Gasgrid Finland Oy

Periodic Consultation of Tariff Methodology

Based on Article 26 of Commission Regulation (EU) 2017/460 of 16 March 2017 establishing a network code on harmonized transmission tariff structures for gas (TAR NC)

Gasgrid Finland Oy
Keilaranta 19 D
FI- 02150 Espoo
Company code. 3007894-1
Domicile, Espoo
www.gasgrid.fi

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Table of abbreviations

ACER	Agency for the Cooperation of Energy Regulators
BC	Balticconnector interconnection point
CEF	Connecting Europe Facility
CWD	Capacity Weighted Distance
LNG	Liquefied Natural Gas
LTIP	Long-Term Investment Plan
NRA	National Regulatory Authority
RPM	Reference Price Methodology
TAR NC	Commission regulation (EU) 2017/460 of 16 March 2017establishing a network code on harmonised transmission tariff structures for gas ('Tariff Network Code')
TSO	Transmission system operator

List of definitions

Allowed revenue means the sum of transmission services revenue and non-transmission services revenue for the provision of services by the transmission system operator for a specific time period within a given regulatory period which such transmission system operator is entitled to obtain under a non-price cap regime and which is set in accordance with Article 41(6)(a) of Directive 2009/73/EC.

Cluster of entry or exit points means a homogeneous group of points or group of entry points or of exit points located within the vicinity of each other and which are considered as, respectively, one entry point or one exit point for the application of the reference price methodology.

Non-price cap regime means a regulatory regime, such as the revenue cap, rate of return and cost plus regime, under which the allowed revenue for the transmission system operator is set in accordance with Article 41(6)(a) of Directive 2009/73/EC.

Reference price means the price for a capacity product for firm capacity with a duration of one year, which is applicable at entry and exit points and which is used to set capacity-based transmission tariffs.

Reference price methodology means the methodology applied to the part of the transmission services revenue to be recovered from capacity-based transmission tariffs with the aim of deriving reference prices.

Transmission services means the regulated services that are provided by the transmission system operator within the entry-exit system for the purpose of transmission.

Transmission service revenue means income collected by Gasgrid Finland by capacity and commodity tariffs.

0 Summary

The periodic consultation regarding reference price methodology (RPM) organized by Gasgrid Finland is based on Article 26 of network code on harmonized transmission tariff structures for gas (TAR NC). The consultation includes the comprehensive description and calculation process of the proposed RPM (postage stamp methodology) which is compared to the capacity weighted distance methodology (CWD). Indicative allowed revenue and indicative capacity reference prices for 2021-2023, and indicative commodity tariffs and non-transmission tariffs for 2021 are part of the consultation. Also, the description of Finnish transmission system and cost allocation assessment are included to the consultation.

Gasgrid Finland emphasizes that the values used in the consultation are indicative, and throughout the document indicative transmission reference prices are shown to illustrate the impact of different reference price methodologies. These indicative tariffs are non-binding. The indicative tariffs are based on estimates of transmission system costs made in 2019 and an average annual gas consumption of 23 TWh/a in Finland. The indicative values will be revised in autumn 2020 prior to new transmission tariffs will come in force from January 2021.

Gasgrid Finland started its operations 1st of January 2020. At the same time, a new physical connection, Balticconnector, was commissioned. Also, Finnish gas market was opened to competition and the new transmission service products, standard capacity products, were introduced. At the time of the preparation of the consultation material, the new gas market has been operational only few months. Due to significant changes on Finnish gas market, some parameters used in this consultation contain uncertainties and the parameters will be revised during this year before the consultation about the tariffs will be organized in the last quarter of tariff year 2020.

The Inter-TSO-Compensation (ITC)-agreement entered into force 1st of January 2020 creating a common entry-tariff zone with Estonian and Latvian TSOs. In the common entry-tariff zone cross-border country points of the area, including Balticconnector interconnection point between Finland and Estonia, have no tariffs. Entry tariffs on external borders to the entry-tariff zone are harmonized. In this consultation, the impact of ITC-agreement to the reference prices and the calculations are illustrated.

In Finland the tariff period is a calendar year. The current regulatory period is 2020-2023. Non-price cap regime is applied which means a regulatory regime under which the allowed revenue for Gasgrid Finland is set.

The proposed reference price methodology is a postage stamp methodology:

- The annual consumption in Finland is estimated to be 20-26 TWh/a based on historical consumption and depending on weather (cold/warm year). In the calculation a medium of 23 TWh/a (GCV) is used for 2020-2023.
- The estimated transmission service revenue is approximately 82 M€ annually. The estimated allowed revenue is approx. 45,5 M€ annually.
- In the primary scenario used in the postage stamp calculation:
    - Entry reference price is the same (0,14277 €/kWh/day/year) for 2021 that it is in 2020.

- Exit reference price will slightly decrease in 2021 (1,00567 €/kWh/day/year) compared to 2020 (1,04859 €/kWh/day/year) due to estimated slight decrease of WACC-% and asset base.[1]
- Entry-exit split: 13%/87%
- Capacity-commodity split: 96%/4%
- Intra-system-cross-system split: 100%/0% (ITC-Agreement re-distributes entry revenue collected from transit flow for the TSO whose system gas is finally consumed. Balticconnector, the only cross-system exit point, has no exit tariff).

- Seasonal factors and discounts are not considered applicable in 2021.
- The impact of the Inter-TSO-Agreement between Finnish, Estonian and Latvian TSOs is described as a part of the consultation.

As the proposed RPM is the postage stamp methodology, the comparison to Capacity Weighted Distance methodology is a part of the consultation following the Article 26(1)(a)(vi) of TAR NC. Reference prices calculated according to the CWD methodology results in high reference price differences in the system. Instead, uniform capacity tariffs according to the postage stamp methodology provides more predictable reference prices. In Finland, top 10 gas consumers use a major share of Finnish total annual consumption. This is foreshadowed by the results of CWD and postage stamp methodology comparison. Furthermore, the ITC-agreement that removes cross-border tariffs between Finnish, Estonian and Latvian TSOs would not be applicable with the CWD methodology, as entry prices are harmonized in the area. The consultation document contains justifications for the proposed reference price methodology.

Commodity and non-transmission tariffs with the description of manner how they are set, are part of the consultation. New market model applicable 1st of January 2020 has brought new price components such as underutilization fee of Balticconnector and datahub charge.

NOTE: The indicative reference prices, allowed revenue and transmission service revenue ("the variables") are based on 2019 estimates of future costs and expected use of the transmission system. These figures shall be revised during 2020 and this may change estimates of the variables. Before publishing the final transmission tariffs for 2021, a public consultation will be organized during the last quarter of 2020 where updated figures for the variables will be presented.

[1] Note that also for 2020, 23 TWh/a as consumption estimate has been used in the indicative calculations. The winter has been unexceptionally warm which may lead to lower annual gas consumption than used for calculations and thus affect tariffs for the coming years.

1 Introduction

In Finland, the derogation of Article 49 of Directive 2009/73/EC of the European parliament[2] ended at the end of 2019. From the beginning of 2020 EU gas market legislation has been applied as such.

Commission Regulation (EU) 2017/460 of 16 March 2017 establishing a network code on harmonized transmission tariff structures for gas ('Tariff Network Code, TAR NC') sets out the Union-wide rules which have the objectives of contributing to market integration, enhancing security of supply and promoting the interconnection between gas networks. Key steps in reaching these objectives is to include increasing transparency of transmission tariff structures and procedures towards setting them.

In order to achieve and ensure a reasonable level of cost reflectivity and predictability, transmission tariffs need to be based on a reference price methodology (RPM) using specific cost drivers. Reference price methodology means the methodology applied to the part of the transmission services revenue to be recovered from capacity-based transmission tariffs with the aim of deriving reference prices. According to the TAR NC, a periodic consultation on the chosen tariff methodology shall be arranged at least every five years. Article 26 of TAR NC sets the content for the consultation while the Article 27 sets the timeline for the National Regulatory Authority ('NRA') and Agency for the cooperation of Energy Regulators ('ACER') to perform their responsibilities in regard to the consultation.

According to Article 26 of TAR NC, the periodic consultation shall contain the following information:

- A description of the proposed reference price methodology (RPM), which includes both information on the components of the RPM and a justification of those components;
- A comparison of the indicative reference prices as calculated by the proposed RPM and the indicative reference prices calculated using the capacity-weighted distance (CWD) counterfactual;
- Results, components and the details of these components for the cost allocation assessments;
- An assessment of the proposed RPM against the criteria set out in Art. 7 of TAR NC;
- Indicative information on the allowed revenue of the Transmission System Operator (TSO);
- Indicative information on commodity-based transmission tariffs and non-transmission tariffs; and,
- Explanation of any change in the level of tariffs resulting from the changes proposed in this document, both for the next tariff year 2021 and over the course of the regulatory period.

The Finnish Energy Authority (FIN: *Energiavirasto*) has decided that Gasgrid Finland shall organize the public consultation on tariff methodology according to the TAR NC article 26. The consultation is performed between April 1 and June 1, 2020. The consulted methodology will be applied from the beginning of 2021. Figure 1 sets the timeline for tariff methodology process according to the TAR NC Article 27. This consultation is subject to the tariff methodology, RPM, which is proposed to be applied in Finland from the beginning of 2021. Finnish NRA makes the final decision about the RPM by the beginning of October. The consultation includes indicative reference prices to illustrate how RPMs affect to the reference prices in different scenarios. During the last quarter of 2020, public consultation about tariffs will be organized so that the final tariffs will be published by 30.11.2020 as shown in the figure below.

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[2] Directive 2009/73/EC of the European parliament[2] and of the council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC

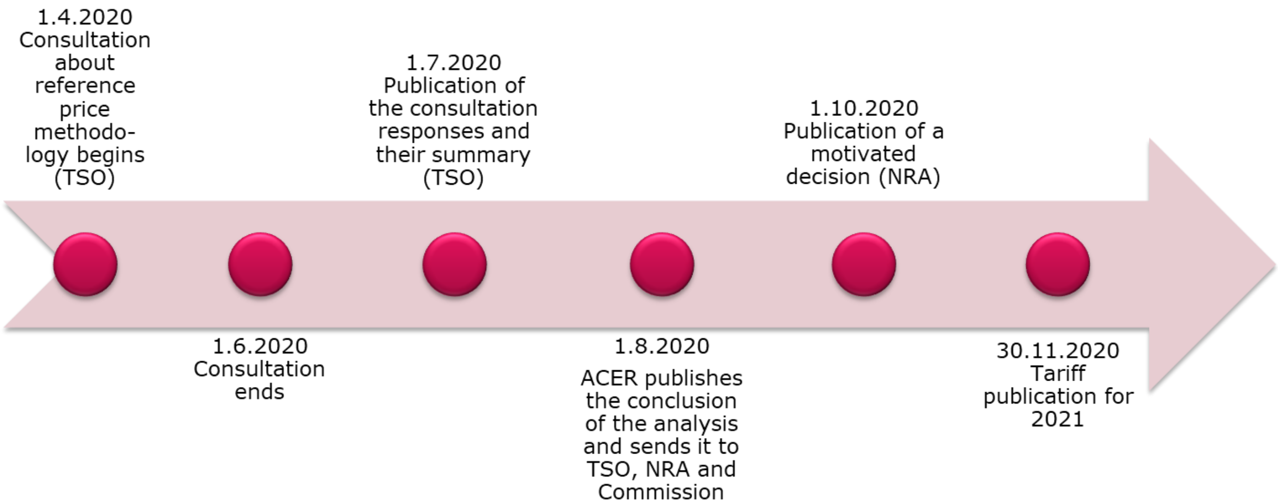

Figure 1. The tariff methodology consultation process. Before tariff publication, separate consultation about the final tariffs will be organized.

The consultation includes indicative reference prices for entry and exit capacity (= the tariff of yearly capacity products). The multipliers of short-term capacity products are consulted at the same time by Energy Authority.

Gasgrid Finland invites all interested parties to submit opinions and comments for this consultation document by e-mail to the e-mail addresses commercial@gasgrid.fi and kirjaamo@energiavirasto.fi by 23.59 EEST on 1 June 2020. In accordance with TAR NC, within one month following the end of this consultation all responses received and their summary will be published on Gasgrid Finland's website. Therefore, please include a non-confidential version of your response suitable for publication.

At the same time when launching this consultation, Gasgrid Finland sends the consultation for ACER. Within two months following the end of the consultation, ACER shall publish the conclusion of its analysis which shall be publicly available.

Further information on the consultation material and the consultation process gives Mika Myötyri, gas market specialist of Gasgrid Finland.

Mika Myötyri
Mika.myotyri@gasgrid.fi
+358451124515

2 Gasgrid Finland Oy and the Finnish gas transmission system (TAR NC Article 26 (1)(a)(i))

2.1 Gasgrid Finland Oy

The derogation from compliance with requirements under EU legislation granted for Finland by the European Union ended when the Balticconnector interconnector pipeline between Finland and Estonia was completed, and the Finnish gas market was opened to competition on 1 January 2020.

Transmission network operations were unbundled from Gasum Ltd into a separate company. From1 January 2020, the gas transmission network company Gasgrid Finland Oy owned by the State of Finland has been responsible for gas transmission in Finland.

