is corrected by the specific network holder.

Network holders must be able to certify the regulatory information delivered during the Energy Authority's regulatory visits or as requested by the Energy Authority.

1.5 UNBUNDLING OF FUNCTIONS

According to section 1, chapter 5 of the Natural Gas Market Act, natural gas companies must separate natural gas network operations from natural gas sales and storage, and from business operations outside the scope of the natural gas industry.

According to section 4 of the unbundling decree, network holders must recognise returns (5.1) and costs (5.2) that can be directly allocated to natural gas network operations, as well as property items (2.1, 2.2 and 2.3) and capital items (2.4), directly in unbundled financial statements regarding natural gas network operations.

Operations regulated within the scope of free competition cannot be separated in natural gas network operations. Moreover, such operations are not within the scope of regulation methods.

The recommendation¹ on the calculated unbundling of electricity and natural gas operations issued by the Energy Authority specifies the handling of unbundling in regulation methods.

1.6 NETWORKS PURCHASED AND SOLD DURING THE REGULATORY PERIOD

CALCULATION OF THE REPLACEMENT VALUE AND REGULATED ASSET VALUE

In the adjustment of the value of the natural gas network assets generated for the buyer:

- the purchased natural gas network is added to the replacement values and regulated asset values of the buyer's natural gas network based on the number and average age of network components
- the lifetime of purchased network components is determined according to the lifetime previously selected by the buyer for each network component.

The sold natural gas network is deducted from the replacement value and regulated asset value of the seller's natural gas network based on the number and average age of network components.

¹ The Energy Authority's recommendation on the calculated unbundling of electricity and natural gas operations (record no. 549/002/2011), 17 June 2011; the recommendation will be revised before the third regulatory period begins.

1.7 INFLATION

The impact of inflation, i.e. the annual change in the value of assets, is considered as follows in the calculation of the reasonable rate of return and realised adjusted profit.

HANDLING INFLATION IN THE CALCULATION OF THE REASONABLE RATE OF RETURN

The reasonable rate of return (WACC rate) is defined as a nominal value, i.e. the effect of inflation is not deducted from it. To avoid including inflation twice in the calculation of reasonable return, the value of unit prices used in the adjustment of natural gas network assets is not adjusted during a regulatory period. With regard to the adjustment of other employed assets, values set in each year's unbundled balance sheet are used.

The reasonable rate of return is calculated by multiplying the adjusted equity employed in natural gas network operations and interest-bearing debt with the nominal reasonable rate of return (WACC rate). As the nominal reasonable rate of return used in the calculation of each year includes the expected inflation rate, the impact of inflation is considered once in the calculation of the reasonable rate of return.

HANDLING INFLATION IN THE CALCULATION OF REALISED ADJUSTED PROFIT

In the calculation of realised adjusted profit, the inflation adjustment is targeted at the efficiency investment incentives. The index of consumer prices applies to the inflation adjustment.

With regard to the efficiency incentive, the inflation adjustment is made annually in the calculation of the reference level for the efficiency incentive.

With regard to the investment incentive, the inflation adjustment is made annually in the calculation of straight-line depreciation calculated based on the replacement value.

USING THE INDEX OF CONSUMER PRICES IN THE INFLATION ADJUSTMENT

The change in the overall index of consumer prices (1995=100) is used in the inflation adjustment.



The index of each year is the average index in April–September in the year in question. For example, the index used in 2016 is the average index in April–September in 2016.

The calculation of the index of consumer prices is presented in Formula 1.

$$\Delta KHI_t = \frac{KHI_t}{KHI_{t-1}} - 1 \quad (1)$$

where

ΔKHI_t = change in the index of consumer prices in year t

t = year under review

KHI_t = average index of consumer prices (1995=100) in April–September in year t

KHI_{t-1} = average index of consumer prices (1995=100) in April–September in year $t-1$

1.8 CALCULATIONS MADE DURING THE REGULATORY PERIOD

During each regulatory period, the Energy Authority calculates the following information annually for network holders using its regulatory information system:

- replacement value of natural gas network assets
- regulated asset value of natural gas network assets
- adjusted straight-line depreciation on natural gas network assets
- adjusted equity employed in natural gas network operations
- adjusted interest-bearing debt employed in natural gas network operations
- adjusted non-interest-bearing debt employed in natural gas network operations
- adjusted capital employed in natural gas network operations
- reasonable return
- realised adjusted profit
- surplus or deficit
- items similar to distributable profit.



The Authority reports this information to network holders via the regulatory information system. The Authority also makes such information publically available for customers of network holders and the media.

The Energy Authority calculates the aforementioned information applying the regulation methods referred to in this document and the regulatory information provided by each network holder.

After receiving the annual calculations as information, network holders must review them and report any errors detected. If required, the Authority will deliver a new calculation as information.

Even if a network holder does not present any immediate comments on the annual calculations after receiving them as information, this does not prevent them from commenting later. The supervisory decision draft is the final document on which comments may be made. For the predictability and functionality of regulation, the Authority recommends that any comments are issued primarily during each regulatory period immediately after obtaining the calculations as information.

The annual calculations prepared by the Authority during each regulatory period do not include any obligations towards network holders and therefore cannot be regarded as administrative decisions for which a appealing right exists. The Energy Authority confirms calculations covering the entire regulatory period after each regulatory period by issuing a regulatory decision (1.9) for which an appeal (1.10) may be presented.

1.9 REGULATORY DECISION ISSUED AFTER THE REGULATORY PERIOD

After a regulatory period, the Energy Authority issues a regulatory decision to network holders pursuant to section 14 of the Supervision Act. With this decision, the Authority defines the amount by which each network holder's realised adjusted profit falls below or exceeds the level of reasonable return.

SURPLUS AND DEFICIT

In the regulatory decision, the Authority summarises the realised adjusted profit from each year of the regulatory period applying the regulation methods confirmed in the confirmation decision and the regulatory information provided by network holders, and deducts the sum of reasonable returns from the same years from this amount. The result is the regulatory period's surplus or deficit.



If the realised adjusted profits accrued over the entire regulatory period are less than the level of reasonable return, the network holder has a deficit.

If the realised adjusted profits accrued over the entire regulatory period are more than the level of reasonable return, the network holder has a surplus.

INTEREST ON SURPLUS

If the realised adjusted profit has, during the regulatory period, exceeded the level of reasonable return by at least 5%, interest on the surplus must be paid. The interest rate used is the average of the reasonable cost of equity (3.2) over the specific regulatory period.

Any interest on surplus is taken into account in the regulatory decision when calculating any surplus or deficit carried over to the following regulatory period. The amount to be lowered in accordance with section 14 of the Supervision Act on which the interest is calculated is the surplus over the closed regulatory period.

SURPLUS OR DEFICIT FROM A PREVIOUS REGULATORY PERIOD

The regulatory decision takes account of any surplus or deficit carried over from the preceding regulatory period. The Energy Authority has confirmed the surplus or deficit in its regulatory decision on the preceding period.

CALCULATING THE SURPLUS OR DEFICIT CARRIED OVER FROM THE PREVIOUS REGULATORY PERIOD

Table 1 presents how any surplus or deficit carried over from the previous regulatory period is calculated.



Table 1. *Calculation of surplus or deficit*

+	Sum of all realised adjusted profits from all years included in the regulatory period
-	Sum of reasonable returns from all years included in the regulatory period
=	Surplus (+) or deficit (-) accrued over the regulatory period
+	Any interest on surplus accrued over the regulatory period
=	Surplus (+) or deficit (-) accrued over the regulatory period with interest
+	Surplus (+) or deficit (-) accrued over the previous regulatory period in accordance with the regulatory decision*
=	SURPLUS (+) OR DEFICIT (-) CARRIED OVER FROM THE PREVIOUS REGULATORY PERIOD

** Any deficit accrued over the regulatory period preceding the previous regulatory period is not taken into account even if the deficit or part thereof remained unbalanced during the previous regulatory period.*

BALANCING A SURPLUS OR DEFICIT

If, based on the calculation presented in Table 1, a network holder has a deficit carried forward to the next regulatory period, it can only be balanced during the next regulatory period.

If, based on the calculation presented in Table 1, a network holder has a surplus carried forward to the next regulatory period, it must be balanced during the next regulatory period.

However, a postponement may be applied for from the Energy Authority for balancing any surplus or deficit for a weighty reason.

1.10 APPEALING FOR VALIDATION AND REGULATORY DECISIONS

The confirmation decision issued by the Energy Authority before the start of a regulatory period and the regulatory decision issued after a regulatory period constitute administrative decisions. Network holders may appeal for a change to these decisions according to section 36, subsection 2 of the Supervision Act.

A appealing is made by filing an appeal to the Market Court. An application for a change to decisions issued by the Market Court can be made by filing an appeal to



the Supreme Administrative Court. In addition, the Authority may apply for a change in a decision by filing an appeal to the Supreme Administrative Court if the Market Court has decided to change its validation or regulatory decision.

According to section 38 of the Supervision Act, validation and regulatory decisions must be complied with regardless of any appealing, unless otherwise stated by the Authority in its decision. Moreover, the appealing court has the right to issue provisions on the execution of decisions as prescribed in the Administrative Judicial Procedure Act.

2 ADJUSTED ASSETS AND CAPITAL EMPLOYED IN NETWORK OPERATIONS

ADJUSTMENT OF ASSETS EMPLOYED IN NETWORK OPERATIONS

The adjustment of any assets employed in network operations is based on assets on the network holder's unbundled balance sheet. They are adjusted as presented in Sections 2.1, 2.2 and 2.3.

