

**Project proposal for the Federal Network  
Agency for approval on the procedure  
initiated in 2019 for incremental capacity  
in the form of a capacity upgrade at the  
IP Greifswald  
at the border between the Russian  
Federation and THE**

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This report comprises a joint analysis of the need for incremental capacity by the following company:

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## **I. Introduction**

After completion of Phase 1 of the procedure initiated in 2019 pursuant to the Regulation (EU) 2017/459 (Network Code on Capacity Allocation Mechanisms in Transmission Networks; hereinafter "NC CAM") for incremental capacity at the market area border between the Russian Federation and the Trading Hub Europe (THE) the involved transmission network operators (TSO) started the planning phase for the corresponding projects (Phase 2) and finished with the consultation phase on September 9 2020.

As presented in the report on the market demand analysis 2019 (published on 21 October 2019), there is a permanent need for freely allocable capacity for at the market area border Russia-THE on the German side in the form of a capacity upgrade from dynamically allocable capacities (DZK) to freely allocable capacities (FZK). The technical study described how the network can be efficiently expanded taking the grid topology and economic aspects into account.

The present project proposal is a document created by the NEL Gastransport GmbH (NGT).

## **II. Approval content of the project proposal to build incremental capacity on the German side of the RU-THE border**

### **1. Information on non-binding market demand**

A technical study was conducted at the market area border Russia-THE on the basis of the non-binding enquiries presented in the report on the market demand analysis. At the entry Interconnection Point (or „IP“) Greifswald to THE an enquiry was made to upgrade 8,691,845 kWh/h of currently booked DZK (DZK 1 and DZK 2) into FZK. A more detailed breakdown of the requested capacity as well as the at least equivalent existing capacity per gasyear (GY) can be seen in Annex 2.

### **2. Information on the network extension measures**

The enquiry was made from the GY 2025/2026 up to and including the GY 2037/2038. However, due to extensive expansion measures for the realization of the capacity upgrade the provision of the capacity is only possible from the GY 2027/2028.

In total, the technical studies of the present cycle for incremental capacity considered 47 scenarios, each based on a different combination of projects based on non-binding demand indications. The expansion measures were developed under the presumption that all non-binding requested capacities are booked and the economic test is carried out successfully. In this document only the measures of the maximum scenario are described in the text, which



are also caused by the requested capacity listed above. All expansion measures of the maximum scenario are shown in Figure 1. A detailed breakdown of costs is not provided here. The basis of the listed expansion measures is the infrastructure contained in the draft document for the network development plan Gas 2020–2030 (published on 1 July 2020; hereinafter “NEP”) including the network expansion measures resulting from the so called "basic variant". The investment costs concern initial estimates. In addition to the cost of the investment, there are operating costs for propellant, which are necessary in order to operate the compressors. The annual costs are stated below for the maximum scenario. Besides the Commodity, these costs also include the natural gas tax as well as the CO<sub>2</sub> costs.