More information about Gasgrid Finland can be found on our website: www.gasgrid.fi/en

2.2 Finnish transmission system

As of 2021 the Finnish gas system will consist of 8 entry points. Cross-border entry points include an interconnection point between Finland and Estonia, (Balticconnector, bi-directional) and a third-country entry point between Finland and Russia (Imatra, direction from Russia to Finland). Additionally, there are four biogas producing plants connected to transmission system and one to distribution system. In 2021, a Liquified Natural Gas ('LNG') terminal is likely to be connected to the Finnish gas transmission system based on the project schedule of the LNG operator (Hamina LNG).

Figure 2. Transmission system and the compressor stations in Finland.

1) Imatra compressor station
    - 3 gas powered compressor units;
        - the shaft power of 2 compressor units is 5 MW each, one unit 10 MW
        - transport capability: 2 compressor units 250 000 m3/h each, one unit 500 000 m3/h
2) Kouvola compressor station
    - 3 gas powered compressor units;
        - the shaft power of 2 compressor units is 5 MW each, one unit 10 MW.
        - transport capability: 2 compressor units 350 000 m3/h each, one unit 700 000 m3/h
3) Mäntsälä compressor station
    - 2 gas powered compressor units;
        - the shaft power of these 2 units is 6,4 MW each.
        - transport capability 300 000 m3/h each
4) Inkoo compressor station
    - Inkoo compressor unit is driven by an electric motor. The shaft power is 6,4 MW and transport capability 300 000 m3/h.

The length of Finnish gas transmission pipelines is approximately 1247 km. Most of the pipelines are onshore pipelines, but approximately 39 km is offshore pipeline in Balticconnector. The lengths of the pipelines with different diameters are presented in the Table 1 below:

Table 1. Pipeline lengths in the Finnish gas transmission system.

DN	Total length [km]
≤200	218,5
250 - 400	352,8
500	385,5
700	167,1
900 - 1000	122,9
Total	**1247**

Most of the pipes are made of steel, most of which are coated with polyethylene plastic. In addition to high-pressure pipelines, the transmission network also features 60 km of low-pressure pipelines. The protection against corrosion provided by the gas pipeline coating is supplemented by a cathodic protection system. The oldest sections of the pipelines were taken into use in 1974. 80 % of the pipelines can be inspected internally.

The transmission pipeline network also includes offshore steel pipeline from Paldiski, Estonia, to Inkoo, Finland, which is jointly owned with the Estonian transmission system operator for electricity and gas, Elering AS. The interconnector pipeline can be operated in both directions.

There are valve stations installed at intervals of 8-32 km along the transmission pipeline network. Their safety cut-off devices can be used to cut off gas transmission and distribution and release gas from a pipeline section using a measure called blowdown. The total number of valve stations is 166, and 40 of these are remotely controlled.

Gasgrid Finland has its own data transporting system with link stations via which the network's operating, monitoring and alert data is submitted to the Kouvola Central Control Room that is staffed 24/7.

Pressure reduction stations form part of the transmission pipeline system. The stations are located at the customer interface close to customers' distribution pipelines or processes. The pressure reduction stations are used to regulate gas pressure to a level suitable for the customer. The volume measurement of gas transmitted takes place at pressure reduction stations.

Gas is odourised before delivery to customers. In special cases, gas can also be delivered unodourised, but this requires a permit from the Finnish Safety and Chemicals Agency (TUKES).

In addition to natural gas, renewable biogas from four different Finnish biogas plants is injected into the gas transmission network. The biogas plants are located in Espoo, Kouvola, Lahti and Riihimäki. In addition, one biogas plant located in Hamina is connected to the distribution network.

In 2017 one of the two parallel pipelines from Imatra to Pajari was decommissioned to increase cost-efficiency of the transmission system. The remaining capacity satisfies well the needs of the Finnish gas market.

Future development

Gasgrid Finland maintains a long-term investment plan ("LTIP") for gas grid development in Finland. The LTIP is a roadmap for future grid investments and maintenance planning. By updating and following the LTIP, Gasgrid Finland is able manage its costs and ensure proper life cycle management of the transmission network assets.

The LTIP ensures continuous upkeep of aging assets. All necessary maintenance investments are carefully planned and updated to LTIP and scheduled to following years. The current gas transmission network has been operated since 1974. Over four decades no significant incidents have incurred on the gas transmission network due well-planned preventive maintenance.

Finnish gas use has decreased from over 50 TWh (GCV) to current 20-26 TWh per annum in the past ten years. As the Finnish gas transmission network is in good condition and in line with current transmission needs and as no significant increase in future gas consumption is expected, no major investments are currently planned to the network. Current focus on network planning is the maintenance of existing assets. Safe, reliable and cost-efficient gas transmission are the key drivers of network development.

Gasgrid Finland has started a project on strategy update in 2020 and as a part of the projects investigates the need and role of the gas transmission system in the future Finnish carbon neutral energy system (2040) which may affect future development needs.

3 Allowed revenue and other relevant financial values

In Finland the regulatory period is four years. The ongoing period takes place 2020-2023. Non-price cap regime is applied. The tariff period is a calendar year.

3.1 Regulation method

Energy Authority (FIN: *Energiavirasto*) is the National Regulatory Authority in Finland. Energy Authority regulates the reasonableness of pricing of gas transmission operations. For this purpose, the regulation method, which have been prepared as an official task within the Energy Authority, is the base for calculating allowed revenue for Gasgrid Finland's business (figure 3 below). The left-hand side of figure 3 presents methods for adjusting the balance sheet, i.e. calculating a reasonable rate of return. The right-hand side of the figure presents methods for adjusting the income statement, i.e. calculating the realized adjusted profit.

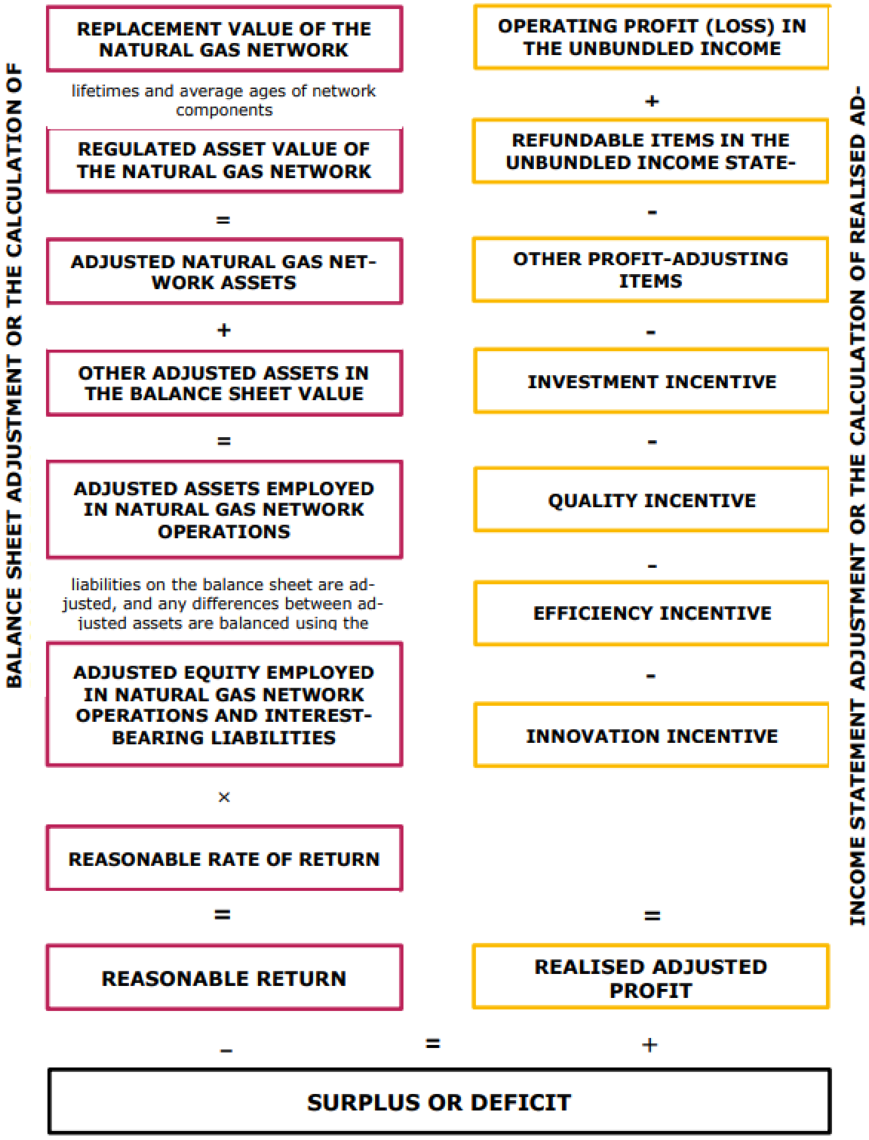

Figure 3: Regulation method during regulatory period of 2020–2023.

In the regulatory decision, the NRA summarizes the realized adjusted profit from each year of the regulatory period applying the regulation method confirmed and the regulatory information provided by Gasgrid Finland. NRA deducts the sum of allowed revenues from the same years from this amount. The result is the regulatory period's surplus or deficit. If the realized adjusted profits accrued over the entire regulatory period are less than the level of allowed revenue, Gasgrid Finland has a deficit. If the realized adjusted profits accrued over the entire regulatory period are more than the level of allowed revenue, Gasgrid Finland has a surplus.

If the realized adjusted profit has, during the regulatory period, exceeded the level of allowed revenue by at least 5%, interest on the surplus must be paid. The interest rate used is the average of the reasonable cost of equity 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 regulatory decision takes account of any surplus or deficit carried over from the preceding regulatory period.

3.2 Revenue and allowed revenue during regulatory period 2020-2023

The information about the deficit or surplus from the previous regulatory period (2016-2019) is not yet available at the time of preparation of this material and launching the consultation 1st of April, **so the transmission service revenue and level of allowed revenue for the year 2021 during the ongoing regulatory period 2020-2023 is defined with the assumption of no deficit or surplus from the previous regulatory period.**

Updated predictions of the level for both revenue and allowed revenue and their implications on the tariff level for 2021-2023 will be provided for Finnish market participants during fourth quarter of 2020 together with updated documentation on tariff levels for 2021. All figures in this documentation are only indicative.

The expected revenue from transmission and non-transmission services are summarized in the table 2 below. The net revenue to be collected by transmission service tariffs are set so that based on the forecasted use of transmission services Gasgrid Finland will not collect surplus nor deficit.

Table 2. Expected revenue to be collected by Gasgrid Finland (t€).

	2020	2021	2022	2023
Net Sales	83 679	82 087	81 513	80 698
Transmission	83 679	82 087	81 513	80 698
Non-transmission	-	-	-	-

Table 2 data is based on the information of 1st quarter 2020. There is legislative amendment foreseen in terms of non-transmission service so the mark "-" might change in the future (see section 11 of this consultation). The non-transmission revenue will be small compared to transmission revenue. The non-transmission revenue is estimated to be approximately 0,2 M€ per year.

The expected profit from transmission and non-transmission services ("Allowed Revenue") are summarized in the table 3 below.

Table 3. Estimated Allowed revenue[t€].

2020	2021	2022	2023
49 700	45 576	41 841	38 969

Gasgrid Finland's allowed revenue is based on the value of the asset (includes Gasgrid Finland's gas infrastructure, IT systems etc.) and the WACC (Weighted Average Cost of Capital) -% which is set by NRA.

NRA sets the WACC-% for the following year during October. Thus, the estimated allowed revenues are based on the forecast of WACC-%. The allowed revenue will be collected by transmission service tariffs.

Transmission service revenue is collected through transmission charges and commodity charges. The only non-transmission charge accounted to the 'non-transmission' account in the future will be the charge for centralized data exchange (datahub charge) in retail market. The row for non-transmission is currently empty as legislation concerning the Act on the Control of the Electricity and Natural Gas Market has not yet (in course of preparation of consultation document) been passed in the Finnish Parliament. The legislation is expected to enter into force during 2020. The amendment to the legislation is in process, because the datahub will be operated by Gasgrid Finland and the datahub system would have a legal monopoly in the provision of its services, so the terms and pricing methods of the services would need to be established. Supervision of the system's operation would be entrusted to the Energy Authority (NRA). According to a preliminary estimate, "non-transmission service revenues" will not generate significant revenue.

In this document, all revenue collected through datahub charges are a part of the transmission pool. In the future, Gasgrid Finland will be allowed to collect profit as the regulatory method is developed and the amendment to the Finnish Gas Market Act is entered into force. The principles of the regulation method will be approved only after the amendment in the legislation has been approved by the Finnish Parliament.

4 ITC Agreement between Finnish, Estonian and Latvian TSOs

Finnish, Estonian and Latvian TSOs have established common entry-tariff zone from 1st of January 2020. The target of the entry-tariff zone is to facilitate the cross-border trading and deepen market integration. The common entry-tariff zone consists of two balancing zones – Finnish balancing zone and Estonian-Latvian balancing zone.

4.1 Principles of the ITC mechanism

The common entry-tariff zone follows the principles described below:

- Setting the same level of entry tariff for all external points (Imatra in Finland) through coordinated decision making;
- No capacity booking on the border between EE and LV;
- Implicit capacity allocation at Balticconnector (FI-EE), no tariff for capacity (two balancing zones in the merged tariff zone);
- No capacity booking and tariff for internal entry-exit point with storage (Incukalns).

Tariff setting principles:

- Every country will apply the same RPM, postage stamp, separately;
- Reference price of entry tariff set using benchmark;
- The same set of short-term multipliers for entry tariffs applied;
- Exit tariffs to domestic consumption and exit tariffs on external entry-exit points – set by national decision;
- The result of ITC process treated as part of transmission service revenue, reducing the share of transmission service revenue collected from exit.

