Bringing Oil to the Market

Transport Tariffs and Underlying Methodologies for Cross-Border Crude Oil and Products Pipelines

Energy Charter Secretariat 2012
Bringing Oil to the Market

Transport Tariffs and Underlying Methodologies for Cross-Border Crude Oil and Products Pipelines

Energy Charter Secretariat 2012
Disclaimer

Information contained in this work has been obtained from sources believed to be reliable. However, neither the Energy Charter Secretariat nor its authors guarantee the accuracy or completeness of any information published herein, and neither the Energy Charter Secretariat nor its authors shall be responsible for any losses or damages arising from the use of this information or from any errors or omissions therein. This work is published with the understanding that the Energy Charter Secretariat and its authors are supplying the information, but are not attempting to render legal or other professional services.

Boulevard de la Woluwe, 56
B-1200 Brussels, Belgium

ISBN: 978-905948-113-8 (English PDF)
ISBN: 978-905948-112-1 (English hard copy)

Reproduction of this work, save where otherwise stated, is authorised, provided the source is acknowledged. All rights otherwise reserved.
Foreword

Pipelines play an important role in bringing crude oil from its source to the global market. The majority of internationally traded oil may be delivered by marine tankers, but pipelines often represent the only economical means of transport for the oil to reach sea ports or centres of consumption. This is particularly true in the case of remote oil fields and land-locked territories. Additional risk can be implied when oil or oil products need to cross borders or transit countries on their way to the market.

This may explain the special role of pipeline transportation in Eurasia as well as some fundamental choices with regard to its regulation. This role has also been the reason for the interest in a binding multilateral framework, as it has been established under the Energy Charter Treaty of 1994.

Rules on access to pipelines and the methodologies to establish transportation tariffs are crucial factors determining whether oil and oil products are able to reach markets at a competitive price. The present study reviews the arrangements applicable to main export and cross-border pipelines in Eastern and South Eastern Europe, Russia, Central Asia and Turkey. It analyses methodologies as well as actual tariffs for selected crude oil and oil product pipelines in the given countries.

This study represents an updated and extended version of a publication that the Energy Charter Secretariat made available in 2007. It was prepared by the Directorate for Trade and Transit of the Energy Charter Secretariat and has further benefited from discussions in the Energy Charter’s Trade and Transit Group.

The study is published under my authority as Secretary General and is without prejudice to the positions of Contracting Parties or their rights or obligations under the Energy Charter Treaty or the WTO Agreements.

Urban Rusnák
Secretary General
Brussels, 29 March 2012
Table of Contents

Foreword .....................................................................................................................3

Executive Summary .................................................................................................6

CHAPTER 1. Introduction ...........................................................................................9
  1.1. The Significance of Pipeline Transport and Transit.............................................. 9
  1.2. Transit in International Law: from GATT to the Energy Charter Treaty ..............9
  1.3. The Object of Investigation .................................................................................. 11
  1.4. Sources ................................................................................................................ 11
  1.6. Abbreviations and Acronyms ............................................................................. 13

CHAPTER 2. Oil Transport Tariff Methodologies for Cross-Border and Transit Flows .................................................................15
  2.1. Introduction ........................................................................................................ 15
  2.2. Allowed Profitability .......................................................................................... 17
  2.3. Cost-of-Service Methodology .......................................................................... 19
  2.4. Negotiated Tariff ............................................................................................... 19
  2.5. Difference between Cross-Border and Domestic Pipelines .............................. 20
  2.6. Transit Tariffs .................................................................................................... 20

CHAPTER 3. Access to Cross-Border and Transit Pipelines ...................................22
  3.1. Introduction ....................................................................................................... 22
  3.2. Russia ................................................................................................................ 22
  3.3. Kazakhstan ........................................................................................................ 23
  3.4. The CPC ........................................................................................................... 24
  3.5. Ukraine .............................................................................................................. 25
  3.6. Belarus ............................................................................................................... 25
  3.7. Azerbaijan-Georgia ........................................................................................... 26
  3.8. Access to Oil and Products Pipelines in East-European Countries and Turkey .... 26