When adjusting assets on the unbundled balance sheet, the adjusted balance sheet total is the value of the adjusted assets employed in network operations.

Adjusted assets employed in network operations consists of the following items:

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

ADJUSTMENT OF CAPITAL EMPLOYED IN NETWORK OPERATIONS

The adjustment of capital employed in network operations is based on debt on the network holder's unbundled balance sheet. They are adjusted as presented in Section 2.4.

When adjusting debt on the unbundled balance sheet, the adjusted balance sheet total is the value of the adjusted capital employed in network operations.

Adjusted capital employed 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)
- balancing item (2.4.1)

2.1 ADJUSTMENT OF NATURAL GAS NETWORK ASSETS RECOGNISED IN FIXED ASSETS

The natural gas network is the largest individual part of the network holder's assets consisting of several different components. It is recognised in fixed assets on the balance sheet.

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

- natural gas pipes and pipelines,
- all associated tanks, devices and equipment containing natural gas.

The value of the natural gas network is adjusted in regulation methods to correspond with its actual replacement cost. The adjustment is made so that the value pertaining to the unbundled balance sheet is not used in the calculation of reasonable return. Instead, the regulated asset value of the natural gas network (2.1.2) calculated from its replacement value (2.1.1) is used.

UNIT PRICES

Unit prices are used to calculate the replacement value of natural gas network assets.

The replacement value is calculated using average network component-specific unit prices. Network components and unit prices are presented in Appendix 1.

No inflation adjustment is made to unit prices over different years, as inflation is considered in the reasonable rate of return. Unit prices listed in Appendix 1 will be used during the third regulatory period in 2016–2019 and during the fourth regulatory period in 2020–2023. Unit prices will not be updated for the fifth regulatory period using a separate unit price survey, as the aim is to improve continuity and predictability between regulatory periods.

Insofar as a component belonging to natural gas network assets is not included in the network components listed in Appendix 1, the specific component can be considered at its balance sheet value as presented in Section 2.2. When delivering regulatory information, network holders must also provide a sufficient account of these components and their balance sheet values pertaining to unbundled financial statements to allow them to be considered.



LIFETIMES

Lifetimes are used to calculate the regulated asset value of natural gas network assets and adjusted straight-line depreciation.

The possible lifetimes of different network components are presented in Appendix 1.

Network holders must select the lifetimes of their network components to correspond with their actual average technical and financial lifetimes within the scope of these lifetime intervals. This refers to the average time over which network components are in use before their replacement. The selected lifetimes take the network holder's maintenance and investment strategy into account.

Network holders must include the average technical and financial lifetimes selected for their network components in regulatory information in conjunction with structural information by the end of March 2017. After this, network holders cannot change the lifetimes selected.

AVERAGE AGES

Average ages are used to calculate the regulated asset value of natural gas network assets.

Network holders must identify the actual age of each network component at the end of each regulatory year. Based on these ages, network holders must calculate the average age of each available network component and report them in the regulatory information system.

Actual age refers to the lifetime of a component, i.e. age calculated from the first commissioning date or the year of manufacture. In the calculation of the average age, the age of each component is limited to the lifetime of the specific component. This means that if a component is older than its lifetime, the lifetime selected by the network holder will be taken into account in the calculation of the average age. When reporting a new component in regulatory information for the first time, its age is basically its actual age, i.e. the age calculated from the first commissioning date. If this date is unknown, the age is 0.5 years.

If network holders are unable to identify the actual age of specific components, their average age is calculated as 90% of the lifetime selected by the network holder over the third regulatory period and as 100% of the selected lifetime during the fourth regulatory period.



COMPONENTS NOT USED IN NETWORK OPERATIONS

Components and property items not included in network operations are not included in adjusted assets employed in network operations. These include land areas that are not used in network operations. These items do not accumulate reasonable returns, as they are not included in network operations.

Network operations do not include components that

- are not controlled by a network holder but are used by the network holder through an arrangement under the law of assets where the right to control the network is not transferred from the network owner (participation in another network holder's fixed assets)
- are not within the scope of the network holder's development obligation
- do not comprise network operations pertaining to the network holder's network licence
- are not necessary for the operation of the network.

COMPONENTS NOT INCLUDED IN NATURAL GAS NETWORK ASSETS

Components that are not included in network operations cannot be included in natural gas network assets. In addition, adjusted natural gas network assets do not include components that

- are not connected to the network
- are not in actual use, such as stored devices and materials
- have not caused acquisition costs to the network holder.

SUBSIDIES OBTAINED FOR BUILDING A NETWORK

Network holders may obtain subsidies or other compensation for network investments from the Finnish Government or the European Union. Correspondingly, a transmission network holder in another EU or EEA state may participate in an investment made in Finland based on EU regulation 347/2013.

Components funded by subsidies or compensation obtained for building a network are not included in the regulated asset value of natural gas network assets, i.e. they do not produce a reasonable return.



However, components funded by subsidies or compensation are considered in the replacement value of natural gas network assets when adjusted straight-line depreciation on natural gas network assets is calculated in the investment incentive (6.1.1).

When delivering regulatory information, network holders must report the amount of subsidies and other compensation obtained. They must also indicate the components in whose construction they have been used and how they have been treated in accounting. If required, the Energy Authority will provide additional instructions for reporting subsidies.

PARTICIPATION IN FOREIGN INVESTMENTS

Based on EU regulation 347/2013, network holders may need to participate in main grid investments in another EU or EEA state if these investments produce benefits in Finland.

The network holder's obligation to participate in investments in another EU or EEA state may be based on the following legally valid official decisions:

- the Energy Authority's decision on the distribution of incentives (article 12, paragraph 4 of regulation 347/2013)
- the decision of the Agency for the Cooperation of Energy Regulators (ACER) on the distribution of costs (article 12, paragraph 6).

When delivering regulatory information, network holders must also provide an account of the costs arising from investments made in another EU or EEA state and the components the investments helped to build.

Components owned by network holders

If a component in which an investment was made in another EU or EEA state is funded by a network holder and under its ownership and control, the following procedure applies.

If the network holder has activated the costs on the unbundled balance sheet

- and it has a network component listed in the table in Appendix 1, it will be considered accordingly in the natural gas network asset's adjusted replacement



value (2.1.1), regulated asset value (2.1.2) and straight-line depreciation (6.1.1)

- but it does not have a network component listed in Appendix 1, it will be considered at its value recognised on the balance sheet in accordance with sections 2.2 and 6.1.2.

If the network holder has recognised the component as a cost in the unbundled income statement

- and it has a network component listed in the table in Appendix 1, it will be considered accordingly in the natural gas network asset's adjusted replacement value, regulated asset value and straight-line depreciation. Costs arising from the component are returned in the calculation of the realised adjusted profit (5.1).
- but it does not have a network component in Appendix 1, it will not be included in the natural gas network asset's adjusted replacement value, regulated asset value or straight-line depreciation. Furthermore, no separate adjustment is made for the component in the calculation of realised adjusted profit. A component recognised wholly in expenses has already been considered in operating profit (loss) in the income statement.

Components not owned by network holders

If a component in which an investment was made in another EU or EEA state is not under a network holder's ownership and control, the following procedure applies.

If the network holder has activated the cost on the unbundled balance sheet, it will be considered at its value recognised on the unbundled balance sheet in accordance with sections 2.2 and 6.1.2.

If the network holder has recognised the component as a cost in the unbundled income statement, no separate adjustment will be made in the calculation of the realised adjusted profit. A component recognised wholly in expenses has already been taken into account in operating profit (loss) in the income statement.

Investments made in another EU or EEA state other than those in accordance with regulation 347/2013

For investments made in another EU or EEA state other than those in accordance with EU regulation 347/2013, network holders must provide the Energy Authority with an account of the project. In the account, the investment must basically be



treated similarly to investments in accordance with the regulation. However, the account must in particular address the benefits of investing in Finland.

The Authority will assess the account and decide on its basis whether the components invested in are considered in regulation methods and to what extent. Insofar as these components are considered in regulation methods, the procedure is the same as that applied to investments in accordance with the regulation as described above.

2.1.1 Adjusted replacement value

The adjusted replacement value of natural gas network assets is calculated for all years in a regulatory period at a value corresponding with the situation valid on the last day of December each year.

The adjusted replacement value of a network component is calculated during the third and fourth regulatory periods by multiplying the unit price listed in Appendix 1 by the number of network components reported by the network holder in regulatory information. The adjusted replacement value of all adjusted natural gas network assets is calculated by adding up all adjusted component-specific replacement values.

The calculation of the adjusted component-specific replacement value is presented in Formula 2.

$$JHA_i = \text{unit price}_i \times \text{quantity}_i \quad (2)$$

The replacement value of all natural gas network assets is calculated by adding up all adjusted component-specific replacement values as presented in Formula 3.

$$JHA = \sum_{i=1}^n (JHA_i) \quad (3)$$

in Formulas 2 and 3

JHA_i = sum of adjusted component-specific replacement values of network component i

unit price_i = unit price of network component i in accordance with Appendix 1

quantity_i = the total number of network components i



JHA = replacement value of all natural gas network assets

2.1.2 Regulated asset value

The regulated asset value of natural gas network assets is calculated for all years in a regulatory period at a value corresponding with the situation valid on the last day of December each year.

The regulated asset value of a network component is calculated from its adjusted replacement value using its lifetime selected by the network holder and its average age reported by the network holder in regulatory information. The regulated asset value of all adjusted natural gas network assets is calculated by adding component-specific regulated asset values.