ITC mechanism with following principles:

- Simple to implement and beneficial for the gas users and shippers in the joint entry-tariff area
- Treatment of entry revenue as a virtual revenue pool;
- Compensation of variable costs of compressor units involved in supporting of gas flows in the region from the virtual revenue pool;
- Monthly sharing of residual of pooled revenue (after compensation of variable costs) according to ITC shares – proportions based on the size of specific national market in combined market size of FI, EE and LV (region is end user market, cross-border flows are not taken into account).
- The entry revenue share of each country is calculated ex-ante. After the calendar year, the revenue is reconciled based on the actual, measured gas quantities (validated metering data).

The entry points with harmonised tariff for the area and concerning the ITC agreement are (status in March 2020):

- RU-FI border: Imatra entry point;
- RU-EE border: Värska entry point;
- RU-EE border: EE-RU entry point on the Pskov-Riga pipeline;
- RU-EE border: Narva entry point;
- LV-LT border: Kiemenai interconnection point.

Entry revenue collected from entry points of the common tariff zone is redistributed between TSOs

The ITC mechanism redistributes the collected entry revenues according to the share of domestic consumption in each country. As a theoretical example, if 100 % of gas would be entered to the tariff zone through Kiemenai entry point, Gasgrid Finland would not get any entry revenue without ITC agreement, because there is no tariff at Balticconnector. Assuming that Finnish gas consumption of total gas consumption in the area is 60 % while Estonian and Latvian TSOs have 20 % share each, 60 % of collected entry revenue would be re-distributed for Gasgrid Finland. NOTE! The figures presented in the example are purely exemplary and do not reflect to the actual figures in the area.

The ITC agreement re-distributes the entry revenue pool so that the Finnish market participants do not compensate the costs of regional flows on behalf of other market areas. The revenue collected from entry capacity product bookings, is allocated so that the country using gas gets the revenue. The revenue not collected by entry revenue is collected by exit revenue set on a national basis. The entry reference price and multipliers are harmonized with Estonian and Latvian TSOs, and the revenue collected by these tariffs are re-distributed based on national consumption. The rest of transmission service revenue is collected by exit charges. Thus, the exit reference price depends on national consumption

Eligible variable costs

As part of the ITC mechanism, the eligible variable costs (costs for TSOs caused by regional flow) are compensated using the variable cost compensation mechanism. The part of variable costs which can be included to the pool of regional flow cost can be subtracted from the entry revenue pool. In practice, the

TSO using its compressor stations for the purpose of regional flow, gets compensation, because instead of sharing the entry revenue pool as such, the eligible variable costs are reduced from the pool so that TSO can keep the subtracted revenue itself.

Theoretical example to describe the principle of eligible variable cost subtraction with the following assumptions:

- Share of Finnish market 50 %, Estonian and Latvian market 25 % each.
- Entry revenue pool 10 M€ (collected from entry points listed above)
- Gasgrid Finland has eligible variable costs 1 M€, no eligible variable costs in EST and LV TSOs

1) Eligible variable costs subtracted from entry revenue pool

$$Entry\ revenue\ basket\ for\ redistribution = 10\ M€ - 1\ M€ = 9\ M€$$

Finnish TSO keeps 1 M€ itself.

2) Entry revenue pool redistributed based on the share of national market

- Finnish TSO: *50 % x 9 M€* = 4,5 M€
- Estonian TSO: *25 % x 9 M€* = 2,25 M€
- Latvian TSO: *25 % x 9 M€* = 2,25 M€

NOTE! The figures presented in the example are purely exemplary and do not reflect to the actual figures in the area.

4.2 Entry tariff setting

In determining the level of entry tariff, the EU entry tariff benchmarking result was adjusted so that the applied value includes the variable costs. Thus, separate commodity tariff is not applied at entry points, but flow-based costs are included to the ITC agreement by the principle of eligible variable cost calculation. As determining the entry tariff, the objective was to set the reference price and the multipliers so that entry tariffs would stay as is several tariff periods for the sake of predictability for market participants. The value for entry tariff is set together with Estonian and Latvian TSOs and NRAs. The currently valid reference price for entry capacity is 0,14277 €/kWh/day/year. Also, the multipliers are harmonized in the common tariff zone:

- Yearly capacity (reference price): 1
- Quarterly capacity: 1,1
- Monthly capacity: 1,25
- Daily capacity: 1,5
- Within-day capacity: 1,7

The reasoning for the multipliers is explained in the consultation carried out by Energy Authority at the same time with this consultation.

4.3 Impacts of ITC agreement to the gas market

In the public consultation of the tariff and tariff methodology during 2019, before market opening in Finland, market participants strongly supported the initiative of not setting a tariff on Balticconnector to facilitate competition and market opening.

First months of operations indicate that forming the common entry-tariff-area and ITC-agreement have been beneficial to the market by enhancing cross-border trading and harmonized gas prices in the Finland-Estonia-Latvia region. Price-convergence between the market area is good (GET Baltic data) even with capacity limitations on the border. All given Balticconnector capacity available has been used by the market.

Without the ITC agreement, for the Finnish gas user, imposing a tariff on the Balticconnector would mean that the gas coming from Estonia would have to be at least equally cheaper than exit tariff set by Estonian TSO and entry tariff set by Gasgrid Finland, so that it would be worth crossing the border. The tariff would be set on both sides of the border. The higher the cross-border transmission charge is, the less likely it is that trade and cross-border flows of gas will occur.

The ITC-Agreement will be renegotiated in case of changes in operating environment or gas markets that cause detrimental effects to the gas markets of any of the ITC-Agreement participating countries.

4.4 Impacts of ITC agreement to the reference price

The impact of ITC agreement to the RPMs are described in sections 6 and 7 of this consultation.

5 Principles and alignments used in Reference Price calculations

As described in TAR NC Article 26 (1)(a)(vi) 'where the proposed reference price methodology is other than the capacity weighted distance (CWD) reference price methodology detailed in Article 8, its comparison against the latter', the comparison of CWD and the proposed RPM, postage stamp methodology, is part of this consultation.

The CWD assumes charging only capacity-based tariffs. Entry-exit split 50:50 must be used. Due to this requirement, CWD calculation with ITC agreement described in section 4 is not possible, as the entry tariff is harmonized with Estonian and Latvian TSOs and there is no tariff in Balticconnector. Thus, the calculation of CWD and postage stamp is done so that impact of ITC agreement is excluded, and Finland evaluated as its own entry-exit area – with tariffs on all borders and without ITC-agreement in place. This approach enables the comparison of RPMs with comparable input values.

In addition to the comparison of CWD and postage stamp RPMs with same entry exit split (50/50), the comparison of postage stamp without ITC agreement and postage stamp with ITC agreement is done. In these calculations, the harmonized entry reference price is used as an input value. This approach enables to illustrate the impact of ITC agreement to the proposed RPM.

The annual consumption in Finland is estimated to be 20-26 TWh/a in 2020-2023 based on historical consumption and depending on weather (cold/warm year). In the calculation a medium of 23 TWh/a (GCV) during the period of 2020-2023 is used. Warm weather in early 2020 and the corona virus and its impacts on gas consumption are factors that give rise to uncertainty in the estimates made in early 2020. Estimate for 2021 gas consumption will be revised this year before final tariffs are set.

Due to a new physical connection (Balticconnector, commissioned 1.1.2020) and opening of gas market including the introduction of new gas market model with standard capacity products in the Finnish gas market, all the values used in the following calculations that are based on market behavior include high uncertainties and should not be seen as official forecasts of Gasgrid Finland. Gasgrid Finland has started its operations 1.1.2020 and has almost to none historical data from market behavior in the new market model.

For transit flows two scenarios have been calculated – one with no transit flow (flow from Estonia to Finland throughout the year) and another with transit flow of 10 GWh/day during the injection season of Incukalns gas storage injection season in Latvia leading to the annual transit flow quantity of 1,66 TWh.

In the flow scenario, it is assumed that all gas flowing to exit direction of BC is considered as transit flow and transit gas has entered into Finnish system from other entry points than Balticconnector entry point.

In this consultation all capacity is considered to be firm capacity. Interruptible capacity is offered only at Imatra entry point, because there is plenty of capacity available at exit zone. Also, at Imatra point, the probability that interruptible capacity will be used is expected to be low. At Balticconnector there is no tariff at all, and according to the applied implicit capacity allocation principle capacity is allocated based on confirmed nominations.

5.1 Annualization factor

According to the exit-exit model, standard capacity products are offered for shippers. In determining the reference prices, the impact of the multipliers of short-term products shall be considered, because shippers do not only book yearly capacity product. Thus, the capacity product booking pattern is considered to compute reference prices.

5.1.1 National and regional booking patterns

The booking pattern of standard capacity products is based on the optimal capacity bookings of one shipper. This approach is chosen, because Gasgrid Finland has no historical data about shippers' capacity booking behavior as the standard capacity products were introduced 1st of January 2020. Booking pattern have been modelled for two cases:

1) Finnish national booking pattern – 'one shipper booking capacity products optimally based on the Finnish gas consumption profile'

2) Regional booking pattern consisting of Finnish, Estonian and Latvian market areas – 'one shipper booking capacity products optimally considering the gas consumption profiles in the common tariff area.

The results of the modelling are presented in the table 4 below.

Table 4. Modelled national and regional capacity booking patterns.

Capacity product	Share FIN (%)	FIN+EST+LV, %	Multiplier
Year	69,2	59	1

Quarter	14,2	20	1,1
Month	5,8	11	1,25
Day	6,6	5	1,5
Within-day	4,2	5	1,7

5.1.2 Calculation of the annualization factor based on booking patterns

The modelled booking patterns have been used for the annualization of estimated consumption which adjust the estimated domestic consumption and transit flows so that the short-term capacity product derivatives are considered. If this would not be done, the reference prices would be too high, because all capacity is not booked by yearly products with multiplier 1, but the actual booking pattern is a combination of standard capacity products.

Exit reference price will be calculated by Gasgrid Finland with inclusion of modelled national booking pattern. For exit capacity, modelled national booking pattern is used to annualize the domestic gas consumption and potential transit flow.

Instead, in calculations of entry reference price and entry revenue, the national and regional boking patterns are used depending on the case. If ITC agreement is included in the calculation, entry booking pattern is used. If ITC agreement is excluded in the calculation, national booking pattern is used. The reason for this is following: Without ITC agreement there is no common tariff zone and there is tariff at BC. With ITC agreement the common tariff zone exists, and the entries are reviewed on a regional basis. Also, there is no tariff at BC.

In all calculations in this consultation, the annual domestic consumption is expected to be 23 TWh. The annualization factor and the treatment of transit flow (whether ITC is included or excluded) affect to the annualized gas quantity used in the calculation.

The annualization factor is calculated as follows:

$$Annualization\ factor = \sum(share\ of\ each\ capacity\ product \times multiplier\ of\ each\ capacity\ product)$$

With this formula, the 'share weighted' multiplier describing the booking pattern is calculated. The annualization factors are the following:

1) The annualization multiplier for the Finnish national entry and exit: 1,0908.

2) The annualization multiplier for regional entry consisting of Finnish, Estonian and Latvian market areas (for the cases where the ITC agreement is included): 1,1075.

The small difference in the annualization factors is caused by the slightly higher share of short-term products in the regional context in the model.

Table 5. Estimated (annualized) capacity bookings used in the calculations for 2021.

Estimated capacity bookings (annualized)	Scenario 1*	Scenario 2**	
ENTRIES (NO ITC)	25 087 655	26 898 317	MWh
EXITS (NO ITC)	25 087 655	26 898 317	MWh

ENTRIES (ITC)	25 472 500	25 472 500	MWh
EXITS (ITC)	25 087 644	25 087 644	MWh

*Scenario 1: Domestic consumption 23 TWh, transit very small (10 GWh)
**Scenario 2: Domestic consumption 23 TWh, transit 1,66 TWh.

6 Capacity Weighted Distance Reference Price Methodology

Reference price methodology means the methodology applied to the part of the transmission services revenue to be recovered from capacity-based transmission tariffs with the aim of deriving reference prices.

TAR NC sets pre-condition for the CWD calculation: 50:50 entry-exit split shall be used. Because of this requirement, CWD calculation for the case with ITC mechanism is not possible to calculate, because the harmonized entry tariff cannot reach the share of 50 % with any arrangement in Finland. Thus, Gasgrid Finland has made a reference price calculation for the case “Finland is not part of any integration and forms its separate entry-exit-area”.

The reference price methodology shall comply with Article 13 of Regulation (EC) No 715/2009 and with the following requirements:

a) enabling shippers to reproduce the calculation of reference prices and their accurate forecast;
b) taking into account the actual costs incurred for the provision of transmission services considering the level of complexity of the transmission network;
c) ensuring non-discrimination and prevent undue cross-subsidization including by taking into account the cost allocation assessments;
d) ensuring that significant volume risk related particularly to transports across an entry-exit system is not assigned to final customers within that entry-exit system;
e) ensuring that the resulting reference prices do not distort cross-border trade.

6.1 The description of Capacity Weighted Distance (CWD) Reference Price Methodology (RPM)

In case of the CWD methodology, the cost drivers for the calculation are distance and capacity. The logic of CWD is to distribute all costs among network points in a cost-reflective way, taking into account both the location of the point in the system, and the booked capacity on all points. The logic behind the usage of CWD values is based on the ‘gas does not stay in the system’ principle. CWD methodology assumes that the share of the allowed revenue to be collected from each point should be proportionate to its contribution to the cost of the capacity of the system.

