## FEASIBILITY STUDY CONTENT

## CONTENTS

## INTRODUCTION

This volume contains the economic assessment of the variants of South Stream gas pipeline construction on the territory of the Republic of Bulgaria. The forecasts of the enterprise's money flow values established for this investment project implementation, gas transport rate value for the period of operation – 25 years, calculates based on the different set levels of efficiency (IRR - 4%,6%,8%,10%,12%), are represented here.

The project is characterized with the following features:

1) As far as this Feasibility Study is only a part of the works in the economical justification of South Stream gas pipeline construction, the obtained economic values do not give an indication of the integral efficiency of the gas pipeline construction as a whole. The made calculations of the capital investments and operating costs represent the level of the cost part of the gas pipeline construction project on the territory of the Republic of Bulgaria. And correspondingly, based on the supposition that all the construction parts (areas in countries participating in the project) of the gas pipeline should function efficiently, the rate value providing the investment return and efficiency levels (IRR) required by the investors for the Bulgarian area of the gas pipeline, has been found in the paper.
2) The rate calculation was made using the method of its value matching, which allows at the relative volume of goods transportation operations, obtaining the proceeds, which would provide the project with the required efficiency (IRR-4%,6%,8%,10%,12%). In addition, the calculation of the proceeds from the project implementation using the method of gas transport rate calculation being in force in the Republic of Bulgaria has been made. One should note that the rate value calculated by the formula given in the method is not the function from IRR. In fact, formation of the income part of the project under this method is based on the principle "costs plus" and has no mechanism of the proceeds value variation depending on the set efficiency parameter (IRR). The above method assumes the calculation of rates for each year of the accounting period. The obtained rate array reflects the definite efficiency level obtained from the costs formed in the project.
3) The project financing scheme accepted for calculation improved the project values in relation to the variant without attracting any borrowed fund, if the set level of the internal rate of return is higher that the credit rate and correspondingly, the attraction of credits for the project implementation is completely justified. If the credit rate is higher than the IRR level, the attraction of borrowed funds worsens the project values.

The following calculations have been made in the project:

- needs in capital investments;
- operating costs;
- need in floating capital;
- gas transport rate value;
- efficiency values;
- efficiency rates' sensitivity to any change of capital investments, operating costs, gas volumes, credit rates, and inflation rate growth.

The efficiency values have been determined subject to attraction by the enterprise of borrowed funds according to the project financing scheme.

According to p. 9.13 of Pre-Investment Examination Task (Annex 1 of Volume 1 Executive Summary) finance and economics model of project efficiency calculation by variants was developed.

As a result of the calculations the following levels of gas transport rates have been obtained by variants:

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| **Variant 1a. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,44** | **1,57** | **1,72** | **1,90** | **2,10** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - Area 2. Provadia - Serbia (km 61 ÷ km 537.8) | 1,24 | 1,36 | 1,49 | 1,65 | 1,83 |
| **Variant 1b. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,45** | **1,57** | **1,73** | **1,91** | **2,11** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,87 | 3,14 | 3,45 |
| - Area 2. Provadia - Chiren (km 61 ÷ km 416) | 1,30 | 1,41 | 1,55 | 1,71 | 1,89 |
| - Area 3. Chiren - Serbia (km 416 ÷ km 537.8) | 1,14 | 1,25 | 1,39 | 1,54 | 1,72 |
| **Variant 2a. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,49** | **1,62** | **1,78** | **1,97** | **2,18** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - Area 2. Provadia - Serbia (km 61 ÷ km 537.8) | 1,30 | 1,42 | 1,56 | 1,73 | 1,93 |
| **Variant 2b. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,49** | **1,62** | **1,78** | **1,97** | **2,18** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,46 | 2,65 | 2,89 | 3,16 | 3,48 |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| - Area 2. Provadia - Chiren (km 61 ÷ km 416) | 1,17 | 1,28 | 1,41 | 1,57 | 1,74 |
| - Area 3. Chiren - Serbia (km 416 ÷ km 537.8) | 1,71 | 1,86 | 2,04 | 2,24 | 2,48 |
| **Variant 3a. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,41** | **1,53** | **1,67** | **1,84** | **2,03** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - Area 2. Provadia - Pleven (km 61 ÷ km 331,0) | 1,29 | 1,39 | 1,52 | 1,68 | 1,86 |
| - Area 3. Pleven - Serbia (km 331,0 ÷ km 537.8) | 1,09 | 1,19 | 1,31 | 1,46 | 1,62 |
| **Gas pipeline - branch to Greece, Du 700** | | | | | |
| - Area 4. Gas pipeline - branch to Greece (km 0 ÷ km 351) | 2,75 | 3,01 | 3,32 | 3,68 | 4,10 |
| **Variant 3b. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,45** | **1,57** | **1,72** | **1,90** | **2,10** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - Area 2. Provadia - Pleven (km 61 ÷ km 331) | 1,31 | 1,42 | 1,55 | 1,71 | 1,89 |
| - Area 3. Pleven - Chiren (km 331 ÷ km 416) | 1,10 | 1,21 | 1,34 | 1,50 | 1,67 |
| - Area 4. Chiren - Serbia (km 416 ÷ km 537.8) | 1,26 | 1,37 | 1,50 | 1,66 | 1,83 |
| **Gas pipeline - branch to Greece, Du 700** | | | | | |
| - Area 5. Pipeline - branch to Greece (km 0 ÷ km 351) | 2,75 | 3,01 | 3,32 | 3,68 | 4,10 |
| **Variant 3c. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,40** | **1,51** | **1,66** | **1,83** | **2,02** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - Area 2. Provadia - Serbia (km 61 ÷ km 537.8) | 1,18 | 1,28 | 1,41 | 1,55 | 1,72 |
| **Variant 3d. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0÷km 537.8)** | **1,42** | **1,53** | **1,68** | **1,85** | **2,04** |
| - Area 1. Black Sea - Provadia (km 0 ÷ km 61) | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - Area 2 . Provadia - Chiren (km 61 ÷ km 416) | 1,15 | 1,25 | 1,38 | 1,52 | 1,69 |
| - Area 3. Chiren - Serbia (km.416 ÷ km 537.8) | 1,37 | 1,49 | 1,63 | 1,79 | 1,98 |

The calculations of the gas pipeline process parameters' optimization for variants 1b, 3b, 3d have been made in the paper. The following rate levels have been obtained:

| Name | IRR |
|---|---|

| | 4% | 6% | 8% | 10% | 12% |
|---|---|---|---|---|---|
| **Variant 1b. Chiren. Recommended** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,35** | **1,46** | **1,61** | **1,77** | **1,96** |
| Area 1 (km 0 ÷ km 2) | 12,18 | 13,37 | 14,80 | 16,45 | 18,30 |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station “Provadia”) | 1,25 | 1,39 | 1,56 | 1,77 | 2,01 |
| Area 3 (km 2 ÷ km 416) | 1,33 | 1,44 | 1,58 | 1,74 | 1,92 |
| Area 4 (km 416 ÷ km 537.8) | 1,17 | 1,27 | 1,39 | 1,54 | 1,70 |
| **Variant 3b. Chiren. Recommended** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,39** | **1,51** | **1,66** | **1,83** | **2,02** |
| Area 1 (km 0 ÷ km 2) | 12,18 | 13,37 | 14,80 | 16,45 | 18,30 |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station “Provadia”) | 1,42 | 1,58 | 1,77 | 2,01 | 2,27 |
| Area 3 (km 2 ÷ km 331) | 1,43 | 1,55 | 1,69 | 1,86 | 2,06 |
| Area 4 (km 331÷ km 416) | 1,02 | 1,12 | 1,24 | 1,39 | 1,56 |
| Area 5 (km 416÷ km 537.8) | 1,24 | 1,34 | 1,47 | 1,62 | 1,80 |
| Area 6 (km 0÷ km 351) (to Greece) Du 700 | **2,75** | **3,01** | **3,32** | **3,68** | **4,10** |
| **Variant 3d. Chiren. Recommended** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | **1,37** | **1,49** | **1,63** | **1,81** | **2,00** |
| Area 1 (km 0 ÷ km 2) | 12,18 | 13,37 | 14,80 | 16,45 | 18,30 |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station “Provadia”) | 1,15 | 1,28 | 1,43 | 1,62 | 1,84 |
| Area 3 (km 2 ÷ km 416) | 1,33 | 1,45 | 1,59 | 1,75 | 1,94 |
| Area 4 (km 416 ÷ km 537.8) | 1,26 | 1,37 | 1,50 | 1,66 | 1,84 |

The obtained levels of the average rate through the transit pipeline for the basic variants do not differ significantly by variants. Herewith, the variant 3c.Provadia is characterized with the lowest level of the gas transport rate level.

The made optimization calculations showed that according to all the considered variants of the gas transport schemes (variants 1b, 3b, 3d), the proposed actions facilitate the rate decrease.

## 1 NORMATIVE BASIS

The calculations have been made according to the following normative documents:

Guide for Preparation of Industrial Technical and Economic Investigations (UNIDO)

Code of the Republic of Bulgaria on Social Insurance

Law of the Republic of Bulgaria on Value Added Tax

Law of the Republic of Bulgaria on Enterprise Corporate Tax.

## 2 METHODOLOGY OF THE ECONOMIC ASSESSMENT. INITIAL DATA. FORECASTS AND ASSUMPTIONS

***General Provisions and Forecasts***

The economic assessment of South Stream gas pipeline construction on the territory of the Republic of Bulgaria has been made according to the provisions of the "Guide for Preparation of Industrial Technical and Economic Investigations" developed by the UN Industrial Development Organization (UNIDO).

The feasibility study has been made based on the Pre-investment Examination Task. The purpose of the economic section of the feasibility study is the determination of the gas pipeline cost, determination of operating costs, forecasts of money flows values for 25 years of operation and calculation of gas transport rates.

The accounting period selected in the paper has been accepted based on the requirements of the Pre-investment Examination Task (investment period and 25 years of operation). The operational stage of the accounting period is preconditioned, including also max amortization service life of the projected facilities (linear portion of gas pipeline). One should also note that the consideration of longer accounting period is inexpedient in terms of the project's money flows calculation because the discount values of the positive and negative cash of the project at the later stages of operation (after 25 years) do not influence practically on the efficiency values and the calculated gas transport rate value.

The basic calculations of the capital investments and operating costs have been made at the level of prices in 2010. The money flows by years of the accounting period have been made at the forecast level of prices using the average annual inflation indices.

The inflation calculation is made using the following data and assumptions:

- forecasts of the average annual indices of inflation on the territory of the European Union;
- the inflation has been accepted as uniform, at which the indices of price changes depend on the accounting period step number, but not on the nature of the money flow components (capital investments, operating costs, proceeds);
- value of tax rates, duties and other financial normative of the state regulation in the Republic of Bulgaria remain at the level of those existing in 2011. The tax rates taken into account in this project have been accepted as unchanged till the end of the accounting period, based on the fact according to the calculation method they are "ad valorem" (i.e. not expressed in percents of the corresponding tax basis). Thus, the absolute value of such taxes will change by steps of the accounting period according to the inflation rates of taxable bases for these taxes.

The average annual inflation rates in the European Union have been accepted for calculation at a level of 2% per year.

***Initial data and Assumption***

The following main parameters and assumptions have been accepted for carrying out the economic calculations:

| | |
|---|---|
| **General Assumptions** | |
| – accounting period duration | – from 2013 to 2040 |
| – start moment of the forecast period | – 01.01.2013 |
| – price basis of the forecast's start period | – for 01.01.2010 |
| – accounting period step | – year |
| – calculation currency | – Euro |
| **Macroeconomic assumptions** | |
| – Assumptions concerning inflation in the European Union | – 2% per year |
| – lev rate to Euro as of 01.01.2010 | – 1.95 |
| – RF* rouble rate to Euro as of 01.01.2010 | – 43.46 |
| **Discounting** | |
| – discount rate (weighted average cost of capital) | – Table 7.2 |
| – first year of discounting | – 2013 |
| **Taxes** | |
| – VAT | – 20% |
| – corporate tax | – 10% |
| **Contributions to state public, additional pension and medical insurance** | **21.1%** |
| – fund "Pensions" | – 7.1% |
| – fund "Thickness and maternity benefits" | – 2.1% |
| – fund "Accidents and professional diseases" | – 0.5% |
| – fund "Unemployment" | – 0.6% |
| – contributions to additional compulsory pension insurance (universal pension fund) | – 2.8% |
| – contributions to medical insurance | – 8.0% |
| **Credits** | |

Project financing:

| | |
|---|---|
| – tranche amount | – in the amount of the annual need in investments, according to the calendar plan of construction |
| – date of project financing opening | – 2013 |
| – rate | – 5.5% |
| – exemption period as to the main debt repayment | – before operation starts |
| – beginning of the period of the main debt amount repayment | – from 2016 |
| – repayment source | – 100% of funds generated by the project |
| – conditions and terms of repayment | – based on the money flow |

* assessment currency in some taxes used in the calculations

## 3 CAPITAL INVESTMENTS

The capital investments have been calculated by the gas transport facilities: linear portion of gas pipeline, linear infrastructure facilities, and Compressor Stations.

The initial data for the capital investments assessment are:

- results of the made hydraulic calculations;
- composition of structures;
- work volumes;
- consumption values of material resources and equipment;
- data on the cost assessment of pipe, stop valves, gas pumping units and other process equipment, gas measuring stations, etc.;
- levels of labor payments for builders and machine operators, cost of machines and mechanisms operation;
- rates of machines and mechanisms operation time;
- data on land cost and its lease, ecological payments and compensations;
- assessment of design cost and costs connected with construction organization.

The capital investments have been determined using the resource and index method subject to the route characteristics and regional peculiarities of the gas pipeline, based on the construction volumes, equipment and need in the main resources.

The main component of the linear part cost is pipe products.

According to item 9.2 of the Pre-investment Examination Task the analysis of pipe products has been made according to the data of the manufacturing plants.

Based on the assumption that the pipe purchase will be made on the grounds of tenders, the calculations should not connected with the price parameters of a specific supplier. Thus, at the stage of the feasibility study, based on the analysis of prices of pipe products the Institute accepted for calculation the cost of pipes 1,422 mm in diameter – 1,400 Euro/t, 711 mm in diameter – 1,700 Euro/t, which corresponds to the moderate optimistic level of prices. OJSC “Gazprom” and VEN sent the confirmation of the proposition on the pipe products cost (Annex 1).

The cost of the main construction materials has been accepted according to the data available with the Institute from construction companies and suppliers in the Republic of Bulgaria:

- soil from the open pit mine – 2.56 Euro/$m^3$;
- road metal – 5.11Euro/t;
- sand – 5.62 Euro/t;
- concrete – 33.23 Euro/$m^3$.

The cost of the other consumables has been accepted according to the data of the Russian and European manufacturing companies.

At this stage of designing the average price parameters of the machines' and mechanisms' operation sots have been accepted according to the data available at the Institute from the databases of the Russian contractors. The list and cost of the machines' and mechanisms' operation is given in Table 3.1.

**Table 3.1 – List and Cost of the Main Machines' and Mechanisms' Operation Cost**

| Name | Cost, Euro/Unit (Machine-Hour) |
|---|---|
| Dump truck with the bearing capacity up to 30 t | 28,07 |
| Mobile welding unit | 25,90 |
| Bulldozers N-303 (410) kW (h.p.) | 63,83 |
| Mobile compressors with the output up to 34 $m^3$/min | 57,33 |
| Pipe-layer cranes d-1400 mm P-63-90t | 45,62 |
| Pipe-layer cranes with the lifting capacity of P-12t | 16,93 |
| Self-propelled compressor units LMF 67/150-D for pneumatic testing of trunk pipelines | 404,77 |
| Pipe truck on a car with the capacity of 48 t | 33,68 |
| Pipe layer D-355C with the capacity of P- 92t | 74,09 |
| One-bucket crawler diesel excavators, bucket volume 1.25 $m^3$, when constructing trunk pipelines | 16,63 |
| One-bucket crawler excavators with bucket volume of 1.6 $m^3$ | 28,63 |
| Motor cranes P-10t when erecting process equipment | 11,99 |
| Crawler tractors N-79 (108) kW (h.p.) at other types of construction | 9,26 |
| Mobile compressors P< 686 kPa Q- 5 m3/min with combustion engine | 4,01 |

The average level of wages according to the categories accepted for calculations is given in Table 3.2.

**Table 3.2 – Average Level of Wages of Builders**

| Personnel Qualification | Average Wages |
|---|---|
| Skilled labor | 8.7 Euro/h |
| Unskilled labor | 5.1 Euro/h |

The cost of the main process equipment has been accepted based on the made analysis of cost according to the data of the European, Russian and Ukrainian manufacturing plants and is given in Table 3.3 and Annexes 2-6.

**Table 3.3 – Cost of the Main Process Equipment**

| Name | Unit of Measurement | Cost (without VAT), Euro |
|---|---|---|
| **Compressor Stations** | | |
| Gas pumping unit GPU-25 MW | pcs. | 12 700 000 |
| Gas pumping unit GPU-16 MW | pcs. | 10 500 000 |
| Gas pumping unit GPU- 4 MW | pcs. | 3 719 627 |
| Air cooler | set | 663 000 |
| Gas treatment unit | pcs. | 475 000 |
| **Linear Portion** | | |
| Ball cranes Du 1400 | pcs. | 535 216 |
| Ball cranes Du 1000 | pcs. | 292 239 |
| Ball cranes Du 700 | pcs. | 165 500 |
| Launchers Du 1400 | pcs. | 579 205 |
| Receivers Du 1400 | pcs. | 596 210 |
| Launchers Du 700 | pcs. | 324 520 |
| Receivers Du 700 | pcs. | 330 758 |
| GMS in Bulgaria | pcs. | 6 548 573 |
| GMS on the border Serbia-Bulgaria | pcs. | 4 365 716 |
| GMS on the border Greece-Bulgaria | pcs. | 1 646 341 |

The calculation of the capital investments was made for the following variants:

***Variant 1a -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 282.5 km and 3 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones)*;*

***Variant 1b -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 318 km and 3 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones)*;*

***Variant 2a -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 310.8 km and 3 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones);

***Variant 2b -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 339.8 km and 3 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones);

***Variant 3a -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 150.5 km and 4 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones). The gas pipeline consisting of pipes 720 mm in diameter rated for 9.8 MPa, 351 km long and 1 CS with GPU units - 4 MW*;*

***Variant 3b -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 215.5 km and 4 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones). The gas pipeline consisting of pipes 720 mm in diameter rated for 9.8 MPa, 351 km long and 1 CS with GPU units - 4 MW*;*

***Variant 3c -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 68 km and 4 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones)*;*

***Variant 3d -*** Gas pipeline 1,420 mm in diameter rated for 9.8 MPa, 537.8 km long with loopings with the total length of 110 km and 4 Compressor Stations equipped with GPU units with the unit capacity of 25 MW (at the head CS) and 16 MW (at all the remaining ones).

The linear portion of gas pipeline includes the complete set of construction works: earthworks, excavation and backfilling of trenches, pipe welding and branch installation, control of welding joints, cleaning and testing of pipelines, anti-corrosion insulation of joints, pipeline ballasting in watered areas, laying into a trench, as well as purchase and erection of stop valves, receivers, launchers of treatment units.

As far as construction will be fulfilled indifferent conditions: with the presence of watered areas, mountain relief of the area, areas with rocky grounds, the calculation of the capital investments has been made subject to the topographic peculiarities of each route section.

The cost of construction of the linear infrastructure facilities: electrical power supply, electrochemical protection, telemechanization, approach roads, communication, gas measuring stations, has been determined based on the construction volumes and specific consumption of resources according to the data of the manufacturing plants, as well as accepted similar projects developed by the Institute subject to the process and territorial peculiarities of this construction site.

The Compressor Stations include the facilities of main production designation: Compressor Shop, treatment units, coolers, fuel Gas Treatment Units, etc., the auxiliary facilities: Auxiliary Power Stations, Diesel Power Stations, Water Treatment and Preparation Stations, intrasite electrical power supply nets, nets of communication, water supply, sewerage, etc., as well as off-site facilities of water supply and sewerage, approach motor roads.

In addition, the calculations of cost of the construction of the gas pipeline linear part's facilities and Compressor Stations took into account the other costs, which include:

- costs for construction of temporary buildings and structures;
- additional costs when carrying out construction and assembly works in winter;
- costs of maintenance of the existing permanent motor roads and their rehabilitation upon the construction completion;
- costs for transportation of the manpower living more than 3 km away from the working place to the working place and way back by motor transport;
- relocation of construction and assembly organizations from one construction site to another;
- "idle" start-up and commissioning works;
- costs for the management maintenance (technical supervision) of the enterprise under construction, costs for training operational personnel;
- costs for design and survey works, maintenance of technical, project expertise.

In addition, the reserve of funds for unforeseen works and costs in the amount of 10% has been taken into account.

The detailed summaries of the costs by the linear part construction facilities and Compressor Stations are given in Annex 7 (Tables 7.1-7.9, 7.13. – 7.17).

The structure of the specific capital investments to the construction of the gas pipeline and Compressor Stations by variants is given in Tables 3.5-3.13.

Tables 3.14-3.21 contain the capital investments to Construction of other facilities (GMS, Receiving Terminal, ACS and communication in Sofia), which cost is taken into account in Annex 7 (Tables 7.1-7.9, 7.13. – 7.17).

**Table 3.5 – Structure of Specific Investments in the Linear Portion. Variant 1a. Provadia**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 537.8) | |
|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run |
| | **Initial data:** | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,44 | 53,47 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Euro/km | 126,46 | 107,74 | 64,38 | 87,13 |
| 4 | Construction and installation works | thous. Euro/km | 736,89 | 756,01 | 658,49 | 719,07 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 537.8) | |
|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 631,58 | 629,84 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 26,91 | 89,23 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,41 | 7,38 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,07 | |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,08 | 51,88 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,23 | 1,74 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,09 | 81,68 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,58 | 18,90 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 224,59 | 220,28 |
| 14 | Taxes | thous. Euro/km | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 470,45** | **2 423,13** |

**Table 3.6 – Structure of Specific Investments in the Linear Portion. Variant 1b. Chiren**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | | Area 3 (km 416 ÷ km 537.8) | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run |
| | **Initial data:** | | | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 | 843,10 | 843,1 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,41 | 18,4 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,21 | 6,2 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,46 | 55,78 | 88,45 | 56,29 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Eu- | 126,46 | 107,74 | 77,34 | 85,94 | 48,18 | 87,76 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | | Area 3 (km 416 ÷ km 537.8) | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run |
| | | ro/km | | | | | | |
| 4 | Construction and installation works | thous. Euro/km | 736,89 | 756,01 | 669,56 | 707,76 | 633,17 | 710,84 |
| | Gas pipeline laying | thous. Euro/k | 631,73 | 628,85 | 633,42 | 632,30 | 633,17 | 631,37 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 36,14 | 75,46 | | 79,47 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | | 55,51 | |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,52 | 6,13 | 10,51 | 7,24 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,15 | | 17,15 | |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,17 | 51,55 | 53,55 | 51,66 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,30 | 1,72 | 3,18 | 1,76 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,27 | 81,27 | 96,75 | 81,47 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,64 | 18,80 | 20,18 | 18,86 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 227,05 | 219,05 | 220,82 | 219,75 |
| 14 | Taxes | thous. Euro/km | - | - | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 497,55** | **2 409,58** | **2 429,04** | **2 417,20** |

**Table 3.7 – Structure of Specific Investments in the Linear Portion. Variant 2a. Provadia**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | |
|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run |
| | **Initial data:** | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,45 | 53,35 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Euro/km | 126,46 | 107,74 | 62,57 | 89,10 |
| 4 | Construction and installation works | thous. Eu- | 736,89 | 756,01 | 657,87 | 711,53 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | |
|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run |
| | | ro/km | | | | |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 630,97 | 632,37 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 26,91 | 79,16 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,35 | 6,73 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,15 | |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,06 | 51,66 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,20 | 1,78 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,04 | 81,44 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,57 | 18,85 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 224,33 | 219,60 |
| 14 | Taxes | thous. Euro/km | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 467,68** | **2 415,63** |

**Table 3.8 – Structure of Specific Investments in the Linear Portion. Variant 2b. Chiren**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | | Area 3 (km 416 ÷ km 537.8) | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run |
| | **Initial data:** | | | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 | 843,10 | 843,10 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1070,3 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,46 | 55,01 | 88,45 | 55,61 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Eu- | 126,46 | 107,74 | 77,34 | 73,31 | 48,18 | 97,68 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | | Area 3 (km 416 ÷ km 537.8) | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run |
| | | ro/km | | | | | | |
| 4 | Construction and installation works | thous. Euro/km | 736,89 | 756,01 | 669,56 | 690,72 | 633,17 | 731,79 |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 633,42 | 630,95 | 633,17 | 630,47 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 36,14 | 59,78 | | 101,32 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | | 55,51 | |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,52 | 5,76 | 10,51 | 6,78 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,23 | | 17,22 | |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,17 | 51,08 | 53,55 | 52,21 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,30 | 1,47 | 3,18 | 1,95 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,27 | 80,39 | 96,75 | 82,37 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,65 | 18,52 | 20,18 | 19,13 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 227,06 | 215,78 | 220,83 | 222,91 |
| 14 | Taxes | thous. Euro/km | - | - | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 497,64** | **2 373,61** | **2 429,12** | **2 452,02** |

**Table 3.9 – Structure of Specific Investments in the Linear Portion. Variant 3a. Provadia**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 331) | | Area 3 (km 331 ÷ km 537.8) | | Area 4 (km km 0 ÷ km 351) (to Greece) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run | |
| | **Initial data:** | | | | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 711 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 12,3 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 | 843,10 | 843,1 | 222,26 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1070,3 | 1 250,6 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,41 | 18,4 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,21 | 6,2 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,00 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,42 | 69,09 | 88,42 | 63,67 | 96,14 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 377,84 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 333,39 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 277,96 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 41,62 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 13,81 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 44,45 |
| 3 | Equipment | thous. Eu- | 126,46 | 107,74 | 81,94 | 125,64 | 68,83 | 213,00 | 21,29 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 331) | | Area 3 (km 331 ÷ km 537.8) | | Area 4 (km km 0 ÷ km 351) (to Greece) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run | |
| | | ro/km | | | | | | | |
| 4 | Construction and installation works | thous. Euro/km | 736,89 | 756,01 | 679,54 | 809,61 | 662,99 | 945,13 | 193,75 |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 632,02 | 625,79 | 631,97 | 627,24 | 180,53 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 47,52 | 183,83 | 31,02 | 317,89 | 13,22 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | | 55,51 | | 40,21 |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,44 | 18,05 | 10,44 | 14,35 | 11,45 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,00 | | 17,15 | | 15,91 |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 0,42 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,25 | 54,62 | 53,71 | 58,18 | 18,46 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,13 | 2,51 | 2,86 | 4,26 | 2,98 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,18 | 86,31 | 96,58 | 92,62 | 48,93 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,59 | 20,33 | 20,08 | 22,28 | 7,19 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 228,46 | 236,78 | 225,81 | 259,51 | 83,46 |
| 14 | Taxes | thous. Euro/km | - | - | - | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 513,04** | **2 604,53** | **2 483,96** | **2 854,57** | **918,04** |

**Table 3.10 – Structure of Specific Investments in the Linear Portion. Variant 3b. Chiren**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 331) | | Area 3 (km 331 ÷ km 416) | | Area 4 (km 416 ÷ km 537.8) | Area 5 (km 0 ÷ km 351) (to Greece) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run | | |
| | **Initial data:** | | | | | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 711 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 12,3 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 | 843,10 | 843,1 | 843,10 | 222,26 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 250,6 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,41 | 18,4 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,21 | 6,2 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,43 | 57,66 | 88,43 | 57,66 | 88,43 | 96,14 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 377,84 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 333,39 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 277,96 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 41,62 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 13,81 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 44,45 |
| 3 | Equipment | thous. Eu- | 126,46 | 107,74 | 81,16 | 105,82 | 43,81 | 105,37 | 85,20 | 21,29 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 331) | | Area 3 (km 331 ÷ km 416) | | Area 4 (km 416 ÷ km 537.8) | Area 5 (km 0 ÷ km 351) (to Greece) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | 1 run | 2 run | | |
| | | ro/km | | | | | | | | |
| 4 | Construction and installation works | thous. Euro/km | 736,89 | 756,01 | 679,24 | 759,60 | 631,73 | 751,91 | 684,39 | 193,75 |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 631,73 | 628,85 | 631,73 | 628,85 | 631,73 | 180,53 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 47,52 | 130,74 | 0,00 | 123,05 | 52,67 | 13,22 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | | 55,51 | | 55,51 | 40,21 |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,46 | 10,24 | 10,46 | 10,24 | 10,46 | 11,45 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,15 | | 17,15 | | 17,15 | 15,91 |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 0,42 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,25 | 53,06 | 52,67 | 52,85 | 54,92 | 18,46 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,14 | 2,12 | 2,22 | 2,11 | 3,89 | 2,98 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,19 | 83,66 | 94,58 | 83,39 | 99,26 | 48,93 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,60 | 19,51 | 19,45 | 19,44 | 20,97 | 7,19 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 228,37 | 227,32 | 219,76 | 226,45 | 230,18 | 83,46 |
| 14 | Taxes | thous. Euro/km | - | - | - | - | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 512,07** | **2 500,57** | **2 417,35** | **2 491,00** | **2 531,94** | **918,04** |

**Table 3.11 – Structure of Specific Investments in the Linear Portion. Variant 3c. Provadia**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 537.8) | |
|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | | |
| | **Initial data:** | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,41 | 50,00 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Euro/km | 126,46 | 107,74 | 80,47 | 397,43 |
| 4 | Construction and installation works | thous. Eu- | 736,89 | 756,01 | 673,72 | 1 229,29 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 537.8) | |
|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | | |
| | | ro/km | | | | |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 633,36 | 654,89 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 40,36 | 574,40 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,57 | 190,12 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,23 | |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,49 | 70,60 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,54 | 7,95 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,95 | 112,06 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,87 | 28,07 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 227,93 | 326,71 |
| 14 | Taxes | thous. Euro/km | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 507,28** | **3 593,81** |

**Table 3.12 – Structure of specific investments in the linear portion. Variant 3d. Chiren**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | | Area 3 (km 416 ÷ km 537.8) |
|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | |
| | **Initial data:** | | | | | | |
| | Operating pressure | MPa | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 843,10 | 843,10 | 843,10 | 843,10 | 843,10 |
| | Price of “black” pipe | Euro/t | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 88,43 | 57,66 | 88,42 | 46,42 | 88,42 |
| 2 | Pipe delivery | thous. Euro/km | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 |
| | “Black” pipe | thous. Euro/km | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Eu- | 126,46 | 107,74 | 83,05 | 151,66 | 94,45 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | | Area 2 (km 61 ÷ km 416) | | Area 3 (km 416 ÷ km 537.8) |
|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 run | 1 run | 2 run | |
| | | ro/km | | | | | |
| 4 | Construction and installation works | thous. Euro/km | 736,89 | 756,01 | 671,43 | 867,90 | 687,43 |
| | Gas pipeline laying | thous. Euro/km | 631,73 | 628,85 | 635,29 | 623,40 | 634,76 |
| | Other facilities | thous. Euro/km | 105,16 | 127,16 | 36,14 | 244,49 | 52,67 |
| 5 | Power facilities | thous. Euro/km | 55,51 | | 55,51 | | 55,51 |
| 6 | Transport facilities | thous. Euro/km | 10,46 | 10,24 | 10,71 | 30,42 | 10,67 |
| 7 | Communication facilities | thous. Euro/km | 17,15 | | 17,23 | | 17,22 |
| 8 | Construction site improvement | thous. Euro/km | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Euro/km | 85,47 | 52,96 | 53,21 | 56,53 | 55,01 |
| 10 | Start-up and commissioning works | thous. Euro/km | 23,62 | 2,15 | 2,39 | 3,03 | 4,08 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 159,69 | 83,58 | 95,43 | 88,80 | 99,59 |
| 12 | Insurance | thous. Euro/km | 40,34 | 19,50 | 19,70 | 21,01 | 21,09 |
| 13 | Extraordinary expenses, 10% | thous. Euro/km | 252,56 | 227,14 | 227,87 | 244,74 | 231,51 |
| 14 | Taxes | thous. Euro/km | - | - | - | - | - |
| | **Total** | thous. Euro/km | **2 778,16** | **2 498,56** | **2 506,52** | **2 692,09** | **2 546,57** |