The calculation of the component-specific regulated asset value is presented in Formula 4.

$$NKA_i = \left(1 - \frac{\text{average age}_i}{\text{lifetime}_i} \right) \times JHA_i \quad (4)$$

The regulated asset value of all natural gas network assets is calculated by adding all component-specific regulated asset values as presented in Formula 5.

$$NKA = \sum_{i=1}^n (NKA_i) \quad (5)$$

in Formulas 4 and 5

NKA_i = regulated asset value of all network components i

lifetime_i = lifetime of network component i

average age_i = average age of all network components i

NKA = regulated asset value of all natural gas network assets

2.2 ADJUSTMENT OF OTHER ASSETS RECOGNISED IN FIXED ASSETS

When adjusting assets employed in network operations, assets recognised in fixed assets on the unbundled balance sheet other than network assets are considered at their balance sheet value. These items include incomplete acquisitions. However,

the goodwill and investments of such assets are taken into account by eliminating them.

OTHER ASSETS RECOGNISED IN NATURAL GAS NETWORK ASSETS

In notes to financial statements, network holders must report such items recognised in natural gas network components that are not taken into account in the calculation of the replacement value and regulated asset value. These items are considered in adjusted assets employed in network operations at their unbundled balance sheet value. Their permitted reasonable depreciation level is planned depreciation based on the income statement. These items include equipment and material related to natural gas network operations in stock.

Components included in these items are not considered in the calculation of the adjusted replacement value of natural gas network assets, even if these components were included in the list of components in Appendix 1. These components are considered at their value on the unbundled balance sheet.

NATURAL GAS NETWORK COMPONENTS RECOGNISED IN ITEMS OTHER THAN NATURAL GAS NETWORK COMPONENTS

If components of the natural gas network are recognised in items other than natural gas network assets in fixed assets on the unbundled balance sheet, the balance sheet value of these assets will be eliminated from these items. The elimination will be applied to those components that have been stated in the network component list pertaining to Appendix 1 and are in proper use in the natural gas network. These components are taken into account in the adjusted assets employed in network operations at the regulated asset value as referred to in Section 2.1.2.

GOODWILL

When adjusting the assets employed in network operations, goodwill pertaining to the unbundled balance sheet is eliminated.

Preparatory legislative work (HE 20/2013 vp) considers business transactions and other arrangements where the value paid for network assets is higher than the actual replacement cost.

Regulation methods must be based on the actual replacement value of the network holder's natural gas network assets and not, for example, the commercial market

value defined based on business arrangements, as this may include valuation or reorganisation items not included in natural gas network operations.

Natural gas network assets pertaining to the unbundled balance sheet is adjusted at the regulated asset value as presented in Section 2.1. This represents the actual replacement value of natural gas network assets in regulation methods.

Based on this, the Energy Authority considers that goodwill on the unbundled balance sheet resulting from a business transaction represents an intangible value which cannot have been allocated to other property items.

Intangible assets

The goodwill of any intangible assets obtained through a merger is similarly treated as goodwill.

INVESTMENTS

When adjusting assets employed in network operations, investments in fixed assets pertaining to the unbundled balance sheet are eliminated.

Investments in fixed assets include investments aimed at obtaining profit other than direct profit from network operations or business expansions. Such investments cannot be regarded as necessary for network operations. As a result, they cannot be included in the adjusted assets employed in network operations.

2.3 ADJUSTMENT OF ASSETS RECOGNISED IN CURRENT ASSETS

FINANCIAL ASSETS

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

Financial assets to be eliminated include the following asset items on the unbundled balance sheet:

- current and non-current receivables
- financial securities
- cash in hand and at banks, and comparable items

According to the ruling of the Supreme Administrative Court (KHO:2010:86), accounts receivable are not eliminated.



The management of financial assets does not comprise network operations, even theoretically. They should not therefore be included in adjusted assets employed in network operations.

To secure network operations, costs arising from necessary financial assets are considered in the calculation of realised adjusted profit as referred to in Section 5.3.

INVENTORIES

When calculating adjusted assets employed in network operations, the book value pertaining to the unbundled balance sheet is used as the value of inventories.

2.4 ADJUSTMENT OF CAPITAL EMPLOYED IN NETWORK OPERATIONS

Liabilities on the adjusted balance sheet are defined by dividing adjusted capital employed in network operations into:

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

2.4.1 Adjustment of equity

On the adjusted balance sheet, equity pertaining to the unbundled balance sheet is regarded as equity.

On the adjusted balance sheet, equity also includes voluntary provisions and the depreciation difference of assets other than natural gas network assets less deferred tax liabilities.

Group contributions are also taken into account in the adjustment of equity.

In addition, the balancing item is added to equity on the adjusted balance sheet.

GROUP CONTRIBUTIONS

Network holders are in an equal position regardless of whether they operate with a group structure.

Granted group contributions



In the adjustment of capital employed in network operations, the amount of group contributions less deferred tax liabilities is returned to equity, regardless of whether the group contribution has been allocated and paid on the closing date.

Granted group contributions comprise an item similar to the distribution of profit which, for network holders operating without a group structure, is recognised in the profit for the period on the unbundled balance sheet.

Received group contributions

In the adjustment of capital employed in network operations, the amount of received group contributions less deferred tax liabilities is deducted from equity. Furthermore, a received group contribution is an item similar to the distribution of profit, increasing the profit for the period.

Receivables are eliminated in the calculation of reasonable return, as presented in Section 2.3. The amount of received group contributions is considered in the elimination.

EQUALISATION ITEM

The equalisation item represents the difference between the value of adjusted assets employed in network operations on the balance sheet and the value of assets on the unbundled balance sheet.

The equalisation item is used to balance assets and liabilities on the adjusted balance sheet. It is recognised in equity in liabilities on the adjusted balance sheet.

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

The equalisation item may also be negative if the value of adjusted assets employed in network operations is smaller than the value of assets on the unbundled balance sheet.

2.4.2 Adjustment of debt

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



ADJUSTED INTEREST-BEARING DEBT

Interest-bearing debt on the unbundled balance sheet is considered as such in adjusted interest-bearing debt. However, interest-bearing group contribution debt in equity is eliminated.

Items in interest-bearing debt include banking, pension and other loans recognised in non-current debt on the unbundled balance sheet and the repayment of the aforementioned loans recognised in current debt on the unbundled balance sheet.

In the adjustment of capital employed in network operations, any capital loans and other interest-bearing loans from owners of a network holder are regarded as interest-bearing debt.

ADJUSTED NON-INTEREST-BEARING DEBT

Non-interest-bearing debt on the unbundled balance sheet is taken into account as such in adjusted non-interest-bearing debt. Such items include accounts payable, accrued expenses and other current debts. However, non-interest-bearing group contribution debt in equity is eliminated.

Mandatory provisions on the unbundled balance sheet are regarded wholly as non-interest-bearing debt. Of the depreciation difference of assets other than natural gas network assets, non-interest-bearing debt include deferred tax liabilities.

CONNECTION OR PARTICIPATION FEES

Any components financed using connection fees are included in adjusted assets employed in network operations.

Network holders are in an equal position regardless of whether they use refundable or non-refundable connection fees (participation fees).

Refundable connection fees (participation fees)

Even a formal refunding condition causes the connection fee to be treated similarly to a debt, even if any refunding is rare in practice. As an exception from other current liabilities, connection fees do not have any interest consequences, i.e. they comprise non-interest-bearing debt. Based on the statement of the Accounting



Standards Board², refundable connection fees cannot be recognised in equity on the unbundled balance sheet.

In the adjustment of capital employed in network operations, refundable connection fees recognised on the unbundled balance sheet by the end of 2014 are regarded as non-interest-bearing debt.

Refundable connection fees entered on the unbundled balance sheet after 2014 do not increase non-interest-bearing debt on the adjusted balance sheet.

A net change in connection fees is returned in the calculation of realised adjusted profit, as presented in Section 5.1.

Network holders must separate the annual amount of refundable connection fees related to their network operations recognised on their balance sheet or the balance sheet of their other companies in notes to unbundled financial statements.

Non-refundable connection fees (participation fees)

Non-refundable connection fees comprise returns from network operations, as stated in Section 5.1.

The Accounting Standards Board's statement on the recognition of electricity connection fees (1650/2001)

3 REASONABLE RATE OF RETURN

3.1 MODEL OF WEIGHTED AVERAGE COST OF CAPITAL

The reasonable rate of return acceptable for adjusted capital employed in network operations is determined using the model of weighted average cost of capital (WACC).

It indicates the average cost of capital used by a company, emphasising the relative values of equity and liabilities.

For defining parameters for the WACC model, the Energy Authority has requested a statement from Ernst & Young Oy (EY)³. This statement is the key criterion for the selection of parameters of the WACC model presented below.

3.2 REASONABLE COST OF EQUITY

When defining the reasonable rate of return, the reasonable cost of equity is calculated using the CAP model (Capital Asset Pricing).

It represents the dependency between the return requirement set for a risk-bearing investment object and the risk.

In the model, the reasonable cost of equity is formulated so that a risk increment calculated by multiplying the market risk premium by the beta coefficient is added to non-risk-bearing interest. Furthermore, the premium for lack of liquidity and the additional risk premium in natural gas transmission network operations are added to non-risk-bearing interest.