# Incremental Capacity Cycle 2019-2021 - Expansion

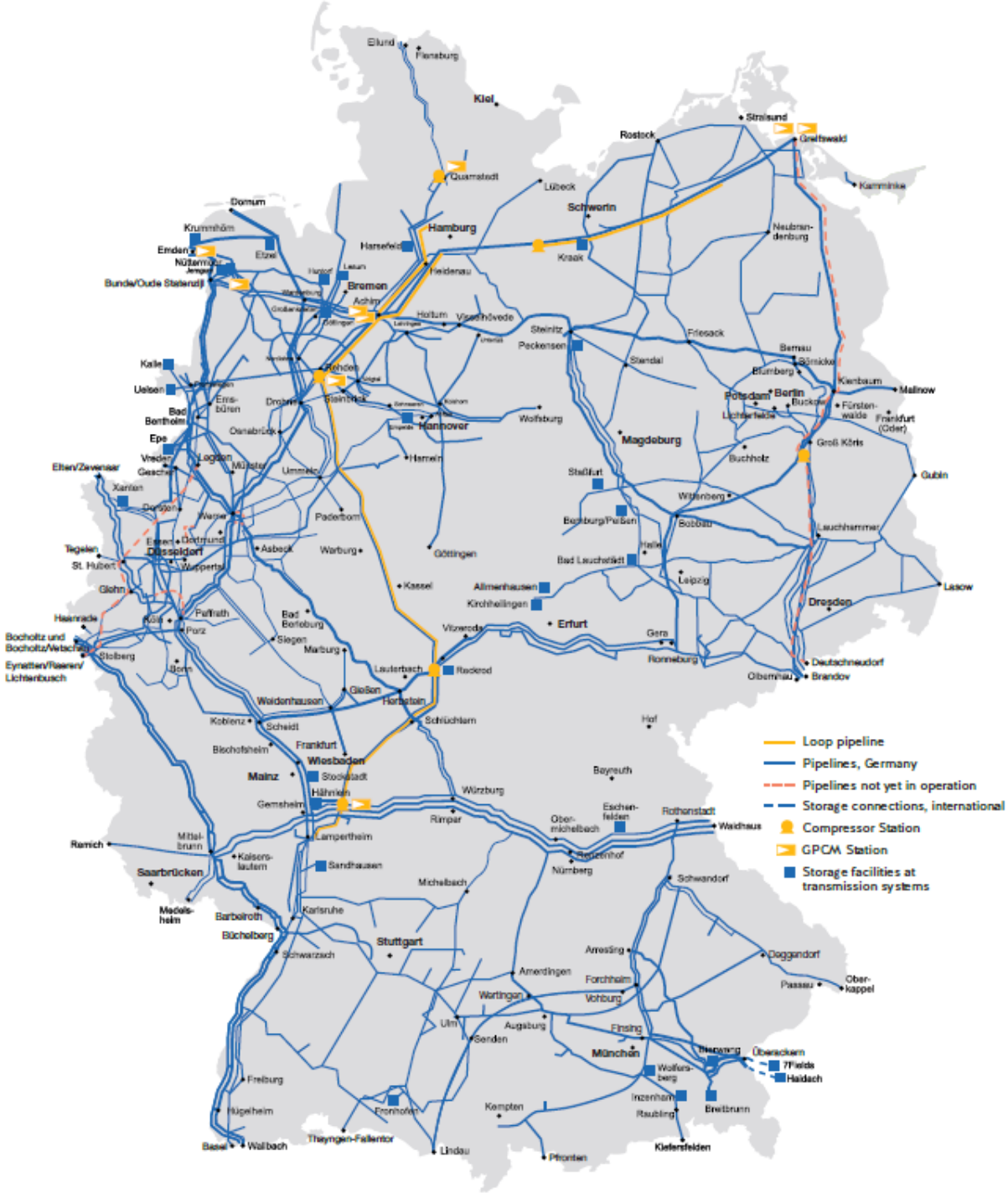


Figure 1: Expansion Measures for the Maximum Scenario



The Greifswald landing station is to be extended. The measures for this purpose are already included in the NEP (GDRM-Annex Greifswald landing station – Annex extension 3, ID-No. 632-01). In total there are thus no additional investments here.

The following measures are necessary on the NEL pipeline east of the Achim shut-off station: A compressor station with a compressor capacity of approx. 75 MW. This is already included in the NEP with a compressor capacity of 50 MW (VDS NEL (middle), ID No. 633-01). The additional investments amount to approx. €m 63. A loop pipeline with a length of approx. 85 km in DN 1400 is to be erected east of the compressor station. The investments amount to approx. €m 360. A loop pipeline with a length of approx. 57 km in DN 1400 is to be erected west of the compressor station, which ends on the Achim shut-off station. The investments amount to approx. €m 242. In total, the additional investments on this section of the pipeline amount to approx. €m 665. The annual costs for propellant for this section are approx. €m 19.6.

An alternative using two compressor stations was considered: One station with approx. 99 MW, of which a compressor capacity of 50 MW is already included in the NEP (VDS NEL (centre), ID-No. 633-01), and a further station with 99 MW near Buchholz. The additional investments for this variant were approx. €m 360 compared to the NEP. The annual operating costs here were as a max. approx. €m 210. This variant is not being further pursued at present. The TSO reserve the right to come back to this variant with the concrete design of the measures within the scope of the creation of the NEP Gas 2022-2032.

The following measure is necessary on the NEL pipeline west of the Achim shut-off station: A loop pipeline with a length of approx. 67 km in DN 1400 is to be erected. Of this 52 km in DN 1400 are already included in the NEP (NEL pipeline West, ID No. 634-01). The additional investments amount to approx. €m 118. In total the additional investments on this section of the pipeline amount to approx. €m 118.