**Table 3.13 – Structure of Specific Investments by Compressor Stations**

| Index Name | | Unit of Meas. | Compressor Stations that are Different by Unit Capacity of GPU | | | | |
|---|---|---|---|---|---|---|---|
| | | | GPU-4, 3 pcs. (2+1) | GPU-16, 5 pcs. (4+1) | GPU-16, 6 pcs. (5+1) | GPU-16, 7 pcs. (5+2) | GPU-25, 8 pcs. (6+2) |
| | **Initial data:** | | | | | | |
| | Unit capacity of GPU | MW | 4 | 16 | 16 | 16 | 25 |
| | Quantity of GPU | pcs. | 3 | 5 | 6 | 7 | 8 |
| | Installed capacity of CS | MW | 12 | 80 | 96 | 112 | 200 |
| | Price of 1 GPU | mln. Euro | 3,72 | 10,50 | 10,50 | 10,50 | 12,70 |
| | **Specific investment** | | | | | | |
| 1 | Construction site preparation and improvement | mln. Euro/MW | 0,36 | 0,08 | 0,08 | 0,07 | 0,04 |
| 2 | Cost of equipment | mln. Euro/MW | 1,43 | 0,96 | 0,95 | 0,95 | 0,69 |
| 2.1 | GPU | mln. Euro/MW | 0,93 | 0,66 | 0,66 | 0,66 | 0,51 |
| 2.2 | Other equipment | mln. Euro/MW | 0,50 | 0,31 | 0,30 | 0,29 | 0,18 |
| 3 | Construction and installation works | mln. Euro/MW | 0,75 | 0,31 | 0,30 | 0,29 | 0,19 |
| 3.1 | Construction and installation works at GPU | mln. Euro/MW | 0,38 | 0,21 | 0,20 | 0,20 | 0,13 |
| 3.2 | Construction and installation works of other equipment | mln. Euro/MW | 0,37 | 0,10 | 0,10 | 0,10 | 0,06 |
| 4 | Facilities of auxiliary and service designation | mln. Euro/MW | 0,17 | 0,03 | 0,03 | 0,03 | 0,01 |
| 5 | Power facilities | mln. Euro/MW | 0,66 | 0,25 | 0,24 | 0,21 | 0,14 |
| 6 | Transport facilities | mln. Euro/MW | 0,31 | 0,06 | 0,05 | 0,04 | 0,03 |
| 7 | Outside nets and structures of water supply, sewerage, heat supply and gas supply | mln. Euro/MW | 0,15 | 0,05 | 0,04 | 0,04 | 0,02 |
| 8 | Temporary buildings and structures | mln. Euro/MW | 0,13 | 0,04 | 0,04 | 0,04 | 0,02 |
| 9 | Start-up and commissioning works | mln. Euro/MW | 0,13 | 0,02 | 0,02 | 0,02 | 0,02 |
| 10 | Management, designing | mln. Euro/MW | 0,55 | 0,17 | 0,16 | 0,14 | 0,09 |
| 11 | Insurance | mln. Euro/MW | 0,04 | 0,02 | 0,02 | 0,02 | 0,01 |
| 12 | Extraordinary expenses, 10 % | mln. Euro/MW | 0,47 | 0,20 | 0,19 | 0,18 | 0,13 |
| 13 | Taxes | mln. Euro/MW | - | - | - | - | - |
| | **TOTAL** | | **5,15** | **2,19** | **2,11** | **2,02** | **1,39** |

**Table 3.14 – Capital Investments in Construction of Other Facilities. Variant 1a. Provadia**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ 537.8) | Total |
|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | 15,5 | **40,9** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 17,2 | **24,6** |
| 4 | Communication of GTE in Sofia | mln. Euro | | **3,5** | **3,5** |

**Table 3.15 - Capital Investments in Construction of Other Facilities. Variant 1b. Chiren**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | 6,5 | 15,5 | **47,4** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 16,5 | 1,7 | **25,6** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | **3,5** | **3,5** |

**Table 3.16 - Capital Investments in Construction of Other Facilities. Variant 2a. Provadia**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ 537.8) | Total |
|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | 15,5 | **40,9** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 17,3 | **24,8** |
| 4 | Communication of GTE in Sofia | mln. Euro | | 3,5 | **3,5** |

**Table 3.17 - Capital Investments in Construction of Other Facilities. Variant 2b. Chiren**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | 6,5 | 15,5 | **47,4** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 10,7 | 7,4 | **25,6** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | 3,5 | **3,5** |

**Table 3.18 - Capital Investments in Construction of Other Facilities. Variant 3a. Provadia**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 537.8) | Area 4 (km 0 ÷ km 351) (to Greece) | Total |
|---|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | | 15,5 | 6,5 | **47,4** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 14,2 | 7,4 | 4,6 | **33,6** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | 3,5 | | **3,5** |

**Table 3.19 - Capital Investments in Construction of Other Facilities. Variant 3b. Chiren**

| Index Names | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Area 5 (km 0 ÷ km 351) (to Greece) | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS | mln. Euro | 25,4 | | 6,5 | 15,5 | 6,5 | **53,9** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 14,6 | 1,0 | 6,6 | 4,6 | **34,2** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | | 3,5 | | **3,5** |

**Table 3.20 - Capital Investments in Construction of Other Facilities. Variant 3c. Provadia**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ 537.8) | Total |
|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | 15,5 | **40,9** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 22,5 | **29,9** |
| 4 | Communication of GTE in Sofia | mln. Euro | | 3,5 | **3,5** |

**Table 3.21 – Capital Investments in Construction of Other Facilities. Variant 3d. Chiren**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | 25,4 | 6,5 | 15,5 | **47,4** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | 7,5 | 15,8 | 7,2 | **30,5** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | 3,5 | **3,5** |

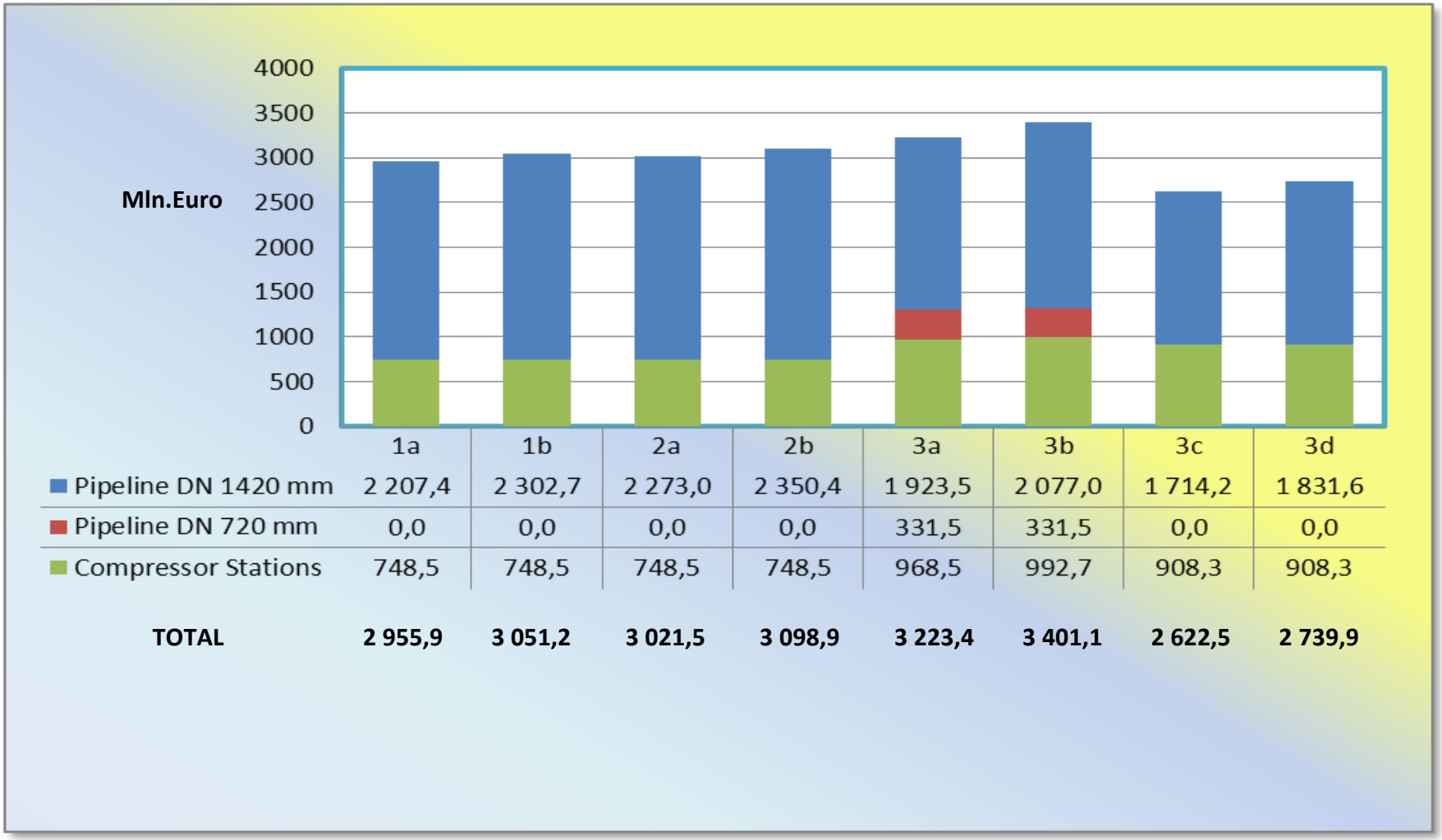
The need in total capital investments by variants is given in Table 3.22.

**Table 3.22 – Total Capital Investments by Variants (without VAT)**

mln. Euro

| Name | Variants | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1a | 1b | 2a | 2b | 3a | 3b | 3c | 3d |
| ***Linear portion*** | ***2 207,4*** | ***2 302,7*** | ***2 273,0*** | ***2 350,4*** | ***2 254,9*** | ***2 408,4*** | ***1 714,2*** | ***1 831,6*** |
| ***DN 1420*** | ***2 207,4*** | ***2 302,7*** | ***2 273,0*** | ***2 350,4*** | ***1 923,5*** | ***2 077,0*** | ***1 714,2*** | ***1 831,6*** |
| Gas pipeline | 1 716,6 | 1 791,4 | 1 772,0 | 1 831,7 | 1 476,9 | 1 600,8 | 1 299,9 | 1 393,5 |
| GMS "Galata" | 109,2 | 109,2 | 109,2 | 109,2 | 109,2 | 109,2 | 109,2 | 109,2 |
| Gas distribution station "Provadia" with GMS | 23,1 | 23,1 | 23,1 | 23,1 | 23,1 | 23,1 | 23,1 | 23,1 |
| GMS on the border with Serbia | 14,1 | 14,1 | 14,1 | 14,1 | 14,1 | 14,1 | 14,1 | 14,1 |
| Gas distribution station "Chiren" with GMS | | 5,9 | | 5,9 | | 5,9 | | 5,9 |
| Other costs | 344,4 | 358,9 | 354,5 | 366,3 | 300,1 | 323,9 | 267,9 | 285,8 |
| ***DN 720*** | | | | | ***331,5*** | ***331,5*** | | |
| Gas pipeline | | | | | 268,2 | 268,2 | | |
| Gas Measuring Station on the border with Greece | | | | | 5,9 | 5,9 | | |
| Other costs | | | | | 57,4 | 57,4 | | |
| ***Compressor Stations*** | ***748,5*** | ***748,5*** | ***748,5*** | ***748,5*** | ***968,5*** | ***992,7*** | ***908,3*** | ***908,3*** |
| CS-1 | 283,9 | 283,9 | 283,9 | 283,9 | 283,9 | 283,9 | 283,9 | 283,9 |
| CS-2 | 232,3 | 232,3 | 232,3 | 232,3 | 232,3 | 232,3 | 208,1 | 208,1 |
| CS-3 | 232,3 | 232,3 | 232,3 | 232,3 | 208,1 | 232,3 | 208,1 | 208,1 |
| CS-4 | | | | | 180,6 | 180,6 | 208,1 | 208,1 |
| CS-5 | | | | | 63,6 | 63,6 | | |
| ***Total*** | **2 955,9** | **3 051,2** | **3 021,5** | **3 098,9** | **3 223,4** | **3 401,1** | **2 622,5** | **2 739,9** |

The structure of the capital investments by the construction facilities is given in Figure 1, the dynamics of their development – in Table 3.23.




| | 1a | 1b | 2a | 2b | 3a | 3b | 3c | 3d |
|---|---|---|---|---|---|---|---|---|
| Pipeline DN 1420 mm | 2 207,4 | 2 302,7 | 2 273,0 | 2 350,4 | 1 923,5 | 2 077,0 | 1 714,2 | 1 831,6 |
| Pipeline DN 720 mm | 0,0 | 0,0 | 0,0 | 0,0 | 331,5 | 331,5 | 0,0 | 0,0 |
| Compressor Stations | 748,5 | 748,5 | 748,5 | 748,5 | 968,5 | 992,7 | 908,3 | 908,3 |
| **TOTAL** | **2 955,9** | **3 051,2** | **3 021,5** | **3 098,9** | **3 223,4** | **3 401,1** | **2 622,5** | **2 739,9** |

**Fig.1 – Structure of the Capital Investments by Variants (mln. Euro without VAT)**

**Table 3.23 – Dynamics of Capital Investments by Years of the Project Implementation (without VAT)**

mln. Euro

| Name \ Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| **Variant 1a** | | | | | | | | |
| Capital investments | 349,2 | 994,3 | 333,8 | 28,4 | 439,5 | 689,8 | 120,9 | **2 955,9** |
| including: | | | | | | | | |
| - linear portion | 322,2 | 854,5 | 224,1 | | 146,7 | 377,5 | 111,5 | **2 036,4** |
| - Compressor Stations | | 66,5 | 88,7 | 27,7 | 273,7 | 273,7 | | **730,3** |
| - other facilities | 27,0 | 73,4 | 21,0 | 0,7 | 19,1 | 38,5 | 9,4 | **189,1** |
| **Variant 1b** | | | | | | | | |
| Capital investments | 352,0 | 1 001,7 | 335,7 | 33,0 | 495,0 | 679,3 | 154,5 | **3 051,2** |
| including: | | | | | | | | |
| - linear portion | 324,7 | 861,2 | 225,9 | 4,3 | 197,8 | 367,8 | 142,5 | **2 124,3** |
| - Compressor Stations | | 66,5 | 88,7 | 27,7 | 273,7 | 273,7 | | **730,3** |
| - other facilities | 27,3 | 74,0 | 21,2 | 1,0 | 23,4 | 37,7 | 12,0 | **196,6** |
| **Variant 2a** | | | | | | | | |
| Capital investments | 349,0 | 993,6 | 347,6 | 153,8 | 533,4 | 546,0 | 98,1 | **3 021,5** |
| including: | | | | | | | | |
| - linear portion | 322,7 | 855,8 | 224,5 | | 266,0 | 342,1 | 90,7 | **2 101,8** |
| - Compressor Stations | | 66,5 | 102,3 | 150,1 | 239,7 | 171,8 | | **730,3** |

| Name \ Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| - other facilities | 26,3 | 71,3 | 20,8 | 3,7 | 27,6 | 32,1 | 7,4 | **189,3** |
| **Variant 2b** | | | | | | | | |
| Capital investments | 352,0 | 1 001,7 | 349,7 | 158,5 | 547,9 | 587,9 | 101,3 | **3 098,9** |
| including: | | | | | | | | |
| - linear portion | 325,3 | 862,7 | 226,3 | 4,3 | 279,2 | 380,6 | 93,6 | **2 172,0** |
| - Compressor Stations | | 66,5 | 102,3 | 150,1 | 239,7 | 171,8 | | **730,3** |
| - other facilities | 26,7 | 72,5 | 21,1 | 4,1 | 28,9 | 35,5 | 7,7 | **196,6** |
| **Variant 3a** | | | | | | | | |
| Capital investments | 352,3 | 1 029,1 | 561,4 | 272,3 | 283,3 | 590,4 | 134,6 | **3 223,4** |
| including: | | | | | | | | |
| - linear portion, including: | 321,2 | 877,5 | 426,4 | 93,4 | 37,8 | 254,4 | 64,7 | **2 075,5** |
| *DN 1420 mm* | 321,2 | 851,8 | 223,4 | | 37,8 | 254,4 | 64,7 | **1 753,3** |
| *DN 720 mm* | | 25,8 | 203,0 | 93,4 | | | | **322,2** |
| - Compressor Stations | | 66,4 | 104,7 | 171,6 | 235,5 | 303,2 | 61,9 | **943,3** |
| - other facilities | 31,2 | 85,2 | 30,3 | 7,3 | 10,0 | 32,8 | 7,9 | **204,6** |
| **Variant 3b** | | | | | | | | |
| Capital investments | 353,9 | 1 033,3 | 562,2 | 243,0 | 322,8 | 725,5 | 160,4 | **3 401,1** |
| including: | | | | | | | | |
| - linear portion, including: | 323,7 | 884,4 | 428,2 | 93,4 | 74,1 | 329,6 | 88,6 | **2 222,0** |

| Name \ Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| *DN 1420 mm* | 323,7 | 858,6 | 225,2 | | 74,1 | 329,6 | 88,6 | **1 899,8** |
| *DN 720 mm* | | 25,8 | 203,0 | 93,4 | | | | **322,2** |
| - Compressor Stations | | 66,4 | 104,4 | 143,1 | 235,7 | 355,9 | 62,0 | **967,5** |
| - other facilities | 30,2 | 82,6 | 29,5 | 6,4 | 13,1 | 40,0 | 9,9 | **211,7** |
| **Variant 3c** | | | | | | | | |
| Capital investments | 353,2 | 1 004,8 | 351,1 | 149,1 | 205,2 | 559,1 | | **2 622,5** |
| including: | | | | | | | | |
| - linear portion | 318,0 | 843,5 | 221,2 | | 27,0 | 133,9 | | **1 543,6** |
| - Compressor Stations | | 66,4 | 102,7 | 145,2 | 170,6 | 399,6 | | **884,4** |
| - other facilities | 35,1 | 95,0 | 27,2 | 3,9 | 7,6 | 25,6 | | **194,5** |
| **Variant 3d** | | | | | | | | |
| Capital investments | 355,8 | 1 011,9 | 353,0 | 149,1 | 221,4 | 648,8 | | **2 739,9** |
| including: | | | | | | | | |
| - linear portion | 321,3 | 852,2 | 223,5 | | 41,7 | 215,3 | | **1 654,0** |
| - Compressor Stations | | 66,4 | 102,7 | 145,2 | 170,6 | 399,6 | | **884,4** |
| - other facilities | 34,5 | 93,3 | 26,8 | 3,9 | 9,1 | 33,9 | | **201,5** |

# 4 OPERATING COSTS

The operating costs have been determined according to the following structure:

| | |
|---|---|
| 1 | Materials |
| 2 | Labor payment costs including: |
| | - engineering manpower |
| | - workers |
| 3 | Contributions to state public, additional pension and medical insurance: |
| | - fund “Pensions” |
| | - fund “Disease and maturity benefits” |
| | - fund “Accidents and professional diseases” |
| | - fund “Unemployment” |
| | - contributions to additional compulsory pension insurance (universal pension fund) |
| | - contributions to medical insurance |
| 4 | Amortization |
| 5 | Repair of the main funds: |
| | - overhaul |
| | - ordinary |
| 6 | Start-up and commissioning works “under load” |
| 7 | Payment for $CO_2$ emissions and other ecological payments |
| 8 | Other costs |

The article “Materials” contains the cost of spare parts, diesel fuel, lubricating materials, coolant, concentrate and other materials.

As far as at this stage of design there are no technical conditions for connecting the gas pipeline facilities to any external electrical power supply sources, the calculations were made subject to construction of own generating capacities – Auxiliary Power Stations (APS) at the Compressor Stations and Gas Turbine Units at the facilities of the gas pipeline linear part. Costs for gas purchase for auxiliaries of the CS and electrical power generation were not taken into account in this section, because they will be taken into account as losses of marketable products to consumers when calculating integral values of the gas pipeline efficiency as a whole.

Thus, the articles “Materials” took into account the costs for gas purchase for auxiliaries and electrical power only for comparison of the electrical power supply variants, as well as the variants of process parameters’ optimization and gas pipeline equipment (section 9). The gas cost for auxiliaries of the Compressor Stations has been accepted as equal to 190 Euro/thous. $m^3$.

The article “Labor payment costs” has been calculated based on the number of maintenance personnel and relative wages under the categories of personnel according to the submitted data.

The section “Contributions to state public, additional pension and medical insurance” includes the compulsory deductions to the different social funds of the Republic of Bulgaria, calculated according to the rates provided by the current legislation.

The contribution amount in percent of the labor payment fund amount to:

| | | |
|---|---|---|
| **Contributions to state public, additional pension and medical insurance:** | - | **21.1%** |
| - fund “Pensions” | - | 7.1% |
| - fund “Disease and maturity benefits” | - | 2.1% |
| - fund “Accidents and professional diseases” | - | 0.5% |
| - fund “Unemployment” | - | 0.6% |
| - contributions to additional compulsory pension insurance (universal pension fund) | - | 2.8% |
| - Contributions to medical insurance | - | 8.0% |

The amortization deductions have been calculated according to the Law of the Republic of Bulgaria on enterprise corporate tax based on the cost of the main funds, which are determined by the capital investments value (exclusive of value added tax)) and annual interest rates of Amortization deductions provided by the legislation.

The annual depreciation norms are given in Table 4.1.

**Table 4.1 – Annual Depreciation Norms**

| Category of Assets | Annual Rates, % | Name of Assets |
|---|---|---|
| I | 4 | Buildings, structures, transmission devices, power transmission lines, communication lines |
| II | 30 | Machines, production equipment, apparatus |
| III | 10 | Transport vehicles, exclusive of motor cars, road illumination and runways |
| IV | 50 | Computers, peripheral units, software and right to use software |
| V | 25 | Motor cars |
| VI | 15 | For all other depreciated assets |
| VII | It is determined according to the duration of the maximum allowable term of usage, but not more 25% | For intangible assets, which have legal limits for the period of usage |

The articles “Repair of main funds” include the costs for overhaul and ordinary repair, which are calculated based on the cost of the main funds and are accepted in the following amounts:

- overhaul - on a case-by-case basis by years of the accounting period – from 0.2% to 2% for the Compressor Stations’ facilities and from 0.1% to 1% - for the facilities of the gas pipeline’s linear part;
- ordinary repair – 0.5% and 0.2% for the Compressor Stations’ facilities and the linear part, correspondingly.

The article “Other costs” should approximately include the following costs:

- services of third party transport;
- diagnostics services;
- communication and Internet services;
- services in fire safety and security provision;
- labor protection and safety services;
- personnel training services;
- software and accompanying services;

- audit;
- legal and consultation services;
- water supply and water disposal services;
- other services of third organizations;
- advertising;
- costs for business trips;
- costs for representative needs;
- board organization;
- other costs.

At this stage the article “Other costs” was determined by experts based on the data available at the Institution on the similar facilities.

The average annual rates of operating costs and their values are given in Tables 4.2 and 4.3, correspondingly. The values of the annual average costs by variants and costs articles are given in Figure 2.

The dynamics of the operating costs (by the costs articles) and amortization deductions by years of the accounting period are given in Annexes 8 and 9 (Tables 8.1-8.8, 9.1).

**Table 4.2 – Rates of Operating Costs and Amortization Deductions**

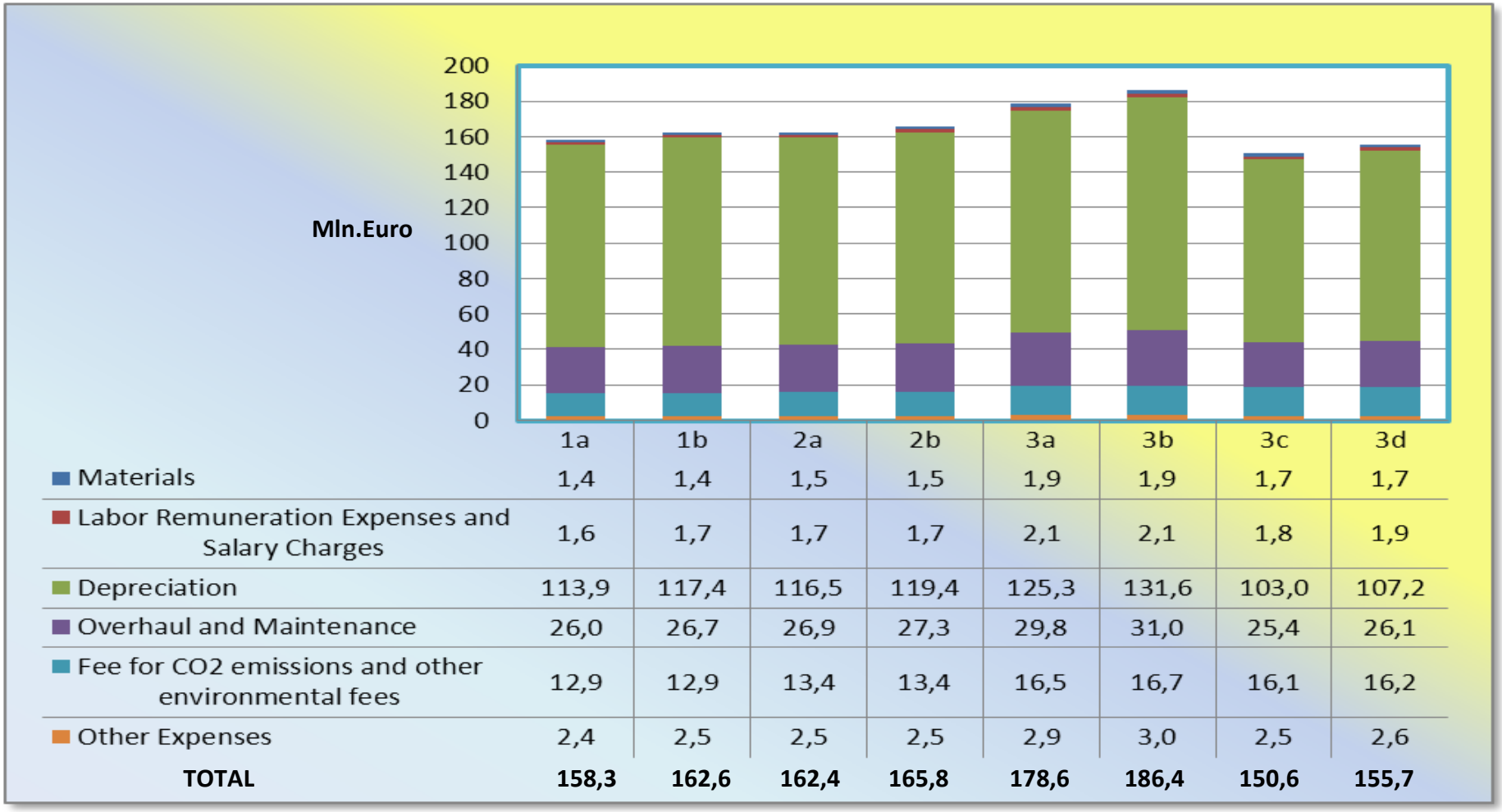
| | Index Name | Unit of Meas. | Variant 1a | Variant 1b | Variant 2a | Variant 2b | Variant 3a | Variant 3b | Variant 3c | Variant 3d |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | **Operating costs** | | | | | | | | | |
| 1.1 | Rates in percents of capital invest-ments(without VAT) | | | | | | | | | |
| | linear portion | % | 0,77% | 0,77% | 0,77% | 0,77% | 0,77% | 0,77% | 0,81% | 0,80% |
| | Compressor Stations | % | 3,63% | 3,63% | 3,78% | 3,75% | 3,65% | 3,60% | 3,69% | 3,68% |
| | other facilities | % | 1,15% | 1,16% | 1,15% | 1,16% | 1,36% | 1,35% | 1,22% | 1,33% |
| 1.2 | Gas price for CS auxiliaries | Euro/thous. $m^3$ | - | - | - | - | - | - | - | - |
| 1.3 | $CO_2$ emissions | Euro/t $CO_2$ | 13,0 | 13,0 | 13,0 | 13,0 | 13,0 | 13,0 | 13,0 | 13,0 |
| **2** | **Amortization deductions *** | | | | | | | | | |
| 2.1 | Rates in percents of capital invest-ments(without VAT) | | | | | | | | | |
| | linear portion | % | 3,74% | 3,74% | 3,74% | 3,74% | 3,72% | 3,70% | 3,82% | 3,80% |
| | Compressor Stations | % | 3,85% | 3,85% | 3,87% | 3,87% | 3,84% | 3,83% | 3,84% | 3,78% |
| | other facilities | % | 5,03% | 5,03% | 5,03% | 5,03% | 5,87% | 5,78% | 5,17% | 5,43% |

* The rates of annual average operating costs and amortization deductions are given
The calculation were made according to the following norms of the legislation of Bulgaria: for buildings, structures, transmission devices, communication lines - 4%; for equipment - 30%

**Table 4.3 – Annual Average Operating Costs by Variants**

mln. Euro

| Variant / Name | 1a | 1b | 2a | 2b | 3a | 3b | 3c | 3d |
|---|---|---|---|---|---|---|---|---|
| Material costs (lubricating materials, spare parts, etc.) | 1,4 | 1,4 | 1,5 | 1,5 | 1,9 | 1,9 | 1,7 | 1,7 |
| Labour payment costs | 1,4 | 1,4 | 1,4 | 1,4 | 1,7 | 1,8 | 1,5 | 1,6 |
| Taxes (charges on payroll) | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Depreciation | 113,9 | 117,4 | 116,5 | 119,4 | 125,3 | 131,6 | 103,0 | 107,2 |
| Repair and maintenance | 26,0 | 26,7 | 26,9 | 27,3 | 29,8 | 31,0 | 25,4 | 26,1 |
| Ecological payments | 12,9 | 12,9 | 13,4 | 13,4 | 16,5 | 16,7 | 16,1 | 16,2 |
| Other costs | 2,4 | 2,5 | 2,5 | 2,5 | 2,9 | 3,0 | 2,5 | 2,6 |
| **TOTAL** | **158,3** | **162,6** | **162,4** | **165,8** | **178,6** | **186,4** | **150,6** | **155,7** |




| | 1a | 1b | 2a | 2b | 3a | 3b | 3c | 3d |
|---|---|---|---|---|---|---|---|---|
| Materials | 1,4 | 1,4 | 1,5 | 1,5 | 1,9 | 1,9 | 1,7 | 1,7 |
| Labor Remuneration Expenses and Salary Charges | 1,6 | 1,7 | 1,7 | 1,7 | 2,1 | 2,1 | 1,8 | 1,9 |
| Depreciation | 113,9 | 117,4 | 116,5 | 119,4 | 125,3 | 131,6 | 103,0 | 107,2 |
| Overhaul and Maintenance | 26,0 | 26,7 | 26,9 | 27,3 | 29,8 | 31,0 | 25,4 | 26,1 |
| Fee for CO2 emissions and other environmental fees | 12,9 | 12,9 | 13,4 | 13,4 | 16,5 | 16,7 | 16,1 | 16,2 |
| Other Expenses | 2,4 | 2,5 | 2,5 | 2,5 | 2,9 | 3,0 | 2,5 | 2,6 |
| **TOTAL** | **158,3** | **162,6** | **162,4** | **165,8** | **178,6** | **186,4** | **150,6** | **155,7** |

**Fig. 2 – Annual Average Operating costs by Variants**

## 5 TECHNICAL AND ECONOMIC VALUES

The main technical and economic values by variants and areas of the gas pipeline are given in Tables 5.1 - 5.8.