The calculation of the model is presented in Formula 6.

$$C_E = R_r + \beta_{debt-bearing} \times (R_m - R_r) + LP + LRP_m \quad (6)$$

where

C_E = reasonable cost of equity

R_r = risk-free interest rate

$\beta_{debt-bearing}$ = debt-bearing beta coefficient

³ Ernst & Young Oy, Defining a reasonable rate of return for capital employed in electricity and natural gas network operations, 10 October 2014



R_m = average returns in markets

$R_m - R_r$ = market risk premium

LP = premium for lack of liquidity

LRP_m = additional risk premium in natural gas transmission network operations

3.2.1 Risk-free interest rate for equity

When defining the reasonable rate of return, the reasonable cost of equity is based on Finland's ten-year interest on bonds used as the risk-free interest rate.

The risk-free interest rate represents the return requirement set for an investment object with the lowest possible risk. Generally, such investment objects include governmental promissory notes of a high credit rating.

Because the equity investment horizon must span several years in network operations, the selection of maturity, i.e. loan period, is the key. As a result, revenues from a bond loan can be used in defining non-risk-bearing interest.

The value of the risk-free interest rate is calculated annually in two different ways: R_{r1} and R_{r2} . Of these two values, the value which provides the risk-free interest rate with a higher value is applied to the following year.

In option R_{r1} , the value of the risk-free interest rate is revised annually using the average of daily values of interest on Finland's ten-year bonds realised in April–September in the previous year. For example, the value of 2016 is determined on the basis of the average daily values realised in April–September 2015.

In option R_{r2} , the value of the risk-free interest rate is revised annually using the average of daily values of interest on Finland's ten-year bonds realised in ten previous years. For example, the value for 2016 is determined based on the average daily values realised in October 2005 – September 2015.

The realised daily values are published by the Bank of Finland⁴.

The aforementioned value of the risk-free interest rate is also used as the risk-free interest rate on which the reasonable cost of debt is based (3.3.1).

⁴ The state's reference loan rates published by the Bank of Finland are calculated every day at 1 pm as the average of purchase quotations in the Reuters system of main market guarantors. If the calculation method changes, the daily values calculated using the new method and published by the Bank of Finland will apply.



3.2.2 Beta coefficient

When defining the reasonable rate of return, a debt-bearing beta coefficient of 0.690 is used.

The beta coefficient represents the risk rate of the reviewed company in relation to the average risk rate of all investments.

The beta coefficient depends on the company's cost structure, debt ratio and growth. In practice, this means that beta coefficients of companies operating in a single business field are close to one another.

The starting point of the regulation methods is that the beta coefficient is a business field-specific variable. It represents the risk rate of investments made in companies operating in the natural gas network industry in relation to all investments in the stock market.

According to the Authority, there are no differences in business risks in Finnish natural gas transmission network operations and natural gas distribution network operations.

The debt-free beta coefficient represents business risks without any risk caused by indebtedness. In the regulation methods, the debt-free beta coefficient has been calculated using the Hamada equation, where the impact of the tax rate is also eliminated.

The value of the debt-free beta coefficient is the upper limit of 0.45 defined for natural gas network fields in the EY survey.

For determining the reasonable cost of equity, the debt-free beta coefficient is corrected into a debt-bearing beta coefficient. This correction where the debt ratio and corporate tax rate are taken into account is calculated according to Formula 7.

$$\beta_{velallinen} = \beta_{velaton} \times \left(1 + (1 - yvk) \times \frac{D}{E} \right) \quad (7)$$

where

$\beta_{debt-bearing}$ = debt-bearing beta coefficient

$\beta_{debt-free}$ = debt-free beta coefficient

yvk = corporate tax rate



D/E = capital structure (interest-bearing debt / equity)

3.2.3 Market risk premium

When defining the reasonable rate of return, the value of the market risk premium is 5%.

The market risk premium represents the difference between risk-free interest and revenues from stock investments, i.e. revenues from shares above risk-free interest.

When defining the cost of equity, there is an interaction between risk-free interest and the market risk premium. This means that the selection of risk-free interest affects the level of the risk premium.

The market risk premium value applied over previous regulatory periods was based on surveys and statements conducted by the Authority. Furthermore, the Market Court has approved the value used in its decision (MAO:635-688/10). According to the survey conducted by EY, the level can be used when risk-free interest is defined applying the Finnish rate of returns from ten-year bonds.

3.2.4 Premium for lack of liquidity

When defining the reasonable rate of return, the value of the premium for lack of liquidity is 0.6%.

The premium for lack of liquidity represents any illiquidity of an investment.

Factors reducing the value of publicly unquoted assets or other illiquid assets include higher transaction costs and a longer sales period compared with the assets of a listed company.

The premium for lack of liquidity has been modelled using various methods when defining the value of a company. However, no single method has been standardised. The premium can be implemented according to discretion.

A conservative level of the premium is supported by the network licence and business transactions carried out within the industry in recent years.

It must also be considered when defining the level of the premium that companies operating in the industry have majority shareholders. In this case, shareholders

have control over the company and are able to have a direct impact on business operations.

In addition to the Market Court's decision (MAO:271–344/2006), the value of the premium for lack of liquidity has been discussed in a number of statements^{3, 5, 6, 7, 8}. The value of the premium can be defined as an average of the values presented here.

3.2.5 Capital structure

When defining the reasonable rate of return, a fixed capital structure is used where the weight of interest-bearing debt is 40% and that of equity is 60%.

The capital structure represents the weights of the cost of equity and the cost of debt in the WACC model.

The capital structure also affects how the beta coefficient is determined. To have compatible beta coefficients for different shares, the impact of a company's capital structure must be eliminated.

According to financing theory, an optimal capital structure must be used when calculating the weighted average cost of capital. The survey conducted by EY³ defined the capital structure of a network holder based on the most similar possible listed reference companies. The assumption is that these companies have optimised their capital structure in order to maximise the value of their companies.

3.2.6 Additional risk premium for natural gas transmission network operations

When defining the reasonable rate of return, the value of the additional risk premium is 1.7% in natural gas transmission network operations.

The additional risk premium for natural gas network operations represents special characteristics of the Finnish natural gas market.

According to section 1a of chapter 7 of the Natural Gas Market Act 508/2000, the special characteristics of the Finnish natural gas market should be considered when

⁵ Martikainen Teppo, Statement to the Energy Authority on the reasonable rate of return for capital employed in distribution network operations, 4 November 1998

⁶ PricewaterhouseCoopers, Statement on the average cost of capital in electricity distribution network operations, 7 April 2004

⁷ Deloitte & Touche Oy, Energy Authority – Evaluation of the WACC model and its parameters in electricity network operations, 6 August 2010

⁸ Kallunki, Juha-Pekka, Statement on the regulatory model used by the Energy Authority in electricity network operations,

defining an acceptable rate of return for natural gas network operations. In the Government's proposal regarding amendments to the Natural Gas Market Act (HE 20/2013 vp, detailed justification for the cancellation of section 1a, chapter 7), the section has basically been cancelled, but its principles are to be transferred to the Supervision Act.

Such special characteristics include risks associated with the availability and sales of natural gas. The availability risk is associated with the acquisition of natural gas from a single foreign supplier. The sales risk means that a significant number of natural gas users can switch to another fuel if there is insufficient natural gas price competition.

The additional risk premium has been evaluated in a survey assigned by the Authority³. Based on this, it can be stated that risks associated with natural gas network operations are largely covered in the beta coefficient determined based on European reference companies. A less developed operating environment compared with Finnish reference companies is considered in the premium for lack of liquidity.

The natural gas availability risk has not resulted in any significant problems, but it is not expected to be eliminated in the near future. The partial increase in liquefied natural gas in Finnish markets will offer optional sources of natural gas. The natural gas sales risk has partially materialised. However, the risk is lower if network holders reach a reasonable price and cost level within the scope of regulation.

Combined, these factors defend the upper limit set as the premium for natural gas transmission network operations in the survey conducted by EY.

3.3 REASONABLE COST OF DEBT

When defining the reasonable rate of return, the reasonable cost of debt is calculated by adding the risk premium for debt to the risk-free interest rate.

The calculation of the reasonable cost of debt is presented in Formula 8.

$$C_D = R_r + DP \quad (8)$$

Where

C_D = reasonable cost of debt

R_r = risk-free interest rate

DP = risk premium for debt



3.3.1 Risk-free interest rate for debt

When defining the reasonable rate of return, the value of the risk-free interest rate used as a basis for the reasonable cost of debt is calculated similarly to equity (3.2.1).

3.3.2 Risk premium for debt

During the third regulatory period (2016–2019), the risk premium for debt will be 1.4% when defining the reasonable rate of return.

The risk premium for debt represents the cost added to risk-free interest from financing subject to debt.

The survey conducted by EY³ evaluates the level of the risk premium for debt in different ways. The survey therefore evaluates the range of the risk premium for debt among Finnish network holders. The value of the premium can be determined as an average of this range.

For the fourth regulatory period (2020–2023), the value of the risk premium will be updated by the end of 2019.

The lower limit is the average index of utility companies with credit rating A in the Bloomberg fair market yield curve, consisting of bond returns over a ten-year period from June 2009 to May 2019, less the average of monthly quotes of German ten-year bonds between June 2009 and May 2019.

The upper limit is the average monthly quotes of the index of utility companies with credit rating BBB in the Bloomberg fair market yield curve, consisting of bond returns over a ten-year period from June 2009 to May 2019, less the average of monthly quotes of German ten-year bonds between June 2009 and May 2019.

Monthly quotes mean the quotation on the last trading day of each month.

The value of the risk premium is the average of the range described above, and it will apply as such during the fourth regulatory period.