For all entry points the total capacity booking (the amount of gas to be injected into the system at that point) is “distributed” among the exit points proportionally to their booked capacity values. The full distance that the gas flows in the system can be calculated by using the (booked) capacity weighted distances between the given entry point and all exit points.

The same applies for exit points: gas going out from the system should have come from one of the entry points, thus the total length of the route the gas was transported on can be calculated as the capacity weighted distance between the given exit point and all entry points. At the end, cost-reflective tariffs for all entry and exit points are calculated, taking into account how much gas should be transported inside the system to realize the level of flows foreshadowed by the bookings on all entry and exit points.

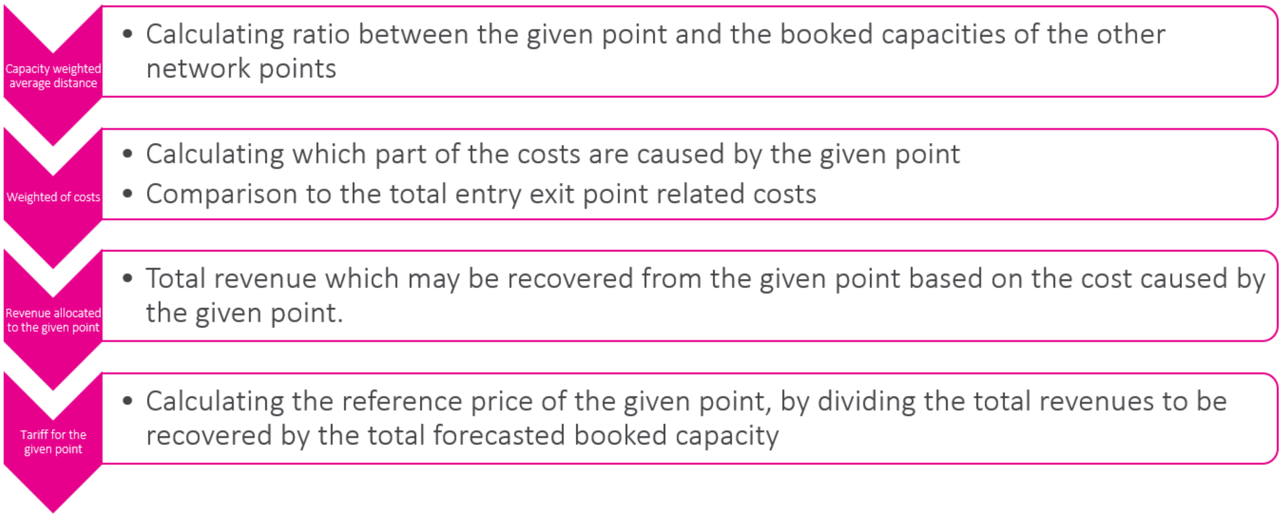

Figure 4: The CWD calculation process.

According to the article 8 of TAR NC parameters for the capacity weighted distance RPM shall be as follows:

a) the part of the transmission services revenue to be recovered from capacity-based transmission tariffs is subject to the calculation;
b) the forecasted contracted capacity at each entry point or a cluster of entry points and at each exit point or a cluster of exit points;
c) where entry points and exit points can be combined in a relevant flow scenario, the shortest distance of the pipeline routes between an entry point or a cluster of entry points and an exit point or a cluster of exit points;
d) the combinations of entry points and exit points, where some entry points and some exit points can be combined in a relevant flow scenario;
e) the entry-exit split shall be 50/50.

6.2 Technical capacity calculation

Technical capacity is calculated for each entry point, exit point and clustered exit point. Regulation (EC) No 715/2009 defines technical capacity as follows: ‘technical capacity’ means the maximum firm capacity that the transmission system operator can offer to the network users, taking account of system integrity and the operational requirements of the transmission network.

In Finland, firm capacity is defined for market participants only at Balticconnector entry and exit point and at Imatra entry point for daily and within-day products. The firm capacity is not published for Finnish exit zone and longer-term capacity products at Imatra point, because Gasgrid Finland has evaluated there is plenty of capacity available for market participants and the capacity can be booked without any limitations. At Imatra point Gasgrid Finland has set the amount of firm capacity offered to shippers, because Gasgrid Finland needs time to operate the system to fulfil the needs in case of rapid changes in gas flows. Gasgrid Finland sets capacity available as much as possible taking into account security of supply and operational abilities.

Entry points

At Imatra entry point, technical capacity used in the calculation is maximum transport capacity.

Hamina LNG is not yet connected to the Finnish gas system. According to the project schedule, the terminal will be connected to Finnish gas system in 2021. The likelihood for the commissioning of LNG terminal is high so it is included into the calculation.

Balticconnector is the only interconnection point in the Finnish gas system. Balticconnector is a bidirectional pipeline. Balticconnector technical capacity is the maximum transport capacity in a design pressure.

Exit points

Balticconnector is the only exit point to the neighboring gas markets. Thus, flow to exit direction equals to transit flow.

Finnish exit zone consist of approximately 200 exit points out of which about 50 % are end consumers directly connected to transmission system and 50 % exit points to distribution network ('city-gates').

All exit points to consumption sites form the Finnish exit zone. The exit points are clustered to 25 exit points. Some clusters cover geographically quite wide area, because the consumption in the clustered area is relatively small. The clustered exit points can be seen from the figure below.

Because the firm capacity is not defined at exit zone, technical capacities for clustered exit points are defined by summing up the technical capacity concluded in the connection agreement between TSO and the end user. Such approach has been chosen, because there is plenty of capacity available for shippers at the exit zone.

Exit points are clustered, because there are quite some small-scale exit points in Finland. Instead of clustering all Finnish domestic exit points into one virtual exit point, the clustered exit points cover certain parts of Finnish transmission system (see figure 5 below). The clusters of exit points increase the level of simplicity in the calculation. The exit point clusters are pipeline branches in most cases, but there are also shorter pipeline sections with great technical capacities and longer pipeline sections with smaller technical capacities.

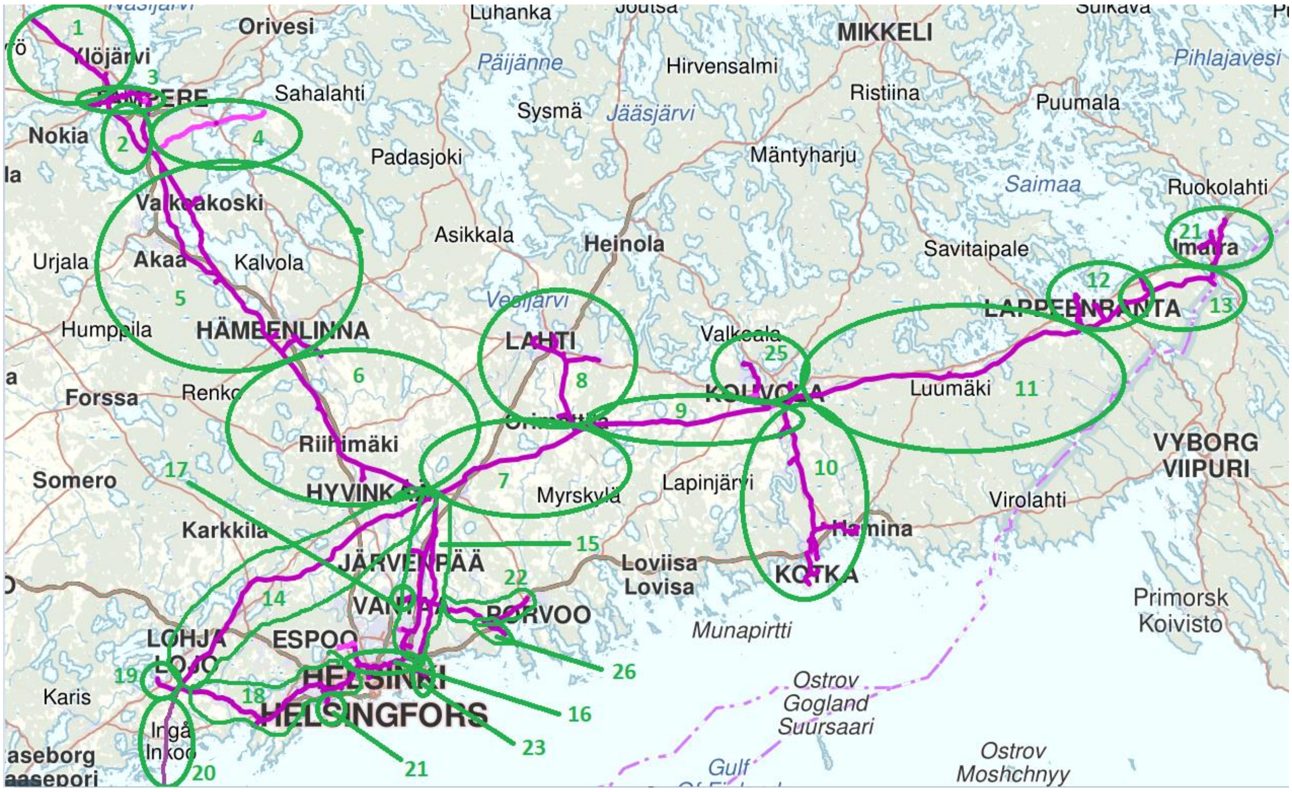

Figure 5. Balticconnector exit point and clustered exit points.

For each entry and exit points, the proportion of technical entry capacity at each point relative to the total technical entry capacity is calculated.

$$P_{En\_i} = \frac{C_{En\_i}}{\sum C_{En}} \qquad ,where$$

P_{En_i} *is the proportion factor of entry point i*
C_{En_i} *is the technical entry capacity of entry point i*

Table 6. Shares of technical capacity of entry points.

Entry point	Maximum technical capacity MWh/day/year	Share from total technical entry capacity [%]
Imatra	270000	75,93
Balticconnector	80800	22,72
Hamina LNG	4800	1,35

The technical capacity of the Balticconnector exit point is 80,800 MWh/day/year. The contract capacities have been used for the cluster of exit points, so they are not published in this document.

The similar calculation also for exit points:

$$P_{Ex1} = \frac{C_{Ex\_i}}{\sum C_{Ex}} \qquad ,where$$

P_{En_j} *is the proportion factor of exit point j*
C_{En_j} *is the technical exit capacity of exit point j*

For domestic exit points, the technical capacities of exit points directly connected to transmission system are based on the connection agreement concluded between TSO and market participant. Thus, the values of maximum technical exit capacities are not listed below to protect the information in the agreements especially in cases where the number of exit points in the cluster is limited. Instead, the proportions are listed below to illustrate the share of each exit point.

Table 7. Shares of technical capacity of exit points.

Exit points	Proportion
Kyröskoski branch	0,014939064
Nokia branch	0,012187131
Marjamäki – Nokia	0,064473857
Kangasala branch	0,008255799
Hämeenlinna - Marjamäki	0,02280173
Mäntsälä - Hämeenlinna	0,04088586
Leipälänkulma - Mäntsälä	0,004717599
Lahti branch	0,055431791
Kouvola - Leipälänkulma	0,0023588
Kotka branch	0,077840388
Hanhijärvi - Kouvola	0,010614598
Lappeenranta branch	0,034595728
Imatra – Hanhijärvi	0,037740794
Mäntsälä – Pölans	0,005110733
Mäntsälä - Suurmetsäntie	0,048748526
Suurmetsäntie - Vihdintie	0,016904731
Martinlaakso branch	0,027126196
Vihdintie - Djupström - Pölans	0,024374263
Pölans – Kirkniemi	0,024767396
Inkoo - BC offshore	0,132354868
Imatra branch	0,04560346
Porvoo branch	0,009042065
Vuosaari branch	0,127768313
Suomenoja branch	0,03970646
Kuusankoski branch	0,030664395
Kilpilahti branch	0,080985454

6.3 Distance calculation (Article 8(1)(c) of TAR NC)

In order to perform the calculation of CWD reference prices, the distances between each entry point and each exit point or cluster of exit points need to be calculated.

Entry points are treated as individual entry points, but exit points used in the calculation are clusters of individual exit points. The Annex A of TAR NC Implementation Guideline states that the calculation of the shortest pipeline distance is determined by selecting a focal point within the transmission system representing the cluster. <u>The locations of the focal exit points representing the clustered exit points are defined by calculating the weighted distance based on the technical capacity of individual exit points in the area of cluster.</u>

Distances between entry and clustered exit points are defined using weight of capacity. For each cluster of exit points, the virtual center point is defined for each clustered exit point, and the distance has been defined from entry point to the virtual center point.

In the following example the distance calculation is demonstrated.

1) Calculation of focal point along the pipeline for each clustered exit point. The focal point for each clustered exit point is calculated as described in the following example.

Table 8. Example of distance clustered exit point to the entry point.

Exit points	Technical capacity [MWh/day/year]	Distance from entry point [km]
Exit 1	1000	250
Exit 2	250	275
Exit 3	500	300

The focal point is calculated as follows (values from the table above):

$$Focal\ point = \frac{1000\ x\ 250 + 250\ x\ 275 + 500\ x\ 300}{(1000 + 250 + 500)} \approx \mathbf{268\ km}$$

For equal treatment, the capacity weighted distance is calculated by defining the focal point of each clustered exit point instead of calculating distance between entry point and the very end of the branch. As described in the figure 6, the focal point is closer to the entry point than exit point 2 located in the middle of two other exit points, because exit point 1 has greater capacity which drags the focal point more towards exit point 1 than exit point 3.