**Table 5.1 – Variant 1a. Provadia**
**Main Technical and Economic Values of the Gas Pipeline. 2025.**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | |
|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 40,7 | 63,0 |
| | including: | | | | |
| | commercial gas | bln. $m^3$/year | 22,0* | 40,5 | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,24 | 0,53 |
| 2 | Capacity use factor | | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 123,8 | 191,8 |
| | including: | | | | |
| | commercial gas | mln. $m^3$/day | 67,0 | 122,8 | 189,8 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 1,0 | 2,0 |
| 4 | Operating pressure in gas pipe-line | MPa | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | |
| | diameter | mm | 1422 | 1422 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insula-tion | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |
| 6 | Route length | km | 61 | 476,8 | 537,8 |
| 7 | Length of laid pipes DN 1420 | km | 121 | 699,3 | 820,3 |
| 8 | Metal investments | thous. t | 100,24 | 579,32 | 679,56 |
| 9 | Number of CS | pcs. | 1 | 2 | 3 |
| 10 | CS location | | CS-1 - km 2 | CS-2 - km 184<br>CS-3 - km 407 | |
| 11 | Number and size of gas pump-ing units (GPU) | | 8 pcs.<br>GCU-25 | 14 pcs.<br>GCU-16 | |
| | including: | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5 | 16 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 2<br>CS-3 - 2 | 6 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | |
|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) | Total |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 112<br>CS-3 - 112 | 424 |
| 13 | Gas parameters at CS entry/exit | | | | |
| | pressure | | CS-1<br>6,22/9,83 | CS-2<br>6,85/9,83<br>CS-3<br>6,81/9,83 | |
| | temperature | | CS-1<br>0,6/35,0 | CS-2<br>19,0/35,0<br>CS-3<br>16,4/35,0 | |
| 14 | Gas parameters in the initial point | | | | |
| | pressure | MPa | 6,5 | 9,0 | |
| | temperature | ºC | 1,2 | 29,8 | |
| 15 | Gas parameters in the end point | | | | |
| | pressure | MPa | 9,0 | 8,6 | |
| | temperature | ºC | 29,8 | 24,2 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 2 206,3 | 2 955,9 |
| | including: | | | | |
| | linear portion | mln. Euro | 319,4 | 1 717,1 | 2 036,4 |
| | Compressor Stations | mln. Euro | 277,2 | 453,1 | 730,3 |
| | other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 36,1 | 189,1 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 26,0 | 42,0 |
| | including: | | | | |
| | linear portion | mln. Euro/year | 2,8 | 10,8 | 13,6 |
| | Compressor Stations | mln. Euro/year | 12,7 | 13,8 | 26,5 |
| | other facilities | mln. Euro/year | 0,5 | 1,4 | 1,9 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 73,4 | 92,5 |
| | including: | | | | |
| | linear portion | mln. Euro/year | 13,6 | 59,8 | 73,4 |
| | Compressor Stations | mln. Euro/year | 3,8 | 6,7 | 10,5 |
| | other facilities | mln. Euro/year | 1,7 | 6,9 | 8,6 |

* Gas discharge to consumers into the existing system

**Table 5.2 – Variant 1b. Chiren**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | | | Area 2 (km 61 ÷ km 416) | | | Area 3 (km 416 ÷ km 537.8) | | | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | | | 42,3 | | | 40,5 | | | 63,0 |
| | including: | | | | | | | | | | | |
| | commercial gas | bln. $m^3$/year | 20,4* | | | 1,6* | | | 40,5 | | | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | | | 0,23 | | | | | | 0,52 |
| 2 | Capacity use factor | | 0,9 | | | 0,9 | | | 0,9 | | | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | | | 128,7 | | | 122,8 | | | 191,8 |
| | including: | | | | | | | | | | | |
| | commercial gas | mln. $m^3$/day | 62,1 | | | 4,9 | | | 122,8 | | | 189,8 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | | | 1,0 | | | | | | 2,0 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | | | 9,8 | | | 9,8 | | | |
| 5 | Linear portion of gas pipeline | | | | | | | | | | | |
| | diameter | mm | 1422 | | | 1422 | | | 1422 | | | |
| | wall thickness | mm | 21,5 | 25,6 | 30,5 | 21,5 | 25,6 | 30,5 | 21,5 | 25,6 | 30,5 | |
| | pipe weight without insulation | t/km | 749,96 | 890,36 | 1057,05 | 749,96 | 890,36 | 1057,05 | 749,96 | 890,36 | 1057,05 | |
| | pipe weight with insulation | t/km | 765,96 | 906,36 | 1073,05 | 765,96 | 906,36 | 1073,05 | 765,96 | 906,36 | 1073,05 | |
| 6 | Route length | km | 61 | | | 355 | | | 121,8 | | | 537,8 |
| 7 | Length of laid pipes Dn 1420 | km | 121 | | | 517 | | | 217,8 | | | 855,8 |
| 8 | Metal investments | thous. t | 100,24 | | | 428,30 | | | 180,43 | | | 708,97 |
| 9 | Number of CS | pcs. | 1 | | | 2 | | | - | | | 3 |
| 10 | CS location | | CS-1 - km 2 | | | CS-2 - km 184<br>CS-3 - km 416 | | | | | | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 61)** | **Area 2 (km 61 ÷ km 416)** | **Area 3 (km 416 ÷ km 537.8)** | **Total** |
| 11 | Number and size of gas pumping units (GPU) | | 8 pcs. GPU-25 | 14 pcs. GPU-16 | - | |
| | including: | | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5 | | 16 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 2<br>CS-3 - 2 | | 6 |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 112<br>CS-3 - 112 | - | 424 |
| 13 | Gas parameters at CS entry/exit | | | | | |
| | pressure | | CS-1<br>6,22/9,83 | CS-2<br>7,00/9,83<br>KC-3<br>6,84/9,83 | | |
| | temperature | | CS-1<br>0,6/35,0 | CS-2<br>19,0/35,0<br>CS-3<br>16,4/35,0 | | |
| 14 | Gas parameters in the initial point | | | | | |
| | pressure | MPa | 6,5 | 9,0 | 9,8 | |
| | temperature | ºC | 1,2 | 29,6 | 34,2 | |
| 15 | Gas parameters in the end point | | | | | |
| | pressure | MPa | 9,0 | 9,8 | 8,7 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| | temperature | ºC | 29,6 | 34,2 | 24,2 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 1 753,0 | 548,5 | 3 051,2 |
| | including: | | | | | |
| | linear portion | mln. Euro | 319,4 | 1 277,0 | 527,9 | 2 124,3 |
| | Compressor Stations | mln. Euro | 277,2 | 453,1 | | 730,3 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 22,9 | 20,6 | 196,6 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 22,7 | 4,0 | 42,7 |
| | including: | | | | | |
| | linear portion | mln. Euro/year | 2,8 | 7,7 | 3,5 | 14,2 |
| | Compressor Stations | mln. Euro/year | 12,7 | 13,8 | | 26,5 |
| | Other facilities | mln. Euro/year | 0,5 | 1,1 | 0,4 | 2,0 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 56,1 | 20,7 | 95,9 |
| | including: | | | | | |
| | linear portion | mln. Euro/year | 13,6 | 44,2 | 18,6 | 76,4 |
| | Compressor Stations | mln. Euro/year | 3,8 | 6,7 | | 10,5 |
| | Other facilities | mln. Euro/year | 1,7 | 5,2 | 2,1 | 8,9 |

* Gas discharge to consumers into the existing system

**Table 5.3 – Variant 2a. Provadia**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | |
|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 40,7 | 63,0 |
| | including: | | | | |
| | commercial gas | bln. $m^3$/year | 22,0* | 40,5 | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,24 | 0,53 |
| 2 | Capacity use factor | | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 123,8 | 191,8 |
| | including: | | | | |
| | commercial gas | mln. $m^3$/day | 67,0 | 122,7 | 189,7 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 1,1 | 2,1 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | |
| | diameter | mm | 1422 | 1422 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insulation | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |
| 6 | Route length | km | 61 | 476,8 | 537,8 |
| 7 | Length of laid pipes Dn 1420 | km | 121 | 727,6 | 848,6 |
| 8 | Metal investments | thous. t | 100,24 | 602,77 | 703,01 |
| 9 | Number of CS | pcs. | 1 | 2 | 3 |
| 10 | CS location | | CS-1 – km 2 | CS-2 - km 210<br>CS-3 - km 462 | |
| 11 | Number and size of gas pumping units (GPU) | | 8 pcs.<br>GPU-25 | 14 pcs.<br>GPU-16 | |
| | including: | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5 | 16 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 2<br>CS-3 - 2 | 6 |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 112<br>CS-3 - 112 | 424 |
| 13 | Gas parameters at CS entry/exit | | | | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | |
|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) | Total |
| | pressure | | CS-1 6,22/9,83 | CS-2 6,77/9,83 CS-3 6,61/9,83 | |
| | temperature | | CS-1 0,6/35,0 | CS-2 17,3/35,0 CS-3 14,7/35,0 | |
| 14 | Gas parameters in the initial point | | | | |
| | pressure | MPa | 6,5 | 9,0 | |
| | temperature | ºC | 1,2 | 29,7 | |
| 15 | Gas parameters in the end point | | | | |
| | pressure | MPa | 9,0 | 9,3 | |
| | temperature | ºC | 29,7 | 28,4 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 2 271,9 | 3 021,5 |
| | including: | | | | |
| | linear portion | mln. Euro | 319,4 | 1 782,4 | 2 101,8 |
| | Compressor Stations | mln. Euro | 277,2 | 453,1 | 730,3 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 36,3 | 189,3 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 27,3 | 43,3 |
| | including: | | | | |
| | linear portion | mln. Euro/year | 2,8 | 11,2 | 14,0 |
| | Compressor Stations | mln. Euro/year | 12,7 | 14,7 | 27,3 |
| | Other facilities | mln. Euro/year | 0,5 | 1,4 | 1,9 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 75,9 | 95,0 |
| | including: | | | | |
| | linear portion | mln. Euro/year | 13,6 | 62,3 | 75,9 |
| | Compressor Stations | mln. Euro/year | 3,8 | 6,7 | 10,5 |
| | Other facilities | mln. Euro/year | 1,7 | 6,9 | 8,6 |

* Gas discharge to consumers into the existing system

**Table 5.4 – Variant 2b. Chiren**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 42,3 | 40,6 | 63,0 |
| | including: | | | | | |
| | commercial gas | bln. $m^3$/year | 20,4* | 1,6* | 40,5 | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,12 | 0,12 | 0,53 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 128,7 | 123,3 | 191,8 |
| | including: | | | | | |
| | commercial gas | mln. $m^3$/day | 62,1 | 4,9 | 122,8 | 189,8 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 0,5 | 0,5 | 2,0 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | |
| | diameter | mm | 1422 | 1422 | 1422 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insulation | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |
| 6 | Route length | km | 61 | 355 | 121,8 | 537,8 |
| 7 | Length of laid pipes Dn 1420 | km | 121 | 559,5 | 197,1 | 877,6 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| 8 | Metal investments | thous. t | 100,24 | 463,51 | 163,28 | 727,03 |
| 9 | Number of CS | pcs. | 1 | 1 | 1 | 3 |
| 10 | CS location | | CS-1 - км 2 | CS-2 - км 210 | CS-3 - км 462 | |
| 11 | Number and size of gas pumping units (GPU) | | 8 шт. GPU-25 | 7 шт. GPU-16 | 7 шт. GPU-16 | |
| | including: | | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | 16 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5 | CS-3 - 5 | 16 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 2 | CS-3 - 2 | 6 |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 112 | CS-3 - 112 | 424 |
| 13 | Gas parameters at CS entry/exit | | | | | |
| | pressure | | CS-1 6,22/9,83 | CS-2 7,13/9,83 | CS-3 6,67/9,83 | |
| | temperature | | CS-1 0,6/35,0 | CS-2 18,4/35,0 | CS-3 14,8/35,0 | |
| 14 | Gas parameters in the initial point | | | | | |
| | pressure | MPa | 6,5 | 9,0 | 7,77 | |
| | temperature | ºC | 1,2 | 29,8 | 19,3 | |
| 15 | Gas parameters in the end point | | | | | |
| | pressure | MPa | 9,0 | 7,77 | 9,3 | |
| | temperature | ºC | 29,8 | 19,3 | 28,4 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 1 615,8 | 733,4 | 3 098,9 |
| | including: | | | | | |
| | linear portion | mln. Euro | 319,4 | 1 372,1 | 480,5 | 2 172,0 |
| | Compressor Stations | mln. Euro | 277,2 | 226,6 | 226,6 | 730,3 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 17,2 | 26,3 | 196,6 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 16,5 | 11,2 | 43,7 |
| | including: | | | | | |
| | linear portion | mln. Euro/year | 2,8 | 8,3 | 3,3 | 14,5 |
| | Compressor Stations | mln. Euro/year | 12,7 | 7,2 | 7,3 | 27,2 |
| | Other facilities | mln. Euro/year | 0,5 | 1,0 | 0,5 | 2,0 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 56,4 | 22,3 | 97,8 |
| | including: | | | | | |
| | linear portion | mln. Euro/year | 13,7 | 47,7 | 17,0 | 78,3 |
| | Compressor Stations | mln. Euro/year | 3,8 | 3,4 | 3,4 | 10,5 |
| | Other facilities | mln. Euro/year | 1,6 | 5,3 | 2,0 | 9,0 |

* Gas discharge to consumers into the existing system

**Table 5.5 – Variant 3a. Provadia**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 537.8) | Area 4 (km 0 ÷ km 351) *(to Greece)* | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 43,2 | 38,5 | 4,5 | 63,0 |
| | including: | | | | | | |
| | commercial gas | bln. $m^3$/year | 19,5* | 4,5* | 38,4 | 4,5 | 62,4 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,25 | 0,10 | 0,03 | 0,67 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 131,4 | 116,6 | 13,7 | 191,8 |
| | including: | | | | | | |
| | commercial gas | mln. $m^3$/day | 59,4 | 13,7 | 116,2 | 13,6 | 189,3 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 1,1 | 0,4 | 0,1 | 2,6 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | 9,8 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | | |
| | diameter | mm | 1422 | 1422 | 1422 | 711 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 10,8 \| 12,9 \| 15,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 188,35 \| 224,30 \| 268,50 | |
| | pipe weight with insulation | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 195,35 \| 231,30 \| 275,50 | |
| 6 | Route length | km | 61 | 270 | 206,8 | 350,8 | 537,8 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 537.8) | Area 4 (km 0 ÷ km 351) *(to Greece)* | Total |
| 7 | Length of pipes to be laid | km | 121 | 336,5 | 230,8 | 350,8 | 1039,1 |
| | including by pipe diameters: | | | | | | |
| | Dn 1422 | km | 121 | 336,5 | 230,8 | | 688,3 |
| | Dn 711 | km | | | | 350,8 | 350,8 |
| 8 | Metal investments | thous. t | 100,24 | 278,77 | 191,2 | 75,53 | 645,74 |
| 9 | Number of CS | pcs. | 1 | 2 | 1 | 1 | 5 |
| 10 | CS location | | CS-1 - km 2 | CS-2 - km 152<br>CS-3 - km 330,5 | CS-4 - km 507,8 | CS-5 – km 334,8 | |
| 11 | Number and size of gas pumping units (GPU) | | 8 pcs.<br>GPU-25 | 13 pcs.<br>GPU-16 | 5 pcs.<br>GPU-16 | 3 pcs.<br>GPU-4 | |
| | including: | | | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | 16 | 4 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5 | CS-4 - 4 | CS-5 - 2 | 22 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 2<br>CS-3 - 1 | CS-4 - 1 | CS-5 - 1 | 7 |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 112<br>CS-3 - 96 | CS-4 - 80 | CS-5 - 12 | 500 |
| 13 | Gas parameters at CS entry/exit | | | | | | |
| | pressure | | CS-1<br>6,22/9,83 | CS-2<br>6,94/9,83<br>CS-3<br>6,80/9,83 | CS-4<br>7,07/9,83 | CS-5<br>6,70/9,83 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 537.8) | Area 4 (km 0 ÷ km 351) *(to Greece)* | Total |
| | temperature | | CS-1 0,6/35,0 | CS-2 20,3/35,0 CS-3 18,2/35,0 | CS-4 19,7/35,0 | CS-5 10,3/29,0 | |
| 14 | Gas parameters in the initial point | | | | | | |
| | pressure | MPa | 6,5 | 9,0 | 9,8 | 9,8 | |
| | temperature | ºC | 1,2 | 29,8 | 35,0 | 35,0 | |
| 15 | Gas parameters in the end point | | | | | | |
| | pressure | MPa | 9,0 | 9,8 | 9,2 | 9,8 | |
| | temperature | ºC | 29,8 | 35,0 | 31,8 | 26,7 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 1 294,9 | 783,9 | 395,0 | 3 223,5 |
| | including: | | | | | | |
| | linear portion | mln. Euro | 319,4 | 851,7 | 582,2 | 322,2 | 2 075,5 |
| | Compressor Stations | mln. Euro | 277,2 | 429,0 | 175,4 | 61,8 | 943,3 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 14,3 | 26,3 | 11,1 | 204,7 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 20,4 | 10,2 | 4,3 | 50,9 |
| | including: | | | | | | |
| | linear portion | mln. Euro/year | 2,8 | 5,1 | 4,0 | 2,0 | 13,9 |
| | Compressor Stations | mln. Euro/year | 12,7 | 14,4 | 5,5 | 2,0 | 34,5 |
| | Other facilities | mln. Euro/year | 0,5 | 0,1 | 0,6 | 0,3 | 2,4 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 39,2 | 25,5 | 13,9 | 97,6 |
| | including: | | | | | | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 537.8) | Area 4 (km 0 ÷ km 351) *(to Greece)* | Total |
| | linear portion | mln. Euro/year | 13,6 | 28,2 | 19,9 | 11,0 | 72,7 |
| | Compressor Stations | mln. Euro/year | 3,8 | 6,4 | 2,7 | 1,3 | 14,2 |
| | other facilities | mln. Euro/year | 1,7 | 4,6 | 2,8 | 1,6 | 10,6 |

* Gas discharge to consumers into the existing system

**Table 5.6 – Variant 3b. Chiren**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Area 5 (km 0 ÷ km 351) *(to Greece)* | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 44,8 | 40,1 | 38,5 | 4,5 | 63,0 |
| | including: | | | | | | | |
| | commercial gas | bln. $m^3$/year | 17,9* | 4,5* | 1,6* | 38,4 | 4,5 | 62,4 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,25 | | 0,10 | 0,03 | 0,67 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 136,3 | 121,5 | 116,6 | 13,7 | 191,8 |
| | including: | | | | | | | |
| | commercial gas | mln. $m^3$/day | 54,5 | 13,7 | 4,9 | 116,2 | 13,6 | 189,3 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 61)** | **Area 2 (km 61 ÷ km 331)** | **Area 3 (km 331 ÷ km 416)** | **Area 4 (km 416 ÷ km 537.8)** | **Area 5 (km 0 ÷ km 351)** *(to Greece)* | **Total** |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 1,1 | | 0,4 | 0,1 | 2,6 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | | | |
| | diameter | mm | 1422 | 1422 | 1422 | 1422 | 711 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 10,8 \| 12,9 \| 15,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 188,35 \| 224,30 \| 268,50 | |
| | pipe weight with insulation | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 195,35 \| 231,30 \| 275,50 | |
| 6 | Route length | km | 61 | 270 | 85 | 121,8 | 350,8 | 537,8 |
| 7 | Length of laid pipes | km | 121 | 363,5 | 147 | 121,8 | 350,8 | 1104,1 |
| | including by pipe diameters: | | | | | | | |
| | DN 1422 | km | 121 | 363,5 | 147 | 121,8 | | 753,3 |
| | DN 711 | km | | | | | 350,8 | 350,8 |
| 8 | Metal investments | thous. t | 100,24 | 301,14 | 121,78 | 100,90 | 75,53 | 699,59 |
| 9 | Number of CS | pcs. | 1 | 2 | | 1 | 1 | 5 |
| 10 | CS location | | CS-1 - км 2 | CS-2 - км 152<br>CS-3 - км 330,5 | | CS-4 - км 521,8 | CS-5 - км 334,8 | |
| 11 | Number and size of gas pumping units (GPU) | | 8 pcs.<br>GPU-25 | 14 pcs.<br>GPU-16 | | 5 pcs.<br>GPU-16 | 3 pcs.<br>GPU-4 | |
| | including: | | | | | | | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 61)** | **Area 2 (km 61 ÷ km 331)** | **Area 3 (km 331 ÷ km 416)** | **Area 4 (km 416 ÷ km 537.8)** | **Area 5 (km 0 ÷ km 351)** *(to Greece)* | **Total** |
| | Unit capacity of GPU at CS | MW | 25 | 16 | | 16 | 4 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5 | | CS-4 - 4 | CS-5 - 2 | 22 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 2<br>CS-3 - 2 | | CS-4 - 1 | CS-5 - 1 | 8 |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 112<br>CS-3 - 112 | | CS-4 - 80 | CS-5 - 12 | 516 |
| 13 | Gas parameters at CS entry/exit | | | | | | | |
| | pressure | | CS-1<br>6,22/9,83 | CS-2<br>7,03/9,83<br>CS-3<br>6,86/9,83 | | CS-4<br>7,24/9,83 | CS-5<br>6,70/9,83 | |
| | temperature | | CS-1<br>0,6/35,0 | CS-2<br>20,4/35,0<br>CS-3<br>18,2/35,0 | | CS-4<br>18,9/33,4 | CS-5<br>10,3/29,0 | |
| 14 | Gas parameters in the initial point | | | | | | | |
| | pressure | MPa | 6,5 | 9,0 | 9,8 | 9,3 | 9,8 | |
| | temperature | ºC | 1,2 | 29,8 | 35,0 | 28,3 | 35,0 | |
| 15 | Gas parameters in the end point | | | | | | | |
| | pressure | MPa | 9,0 | 9,8 | 9,3 | 9,5 | 9,8 | |
| | temperature | ºC | 29,8 | 35,0 | 28,3 | 33,4 | 26,7 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 1 379,8 | 367,4 | 509,3 | 395,0 | 3 401,1 |
| | including: | | | | | | | |
| | linear portion | mln. Euro | 319,4 | 912,1 | 359,9 | 308,4 | 322,2 | 2 222,0 |
| | Compressor Stations | mln. Euro | 277,2 | 453,1 | | 175,4 | 61,8 | 967,5 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 331) | Area 3 (km 331 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Area 5 (km 0 ÷ km 351) *(to Greece)* | Total |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 14,6 | 7,4 | 25,6 | 11,1 | 211,7 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 21,2 | 2,4 | 8,4 | 4,3 | 52,2 |
| | including: | | | | | | | |
| | linear portion | mln. Euro/year | 2,8 | 5,5 | 2,1 | 2,4 | 2,0 | 14,8 |
| | Compressor Stations | mln. Euro/year | 12,7 | 14,7 | | 5,6 | 2,0 | 35,0 |
| | other facilities | mln. Euro/year | 0,5 | 0,9 | 0,3 | 0,4 | 0,3 | 2,5 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 41,8 | 14,0 | 15,0 | 13,9 | 103,7 |
| | including: | | | | | | | |
| | linear portion | mln. Euro/year | 13,6 | 30,6 | 12,4 | 10,7 | 11,0 | 78,3 |
| | Compressor Stations | mln. Euro/year | 3,8 | 6,7 | | 2,7 | 1,3 | 14,5 |
| | other facilities | mln. Euro/year | 1,7 | 4,6 | 1,6 | 1,5 | 1,5 | 10,9 |

* Gas discharge to consumers into the existing system

**Table 5.7 – Variant 3c. Provadia**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | |
|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 38,7 | 63,0 |
| | including: | | | | |
| | commercial gas | bln. $m^3$/year | 24,0* | 38,4 | 62,4 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,36 | 0,65 |
| 2 | Capacity use factor | | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 117,7 | 191,8 |
| | including: | | | | |
| | commercial gas | mln. $m^3$/day | 73,1 | 116,1 | 189,2 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 1,6 | 2,6 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | |
| | diameter | mm | 1422 | 1422 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insulation | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |
| 6 | Route length | km | 61 | 476,8 | 537,8 |
| 7 | Length of laid pipes DN 1420 | km | 121 | 484,8 | 605,8 |
| 8 | Metal investments | thous. t | 100,24 | 401,63 | 501,87 |
| 9 | Number of CS | pcs. | 1 | 3 | 3 |
| 10 | CS location | | CS-1 - km 2 | CS-2 - km 179<br>CS-3 - km 355<br>CS-4 - km 522,8 | |
| 11 | Number and size of gas pumping units (GPU) | | 8 pcs.<br>GPU-25 | 18 pcs.<br>GPU-16 | |
| | including: | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5<br>CS-4 - 5 | 21 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 1<br>CS-3 - 1<br>CS-4 - 1 | 5 |
| 12 | Installed capacity of CS | MW | MW | CS-2 - 96<br>CS-3 - 96<br>CS-4 - 96 | 488 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | |
|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) | Total |
| 13 | Gas parameters at CS entry/exit | | | | |
| | pressure | | CS-1<br>6,22/9,83 | CS-2<br>6,87/9,83<br>CS-3<br>6,49/9,83<br>CS-4<br>6,66/9,83 | |
| | temperature | | CS-1<br>0,6/35,0 | CS-2<br>19,4/35,0<br>CS-3<br>18,7/35,0<br>CS-4<br>19,4/35,0 | |
| 14 | Gas parameters in the initial point | | | | |
| | pressure | MPa | 6,5 | 9,0 | |
| | temperature | ºC | 1,2 | 29,8 | |
| 15 | Gas parameters in the end point | | | | |
| | pressure | MPa | 9,0 | 9,5 | |
| | temperature | ºC | 29,8 | 33,4 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 1 872,9 | 2 622,5 |
| | including: | | | | |
| | linear portion | mln. Euro | 319,4 | 1 224,2 | 1 543,6 |
| | Compressor Stations | mln. Euro | 277,2 | 607,2 | 884,4 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 41,4 | 194,5 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 29,6 | 45,6 |
| | including: | | | | |
| | linear portion | mln. Euro/year | 2,8 | 8,1 | 10,8 |
| | Compressor Stations | mln. Euro/year | 12,6 | 20,1 | 32,7 |
| | Other facilities | mln. Euro/year | 0,6 | 1,5 | 2,0 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 56,7 | 75,7 |
| | including: | mln. Euro/year | | | |
| | linear portion | | 13,6 | 40,6 | 54,2 |
| | Compressor Stations | mln. Euro/year | 3,7 | 9,3 | 13,0 |
| | Other facilities | mln. Euro/year | 1,8 | 6,8 | 8,6 |

* Gas discharge to consumers into the existing system

**Table 5.8 – Variant 3d. Chiren**
**Main Technical and Economic Values of the Gas Pipeline. 2025**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 40,3 | 38,5 | 63,0 |
| | including: | | | | | |
| | commercial gas | bln. $m^3$/year | 22,4* | 1,6* | 38,4 | 62,4 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | 0,29 | 0,24 | 0,12 | 0,65 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 122,6 | 116,6 | 191,8 |
| | including: | | | | | |
| | commercial gas | mln. $m^3$/day | 68,2 | 4,9 | 116,1 | 189,2 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | 1,0 | 1,1 | 0,5 | 2,6 |
| 4 | Operating pressure in gas pipeline | MPa | 9,8 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | |
| | diameter | mm | 1422 | 1422 | 1422 | |
| | wall thickness | mm | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insulation | t/km | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |
| 6 | Route length | km | 61 | 355 | 121,8 | 537,8 |
| 7 | Length of laid pipes DN 1420 | km | 121 | 405 | 121,8 | 647,8 |
| 8 | Metal investments | thous. t | 100,24 | 335,52 | 100,90 | 536,66 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| 9 | Number of CS | pcs. | 1 | 2 | 1 | 4 |
| 10 | CS location | | CS-1 - km 2 | CS-2 - km 179<br>CS-3 - km 363 | CS-4 - km 522,8 | |
| 11 | Number and size of gas pumping units (GPU) | | 8 pcs.<br>GPU-25 | 12 pcs.<br>GPU-16 | 6 pcs.<br>GPU-16 | |
| | including: | | | | | |
| | Unit capacity of GPU at CS | MW | 25 | 16 | 16 | |
| | number of operating GPU at each CS | pcs. | CS-1 - 6 | CS-2 - 5<br>CS-3 - 5 | CS-4 - 5 | 16 |
| | number of standby GPU at each CS | pcs. | CS-1 - 2 | CS-2 - 1<br>CS-3 - 1 | CS-4 - 1 | 6 |
| 12 | Installed capacity of CS | MW | CS-1 - 200 | CS-2 - 96<br>CS-3 - 96 | CS-4 - 96 | 488 |
| 13 | Gas parameters at CS entry/exit | | | | | |
| | pressure | | CS-1<br>6,22/9,83 | CS-2<br>6,93/9,83<br>CS-3<br>6,49/9,74 | CS-4<br>6,60/9,83 | |
| | temperature | | CS-1<br>0,6/35,0 | CS-2<br>19,3/35,0<br>CS-3<br>17,7/35,0 | CS-4<br>19,7/35,0 | |
| 14 | Gas parameters in the initial point | | | | | |
| | pressure | MPa | 6,5 | 9,0 | 8,8 | |
| | temperature | ºC | 1,2 | 29,8 | 30,1 | |
| 15 | Gas parameters in the end point | | | | | |
| | pressure | MPa | 9,0 | 8,8 | 9,5 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | |
|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 416) | Area 3 (km 416 ÷ km 537.8) | Total |
| | temperature | ºC | 29,8 | 30,1 | 33,4 | |
| 16 | Capital investments without VAT | mln. Euro | 749,6 | 1 451,5 | 538,7 | 2 739,9 |
| | including: | | | | | |
| | linear portion | mln. Euro | 319,4 | 1 024,4 | 310,2 | 1 654,0 |
| | Compressor Stations | mln. Euro | 277,2 | 404,8 | 202,4 | 884,4 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 153,0 | 22,3 | 26,2 | 201,5 |
| 17 | Operating costs | mln. Euro/year | 16,0 | 20,9 | 9,6 | 46,5 |
| | including: | | | | | |
| | linear portion | mln. Euro/year | 2,8 | 6,3 | 2,4 | 11,5 |
| | Compressor Stations | mln. Euro/year | 12,6 | 13,4 | 6,7 | 32,7 |
| | other facilities | mln. Euro/year | 0,6 | 1,2 | 0,5 | 2,3 |
| 18 | Depreciation charges | mln. Euro/year | 19,1 | 45,6 | 15,3 | 80,0 |
| | including: | | | | | |
| | linear portion | mln. Euro/year | 13,6 | 34,0 | 10,6 | 58,1 |
| | Compressor Stations | mln. Euro/year | 3,7 | 6,0 | 3,0 | 12,7 |
| | other facilities | mln. Euro/year | 1,8 | 5,6 | 1,7 | 9,1 |

* Gas discharge to consumers into the existing system

## 6 FLOATING CAPITAL

According to the “Guide for Preparation of Industrial Technical and Economic Investigations”, the need in floating capital was taken into account in the composition of the money flow from the investment activity.

The floating capital represents the difference between the current assets and current liabilities. The increase of the floating capital is a part of investment costs (outflow), the decrease of the floating capital is a part of investment inflows.

Taking into account the fact that the production volume in the project and expenses change during the accounting period, the need in the floating capital is determined in dynamics.

The initial data and assumptions taken in the calculation of the need in the floating capital are given in Table 6.1.

**Table 6.1 - Initial Data and Assumptions for Calculation of the Floating Capital**

| Name | Assumption on Value |
|---|---|
| **Working assets** | |
| ***Floating assets*** | |
| Reserves: | |
| - in investment activity | 10% of capital investments development for the future period |
| - in main activity | 90 days reserve of materials |
| Accounts receivable | 60 days delay in payment arrival for gas transportation services |
| Down payments made (investment activity) | 30% of capital investments coming in the future period |
| **Working liabilities** | |
| ***Short-term liabilities*** | |
| Accounts payable: | |
| - of suppliers and contractors | 30 days debt for materials and services payment |
| - tax and duties debts | In the volume of tax payments for a quarter |

The results of the calculations are given in Annex 10 (Tables 10.1-10.8) and in the summary Table 6.2.