The aforementioned indices must include several companies when the risk premium is updated. Otherwise, the Authority will apply 1.4% as the risk premium for debt during the fourth regulatory period.

3.4 CALCULATION OF A REASONABLE RATE OF RETURN

In regulation methods, the weighted average cost of adjusted capital employed in network operations is used as the reasonable rate of return (WACC rate).

Using the weighted average of cost of equity and interest-bearing liabilities, the cost of entire capital can be calculated. As the return requirement for interest-bearing debt is zero, it is not necessary to include it in the calculation of the reasonable rate of return.

In regulation methods, a reasonable rate of return before taxes (pre-tax) is used.

Corporate taxes are therefore considered in the calculation of the reasonable rate of return, and they are not deducted in the calculation of realised adjusted profit. The application of a reasonable rate of return pre-tax clarifies the regulation methods and places network holders in an equal position, regardless of their company form or group structure.

The reasonable rate of return is first calculated after taxes (post-tax) as presented in Formula 9.

$$WACC_{post-tax} = C_E \times \frac{E}{E + D} + C_D \times (1 - yvk) \times \frac{D}{E + D} \quad (9)$$

where

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

C_E = reasonable cost of equity

C_D = reasonable cost of interest-bearing debt

E = adjusted equity employed in network operations

D = adjusted interest-bearing debt employed in network operations

yvk = valid corporate tax



After this, the aforementioned reasonable rate of return after taxes (post-tax) is adjusted with the valid corporate tax rate. As a result, the reasonable rate of return pre-tax can be calculated. Its calculation is presented in Formula 10.

$$WACC_{pre-tax} = \frac{WACC_{post-tax}}{(1 - yvk)} \quad (10)$$

where

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

A fixed capital structure is applied to network holders where the weight of interest-bearing debt is 40% and that of equity is 60%. As a result, the reasonable rate of return before taxes (pre-tax) is calculated as shown in Formula 11.

$$WACC_{pre-tax} = \frac{C_E \times 0,60}{(1 - yvk)} + C_D \times 0,40 \quad (11)$$

4 REASONABLE RETURN

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

As a result, network holders obtain a reasonable return

- on adjusted equity employed in network operations
- on adjusted interest-bearing debt employed in network operations.

A reasonable return cannot be obtained on non-interest-bearing debt employed in network operations because the return requirement is zero.

The calculation of reasonable return before corporate taxes (pre-tax) is presented in Formula 12.

$$R_{k, pre-tax} = WACC_{pre-tax} \times (E + D) \quad (12)$$

where

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

$WACC_{pre-tax}$ = reasonable rate of return, %

E = adjusted equity employed in network operations, EUR

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

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

4.1 ADJUSTED ASSETS AND CAPITAL EMPLOYED IN NETWORK OPERATIONS

ADJUSTED ASSETS EMPLOYED IN NETWORK OPERATIONS

Adjusted assets employed in network operations consist of adjusted natural gas assets on the unbundled balance sheet (2.1), other assets recognised in fixed assets (2.2), and assets recognised in current assets (2.3).

The key property item in natural gas network operations, i.e. natural gas network assets in fixed assets on the unbundled balance sheet, is replaced by adjusted natural gas network assets (2.1). It consists of the regulated asset value of the natural gas network (2.1.2), which is calculated from the replacement value of the natural

gas network (2.1.1) using component-specific lifetimes and average ages. The adjusted replacement value is calculated based on the number and unit prices of network components (Appendix 1).

Then, other assets employed in natural gas network operations (2.2 and 2.3) are adjusted.

Table 2 presents how assets on the balance sheet are adjusted in the calculation of adjusted assets employed in network operations.

Table 2. *Adjusting assets on the balance sheet*

ASSETS

UNBUNDLED BALANCE SHEET

ADJUSTED BALANCE SHEET

Fixed assets

Adjusted fixed assets

Natural gas network
set value

Natural gas network at the regulated as-

Goodwill

Investments

Other fixed assets
value

Other fixed assets at the balance sheet

Current assets

Adjusted current assets

Inventories
balance sheet value

Inventories at the bal-

Accounts receivable
value

Accounts receivable at the balance sheet

Financial assets

**TOTAL ASSETS
SHEET TOTAL**

ADJUSTED BALANCE



ADJUSTED CAPITAL EMPLOYED IN NETWORK OPERATIONS

Adjusted capital employed in network operations is calculated by adding adjusted equity (2.4.1), adjusted interest-bearing debt (2.4.2) and adjusted non-interest-bearing debt (2.4.2). The balancing item (2.4.1) used to balance both sides of the balance sheet is added to this result.

Table 3 presents how debt on the balance sheet is adjusted in the calculation of adjusted capital employed in network operations.



Table 3. *Adjusting liabilities on the balance sheet*

LIABILITIES

UNBUNDLED BALANCE SHEET

ADJUSTED BALANCE SHEET

Equity

Adjusted equity

Equity

Equity at the balance sheet value

Group contributions granted less deferred tax liabilities

Depreciation difference of assets other than natural gas network assets less deferred tax liabilities and voluntary provisions

- Group contributions received less deferred tax liabilities

Balancing item on the adjusted balance sheet

Accrued appropriations

Depreciation difference and provisions

Mandatory provisions

Mandatory provisions

Liabilities

Adjusted liabilities

Interest-bearing

Interest-

Interest-bearing debts

Interest-bearing debts at the balance sheet value

Capital loans

Capital loans at the balance sheet value

- Proportion of equity from interest-bearing group contributions granted but not paid

Non-interest-bearing

Non-interest-

bearing

Non-interest-bearing debts
balance sheet value

Non-interest-bearing debts at the

- Proportion of equity from non-interest-bearing group contributions granted but not paid
Mandatory provisions at the balance sheet value



Proportion of deferred tax liabilities from depreciation difference of assets other than natural gas network assets

**TOTAL LIABILITIES
TOTAL**

ADJUSTED BALANCE SHEET TO-

4.2 REASONABLE RATE OF RETURN

The reasonable rate of return is calculated based on the weighted average cost of capital (WACC model).

When the definition of the reasonable rate of return presented in Formula 11 is placed in Formula 12, the calculation of the reasonable rate of return before corporate taxes (pre-tax) for adjusted capital employed in network operations is as presented in Formula 13.

$$R_{k,pre-tax} = \left(\frac{C_E \times 0,60}{(1 - yvk)} + C_D \times 0,40 \right) \times (E + D) \quad (13)$$

The reasonable cost of adjusted equity employed in network operations as presented in Formula 13 is calculated according to Formula 14.

$$C_E = R_r + \beta_{debt-free} \times \left(1 + (1 - yvk) \times \frac{40}{60} \right) \times (R_m - R_r) + LP + LRP_m \quad (14)$$

The reasonable cost of adjusted interest-bearing debt employed in network operations as presented in Formula 13 is calculated according to Formula 15.

$$C_D = R_r + DP \quad (15)$$

in Formulas 13, 14 and 15



$R_{k, pre-tax}$	=	reasonable return before corporate taxes
C_E	=	reasonable cost of equity
C_D	=	reasonable cost of interest-bearing debt
yvk	=	corporate tax rate
E	=	adjusted equity employed in network operations
D	=	adjusted interest-bearing debt employed in network operations
R_r	=	risk-free interest rate
$\beta_{debt-free}$	=	debt-free beta coefficient
$R_m - R_r$	=	market risk premium
LP	=	premium for lack of liquidity
LRP_m	=	additional risk premium in natural gas transmission network operations
DP	=	risk premium for debt

Table 4 presents parameters applied to the reasonable rate of return over the third regulatory period.

Table 4. *Parameters applied to the reasonable rate of return over the third regulatory period*

PARAMETER	APPLIED VALUE
RISK-FREE INTEREST RATE	Higher of the following two values calculated annually R_{r1} = Average of daily values of interest on Finland's 10-year bonds in April–September in the previous year R_{r2} = Average of daily values of interest on Finland's 10-year bonds in ten previous years
DEBT-FREE BETA	0.45
DEBT-BEARING BETA	0.690



MARKET RISK PREMIUM	5.0%
PREMIUM FOR LACK OF LIQUIDITY	0.6%
CAPITAL STRUCTURE (debt/equity)	40%/60%
RISK PREMIUM FOR DEBT	1.4%
ADDITIONAL RISK PREMIUM FOR NATURAL GAS TRANSMISSION NET- WORK OPERATIONS	1.7%
CORPORATE TAX RATE	20.0%



REVISING PARAMETERS APPLIED TO THE REASONABLE RATE OF RETURN

The Energy Authority revises the risk-free interest rate annually.

If required, the Authority revises the corporate tax rate annually to correspond with the actual value.

For the fourth regulatory period, the Authority will revise the risk premium for debt applied to the reasonable rate of return.

The following parameters applied to the reasonable rate of return will remain constant during all years in the third and fourth regulatory periods:

- market risk premium
- premium for lack of liquidity
- additional risk premium for natural gas transmission network operations
- debt-free beta
- debt-bearing beta
- capital structure

5 REVENUES AND COSTS FROM NETWORK OPERATIONS

In the calculation of realised adjusted profit, the starting point is operating profit (loss) from network operations pertaining to the unbundled income statement. It is adjusted with the profit adjustment items described in this section. In the calculation of realised adjusted profit, the impact of incentives (6) is also deducted.

5.1 REVENUES FROM NETWORK OPERATIONS

In the calculation of realised adjusted profit, revenues recognised in the unbundled income statement before operating profit (loss) is used as profit from network operations.