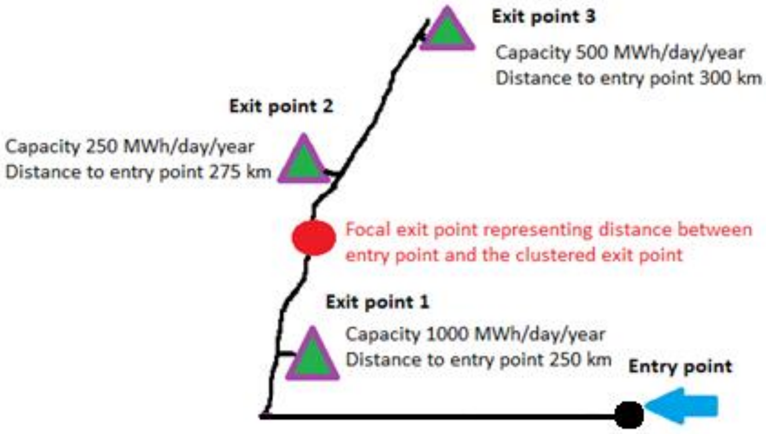

Figure 6: Calculation principle of focal point for each clustered exit point.

Calculation of capacity weighted average distance. By defining the focal point of the pipeline section which is as part of clustered exit point, the weighted distance between entry and clustered exit point are calculated.

The technical capacity of each exit point is multiplied by the distance to each entry point. The same calculation is done for all exit points belonging to the clustered exit point. The sum of values calculated is divided by the sum of technical capacities of each exit points belonging to the clustered exit point.

$$Capacity\ weighted\ average\ distance = \frac{\sum(technical\ capacity\ \times distance)}{\sum(technical\ capacity)}$$

The calculation is performed for each entry point as follows:

$$AD_{En\_i} = \sum P_{Ex\_j} \times D_{En\_i,Ex\_j} \qquad \text{,where}$$

AD_{En_i} *is the capacity weighted average distance from entry i*
P_{Ex_i} *is the proportion factor of exit point j*
D_{En_i,Ex_j} *is the distance from entry i to exit j*

Table 9. Capacity weighted average distance from each entry point to all exit points.

Entry points	Capacity Weighted Average Distance [km]
Imatra	245
Balticconnector	184
Hamina	190

The calculation is performed for each exit point as follows:

$$AD_{Ex\_j} = \sum P_{En\_i} \times D_{Ex\_j,En\_i} \qquad \text{,where}$$

AD_{Ex_j} *is the capacity weighted average distance from exit j*

P_{En_j} *is the proportion factor of entry point i*
D_{Ex_j,En_i} *is the distance from exit j to entry i*

Table 10. Capacity weighted average distance from each exit point to all entry points.

Exit points	Capacity Weighted Average Distance [km]
Kyröskoski branch	358
Nokia branch	341
Marjamäki – Nokia	334
Kangasala branch	327
Hämeenlinna - Marjamäki	298
Mäntsälä - Hämeenlinna	245
Leipälänkulma - Mäntsälä	193
Lahti branch	202
Kouvola - Leipälänkulma	158
Kotka branch	184
Hanhijärvi - Kouvola	145
Lappeenranta branch	125
Imatra – Hanhijärvi	114
Mäntsälä – Pölans	229
Mäntsälä - Suurmetsäntie	220
Suurmetsäntie - Vihdintie	228
Martinlaakso branch	236
Vihdintie - Djupström - Pölans	239
Pölans – Kirkniemi	243
Inkoo - BC offshore	263
Imatra branch	116
Porvoo branch	242
Vuosaari branch	230
Suomenoja branch	241
Kuusankoski branch	161
Kilpilahti branch	239

6.4 Determination of the weight and revenue allocation of each entry and exit point

Weight of each entry and exit point is calculated as the ratio between the product of its technical capacity with its average distance and the sums of such products for all entry points (respectively exit point).

$$W_{En\_i} = \frac{C_{En\_i} \times AD_{En\_i}}{\sum C_{En\_i} \times AD_{En\_i}}$$ *, where*

W_{En_i} *is the weight of entry point i*

$$W_{Ex\_j} = \frac{C_{Ex\_j} \times AD_{Ex\_j}}{\sum C_{Ex\_j} \times AD_{Ex\_j}}$$ *, where*

W_{Ex_j} *is the weight of exit point j*

With the weight of each entry and exit point, the share of transmission service revenue to be collected from each entry and exit point is calculated by multiplying the total revenue to be collected from entry points (respectively exit points) by the weight of each entry point (respectively exit point) as follows:

$$R_{En\_i} = W_{En\_i} \times R_{En} \qquad \text{,where}$$

R_{En_i} *is the revenue to be collected from entry point i*

$$R_{Ex\_j} = W_{Ex\_j} \times R_{Ex} \qquad \text{,where}$$

R_{Ex_j} *is the revenue to be collected from exit point j*

As a result, the revenue which is supposed to collect from the entry and exit points is determined.

6.5 Determination of the reference price for each entry and exit point

The reference price can be calculated by dividing the entry/exit revenue to be collected from the particular entry/exit point by the forecasted capacity of the particular entry/exit point. For the domestic exit points, the estimated capacity is based on the gas consumption during the year 2019. During that time standard capacity products and entry-exit market model weren't applied. Due to lack of historical data, the reference price calculation has been made for two different scenarios to illustrate the impact of scenario to the reference price calculation. As the entry exit split is 50/50, the transmission service revenue to be collected by capacity tariffs is approximately 39,5 M€ by entry capacity tariffs and 39,5 M€ by exit capacity tariffs. The CWD reference prices for each entry and exit points can be calculated as the weight of each entry and exit point and the estimated capacity is known.

Reference prices derived from CWD methodology are calculated for two scenarios to illustrate how the flow scenarios will impact on reference prices. Note that the scenarios are not the most potential scenarios seen by Gasgrid Finland, but the purpose of the scenarios is to illustrate the impact to the reference prices. Gasgrid Finland will be modelling scenarios during this year for the new market situation with alternative physical connection (before 2020 all gas excluding domestic biogas injection was entered into Finnish gas system through Imatra point).

1) **Scenario 1 (used latter in the comparison of CWD and postage stamp methodologies):** Domestic consumption 23 TWh, transit flow 1,66 TWh. This case has used in comparison of CWD and postage stamp methodology.

Table 11. Flow scenario 1 of CWD methodology.

ENTRIES	Scenario 1
BC	29 %
Imatra	70 %
Hamina	1%
EXITS	Scenario 1
BC	6 %

EXIT ZONE	94 %

Table 12. Entry reference prices for flow scenario 1.

ENTRY	€/kWh/day/year
Imatra	0,6189
Balticconnector	0,3358
Hamina	0,5988

Table 13. Exit reference prices for flow scenario 1.

EXIT	€/kWh/day/year
Kyröskoski branch	2,5238
Nokia branch	4,6414
Marjamäki – Nokia	0,9545
Kangasala branch	0,9582
Hämeenlinna - Marjamäki	0,8563
Mäntsälä - Hämeenlinna	0,6498
Leipälänkulma - Mäntsälä	0,9773
Lahti branch	1,7041
Kouvola - Leipälänkulma	0,5578
Kotka branch	0,4096
Hanhijärvi - Kouvola	0,6809
Lappeenranta branch	1,8515
Imatra – Hanhijärvi	0,2093
Mäntsälä – Pölans	0,8701
Mäntsälä - Suurmetsäntie	1,9525
Suurmetsäntie - Vihdintie	1,2278
Martinlaakso branch	2,3407
Vihdintie - Djupström - Pölans	2,0224
Pölans – Kirkniemi	2,0150
Balticconnector	1,2703
Imatra branch	0,2282
Porvoo branch	1,4372
Vuosaari branch	0,3557
Suomenoja branch	0,8307
Kuusankoski branch	0,2859
Kilpilahti branch	0,1538

2) **Scenario 2:** Domestic consumption 23 TWh, transit flow extremely small.

Table 14. Flow scenario 2 of CWD methodology.

ENTRIES	Scenario 2
BC	49 %
Imatra	50 %

Hamina	1 %
EXITS	Scenario 2
BC	0,1 %
EXIT ZONE	99,9 %

Table 15. Entry reference prices for flow scenario 2.

ENTRY	€/kWh/day/year
Imatra	0,9285
Balticconnector	0,2130
Hamina	0,6418

Table 16. Exit reference prices for flow scenario 2.

EXIT	€/kWh/day/year
Kyröskoski branch	2,5238
Nokia branch	4,6414
Marjamäki – Nokia	0,9545
Kangasala branch	0,9582
Hämeenlinna - Marjamäki	0,8563
Mäntsälä - Hämeenlinna	0,6498
Leipälänkulma - Mäntsälä	0,9773
Lahti branch	1,7041
Kouvola - Leipälänkulma	0,5578
Kotka branch	0,4096
Hanhijärvi - Kouvola	0,6809
Lappeenranta branch	1,8515
Imatra – Hanhijärvi	0,2093
Mäntsälä – Pölans	0,8701
Mäntsälä - Suurmetsäntie	1,9525
Suurmetsäntie - Vihdintie	1,2278
Martinlaakso branch	2,3407
Vihdintie - Djupström - Pölans	2,0224
Pölans – Kirkniemi	2,0150
Balticconnector	210,8728
Imatra branch	0,2282
Porvoo branch	1,4372
Vuosaari branch	0,3557
Suomenoja branch	0,8307
Kuusankoski branch	0,2859
Kilpilahti branch	0,1538

In scenario 2, the feature of CWD can be recognized. In this scenario technical capacity is relatively high, but the bookings are extremely low. Technical capacity sets the target for revenue collection from this exit point. While forecasted capacity is low, the unit price is unreasonably high. The methodology targets to collect the revenue by this very limited flow.

6.6 Analysis of the scenarios

As can be seen from the scenarios above, the case with very limited transit flow would increase the Balticconnector exit reference price significantly to a very high level. The reference prices at other exit points are the same, because in CWD methodology cost drivers are estimated consumption per entry and exit point, technical capacity and the distance between entry and exit points. If the estimated consumption changes at Balticconnector exit, it does not affect to the reference prices of other exit points, but it affects to Balticconnector exit reference price.

The characteristic of Finnish gas system is reflected from the reference prices. The number of household customers is limited and centralized to few certain areas. The share of CHP production and industry plays a great role. Less than ten biggest end consumers cover a great share of total annual consumption. The Finnish transmission system has capability to transport much higher gas quantities than at the time except Balticconnector which is used with high utilization rate during first three months of commissioning. Balticconnector's capacity has been limited to about 40% of maximum capacity due to delays in the commissioning of compressor stations related to the Balticconnector project. At the exit zone, great technical capacity, but relatively small consumption CWD methodology derives unreasonable reference prices for certain exit points. The range between the highest and lowest reference price is big due to the points mentioned before.

7 Postage Stamp - The proposed Reference Price Methodology (TAR NC Article 26 (1)(a)

The postage stamp methodology foresees the same reference price at all entries and the same reference price at all exits. The required inputs are the allowed revenue and the assumptions on capacity bookings. The reference price for each category of points is given by the targeted revenue for entry (respectively exit) divided by the total booked capacity, which is assumed for entry points (respectively exit points). Thus, the postage stamp methodology does not provide any locational signal, because the tariff is the same at each entry and each exit points.

The postage stamp is simplest methodology for deriving the reference prices.

$$Reference\ price\ entry\ (exit) = \frac{Revenue\ to\ be\ collected\ from\ entry\ (respectively\ exit) points}{Booked\ entry(\ respectively\ exit)\ capacity}$$

Because Finland is part of common entry tariff zone with Estonia and Latvia, postage stamp calculation is done for few cases to illustrate the influence of ITC agreement to the reference price and compare the reference prices derived from CWD and postage stamp methodologies.

1) Postage stamp calculation with ITC agreement
2) Postage stamp calculation with no ITC agreement, but with the entry reference price coordinated with Estonian and Latvian TSOs.
3) Postage stamp with ex-ante entry-exit split 50/50 for comparison of CWD and postage stamp methodology

Note that all the following cases are based on the flow scenario where there is transit flow from Finland to Estonia through Balticconnector. The transit volume used is mainly to illustrate the impact of transit flow, it is not the forecast of Gasgrid Finland on the flow profile for 2021. The scenario with transit flow illustrates the impact of ITC agreement better than with the case where all gas injected to Finnish gas system is also used by Finnish end consumers.

7.1 Calculation cases for postage stamp methodology

Three cases have calculated using postage stamp methodology:

1) Postage stamp methodology with common entry-tariff area with Estonia and Latvia with ITC agreement i.e. postage stamp hybrid
   - Reason for inclusion of the case to the consultation: <u>The case is the proposed methodology for 2021.</u>

2) Postage stamp methodology without common entry-tariff area with Estonia and Latvia and without ITC agreement, but ex-post entry-exit split so that share of entry gives the result of coordinated harmonized entry tariff of 0,14277 €/kWh/day/year.
   - Reason for inclusion of the case to the consultation: To illustrate the impact of ITC agreement to the reference price.

3) Postage stamp methodology with ex-ante entry-exit split of 50/50 without common entry-tariff area with Estonia and Latvia and without ITC agreement.
   - Reason for inclusion of the case to the consultation: For comparison of CWD and postage stamp calculation.

Table 17. Input values used in all 3 cases below.