**Table 6.2 – Change of Net Floating Capital by Variants**

mln. Euro

| *Year* / *Variant* | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Variant 1a. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 63,7 | 75,2 | -125,4 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 537.8) | **43,8** | 287,5 | 139,9 | -301,7 | -80,5 | 0,6 | -0,01 | 0,2 | -1,6 | -0,5 | 0,1 | -0,2 | -0,2 |
| **Variant 1b. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 87,6 | -41,4 | -32,8 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 416) | **35,2** | 261,6 | 87,0 | -246,5 | -66,1 | 0,5 | | 0,2 | 0,2 | -1,8 | 0,2 | -0,2 | -0,2 |
| Area 3 (km 416 ÷ 537.8) | **10,4** | 39,6 | 64,8 | -53,0 | -40,8 | 0,1 | -0,2 | -0,2 | 0,1 | -0,01 | 0,01 | -0,1 | -0,1 |
| **Variant 2a. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 63,7 | 75,2 | -125,4 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 537.8) | **45,9** | 355,9 | -41,5 | -205,2 | -61,9 | 0,6 | -0,01 | 0,2 | -0,5 | -1,7 | 0,1 | -0,2 | -0,2 |
| **Variant 2b. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 98,9 | 0,5 | -86,0 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,7 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 416) | **32,1** | 269,5 | -44,4 | -122,8 | -69,5 | 0,5 | | -0,2 | -1,1 | 0,04 | 0,2 | -0,2 | -0,2 |
| Area 3 (km 416 ÷ 537.8) | **15,2** | 62,2 | 100,0 | -151,6 | 5,1 | 0,2 | | 0,1 | 0,2 | -0,4 | -0,6 | -0,1 | -0,1 |
| **Variant 3a. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 63,7 | 75,2 | -125,4 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 331) | **26,9** | 144,8 | 23,2 | -93,2 | -47,4 | 0,3 | | 0,1 | 0,5 | -0,3 | -1,3 | -0,1 | -0,1 |

| Year / Variant | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Area 3 (km 331 ÷ km 537.8) | **15,9** | 7,3 | 52,2 | -48,5 | 5,6 | 0,05 | | | -0,4 | -0,4 | 0,04 | -0,1 | -0,1 |
| Area 4 (km 0 ÷ km 351) (to Greece) | **7,9** | | 6,3 | 50,1 | -49,9 | 0,7 | | 0,4 | 0,2 | -0,1 | 0,3 | -0,04 | -0,04 |
| **Variant 3b. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 63,7 | 75,2 | -125,4 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 331) | **28,5** | 157,1 | 68,2 | -128,9 | -67,6 | 0,4 | | 0,1 | 0,5 | -0,6 | -0,8 | -0,1 | -0,1 |
| Area 3 (km 331 ÷ km 416) | **6,9** | 22,1 | 80,8 | -98,1 | 2,3 | 0,04 | -0,2 | -0,2 | 0,02 | 0,01 | 0,04 | -0,04 | -0,04 |
| Area 4 (km 416 ÷ km 537.8) | **10,6** | 19,9 | 108,7 | -121,2 | 3,7 | 0,03 | | | 0,1 | -0,3 | -0,4 | -0,1 | -0,1 |
| Area 5 (km 0 ÷ km 351) (to Greece) | **7,9** | | 6,3 | 50,1 | -49,9 | 0,7 | | 0,4 | 0,2 | -0,1 | 0,3 | -0,04 | -0,04 |
| **Variant 3c. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 63,7 | 75,2 | -125,4 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 537.8) | **39,2** | 109,1 | 214,4 | -296,3 | 13,7 | 0,1 | -0,01 | -0,01 | 0,5 | -1,4 | -1,1 | -0,2 | -0,2 |
| **Variant 3d. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | **16,7** | 63,7 | 75,2 | -125,4 | 3,7 | 0,2 | | 0,1 | 0,2 | -0,6 | -0,4 | -0,1 | -0,1 |
| Area 2 (km 61 ÷ km 416) | **29,8** | 117,9 | 202,7 | -299,6 | 10,0 | 0,2 | | -0,01 | 0,3 | -1,8 | 0,2 | -0,1 | -0,2 |
| Area 3 (km 416 ÷ 537.8) | **11,5** | 3,8 | 70,0 | -65,8 | 4,0 | 0,03 | | | 0,2 | -0,1 | -0,6 | -0,1 | -0,1 |

| Year / Variant | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| **Variant 1a. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 537.8) | -0,2 | -0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| **Variant 1b. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 416) | -0,2 | -0,1 | 0,05 | 0,05 | 0,05 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Area 3 (km 416 ÷ 537.8) | -0,1 | -0,1 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| **Variant 2a. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 537.8) | -0,3 | -0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| **Variant 2b. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | 0,01 | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 416) | -0,2 | -0,1 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 | 0,05 | 0,1 |
| Area 3 (km 416 ÷ 537.8) | -0,1 | -0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 |
| **Variant 3a. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 331,0) | -0,1 | -0,1 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 | 0,1 |
| Area 3 (km 331,0 ÷ km 537.8) | -0,1 | | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |

| Year / Variant | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Area 4 (km 0 ÷ km 351) | -0,05 | -0,04 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| **Variant 3b. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 331,0) | -0,1 | -0,1 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 | 0,1 | 0,1 | 0,1 |
| Area 3 (km 331,0 ÷ km 416) | -0,04 | -0,03 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| Area 4 (km 416 ÷ km 537.8) | -0,1 | -0,01 | 0,01 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| Area 5 (km 0 ÷ km 351) | -0,05 | -0,04 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| **Variant 3c. Provadia** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 537.8) | -0,2 | -0,03 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| **Variant 3d. Chiren** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 61) | -0,1 | | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Area 2 (km 61 ÷ km 416) | -0,2 | -0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 | 0,1 | 0,1 | 0,1 |
| Area 3 (km 416 ÷ 537.8) | -0,1 | | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |

# 7 EFFICIENCY OF INVESTMENTS. CALCULATION OF GAS TRANSPORTATE

## ***Goods Transportation Operation. Income Part of the Project (Proceeds)***

The income part of the project is formed on the basis of the goods transportation operation volumes and calculated rate, providing the required efficiency level.

The goods transportation operation (GTO) is determined based on transported gas volumes through the pipeline and its length. Ito calculate the value of the goods transportation operation the length of the pipeline is divided into areas, which number differs by areas because it depends on the number of gas extraction to consumers and auxiliaries of the Compressor Stations.

The commercial gas volumes, extractions to consumers and arees of the Compressor Stations, length of the areas and calculation of the goods transportation operation by variants are given in Annex 11 (Tables 11.1-11.8).

The summary table of GTO by variants is given in Table 7.1.

The calculation of the income part of the project is made using the method of a rate matching, which allows, at the corresponding volume of goods transportation operation, obtaining the proceeds, which would provide the required efficiency for the project.

The calculation formula determining the income part of the project's total money flow, can look as follows:

$$B_i = T * TTP_i ,$$

where $B_i$ – proceeds in the i-st year of the accounting period;

$T$ – matched value of the rate, which is unique for the whole calculation period;

$TTP_i$ – goods transportation operation in i-st year of the accounting period.

**Table 7.1 – Goods Transportation Operation by Variants**

bln. $m^3$*km

| Year \ Variant | 1a | 1b | 2a | 2b | 3a | | 3b | | 3c | 3d |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DN 1400 | DN 700 | DN 1400 | DN 700 | | |
| 2016 | 6 601,8 | 6 601,8 | 5 314,5 | 5 314,5 | 6 601,8 | | 6 598,6 | | 6 595,4 | 6 595,4 |
| 2017 | 11 856,6 | 12 282,6 | 10 708,9 | 11 134,6 | 12 163,0 | 1 158,6 | 12 587,6 | 1 158,6 | 11 283,5 | 11 709,5 |
| 2018 | 15 326,3 | 15 747,7 | 15 371,0 | 15 798,4 | 15 631,8 | 1 158,6 | 16 055,1 | 1 158,6 | 14 755,7 | 15 180,2 |
| 2019 | 22 148,0 | 22 576,8 | 22 155,6 | 22 582,7 | 22 434,1 | 1 193,7 | 22 856,0 | 1 193,7 | 21 527,1 | 21 953,2 |
| 2020 | 22 434,9 | 22 897,1 | 22 440,7 | 22 902,6 | 22 632,7 | 1 333,8 | 23 095,3 | 1 333,8 | 21 615,5 | 22 078,0 |
| 2021 | 22 434,9 | 22 897,1 | 22 440,7 | 22 902,6 | 22 632,7 | 1 333,8 | 23 095,3 | 1 333,8 | 21 615,5 | 22 078,0 |
| 2022 | 22 545,5 | 23 009,8 | 22 553,4 | 23 015,3 | 22 703,2 | 1 404,0 | 23 166,5 | 1 404,0 | 21 633,3 | 22 094,7 |
| 2023 | 22 873,2 | 23 335,5 | 22 879,1 | 23 341,0 | 23 034,5 | 1 474,1 | 23 497,9 | 1 474,1 | 21 911,5 | 22 372,8 |
| 2024 | 22 997,2 | 23 494,9 | 23 003,5 | 23 500,5 | 23 185,1 | 1 509,2 | 23 683,4 | 1 509,2 | 22 035,2 | 22 531,8 |
| 2025 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2026 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2027 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2028 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2029 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2030 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2031 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2032 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2033 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2034 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2035 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2036 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2037 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2038 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2039 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| 2040 | 23 180,9 | 23 748,9 | 23 187,0 | 23 754,9 | 23 421,3 | 1 579,4 | 23 990,2 | 1 579,4 | 22 218,5 | 22 785,2 |
| **TOTAL** | **540 112,1** | **552 826,5** | **537 858,7** | **550 570,4** | **545 759,4** | **35 835,4** | **558 479,1** | **35 835,4** | **518 468,9** | **531 157,5** |

According to the methods accepted for calculation of the gas transport rate in the Republic of Bulgaria, its value calculated by the formula is not a function from IRR. In fact, formation of the income part of the project is based on the principle “costs plus” and has no mechanism of the proceeds value variation depending on the set efficiency parameter (IRR).

Herewith, according to the design task (item 9.13) the calculated model should be developed in such a way that to have a possibility of changing the set efficiency parameter (IRR), changing the proceeds value (at the account of the rate change) in order to achieve its required values (IRR – 4%,6%,8%,10%,12%).

However, the rates according to thses methods for variant 1a were calculated in the paper and they are given in Annex 12 (Tables 12.27 – 12.29).

The gas transport cost on the territory of the Republic of Bulgaria is calculated according to the following documents: “Provision on Natural Gas Price Adjustment” and “Instructions for Formation of Natural Gas Transport and Storage Prices”.

The methods of the gas transport calculation rate used on the territory of the Republic of Bulgaria determined its value by the following formula:

$$НП = Р + (РБА \times НВ),$$

where: *НП* – required annual incomes;

*Р* – annual costs;

*РБА* – regulatory base of assets;

*НВ* – capital return rate.

The capital return rate is equal to the weighted average cost of the capital. The weighted average cost of the capital is the return rate of attracted and own capitals, according to the size of these financing resources in the general structure of the capital.

The capital return rate is determined as actual pre-tax rate by the following formula:

$$НВ = Д_{СК} \times \frac{НВ_{СК}}{1 - ДС} + Д_{ПК} \times НВ_{ПК} \quad ,$$

where *НВ* – pre-tax capital return rate;

$Д_{ск}$ – relation of own capital to general capital;

$НВ_{ск}$ – own capital return rate after taxation;

*ДС* – corporate tax (10%);

$Д_{пк}$ - relation of borrowed capital to total capital;

$НВ_{ПК}$ – attracted capital return rate according to market rates

The regulatory base of assets is a recognized cost of assets, according to which the return of the invested capital of an enterprise is calculated; it is calculated by formula:

$$РБА = А - Ф - Ам + ОК + Инв,$$

where *РБА* - regulatory base of assets;

*А* – recognized cost of assets determined on the basis of their purchase price;

*Ф* – balance cost of assets purchased free of charge;

*Ам* – amortization of assets for the period of usage;

*ОК* – floating capital;

*Инв* – forecast amount of investments.

***Money Flows***

In order to determine the efficiency values, the calculations of money flows have been made. The net flow of real money consists of receipts from marketable products' and services' sale, as well as extraordinary income (real money inflow), costs and payments under the project (real money outflow).

For planning convenience, they differentiated the investment flows to the main capital, financial flows connected with these investments' financing and flows connected with the enterprise operation established as a result of the project implementation (operational flows of real money). Therefore, the net (total) flow of real money is divided conditionally into three components according to the types of activity:

- money flow from the investment activity;
- money flow from the operational activity;
- money flow from the financial activity.

The capital investments to construction distributed by the steps of the accounting period are included into the money flows from the **investment activity**. In addition, this flow also includes changes of the floating capital. The increase of the floating capital is considered as the funds outflow, the decrease – as inflow.

According to the tax legislation of the Republic of Bulgaria the procedure of VAT refund, including inspections and administration, should not exceed 3 months.

Accordingly, taking into account the fact that the step of the accounting period is one year, VAT payment and refund takes place within one step. Thus, the capital investments are taken into account in the money flows calculations without VAT and mechanism of its refund.

The incomes from rendering services in gas transportation and costs connected with the enterprise functioning, payment of all the taxes are taken into account in the flows from the **operational activity**.

In addition, the mechanisms of tax loss carry forwards to future periods and their influence on the corporate tax value are taken into account according to the legislation of the Republic of Bulgaria. The legislation provides for the possibility of writing off the loss occurred in the current period during the next 5 years.

The corporate tax rate according to the current legislation of the Republic of Bulgaria is 10%.

The money flows from the **financial activity** are formed based in the scheme of the project financing subject to attraction of borrowed funds (volume, term, term of obtaining, return and servicing).

The carried out analysis of the credit resources' cost in the European zone, taking into consideration the reputation and credit worthiness of the companies implementing the project, allows counting upon the possibility of obtaining a credit in the amount of 70% of the summary investments with the annual rate within 4.5 to 6% in Euro.

Based on this, the following assumptions as to the attracted credit funds volumes, plan of the main debt return under the credit, accrual and payment of interests were accepted for the calculations:

| | |
|---|---|
| volume of credit resources | - 70% of the total value of investments |
| tranche amount | - in the amount of the annual need in investments |
| date of opening the project financing | - 2013 |
| rate, including: | - 5.5% |
| - EURIBOR (annual, as of 01.01.2010) | - 1.25% |
| - bank premium | - 4.25% |
| privilege period for the main debt return | - before operation starts |
| beginning of the period of the main debt amount refund | - from the beginning of operation |
| repayment source | - 100 % of funds generated by the project |
| conditions and terms of repayment | - based on the money flow |

The calculations of the flows from the financial activity according to the scheme of the project financing were made based in the condition of maximum quick return, at which the max possible quantity of funds generated by the project are sent to the debt and its interests repay-

ment. The interests are not paid before operation starts; they are added to the main amount of the debt (are capitalized).

According to the legislation of Bulgaria, interests accrued by a credit organization are included into costs for income taxation (corporate tax) purposes.

As far as the project financing is planned to be at the account of own (30%) and borrowed (70%) funds, the discount rate value will be determined by **WACC** (Weight Average Cost of Capital) value – weighted average capital cost.

The weighted average capital cost is found by formula:

$$WACC = K_S \times W_S + K_d + W_d \times (1 - T),$$

where $K_s$ – cost of own capital;

$W_s$ – share of own capital (in %);

$K_s$ – cost of borrowed capital;

$W_s$ – share of borrowed capital (in %);

$T$– corporate tax rate (in %);

Thus, the levels of the discount rate values for all the set efficiency values (IRR – 4, 6, 8, 10, 12%) are calculated in the paper and are given in Table 7.2.

**Table 7.2 – Values of Discount Rates for Different Set Efficiency Levels of the Project**

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | **4%** | **6%** | **8%** | **10%** | **12%** |
| cost of own capital,% | 4 | 6 | 8 | 10 | 12 |
| share of own capital,% | 30 | 30 | 30 | 30 | 30 |
| cost of borrowed capital, % | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 |
| share of borrowed capital,% | 70 | 70 | 70 | 70 | 70 |
| **Discount rate** | **4,67%** | **5,27%** | **5,87%** | **6,47%** | **7,07%** |

Formation of the money flows and calculation of the rates were made by areas of the gas pipeline, which are determined depending in the gas extraction point to consumers.

The money flows from the investment, financial activity of the project by areas of the pipeline for each variant of the process scheme of gas transport at the set efficiency level IRR=8% are given in Annex 12 (Tables 12.1 – 12.28).

The consolidated economic values for all the set efficiency levels (IRR – 4, 6, 8, 10, 12%) are given in Table 7.3.

**Table 7.3 – Consolidated Economic Values by Variants**

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| **Variant 1a. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,44 | 1,57 | 1,72 | 1,90 | 2,10 |
| - NPV, mln. Euro | -99,0 | 113,8 | 338,3 | 566,3 | 790,4 |
| - max term for reimbursement of one tranche of credit, years | 13 years 1 m. | 11 ears 4 m. | 9 years 11 m. | 8 years 8 m. | 7 years 8 m. |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - NPV, mln. Euro | -25,5 | 29,3 | 87,1 | 145,8 | 204,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 ears 8 m. | 10 years 2 m. | 8 years 10 m. | 7 years 9 m. |
| ***Area 2. Provadia - Serbia (km 61 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,24 | 1,36 | 1,49 | 1,65 | 1,83 |
| - NPV, mln. Euro | -73,4 | 84,4 | 251,1 | 420,2 | 587,0 |
| - max term for reimbursement of one tranche of credit, years | 13 years 3 m. | 11 years 4 m. | 9 years 10 m. | 8 years 8 m. | 7 years 10 m. |
| **Variant 1b. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,45 | 1,57 | 1,73 | 1,91 | 2,11 |
| - NPV, mln. Euro | -101,5 | 116,7 | 346,9 | 580,4 | 810,3 |
| - max term for reimbursement of one tranche of credit, years | 13 years 2 m. | 11 years 3 m. | 9 years 9 m. | 8 years 6 m. | 7 years 8 m. |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,87 | 3,14 | 3,45 |
| - NPV, mln. Euro | -25,4 | 29,3 | 86,9 | 145,4 | 202,8 |
| - max term for reimbursement of one tranche of credit, years | 12 years 10 m. | 10 years 12 m. | 9 years 10 m. | 8 years 10 m. | 7 years 12 m. |
| ***Area 2. Provadia - Chiren (km 61 ÷ km 416)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,30 | 1,41 | 1,55 | 1,71 | 1,89 |
| - NPV, mln. Euro | -57,7 | 66,3 | 197,0 | 329,4 | 459,6 |
| - max term for reimbursement of one tranche of credit, years | 13 years 2 m. | 11 years 3 m. | 9 years 10 m. | 8 years 8 m. | 7 years 8 m. |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| ***Area 3. Chiren - Serbia (km 416 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,14 | 1,25 | 1,39 | 1,54 | 1,72 |
| - NPV, mln. Euro | -18,3 | 21,1 | 62,8 | 105,3 | 147,2 |
| - max term for reimbursement of one tranche of credit, years | 13 years 7 m. | 11 years 7 m. | 9 years 11 m. | 8 years 10 m. | 8 years 4 m. |
| **Variant 2a. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,49 | 1,62 | 1,78 | 1,97 | 2,18 |
| - NPV, mln. Euro | -102,8 | 118,4 | 352,3 | 590,3 | 824,7 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 9 m. | 10 years 2 m. | 8 years 11 m. | 7 years 10 m. |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - NPV, mln. Euro | -25,5 | 29,3 | 87,1 | 145,8 | 204,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 10 m. | 7 years 9 m. |
| ***Area 2. Provadia - Serbia (km 61 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,30 | 1,42 | 1,56 | 1,73 | 1,93 |
| - NPV, mln. Euro | -77,2 | 88,9 | 264,7 | 443,4 | 620,2 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 9 m. | 10 years 3 m. | 8 years 11 m. | 7 years 11 m. |
| **Variant 2b. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,49 | 1,62 | 1,78 | 1,97 | 2,18 |
| - NPV, mln. Euro | -105,2 | 121,2 | 360,4 | 603,7 | 843,4 |
| - max term for reimbursement of one tranche of credit, years | 13 years 4 m | 11 years 8 m | 10 years 2 m | 8 years 11 m | 7 years 10 m |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,46 | 2,65 | 2,89 | 3,16 | 3,48 |
| - NPV, mln. Euro | -25,7 | 29,7 | 88,5 | 148,4 | 207,6 |
| - max term for reimbursement of one tranche of credit, years | 13 years 9 m. | 11 years 10 m. | 10 years 2 m. | 8 years 9 m. | 7 years 7 m. |
| ***Area 2. Provadia - Chiren (km 61 ÷ km 416)*** | | | | | |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| - rate, Euro/1,000 $m^3$*100 km | 1,17 | 1,28 | 1,41 | 1,57 | 1,74 |
| - NPV, mln. Euro | -54,8 | 63,2 | 188,5 | 316,0 | 442,3 |
| - max term for reimbursement of one tranche of credit, years | 13 years 4 m. | 11 years 8 m. | 10 years 2 m. | 8 years 11 m. | 7 years 11 m. |
| ***Area 3. Chiren - Serbia (km 416 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,71 | 1,86 | 2,04 | 2,24 | 2,48 |
| - NPV, mln. Euro | -24,6 | 28,3 | 83,7 | 139,8 | 194,6 |
| - max term for reimbursement of one tranche of credit, years | 13 years 0 m. | 11 years 5 m. | 9 years 11 m. | 8 years 9 m. | 7 years 9 m. |
| **Variant 3a. Provadia** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,41 | 1,53 | 1,67 | 1,84 | 2,03 |
| - NPV, mln. Euro | -95,4 | 109,8 | 326,3 | 547,0 | 763,5 |
| - max term for reimbursement of one tranche of credit, years | 12 years 12 m. | 11 years 1 m. | 9 years 7 m. | 8 years 6 m. | 7 years 10 m. |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - NPV, mln. Euro | -25,5 | 29,3 | 87,1 | 145,8 | 204,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 10 m. | 7 years 9 m. |
| ***Area 2. Provadia - Pleven (km 61 ÷ km 331)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,29 | 1,39 | 1,52 | 1,68 | 1,86 |
| - NPV, mln. Euro | -43,1 | 49,6 | 147,5 | 247,1 | 345,3 |
| - max term for reimbursement of one tranche of credit, years | 13 years 4 m. | 11 years 7 m. | 10 years 2 m. | 8 years 10 m. | 8 years |
| ***Area 3. Pleven - Serbia (km 331 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,09 | 1,19 | 1,31 | 1,46 | 1,62 |
| - NPV, mln. Euro | -27,1 | 31,3 | 93,2 | 156,4 | 218,9 |
| - max term for reimbursement of one tranche of credit, years | 12 years 10 m. | 10 years 11 m. | 9 years 9 m. | 8 years 11 m. | 8 years 2 m. |
| **Gas pipeline - branch to Greece Du 700** | | | | | |
| ***Area 4. Gas pipeline - branch to Greece (km 0 ÷ km 351)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,75 | 3,01 | 3,32 | 3,68 | 4,10 |
| - NPV, mln. Euro | -13,1 | 15,0 | 44,8 | 75,0 | 104,9 |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| - max term for reimbursement of one tranche of credit, years | 14 years 7 m. | 12 years 11 m. | 11 years 6 m. | 11 years | 9 years 2 m. |
| **Variant 3b. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,45 | 1,57 | 1,72 | 1,90 | 2,10 |
| - NPV, mln. Euro | -100,6 | 115,8 | 344,1 | 576,0 | 803,7 |
| - max term for reimbursement of one tranche of credit, years | 13 years | 11 years 4 m. | 9 years 11 m. | 8 years 8 m. | 7 years 8 m. |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - NPV, mln. Euro | -25,5 | 29,3 | 87,1 | 145,8 | 204,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 10 m. | 7 years 9 m. |
| ***Area 2. Provadia - Pleven (km 61 ÷ km 331)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,31 | 1,42 | 1,55 | 1,71 | 1,89 |
| - NPV, mln. Euro | -45,2 | 52,0 | 154,4 | 258,4 | 360,7 |
| - max term for reimbursement of one tranche of credit, years | 13 years 2 m. | 11 years 3 m. | 9 years 11 m. | 8 years 8 m. | 7 years 8 m. |
| ***Area 3. Pleven - Chiren (km 331 ÷ km 416)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,10 | 1,21 | 1,34 | 1,50 | 1,67 |
| - NPV, mln. Euro | -12,6 | 14,5 | 43,1 | 72,1 | 100,7 |
| - max term for reimbursement of one tranche of credit, years | 13 years 4 m. | 11 years 4 мес. | 9 years 10 m. | 8 years 8 m. | 7 years 11 m. |
| ***Area 4. Chiren - Serbia (km 416 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,26 | 1,37 | 1,50 | 1,66 | 1,83 |
| - NPV, mln. Euro | -17,3 | 19,9 | 59,2 | 99,5 | 139,3 |
| - max term for reimbursement of one tranche of credit, years | 12 years 11 m. | 11 years 2 m. | 9 years 9 m. | 8 years 10 m. | 8 years 6 m. |
| **Du 700** | | | | | |
| ***Area 5. Pipeline - branch to Greece (km 0 ÷ km 351)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,75 | 3,01 | 3,32 | 3,68 | 4,10 |
| - NPV, mln. Euro | -13,1 | 15,0 | 44,8 | 75,0 | 104,9 |
| - max term for reimbursement of one tranche of credit, years | 14 years 7 m. | 12 years 11 m. | 11 years 6 m. | 11 years | 9 years 2 m. |
| **Variant 3c. Provadia** | | | | | |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| **Gas pipeline Black Sea - border with Serbia, Du 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,40 | 1,51 | 1,66 | 1,83 | 2,02 |
| - NPV, mln. Euro | -90,1 | 103,8 | 309,1 | 518,3 | 726,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 10 m. | 8 years |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - NPV, mln. Euro | -25,5 | 29,3 | 87,1 | 145,8 | 204,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 10 m. | 7 years 9 m. |
| ***Area 2. Provadia - Serbia (km 61 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,18 | 1,28 | 1,41 | 1,55 | 1,72 |
| - NPV, mln. Euro | -64,6 | 74,5 | 221,9 | 372,6 | 522,5 |
| - max term for reimbursement of one tranche of credit, years | 13 years 6 m. | 11 years 9 m. | 10 years 2 m. | 8 years 11 m. | 8 years 2 m. |
| **Variant 3d. Chiren** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, Du 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,42 | 1,53 | 1,68 | 1,85 | 2,04 |
| - NPV, mln. Euro | -93,6 | 107,8 | 320,7 | 537,6 | 750,8 |
| - max term for reimbursement of one tranche of credit, years | 13 years 4 m. | 11 years 7 m. | 10 years 1 m. | 8 years 10 m. | 7 years 11 m. |
| ***Area 1. Black Sea - Provadia (km 0 ÷ km 61)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,45 | 2,64 | 2,88 | 3,15 | 3,46 |
| - NPV, mln. Euro | -25,5 | 29,3 | 87,1 | 145,8 | 204,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 10 m. | 7 years 9 m. |
| ***Area 2. Provadia - Chiren (km 61 ÷ km 416)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,15 | 1,25 | 1,38 | 1,52 | 1,69 |
| - NPV, mln. Euro | -49,5 | 57,0 | 169,6 | 284,6 | 397,5 |
| - max term for reimbursement of one tranche of credit, years | 13 years 2 m. | 11 years 5 m. | 9 years 12 m. | 8 years 9 m. | 7 years 11 m. |
| ***Area 3. Chiren - Serbia (km 416 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,37 | 1,49 | 1,63 | 1,79 | 1,98 |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| - NPV, mln. Euro | -18,6 | 21,5 | 64,1 | 107,8 | 151,3 |
| - max term for reimbursement of one tranche of credit, years | 13 years 10 m. | 11 years 11 m. | 10 years 5 m. | 9 years 2 m. | 8 years 2 m. |

The economic values subject to determination of the income part of the project suing the method accepted for calculation of the gas transport rate in the Republic of Bulgaria, are given in Table 7.4.

**Table 7.4 – Gas Transport Rates by Variant 1a. Provadia, Calculated Using the Method in Force in the Republic of Bulgaria**

Euro/thous. $m^3$x100 km

| Year | Gas pipeline "Black Sea – border with Serbia» (km 0 ÷ km 537.8) | Area 1 (km 0 ÷ km 61) | Area 2 (km 61 ÷ km 537.8) |
|---|---|---|---|
| 2016 | 4,13 | 11,91 | 2,80 |
| 2017 | 2,47 | 6,40 | 1,71 |
| 2018 | 2,32 | 4,60 | 1,79 |
| 2019 | 2,01 | 3,28 | 1,76 |
| 2020 | 1,85 | 2,49 | 1,73 |
| 2021 | 1,65 | 2,19 | 1,54 |
| 2022 | 1,29 | 1,81 | 1,19 |
| 2023 | 1,12 | 1,65 | 1,02 |
| 2024 | 1,10 | 1,63 | 0,99 |
| 2025 | 1,08 | 1,60 | 0,97 |
| 2026 | 1,06 | 1,59 | 0,95 |
| 2027 | 1,04 | 1,58 | 0,94 |
| 2028 | 1,03 | 1,57 | 0,92 |
| 2029 | 1,01 | 1,56 | 0,90 |
| 2030 | 1,00 | 1,55 | 0,89 |
| 2031 | 0,98 | 1,55 | 0,87 |
| 2032 | 0,97 | 1,54 | 0,86 |
| 2033 | 0,96 | 1,54 | 0,84 |
| 2034 | 0,95 | 1,53 | 0,83 |
| 2035 | 0,93 | 1,53 | 0,82 |
| 2036 | 0,92 | 1,53 | 0,80 |
| 2037 | 0,91 | 1,52 | 0,79 |
| 2038 | 0,90 | 1,52 | 0,78 |
| 2039 | 0,89 | 1,52 | 0,77 |
| 2040 | 0,88 | 1,53 | 0,76 |

## 8 SENSITIVITY ANALYSIS

The purpose of this paper is the calculation of the rate level for gas transportation through the Bulgarian area of South Stream gas pipeline. Thus, the sensitivity calculation has been made in order to determine possible deviations of the project parameters, as well as external environmental factors by the calculated rate value. For this purpose, the calculations of its value stability as to the change of the following main parameters have been made:

- volume of investments;
- volumes of gas pumping;
- credit rates;
- current expenses;
- inflation rate growth.

The sensitivity analysis was carried out as to the change of the above listed parameters within the range of -20 to +20%.

Herewith, the wider the range of the parameters, in which the rate value has the least deviations from the basic values, the higher “safety factor” of the project and it is better protected against deviations of adverse factors.

Variant 3a Provadia was accepted as the basic variant for the sensitivity calculation, with the set level of internal rate of return for the rate calculation – 8%. Using the example of this variant, as the most complete in terms of the facilities list considered in this paper, one can estimate the impact of adverse factors on the level of calculated rates.

The sensitivity analysis shows that the risk of capital investment increase is most valuable. The sensitivity calculations have been made subject to the change of capital investments and values derived from them (amortization, fund repair, etc.).

The risk of decreasing gas pumping volumes should be noted as the next important one for this project. In the conditions of the financial and economic crisis, this risk has high probability because the possible decrease of the world economy rate growth down to its recession and even deceleration can lead to the decrease of demand for hydrocarbons, which in its turn will have a negative impact on the project values. This risk is compounded by the fact that the enterprise has high percent of permanent expenses (level of production leverage of the enterprise is very high) in the general structure of production costs (especially in the linear part of the gas pipeline). Thus, when the volumes of gas sale decrease the production costs doe not practically decrease and as a result, the efficiency values decrease.

The significant risk is also the inflation growth in the European area. Correspondingly, the project costs can increase in rates exceeding the basic forecast used in the calculations,

which will also lead to the growth of gas transportation rates. One of the methods of struggle with the inflation processes can be the money policy strengthening in the European Union, namely the increase of the bank rate by the European Central Bank, which will lead to the appreciation of credit resources. This was also considered in the sensitivity analysis.

One should note that the risk of the credit rate increase is rather considerable. This risk has high probability because the credit resources become less accessible for the real sector of economy due to the decrease of credit organizations' liquidity, high risks of non-return and uncertainty in the conditions of crisis events in the world and European economy, which can imply on the credit rate value, even notwithstanding the available low level of the bank rate in the European Central Bank and most of the Central banks in the European countries.

The calculation of the sensitivity efficiency values as to the impact of the current expenses value has been made based on the supposition about the change of all expenses, except for amortization as the value derived from capital investments.

The sensitivity analysis results for calculations are shown in Table 8.1 and in Figures 3-5.