CHAPTER 4. Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia ......28
  4.1. Russia ................................................................................................................ 28
  4.2. Ukraine ............................................................................................................. 34
Table of Contents

4.3. Belarus ...............................................................................................................................................36
4.4. Kazakhstan ......................................................................................................................................37
4.5. CPC .....................................................................................................................................................39
4.6. Uzbekistan .......................................................................................................................................40
4.7. Georgia .............................................................................................................................................. 41
4.8. Azerbaijan ........................................................................................................................................ 41
4.9. Turkey .................................................................................................................................................43
4.10. Romania ..........................................................................................................................................43
4.11. Croatia ..............................................................................................................................................44

CHAPTER 5. Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines .................................................................45
5.1. Cross-Border and Transit Oil Pipelines Tariffs .............................................................................45
5.2. Cross-Country Comparison of Transit Tariffs ..............................................................................52
5.3. Comparison of Transit and Cross-Border Tariffs with Domestic Tariffs ......................................53
5.4. Cross-Border and Transit Products Pipelines Tariffs ................................................................. 57
5.5. Cross-Country Comparison of Cross-Border / Transit Products Pipelines Tariffs ...................61
5.6. Comparison of Transit and Cross-Border Tariffs with Domestic Tariffs for Products Transportation .............................................................................................................62

CHAPTER 6. Conclusions ......................................................................................................................... 64

ANNEX 1. Main Cross-Border / Export Oil Flows in Eastern Europe / FSU ..........................65
ANNEX 2. Main Cross-Border / Export Petroleum Products Flows ..............................................77
ANNEX 3. Domestic and Intra-FSU Oil Flows ....................................................................................79
ANNEX 4. Domestic and Intra-FSU Oil Products Flows .................................................................84
ANNEX 5. The New Projects ..................................................................................................................88
ANNEX 6. Petroleum Products Pipelines Projects ............................................................................93
ANNEX 7. Transit Pipelines in Western Europe ..................................................................................94
Executive Summary

The key problems for the pipeline transport are the tariffs and the rules for access. The objectives of this study are to describe and analyse existing crude and oil product transport tariffs and methodologies as well as rules for access where relevant for existing and new cross-border oil pipeline systems across countries of the former Soviet Union (Russia, Ukraine, Belarus, Azerbaijan, Georgia, Kazakhstan, Uzbekistan), selected EU members (Bulgaria, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia) and two non-EU, non-FSU countries (Turkey and Croatia).

A special emphasis will be made on oil pipeline transit. The Energy Charter Treaty has specific legally binding provisions on energy transit, including by fixed infrastructure. Common standards for access and transit tariffs have been developed during the negotiations on a separate Transit Protocol. The factual information presented in this report will thus be looked at from the perspective of these standards, and in particular the requirement of non-discrimination.

Essential technical and economic elements influencing costs of oil and products pipeline transportation are described, as well as typical tariff methodologies. Amounts and methodologies of oil pipeline tariffs are examined and, where relevant, cross-border tariff regimes are compared with those for domestic transport.

- Chapter 2 gives principles of pipeline tariff methodologies applied in the countries examined including general technical and economic background for calculation of pipeline transport tariffs.
- Chapter 3 deals with the rules of access to cross-border and transit pipelines, while
- Tariff methodologies in place for domestic, cross-border and transit oil and products pipelines in selected countries are discussed Chapter 4.
- Tariffs for transit, cross-border and domestic oil and products pipelines are compared in Chapter 5, and
- Chapter 6 offers conclusions.
- A brief review on main domestic and cross-border oil and products flows as well as new projects in the countries examined can be found in the Annexes.

General findings

Transit tariffs across the countries examined show a wide range of variations.

Cost-reflective tariffs and negotiated tariffs are the two methodologies used. Transit tariffs are typically subject to negotiations. Specific requirements of a pipeline project may require the setting of tariffs for short or a longer term.