The following expansion measures are necessary on the MIDAL pipeline: The Rehden compressor station must be extended by a compressor capacity of approx. 48 MW. The investments amount to approx. €m 250. A GPRM plant with a plant capacity of 2.2 million Nm<sup>3</sup>/h is to be additionally erected in Rehden. The investments amount to approx. €m 17. A loop pipeline with a length of approx. 260 km in DN 1400 is to be erected from Rehden to Reckrod. Of this 61 km are already included in the NEP (MIDAL pipeline middle north, ID No. 627-01; MIDAL pipeline middle south, ID No. 628-01). The additional investments amount to approx. €m 905. A compressor station with a compressor capacity of 84MW is to be erected near Reckrod. This is already included in the NEP with a compressor capacity of 36 MW (VDS Reckrod, ID No. 629-01). The additional investments amount to approx. €m 145. A loop pipeline with a length of approx. 200 km in DN 1400 is to be erected from Reckrod to



Lampertheim. Of this 115 km in DN 1000 are already included in the NEP (Wirtheim-Lampertheim pipeline, ID No. 609-01). The additional investments amount to approx. €m 535. A compressor station with a compressor capacity of approx. 46 MW is to be erected near Herchenrode. The investments amount to approx. €m 180. In addition, a GPRM plant with a plant capacity of approx. 4 million Nm<sup>3</sup>/h is to be erected in Herchenrode. The investments amount to approx. €m 31. In total the additional investments on this section of the pipeline amount to approx. €m 2,063. The annual costs for propellant for this section are approx. €m 33.

Due to the large number of non-binding demand indications for incremental capacity, depending on the booking behaviour in the annual auctions 2021 respectively within the scope of the alternative allocation mechanism, there are interdependencies with regard to the project costs to be allocated. Depending on the incremental capacity to be provided on a network section, synergies or dyssynergies may arise. Synergies essentially arise in this case through economies of scale. The larger respectively the standard diameter of a loop pipeline is chosen, the lower the specific transport costs will be, as a rule, with the same relative capacity utilisation. Dyssynergies primarily arise from leapfrogging investments, e.g. if only the combined additional capacity requirements for several enquiries trigger, for example, a dimensioning leap in a pipeline measure. The cost allocation per expansion measure is carried out broken down according to the provided capacity. The dependencies of the projects are shown in Annex 1 to this consultation document.

The costs that are to be compared with the bookings that are submitted binding will therefore only be known finally after execution of the annual auctions and the alternative allocation mechanism.

### **3. Information on handling statements received regarding the project proposal**

During the consultation period of the project proposal for RU-THE, no statement regarding this consultation document was submitted.

### **4. Approval content according to Art. 28 (1) NC CAM**

#### **a. Offer Level**

The economic test pursuant to Art. 22 NC CAM determines for each offer level whether the present value of the total revenues from binding commitments of network users for contracting capacity in July 2021 (“revenues”) are at least equal to the present value of the estimated increase in the TSOs’ allowed revenue included in the offer level as defined by the f-factor (“costs”). In this process there is only one offer level depending on the project proposal and therefore no competing offer levels.





### *Product Design*

Pursuant to Art. 3 No. 5 NC CAM an offer level refers to the amount of the existing<sup>1</sup> and the incremental capacity. In conjunction with Art. 29 Para. 1 NC CAM an offer level must, if applicable, include several bundled standard capacity products (for example with several relevant IPs between market areas). The relevant capacity will be published in May 2021 as far as possible bundled standard products for each GY, IP, TSO and product. The offer level is published on the website [www.fnb-gas-capacity.de](http://www.fnb-gas-capacity.de). In this case the offer level comprises FZK in the amount of the already booked DZK, which is to be upgraded, as well as the capacity, which after the originally booked period of time will no longer exist as DZK, but from now on is only available as FZK still. It is necessary in this case that an enquiry is made for both capacity products to the full extent in order for the economic test to be passed.

### *Marketing Horizon*

As the offer level includes incremental capacity, the offer levels can be offered and booked including the existing capacity pursuant to Art. 11 Para. 3 S. 2 NC CAM for a period of up to 15 years after the forecast start of the operational use of the new capacity products. Here this corresponds with the period of time from the GY 2027/2028 up to and including GY 2041/2042.

### *Allocation Methodology for Existing Products*

As regards the marketing of yearly capacity in 2021, the involved TSOs plan to market the existing capacity outside the offer levels on a regular basis. As, in this case, it concerns an upgrade of already existing booked DZK, which will be upgraded via booking of the offer level, it is not necessary to book existing capacities.