## Table 8.1 - Impact of Unexpected Factors on Efficiency Values

| Values | % of Change | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -20% | | | | -10% | | | | 0% (basic) | | | | 10% | | | | 20% | | | |
| ***Change of Capital Investments*** | | | | | | | | | | | | | | | | | | | | |
| Basic rate for gas pumping, Euro/thous. $m^3$x100 km | 1,41 | | | | 1,57 | | | | 1,72 | | | | 1,88 | | | | 2,04 | | | |
| NPV (exclusive of financing), mln. Euro | 275,4 | | | | 309,6 | | | | 344,1 | | | | 378,2 | | | | 412,5 | | | |
| Term of credit reimbursement | 9 | y. | 11 | m. | 9 | y. | 11 | m. | 9 | y. | 11 | m. | 9 | y. | 11 | м. | 9 | y. | 11 | m. |
| ***Change of Operating Costs*** | | | | | | | | | | | | | | | | | | | | |
| Basic rate for gas pumping, Euro/thous. $m^3$x100 km | 1,66 | | | | 1,69 | | | | 1,72 | | | | 1,75 | | | | 1,78 | | | |
| NPV (exclusive of financing), mln. Euro | 347,0 | | | | 345,4 | | | | 344,1 | | | | 342,4 | | | | 341,0 | | | |
| Term of credit reimbursement | 9 | y. | 12 | m. | 9 | y. | 11 | m. | 9 | y. | 11 | m. | 9 | y. | 10 | м. | 9 | y. | 10 | m. |
| ***Change of Gas Volumes*** | | | | | | | | | | | | | | | | | | | | |
| Basic rate for gas pumping, Euro/thous. $m^3$x100 km | 2,15 | | | | 1,91 | | | | 1,72 | | | | 1,57 | | | | 1,44 | | | |
| NPV (exclusive of financing), mln. Euro | 343,2 | | | | 343,6 | | | | 344,1 | | | | 344,4 | | | | 344,8 | | | |
| Term of credit reimbursement | 9 | y. | 11 | m. | 9 | y. | 11 | m. | 9 | y. | 11 | m. | 9 | y | 11 | м. | 9 | y. | 11 | m. |
| ***Change of Credit Rate*** | | | | | | | | | | | | | | | | | | | | |
| Basic rate for gas pumping, Euro/thous. $m^3$x100 km | 1,67 | | | | 1,69 | | | | 1,72 | | | | 1,76 | | | | 1,79 | | | |
| NPV (exclusive of financing), mln. Euro | 489,0 | | | | 414,1 | | | | 344,1 | | | | 278,2 | | | | 216,8 | | | |
| Term of credit reimbursement | 9 | y. | 6 | m. | 9 | y | 9 | m. | 9 | y. | 11 | m. | 10 | y. | 1 | м. | 10 | y. | 4 | m. |
| ***Change of Inflation Rate Growth*** | | | | | | | | | | | | | | | | | | | | |
| Basic rate for gas pumping, Euro/thous. $m^3$x100 km | 1,67 | | | | 1,70 | | | | 1,72 | | | | 1,75 | | | | 1,78 | | | |
| NPV (exclusive of financing), mln. Euro | 337,8 | | | | 340,9 | | | | 344,1 | | | | 347,0 | | | | 350,1 | | | |
| Term of credit reimbursement | 9 | y. | 12 | m. | 9 | y. | 11 | m. | 9 | y. | 11 | m. | 9 | y. | 10 | м. | 9 | y. | 10 | m. |

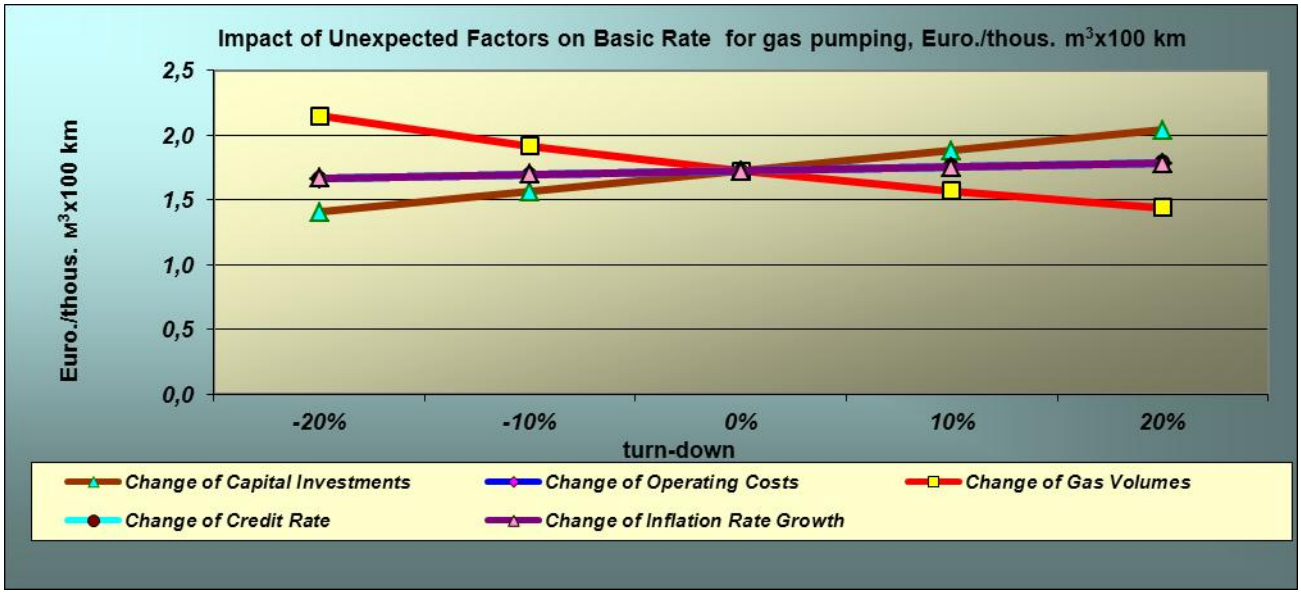



**Fig. 3 – Impact of Unexpected Factors on the Rate for Gas Pumping**

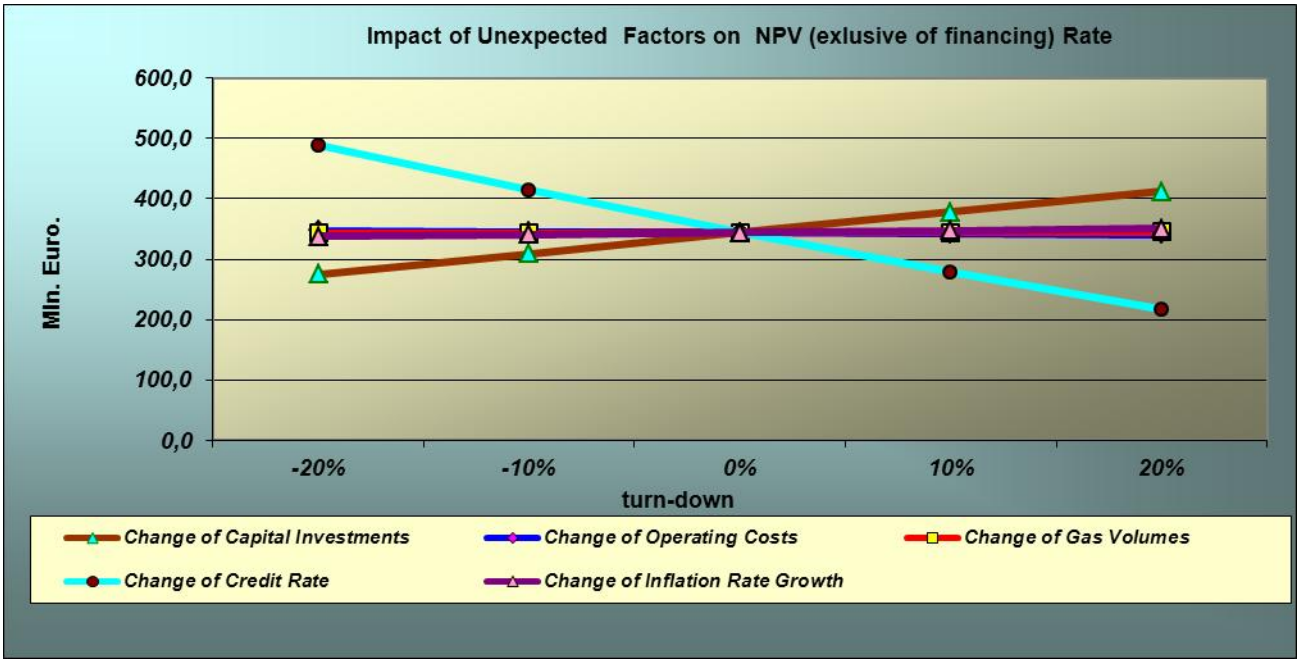



**Fig. 4 – Impact of Unexpected Factors on the NPV Value Exclusive of Financing**

The tax legislation analysis gives evidence of the moderate fiscal load and allows making a conclusion on rather “comfortable” conditions for business, including the gas one.

The main tax rates, which influence on the project efficiency values (corporate tax of 10%, insurance contributions 21.1 % of the labour payment fund) are not high (in comparison, for example, with the Russian Federation where the level of similar taxes is almost twice higher). The exclusion is only VAT. However, the mechanisms of its return to an investor (within 3 months) provided in the Bulgarian legislation allow supposing that its value will have an insignificant impact on the project efficiency values.

The calculations with the tax load decrease on the project have been made in terms of the possible propositions as to taxation optimization. The calculation results showed that even “setting to zero” of all the tax rates leads to the rate decrease within 3-5 %, which means the insignificance of this factor impact on the project.

Thus, one can make a conclusion that the project can be implemented absolutely in terms of the current tax legislation of the Republic of Bulgaria.

# 9 PROPOSITION FOR OPTIMIZATION OF THE GAS TRANSPORT SCHEME.ECONOMIC ASSESSMENT OF VARIANTS.

The economic assessment has been made for each of the propositions considered in volume 3 for the gas pipeline process parameters' optimization.

The following has been accepted as the criteria of the variant selection: minimum capital investments, operating costs, as well as total discounted costs as the main integral value for comparison of the variants.

The discount rate of 8% has been accepted for optimization calculations.

## 9.1 Comparison of the Gas Transport Scheme Optimization Variants

This section contains the comparison of the following variants:

***Variant 1b –*** Gas pipeline consisting of pipes 1,420 mm in diameter, rated for 9.8 MPa, 535.8 km long, with loopings with the total length of 316.5 km and 2 Compressor Stations equipped with GPU plants with the unit capacity of 16 MW*;*

***Variant 1b-1 -*** Gas pipeline consisting of pipes 1,420 mm in diameter, rated for 9.8 MPa, 535.8 km long, with loopings with the total length of 193 km and 3 Compressor Stations equipped with GPU plants with the unit capacity of 25 MW.

The costs, which do not differ in the variants, were not taken into account in the calculations, because they do not influence the variant selection. For this reason, the capital investments to construction were excluded from the calculation for comparison of the variants:

- receiving terminal;
- CS-1;
- junction point to CS-1;
- start area of the gas pipeline from the receiving terminal to CS-1 (2.0 km – main run, 1.5 km – looping);
- pig receiver Du 1400 – 1 pcs.;
- block valve stations Du 1400 – 3 pcs.

The capital investments, dynamics of their development, operating costs, total discounted costs and technical-and-economic values by variants 1b and 1b-1 ate given in Tables 9.1.1-9.1.7.

**Table 9.1.1 – Capital investments (without VAT) by Variants 1b and 1b-1**

mln. Euro

| Name | Variant 1b | Variant 1b-1 |
|---|---|---|
| **Linear portion Du 1400** | **2 184,2** | **1 875,2** |
| Gas pipeline Du 1400 | 1 798,9 | 1 537,9 |
| Gas distribution station "Provadia" with GMS | 23,1 | 23,1 |
| GMS on the border with Serbia | 14,1 | 14,1 |
| Gas distribution station "Chiren" with GMS | 5,9 | 5,9 |
| Other costs | 342,3 | 294,2 |
| **Compressor Stations** | **464,6** | **507,6** |
| CS-2 | 232,3 | 169,2 |
| CS-3 | 232,3 | 169,2 |
| CS-4 | | 169,2 |
| **Total** | **2 648,8** | **2 382,8** |

**Таблица 9.1.2 – Dynamics of Capital Investments Development (without VAT) by Variants 1b и 1b-1**

mln. Euro

| Year / Name | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| **Variant 1b** | | | | | | | | |
| Capital investments | 328,3 | 870,7 | 228,4 | 3,9 | 637,3 | 458,4 | 121,8 | **2 648,8** |
| including: | | | | | | | | |
| - linear portion | 328,3 | 870,7 | 228,4 | 3,9 | 385,5 | 245,6 | 121,8 | **2 184,2** |
| - compressor station | | | | | 251,8 | 212,8 | | **464,6** |
| **Variant 1b-1** | | | | | | | | |
| Capital investments | 321,0 | 851,4 | 223,3 | 35,5 | 314,2 | 505,0 | 132,4 | **2 382,8** |
| including: | | | | | | | | |
| - linear portion | 321,0 | 851,4 | 223,3 | 22,4 | 147,7 | 177,0 | 132,4 | **1 875,2** |
| - Compressor Stations | | | | 13,1 | 166,5 | 327,9 | | **507,6** |

**Table 9.1.3 – Dynamics of Operating Costs. Variant 1b**

mln. Euro

| Values \ Years | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **4 699,3** | 84,3 | 84,0 | 155,5 | 270,3 | 266,1 | 243,7 | 194,6 | 177,0 | 178,5 | 181,6 | 182,7 | 183,9 | 185,1 |
| - linear portion | **2 521,4** | 84,3 | 84,0 | 88,1 | 100,0 | 102,7 | 102,9 | 99,7 | 97,1 | 97,1 | 98,0 | 98,8 | 99,6 | 100,4 |
| - Compressor Stations | **2 177,9** | | | 67,4 | 170,3 | 163,4 | 140,8 | 95,0 | 79,9 | 81,3 | 83,6 | 84,0 | 84,3 | 84,7 |
| including: | | | | | | | | | | | | | | |
| Materials costs | **1 174,2** | 0,1 | 0,1 | 20,6 | 53,0 | 48,8 | 48,8 | 49,2 | 50,9 | 51,7 | 53,2 | 53,2 | 53,2 | 53,2 |
| - linear portion | **2,9** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | **1 171,3** | | | 20,5 | 52,9 | 48,7 | 48,7 | 49,1 | 50,8 | 51,6 | 53,1 | 53,1 | 53,1 | 53,1 |
| Labor payment costs | **25,4** | 0,6 | 0,6 | 0,8 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 |
| - linear portion | **15,3** | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| - Compressor Stations | **10,1** | | | 0,2 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Taxes (charges on payroll) | **4,9** | 0,1 | 0,1 | 0,1 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| - linear portion | **2,9** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | **2,0** | | | 0,0 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Amortization deductions | **2 539,1** | 77,6 | 77,6 | 118,3 | 184,6 | 186,0 | 162,6 | 111,8 | 90,7 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 |
| - linear portion | **2 092,3** | 77,6 | 77,6 | 80,9 | 90,3 | 91,8 | 91,3 | 87,2 | 83,8 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 |
| - Compressor Stations | **446,8** | | | 37,4 | 94,2 | 94,2 | 71,3 | 24,6 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 |
| Repair and maintenance | **538,4** | 4,3 | 4,8 | 6,9 | 11,0 | 12,7 | 13,8 | 15,0 | 16,2 | 17,3 | 18,5 | 19,7 | 20,8 | 22,0 |
| - linear portion | **381,9** | 4,3 | 4,8 | 5,5 | 7,6 | 8,9 | 9,8 | 10,6 | 11,4 | 12,2 | 13,0 | 13,8 | 14,7 | 15,5 |
| - Compressor Stations | **156,5** | | | 1,3 | 3,4 | 3,7 | 4,1 | 4,4 | 4,8 | 5,1 | 5,5 | 5,8 | 6,2 | 6,5 |
| Ecological payments | **141,1** | | | 2,5 | 6,4 | 5,9 | 5,9 | 5,9 | 6,1 | 6,2 | 6,4 | 6,4 | 6,4 | 6,4 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **141,1** | | | 2,5 | 6,4 | 5,9 | 5,9 | 5,9 | 6,1 | 6,2 | 6,4 | 6,4 | 6,4 | 6,4 |
| Other costs | **276,2** | 1,5 | 0,7 | 6,3 | 14,1 | 11,4 | 11,4 | 11,4 | 11,8 | 11,9 | 12,2 | 12,2 | 12,2 | 12,2 |
| - linear portion | **26,2** | 1,5 | 0,7 | 0,8 | 1,2 | 1,1 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 |
| - Compressor Stations | **250,0** | | | 5,5 | 12,9 | 10,3 | 10,3 | 10,4 | 10,7 | 10,9 | 11,2 | 11,2 | 11,2 | 11,2 |

| Years / Values | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 186,3 | 187,4 | 188,6 | 189,8 | 190,9 | 192,1 | 193,3 | 194,4 | 195,6 | 196,8 | 197,9 | 199,1 |
| - linear portion | 101,2 | 102,1 | 102,9 | 103,7 | 104,5 | 105,3 | 106,2 | 107,0 | 107,8 | 108,6 | 109,4 | 110,2 |
| - Compressor Stations | 85,0 | 85,4 | 85,7 | 86,1 | 86,4 | 86,8 | 87,1 | 87,5 | 87,8 | 88,2 | 88,5 | 88,8 |
| including: | | | | | | | | | | | | |
| Materials costs | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 | 53,2 |
| - linear portion | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 | 53,1 |
| Labor payments costs | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 |
| - linear portion | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| - Compressor Stations | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Taxes (charges on payroll) | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| - linear portion | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 |
| - linear portion | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 | 83,0 |
| - Compressor Stations | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 | 6,9 |
| Repair and maintenance | 23,2 | 24,4 | 25,5 | 26,7 | 27,9 | 29,0 | 30,2 | 31,4 | 32,5 | 33,7 | 34,9 | 36,0 |
| - linear portion | 16,3 | 17,1 | 17,9 | 18,8 | 19,6 | 20,4 | 21,2 | 22,0 | 22,9 | 23,7 | 24,5 | 25,3 |
| - Compressor Stations | 6,9 | 7,2 | 7,6 | 7,9 | 8,3 | 8,6 | 9,0 | 9,3 | 9,7 | 10,0 | 10,4 | 10,7 |
| Ecological payments | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 | 6,4 |
| Other costs | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| - linear portion | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 |
| - Compressor Stations | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 | 11,2 |

**Таблица 9.1.4 – Dynamics of Production Costs. Variant 1b-1**

mln. Euro

| Values \ Years | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **4 942,5** | 84,8 | 84,4 | 145,6 | 287,1 | 280,1 | 262,7 | 208,2 | 187,7 | 188,3 | 192,7 | 193,8 | 194,9 | 196,0 |
| - linear portion | **2 196,9** | 84,8 | 84,4 | 91,8 | 84,8 | 86,7 | 86,2 | 84,9 | 83,3 | 83,2 | 83,9 | 84,6 | 85,3 | 86,0 |
| - Compressor Stations | **2 745,7** | | | 53,8 | 202,2 | 193,4 | 176,4 | 123,3 | 104,5 | 105,1 | 108,8 | 109,2 | 109,6 | 110,0 |
| including: | | | | | | | | | | | | | | |
| Material costs | **1 557,7** | 0,1 | 0,1 | 17,5 | 70,2 | 65,0 | 65,0 | 65,6 | 68,4 | 68,6 | 71,1 | 71,1 | 71,1 | 71,1 |
| - linear portion | **2,9** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | **1 554,8** | | | 17,4 | 70,1 | 64,9 | 64,9 | 65,5 | 68,2 | 68,4 | 71,0 | 71,0 | 71,0 | 71,0 |
| Labor payment costs | **30,1** | 0,6 | 0,6 | 0,9 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 |
| - linear portion | **15,3** | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| - Compressor Stations | **14,8** | | | 0,3 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 |
| Taxes (charges on payroll) | **5,9** | 0,1 | 0,1 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| - linear portion | **2,9** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | **3,0** | | | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | **2 304,9** | 78,2 | 78,2 | 112,9 | 178,6 | 179,2 | 160,7 | 104,3 | 79,2 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 |
| - linear portion | **1 818,1** | 78,2 | 78,2 | 84,5 | 76,4 | 77,0 | 75,9 | 73,8 | 71,5 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 |
| - Compressor Stations | **486,8** | | | 28,4 | 102,2 | 102,2 | 84,9 | 30,5 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 |
| Repair and maintenance | **503,9** | 4,2 | 4,7 | 6,6 | 10,4 | 11,9 | 13,0 | 14,1 | 15,2 | 16,3 | 17,3 | 18,4 | 19,5 | 20,6 |
| - linear portion | **334,3** | 4,2 | 4,7 | 5,6 | 6,7 | 7,9 | 8,6 | 9,3 | 10,0 | 10,7 | 11,4 | 12,1 | 12,8 | 13,5 |
| - Compressor Stations | **169,5** | | | 1,0 | 3,7 | 4,0 | 4,4 | 4,8 | 5,2 | 5,6 | 5,9 | 6,3 | 6,7 | 7,1 |
| Ecological payments | **187,8** | | | 2,1 | 8,5 | 7,8 | 7,8 | 7,9 | 8,2 | 8,3 | 8,6 | 8,6 | 8,6 | 8,6 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **187,8** | | | 2,1 | 8,5 | 7,8 | 7,8 | 7,9 | 8,2 | 8,3 | 8,6 | 8,6 | 8,6 | 8,6 |
| Other costs | **352,4** | 1,6 | 0,7 | 5,4 | 17,9 | 14,6 | 14,6 | 14,7 | 15,2 | 15,3 | 15,8 | 15,8 | 15,8 | 15,8 |
| - linear portion | **23,4** | 1,6 | 0,7 | 0,8 | 0,9 | 1,0 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 |
| - Compressor Stations | **329,0** | | | 4,6 | 17,0 | 13,6 | 13,6 | 13,8 | 14,3 | 14,4 | 14,9 | 14,9 | 14,9 | 14,9 |

| Years / Values | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 197,1 | 198,1 | 199,2 | 200,3 | 201,4 | 202,5 | 203,6 | 204,6 | 205,7 | 206,8 | 207,9 | 209,0 |
| - linear portion | 86,7 | 87,4 | 88,1 | 88,8 | 89,5 | 90,2 | 90,9 | 91,6 | 92,3 | 93,0 | 93,7 | 94,5 |
| - Compressor Stations | 110,3 | 110,7 | 111,1 | 111,5 | 111,9 | 112,2 | 112,6 | 113,0 | 113,4 | 113,8 | 114,2 | 114,5 |
| including: | | | | | | | | | | | | |
| Material costs | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 | 71,1 |
| - linear portion | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 | 71,0 |
| Labour payment costs | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 |
| - linear portion | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| - Compressor Stations | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 |
| Taxes (charges on payroll) | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| - linear portion | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 |
| - linear portion | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 | 70,7 |
| - Compressor Stations | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 | 7,7 |
| Repair and maintenance | 21,7 | 22,8 | 23,8 | 24,9 | 26,0 | 27,1 | 28,2 | 29,3 | 30,3 | 31,4 | 32,5 | 33,6 |
| - linear portion | 14,2 | 14,9 | 15,6 | 16,3 | 17,0 | 17,7 | 18,4 | 19,1 | 19,8 | 20,5 | 21,2 | 21,9 |
| - Compressor Stations | 7,5 | 7,8 | 8,2 | 8,6 | 9,0 | 9,4 | 9,8 | 10,1 | 10,5 | 10,9 | 11,3 | 11,7 |
| Ecological payments | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 | 8,6 |
| Other costs | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 | 15,8 |
| - linear portion | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 |
| - Compressor Stations | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 | 14,9 |

**Таблица 9.1.5 – Calculation of Total Discount Costs. Variant 1b. Basic**

mln. Euro

| Values \ Years | Total | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **2 648,8** | 328,3 | 870,7 | 228,4 | 3,9 | 637,3 | 458,4 | 121,8 | | | | | | | |
| Operating costs, exclusive of amortization | **2 160,2** | | | | 6,6 | 6,4 | 37,2 | 85,7 | 80,0 | 81,1 | 82,8 | 86,2 | 88,5 | 91,6 | 92,8 |
| Amortization | **2 539,1** | | | | 77,6 | 77,6 | 118,3 | 184,6 | 186,0 | 162,6 | 111,8 | 90,7 | 90,0 | 90,0 | 90,0 |
| Net profit change | **4 229,4** | | | | 75,8 | 75,6 | 139,9 | 243,3 | 239,5 | 219,3 | 175,2 | 159,3 | 160,6 | 163,4 | 164,5 |
| Total costs | **4 339,1** | 328,3 | 870,7 | 228,4 | 2,1 | 635,3 | 480,0 | 180,5 | 53,4 | 56,7 | 63,4 | 68,5 | 70,6 | 73,4 | 74,5 |
| Discount costs flow | **2 697,3** | 328,3 | 806,2 | 195,8 | 1,6 | 467,0 | 326,7 | 113,7 | 31,2 | 30,7 | 31,7 | 31,7 | 30,3 | 29,2 | 27,4 |

| Values \ Years | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 93,9 | 95,1 | 96,3 | 97,4 | 98,6 | 99,8 | 100,9 | 102,1 | 103,3 | 104,4 | 105,6 | 106,8 | 107,9 | 109,1 |
| Amortization | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 | 90,0 |
| Net profit change | 165,5 | 166,6 | 167,6 | 168,7 | 169,7 | 170,8 | 171,8 | 172,9 | 173,9 | 175,0 | 176,0 | 177,1 | 178,1 | 179,2 |
| Total costs | 75,5 | 76,6 | 77,6 | 78,7 | 79,7 | 80,8 | 81,8 | 82,9 | 83,9 | 85,0 | 86,0 | 87,1 | 88,1 | 89,2 |
| Discount costs flow | 25,7 | 24,1 | 22,7 | 21,3 | 20,0 | 18,7 | 17,6 | 16,5 | 15,4 | 14,5 | 13,6 | 12,7 | 11,9 | 11,2 |

**Таблица 9.1.6 – Calculation of total discount costs . Variant 1b-1**

mln. Euro

| Values \ Years | Total | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **2 382,8** | 321,0 | 851,4 | 223,3 | 35,5 | 314,2 | 505,0 | 132,4 | | | | | | | |
| Operating costs, exclusive of amortization | **2 637,7** | | | | 6,6 | 6,3 | 32,7 | 108,5 | 100,9 | 101,9 | 103,8 | 108,5 | 109,9 | 114,3 | 115,4 |
| Amortization | **2 304,9** | | | | 78,2 | 78,2 | 112,9 | 178,6 | 179,2 | 160,7 | 104,3 | 79,2 | 78,4 | 78,4 | 78,4 |
| Net profit change | **4 448,3** | | | | 76,3 | 76,0 | 131,1 | 258,4 | 252,1 | 236,4 | 187,4 | 169,0 | 169,5 | 173,5 | 174,4 |
| Total costs | **4 526,2** | 321,0 | 851,4 | 223,3 | 33,6 | 312,0 | 523,1 | 212,1 | 72,9 | 75,7 | 83,0 | 89,7 | 91,0 | 95,0 | 96,0 |
| Discount costs flow | **2 634,6** | 321,0 | 788,3 | 191,5 | 26,7 | 229,4 | 356,0 | 133,7 | 42,5 | 40,9 | 41,5 | 41,6 | 39,0 | 37,7 | 35,3 |

| Values \ Years | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 116,4 | 117,5 | 118,6 | 119,7 | 120,8 | 121,9 | 123,0 | 124,0 | 125,1 | 126,2 | 127,3 | 128,4 | 129,5 | 130,5 |
| Amortization | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 | 78,4 |
| Net profit change | 175,4 | 176,4 | 177,4 | 178,3 | 179,3 | 180,3 | 181,3 | 182,2 | 183,2 | 184,2 | 185,2 | 186,1 | 187,1 | 188,1 |
| Total costs | 97,0 | 97,9 | 98,9 | 99,9 | 100,9 | 101,8 | 102,8 | 103,8 | 104,8 | 105,7 | 106,7 | 107,7 | 108,7 | 109,6 |
| Discount costs flow | 33,0 | 30,9 | 28,9 | 27,0 | 25,2 | 23,6 | 22,1 | 20,6 | 19,3 | 18,0 | 16,8 | 15,7 | 14,7 | 13,7 |

**Table 9.1.7 – Technical and Economic Values of the Gas Transport Scheme Optimization Variants (without CS-1 and receiving terminal)**

| Name | Variant 1b | Variant 1b-1 |
|---|---|---|
| Route length, km | 535,8 | |
| Looping length, km | 316,5 | 193,0 |
| Number of CS, pcs. | 2 | 3 |
| Type of GPU | GPU-16 | GPU-25 |
| Quantity of GPU, pcs. | 14 | 12 |
| Installed capacity of CS, MW | 224 | 300 |
| Operating capacity of CS, MW | 160 | 225 |
| Gas supply volume (after CS-1), bln. $m^3$/g. | 62,7 | |
| Gas extraction volume along the route, bln. $m^3$/g. | 22,0 | |
| Gas volume in the end point on the border with Serbia, bln. $m^3$/g. | 40,5 | 40,4 |
| Gas consumption for the CS auxiliaries, mln. $m^3$/g. | 227 | 306 |
| Number of personnel, persons | 117 | 145 |
| Capital investments without VAT, mln. Euro | 2 648,8 | 2 382,8 |
| including:<br>- linear portion | 2 184,2 | 1 875,2 |
| - Compressor Stations | 464,6 | 507,6 |
| Annual operating costs (2025), mln. Euro | 181,6 | 192,7 |
| Total discount costs, mln. Euro | 2 697,3 | 10 634,6 |

According to the main criterion of the variants' economic assessment – total discount costs and capital investments – Variant 1b-1 prevails. According to the operating costs Variant 1b has an inconsiderable advantage.

### 9.2 Comparison of Variants of the Receiving Terminal Location

This section contains the economic comparison (by distinguishing items of costs) of the receiving terminal location. In the basic variant, the Receiving Terminal site is located at the beginning of the pipeline. The location of the receiving terminal on CS-1 site is considered for comparison.

Capital investments, dynamics of their development, operating costs, total discount costs and technical-and-economic values of the variants of the receiving terminal locations are given in Tables 9.2.1-9.2.7.