Expected Revenue (capacity tariff)	79 083 760	€
Annual domestic consumption	23 000 000	MWh
Transit flow (from FIN to EST)	1 660 000	MWh

7.1.1 <u>Case 1 - Postage Stamp with ITC agreement “Postage stamp hybrid” (Current model)</u>

Case 1 is the current and proposed model for 2021, entry revenue of Gasgrid Finland is collected according to the principles of ITC agreement for reaching the common entry tariff zone.

In this case, transit flow and the revenue collected from it does not change the reference prices, because entry revenue will be re-distributed according to the share of gas consumption in each country, and exit revenue from transit flow is not collected at all, because there is no tariff at Balticconnector. Thus, only the national entry and exit capacity bookings have impact on the reference price. Domestic exit tariffs and exit tariffs out of the zone are not a part of the ITC agreement.

The domestic consumption used is 23 TWh. As the annual consumption is annualized, the values presented in table 17 are used. There is a slight difference between the annualized entry and exit gas quantities, because the annualization factor differs a bit in national and regional context (see section 5 of this consultation).

Transit flow is not considered in the calculation, because ITC mechanism re-distributes the entry revenue pool so that domestic consumption is relevant for reference price calculation. The annualized entry and exit equals to the domestic consumption multiplied by a factor representing the standard capacity product booking ratio.

$$Annualized\ consumption = Forecasted\ consumption\ x\ annualization\ factor$$

$$Annualized\ entry = 23\ 000\ 000\ MWh\ x\ 1{,}1075 = 25\ 472\ 500\ MWh$$

$$Annualized\ exit = 23\ 000\ 000\ MWh\ x\ 1{,}0908 = 25\ 087\ 644\ MWh$$

Table 18. Values used for case 1 of postage stamp calculation.

Annualized entry	25 472 500	MWh
Annualized exit	25 087 644	MWh
Entry reference price	0,14277	€/kWh/day/year

In this case, due to the ITC agreement, entry tariff is set to the harmonized value. Rest of transmission service revenue collected from capacity tariffs are collected from exit tariffs.

Converted to energy unit, the entry tariff of 0,14277 €/kWh/day/year equals to 0,391 €/MWh. The revenue to be collected by exit tariffs is calculated using the following formula:

$$Reveue\ collected\ from\ exit = total\ revenue - (entry\ reference\ price\ x\ annualized\ consumption)$$

Table 19. Values calculated from postage stamp calculation case 1.

Case 1 - ITC agreement		
Entry revenue	9 963 586	€
Exit revenue	69 123 174	€
Total	79 086 760	€
Entry reference price	**0,14277**	**€/kWh/day/year**
Exit reference price	**1,00567**	**€/kWh/day/year**
Total	1,14844	€/kWh/day/year

7.1.2 Case 2 - Postage Stamp without ITC agreement, entry reference price set to the harmonized value (0,14277 €/kWh/day/year)

In this case it is assumed that the flows are the same without the ITC agreement and with ITC agreement to illustrate the impact of the agreement to the reference price. In this case the annualized entry and exit values are higher, because entry and exit revenue is collected also from the transit flow (1,66 TWh) in this case. Because ITC agreement is excluded, the annualization factor both for entry and exit used is the national one (1,0908). If shipper wants to transport gas e.g. from Imatra entry point to BC exit to Estonia, entry and exit charges must be paid by shipper for transit flow.

Table 20. Input values used for case 2 of postage stamp calculation.

Annualization entry	26 898 317	MWh
Annualization exit	26 898 317	MWh
Entry reference price	0,14277	€/kWh/day/year

The postage stamp methodology gives the following results:

Table 21. Values calculated from postage stamp case 2.

Case 2 - no ITC agreement, ex-ante E/E split		
Entry revenue	10 521 295	€
Exit revenue	68 565 465	€
Total	79 086 760	€
Entry reference price	**0,14277**	**€/kWh/day/year**
Exit reference price	**0,93040**	**€/kWh/day/year**
Total	1,07317	€/kWh/day/year

The inclusion of transit flow increases the entry revenue collected by entry reference price. This leads to slightly smaller exit revenue to be collected by exit tariffs, and further smaller exit reference price.

7.1.3 Case 3 - Postage Stamp without ITC agreement, ex-ante entry-exit split 50/50

The results from case 3 are comparable to CWD calculation results, because the entry-exit split and the treatment of ITC agreement are the same. Annualized entry and exit quantities are the same than the case 2.

Table 22. Input values used for case 3 of postage stamp calculation.

Annualization entry	26 898 317	MWh
Annualization exit	26 898 317	MWh

50/50 entry-exit split means that the expected revenue pool is shared equally between entry and exit points which leads to the fact that entry and exit reference prices are the same. As the entry-exit split is 50/50 and entry and exit revenues are the same, the calculation produces equal entry and exit reference prices.

Table 23. Values calculated from postage stamp case 3.

Case 3 - no ITC, entry-exit split 50/50		
Entry revenue	39 543 380	€
Exit revenue	39 543 380	€
Total	79 086 760	€
Entry reference price	**0,53659**	**€/kWh/day/year**
Exit reference price	**0,53659**	**€/kWh/day/year**
Total	1,07318	€/kWh/day/year

7.2 Information according to the Article 30 (1)(b)(v)

In this section capacity-commodity split, entry-exit split and intra-system/cross-system split is calculated for all 3 cases described in section 7.1.

Capacity-commodity split means the breakdown between the revenue from capacity-based transmission tariffs and the revenue from commodity-based transmission tariffs.

$$Capacity\ share = \frac{Capacity\ revenue}{Total\ transmission\ service\ revenue} \times 100\%$$

$$Commodity\ share = \frac{Commodity\ revenue}{Total\ transmission\ service\ revenue} \times 100\%$$

Table 24. Capacity-commodity splits for the three cases of postage stamp methodology.

Capacity-commodity split	Capacity	Commodity
Case 1	96 %	4 %
Case 2	96 %	4 %
Case 3	96 %	4 %

Entry-exit split means the breakdown between the revenue from capacity-based transmission tariffs at all entry points and the revenue from capacity-based transmission tariffs at all exit points.

$$Entry\ share = \frac{Entry\ revenue}{Total\ revenue\ collected\ by\ capacity\ tariffs} \times 100\%$$

$$Exit\ share = \frac{Exit\ revenue}{Total\ revenue\ ollected\ by\ capacity\ tariffs} \times 100\%$$

Table 25. Entry-exit splits for the three cases of postage stamp methodology.

Entry-exit split	Entry	Exit
Case 1	**12,6 %**	**87,4 %**
Case 2	13,3 %	86,7 %
Case 3	50 %	50 %

The slight differences in case 1 and 2 is caused by transit flow. In case 1 transit flow is excluded from the calculation, because transit flow revenue is re-distributed for the Estonian or Latvian TSO which has used gas. In case 2, entry and exit revenue of transit flow is collected by Gasgrid Finland. The share of entry revenue is bigger which leads to slightly smaller exit share than in case 1. The entry-exit split stays as is in case 1 whether there is transit flow or not, because transit revenue is re-distributed and entry share depends on the Finnish national consumption.

Intra-system/cross-system split means the breakdown between the revenue from intra-system network use at both entry points and exit points and the revenue from cross-system network use at both entry points and exit points.

Table 26. Intra-system - cross-system splits for the three cases of postage stamp methodology.

Intra-system - cross-system split	Intra	Cross
Case 1	100 %*	0 %*
Case 2	93 %**	7 %**
Case 3	93 %**	7 %**

**ITC mechanism redistributes the entry* revenue *based on domestic consumption. Thus, TSOs in the common tariff area do not collect revenue from cross-system flows.*
***includes significant uncertainties due to lack of historical data with alternative physical connection. 93 %/7 % is based on the flow scenario where the transit flow is 1,66 TWh/year.*

Due to the ITC agreement, revenue collected from cross-system use is re-distributed so that Gasgrid Finland does not collect any revenue from cross-system flows.

7.3 Summary of the cases calculated by postage stamp methodology

Table 27. Summary of postage stamp calculation cases.

	Case 1 - ITC	Case 2 - no ITC	Case 3 - no ITC, E/E split 50/50	
Entry revenue	9 963 586	10 521 295	39 543 380	€
Exit revenue	69 123 174	68 565 465	39 543 380	€
Total	79 086 760	79 086 760	79 086 760	€
Entry tariff	**0,14277**	**0,14277**	**0,53659**	€/kWh/day/year
Exit tariff	**1,00567**	**0,93040**	**0,53659**	€/kWh/day/year
Total	1,14844	1,07317	1,07318	€/kWh/day/year

7.4 Assessment of the proposed RPM in accordance with Article 7

Gasgrid Finland proposes continue using postage stamp methodology including common entry-tariff area with Estonia and Latvia with ITC agreement ("postage stamp hybrid").

In this section, the proposed RPM, postage stamp, is assessed against the requirements set by TAR NC.

- Postage stamp methodology enables shippers to reproduce the calculation of reference prices and their accurate forecast. Postage stamp methodology is simple, and the cost drivers are forecasted capacity and transmission service revenue collected by capacity tariffs. Market participants have given positive feedback about postage stamp methodology, because the mechanism is simple and straightforward.
- The postage stamp methodology enables better predictability for tariffs than CWD methodology, as the Finnish gas consumption is expected to remain approximately at the same level during the ongoing regulatory period. Thus, no major changes in reference prices are expected between tariff years.

- Postage stamp methodology takes into account the actual costs incurred for the provision of transmission services considering the level of complexity of the transmission network. The feature of Finnish gas user portfolio is that there are few big gas consumers connected to the system, but quite some small-scale users. The distances are relatively long, because Finland is sparsely populated country also in southern part of country where the transmission system is located. Also, there is great potential to transport much bigger gas quantities at the exit zone than it is currently used. With these facts, some of Finnish gas users would face unreasonably high reference prices by CWD methodology which would most likely lead to smaller gas use, and further to increasing reference prices.
- Finland, Estonia and Latvia form a common tariff zone where entry reference price of common zone is harmonized. In all countries, postage stamp methodology is applied nationally so that revenue not collected by harmonized entry tariffs are collected by exit tariffs set on a national basis. ITC agreement concluded between Finnish, Estonian and Latvian TSOs re-distribute the collected entry revenue. Proposed methodology ensures that the resulting reference prices do not distort cross-border trade in the common tariff zone. Due to the ITC agreement, there is no tariff at Balticconnector at all, which facilitates cross-border trading between market areas.
- Methodology ensures that significant volume risk related particularly to transports across an entry-exit system is not assigned to final customers within that entry-exit system. Because of ITC agreement, the revenue collected from transit flows is re-distributed to the TSO whose area gas is consumed. The eligible variable costs caused by regional flow is compensated according to the principles of ITC mechanism. Transit flow (inside the common tariff zone) equals to the flow through Balticconnector exit point. ITC mechanism set the revenue sharing so that the country using gas and using its gas infrastructure for transporting gas from country to another inside the common tariff zone, gets compensated. Market area of common tariff zone is an end user market which means the use of common tariff zone area for transit purposes is limited.
- The postage stamp methodology makes it possible to apply the exit zone principle which is currently applied in Finland giving flexibility for market participants. The postage stamp methodology enables to import gas through entry point from where it is cheapest. If the CWD methodology were used to determine different prices for the pick-up points, the shipper would have to book exit capacity for each exit point separately due to the different reference prices. Diverging transmission tariffs for entry capacity would also mean that it might not be possible to transport gas from where it would be the cheapest.

7.5 Transmission tariff levels (Indicative information set out in Article 30(2))

The difference in the level of transmission tariffs for the same type of transmission service applicable for the prevailing tariff period and for the tariff period for which the information is published:

Table 28. Comparison of reference prices of 2020 and 2021.

	2020	2021	**Difference**
Entry reference price [€/kWh/day/year]	0,14277	0,14277	**0 %**
Exit reference price [€/kWh/day/year]	1,04859	1,00567	**-4 %**
Balticconnector entry/exit	-	-	**- %**

The estimated differences in the level of transmission tariffs for the same type of transmission service applicable for the tariff period for which the information is published and for each tariff period within the remainder of the regulatory period are estimated in table 29. The average annual domestic consumption used in the calculation is 23 TWh for the rest of the years of ongoing regulatory period (2021-2023). Also, due to lack of historical data for analysis, in this calculation the commodity revenue is estimated to be in the same level (3 M€) in 2021, 2022 and 2023. The allowed revenue is expected to decrease which has decreasing impact on the reference prices.

Table 29. Comparison of reference prices 2021, 2022 and 2023.

	2021	2022	2023	Difference 2021-2022	Difference 2022-2023
Entry reference price [€/kWh/day/year]	0,14277	0,14277	0,14277	0,0 %	0,0 %
Exit reference price [€/kWh/day/year]	1,00567	0,99733	0,98547	-0,8 %	-1,2 %
Balticconnector entry/exit reference price	-	-	-	- %	- %

Updated predictions of the level for both transmission service revenue and allowed revenue and their implications on the tariff level for 2021-2023 will be provided for Finnish market participants during fourth quarter of 2020 together with updated documentation on tariff levels for 2021. Gasgrid Finland stresses that all figures in this documentation are only indicative and base on estimations done in late 2019. They do not include. e.g. the possible effects of the exceptionally warm Q1/2020.