### *Amount of the Offered Capacity*

For the already existing capacity bookings that are to be upgraded, the FZK will be offered in the scope of the existing booking value so that the capacity can be upgraded in full. For the capacity, which is offered after the original booking period, the reservation quota of 20% pursuant to Art. 8 (8) NC CAM and determination of the Federal Network Agency (Bundesnetzagentur, hereinafter: "BNetzA") BK7-15-001 (hereinafter: "KARLA Gas") is taken into account.

### *Concrete Offer Level*

The offer level 1 can be seen from Annex 2 and is designed so that it passes the economic test if 100% of the offered capacities are booked binding.

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<sup>1</sup> The terms „available “ and „existing“ are used synonymously in the NC CAM.



### **b. Supplementary terms and conditions (Art. 28 (1) lit. b NC CAM)**

The draft of the supplementary terms and conditions (EGB) is enclosed with this document as Annex 3.

### **c. Project schedule (Art. 28 (1) lit. c NC CAM)**

The projects described above will be initiated after completion of the annual auctions in July 2021. Operational readiness of all technical measures is envisaged for the 1 October 2027– under the presumption that the economic test conducted after the auctions is successful.

The further procedure within the scope of the ongoing process cycle can be seen as follows:

<b>Start</b>	<b>End</b>	<b>Description</b>
10.08.2020		Publication of the consultation documents
10.08.2020	10.09.2020	Public consultation
11.09.2020	06.10.2020	Planning of the offer levels by the TSO in close cooperation with the national regulatory authority
07.10.2020		Submission of the project proposal to the national regulatory authority
07.10.2020	06.04.2021	Processing of the project proposal by the national regulatory authority
07.04.2021		Approval and publication of the necessary parameters by the national regulatory authority pursuant to Art. 28 Para. 1 NC CAM
08.04.2021	04.05.2021	Adjustment of the offer levels by the TSO to the stipulations of the regulatory authority
05.05.2021		Publication of the approved parameters, the capacity products and of the sample contract or the sample contracts for the capacities offered within the scope of the network expansion project
05.07.2021		Annual auction; the economic test will be carried out after completion of the annual auction

**Table 1: Provisional time planning**

The stated dates are provisional and can therefore be subjected to changes still.

With a positive result of the economic test, allocated capacity will subsequently flow into the process for the creation of the German network development Gas 2022-2032 and will be taken into consideration in the scenario framework as well as with the (national) modelling.

The milestones are available in Table 2.



Milestones	Years of completion of project phases of the measures
Project concept	2021
Basic evaluation/feasibility review	2021-2022
Design planning	2022-2023
Preparation of general planning procedure	2022
Implementation of general planning procedure	2023-2024
Preparation of Federal Emission Control Act (BlmSchG)	2023
Property acquisition	2025
Preparation of plan approval procedure	2023
Implementation of plan approval procedure	2024-2025
Acquisition of right of way	2025-2026
Implementation of Federal Emission Control Act (BlmSchG)	2024-2025
Construction approval process	2025
Material and service procurement	2023-2026
Preparation and start of construction	2025-2026
Assembly/construction	2025-2027
Commissioning	2027
Project conclusion/completion	2028

**Table 1: Milestones in the implementation schedule of technical measures**



**d. Defined parameters according to Art. 22 (1) NC CAM (Art. 28 (1) lit. d NC CAM)**

*Estimated reference price according to Art. 22 (1) lit. a No. i NC CAM:*

The current forecast of the reference price is the reference price published in the BNetzA decision REGENT 2021 for freely allocable capacity (FZK) of the market area THE for 2023 in the amount of € 3.73/(kWh/h)/annum. This reference price is solely used in the economic test and is not a part of the contract.

*Auction premium according to Art. 22 (1) lit. a NC CAM*

The auction of incremental capacities to be built according to Art. 29 (1) NC CAM makes use of the algorithm for multi-step, ascending price auctions pursuant to Art. 17 NC CAM. It is possible that this will result in an auction premium. This will be known after the 2019 annual auctions. For this reason, it was not included in the calculation of the F-factor, but pursuant to Art. 22 (1) lit. a NC CAM, it must be entered in the economic test.

*Cash value of the estimated increase in allowable revenue according to Art. 22 (1) lit. b NC CAM:*

The present value of the estimated increase in allowable revenue (EOG) depends on the amount and timing of the costs allocated to the project. The costs depend on the other projects for incremental capacity. The present value of the estimated increase in EOG is shown in Annex 4.