Revenues from network operations include:

- revenues from network service charges
- revenues from system services
- revenues from balance services
- non-refundable connection fees (participation fees)
- revenues from other services associated with network operations.

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

- annual net change in refundable connection fees
- planned depreciation on and impairment of natural gas network assets in fixed assets
- planned depreciation on goodwill
- sales loss from the sale of a network section.

Sales gains from the sale of a network section recognised in other income is deducted in the calculation of realised adjusted profit.

CONNECTION FEES OR PARTICIPATION FEES

The annual net change in refundable connection fees (participation fees) recognised on the unbundled balance sheet is returned in the calculation of realised adjusted profit.



The annual net change in connection fees is calculated by deducting the amount of connection fees on the previous financial period's unbundled balance sheet from the amount of connection fees on the current financial period's unbundled balance sheet.

Non-refundable connection fees constitute revenues from network operations.

The handling of connection fees in balance sheet adjustments is presented in Section 2.4.2.

Connection fees (participation fees) are not carried forward

The Authority has considered an alternative method of handling connection fees in order to carry large accruals forward. This has also been discussed during the hearing of network holders, in a previous survey, and at a court of law based on network holders' appeals (MAO:13/10 and MAO:427-501/12).

No such alternative handling method which would secure the equal treatment of network holders has been presented.

Connection fees are not carried forward; they are treated as revenues from network operations for the financial period for which they have been recognised in unbundled financial statements.

DEPRECIATION ON NATURAL GAS NETWORK ASSETS IN FIXED ASSETS

Planned depreciation on natural gas network assets made in the unbundled income statement is returned in the calculation of realised adjusted profit.

PLANNED DEPRECIATION ON GOODWILL

Planned depreciation on goodwill made in the unbundled income statement is returned in the calculation of realised adjusted profit.

SALES GAINS AND LOSSES ACCUMULATED FROM THE SALE OF A NETWORK SECTION

If sales gains accumulated from the sale of a network section have been recognised in other operating income in the unbundled income statement, the amount of sales gains will be deducted in the calculation of realised adjusted profit.

If sales losses have been recognised in other operating expenses in the unbundled income statement, they will be returned in the calculation of realised adjusted profit.

5.2 COSTS FROM NETWORK OPERATIONS

In the calculation of realised adjusted profit, expenses recognised in the unbundled income statement are used as costs from network operations. These are adjusted using the adjustment items presented in this section.

According to chapter 1, section 3, subsection 8 of the Natural Gas Market Act, natural gas network operations mean business activities where the network holder is engaged, without any compensation, in natural gas transmission operations in a natural gas transmission or distribution network, and produces and offers other services prescribed for the network holder in the natural gas market legislation as required.

Natural gas network operations include

- the planning, construction, maintenance and use of the natural gas network
- the connection of customers' natural gas equipment to the network
- the measurement of natural gas
- other activities required for the transmission or distribution of natural gas necessary for the transmission or distribution of natural gas or for other network services

Any costs associated with these activities comprise costs from network operations.

Costs from network operations also include

- costs from system services
- costs from balance services
- compensation paid by network holders to their customers for interruptions.

In accounting, such costs must be allocated to business functions according to the matching principle.

EQUAL TREATMENT OF INVESTMENTS AND COSTS IN ACCOUNTING

Network holders are in an equal position regardless of whether they activate their investment costs or recognise them as expenses.



Costs arising from a component are not treated twice in regulation methods.

If an investment in a component is recognised in operating costs, the component will not be included in the adjusted replacement value or the regulated asset value. Furthermore, no separate adjustment is made for the component in the calculation of realised adjusted profit. A component recognised wholly in expenses has already been considered in operating profit (loss) in the income statement.

Cancellation and general costs recognised in expenses are taken into account in the calculation of realised adjusted profit in a similar manner to other costs.

Any cancellation costs from replacement investments activated on the unbundled balance sheet are taken into account in adjusted assets employed in network operations at their value presented on the unbundled balance sheet in accordance with Section 2.2.

Network holders must present activated costs arising from investments recognised in expenses as a separate cost item in notes to unbundled financial statements.

COSTS NOT INCLUDED IN NETWORK OPERATIONS

In the calculation of realised adjusted profit, only costs for which network holders obtain compensation are accepted as costs from network operations.

Costs without compensation are treated as items similar to the distribution of profit and returned in the calculation of realised adjusted profit. Such costs include compensation for component positioning.

If a network holder wishes that these costs are accepted as costs from network operations, it must provide an account of such costs in connection with regulatory information. The network holder must verify the actual compensation obtained for the network holder's costs. The Authority will evaluate the account and decide on its basis how to handle such costs.

COMPENSATION PAID TO CUSTOMERS FOR INTERRUPTIONS

Any compensation paid by network holders to their customers for interruptions comprises costs from network operations. Furthermore, compensation treated as sales adjustments comprise costs from network operations.

Network holders must present compensation paid to customers for interruptions as a separate cost item in notes to unbundled financial statements.



DEPRECIATION ON OTHER ASSETS IN FIXED ASSETS

In the calculation of realised adjusted profit, planned depreciation based on the unbundled income statement is used as depreciation on fixed assets other than natural gas network assets. These items have already been taken into account in operating profit (loss) in the unbundled income statement. For these, no separate adjustment is made in the calculation of realised adjusted profit.

If components of the natural gas network are recognised in items other than natural gas network assets in fixed assets on the unbundled balance sheet, depreciation on these components will be eliminated from depreciation on other assets in fixed assets. This process is applied because natural gas network components are considered in adjusted straight-line depreciation on natural gas network assets, as referred to in Section 6.1.1.

CONTROLLABLE AND UNCONTROLLABLE OPERATING COSTS

Costs arising for network holders from functions included in network operations and recognised through profit or loss are divided into controllable and uncontrollable operating costs in the calculation of realised adjusted profit. Controllable operating costs include an efficiency goal in the efficiency incentive (6.3).

Table 5 presents how controllable operating costs (KOPEX) are defined.



Table 5. *Controllable operating costs*

KOPEX	=	Materials, supplies and energy costs
	+	Increase or decrease in stocks
	+	Personnel expenses
	+	Rental expenses
	+	Other external services
	+	Internal expenses
	+	Other operating expenses
	+	Compensation paid to customers (if not included in other expenses)
	+	Costs from components recognised in expenses (if not included in other aforementioned items)
	-	Manufacturing for own use
	-	Costs from balance services
	-	Compressor gases and additional pressure purchased from Russia
	-	Maintenance fees for the European marketplace in accordance with EU reg- ulation
	-	Fuel tax on imports and emergency supply fee
	-	Emissions rights
	-	Costs/profit associated with the control of gas consumption

If required, network holders must provide the Energy Authority with an account of the efficiency and impact of maintenance fees for the European marketplace. The Authority will evaluate the account and decide on its basis how to handle such costs.

Costs from network operations other than those presented in Table 5 comprise uncontrollable operating costs.

5.3 FINANCING COSTS FROM NETWORK OPERATIONS

In the calculation of realised adjusted profit, reasonable costs arising from financial assets are considered financing costs.



REASONABLE COSTS ARISING FROM FINANCIAL ASSETS

Network operations require specific financial assets. They are needed to make regular payments because network holders need to complete payments at a different schedule as they receive payments. In addition, they are needed to prepare for unexpected costs.

Reasonable costs arising from the financial assets required to secure network operations are therefore considered in the calculation of realised adjusted profit. They are considered so that calculated costs from financial assets are not unreasonably low or insufficient for network holders in accordance with the ruling of the Supreme Administrative Court (KHO:2010:86).

Of financial assets recognised on the unbundled balance sheet, the following are taken into account:

- current and non-current receivables, apart from accounts receivable
- financial securities
- cash in hand and at banks, and comparable items

In the calculation of realised adjusted profit, the maximum amount of financial assets is 10% of the turnover of network operations.

Reasonable costs arising from financial assets are calculated by multiplying the maximum amount of financial assets by the reasonable cost of debt used in the calculation of the reasonable rate of return (3.3).

When calculating realised adjusted profit, the resulting reasonable costs arising from the financial assets required to secure network operations are deducted.

6 INCENTIVES

6.1 INVESTMENT INCENTIVE

The purpose of the investment incentive is to encourage network holders to make cost-efficient investments and to enable replacement investments.

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

The incentive impact based on unit prices guides network holders to invest more efficiently than on average and to identify more cost-efficient implementation methods. The incentive impact is based on the difference between investments calculated at unit prices and costs from investments made. By making cost-efficient investments, network holders obtain a value higher than the realised investment costs (adjusted replacement value) for their investments.

The incentive impact based on straight-line depreciation calculated from the network holder's adjusted replacement value, together with the regulated asset value, guides network holders to maintain their networks in actual use as part of their network assets following the lifetimes selected and enables sufficient replacement investments.

The incentive impact is based on the methodology providing network holders with an annual depreciation level based on the average adjusted straight-line depreciation following the lifetimes selected. Calculated straight-line depreciation is always permitted in full, insofar as the component is in actual use. In other words, calculated straight-line depreciation is calculated for components after their defined lifetimes if they are still in actual use.

If the lifetime is selected correctly, the straight-line depreciation offered by the investment incentive enables and covers all necessary replacement investments, including premature ones. This means that the investment incentive enables the replacement value of network components to be depreciated in full. Straight-line depreciation can be calculated for components that have already reached the end of their lifetimes in proportion to the residual value of the components that have likewise been dismantled before the end of their lifetimes.