8 The comparison of the proposed Reference Price Methodology and the CWD methodology described in article 8 of the TAR NC

Where the proposed reference price methodology is other than the capacity weighted distance reference price methodology, the latter should serve as a counterfactual for comparison with the proposed reference price methodology. The NRAs of Finland and Baltic States have performed consultant study ‘Pricing model for the natural gas entry-exit system for the common Baltic-Finnish market’ in spring 2018. The result of the study was that the postage stamp methodology is the most beneficial reference price methodology taking into account the characteristics of the Finnish-Baltic market area. The results of the study prepared by Baringa Partners have presented below.

Table 30. Comparison of reference price methodologies in the Finnish-Baltic market area.

Criterion	Key consideration	Postage Stamp	CWD	Matrix
Economic efficiency	• Short run economic efficiency defined by lowest cost to consumers • Postage Stamp is estimated to bring the highest level of consumer welfare • Level playing field in tariffs among different supply sources ensures short-run efficiency as the cheapest supply source will generally flow first	◕	◒	◒
Facilitation of long-run consumer welfare	• A cost-reflective tariff methodology that incentivises investment to minimise total gas network cost would be expected to score highly on this criterion • Less relevant in the context of shrinking demand where the majority of future network cost is already sunk	◒	◕	◕
Facilitation of competition	• Equality of treatment across different supply sources likely to maximise benefits of competition • Differences in entry tariffs can be used by a dominant supplier to differentiate prices and extract consumer surplus • Low demand elasticity means that differentiated exit tariffs are not a competition concern	◕	◒	◔
Simplicity	• Ability of industry participants to replicate tariff methodology is the key determining factor • Matrix methodology is a clear outlier in terms of having the most significant requirement for data and being difficult to replicate and run	◕	◒	◔
Avoidance of significant transfers between national TSOs	• Model which produces lowest total transfers across a number of scenarios would perform well on this criterion • Matrix model results in lowest transfers due to its ability to reflect the costs of the local network in tariffs	◔	◒	◕

In order to compare the reference prices calculated by CWD methodology and postage stamp methodology, entry exit split of 50/50 is assumed. For postage stamp methodology, this is case 3 presented in section 7.2. above. The comparison of CWD and postage stamp gives the following results:

Scenario 1: Domestic consumption 23 TWh; transit 1,66 TWh.

Table 31. Comparison of the reference prices of CWD and postage stamp methodologies – scenario 1.

€/kWh/day/year

ENTRY	CWD	Postage Stamp - no ITC	Spread (100 % = no difference)
Imatra	0,6189	0,53659	87
Balticconnector	0,3358	0,53659	160
Hamina	0,5988	0,53659	90

EXIT	CWD	Postimerkki – ei ITC-sopimusta	Ero (100 % = ei eroa)
Kyroskoski branch	2,52380	0,53659	21
Nokia branch	4,64136	0,53659	12
Marjamäki – Nokia	0,95447	0,53659	56
Kangasala branch	0,95819	0,53659	56
Hämeenlinna - Marjamäki	0,85626	0,53659	63
Mäntsälä - Hämeenlinna	0,64978	0,53659	83
Leipälänkulma - Mäntsälä	0,97730	0,53659	55
Lahti branch	1,70408	0,53659	31
Kouvola - Leipälänkulma	0,55780	0,53659	96

Kotka branch	0,40961	0,53659	131
Hanhijärvi - Kouvola	0,68089	0,53659	79
Lappeenranta branch	1,85146	0,53659	29
Imatra – Hanhijärvi	0,20927	0,53659	256
Mäntsälä – Pölans	0,87011	0,53659	62
Mäntsälä - Suurmetsäntie	1,95249	0,53659	27
Suurmetsäntie - Vihdintie	1,22777	0,53659	44
Martinlaakso branch	2,34072	0,53659	23
Vihdintie - Djupström - Pölans	2,02241	0,53659	27
Pölans – Kirkniemi	2,01497	0,53659	27
Inkoo - BC offshore	1,27032	0,53659	42
Imatra branch	0,22820	0,53659	235
Porvoo branch	1,43725	0,53659	37
Vuosaari branch	0,35567	0,53659	151
Suomenoja branch	0,83071	0,53659	65
Kuusankoski branch	0,28588	0,53659	188
Kilpilahti branch	0,15380	0,53659	349

Scenario 2: the transit flow (=BC exit) is very low (10 GWh/year) while national consumption is still 23 TWh.

Table 32. Reference price comparison scenario 2.

€/kWh/day/year

ENTRY	CWD	Postage Stamp - no ITC	Spread (100 % = no difference)
Imatra	0,66324	0,57532	87
Balticconnector	0,35993	0,57532	160
Hamina	0,64177	0,57532	90

EXIT	CWD	Postage Stamp - no ITC	Spread (100 % = no difference)
Kyroskoski branch	2,52380	0,57532	23
Nokia branch	4,64136	0,57532	12
Marjamäki – Nokia	0,95447	0,57532	60
Kangasala branch	0,95819	0,57532	60
Hämeenlinna - Marjamäki	0,85626	0,57532	67
Mäntsälä - Hämeenlinna	0,64978	0,57532	89
Leipälänkulma - Mäntsälä	0,97730	0,57532	59
Lahti branch	1,70408	0,57532	34
Kouvola - Leipälänkulma	0,55780	0,57532	103
Kotka branch	0,40961	0,57532	140
Hanhijärvi - Kouvola	0,68089	0,57532	84
Lappeenranta branch	1,85146	0,57532	31
Imatra – Hanhijärvi	0,20927	0,57532	275
Mäntsälä – Pölans	0,87011	0,57532	66
Mäntsälä - Suurmetsäntie	1,95249	0,57532	29
Suurmetsäntie - Vihdintie	1,22777	0,57532	47

Martinlaakso branch	2,34072	0,57532	25
Vihdintie - Djupström - Pölans	2,02241	0,57532	28
Pölans – Kirkniemi	2,01497	0,57532	29
Inkoo - BC offshore	210,87276	0,57532	1
Imatra branch	0,22820	0,57532	252
Porvoo branch	1,43725	0,57532	40
Vuosaari branch	0,35567	0,57532	162
Suomenoja branch	0,83071	0,57532	69
Kuusankoski branch	0,28588	0,57532	201
Kilpilahti branch	0,15380	0,57532	374

In the scenario 2, national consumption is 23 TWh – as in scenario 1, but the transit flow is very low. Because ITC is not part of the comparison, the reference price of postage stamp methodology is bit higher due to smaller total quantity flowing in the Finnish system. Because in CWD methodology, certain amount of revenue is expected to collect from Balticconnector exit and the flow is very limited, CWD results unreasonably high reference price as can be seen from table 31. Excluding BC, the CWD calculation sets the same reference prices for all exit point as in scenario 1, since the amount of capacity booked for the exit point remains the same as the only changing factor is transit flow. Thus, in the postage stamp methodology, the reference price increases slightly, while in CWD the reference price remains the same except at Balticconnector. For entry points, changes in the calculation are assumed to occur in the same proportion, so the relative change in the entry reference price stays the same in these scenarios.

Reference prices calculated according to the CWD methodology results in high price differences in the system. Such tariff differentiation would impact on competition between points in the Finnish transmission system. Instead, uniform capacity tariffs according to the postage stamp methodology provides more transparent price signal compared to the CWD. It enables shippers to reproduce the tariff calculation based on the total expected capacity bookings.

The flow scenarios have an impact on the reference prices calculated by CWD methodology while postage stamp methodology does not consider which point is used and how much. ITC agreement is not part of the comparison, because CWD calculation with ITC mechanism is not possible. The cost drivers of CWD are distance and capacity of each entry and exit point separately. If market situation changes so than one year gas is cheaper to be transported through one point and another year gas is cheaper to be transported through another point, this would change the reference prices significantly so that the reference price of entry point through which gas is forecasted to be injected more to the gas system decreases while another point the reference price increases. While comparing the results above, it should be noted that the scenario is chosen for illustrating the impact of the methodologies. They are not demand forecasts of Gasgrid Finland.

In Finland, top 10 gas consumers use a major share of Finnish annual consumption. The share of few big end consumers from total Finnish consumption is significant. This is foreshadowed by the results of CWD and postage stamp methodology comparison. Where the annual consumption is high and closer to the technical capacity, these drives have decreasing impact on the reference price as the cost drivers are capacity and distance. High technical capacity and low forecasted capacity have an increasing impact on the reference price in CWD.

In some clustered exit points the gas consumption has decreased significantly during last decade. Combining this to high technical capacity, the CWD gives higher reference prices than postage stamp methodology. On the contrary, in the entry or exit points where forecasted capacity is high and the technical capacity is utilized relatively well, the CWD gives lower reference prices than postage stamp methodology.

Baringa study above (table 29) evaluates that postage stamp model produces the highest net consumer welfare result in the main modelled scenario compared to other reference price methodologies. The postage stamp model enables equal tariffs across different entry points allowing to maximize flow from lowest marginal cost supply source. CWD is estimated to result in consumer welfare being lower than under postage stamp on average based on the two modelled scenarios and years in Baringa study. Also, sources that are distant from demand centers are penalized on the basis of likely higher associated network cost even if they have low marginal cost.

CWD sets out the exit points where the technical capacity is high, but consumption is low to unreasonable reference prices. The distances between entry and exit points are quite long in Finland. Exit points in Tampere area have the longest average distance to entry points. Depending on the entry point where does gas is entered into Finnish gas system influences on the reference price. For instance, end consumers close to Imatra entry point have the higher reference price the more gas is flowing from Balticconnector entry point instead of Imatra entry. Instead, high quantities from Imatra point has decreasing impact on the reference price due to short distance between entry and exit points.

Since the CWD methodology determines a separate reference price for each entry and exit point, the Finnish exit zone principle could not be applied due to different reference prices in each exit point. The different reference prices would require market participants to book capacity for each exit point. As a result, a market participant would not be able to book capacity for the exit zone, but it would have to book capacity for its consumption sites separately.

9 TAR NC article 26(1)(a)(2)(ii): The value of the proposed adjustments for capacity-based transmission tariffs pursuant to TAR NC Article 9

Article 9 sets the requirements for adjustments of tariffs at entry points from and exit points to storage facilities and at entry points from LNG facilities and infrastructure ending isolation. At the moment, there is no LNG terminal connected to gas system, but in 2021, according to the project operator’s schedule, LNG terminal will be connected to the Finnish gas system.

No discounts are foreseen to be applied in 2021.

10 Commodity-based transmission tariff (TAR NC Article 26 (c)(i))

Commodity tariff is flow-based tariff which is collected from the exit zone. Due to the ITC agreement, compressor costs caused by regional flow (exit through Balticconnector), are compensated via the agreement. The major part of the flow-based costs is caused by the compressor stations – more specifically the compressor units’ gas and electricity which is used for the own use. Part of the maintenance cost depends on the flows which is approximately 15 % of the total costs to be covered via the commodity component. A flow-based charge provides the way of recovering the associated costs from shippers in a cost reflective manner.

The commodity-based tariff shall be set so that it covers the flow-based cost of domestic gas consumption and shall provide a reasonable rate of return, in proportion to Allowed revenue of the capacity charges. The costs of compressor fuel and the maintenance costs with flow-dependence includes uncertainty due to new compressor station and new flow profiles. If surplus or deficit is collected by this tariff, the tariff can be adjusted during the following years to reach the cost-reflective revenue collection.

For the year 2021, the target revenue to be collected by commodity tariff is 3 M€. With the estimate that domestic gas consumption is 23 TWh, the indicative commodity tariff is 0,0001304 €/kWh.

Compared to year 2020, the commodity tariff is higher for two reasons: 1) Estimate of costs caused by new compressor station in Inkoo updated. 2) Maintenance costs (≈ 15 % of total expected commodity revenue) which can be attributed to the costs mainly driven by the quantity of the gas flow. The inclusion of maintenance costs driven by gas quantities means that these costs are reduced in the regulatory model so that the costs are not covered twice. Gasgrid Finland emphasizes that at the time of launching the consultation there is no data of actual flow-based costs in the new market situation with alternative physical connection. Thus, indicative commodity tariff contains uncertainty ant the revision will be done before publishing the final commodity tariff before the tariff period of 2021.

11 Non-transmission tariffs (TAR NC Article 26 (c)(ii))

Non-transmission services revenue means the part of the allowed revenue which is recovered by non-transmission tariffs.

Centralized data exchange charge (=Datahub charge)

From the beginning of 2020, centralized information exchange system, datahub, was introduced in the retail market. Retailers and distribution system operators are carrying out their retail market processes through the datahub. The datahub is operated by Gasgrid Finland. Since the system has a legal monopoly in the provision of its services, the terms and pricing methods of the services will be established. Supervision of datahub's operation are entrusted to the Energy Authority. Regulation method is under development and will be approved by NRA at the same time as the amendment to Finnish gas market act will be entered into force.

The DSO is charged with regard to the consumption sites in distribution networks owned or operated by the DSO for which information is maintained in the register of centralized data exchange system (= all daily or non-daily read metering sites in the distribution network except for small-scale individual non-daily read sites using gas only for cooking purposes).

Taking into account the depreciation of investment and system operating costs, the datahub cost to be covered by datahub charge is 180 000 € in 2021.

There are approximately 7000 consumption sites which are metered. The indicative datahub charge for 2021 is 2,14 €/month/metering point.

Compared to the year 2020, the charge would increase 71 %. The reason for increasing datahub charge is that TSO didn't have information about the number of metering points in the distribution networks before market opening and the introduction of datahub. Based on the data from the first quarter of 2020 the amount of metering points is found to be smaller than expected. The amendment to the gas market act with new regulatory method which wasn't yet developed by the time of launching this consultation brings uncertainties to the final value of the datahub charge (see chapter 3.2. of this consultation).