*Mandatory minimum premium according to Art. 22 (1) lit. a No. ii NC CAM*

Analogously to the f-factor and the present value of the estimated increase in the EOG, the mandatory minimum premium also depends on what measures become necessary due to the marketing of incremental capacity on 05/07/2021. The mandatory minimum premium to be applied to the pertinent booking scenario is shown in Annex 4. The amount for each scenario has been measured so that the economic test will be positive solely if the capacity included in the offer level is fully booked. This should also guarantee that the transport customer must not over-compensate the estimated increase in the EOG.



*F-factor according to Art. 22 (1) lit. c NC CAM:*

According to Article 27 (3) NC CAM the consultation shall cover the level of user commitments, expressed as an estimate of the f-factor in accordance with Article 23, which, after having consulted with the transmission system operators, is proposed and subsequently approved by the concerned national regulatory authorities.

The f-factor for each offer level is stipulated by the national regulatory authorities by taking the following aspects into consideration (Art. 23 Para. 1 NC CAM):

- a) the quantity of technical capacity, which will be withheld pursuant to Art. 8 Para. 8 and 9;
- b) the positive external effects of the project for new capacity to be created on the market or the transmission network or both;
- c) the term of the binding commitments of the network users for the requested capacity compared to the commercial useful life of the plant;
- d) the expected continued existence of the demand for the capacity, which is created by the project for new capacity to be created, after the end of the time horizon used as a basis in the economic test.

For the economic test pursuant to Art. 22 NC CAM the BNetzA has created and published a calculation tool in order to improve the transparency (hereinafter referred to as "BNetzA-Tool"). The result of the completed BNetzA-Tool with the data relating to the offer levels analysed here is enclosed with this consultation document as Annex.

The BNetzA-Tool contains mathematical evaluations for the determination of the f-factor. The f-factor is produced hereby from the ratio of the present value of the binding commitment of network users to the contracting of capacities over the time horizon of the first annual auction, in which the respective new capacities to be created were offered, pursuant to Art. 22 Para. 1 lit. a NC CAM at the present value of all expected commitments of network users to the contracting of the respective capacities.

The most recent currently known reference price is estimated in the BNetzA-Tool as estimated reference price pursuant to Art. 22 Para. 1 lit. a Subclause i NC CAM and is updated until the respective year. Since inflation is not taken into account when determining the increase in the revenue cap of the pertinent TSO resulting from the incremental capacities in each offer level, the inflation index for the reference prices was also set at 0 percent.

The proposed f-factor was determined as follows:

- a) Pursuant to Art. 8 (8) NC CAM and KARLA Gas, technically available capacity is retained in the amount of 20 percent of the incremental technical capacity contained in the pertinent



offer level It is assumed here that the retained capacities will be fully utilised in subsequent years as part of the marketing of the capacities and will therefore also be booked. Since from GY 2035/36 existing, booked capacity can be upgraded up to 100 %, the reservation quota of 20 % is only taken into account for capacity which is offered starting from GY 2036/2037. The f-factor should take into consideration that 100 % of reserved capacity is booked at a later time.

b) Further positive external effects were not examined.

c) Pursuant to Article 11 Para. 3 NC CAM offer levels can be offered for new capacities to be created within the scope of the annual auctions for a maximum period of 15 years from the start of the operational use.

For the period of time from the GY 2027/2028 up to and including GY 2041/2042 it was assumed that the new capacities to be created that were offered in the annual auction 2021 will be fully booked.

The start of the operational use is envisaged for the year 2027. The commercial useful life of the plants was estimated in line with the regulatory and normal depreciation durations. The described investments refer to compressor stations as well as to the pipeline construction. Consequently, an average useful life of 45 years for pipelines in accordance with the Gas Network Charges Regulation (Gasnetzentgeltverordnung; GasNEV) is assumed. The start of the operational use is envisaged for 2027, the end of the operational use is for the time being assumed for GY 2071/2072.

The gas infrastructure concerned in this procedure will be of great importance in the future energy market. Thus, the TSOs assume that the infrastructure will be reused for hydrogen. The transport of hydrogen is expected to result in a lower transport potential. As a result, the use of the infrastructure is assumed to be 65% for the period from GWY 2053/2054 to GWY 2071/72.

d) The decisive year for the determination of the time horizon of the commercial useful life and the economic test is 2072. No bookings were taken into consideration for the period of time from 2072.