6.1.1 Adjusted straight-line depreciation

Adjusted straight-line depreciation on natural gas network assets is calculated for each network component from the replacement value of natural gas network assets



(2.1.1). Adjusted straight-line depreciation is calculated for all years in a regulatory period at a value corresponding with the situation valid on the last day of December each year. Because unit prices are not revised for the fifth regulatory period and inflation has not been considered in unit prices, the change in unit prices is considered in the calculation of straight-line depreciation using the index of consumer prices.

The calculation of adjusted straight-line depreciation on network component i in year k is presented in Formula 16.

$$JHATP_{i,k} = \frac{JHA_i}{lifetime_i} \times \left(\frac{KHI_k}{KHI_{2016}} \right) \quad (16)$$

Adjusted straight-line depreciation on the entire natural gas network is calculated by adding all component-specific straight-line depreciation values as presented in Formula 17.

$$JHATP_k = \sum_{i=1}^n \left(\frac{JHA_i}{lifetime_i} \right) \times \left(\frac{KHI_k}{KHI_{2016}} \right) \quad (17)$$

in Formulas 16 and 17

$JHATP_{i,k}$ = adjusted straight-line depreciation on network component i in year k

$JHATP_k$ = adjusted straight-line depreciation on all natural gas network assets in year k

JHA_i = adjusted replacement value of network component i

$lifetime_i$ = technical and financial lifetime of network component i

KHI_k = index of consumer prices in year k

KHI_{2016} = index of consumer prices in 2016

SUBSIDIES OBTAINED FOR BUILDING A NETWORK

Network holders may obtain subsidies or other compensation for network investments from the Finnish Government or the European Union. Components funded by subsidies or compensation are considered in the replacement value of natural



gas network assets when adjusted straight-line depreciation on natural gas network assets is calculated in the investment incentive.

6.1.2 Investment incentive in the calculation of realised adjusted profit

The impact of the investment incentive is deducted when calculating realised adjusted profit. The impact of the investment incentive on the realised adjusted profit is calculated annually using Formula 17.

6.2 QUALITY INCENTIVE

The purpose of the quality incentive is to encourage network holders to develop the quality of the natural gas transmission system.

6.2.1 Quality bonus scheme

The development of the quality incentive was studied in the survey assigned by the Energy Authority from Gaia Consulting Oy⁹. Based on the survey, a quality bonus scheme is used in the quality incentive.

The quality bonus scheme is a goal-based system in which sanctions and bonuses are defined based on fixed steps. There are three different levels:

- when the quality indicator is within the target range, the network holder obtains no sanctions or bonuses
- when the quality indicator is below the target range, the network holder obtains a bonus
- when the quality indicator is above the target range, the network holder obtains a sanction

The quality indicator represents the quality of the operations of network holders, and is used to define the impact of the incentive on the calculation of realised adjusted profit.

The quality indicator is the amount of undelivered energy. Undelivered energy is calculated according to actual customer consumption based on the contracted capacity at the time of an interruption in delivery. The part exceeding the customer-specific contracted capacity is not taken into account in undelivered energy.

⁹ Gaia Consulting Oy, Karttunen Ville, Vanhanen Juha, Partanen Jarmo, Matschoss Kaisa, Bröckl Marika, Haakana Juha, Hagström Markku, Lassila Jukka, Pesola Aki and Vehviläinen Iivo, Survey of the functionality of the quality incentive and any needs for development in 2016–2023, 27 October 2014

The reference level for the quality incentive is the network holder's eight-year level of undelivered energy. The target range and upper and lower quartiles of the quality incentive are generated from the reference level.

If the annual amount of undelivered energy is within the lower quartile of the reference level, a sanction will be imposed on the network holder. Correspondingly, if the annual amount of undelivered energy is within the upper quartile, the network holder will obtain a bonus.

If the amount of undelivered energy is between the upper and lower quartiles of the reference level, the quality incentive will have no impact on the calculation of realised adjusted profit.

6.2.2 Reference level during the third and fourth regulatory periods

During the third regulatory period, the reference level will be the amount of undelivered energy in 2008–2015.

During the fourth regulatory period, the reference level will be the amount of undelivered energy in 2012–2019.

6.2.3 Annual realised level during the third and fourth regulatory periods

The annual realised level of the quality incentive during the third and fourth regulatory periods will be the amount of energy left undelivered each year.

6.2.4 Quality incentive in the calculation of 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 the annual realised level with the reference level.

Highest deviations in the realised undelivered energy are considered by limiting the impact of the quality incentive to at most 2% of the network holder's reasonable return during the year in question. This means that the level of the incentive does not depend on how much the amount of undelivered energy is above or below the limits defined.

If the amount of undelivered energy is within the target range of the reference level, the impact of the incentive is 0%.



If the amount of undelivered energy is within the lower quartile, the bonus of the quality incentive is 2% of the network holder's reasonable return during the year in question.

If the amount of undelivered energy is within the upper quartile, the sanction of the quality incentive is 2% of the network holder's reasonable return during the year in question.

6.3 EFFICIENCY INCENTIVE

The purpose of the efficiency incentive is to encourage network holders to be cost efficient.

The operations of network holders are cost efficient when operational inputs, i.e. costs, are as low as possible compared with operational outputs.

CALCULATION OF THE EFFICIENCY INCENTIVE

The calculation of the efficiency incentive consists of five different factors:

- general efficiency incentive (6.3.1)
- company-specific efficiency incentive (6.3.2)
- reference level for the company-specific efficiency incentive (6.3.3)
- realised company-specific efficiency costs (6.3.4)
- efficiency incentive in the calculation of realised adjusted profit (6.3.5)

6.3.1 General efficiency incentive

The purpose of the general efficiency incentive is to encourage network holders, who are also considered efficient as a result of an efficiency measurement, to operate more efficiently in accordance with the general development of productivity.

When regulating monopolies, it is natural that a general efficiency incentive is set for companies.

DEVELOPMENT OF PRODUCTIVITY IN NETWORK OPERATIONS

A survey assigned by the Energy Authority¹⁰ assessed the level of the general efficiency goal by examining the development of productivity in different network functions.

Productivity figures vary depending on network operations and the period under review. The survey recommends defining a general efficiency goal based on the long-term development of productivity.

The survey therefore recommends setting a single annual general efficiency goal for all network functions. Its value should be 2%.

NEW TASKS AND OPERATING METHODS

Through changes in legislation, new tasks have been and will be assigned to network holders. Previously existing tasks are also required to be conducted using new operating methods.

It is difficult to consider additional costs arising from new tasks and operating methods and the cost savings resulting from these reliably in the calculation of realised adjusted profit.

According to the Authority, the clearest and also the sufficiently correct way is to consider these costs and savings in the calculation of realised adjusted profit by adjusting the level of the general efficiency goal.

APPLICABLE LEVEL

During the third and fourth regulatory periods, the value of the general efficiency goal will be 0% instead of the level of 2% defined based on the long-term development of productivity.

This will compensate for the impact of additional costs incurred by network holders from new tasks and operating methods in the calculation of realised adjusted profit.

¹⁰ Sigma-Hat Economics Oy / Kuosmanen, T., Saastamoinen, A., Keshvari, A., Johnson, A., & Parmeter, C., General efficiency goal in regulatory models for electricity and natural gas transmission and distribution network operations and assessment of the efficiency incentive: Proposal for the development of the Energy Authority's methodology during the fourth regulatory period 2016–2019, 21 October 2014



6.3.2 Company-specific efficiency goal

The purpose of the company-specific efficiency goal is to encourage network holders, who are considered inefficient through an efficiency measurement, to reach the level of efficient operations.

EFFICIENCY POTENTIAL

The efficiency goal is based on the identified efficiency potential of a network holder.

The efficiency potential can be identified, for example, by comparing the network holder's realised costs and production to those of all network holders.

As there is only one transmission network holder in Finland, the reference group used in the evaluation of the efficiency potential should consist of other European natural gas transmission network holders. However, no European-level comparison with this reference group has been conducted.

AVAILABLE METHODS

Results from a European comparison are not yet available. In addition, the general efficiency incentive during the third and fourth regulatory periods will be 0%.

The measurement of the network holder's efficiency therefore only consists of the comparison of the network holder's costs to its previous costs.

The calculation of the efficiency potential starts from the network holder's controllable operating costs (KOPEX). These are compared to the reference level calculated based on realised costs in previous years, i.e. reasonable controllable operating costs (SKOPEX).

6.3.3 Reference level for efficiency costs

Reasonable controllable operating costs (SKOPEX) are used as the reference level for efficiency costs. The reference level is calculated annually, taking the impact of inflation into account.

During the first year of a regulatory period, the reference level for efficiency costs is defined based on the network holder's average realised controllable operating costs during the previous regulatory period, i.e. the previous four years.

During the next years of a regulatory period, reasonable controllable operating costs from the previous year are used as the reference level for efficiency costs.

REFERENCE LEVEL FOR EFFICIENCY COSTS DURING THE THIRD REGULATORY PERIOD

The calculation of the reference level in 2016 is presented in Formula 21.

$$SKOPEX_{2016} = \frac{1}{4} \sum_{t=2012}^{2015} ((1 + \Delta KHI_{2016}) \times KOPEX_t)$$

(21)

where

$SKOPEX_{2016}$ = reference level for efficiency costs, i.e. reasonable controllable operating costs in 2016

ΔKHI_{2016} = change in the index of consumer prices from year t to 2016

$KOPEX_t$ = realised controllable operating costs in year t

The calculation of the reference level during the next years (2017–2019) of the regulatory period is presented in Formula 22.