**Table 9.2.1 – Capital Investments of Variants of the Receiving Terminal Location**

| Name | Location of the Receiving Terminal at the Beginning of the Pipeline | | Location of the Receiving Terminal on CS-1 Site | |
|---|---|---|---|---|
| | Number | Capital Investments without VAT, mln. Euro | Number | Capital Investments without VAT, mln. Euro |
| Length of laid pipes, km<br>- DN 1400 Pp 9,8 MPa<br>- DN 800 Pp 28,45 MPa | <br>3,5<br>- | <br>10,2 | <br>-<br>8,0 | <br><br>19,7 |
| ITF launcher DN 1,400, pcs. | 2 | 11,9 | - | |
| ITF receiver DN1,400, pcs. | 2 | 16,0 | - | |
| Block valve station DN 1,400, pcs. | 3 | 3,9 | - | |
| Gas treatment plant of CS-1, pcs. | 1 | 8,0 | - | |
| **TOTAL** | | **50,0** | | **19,7** |

**Table 9.2.2 – Dynamics of Capital Investments Development (without VAT) of the Receiving Terminal Location Variants**

mln. Euro

| Name \ Year | 2015 | 2016 | 2017 | 2018 | Total |
|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | |
| Location of the receiving terminal at the beginning of the gas pipeline | 30,4 | | 19,6 | | **50,0** |
| Location of the receiving terminal on CS-1 site | 4,9 | 4,9 | 4,9 | 4,9 | **19,7** |

**Table 9.2.3 – Dynamics of Operating Costs. Variant of the Receiving Terminal Location at the Beginning of the Gas Pipeline**

mln. Euro

| Years / Values | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **60,9** | 5,0 | 4,9 | 7,4 | 4,7 | 3,3 | 2,1 | 1,6 | 1,6 | 1,6 | 1,6 | 1,7 | 1,7 | 1,7 |
| including: | | | | | | | | | | | | | | |
| Material costs | **0,5** | 0,01 | 0,01 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| Depreciation charges | **48,9** | 4,7 | 4,7 | 7,1 | 4,4 | 3,0 | 1,8 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| Repair and maintenance | **10,6** | 0,1 | 0,1 | 0,2 | 0,2 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,4 | 0,4 | 0,4 | 0,4 |
| Other costs | **0,8** | 0,1 | 0,02 | 0,09 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |

| Years / Values | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 1,7 | 1,7 | 1,8 | 1,8 | 1,8 | 1,8 | 1,9 | 1,9 | 1,9 | 1,9 | 1,9 | 2,0 |
| including: | | | | | | | | | | | | |
| Material costs | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| Depreciation charges | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| Repair and maintenance | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,7 | 0,7 |
| Other costs | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |

**Table 9.2.4 – Dynamics of Operating Costs. Variant of the Receiving Terminal Location on CS-1 Site**

mln. Euro

| Years / Values | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **50,5** | 0,6 | 1,1 | 1,3 | 1,9 | 1,9 | 1,9 | 1,9 | 1,9 | 2,1 | 2,2 | 2,2 | 2,2 | 2,2 |
| including: | | | | | | | | | | | | | | |
| Material costs | **23,7** | 0,29 | 0,57 | 0,57 | 0,86 | 0,86 | 0,86 | 0,86 | 0,86 | 1,01 | 1,06 | 1,06 | 1,06 | 1,06 |
| Depreciation charges | **18,5** | 0,2 | 0,4 | 0,6 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| Repair and maintenance | **3,3** | 0,01 | 0,03 | 0,05 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Other costs | **4,9** | 0,1 | 0,12 | 0,12 | 0,18 | 0,18 | 0,18 | 0,18 | 0,18 | 0,21 | 0,22 | 0,22 | 0,22 | 0,22 |

| Years / Values | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 2,2 | 2,2 | 2,2 | 2,2 | 2,2 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| including: | | | | | | | | | | | | |
| Material costs | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 |
| Depreciation charges | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| Repair and maintenance | 0,1 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| Other costs | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 | 0,22 |

**Table 9.2.5 – Calculation of Total Discount Costs. Variant of the Receiving Terminal Location at the Beginning of the Gas Pipeline**

mln. Euro

| Values \ Years | Total | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **50,0** | | | 30,4 | | 19,6 | | | | | | | | | |
| Operating costs, exclusive of amortization | **12,0** | | | | 0,2 | 0,2 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,4 | 0,4 | 0,4 | 0,4 |
| Amortization | **48,9** | | | | 4,7 | 4,7 | 7,1 | 4,4 | 3,0 | 1,8 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| Net profit change | **54,8** | | | | 4,5 | 4,4 | 6,7 | 4,2 | 3,0 | 1,9 | 1,4 | 1,4 | 1,5 | 1,5 | 1,5 |
| Total costs | **55,9** | | | 30,4 | -0,3 | 19,3 | -0,4 | -0,2 | 0,0 | 0,1 | 0,2 | 0,2 | 0,2 | 0,3 | 0,3 |
| Discount costs flow | **41,4** | | | 26,1 | -0,2 | 14,2 | -0,3 | -0,1 | 0,0 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |

| Values \ Years | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,6 | 0,6 | 0,6 | 0,6 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 |
| Amortization | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| Net profit change | 1,5 | 1,5 | 1,5 | 1,6 | 1,6 | 1,6 | 1,6 | 1,6 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,8 |
| Total costs | 0,3 | 0,3 | 0,3 | 0,3 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Discount costs flow | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |

**Table 9.2.6 – Calculation of Total Discount Costs. Variant of the Receiving Terminal Location on CS-1 Site**

mln. Euro

| Values \ Years | Total | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **19,7** | | | 4,9 | 4,9 | 4,9 | 4,9 | | | | | | | | |
| Operating costs, exclusive of amortization | **32,0** | | | | 0,4 | 0,7 | 0,7 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 | 1,3 | 1,4 | 1,4 |
| Amortization | **18,5** | | | | 0,2 | 0,4 | 0,6 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| Net profit change | **45,4** | | | | 0,5 | 1,0 | 1,2 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,9 | 2,0 | 2,0 |
| Total costs | **46,6** | | | 4,9 | 5,2 | 5,5 | 5,5 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 1,1 | 1,2 | 1,2 |
| Discount costs flow | **23,8** | | | 4,2 | 4,1 | 4,1 | 3,8 | 0,6 | 0,5 | 0,5 | 0,5 | 0,4 | 0,5 | 0,5 | 0,4 |

| Values \ Years | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| Amortization | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| Net profit change | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,0 | 2,1 | 2,1 | 2,1 |
| Total costs | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,3 | 1,3 | 1,3 | 1,3 | 1,3 |
| Discount costs flow | 0,4 | 0,4 | 0,4 | 0,3 | 0,3 | 0,3 | 0,3 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |

**Table 9.2.7 – Technical and Economic Values of the Receiving Terminal Location Variants**

| Name | Location of the Receiving Terminal at the Beginning of the Gas Pipeline | Location of the Receiving Terminal on CS-1 Site |
|---|---|---|
| Length of laid pipes, km<br>- DN 1400 mm<br>- DN 800 km | <br>3,5<br>- | <br>-<br>8,0 |
| ITF launcher DN 1,400, pcs. | 2 | - |
| ITF receiver DN 1,400, pcs. | 2 | - |
| Block valve station DN 1400 mm, pcs. | 3 | - |
| Gas treatment plant of CS-1, pcs. | 1 | - |
| Increase of gas consumption for CS-1 auxiliaries, mln. $m^3$/g. | - | 5,6 |
| Capital investments without VAT, mln. Euro | 50,0 | 19,7 |
| Annual operating costs (2025), mln. Euro. | 1,6 | 2,2 |
| Discount total costs, mln. Euro. | 41,4 | 23,8 |

According to the main criterion of the variants' economic assessment – total discount costs and capital investments – the variant with the receiving terminal location on CS-1 prevails. According to the operating costs, the variant with the receiving terminal location at the beginning of the gas pipeline has an inconsiderable advantage.

### 9.3 Comparison of Variants of Gas Transport to the Gas Distribution Station "Provadia"

This section contains the comparison of the following variants of gas transport to the Gas Distribution Station «Provadia»:

***Compressor gas delivery*** – All gas flow coming to the Receiving Terminal is compressed at CS-1. On the 61 km, a part of the gas flow intended for discharge to the GTS of Bulgaria is reduced to the set pressure on the site of the Gas Distribution Station "Provadia".

***Non-compressor gas delivery*** – A part of the gas flow intended for discharge to Provadia area is extracted after the Receiving Terminal, but is not compressed at CS-1. Gas heating to the required temperature is made on the site of CS-1 in recuperative heat exchangers by the compressed gas flow. The further gas transport to Provadia area is fulfilled through a separate pipeline Du 1400 rated for the operating pressure of 7.4 MPa.

As far as the economic comparison of the variants was made under different articles of costs, the calculation does not take into account the cost of the pipeline construction to CS-1, Receiving Terminal, first run of Du 1400 rated for 9.8 MPa on the site of CS-1 – CS-2.

The capital investments, dynamics of their development, operating costs, total discount costs and technical-and-economic values of the variants of gas transport to the Gas Distribution Station "Provadia" are given in Tables 9.3.1-9.3.7.

**Table 9.3.1 – Capital Investments of Variants of Gas Transport to the Gas Distribution Station "Provadia"**

| Name | Compressor Gas Delivery | | Non-Compressor Gas delivery | |
|---|---|---|---|---|
| | Number | Capital Investments without VAT, mln. Euro | Number | Capital Investments without VAT, mln. Euro |
| CS-1 (c GPU-25) | 8 GCU | 275,5 | 7 GCU | 246,7 |
| Installation of recuperative heat exchangers at CS-1, pcs. | - | - | 1 | 4,9 |
| Pipeline Du 1400 rated for Pp 7.4 MPa, km | - | - | 59,0 | 115,3 |
| Looping between CS-1 and CS-2, km | 101 | 241,4 | 75 | 183,5 |
| **TOTAL** | | **516,9** | | **550,4** |

**Table 9.3.2 – Dynamics of the Capital Investments Development of Variants of Gas Transport to the Gas Distribution Station "Provadia"**

| Year / Name | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | |
| **Compressor gas delivery** | | | | | | | |
| Capital investments | 69,6 | 92,3 | 38,3 | 153,6 | 105,4 | 57,8 | **516,9** |
| including: | | | | | | | |
| - linear portion | | | 15,5 | 108,1 | 59,9 | 57,8 | **241,4** |
| - Compressor Stations | 69,6 | 92,3 | 22,7 | 45,4 | 45,4 | | **275,5** |
| **Non-compressor gas delivery** | | | | | | | |
| Capital investments | 80,0 | 173,1 | 22,8 | 61,4 | 156,2 | 56,9 | **550,4** |
| including: | | | | | | | |
| - linear portion | 20,7 | 94,5 | | 15,9 | 110,7 | 56,9 | **298,8** |
| - Compressor Stations | 59,3 | 78,6 | 22,8 | 45,5 | 45,5 | | **251,6** |

**Table 9.3.3 – Dynamics of Operating Costs. Variant of Compressor Gas Delivery to the Gas Distribution Station "Provadia"**

mln. Euro

| Values \ Year | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **2 729,2** | 56,1 | 82,8 | 125,9 | 137,7 | 128,9 | 119,7 | 109,0 | 105,8 | 106,4 | 107,6 | 107,9 | 108,2 | 108,5 |
| - linear portion | **255,4** | | | 6,1 | 9,2 | 12,4 | 11,8 | 11,2 | 10,8 | 10,7 | 10,8 | 10,9 | 11,0 | 11,1 |
| - Compressor Stations | **2 473,8** | 56,1 | 82,8 | 119,8 | 128,6 | 116,6 | 107,9 | 97,8 | 95,0 | 95,8 | 96,8 | 97,0 | 97,2 | 97,4 |
| including: | | | | | | | | | | | | | | |
| Material costs | **1 575,9** | 17,5 | 33,8 | 53,2 | 65,0 | 65,6 | 65,6 | 65,8 | 66,2 | 66,7 | 67,3 | 67,3 | 67,3 | 67,3 |
| - linear portion | **0,2** | | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| - Compressor Stations | **1 575,8** | 17,5 | 33,8 | 53,2 | 65,0 | 65,6 | 65,6 | 65,8 | 66,2 | 66,6 | 67,3 | 67,3 | 67,3 | 67,3 |
| Labor payment costs | **8,3** | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **8,3** | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | **1,6** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **1,6** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | **488,7** | 30,3 | 35,9 | 52,5 | 48,0 | 38,2 | 28,7 | 17,4 | 13,4 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 |
| - linear portion | **215,5** | | | 5,7 | 8,5 | 11,4 | 10,7 | 10,1 | 9,6 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 |
| - Compressor Stations | **273,3** | 30,3 | 35,9 | 46,9 | 39,5 | 26,8 | 18,0 | 7,3 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 |
| Repair and maintenance | **141,6** | 1,1 | 1,4 | 2,2 | 2,9 | 3,4 | 3,7 | 4,0 | 4,3 | 4,6 | 4,9 | 5,2 | 5,5 | 5,8 |
| - linear portion | **37,5** | | | 0,4 | 0,6 | 0,8 | 0,9 | 1,0 | 1,1 | 1,2 | 1,3 | 1,4 | 1,5 | 1,6 |
| - Compressor Stations | **104,1** | 1,1 | 1,4 | 1,9 | 2,4 | 2,6 | 2,8 | 3,0 | 3,2 | 3,4 | 3,6 | 3,8 | 4,0 | 4,2 |
| Ecological payments | **185,2** | 2,1 | 4,1 | 6,2 | 7,6 | 7,7 | 7,7 | 7,7 | 7,8 | 7,8 | 7,9 | 7,9 | 7,9 | 7,9 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **185,2** | 2,1 | 4,1 | 6,2 | 7,6 | 7,7 | 7,7 | 7,7 | 7,8 | 7,8 | 7,9 | 7,9 | 7,9 | 7,9 |
| Other costs | **327,8** | 4,7 | 7,2 | 11,4 | 13,8 | 13,6 | 13,6 | 13,6 | 13,7 | 13,8 | 13,9 | 13,9 | 13,9 | 13,9 |
| - linear portion | **2,2** | | | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | **325,6** | 4,7 | 7,2 | 11,3 | 13,7 | 13,5 | 13,5 | 13,5 | 13,6 | 13,7 | 13,8 | 13,8 | 13,8 | 13,8 |

| Values \ Year | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 108,8 | 109,1 | 109,4 | 109,7 | 109,9 | 110,2 | 110,5 | 110,8 | 111,1 | 111,4 | 111,7 | 112,0 |
| - linear portion | 11,1 | 11,2 | 11,3 | 11,4 | 11,5 | 11,6 | 11,7 | 11,8 | 11,9 | 12,0 | 12,0 | 12,1 |
| - Compressor Stations | 97,6 | 97,8 | 98,0 | 98,2 | 98,4 | 98,7 | 98,9 | 99,1 | 99,3 | 99,5 | 99,7 | 99,9 |
| including: | | | | | | | | | | | | |
| Material costs | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 |
| - linear portion | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| - Compressor Stations | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 | 67,3 |
| Labor payment costs | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 |
| - linear portion | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 | 9,4 |
| - Compressor Stations | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 | 3,8 |
| Repair and maintenance | 6,1 | 6,4 | 6,7 | 7,0 | 7,3 | 7,6 | 7,9 | 8,2 | 8,5 | 8,8 | 9,0 | 9,3 |
| - linear portion | 1,7 | 1,7 | 1,8 | 1,9 | 2,0 | 2,1 | 2,2 | 2,3 | 2,4 | 2,5 | 2,6 | 2,6 |
| - Compressor Stations | 4,4 | 4,6 | 4,8 | 5,0 | 5,3 | 5,5 | 5,7 | 5,9 | 6,1 | 6,3 | 6,5 | 6,7 |
| Ecological payments | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 | 7,9 |
| Other costs | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 | 13,9 |
| - linear portion | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 | 13,8 |

**Table 9.3.4 – Dynamics of Production Costs. Variant of Non-Compressor Gas Delivery to the Gas Distribution Station "Provadia"**

mln. Euro

| Values \ Year | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **2 162,3** | 49,3 | 69,5 | 93,0 | 110,3 | 106,4 | 97,8 | 86,6 | 83,0 | 83,6 | 84,2 | 84,5 | 84,8 | 85,1 |
| - linear portion | **326,3** | 6,5 | 6,5 | 6,6 | 11,9 | 14,7 | 14,8 | 14,0 | 13,2 | 13,1 | 13,2 | 13,3 | 13,4 | 13,6 |
| - Compressor Stations | **1 836,0** | 42,8 | 63,0 | 86,5 | 98,4 | 91,6 | 83,0 | 72,5 | 69,7 | 70,5 | 71,0 | 71,1 | 71,3 | 71,5 |
| including: | | | | | | | | | | | | | | |
| Material costs | **1 119,7** | 11,8 | 23,1 | 32,3 | 43,8 | 47,2 | 47,2 | 47,2 | 47,6 | 48,0 | 48,2 | 48,2 | 48,2 | 48,2 |
| - linear portion | **0,3** | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| - Compressor Stations | **1 119,4** | 11,8 | 23,1 | 32,3 | 43,8 | 47,2 | 47,2 | 47,2 | 47,6 | 48,0 | 48,2 | 48,2 | 48,2 | 48,2 |
| Labor payment costs | **8,3** | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **8,3** | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | **1,6** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **1,6** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | **524,6** | 31,0 | 36,5 | 47,5 | 48,6 | 40,0 | 31,2 | 19,7 | 15,2 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 |
| - linear portion | **275,2** | 6,1 | 6,1 | 6,1 | 11,0 | 13,5 | 13,5 | 12,6 | 11,7 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 |
| - Compressor Stations | **249,4** | 24,9 | 30,4 | 41,5 | 37,5 | 26,5 | 17,7 | 7,1 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 |
| Repair and maintenance | **142,4** | 1,3 | 1,6 | 2,1 | 2,9 | 3,4 | 3,7 | 4,0 | 4,3 | 4,6 | 4,9 | 5,2 | 5,5 | 5,8 |
| - linear portion | **47,9** | 0,3 | 0,4 | 0,4 | 0,7 | 1,1 | 1,2 | 1,3 | 1,4 | 1,5 | 1,6 | 1,7 | 1,9 | 2,0 |
| - Compressor Stations | **94,5** | 1,0 | 1,2 | 1,7 | 2,1 | 2,3 | 2,5 | 2,7 | 2,9 | 3,1 | 3,3 | 3,5 | 3,6 | 3,8 |
| Ecological payments | **129,3** | 1,4 | 2,8 | 3,6 | 5,0 | 5,4 | 5,4 | 5,4 | 5,5 | 5,5 | 5,6 | 5,6 | 5,6 | 5,6 |
| - linear portion | | | | | | | | | | | | | | |
| - Compressor Stations | **129,3** | 1,4 | 2,8 | 3,6 | 5,0 | 5,4 | 5,4 | 5,4 | 5,5 | 5,5 | 5,6 | 5,6 | 5,6 | 5,6 |
| Other costs | **236,5** | 3,4 | 5,1 | 7,1 | 9,6 | 9,9 | 9,9 | 9,9 | 10,0 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 |
| - linear portion | **2,9** | 0,1 | 0,0 | 0,0 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | **233,5** | 3,3 | 5,0 | 7,1 | 9,4 | 9,8 | 9,8 | 9,8 | 9,8 | 9,9 | 10,0 | 10,0 | 10,0 | 10,0 |

| Values \ Year | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 85,4 | 85,7 | 86,0 | 86,3 | 86,6 | 86,9 | 87,2 | 87,5 | 87,8 | 88,1 | 88,4 | 88,7 |
| - linear portion | 13,7 | 13,8 | 13,9 | 14,0 | 14,1 | 14,2 | 14,3 | 14,5 | 14,6 | 14,7 | 14,8 | 14,9 |
| - Compressor Stations | 71,7 | 71,9 | 72,1 | 72,3 | 72,5 | 72,7 | 72,8 | 73,0 | 73,2 | 73,4 | 73,6 | 73,8 |
| including: | | | | | | | | | | | | |
| Material costs | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 |
| - linear portion | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| - Compressor Stations | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 | 48,2 |
| Labor payment costs | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 |
| - linear portion | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 | 11,5 |
| - Compressor Stations | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 |
| Repair and maintenance | 6,1 | 6,4 | 6,7 | 7,0 | 7,3 | 7,6 | 7,9 | 8,2 | 8,5 | 8,8 | 9,1 | 9,4 |
| - linear portion | 2,1 | 2,2 | 2,3 | 2,4 | 2,5 | 2,6 | 2,7 | 2,9 | 3,0 | 3,1 | 3,2 | 3,3 |
| - Compressor Stations | 4,0 | 4,2 | 4,4 | 4,6 | 4,8 | 5,0 | 5,2 | 5,3 | 5,5 | 5,7 | 5,9 | 6,1 |
| Ecological payments | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 |
| - linear portion | | | | | | | | | | | | |
| - Compressor Stations | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 | 5,6 |
| Other costs | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 | 10,1 |
| - linear portion | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| - Compressor Stations | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 | 10,0 |

**Table 9.3.5 – Calculation of Total Discount Costs. Variant of Compressor Gas Delivery to the Gas Distribution Station "Provadia"**

mln. Euro

| Values \ Year | Total | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **516,9** | 69,6 | 92,3 | 38,3 | 153,6 | 105,4 | 57,8 | | | | | | | |
| Operating costs, exclusive of amortization | **2 240,5** | | | 25,8 | 47,0 | 73,4 | 89,7 | 90,7 | 91,0 | 91,6 | 92,4 | 93,3 | 94,4 | 94,7 |
| Amortization | **488,7** | | | 30,3 | 35,9 | 52,5 | 48,0 | 38,2 | 28,7 | 17,4 | 13,4 | 13,2 | 13,2 | 13,2 |
| Net profit change | **2 456,3** | | | 50,5 | 74,5 | 113,3 | 124,0 | 116,0 | 107,7 | 98,1 | 95,2 | 95,8 | 96,8 | 97,1 |
| Total costs | **2 484,4** | 69,6 | 92,3 | 58,4 | 192,3 | 166,2 | 133,7 | 77,8 | 79,0 | 80,7 | 81,8 | 82,6 | 83,6 | 83,9 |
| Discount costs flow | **1 053,8** | 64,4 | 79,1 | 46,4 | 141,3 | 113,1 | 84,3 | 45,4 | 42,7 | 40,3 | 37,9 | 35,4 | 33,2 | 30,8 |

| Values \ Year | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 95,0 | 95,3 | 95,6 | 95,9 | 96,2 | 96,5 | 96,8 | 97,1 | 97,4 | 97,6 | 97,9 | 98,2 | 98,5 | 98,8 |
| Amortization | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 | 13,2 |
| Net profit change | 97,3 | 97,6 | 97,9 | 98,2 | 98,4 | 98,7 | 99,0 | 99,2 | 99,5 | 99,8 | 100,0 | 100,3 | 100,6 | 100,8 |
| Total costs | 84,2 | 84,4 | 84,7 | 85,0 | 85,2 | 85,5 | 85,8 | 86,0 | 86,3 | 86,6 | 86,8 | 87,1 | 87,4 | 87,6 |
| Discount costs flow | 28,7 | 26,6 | 24,7 | 23,0 | 21,3 | 19,8 | 18,4 | 17,1 | 15,9 | 14,7 | 13,7 | 12,7 | 11,8 | 11,0 |

**Table 9.3.6 – Calculation of Total Discount Costs. Variant of Non-Compressor Gas Delivery to the Gas Distribution Station "Provadia"**

mln. Euro

| Values \ Year | Total | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **550,4** | 80,0 | 173,1 | 22,8 | 61,4 | 156,2 | 56,9 | | | | | | | |
| Operating costs, exclusive of amortization | **1 637,8** | | | 18,4 | 33,0 | 45,5 | 61,7 | 66,3 | 66,6 | 66,9 | 67,8 | 68,6 | 69,2 | 69,5 |
| Amortization | **524,6** | | | 31,0 | 36,5 | 47,5 | 48,6 | 40,0 | 31,2 | 19,7 | 15,2 | 15,0 | 15,0 | 15,0 |
| Net profit change | **1 946,1** | | | 44,4 | 62,6 | 83,7 | 99,2 | 95,7 | 88,0 | 77,9 | 74,7 | 75,2 | 75,8 | 76,0 |
| Total costs | **1 971,9** | 80,0 | 173,1 | 36,2 | 87,5 | 192,4 | 107,6 | 55,7 | 56,8 | 58,2 | 59,5 | 60,2 | 60,8 | 61,0 |
| Discount costs flow | **896,7** | 74,1 | 148,4 | 28,7 | 64,3 | 131,0 | 67,8 | 32,5 | 30,7 | 29,1 | 27,5 | 25,8 | 24,1 | 22,4 |

| Values \ Year | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 69,8 | 70,1 | 70,4 | 70,7 | 71,0 | 71,3 | 71,6 | 71,9 | 72,2 | 72,5 | 72,8 | 73,1 | 73,4 | 73,7 |
| Amortization | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 | 15,0 |
| Net profit change | 76,3 | 76,6 | 76,8 | 77,1 | 77,4 | 77,7 | 77,9 | 78,2 | 78,5 | 78,7 | 79,0 | 79,3 | 79,5 | 79,8 |
| Total costs | 61,3 | 61,6 | 61,8 | 62,1 | 62,4 | 62,7 | 62,9 | 63,2 | 63,5 | 63,7 | 64,0 | 64,3 | 64,6 | 64,8 |
| Discount costs flow | 20,9 | 19,4 | 18,1 | 16,8 | 15,6 | 14,5 | 13,5 | 12,6 | 11,7 | 10,9 | 10,1 | 9,4 | 8,7 | 8,1 |

**Table 9.3.7 – Technical and Economic Values of Variants of Gas Transport to the Gas Distribution Station "Provadia"**

| Name | Compressor Gas Delivery | Non-Compressor Gas Delivery |
|---|---|---|
| Gas distribution, bln. $m^3$/g., total | 63,0 | 63,0 |
| - to CS-1 | 63,0 | 42,6 |
| - to independent gas pipeline | - | 20,4 |
| Quantity of GPU-25 at CS-1 | 8 | 7 |
| Operating power, MW | 150 | 125 |
| Installed capacity of CS, MW | 200 | 175 |
| Gas consumption for auxiliaries, mln. $m^3$/g. | 295 | 206 |
| Length of laid pipes, km, total, | 101 | 134 |
| including: | | |
| - looping between CS-1 and CS-2 | 101 | 75 |
| - pipeline Du 1400 rated for Pp 7.4 MPa | – | 59 |
| Installation of recuperative heat exchangers at CS-1, pcs. | – | 1 |
| Capital investments without VAT, mln. Euro | 516,9 | 550,4 |
| Annual operating costs (2025), mln. Euro. | 107,6 | 84,2 |
| Total discount costs, mln. Euro. | 1 053,8 | 896,7 |

According to the main criterion of the economic assessment of the variants – total discount costs and operating costs – the variant with non-compressor gas delivery prevails. According to the capital investments the variant with compressor gas delivery prevails.

### 9.4 Comparison of Variants of CS-1 Compressor Station Equipment

This section contains the comparison of the variants of CS-1 Compressor Station equipment with units with unit capacity of 32 MW instead of units 25 MW.

The dynamics of the capital investment development and operating costs, total discount costs and technical-and-economic values of the variants of gas transport to the Gas Distribution Station "Provadia" is given in Tables 9.4.1-9.4.6.

**Table 9.4.1 – Dynamics of Capital Investments Development (without VAT) of CS-1 Equipment Variants**

| Year / Name | 2014 | 2015 | 2016 | 2017 | 2018 | Total |
|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | |
| CS-1 equipped with GPU-25 (7 pcs.) | 59,3 | 78,6 | 22,8 | 45,5 | 45,5 | **251,6** |
| CS-1 equipped with GPU-32 (5 pcs.) | 57,7 | 76,5 | 29,0 | 29,0 | 29,0 | **221,0** |

**Table 9.4.2 – Dynamics of Operating Costs. Variant CS-1 Equipment with GPU-25 (7 pcs.)**

mln. Euro

| Values \ Year | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **1 769,5** | 42,8 | 63,0 | 83,6 | 95,5 | 88,7 | 80,1 | 69,6 | 66,9 | 67,6 | 68,1 | 68,3 | 68,4 | 68,6 |
| including: | | | | | | | | | | | | | | |
| Material costs | **1 064,6** | 11,8 | 23,1 | 29,9 | 41,4 | 44,8 | 44,8 | 44,8 | 45,2 | 45,6 | 45,8 | 45,8 | 45,8 | 45,8 |
| Labour payment costs | **8,3** | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | **1,6** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | **249,4** | 24,9 | 30,4 | 41,5 | 37,5 | 26,5 | 17,7 | 7,1 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 |
| Repair and maintenance | **94,5** | 1,0 | 1,2 | 1,7 | 2,1 | 2,3 | 2,5 | 2,7 | 2,9 | 3,1 | 3,3 | 3,5 | 3,6 | 3,8 |
| Ecological payments | **128,5** | 1,4 | 2,8 | 3,6 | 5,0 | 5,4 | 5,4 | 5,4 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 |
| Other costs | **222,6** | 3,3 | 5,0 | 6,6 | 9,0 | 9,3 | 9,3 | 9,3 | 9,4 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 |

| Values \ Year | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 68,8 | 69,0 | 69,2 | 69,4 | 69,6 | 69,8 | 70,0 | 70,1 | 70,3 | 70,5 | 70,7 | 70,9 |
| including: | | | | | | | | | | | | |
| Material costs | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 | 45,8 |
| Labour payment costs | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 |
| Repair and maintenance | 4,0 | 4,2 | 4,4 | 4,6 | 4,8 | 5,0 | 5,2 | 5,3 | 5,5 | 5,7 | 5,9 | 6,1 |
| Ecological payments | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 |
| Other costs | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 | 9,5 |

**Table 9.4.3 – Dynamics of Operating Costs. Variant of CS-1 Equipment with GPU-32 (5 pcs.)**

mln. Euro

| Values \ Year | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Operating costs, total | **1 709,0** | 43,5 | 64,5 | 80,4 | 86,9 | 79,3 | 73,0 | 66,7 | 65,3 | 66,0 | 66,5 | 66,6 | 66,8 | 67,0 |
| including: | | | | | | | | | | | | | | |
| Material costs | **1 050,6** | 12,1 | 23,0 | 29,7 | 40,8 | 44,1 | 44,1 | 44,1 | 44,6 | 45,0 | 45,2 | 45,2 | 45,2 | 45,2 |
| Labour payment costs | **7,9** | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | **1,6** | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | **219,3** | 25,3 | 32,1 | 38,8 | 30,2 | 18,3 | 11,8 | 5,3 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 |
| Repair and maintenance | **84,2** | 0,9 | 1,2 | 1,6 | 1,9 | 2,1 | 2,2 | 2,4 | 2,6 | 2,7 | 2,9 | 3,1 | 3,2 | 3,4 |
| Ecological payments | **126,8** | 1,4 | 2,8 | 3,6 | 4,9 | 5,3 | 5,3 | 5,3 | 5,4 | 5,4 | 5,5 | 5,5 | 5,5 | 5,5 |
| Other costs | **218,8** | 3,4 | 5,0 | 6,4 | 8,7 | 9,1 | 9,1 | 9,1 | 9,2 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 |

| Values \ Year | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Operating costs, total | 67,1 | 67,3 | 67,5 | 67,6 | 67,8 | 68,0 | 68,1 | 68,3 | 68,5 | 68,6 | 68,8 | 68,9 |
| including: | | | | | | | | | | | | |
| Material costs | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 | 45,2 |
| Labour payment costs | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 |
| Taxes (charges on payroll) | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Depreciation charges | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 |
| Repair and maintenance | 3,6 | 3,7 | 3,9 | 4,1 | 4,2 | 4,4 | 4,6 | 4,7 | 4,9 | 5,1 | 5,2 | 5,4 |
| Ecological payments | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 |
| Other costs | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 | 9,3 |

**Table 9.4.4 – Calculation of Total Discount Costs. Variant CS-1 Equipment with GPU-25 (7 pcs.)**

mln. Euro

| Values \ Year | Total | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **251,6** | 59,3 | 78,6 | 22,8 | 45,5 | 45,5 | | | | | | | | |
| Operating costs, exclusive of amortization | **1 520,1** | | | 17,9 | 32,6 | 42,1 | 57,9 | 62,2 | 62,4 | 62,6 | 63,3 | 64,1 | 64,5 | 64,7 |
| Amortization | **249,4** | | | 24,9 | 30,4 | 41,5 | 37,5 | 26,5 | 17,7 | 7,1 | 3,5 | 3,5 | 3,5 | 3,5 |
| Net profit change | **1 592,5** | | | 38,5 | 56,7 | 75,2 | 85,9 | 79,9 | 72,1 | 62,7 | 60,2 | 60,8 | 61,3 | 61,4 |
| Total costs | **1 594,7** | 59,3 | 78,6 | 36,4 | 71,8 | 79,3 | 48,4 | 53,3 | 54,4 | 55,6 | 56,6 | 57,3 | 57,7 | 57,9 |
| Discount costs flow | **650,3** | 54,9 | 67,4 | 28,9 | 52,8 | 54,0 | 30,5 | 31,1 | 29,4 | 27,8 | 26,2 | 24,6 | 22,9 | 21,3 |

| Values \ Year | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 64,9 | 65,1 | 65,3 | 65,5 | 65,7 | 65,8 | 66,0 | 66,2 | 66,4 | 66,6 | 66,8 | 67,0 | 67,2 | 67,4 |
| Amortization | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 |
| Net profit change | 61,6 | 61,8 | 61,9 | 62,1 | 62,3 | 62,4 | 62,6 | 62,8 | 63,0 | 63,1 | 63,3 | 63,5 | 63,6 | 63,8 |
| Total costs | 58,1 | 58,2 | 58,4 | 58,6 | 58,7 | 58,9 | 59,1 | 59,2 | 59,4 | 59,6 | 59,8 | 59,9 | 60,1 | 60,3 |
| Discount costs flow | 19,8 | 18,4 | 17,0 | 15,8 | 14,7 | 13,6 | 12,7 | 11,8 | 10,9 | 10,1 | 9,4 | 8,8 | 8,1 | 7,5 |

**Table 9.4.5 – Calculation of Total Discount Costs. Variant of CS-1 Equipment with GPU-32 (5 pcs.)**

mln. Euro

| Values \ Year | Total | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Capital investments (without VAT) | **221,0** | 57,7 | 76,5 | 29,0 | 29,0 | 29,0 | | | | | | | | |
| Operating costs, exclusive of amortization | **1 489,8** | | | 18,2 | 32,4 | 41,6 | 56,7 | 61,1 | 61,2 | 61,4 | 62,1 | 62,8 | 63,3 | 63,4 |
| Amortization | **219,3** | | | 25,3 | 32,1 | 38,8 | 30,2 | 18,3 | 11,8 | 5,3 | 3,2 | 3,2 | 3,2 | 3,2 |
| Net profit change | **1 538,1** | | | 39,1 | 58,0 | 72,4 | 78,2 | 71,4 | 65,7 | 60,1 | 58,8 | 59,4 | 59,8 | 60,0 |
| Total costs | **1 539,9** | 57,7 | 76,5 | 42,8 | 54,9 | 62,5 | 48,0 | 53,1 | 53,9 | 54,7 | 55,6 | 56,2 | 56,6 | 56,8 |
| Discount costs flow | **621,8** | 53,4 | 65,6 | 34,0 | 40,4 | 42,6 | 30,2 | 31,0 | 29,1 | 27,4 | 25,7 | 24,1 | 22,5 | 20,9 |

| Values \ Year | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Capital investments (without VAT) | | | | | | | | | | | | | | |
| Operating costs, exclusive of amortization | 63,6 | 63,8 | 63,9 | 64,1 | 64,3 | 64,4 | 64,6 | 64,8 | 64,9 | 65,1 | 65,3 | 65,4 | 65,6 | 65,8 |
| Amortization | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 | 3,2 |
| Net profit change | 60,1 | 60,3 | 60,4 | 60,6 | 60,7 | 60,9 | 61,0 | 61,2 | 61,3 | 61,5 | 61,6 | 61,8 | 61,9 | 62,1 |
| Total costs | 56,9 | 57,1 | 57,2 | 57,4 | 57,5 | 57,7 | 57,8 | 58,0 | 58,1 | 58,3 | 58,4 | 58,6 | 58,7 | 58,9 |
| Discount costs flow | 19,4 | 18,0 | 16,7 | 15,5 | 14,4 | 13,4 | 12,4 | 11,5 | 10,7 | 9,9 | 9,2 | 8,6 | 7,9 | 7,4 |

**Table 9.4.6 – Technical and Economic Values of Variants of CS-1 Equipment**

| Name | CS Equipment with GPU-25 | CS Equipment with GPU-32 |
|---|---|---|
| Gas income volume, bln. $m^3$/g. | 42,6 | |
| Quantity of GPU, pcs. | 7 (5 working + 2 standby) | 5 (4 working + 1 standby) |
| Installed capacity of CS, MW | 175 | 160 |
| Operating capacity of CS, MW | 125 | 128 |
| Gas consumption for auxiliaries, mln. $m^3$/g. | 206 | 201 |
| Number of personnel, persons. | 40 | 38 |
| Capital investments without VAT, mln. Euro | 251,6 | 221,0 |
| Annual operating costs (2025), mln. Euro | 68,1 | 66,5 |
| Total discount costs, mln. Euro | 650,3 | 621,8 |

According to the main criterion of the economic assessment of the variants – total discount costs, as well as capital investments and production costs – the variant with CS equipment with units with the unit capacity of 32 MW prevails.