The proposed f-factor is oriented to the occurred booking scenario and is included in Annex 4.

#### **e. Differing marketing timeframe (Art. 28 (1) lit. e NC CAM)**

A differing marketing timeframe does not apply.



#### **f. Alternative allocation mechanisms (Art. 28 (1) lit. f NC CAM)**

An alternative allocation mechanism does not apply.

#### **g. Fixed price basis (Art. 28 (1) lit. g NC CAM)**

There is a variable price system in Germany; fixed prices do not apply.

#### **h. Economic test**

For the economic test pursuant to Art. 22 NC CAM the BNetzA has created and published a calculation tool in order to improve the transparency. This was used by the TSO for the calculations presented below.

Pursuant to Subclause 1 of the operative part of the resolution of the BK 9 (ref. no. BK9-17/609) with the title INKA the economic test is carried out for each offer level of a project for incremental capacity pursuant to Art. 22 NC CAM by the BNetzA. In Part II of the stipulation resolution the BNetzA states that the economic test is an object of the project proposal and all principle questions of the economic test are to be clarified there. The following principle questions of the economic test must be defined still:

1. Derecognition requirement of existing capacity products
2. Economic test of the offer levels

The TSO are therefore planning to apply for the following procedure for the conducting of the economic test at the BNetzA:

##### *1. Derecognition Requirement of Existing Capacity Products*

As this booking concerns an upgrade of already existing, booked capacity, the derecognition requirement of existing capacity products ceases to apply as these have been booked already.

##### *2. Economic Test of the Offer Level*

As in this cycle for incremental capacity six projects will be analysed for new freely allocable incremental capacity, as described under II.1. there are comprehensive overlappings of the measures, which are necessary in order to be able to offer the capacity at the various market area borders. Therefore, an individual analysis of the enquiries with the associated measures is not target-oriented. The procedure, which the TSO have agreed upon in order to depict all possible booking scenarios, is described below.

In total, in the current cycle an enquiry is made for incremental capacity at five market area borders. At the market area border to Russia, in addition to incremental capacity, at the IPs Greifswald and Lubmin II an enquiry was respectively made for a capacity upgrade from



existing DZK to FZK. Consequently, in the current cycle offer levels can be booked for the following projects:

1. Poland TGPS
2. Russian Federation (combined in an alternative allocation mechanism)
3. The Netherlands
4. Russian Federation/Greifswald (capacity upgrade)
5. Russian Federation/Lubmin II (capacity upgrade)
6. Denmark

One offer level exists for each of these six projects. An enquiry can be made independently for each of the offer levels and pass the economic test. As a result, all combinations of positive and negative economic tests are conceivable. Which of the aforementioned enquiries are actually made binding can only be determined after the auctions or the evaluation of the alternative allocation mechanism.

In order to guarantee an efficient network expansion, the TSO have depicted all possible combinations of enquiries and determined the need for expansion respectively necessary for this. The overview of all 47 combinations is listed in Annex 1. The costs of a necessary expansion measure including operating costs will be allocated to the enquiries causing this measure respectively in the ratio of the requested capacity. The present value of the sum of these pro rata costs for specific measures results in the total allowed increase in the revenue cap (hereinafter “EOG”) assumed for a project in the economic test.

24 scenarios of combinations are derived for each enquiry with enquiries at the other market area borders. Each of these scenarios has following specific parts, which are listed in Annex 4:

1. f-factor
2. Present value of the estimated increase in the EOG
3. Mandatory minimum premium

When conducting the economic test with the BNetzA-Tool it must first of all be determined which of the 47 booking scenarios has occurred in order to subsequently enter the three parts listed above in the tool for the economic calculation.

In the present case a capacity upgrade is requested. This means already booked capacity is taken into account. The revenues from marketing the capacity upgrade are therefore included in the economic test to an amount of 10 %. The tariff discount for DZK products is





10 % compared to the tariff for FZK products. A conversion from DZK to FZK thus generates additional revenues amounting to 10% of the FZK tariff, so that only these additional revenues are included in the economic test.

From the GY when DZK capacity initially booked and requested for upgrade is no longer booked, but instead incremental FZK capacity is offered, the revenues are fully included in the economic test.

### **III. Application for approval**

NGT requests approval from BNetzA for the content under section II and in the corresponding enclosures for the continued implementation of the procedure to build new capacities according to NC CAM.



#### **IV. Contact data**

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