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

(22)

where

$SKOPEX_t$ = reference level for efficiency costs, i.e. reasonable controllable operating costs in year t

$SKOPEX_{t-1}$ = reference level for efficiency costs, i.e. reasonable controllable operating costs in year $t-1$

ΔKHI_t = change in the index of consumer prices in from year $t-1$ to year t

t = year 2017, 2018 or 2019

REFERENCE LEVEL FOR EFFICIENCY COSTS DURING THE FOURTH REGULATORY PERIOD

The calculation of the reference level in 2020 is presented in Formula 23.

$$SKOPEX_{2020} = \frac{1}{4} \sum_{t=2016}^{2019} ((1 + \Delta KHI_{2020}) \times KOPEX_t) \quad (23)$$

where

$SKOPEX_{2020}$ = reference level for efficiency costs, i.e. reasonable controllable operating costs in 2020

ΔKHI_{2020} = change in the index of consumer prices from year t to 2020

$KOPEX_t$ = realised controllable operating costs in year t

The calculation of the reference level during the next years (2021–2023) of the regulatory period is presented in Formula 24.

$$SKOPEX_t = (1 + \Delta KHI_t) \times SKOPEX_{t-1} \quad (24)$$

where

$SKOPEX_t$ = reference level for efficiency costs, i.e. reasonable controllable operating costs in year t

$SKOPEX_{t-1}$ = reference level for efficiency costs, i.e. reasonable controllable operating costs in year $t-1$

ΔKHI_t = change in the index of consumer prices in from year $t-1$ to year t

t = year 2021, 2022 or 2023



6.3.4 Realised efficiency costs

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

Cost items pertaining to each year's unbundled income statement are used as controllable operating costs. Table 5 in Section 5.2 presents items included in controllable operating costs.

6.3.5 Efficiency incentive in the calculation of realised adjusted profit

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

The impact of the efficiency incentive is calculated by deducting efficiency costs realised during the year from the reference level for efficiency costs.

The maximum impact of the efficiency incentive on the calculation of realised adjusted profit is set to be reasonable. Highest deviations in annual controllable operating costs are considered by setting upper and lower limits for the efficiency incentive. This means that any difference between the reference level for efficiency costs and realised efficiency costs higher than the limit set has no impact on the calculation of realised adjusted profit.

The maximum impact of the efficiency incentive on the calculation of realised adjusted profit is 5% of the network holder's reasonable return during the year in question. This applies to the efficiency bonus obtained from the calculation of costs and the efficiency sanction resulting from increased costs.

6.4 INNOVATION INCENTIVE

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

The survey¹¹ conducted by Gaia Consulting Oy for the Authority evaluated the functionality of the innovation incentive and presented development proposals.

¹¹ Gaia Consulting Oy / Vehviläinen Iivo, Ryyänen Erkka, Hjelt Mari, Descombes Laura, Vanhanen Juha, Evaluation of the innovation incentive applied in the Energy Authority's regulation methods, 18 September 2014



6.4.1 Research and development costs

Key objectives set for research and development activities in network operations include the development and commissioning of smart natural gas networks and other new technologies and operating methods. Network holders may therefore accrue research and development costs before the new technologies and operating methods are fully usable and deployable.

The Authority encourages network holders towards active 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 based on the generation of new information, technologies, products or operating methods in network operations. They may also be associated with the planning of such a project.

The results of projects, the inclusion of whose costs are accepted in the innovation incentive, must be public and, for example, utilisable by other network holders in their network operations. However, any confidential information about customers does not need to be made public. Furthermore, results protected by industrial property rights do not need to be made public. Published results must be sent to the Energy Authority, which will publish them on its website.

Acceptable research and development costs must be recognised as expenses in the unbundled income statement. Activated research and development costs are not accepted in the calculation of the innovation incentive.

Network holders must present non-activated research and development costs separately in notes to 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 at most a share corresponding to 1% from the sum of turnovers of network operations in unbundled income statements over a regulatory period is treated as reasonable research and development costs.



The amount of research and development costs acceptable over a single year may be higher or lower than the share of 1% from the turnover of network operations over the specific year.

7 REALISED ADJUSTED PROFIT

Realised adjusted profit is calculated based on the operating profit (loss) pertaining to the unbundled income statement.

In the calculation of realised adjusted profit, the annual change in refundable connection fees (participation fees) pertaining to the unbundled balance sheet, planned depreciation on and impairment of natural gas network assets pertaining to the unbundled income statement, depreciation on goodwill and sales loss from the sales loss from the sale of a network section are first returned (5.1). Instead, sales gains from a network section recognised in other income are deducted (5.1) in the calculation of realised adjusted profit.

Next, reasonable costs of financial assets are deducted as a profit-adjusting item (5.3).

In the calculation of realised adjusted profit, the impact of incentives is also deducted. Incentives include the investment (6.1), quality (6.2), efficiency (6.3) and innovation incentive (6.4).

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

The impact of the quality incentive is calculated based on the quality sanctions and bonuses.

The impact of the efficiency incentive is calculated by deducting realised efficiency costs from the reference level for efficiency costs.

The impact of the innovation incentive is calculated from network holders' reasonable research and development costs.

This calculation produces realised adjusted profit as the result.

The aforementioned calculation is presented in Table 8.



Table 8. *Calculation of realised adjusted profit*

OPERATING PROFIT (LOSS) FROM NETWORK OPERATIONS IN THE UNBUNDLED INCOME STATEMENT

- + Refundable items in the unbundled income statement
 - + Net change in refundable connection fees (participation fees)
 - + Planned depreciation on goodwill
 - + Sales losses from a network section recognised in other expenses
 - Sales gains from a network section recognised in other income
 - + Planned depreciation on and impairment of natural gas network assets
- Other profit-adjusting items
 - + Reasonable costs arising from financial assets
- Investment incentive
 - + Adjusted straight-line depreciation on natural gas network assets
- Quality incentive
 - + Quality bonus
 - Quality sanction
- Efficiency incentive
 - + Reference level for efficiency costs
 - Realised efficiency costs
- Innovation incentive
 - + Reasonable research and development costs

= REALISED ADJUSTED PROFIT

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APPENDIX 1. NETWORK COMPONENTS, UNIT PRICES AND LIFETIMES

In this appendix, the Energy Authority defines unit prices and lifetimes, considering the network holder's account of their average unit prices. Unit prices are based on the network holder's realised costs. The unit prices defined in this appendix will be used during the third and fourth regulatory periods.

The unit prices have been rounded to the nearest EUR 10,000 regarding network components of more than EUR 100,000.

Meanings of colour codes used in the table:

- red background: network type, i.e. main division of network component groups
- yellow background: network component group
- grey background: description
- white background: network component and its unit, unit price and lifetime range

TRANSMISSION PIPELINE NETWORK			
PIPELINE SIZE, 54 bar(g)			
Network component	Unit	Unit price, EUR	Lifetime, years
DN 80 or lower	km	350,000	50-65
DN 100	km	380,000	50-65
DN 150	km	450,000	50-65
DN 200	km	490,000	50-65
DN 250	km	530,000	50-65
DN 300	km	530,000	50-65
DN 400	km	650,000	50-65
DN 500	km	840,000	50-65
DN 700	km	1,020,000	50-65
DN 800	km	1,400,000	50-65
DN 900	km	1,470,000	50-65
DN 1000	km	3,160,000	50-65
PIPELINE SIZE, 80 bar(g)			
Network component	Unit	Unit price, EUR	Lifetime, years
DN 500	km	820,000	50-65
PIPELINE SIZE, 8 bar(g), LOW PRESSURE PIPELINE, PEH PLASTIC			
Network component	Unit	Unit price, EUR	Lifetime, years
PEH 315	km	320,000	65
PEH 200	km	280,000	65
under PEH 200	km	260,000	65
TRANSMISSION NETWORK STATIONS			
PRESSURE REGULATING STATIONS			
Network component	Unit	Unit price, EUR	Lifetime, years



Pressure reducing station, 500–1,000 MW	quantity	2,030,000	65
Pressure reducing station, 250–500 MW	quantity	1,530,000	65
Pressure reducing station, 100–250 MW	quantity	1,200,000	65
Pressure reducing station, 50–100 MW	quantity	670,000	65
Pressure reducing station, under 50 MW	quantity	450,000	65
Quality management equipment, station-	quantity	170,000	20
Pressure increasing equipment, more than 4	quantity	1,540,000	50
Pressure increasing equipment, under 4 MW	quantity	1,210,000	50
Processing plant, more than 4 MW	quantity	3,590,000	50
Processing plant, under 4 MW	quantity	2,760,000	50

ACCEPTANCE MEASUREMENT AND COMPRESSOR STATIONS

Network component	Unit	Unit price, EUR	Lifetime, years
Acceptance measurement, Imatra	quantity	8,750,000	60
Compressor station pipelines and equipment	quantity	7,770,000	60
Compressor unit, 4.7 MW	quantity	6,830,000	60
Compressor unit, 5.0 MW	quantity	6,920,000	60
Compressor unit, 6.5 MW	quantity	7,070,000	60
Compressor unit, 10.0 MW	quantity	10,590,000	60
Compressor station automation equipment, station-specific	quantity	4,450,000	20
Compressor facility	m ²	2,808	60

TRANSMISSION NETWORK SYSTEMS AND COMMUNICATIONS

SYSTEMS AND COMMUNICATIONS NETWORKS

Network component	Unit	Unit price, EUR	Lifetime, years
Data transfer system	quantity	3,310,000	20
Operations monitoring system	quantity	3,580,000	20
Measurement and balance management	quantity	4,530,000	20