### 9.5 Recommended Schemes of Gas Transport

According to the results of the technical and economic comparison of the optimization variants it is proposed to use a scheme of gas transport, which provides:

- construction of four CS;
- equipment of CS-1 with GPU-32 (5 pcs.), CS-2-CS-4 – GPU-25 (4 pcs.);
- location of the Receiving Terminal on the site of CS-1;
- transport to the area of the existing CS “Provadia” through a separate pipeline Du.

For variants 1b, 3b and 3d with the basic scheme of gas transport, the above listed optimization solutions were taken into account and the recommended variants 1b, 3b and 3d were calculated.

For recommended variants 1b, 3b and 3d, the similar calculations described in sections 3-8 are made and given in Tables 9.5.1 – 9.5.12 and in Annexes 7-12 (Tables 7.10 – 7.12, 7.18, 7.19, 8.9 – 8.11, 9.2, 10.9 – 10.11,9 - 11.11, 12.32 – 12.47).

**Table 9.5.1 – Structure of Specific Investments in the Linear Portion. Variant 1b. Chiren. Recommended**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 2) | | Area 2 (km 2 ÷ km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2÷km 416) | | Area 4 (km 416 ÷ km 537.8) |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 and next runs | | 1 run | 2 run | |
| | **Initial data:** | | | | | | | |
| | Operating pressure | MPa | 28,45 | 28,45 | 7,4 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 813 | 813 | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 37,4 | 37,4 | 18,0 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 736,13 | 736,13 | 647,51 | 843,10 | 843,1 | 843,10 |
| | Price of «black» pipe | Euro/t | 1 715,6 | 1 715,6 | 995,0 | 1 070,3 | 1070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/$m^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,4 | 18,41 |
| | Inner pipe lining | Euro/$m^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,2 | 6,21 |
| | Pipe transport, provision and ware-house costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Eu-ro/km | | | | | | |
| 1 | Construction site preparation | thous. Eu-ro/km | 28,98 | 28,98 | 57,99 | 88,59 | 56,03 | 88,59 |
| 2 | Pipe delivery | thous. Eu-ro/km | 1 472,26 | 1 472,26 | 883,21 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Eu-ro/km | 1 325,04 | 1 325,04 | 753,70 | 1 011,72 | 1 011,72 | 1 011,72 |
| | "Black" pipe | thous. Eu-ro/km | 1 262,93 | 1 262,93 | 644,28 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Eu-ro/km | 46,98 | 46,98 | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Eu-ro/km | 15,13 | 15,13 | 27,35 | 27,24 | 27,24 | 27,24 |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Eu-ro/km | 147,23 | 147,23 | 129,50 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Eu- | | | 71,55 | 71,74 | 114,56 | 82,11 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 2) | | Area 2 (km 2 ÷ km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2÷km 416) | | Area 4 (km 416 ÷ km 537.8) |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 and next runs | | 1 run | 2 run | |
| | | ro/km | | | | | | |
| 4 | Construction and installation works | thous. Eu-ro/km | 555,67 | 555,67 | 581,92 | 666,10 | 766,28 | 683,38 |
| | Gas pipeline laying | thous. Eu-ro/km | 555,67 | 555,67 | 478,47 | 630,71 | 629,22 | 630,71 |
| | Other facilities | thous. Eu-ro/km | | | 103,45 | 35,38 | 137,05 | 52,67 |
| 5 | Power facilities | thous. Eu-ro/km | | | 44,41 | 55,72 | | 55,72 |
| 6 | Transport facilities | thous. Eu-ro/km | | | 10,98 | 10,43 | 13,08 | 10,43 |
| 7 | Communication facilities | thous. Eu-ro/km | | | | 17,21 | | 17,21 |
| 8 | Construction site improvement | thous. Eu-ro/km | | | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Eu-ro/km | 247,26 | 247,26 | 46,83 | 53,04 | 53,31 | 54,90 |
| 10 | Start-up and commissioning works | thous. Eu-ro/km | 130,63 | 130,63 | 5,29 | 2,10 | 2,29 | 3,81 |
| 11 | Costs connected with management, design and organization of construction | thous. Eu-ro/km | 477,62 | 477,62 | 90,95 | 95,31 | 84,14 | 99,56 |
| 12 | Insurance | thous. Eu- | 143,62 | 143,62 | 18,83 | 19,51 | 19,66 | 20,92 |
| 13 | Extraordinary expenses, 10% | thous. Eu- | 305,60 | 305,60 | 181,32 | 226,14 | 229,09 | 229,82 |
| 14 | Taxes | thous. Eu- | - | - | - | - | - | - |
| | **Total** | thous. Eu- | **3 361,64** | **3 361,64** | **1 994,53** | **2 487,49** | **2 520,02** | **2 528,05** |

**Table 9.5.2 – Structure of Specific Investments in the Linear Portion. Variant 3b. Chiren. Recommended**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 2) | | Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 331) | | Area 4 (km 331 ÷ km 416) | | Area 5 (km 416÷ km 537.8) | Area 6 (km 0 ÷ km 351) (to Greece) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 and next runs | | 1 run | 2 run | 1 run | 2 run | | |
| | **Initial data:** | | | | | | | | | | |
| | Operating pressure | MPa | 28,45 | 28,45 | 7,4 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 813 | 813 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 1 420 | 711 |
| | Pipe wall | mm | 37,4 | 37,4 | 18,0 | 23,6 | 23,6 | 23,6 | 23,6 | 23,6 | 12,3 |
| | Pipe weight | t/km | 736,13 | 736,13 | 647,51 | 843,10 | 843,1 | 843,10 | 843,1 | 843,10 | 222,26 |
| | Price of «black» pipe | Euro/t | 1 715,6 | 1 715,6 | 995,0 | 1 070,3 | 1070,3 | 1 070,3 | 1070,3 | 1 070,3 | 1 250,6 |
| | Outer pipeline lining | Euro/m$^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,4 | 18,41 | 18,4 | 18,41 | 18,41 |
| | Inner pipe lining | Euro/m$^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,2 | 6,21 | 6,2 | 6,21 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 28,98 | 28,98 | 57,99 | 88,60 | 55,57 | 88,60 | 55,57 | 88,60 | 96,14 |
| 2 | Pipe delivery | thous. Euro/km | 1 472,26 | 1 472,26 | 883,21 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 1 180,33 | 377,84 |
| 2.1 | Pipes | thous. Euro/km | 1 325,04 | 1 325,04 | 753,70 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 1 011,72 | 333,39 |
| | "Black" pipe | thous. Euro/km | 1 262,93 | 1 262,93 | 644,28 | 902,40 | 902,40 | 902,40 | 902,40 | 902,40 | 277,96 |
| | External coating | thous. Euro/km | 46,98 | 46,98 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 82,08 | 41,62 |
| | Internal coating | thous. Eu- | 15,13 | 15,13 | 27,35 | 27,24 | 27,24 | 27,24 | 27,24 | 27,24 | 13,81 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 2) | | Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 331) | | Area 4 (km 331 ÷ km 416) | | Area 5 (km 416÷ km 537.8) | Area 6 (km 0 ÷ km 351) (to Greece) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 and next runs | | 1 run | 2 run | 1 run | 2 run | | |
| | | ro/km | | | | | | | | | |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Eu-ro/km | 147,23 | 147,23 | 129,50 | 168,62 | 168,62 | 168,62 | 168,62 | 168,62 | 44,45 |
| 3 | Equipment | thous. Eu-ro/km | | | 71,55 | 66,63 | 89,31 | 102,23 | 136,85 | 84,31 | 21,29 |
| 4 | Construction and installation works | thous. Eu-ro/km | 555,67 | 555,67 | 581,92 | 656,47 | 717,58 | 706,91 | 799,93 | 684,11 | 193,75 |
| | Gas pipeline laying | thous. Eu-ro/km | 555,67 | 555,67 | 478,47 | 631,44 | 630,39 | 631,44 | 630,39 | 631,44 | 180,53 |
| | Other facilities | thous. Eu-ro/km | | | 103,45 | 25,03 | 87,19 | 75,47 | 169,54 | 52,67 | 13,22 |
| 5 | Power facilities | thous. Eu-ro/km | | | 44,41 | 55,72 | | 55,72 | | 55,72 | 40,21 |
| 6 | Transport facilities | thous. Eu-ro/km | | | 10,98 | 10,46 | 10,14 | 10,46 | 10,14 | 10,46 | 11,45 |
| 7 | Communication facilities | thous. Eu-ro/km | | | | 17,21 | | 17,21 | | 17,21 | 15,91 |
| 8 | Construction site improvement | thous. Eu-ro/km | | | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 1,25 | 0,42 |
| 9 | Temporary buildings and structures | thous. Eu- | 247,26 | 247,26 | 46,83 | 52,64 | 51,92 | 54,71 | 54,14 | 54,92 | 18,46 |
| 10 | Start-up and commissioning works | thous. Eu- | 130,63 | 130,63 | 5,29 | 1,85 | 1,79 | 3,39 | 2,74 | 3,87 | 2,98 |
| 11 | Costs connected with management, design and organization of construction | thous. Eu-ro/km | 477,62 | 477,62 | 90,95 | 93,69 | 81,81 | 98,03 | 85,67 | 98,83 | 48,93 |
| 12 | Insurance | thous. Eu- | 143,62 | 143,62 | 18,83 | 19,26 | 18,95 | 20,67 | 20,14 | 20,96 | 7,19 |
| 13 | Extraordinary expenses, 10% | thous. Eu- | 305,60 | 305,60 | 181,32 | 224,41 | 220,87 | 233,95 | 234,68 | 230,06 | 83,46 |
| 14 | Taxes | thous. Eu- | - | - | - | - | - | - | - | - | - |
| | **Total** | thous. Eu- | **3 361,64** | **3 361,64** | **1 994,53** | **2 468,52** | **2 429,53** | **2 573,47** | **2 581,44** | **2 530,63** | **918,04** |

**Table 9.5.3 – Structure of Specific Investments in the Linear Portion. Variant 3d. Chiren. Recommended**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 2) | | Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | | Area 4 (km 416 ÷ km 537.8) |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 and next runs | | 1 run | 2 run | |
| | **Initial data:** | | | | | | | |
| | Operating pressure | MPa | 28,45 | 28,45 | 7,4 | 9,8 | 9,8 | 9,8 |
| | Diameter | mm | 813 | 813 | 1 420 | 1 420 | 1 420 | 1 420 |
| | Pipe wall | mm | 37,4 | 37,4 | 18,0 | 23,6 | 23,6 | 23,6 |
| | Pipe weight | t/km | 736,13 | 736,13 | 647,51 | 843,10 | 843,1 | 843,10 |
| | Price of «black» pipe | Euro/t | 1 715,6 | 1 715,6 | 995,0 | 1 070,3 | 1070,3 | 1 070,3 |
| | Outer pipeline lining | Euro/$m^2$ | 18,41 | 18,41 | 18,41 | 18,41 | 18,4 | 18,41 |
| | Inner pipe lining | Euro/$m^2$ | 6,21 | 6,21 | 6,21 | 6,21 | 6,2 | 6,21 |
| | Pipe transport, provision and warehouse costs | Euro/t | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 | 200,0 |
| | **Specific investments in the linear portion** | thous. Euro/km | | | | | | |
| 1 | Construction site preparation | thous. Euro/km | 28,98 | 28,98 | 57,99 | 88,58 | 50,45 | 88,58 |
| 2 | Pipe delivery | thous. Euro/km | 1 472,26 | 1 472,26 | 883,21 | 1 180,33 | 1 180,33 | 1 180,33 |
| 2.1 | Pipes | thous. Euro/km | 1 325,04 | 1 325,04 | 753,70 | 1 011,72 | 1 011,72 | 1 011,72 |
| | "Black" pipe | thous. Euro/km | 1 262,93 | 1 262,93 | 644,28 | 902,40 | 902,40 | 902,40 |
| | External coating | thous. Euro/km | 46,98 | 46,98 | 82,08 | 82,08 | 82,08 | 82,08 |
| | Internal coating | thous. Euro/km | 15,13 | 15,13 | 27,35 | 27,24 | 27,24 | 27,24 |

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 2) | | Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | | Area 4 (km 416 ÷ km 537.8) |
|---|---|---|---|---|---|---|---|---|
| | | | 1 run | 2 and next runs | | 1 run | 2 run | |
| 2.2 | Pipe transport, provision and warehouse costs | thous. Euro/km | 147,23 | 147,23 | 129,50 | 168,62 | 168,62 | 168,62 |
| 3 | Equipment | thous. Euro/km | | | 71,55 | 71,74 | 127,34 | 82,11 |
| 4 | Construction and installation works | thous. Euro/km | 555,67 | 555,67 | 581,92 | 666,10 | 805,40 | 683,38 |
| | Gas pipeline laying | thous. Euro/km | 555,67 | 555,67 | 478,47 | 630,71 | 625,18 | 630,71 |
| | Other facilities | thous. Euro/km | | | 103,45 | 35,38 | 180,22 | 52,67 |
| 5 | Power facilities | thous. Euro/km | | | 44,41 | 55,72 | | 55,72 |
| 6 | Transport facilities | thous. Euro/km | | | 10,98 | 10,45 | 16,82 | 10,45 |
| 7 | Communication facilities | thous. Euro/km | | | | 17,28 | | 17,28 |
| 8 | Construction site improvement | thous. Euro/km | | | 1,25 | 1,25 | 1,25 | 1,25 |
| 9 | Temporary buildings and structures | thous. Eu- | 247,26 | 247,26 | 46,83 | 53,04 | 54,47 | 54,90 |
| 10 | Start-up and commissioning works | thous. Eu- | 130,63 | 130,63 | 5,29 | 2,09 | 2,55 | 3,80 |
| 11 | Costs connected with management, design and organization of construction | thous. Euro/km | 477,62 | 477,62 | 90,95 | 94,88 | 85,76 | 99,13 |
| 12 | Insurance | thous. Euro/km | 143,62 | 143,62 | 18,83 | 19,51 | 20,12 | 20,92 |
| 13 | Extraordinary expenses, 10% | thous. Eu- | 305,60 | 305,60 | 181,32 | 226,10 | 234,45 | 229,79 |
| 14 | Taxes | thous. Eu- | - | - | - | - | - | - |
| | **Total** | thous. Eu- | **3 361,64** | **3 361,64** | **1 994,53** | **2 487,08** | **2 578,93** | **2 527,64** |

**Table 9.5.4 – Structure of Specific Investments by Compressor Stations**

| | Index Name | Unit of Meas. | Compressor Stations Different in Unit Capacity of GPU | |
|---|---|---|---|---|
| | | | GPU-25, 4 pcs. (3+1) | GPU-32, 5 pcs. (4+1) |
| | **Initial data:** | | | |
| | Unit capacity of GPU | MW | 25 | 32 |
| | Quantity of GPU | pcs. | 4 | 5 |
| | Installed capacity of CS | MW | 100 | 160 |
| | Price of 1 GPU | mln. Euro | 12,70 | 15,30 |
| | **Specific investment** | | | |
| 1 | Construction site preparation and improvement | mln. Euro/MW | 0,06 | 0,04 |
| 2 | Cost of equipment | mln. Euro/MW | 0,74 | 0,65 |
| 2.1 | GPU | mln. Euro/MW | 0,51 | 0,48 |
| 2.2 | Other equipment | mln. Euro/MW | 0,23 | 0,17 |
| 3 | Construction and installation works | mln. Euro/MW | 0,20 | 0,19 |
| 3.1 | Construction and installation works GPU | mln. Euro/MW | 0,13 | 0,15 |
| 3.2 | Construction and installation works of other equipment | mln. Euro/MW | 0,07 | 0,04 |
| 4 | Facilities of auxiliary and service designation | mln. Euro/MW | 0,03 | 0,02 |
| 5 | Power facilities | mln. Euro/MW | 0,19 | 0,13 |
| 6 | Transport facilities | mln. Euro/MW | 0,04 | 0,04 |
| 7 | Outside nets and structures of water supply, sewerage, heat supply and gas supply | mln. Euro/MW | 0,04 | 0,03 |
| 8 | Temporary buildings and structures | mln. Euro/MW | 0,03 | 0,02 |
| 9 | Start-up and commissioning works | mln. Euro/MW | 0,02 | 0,02 |
| 10 | Management, designing | mln. Euro/MW | 0,13 | 0,09 |
| 11 | Insurance | mln. Euro/MW | 0,01 | 0,01 |
| 12 | Extraordinary expenses, 10 % | mln. Euro/MW | 0,15 | 0,12 |
| 13 | Taxes | mln. Euro/MW | - | - |
| | **TOTAL** | | **1,64** | **1,35** |

**Table 9.5.5 - Capital Investments in Construction of Other Facilities. Variant 1b. Chiren. Recommended**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 2) | Area 2 (km 1 – km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
|---|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | | 25,4 | 6,5 | 15,5 | **47,4** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | | 0,2 | 19,8 | 6,4 | **26,3** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | | 3,5 | **3,5** |

**Table 9.5.6 - Capital Investments in Construction of Other Facilities. Variant 3b. Chiren. Recommended**

| Index Name | | Unit of Meas. | Area 1 (km 0 ÷ km 2) | Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 331) | Area 4 (km 331 ÷ km 416) | Area 5 (km 416 ÷ km 537.8) | Area 6 (km 0 ÷ km 351) (to Greece) | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | | 25,4 | | 6,5 | 15,5 | 6,5 | **53,9** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | | 0,2 | 19,2 | 1,0 | 6,5 | 4,6 | **31,5** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | | | 3,5 | | **3,5** |

**Table 9.5.7 - Capital Investments in Construction of Other Facilities. Variant 3d. Chiren. Recommended**

| | Index Name | Unit of Meas. | Area 1 (km 0 ÷ km 2) | Area 2 (km 1 – km 59) to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
|---|---|---|---|---|---|---|---|
| 1 | Gas Metering Station (GMS) | mln. Euro | | 25,4 | 6,5 | 15,5 | **47,4** |
| 2 | Receiving Terminal | mln. Euro | 120,1 | | | | **120,1** |
| 3 | Process Control System (PCS) | mln. Euro | | 0,2 | 19,5 | 6,3 | **25,9** |
| 4 | Communication of GTE in Sofia | mln. Euro | | | | 3,5 | **3,5** |

**Table 9.5.8 – Total Capital Investments (without VAT)**

mln. Euro.

| Name | Variants | | |
|---|---|---|---|
| | 1b. Recommended | 3b. Recommended | 3d. Recommended |
| ***Linear portion*** | ***2 080,0*** | ***2 533,9*** | ***1 986,0*** |
| ***DN 1400*** | ***2 080,0*** | ***2 202,4*** | ***1 986,0*** |
| Gas pipeline | *1 585,7* | *1 689,7* | *1 506,5* |
| GMS "Galata" | 109,2 | 109,2 | 109,2 |
| Gas distribution station "Provadia" with GMS | 23,1 | 23,1 | 23,1 |
| GMS on the border with Serbia | 14,1 | 14,1 | 14,1 |
| Gas distribution station "Chiren" with GMS | 5,9 | 5,9 | 5,9 |
| Other costs | 325,4 | 344,0 | 310,7 |
| ***DN 800*** | *16,5* | *16,5* | *16,5* |
| ***DN 700*** | | 331,5 | |
| Gas pipeline | | 268,2 | |
| Gas Measuring Station on the border with Greece | | 5,9 | |
| Other costs | | 57,4 | |
| ***Compressor Stations*** | ***728,5*** | ***792,1*** | ***728,5*** |
| CS-1 | 221,0 | 221,0 | 221,0 |
| CS-2 | 169,2 | 169,2 | 169,2 |
| CS-3 | 169,2 | 169,2 | 169,2 |
| CS-4 | 169,2 | 169,2 | 169,2 |
| CS-5 | | 63,6 | |
| ***Total*** | **2 808,5** | **3 326,0** | **2 714,5** |

**Table 9.5.9 – Dynamics of Capital Investments by Years of the Project Implementation (without VAT)**

mln. Euro

| Name \ Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| **Variant 1b. Recommended** | | | | | | | | |
| Capital investments | 347,8 | 931,2 | 494,7 | 45,6 | 283,0 | 573,7 | 132,4 | **2 808,5** |
| including: | | | | | | | | |
| - linear portion, including: | 337,6 | 895,3 | 258,0 | 1,2 | 106,9 | 175,5 | 128,5 | **1 903,1** |
| *DN 1400* | | | 23,2 | 1,2 | 1,2 | 1,2 | | 26,9 |
| *DN 800* | 337,6 | 895,3 | 234,8 | | 105,7 | 174,3 | 128,5 | 1 876,3 |
| - Compressor Stations | | 8,6 | 122,4 | 37,8 | 162,7 | 376,5 | | **708,0** |
| - other facilities | 10,2 | 27,3 | 114,3 | 6,6 | 13,4 | 21,7 | 3,9 | **197,3** |
| **Variant 3b. Recommended** | | | | | | | | |
| Capital investments | 348,2 | 958,9 | 717,4 | 277,1 | 331,8 | 472,9 | 219,6 | **3 326,0** |
| including: | | | | | | | | |
| - linear portion, including: | 348,2 | 950,1 | 577,9 | 102,8 | 147,4 | 251,3 | 156,1 | **2 533,9** |
| *DN 1400* | | | 126,9 | 6,7 | 6,7 | 6,7 | | **147,0** |
| *DN 800* | 348,2 | 923,6 | 242,2 | | 140,7 | 244,5 | 156,1 | **2 055,4** |
| *DN 700* | | 26,5 | 208,8 | 96,1 | | | | **331,5** |
| - Compressor Stations | | 8,6 | 135,5 | 169,3 | 179,2 | 215,3 | 61,8 | **769,8** |
| - other facilities | 9,7 | 26,7 | 16,5 | 7,6 | 9,1 | 13,1 | 6,1 | **88,8** |

| Name \ Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| **Variant 3d. Recommended** | | | | | | | | |
| Capital investments | 347,6 | 930,8 | 504,8 | 150,5 | 304,6 | 476,1 | | **2 714,5** |
| including: | | | | | | | | |
| - linear portion, including: | 337,0 | 893,8 | 257,6 | 1,2 | 144,1 | 175,9 | | **1 809,6** |
| *DN 1400* | | | 23,2 | 1,2 | 1,2 | 1,2 | | **26,9** |
| *DN 800* | 337,0 | 893,8 | 234,4 | | 142,9 | 174,6 | | **1 782,7** |
| - Compressor Stations | | 8,6 | 132,3 | 139,7 | 146,3 | 281,1 | | **708,0** |
| - other facilities | 10,6 | 28,5 | 114,9 | 9,5 | 14,2 | 19,2 | | **196,9** |

**Table 9.5.10 – Rates of Operating Costs and Amortization Deductions**

| | Index Name | Unit of Meas. | Variant 1b. Recommended | Variant 3b. Recommended | Variant 3d. Recommended |
|---|---|---|---|---|---|
| **1** | **Operating costs** | | | | |
| 1.1 | Rates in percents of capital investments (without VAT) | | | | |
| | linear portion | % | 0,79% | 0,78% | 0,80% |
| | Compressor Stations | % | 3,68% | 3,76% | 3,75% |
| | other facilities | % | 1,19% | 1,21% | 1,19% |
| 1.2 | Gas price for CS auxiliaries | Euro/thous. $m^3$ | - | - | - |
| 1.3 | $CO_2$ emissions | Euro/t $CO_2$ | 13,0 | 13,0 | 13,0 |
| **2** | **Depreciation Charges *** | | | | |
| 2.1 | Rates in percents of capital investments (without VAT) | | | | |
| | linear portion | % | 3,78% | 3,77% | 3,81% |
| | Compressor Stations | % | 3,83% | 3,83% | 3,86% |
| | other facilities | % | 5,10% | 5,09% | 5,09% |

* The rates of annual average operating costs and amortization deductions are given
The calculation was made according to the following norms of the legislation of Bulgaria: for buildings, structures, transmission devices, communication lines - 4%; for equipment - 30%

**Table 9.5.11 – Annual Average Operating costs by Variants**

mln. Euro

| Variant / Name | 1b. Recommended | 3b. Recommended | 3d. Recommended |
|---|---|---|---|
| Material costs (lubricating materials, spare parts, etc.) | 1,5 | 1,7 | 1,5 |
| Labor payment costs | 1,6 | 1,8 | 1,6 |
| Taxes (charges on payroll) | 0,3 | 0,3 | 0,3 |
| Depreciation | 109,1 | 128,7 | 106,2 |
| Repair and maintenance | 25,0 | 29,2 | 24,7 |
| Ecological payments | 12,6 | 13,9 | 12,8 |
| Other costs | 2,4 | 2,8 | 2,4 |
| **TOTAL** | **152,5** | **178,5** | **149,5** |

The main technical and economic values of the recommended variants 1b, 3b and 3d are given in Tables 9.5.12 – 9.5.14.

**Table 9.5.12 – Main Technical and Economic Values by Variant 1b. Recommended**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 2) | Area 2 (km 0 ÷ km 59) *(to the Gas Distribution Station "Provadia")* | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 20,4 | 42,6 | 40,5 | 63,0 |
| | including: | | | | | | |
| | commercial gas | bln. $m^3$/year | 20,4 | 20,4 | 1,6 | 40,5 | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | | | 0,41 | 0,1 | 0,51 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 62,1 | 129,7 | 123,1 | 191,8 |
| | including: | | | | | | |
| | commercial gas | mln. $m^3$/day | 62,1 | 62,1 | 4,9 | 122,6 | 189,6 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | | | 1,7 | 0,5 | 2,2 |
| 4 | Operating pressure in gas pipeline | MPa | 28,45 | 7,4 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | | |
| | diameter | mm | 812,8 | 1422 | 1422 | 1422 | |
| | wall thickness | mm | 39 | 16,4 \| 19,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 751,64 | 574,14 \| 681,16 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insulation | t/km | 759,64 | 590,14 \| 697,16 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 2)** | **Area 2 (km 0 ÷ km 59) *(to the Gas Distribution Station "Provadia")*** | **Area 3 (km 2 ÷ km 416)** | **Area 4 (km 416 ÷ km 537.8)** | **Total** |
| 6 | Route length | km | 2 | 59 | 414 | 121,8 | 596,8 |
| 7 | Length of laid pipes | km | 8 | 59 | 581 | 121,8 | 769,8 |
| | including by pipe diameters: | | | | | | |
| | DN 1422 | km | | 59 | 581 | 121,8 | 761,8 |
| | DN 812.8 | km | 8 | | | | 8 |
| 8 | Metal investments | thous. t | 6,06 | 37,25 | 481,32 | 100,90 | 625,53 |
| 9 | Number of CS | pcs. | - | - | 3 | 1 | 4 |
| 10 | CS location | | | | CS-1 - km 2<br>CS-2 - km 167,8<br>CS-3 - km 330,5 | CS-4 - км 522,8 | |
| 11 | Number and size of gas pumping units (GPU) | | | | 5 pcs.GPU-32<br>8 pcs. GPU-25 | 4 pcs.<br>GPU-25 | |
| | including: | | | | | | |
| | unit capacity of GPU at CS | MW | | | 32<br>25 | 25 | |
| | number of operating GPU at each CS | pcs. | | | CS-1 - 4<br>CS-2 - 3<br>CS-3 - 3 | CS-4 - 3 | 13 |
| | number of standby GPU at each CS | pcs. | | | CS-1 - 1<br>CS-2 - 1<br>CS-3 - 1 | CS-4 - 1 | 4 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 2)** | **Area 2 (km 0 ÷ km 59) *(to the Gas Distribution Station "Provadia")*** | **Area 3 (km 2 ÷ km 416)** | **Area 4 (km 416 ÷ km 537.8)** | **Total** |
| 12 | Installed capacity of CS | MW | | | CS-1 - 160<br>CS-2 - 100<br>CS-3 - 100 | CS-4 - 100 | 460 |
| 13 | Gas parameters at CS entry/exit | | | | | | |
| | pressure | | | | CS-1<br>6,28/9,78<br>CS-2<br>7,23/9,83<br>CS-3<br>7,22/9,83 | CS-4<br>6,43/9,01 | |
| | temperature | | | | CS-1<br>0,30/30,0<br>CS-2<br>17,5/35,0<br>CS-3<br>20,0/35,0 | CS-4<br>17,0/35,0 | |
| 14 | Gas parameters in the initial point | | | | | | |
| | pressure | MPa | 6,5 | 6,0 | 6,3 | 8,9 | |
| | temperature | ºC | 1,2 | 22,0 | 0,3 | 27,8 | |
| 15 | Gas parameters in the end point | | | | | | |
| | pressure | MPa | 6,3 | 5,5 | 8,9 | 8,7 | |
| | temperature | ºC | 0,3 | 18,7 | 27,8 | 33,2 | |
| 16 | Capital investments | mln. Euro | 147,0 | 143,3 | 2 020,8 | 497,3 | 2 808,5 |
| | including: | | | | | | |
| | linear portion | mln. Euro | 26,9 | 117,7 | 1 450,7 | 307,9 | 1 903,1 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 2) | Area 2 (km 0 ÷ km 59) *(to the Gas Distribution Station "Provadia")* | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
| | Compressor Stations | mln. Euro | | | 543,9 | 164,1 | 708,0 |
| | Other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 120,1 | 25,6 | 26,2 | 25,3 | 197,3 |
| 17 | Operating costs | mln. Euro/year | 1,1 | 1,0 | 31,1 | 8,2 | 41,4 |
| | including: | | | | | | |
| | linear portion | mln. Euro/year | 1,0 | 0,9 | 8,6 | 2,4 | 13,0 |
| | Compressor Stations | mln. Euro/year | | | 21,0 | 5,4 | 26,4 |
| | Other facilities | mln. Euro/year | 0,1 | 0,1 | 1,4 | 0,4 | 2,0 |
| 18 | Depreciation charges | mln. Euro/year | 3,6 | 5,0 | 64,0 | 14,7 | 87,3 |
| | including: | | | | | | |
| | linear portion | mln. Euro/year | 3,2 | 4,5 | 49,5 | 10,8 | 68,0 |
| | Compressor Stations | mln. Euro/year | | | 8,0 | 2,5 | 10,5 |
| | other facilities | mln. Euro/year | 0,4 | 0,6 | 6,5 | 1,4 | 8,9 |