Balticconnector underutilization fee

Underutilization fee is applicable in the Balticconnector interconnection point and it is applied only during days, when Balticconnector is congested. Shippers may renominate downward in the Balticconnector free of charge a maximum of 50 000 kWh/h (tolerance) compared to the Shipper's highest confirmed nomination for the gas day. For amounts exceeding the tolerance limit, the shipper shall pay an underutilization fee which is 0,002 €/kWh. The level of tolerance and the underutilization fee was part of public consultation organized in 2019.

Balticconnector underutilization fee is not subject for profit. The revenue of this component will not be included to the non-transmission service pool. The revenue collected from the market will we returned to market by adjusting the other pricing components.

The tolerance is set to the absolute value so that the tolerance gives flexibility for shippers, but it does not endanger operational capabilities to operate the transmission system cost-effectively with high security of supply. Absolute value means that shippers transporting smaller quantities have smaller risk to reach the tolerance limit compared to shippers transporting plenty of gas through BC. The absolute value instead of relative value (%-based tolerance for downward renomination) is set, because Balticconnector capacity is an absolute value and small absolute change in the transported gas quantities does not have impact on the physical network operations.

Underutilization fee is set so that the fee provides incentive for shippers to submit nominations close to their actual needs instead of allowing nominate great quantities just in case knowing that downward renominations can be submitted later as the actual need is known more precisely. Upward nominations can be submitted freely in line with Balticconnector rules. On the other hand, defining the value for the fee it is considered that the fee is reasonable and does not cause undue precautions in shippers' operations. Balticconnector underutilization fee is not subject for profit. The revenue of this component will not be included to the non-transmission service pool. The revenue collected from the market will we returned to market by adjusting the other pricing components.

12 Cost Allocation Assessment (TAR NC article 5)

As part of the periodic consultation, two assessments are performed to comply with the principle of avoiding cross-subsidies between network uses. One assessment is for capacity charges, the other is for commodity charges. According to the article 5 of TAR NC, the assessments involve calculations that may be based on forecasted revenues, bookings, flows and cost drivers, potentially based on historical data. Gasgrid Finland, Elering AS and Conexus Baltic Grid form a common tariff zone. Thus, cross-border exit flows in Finland (equals to exit flows through Balticconnector) are still intra-flows from common tariff zone point of view, because Balticconnector entry and exit tariffs are removed. In this consultation the definition transit flow is used to describe the flows entering Finnish gas system and exiting through BC. For instance, the common tariff area enables that gas can be transported from Imatra entry point through Finnish gas system to Incukalns gas storage and withdraw gas quantities later back to Finnish gas system for end consumption.

Shippers need to pay entry tariff as gas is entered to common tariff one and exit tariff as gas is transported for end consumption. With the ITC agreement, there are no tariffs between Finland and Estonia and Estonia and Latvia.

12.1 Cost Allocation Assessment for capacity-based tariffs

A cost allocation assessment relating to the transmission services revenue to be recovered by capacity-based transmission tariffs shall be based exclusively on one of the following cost drivers:

a. technical capacity;
b. forecasted contracted capacity;
c. technical capacity and distance;
d. forecasted contracted capacity and distance.

In Finland the assessment is performed by choosing the cost driver of forecasted contracted capacity.

Taking into account the capacity and the distance of each entry point of the system to each exit point, a capacity weighted average distance can be calculated for the entry and exit points. In CAA calculation, the airline distance approach is applied, because the virtual point describing exit zone is not along located along the pipelines and the difference in altitude differences in southern part of Finland are relatively small.

Table 33. Airline distances between entry and exit points.

Distances [km]	BC	Exit zone
Hamina	185	83
BC	0	123
Imatra	300	188

In Finland, the only exit point to the neighboring gas system is Balticconnector. Thus, the booked exit capacity BC equals to the cross-system use. The exit zone is representative for many exit points. For CAA calculation the capacity weighted center is calculated, and the exit capacities of exit zone are all summarized to this virtual center point. This approach enables the distance calculation for each entry point to domestic exit zone. The virtual point describes the center of Finnish exit zone which equals to intra-system use. The virtual point is defined by using the validated consumption data of 2019.

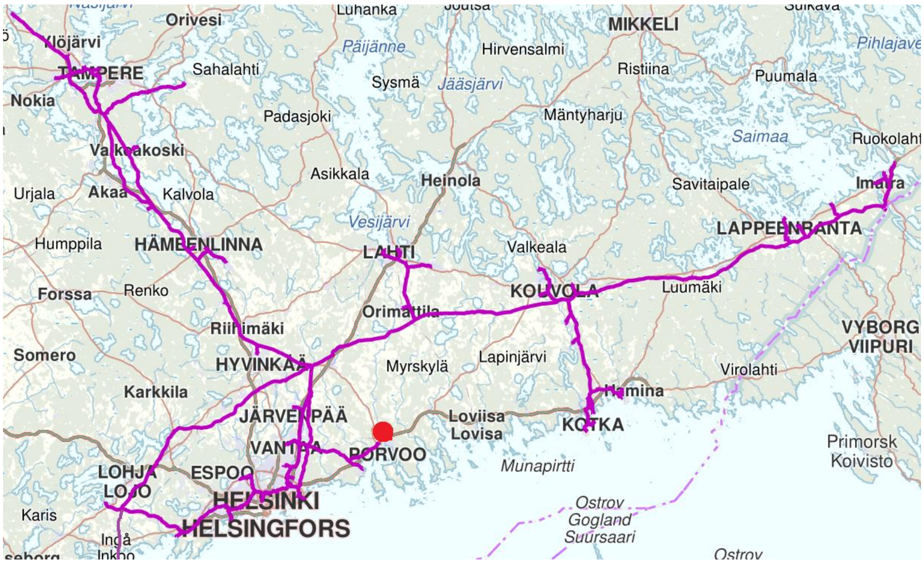

Figure 6: The location of virtual exit point describing the exit zone.

For the cost allocation assessment, the forecasted contracted capacity values are used. This approach reflects the expected revenue collection of intra-system use and cross-system use. The proposed reference price methodology, postage stamp, is used in the calculation.

Taking into account the capacity and the distance of every entry point of the system to one specific exit, a capacity weighted average distance can be calculated for this exit point. Corresponding approach is for one specific entry point.

The average distance of one exit point is determined by the sum of each entry capacity, times the distance to this respective entry point from the considered exit point, divided by the sum of all entry capacities. In the calculation, by defining the average distance for BC exit, the entry capacity of BC is not included to the sum of entry capacities. This is done, because Balticconnector is both an entry and an exit point, and the entry followed by the exit does not constitute a potential flow scenario. Such use is insignificant and considering it as a flow scenario would distort relative distances.

The calculation of average distances for each entry point to the group of exit points is carried out by analogue processing. In contrast to exit points, for entry points there is a distinction regarding the average distance to intra-system exits and to cross-system exits, because this distinction is made to later define the intra/cross system drivers for entry points.

For the CAA, the drivers must be calculated. The driver is the result of capacity multiplied by the average distance. For entry points, the drivers will again be split and allocated to intra- and cross-system use. These drivers are determined by entry capacity and the relevant average distance to cross- and intra-system exits. Drivers for intra-use and cross-use are only considered for the CAA, not for reference price setting purposes, because Gasgrid publishes only entry and exit reference prices regardless of the intra- or cross-use of the capacity. The split of intra- and cross-use is made in accordance to TAR NC Article 5(5)(a).

For performing the assessment, to determine the capacity revenues obtained by intra- or cross-system network use according to Article 5(5), the entry capacity itself must be allocated to intra- or cross-system use. As set out in Article 5(5)(a), the entry capacity allocated to cross-system use must be equal to the actual total cross-system exit capacity.

The intra-system capacity ratio is calculated according to the following formula:

$$Ratio_{cap}^{intra} = \frac{Revenue_{cap}^{intra}}{Driver_{cap}^{intra}} \qquad ,where$$

$Revenue_{cap}^{intra}$ is the revenue, which is obtained from capacity tariffs and charged for intra-system network use

$Driver_{cap}^{intra}$ is the value of capacity-related cost driver(s) for intra-system network use, such as the sum of the average yearly forecasted capacities contracted at each intra-system entry point and intra-system cluster of exit points.

The cross-system capacity ratio is calculated in the same way than intra-system capacity ratio.

The capacity cost allocation comparison index between the ratios calculated above, shall be calculated in accordance with the following formula:

$$Comp_{cap} = \frac{2 \times \left| Ratio_{cap}^{intra} - Ratio_{cap}^{cross} \right|}{Ratio_{cap}^{intra} + Ratio_{cap}^{cross}} \times 100\ \%$$

In the calculation, it is assumed that contracted capacity at exit IPs corresponds to 'cross system network use' and contracted capacity at domestic consumption points corresponds to 'intra-system network use'.

Cost Drivers in this Scenario are a combination of distance and capacity. For the expected revenues, the allowed total capacity revenue and a split of this into exit and entry share is given. The calculation is based on a flow scenario where the transit flow from Finland to Estonia is 1,66 TWh / year and domestic consumption is 23 TWh.

The calculation process described above gives the following results:

Table 34. Parameters of CAA calculation for capacity-based tariffs.

Capacity revenue	79086760	€
Entry share	13	%
Exit share	87	%
Entry revenue	9963586	€
Exit revenue	69123174	€
Entry revenues dedicated for intra	9963586	€
Entry revenue dedicated for cross	0*	€
Exit revenues dedicated for intra	69123174	€
Exit revenue dedicated for cross	0**	€
Revenue for Intra	**79086760**	€
Revenue for Cross	**0***	€

Cost driver for entry intra	3966933	km x GWh/y
Cost driver for exit intra	3933348	km x GWh/y
Cost driver for Intra	**7900281**	km x GWh/y
Cost driver for entry cross	503901	km x GWh/y
Cost driver for exit cross	503901	km x GWh/y
Cost driver for Cross	**1007802**	km x GWh/y
Ratio intra	10,0106267	
Ratio cross	0,000000000	
CAA	200	%

*Gasgrid Finland will not collect revenue from transit flows due to ITC agreement and tariff removal at BC.
**due to ITC agreement, there is no exit tariff at Balticconnector.

As a result, the CAA gives the value of 200 %. According to article 5(6) of TAR NC, Where the results of the capacity cost allocation comparison indexes, exceed 10 percent, the NRA shall provide the justification for such results in the decision. The reason for exceeding the 10 % limit in CAA is the ITC agreement.

ITC agreement, which enables the establishment of common entry-tariff zone, has a major impact to the CAA calculation due to the following reasons:

1) All entry revenue collected from transit flow will be re-distributed so that Gasgrid Finland do not collect revenue from capacity tariffs from transit flows as these revenues are collected to entry revenue pool.

2) There is no tariff at all in Balticconnector exit point which is the only exit point which is used for cross-system use.

Gasgrid Finland, Elering AS and Conexus Baltic Grid form a common tariff zone. In this consultation the definition transit flow is used to describe the flows entering Finnish gas system and exiting through BC. Even though exiting Finnish gas system, gas flow stays inside the common tariff zone. The common tariff zone consists of the areas of 3 TSOs with individual regulatory methods so in this context 'transit flow' is used although gas flow stays inside the common tariff zone.

The CAA results to high value, because Gasgrid Finland do not collect any revenue from transit flows, but do not pay any costs caused by regional flow due to compensation mechanism according to the principles of ITC agreement. This approach facilitates cross-border trading, because the tariff removal from Balticconnector and entry revenue re-distribution enables market participants to operate in a bigger market area in terms of number of market participants and alternative entry points. Also, this approach removes the 'pancaking' between the borders of two separate balancing zones – balancing zone of Finnish market area and balancing zone of Estonian-Latvian market area. Without common tariff zone, entry and exit revenue would be collected similarly from transit and intra flows. If cross-system revenue would be collected from Balticconnector, which means common tariff zone does not exist, it is seen as a factor of slowing down the development of gas market and competition in Finland as the cross-border trading activity would most probably decrease due to entry and exit tariffs at Balticconnector. Also, feedback from market participants were considered. The tariff removal from Balticconnector and deepening the level of market integration with Baltic States were seen significant drivers of market development from gas users' point of view.

12.2 Cost Allocation Assessment for commodity-based tariffs

The commodity assessment compares transmission service revenue collected by commodity charges for intra-system and cross-system network use taking into account cost drivers. The commodity assessment compares the intra-system commodity ratio to the cross-system commodity ratio.

Commodity tariff will be set for Finnish exit zone. Because there is no tariff at Balticconnector, there is no commodity charge at Balticconnector exit point. Cross-system commodity costs are covered by the mechanism described in the ITC agreement. The mechanism description can be found from section 4.1. of this consultation. The cost incurred from the transit flows are included into the calculation so that the TSO operating its system for transit can reduce the incurred costs from the common entry revenue pool and get the compensation.

The target revenue to be collected by commodity tariff is 3 M€. The transit flow costs are considered as setting the target revenue so that the total commodity charge revenue is adjusted to deal with the flows of intra-system use.

Because there is no commodity component for cross-system exit point, the result of CAA is 200 %. The reason for exceeding the value of 10 % is the ITC agreement which sets no tariff for Balticconnector and flow-based the entry revenue redistributed based on the national consumption among the TSOs of common tariff zone.

13 The simplified tariff model according to TAR NC ARTICLE 30 (2)(b)

The simplified tariff model can be found from Gasgrid Finland's website: https://gasgrid.fi/en/our-services/transmission-tariffs-and-service-price-list/