**Table 9.5.13 – Main Technical and Economic Values by Variant 3b. Recommended**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 2)** | **Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia")** | **Area 3 (km 2 ÷ km 331)** | **Area 4 (km 331 ÷ km 416)** | **Area 5 (km 416 ÷ km 537.8)** | **Area 6 km 0 ÷ km 350,8** *(to Greece)* | **Total** |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 17,9 | 45,1 | 40,2 | 38,6 | 4,5 | 63,0 |
| | including: | | | | | | | | |
| | commercial gas | bln. $m^3$/year | 17,9 | 17,9 | 4,5 | 1,6 | 38,5 | 4,5 | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | | | 0,42 | | 0,11 | 0,03 | 0,56 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 54,5 | 137,3 | 121,9 | 117 | 13,7 | 191,8 |
| | including: | | | | | | | | |
| | commercial gas | mln. $m^3$/day | 54,5 | 54,5 | 13,7 | 4,9 | 116,5 | 13,6 | 189,6 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | | | 1,7 | | 0,5 | 0,1 | 2,3 |
| 4 | Operating pressure in gas pipeline | MPa | 28,45 | 7,4 | 9,8 | 9,8 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | | | | |
| | diameter | mm | 812,8 | 1422 | 1422 | 1422 | 1422 | 711 | |
| | wall thickness | mm | 39 | 16,4 \| 19,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | 10,8 \| 12,9 \| 15,5 | |

| | Index Name | Unit of Meas. | Gas Pipeline Areas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 2)** | **Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia")** | **Area 3 (km 2 ÷ km 331)** | **Area 4 (km 331 ÷ km 416)** | **Area 5 (km 416 ÷ km 537.8)** | **Area 6 km 0 ÷ km 350,8** *(to Greece)* | **Total** |
| | pipe weight without insulation | t/km | 751,64 | 574,14 \| 681,16 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | 188,35 \| 224,30 \| 268,50 | |
| | pipe weight with insulation | t/km | 759,64 | 590,14 \| 697,16 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | 195,35 \| 231,30 \| 275,50 | |
| 6 | Route length | km | 2 | 59 | 329 | 85 | 121,8 | 350,8 | 537,8 |
| 7 | Length of laid pipes | km | 8 | 59 | 504 | 130 | 121,8 | 350,8 | 1173,6 |
| | including by pipe diameters: | | | | | | | | |
| | Dn 1422 | km | | 59 | 504 | 130 | 121,8 | | 814,8 |
| | Dn 812.8 | km | 8 | | | | | | 8 |
| | Dn 711 | km | | | | | | 350,8 | 350,8 |
| 8 | Metal investments | thous. t | 6,06 | 37,25 | 417,53 | 107,70 | 100,90 | 75,53 | 744,97 |
| 9 | Number of CS | pcs. | - | - | 3 | | 1 | 1 | 5 |
| 10 | CS location | | | | CS-1 - km 2<br>CS-2 - km 167,8<br>CS-3 - km 330,5 | | CS-4 - km 522,8 | CS-5 - km 334,8 | |
| 11 | Number and size of gas pumping units (GPU) | | | | 5 шт. GPU-32<br>8 шт. GPU-25 | | 5 шт.<br>GPU-16 | 3 шт.<br>GPU-4 | |
| | including: | | | | | | | | |
| | Unit capacity of GPU at CS | MW | | | 32<br>25 | | 25 | 4 | |
| | number of operating GPU at each CS | pcs. | | | CS-1 - 4<br>CS-2 - 3<br>CS-3 - 3 | | CS-4 - 3 | CS-5 - 2 | 15 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 2)** | **Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia")** | **Area 3 (km 2 ÷ km 331)** | **Area 4 (km 331 ÷ km 416)** | **Area 5 (km 416 ÷ km 537.8)** | **Area 6 km 0 ÷ km 350,8** *(to Greece)* | **Total** |
| | number of standby GPU at each CS | pcs. | | | CS-1 - 1<br>CS-2 - 1<br>CS-3 - 1 | | CS-4 - 1 | CS-5 - 1 | 5 |
| 12 | Installed capacity of CS | MW | | | CS-1 - 160<br>CS-2 - 100<br>CS-3 - 100 | | CS-4 - 100 | CS-5 - 12 | 472 |
| 13 | Gas parameters at CS entry/exit | | | | | | | | |
| | pressure | | | | CS-1<br>6,28/9,78<br>CS-2<br>7,40/9,83<br>CS-3<br>7,33/9,83 | | CS-4<br>6,91/9,83 | CS-5<br>6,70/9,83 | |
| | temperature | | | | CS-2<br>0,30/32,0<br>CS-3<br>19,8/35,0<br>CS-3<br>20,1/35,0 | | CS-4<br>18,3/35,0 | CS-5<br>10,3/29,0 | |
| 14 | Gas parameters in the initial point | | | | | | | | |
| | pressure | MPa | 6,5 | 6,0 | 6,3 | 9,8 | 9,1 | 9,8 | |
| | temperature | ºC | 1,2 | 24,0 | 0,3 | 35,0 | 28,0 | 35,0 | |
| 15 | Gas parameters in the end point | | | | | | | | |
| | pressure | MPa | 6,3 | 5,6 | 9,8 | 9,1 | 9,5 | 9,8 | |
| | temperature | ºC | 0,3 | 20,4 | 35,0 | 28,0 | 33,4 | 26,7 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Area 1 (km 0 ÷ km 2)** | **Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia")** | **Area 3 (km 2 ÷ km 331)** | **Area 4 (km 331 ÷ km 416)** | **Area 5 (km 416 ÷ km 537.8)** | **Area 6 km 0 ÷ km 350,8** *(to Greece)* | **Total** |
| 16 | Gas parameters in the end point | mln. Euro | 147,0 | 143,3 | 1 800,5 | 342,4 | 497,8 | 395,0 | 3 326,0 |
| | including: | | | | | | | | |
| | linear portion | mln. Euro | 26,9 | 117,7 | 1 237,3 | 334,9 | 308,2 | 322,2 | 2 347,3 |
| | Compressor Stations | mln. Euro | | | 543,9 | | 164,1 | 61,8 | 769,8 |
| | other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 120,1 | 25,6 | 19,2 | 7,5 | 25,5 | 11,1 | 209,0 |
| 17 | Operating costs | mln. Euro/year | 1,1 | 1,0 | 30,0 | 2,2 | 8,5 | 4,3 | 47,2 |
| | including: | | | | | | | | |
| | linear portion | mln. Euro/year | 1,0 | 0,9 | 7,4 | 2,0 | 2,5 | 2,0 | 15,8 |
| | Compressor Stations | mln. Euro/year | | | 21,5 | | 5,6 | 2,0 | 29,1 |
| | other facilities | mln. Euro/year | 0,1 | 0,1 | 1,1 | 0,2 | 0,4 | 0,3 | 2,2 |
| 18 | Depreciation charges | mln. Euro/year | 3,6 | 5,0 | 55,9 | 12,8 | 14,7 | 13,9 | 105,9 |
| | including: | | | | | | | | |
| | linear portion | mln. Euro/year | 3,2 | 4,6 | 43,0 | 11,6 | 10,9 | 11,3 | 84,6 |
| | Compressor Stations | mln. Euro/year | | | 8,0 | | 2,5 | 1,3 | 11,8 |
| | other facilities | mln. Euro/year | 0,4 | 0,5 | 4,9 | 1,2 | 1,3 | 1,3 | 9,5 |

**Table 9.5.14 – Main Technical and Economic Values by Variant 3d. Recommended**

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 2) | Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
| 1 | Transported gas volume | bln. $m^3$/year | 63,0 | 22,4 | 40,6 | 38,6 | 63,0 |
| | including: | | | | | | |
| | commercial gas | bln. $m^3$/year | 22,4 | 22,4 | 1,6 | 38,5 | 62,5 |
| | gas consumption for Compressor Station (CS) auxiliaries | bln. $m^3$/year | | | 0,40 | 0,11 | 0,51 |
| 2 | Capacity use factor | | 0,9 | 0,9 | 0,9 | 0,9 | |
| 3 | Transported gas volume | mln. $m^3$/day | 191,8 | 68,2 | 123,6 | 117,1 | 191,8 |
| | including: | | | | | | |
| | commercial gas | mln. $m^3$/day | 68,2 | 68,2 | 4,9 | 116,6 | 189,7 |
| | gas consumption for Compressor Station (CS) auxiliaries | mln. $m^3$/day | | | 1,6 | 0,5 | 2,1 |
| 4 | Operating pressure in gas pipeline | MPa | 28,45 | 7,4 | 9,8 | 9,8 | |
| 5 | Linear portion of gas pipeline | | | | | | |
| | diameter | mm | 812,8 | 1422 | 1422 | 1422 | |
| | wall thickness | mm | 39 | 16,4 \| 19,5 | 21,5 \| 25,6 \| 30,5 | 21,5 \| 25,6 \| 30,5 | |
| | pipe weight without insulation | t/km | 751,64 | 574,14 \| 681,16 | 749,96 \| 890,36 \| 1057,05 | 749,96 \| 890,36 \| 1057,05 | |
| | pipe weight with insulation | t/km | 759,64 | 590,14 \| 697,16 | 765,96 \| 906,36 \| 1073,05 | 765,96 \| 906,36 \| 1073,05 | |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 2) | Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
| 6 | Route length | km | 2 | 59 | 414 | 121,8 | 537,8 |
| 7 | Length of laid pipes DN 1420 | km | 8 | 59 | 541 | 121,8 | 729,8 |
| | including by pipe diameters: | | | | | | |
| | DN 1422 | km | | 59 | 541 | 121,8 | 721,8 |
| | DN 812.8 | km | 8 | | | | 8,0 |
| 8 | Metal investments | thous. t | 6,06 | 37,25 | 448,18 | 100,90 | 592,39 |
| 9 | Number of CS | pcs. | - | - | 2 | 1 | 3 |
| 10 | CS location | | | | CS-1 - km 2<br>CS-2 - km 167,8<br>CS-3 - km 330,5 | CS-4 - km 522,8 | |
| 11 | Number and size of gas pumping units (GPU) | | | | 5 pcs. GPU-32<br>8 pcs. GPU-25 | 4 pcs. GPU-25 | |
| | including: | | | | | | |
| | Unit capacity of GPU at CS | MW | | | 32<br>25 | 25 | |
| | number of operating GPU at each CS | pcs. | | | CS-1 - 4<br>CS-2 - 3<br>CS-3 - 3 | CS-4 - 3 | 13 |
| | number of standby GPU at each CS | pcs. | | | CS-1 - 1<br>CS-2 - 1<br>CS-3 - 1 | CS-4 - 1 | 4 |
| 12 | Installed capacity of CS | MW | | | CS-1 - 160<br>CS-2 - 100<br>CS-3 - 100 | CS-4 - 100 | 460 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 2) | Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
| 13 | Gas parameters at CS entry/exit | | | | | | |
| | pressure | | | | CS-1<br>6,28/9,78<br>CS-2<br>7,12/9,83<br>CS-3<br>7,11/9,83 | CS-4<br>6,91/9,83 | |
| | temperature | | | | CS-1<br>0,30/28,0<br>CS-2<br>15,7/35,0<br>CS-3<br>20,1/35,0 | CS-4<br>18,3/35,0 | |
| 14 | Gas parameters in the initial point | | | | | | |
| | pressure | MPa | 6,5 | 6,0 | 6,3 | 9,1 | |
| | temperature | ºC | 1,2 | 20,0 | 0,3 | 28,0 | |
| 15 | Gas parameters at the end point | | | | | | |
| | pressure | MPa | 6,3 | 5,4 | 9,1 | 9,5 | |
| | temperature | ºC | 0,3 | 16,9 | 28,0 | 33,4 | |
| 16 | Capital investments | mln. Euro | 147,0 | 143,3 | 1 927,0 | 497,2 | 2 714,5 |
| | including: | | | | | | |
| | linear portion | mln. Euro | 26,9 | 117,7 | 1 357,2 | 307,9 | 1 809,6 |
| | Compressor Stations | mln. Euro | 0,0 | 0,0 | 543,9 | 164,1 | 708,0 |

| Index Name | | Unit of Meas. | Gas Pipeline Areas | | | | |
|---|---|---|---|---|---|---|---|
| | | | Area 1 (km 0 ÷ km 2) | Area 2 (km 0 ÷ km 59) (to the Gas Distribution Station "Provadia") | Area 3 (km 2 ÷ km 416) | Area 4 (km 416 ÷ km 537.8) | Total |
| | other facilities (gas storages, infrastructure facilities, etc.) | mln. Euro | 120,1 | 25,6 | 25,9 | 25,3 | 196,9 |
| 17 | Operating costs | mln. Euro/year | 1,1 | 1,0 | 30,4 | 8,6 | 41,1 |
| | including: | | | | | | |
| | linear portion | mln. Euro/year | 1,0 | 0,9 | 8,2 | 2,4 | 12,5 |
| | Compressor Stations | mln. Euro/year | | | 20,8 | 5,8 | 26,6 |
| | other facilities | mln. Euro/year | 0,1 | 0,1 | 1,4 | 0,4 | 2,0 |
| 18 | Depreciation charges | mln. Euro/year | 3,6 | 5,0 | 60,4 | 14,7 | 83,7 |
| | including: | | | | | | |
| | linear portion | mln. Euro/year | 3,2 | 4,5 | 46,1 | 10,7 | 64,4 |
| | Compressor Stations | mln. Euro/year | | | 8,0 | 2,5 | 10,5 |
| | other facilities | mln. Euro/year | 0,4 | 0,6 | 6,3 | 1,5 | 8,8 |

The calculations of all the economic values listed in sections 6 and 7 were made for the recommended variants and they are given in the corresponding Tables:

- floating capital calculation – Annex 10 (tables 10.9 – 1.11) and Table 9.5.15;
- goods transportation operation calculation – Annex 11 (tables 11.9 - 11.11) and Table 9.5.16;
- money flows from the investment, operational, financial activity of the project by the pipeline sections at the set level of efficiency IRR=8% - Annex 12 (tables 12.17, 12.32 – 12.45).
- consolidated economic values – Table 9.5.17.

**Table 9.5.15 – Change of Net Working Capital by Variants**

mln. Euro

| *Years* / *Variant* | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Variant 1b. Chiren. Recommended** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 2) | **2,8** | 5,8 | 0,9 | -4,4 | 0,6 | 0,03 | | 0,01 | 0,03 | -0,2 | 0,01 | -0,02 | -0,02 |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | **2,8** | 0,6 | 0,8 | 1,6 | | 0,01 | | 0,01 | -0,2 | | 0,01 | -0,02 | -0,02 |
| Area 3 (km 2 ÷ km 416) | **41,9** | 209,1 | 134,9 | -210,4 | -90,9 | 0,6 | -0,01 | 0,2 | -0,4 | -1,5 | 0,3 | -0,2 | -0,2 |
| Area 4 (km 416 ÷ km 537.8) | **10,4** | 16,1 | 107,4 | -116,2 | 3,4 | 0,1 | | 0,1 | 0,2 | -0,3 | -0,4 | -0,1 | -0,1 |
| **Variant 3b. Chiren. Recommended** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 2) | **2,8** | 5,8 | 0,9 | -4,4 | 0,6 | 0,03 | | 0,01 | 0,03 | -0,2 | 0,01 | -0,02 | -0,02 |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | **2,8** | | | | 0,7 | 0,6 | 1,8 | | 0,02 | | 0,02 | -0,2 | -0,01 |
| Area 3 (km 2 ÷ km 331) | **38,0** | 241,1 | -21,5 | -112,4 | -68,8 | 0,5 | -0,01 | 0,2 | 0,6 | -1,5 | -0,3 | -0,2 | -0,2 |
| Area 4 (km 331 ÷ km 416) | **6,5** | 5,1 | 43,4 | -1,4 | -40,4 | 0,04 | | -0,3 | | | 0,04 | -0,04 | -0,04 |
| Area 5 (km 416 ÷ km 537.8) | **10,5** | 16,3 | 107,1 | -116,1 | 3,6 | 0,03 | | -0,003 | 0,1 | -0,3 | -0,3 | -0,1 | -0,1 |
| Area 6 (km 0 ÷ km 351) (to Greece) | **7,9** | | 6,3 | 50,1 | -49,9 | 0,7 | | 0,4 | 0,2 | -0,1 | 0,3 | -0,04 | -0,04 |
| **Variant 3d. Chiren. Recommended** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 2) | **2,8** | 5,8 | 0,9 | -4,4 | 0,6 | 0,03 | | 0,01 | 0,03 | -0,2 | 0,01 | -0,02 | -0,02 |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia") | **2,9** | 0,5 | 0,9 | 1,4 | 0,01 | 0,1 | | 0,04 | -0,2 | -0,02 | 0,01 | -0,02 | -0,02 |

| *Years* / *Variant* | Total | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Area 3 (km 2 ÷ km 416) | **40,3** | 238,4 | 105,0 | -315,2 | 13,5 | 0,2 | -0,01 | -0,01 | 0,1 | -2,0 | 0,3 | -0,2 | -0,2 |
| Area 4 (km 416 ÷ km 537.8) | **10,7** | 3,5 | 44,1 | -40,2 | 3,7 | 0,02 | | | 0,1 | -0,3 | -0,4 | -0,1 | -0,1 |

| *Years* / *Variant* | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| **Variant 1b. Chiren. Recommended** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 2) | -0,02 | | | | | | | | | | | | |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station “Provadia”) | -0,01 | | | | | | | | | | | | |
| Area 3 (km 2 ÷ km 416) | -0,2 | -0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Area 4 (km 416 ÷ km 537.8) | -0,1 | -0,01 | 0,01 | 0,01 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| **Variant 3b. Chiren. Recommended** | | | | | | | | | | | | | |
| Area 1 (km 0 ÷ km 2) | -0,02 | | | | | | | | | | | | |
| Area 2 (km 2 – to the Gas Distribution Station “Provadia”) | -0,01 | | | | | | | | | | | | |
| Area 3 (km 2 ÷ km 331) | -0,2 | -0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Area 4 (km 331 ÷ km 416) | -0,04 | -0,03 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| Area 5 (km 416 ÷ km 537.8) | -0,1 | | 0,01 | 0,01 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |
| Area 6 (km 0 ÷ km 351) (to Greece) | -0,05 | -0,04 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 | 0,01 |
| **Variant 3d. Chiren. Recommended** | | | | | | | | | | | | | |

| *Years* / *Variant* | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Area 1 (km 0 ÷ km 2) | -0,02 | | | | | | | | | | | | |
| Area 2 (km 2 – km 59) (to the Gas Distribution Station “Provadia”) | -0,01 | | | | | | | | | | | | |
| Area 3 (km 2 ÷ km 416) | -0,2 | -0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Area 4 (km 416 ÷ km 537.8) | -0,1 | 0,01 | 0,01 | 0,01 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 |

**Table 9.5.16 – Goods Transport Operation by Recommended Variants**

bln. $m^3$*km

| Variant / Year | 1b | 3b | | 3d |
|---|---|---|---|---|
| | | DN 1400 | DN 700 | |
| 2016 | 6 614,7 | 6 613,1 | | 6 608,8 |
| 2017 | 12 309,4 | 12 608,3 | 1 158,6 | 11 737,5 |
| 2018 | 15 815,8 | 16 108,6 | 1 158,6 | 15 240,6 |
| 2019 | 22 622,6 | 22 909,9 | 1 193,7 | 22 009,5 |
| 2020 | 22 937,3 | 23 149,8 | 1 333,8 | 22 128,9 |
| 2021 | 22 937,3 | 23 149,8 | 1 333,8 | 22 128,9 |
| 2022 | 23 050,3 | 23 221,0 | 1 404,0 | 22 147,2 |
| 2023 | 23 375,6 | 23 553,0 | 1 474,1 | 22 425,4 |
| 2024 | 23 535,4 | 23 738,0 | 1 509,2 | 22 585,1 |
| 2025 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2026 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2027 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2028 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2029 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2030 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2031 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2032 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2033 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2034 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2035 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2036 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2037 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2038 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2039 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| 2040 | 23 789,2 | 24 046,2 | 1 579,4 | 22 840,1 |
| **TOTAL** | **553 825,7** | **559 791,5** | **35 835,4** | **532 453,0** |

**Table 9.5.17 – Consolidated Economic Values by Recommended Variants**

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| **Variant 1b. Chiren. Recommended** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,35 | 1,46 | 1,61 | 1,77 | 1,96 |
| - NPV, mln. Euro | -94,4 | 108,8 | 324,0 | 543,2 | 759,0 |
| - max term for reimbursement of one tranche of credit, years | 13 years 2 m. | 11 years 6 m. | 10 years | 8 years 11 m. | 8 years 3 m. |
| ***Area 1 (km 0 ÷ km 2)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 12,18 | 13,37 | 14,80 | 16,45 | 18,30 |
| - NPV, mln. Euro | -5,2 | 6,0 | 17,7 | 29,5 | 41,1 |
| - max term for reimbursement of one tranche of credit, years | 14 years 9 m. | 12 years 10 m. | 11 years 4 m. | 10 years | 8 years 11 m. |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| ***Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia")*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,25 | 1,39 | 1,56 | 1,77 | 2,01 |
| - NPV, mln. Euro | -5,8 | 6,8 | 20,3 | 34,5 | 48,7 |
| - max term for reimbursement of one tranche of credit, years | 15 years. 6 m. | 13 years 4 m. | 11 years 6 m. | 9 years 11 m. | 8 years 9 m. |
| ***Area 3 (km 2 ÷ km 416)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,33 | 1,44 | 1,58 | 1,74 | 1,92 |
| - NPV, mln. Euro | -67,0 | 77,1 | 229,5 | 384,4 | 537,2 |
| - max term for reimbursement of one tranche of credit, years | 13 years 2 m. | 11 years 4 m. | 9 years 11 m. | 8 years 8 m. | 7 years 11 m. |
| ***Area 4 (km 416 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,2 | 1,3 | 1,4 | 1,5 | 1,7 |
| - NPV, mln. Euro | -16,9 | 19,5 | 58,3 | 98,1 | 137,4 |
| - max term for reimbursement of one tranche of credit, years | 13 years 11 m. | 12 years 9 m. | 9 years 9 m. | 8 years 11 m. | 8 years 3 m. |
| **Variant 3b. Chiren. Recommended** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,39 | 1,51 | 1,66 | 1,83 | 2,02 |
| - NPV, mln. Euro | -98,4 | 113,5 | 337,9 | 566,3 | 791,7 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 8 m. | 10 years 2 m. | 8 years 11 m. | 8 years 1 m. |
| ***Area 1 (km 0 ÷ km 2)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 12,18 | 13,37 | 14,80 | 16,45 | 18,30 |
| - NPV, mln. Euro | -5,2 | 6,0 | 17,7 | 29,5 | 41,1 |
| - max term for reimbursement of one tranche of credit, years | 14 years 9 m. | 12 years 10 m. | 11 years 4 m. | 10 years | 8 years 11 m. |
| ***Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia")*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,42 | 1,58 | 1,77 | 2,01 | 2,27 |
| - NPV, mln. Euro | -5,8 | 6,7 | 20,3 | 34,4 | 48,5 |
| - max term for reimbursement of one tranche of credit, years | 15 yeras 6 m. | 13 years 4 m. | 11 years 5 m. | 9 years 11 m. | 8 years 8 m. |
| ***Area 3 (km 2 ÷ km 331)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,43 | 1,55 | 1,69 | 1,86 | 2,06 |
| - NPV, mln. Euro | -59,7 | 68,7 | 204,1 | 341,5 | 476,9 |
| - max term for reimbursement of one tranche of credit, years | 13 years 5 m. | 11 years 9 m. | 10 years 3 m. | 8 years 11 m. | 8 years 1 m. |
| ***Area 4 (km 331÷ km 416)*** | | | | | |

| Name | IRR | | | | |
|---|---|---|---|---|---|
| | 4% | 6% | 8% | 10% | 12% |
| - rate, Euro/1,000 $m^3$*100 km | 1,02 | 1,12 | 1,24 | 1,39 | 1,56 |
| - NPV, mln. Euro | -11,5 | 13,3 | 39,9 | 67,2 | 94,5 |
| - max term for reimbursement of one tranche of credit, years | 13 years 8 m. | 11 years 10 m. | 10 years 8 m. | 9 years 8 m. | 8 years 10 m. |
| ***Area 5 (km 416÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,2 | 1,3 | 1,5 | 1,6 | 1,8 |
| - NPV, mln. Euro | -16,9 | 19,5 | 58,3 | 98,0 | 137,2 |
| - max term for reimbursement of one tranche of credit, years | 13 years 11 m. | 11 years 2 m. | 9 years 9 m. | 8 years 10 m. | 8 years 2 m. |
| ***Area 6 (km 0÷ km 351) (to Greece) DN 700*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 2,8 | 3,0 | 3,3 | 3,7 | 4,1 |
| - NPV, mln. Euro | -13,1 | 15,0 | 44,8 | 75,0 | 104,9 |
| - max term for reimbursement of one tranche of credit, years | 14 years 7 m. | 12 years 11 m. | 11 years 6 m. | 11 years | 9 years 2 m. |
| **Variant 3d. Chiren. Recommended** | | | | | |
| **Gas pipeline Black Sea - border with Serbia, DN 1400 (km 0 ÷ km 537.8)** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,37 | 1,49 | 1,63 | 1,81 | 2,00 |
| - NPV, mln. Euro | -93,5 | 107,8 | 321,6 | 540,9 | 758,0 |
| - max term for reimbursement of one tranche of credit, years | 13 years 10 m. | 12 years | 10 years 4 m. | 8 years 11 m. | 7 years 11 m. |
| ***Area 1 (km 0 ÷ km 2)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 12,18 | 13,37 | 14,80 | 16,45 | 18,30 |
| - NPV, mln. Euro | -5,2 | 6,0 | 17,7 | 29,5 | 41,1 |
| - max term for reimbursement of one tranche of credit, years | 14 years 9 m. | 12 years 10 m. | 11 years 4 m. | 10 years | 8 years 11 m. |
| ***Area 2 (km 2 – km 59) (to the Gas Distribution Station "Provadia")*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,15 | 1,28 | 1,43 | 1,62 | 1,84 |
| - NPV, mln. Euro | -5,8 | 6,8 | 20,4 | 34,6 | 48,9 |
| - max term for reimbursement of one tranche of credit, years | 15 years 7 m. | 13 years 5 m. | 11 years 7 m. | 11 years | 8 years 9 m. |
| ***Area 3 (km 2 ÷ km 416)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,33 | 1,45 | 1,59 | 1,75 | 1,94 |
| - NPV, mln. Euro | -65,6 | 75,5 | 224,6 | 376,3 | 526,1 |
| - max term for reimbursement of one tranche of credit, years | 13 years 6 m. | 11 years 9 m. | 10 years 3 m. | 8 years 11 m. | 7 years 10 m. |
| ***Area 4 (km 416 ÷ km 537.8)*** | | | | | |
| - rate, Euro/1,000 $m^3$*100 km | 1,26 | 1,37 | 1,50 | 1,66 | 1,84 |
| - NPV, mln. Euro | -17,6 | 20,3 | 60,9 | 102,3 | 143,7 |
| - max term for reimbursement of one tranche of credit, years | 14 years 9 m. | 12 years 6 m. | 9 years 9 m. | 8 years 7 m. | 7 years 9 m. |

The carried out calculations of the parameters' optimization showed that implementation of the actions for optimization according to any of the variants of the transport process scheme will allow reducing the gas transport rate from 3% to 7 % on an average.

### 9.6 Comparison of the Electrical Power Supply Variants

One of the ways of costs optimization can be selection of an optimal scheme of electrical power supply to the gas pipeline facilities (Compressor Stations and linear consumers).

According to item 15.2 of the Pre-Investment Examination Task the possibility of using the existing and independent electrical power supply sources was considered. The comparison was made for the linear part facilities and Compressor Stations.

Gas turbine units were considered as independent sources of electrical power supply to the Block Valve Stations, Launchers, Treatment Facilities Receivers, Electrical Protection Devices and Telemechanics Control Stations, Auxiliary Power Stations – for Compressor Stations.

As far as there are no data on the distance of the route of the gas pipeline under construction from the external electrical power supply sources at this stage of the project, the calculations come to the determination of the max distance value for connecting the gas pipeline facilities, in case of which external electric power supply will be more preferential than the independent one according to the total discount costs.

Thus, this section contains the calculation of the connection length, at which the total discount costs by variants of electrical power supply (external and independent) will be equal.

The capital investments were determined using the analogue facilities developed by the Institute with bringing them to the construction conditions.

The calculations of the production costs were made according to the methodology described in section 4. The gas cost for auxiliaries was accepted to be 190 Euro/thous. $m^3$. The cost of electric power was accepted at the rates in force on the territory of the Republic of Bulgaria, for industrial consumers and amounts to 0.07 Euro/Wh.

The calculations' results are given in Tables 9.6.1 and 9.6.2.

**Table 9.6.1 – Comparison of the Variants of Electrical Power Supply to Linear Consumers**

| Index | Variant with Construction of Enroute Power Transmission Line | Variant with Gas Turbine Installation |
|---|---|---|
| Capital investments (in full volume without VAT), mln. Euro | 0,8 | 0,6 |
| Annual production costs, mln. Euro | 0,13 | 0,14 |
| Total discount costs, mln. Euro | 0,86 | 0,86 |
| Max distance of enroute power transmission line, in case of which external electrical power supply is more preferential than independent, km | 1,98 | |

**Table 9.6.2 – Comparison of the Variants of Electrical Power Supply to the Compressor Stations**

| Index | CS-1 (GPU-25, 8 pcs.) | | CS-2 (GPU-16, 7 pcs.) | | CS-4 (GPU-16, 5 pcs.) | | CS-5 (GPU-4, 3 pcs.) | |
|---|---|---|---|---|---|---|---|---|
| | Construction of Transformer Substation and HVL | Construction of APS | Construction of Transformer Substation and HVL | Construction of APS | | Construction of Transformer Substation and HVL | Construction of APS | Construction of Transformer Substation and HVL |
| Capital investments (in full volume without VAT), mln. Euro | 12,4 | 8,5 | 12,1 | 8,5 | 10,5 | 7,3 | 5,1 | 2,4 |
| - construction of Transformer Substation | 3,1 | | 3,1 | | 3,1 | | 3,1 | |
| - construction of en-route power transmission line | 9,3 | | 9,0 | | 7,4 | | 2,0 | |
| - construction of Auxiliary Power Station | | 8,5 | | 8,5 | | 7,3 | | 2,4 |
| Annual production costs, mln. Euro | 4,2 | 5,8 | 3,8 | 5,4 | 3,0 | 4,3 | 1,8 | 1,9 |
| Total discount costs, mln. Euro | 34,4 | 34,4 | 31,1 | 31,1 | 23,8 | 23,8 | 11,5 | 11,5 |
| Max distance of en-route power transmission line, in case of which external electrical power supply is more preferential than independent, km | 40,1 | | 38,9 | | 31,9 | | 8,5 | |

**CONCLUSIONS**

1. The capital investments (without VAT) in prices of 2010 per variants are the following:

   Variant 1a – 2 955,5 mln. Euro;

   Variant 1b – 3 051,2 mln. Euro;

   Variant 2a – 3 021,5 mln. Euro;

   Variant 2b – 3 098,9 mln. Euro;

   Variant 3a – 3 223,4 mln. Euro;

   Variant 3b – 3 401,1 mln. Euro;

   Variant 3c – 2 622,5 mln. Euro;

   Variant 3d – 2 739,9 mln. Euro.

2. The capital investments (without VAT) in prices of 2010 for three variants of optimization per variants are the following:

   Variant 1b – 2 808,5 mln. Euro;

   Variant 3b – 3 326,0 mln. Euro;

   Variant 3d – 2 714,5 mln. Euro.

3. Obtained levels of average rate for transit gas pipeline have minor differences for basic variants. At that, the variant 3c. Provadia has the lowest gas transport rate level. The minor difference in rates for gas feeding to Republic of Bulgaria' consumers to Provadia and Chiren gas distribution centers is explained by increase of the costs for gas transportation to Chiren center, and to the large extent it is compensated by growth of good transportation operation on these variants.
4. Optimization calculations performed have shown that on all variants studied, the gas transport scheme (variants 1b, 3b, 3d), measures suggested do promote to reduction of rate.
5. Sensitivity analysis has shown that the most significant risk of this project is reduction of gas transport volume and risk of capital investment increase.

# ANNEXES