The analysis of existing tariffs (i.e. transit, export and domestic tariffs) and underlying methodologies involves detailed examination of various factors, including a number
of technical, economic, financial, geographical and legal / regulatory parameters. This would include, among others:

- **Technical factors:**
  - Pipeline design parameters such as capacity, diameter, length, pressure;
  - Actual utilisation rate (load factor);
  - Composition / density.

- **Economic factors:**
  - Costs, including financing cost (premium for political / country risks);
  - Valuation of assets by replacement costs vs. book value;
  - External factors such as fluctuations in world steel prices, labour cost, inflation, and currency rate.

- **Legal and regulatory factors:**
  - Negotiated systems vs. regulated systems;
  - Pipeline access rules;
  - Transparency rules;
  - Access to congested pipelines;
  - Cost allocation in case of establishment of additional capacity.

- **Other factors:**
  - Climatic and natural conditions, including terrain, of the pipeline route and the associated costs;
  - Types of transit system: Pure transit line with no supply to transit country; transit line with some supply to transit country;
  - Pipeline ownership: Ownership and operation by state / state companies, by private investors or joint ownership;
  - Quality management (commingled stream vs. batch operations and related investment costs).

Among various cost elements included in the tariff calculation, the two essential factors that have a significant impact on transportation / transit tariffs are pipeline throughput capacity (which is a function of pipe diameter) and utilisation rate.

Different tariffication methodologies may be chosen by governments at the national level, taking into account of the particularities of the country’s transportation and transit system.

Application of different methodologies and particularities of each case may lead to differences, sometimes by significant margins, at the tariff levels between two transit cases or between domestic transport and transit of comparable movements.
Varying aspects of a particular movement can create a wide range of tariffs, even under a methodology which is compatible with efficient system operation and adequate profits.

With respect to comparison of transit and export/domestic tariffs, it is difficult to find comparable flows. Each case requires detailed assessment of particular transit and domestic transport under different approaches and circumstances.

Lack of transparency of transit tariffs is an important challenge. In most of the countries, such tariffs are negotiated at the state level and set through intergovernmental agreements. Such negotiations are often conducted under strict confidentiality and the outcomes are often not revealed to the public.

In the countries where pipeline transport of oil is regarded as natural monopoly, access and tariffs for domestic transport are regulated by the state and they are often published. In the Western Europe, oil transport activities are commercially driven among private actors without state interference and only subject to general competition rules of the EU and the country itself. But the information on tariffs is then considered to be confidential and is not publicly available.

The lack of transparency makes a thorough assessment of the degree of cost-reflectiveness of transit tariffs difficult. The peculiarities of each transit case associated with its technical, economic, geographical, legal/regulatory and other characteristics would result in a range of possible cost-reflective tariffs.
CHAPTER 1. Introduction

1.1. The Significance of Pipeline Transport and Transit

Most of internationally traded oil is delivered by marine tankers. This transportation option allows for high flexibility in delivery routes, distances, volumes and quality needed. Compared to tankers the pipeline represents a much more rigid transportation option, usually locked down to an oil production site / region or a final consumer, a refinery or a sea port terminal. It may have less options to deliver different quality grades of the crude desired by the consumers, can only deliver volumes limited by the throughput capacity, requires a line fill quantity (which can be significant) to enable the operation.

Such demanding requirements notwithstanding, pipelines play a significant role in the international crude oil logistics. They allow exploring remote oil fields and are a much cheaper and convenient option, for instance, compared to railway. This is especially important for landlocked territories with no or limited access to the sea. Thanks to the construction of pipelines, the last two decades have seen the emergence of new suppliers on the world oil market. For the latter secure and economical transit through third countries in order to access world markets is of critical importance. This explains their interest in binding multilateral rules to govern energy transit. This study analyses the methodology for oil pipeline tariffs and the actual rates with a special emphasis on the phenomenon of transit. The findings will be used to provide the reader with an understanding in how far energy in transit is treated in a non-discriminatory way in comparison to domestic flows. The background for this interest is the binding provisions of the Energy Charter Treaty of 1994 on transit and the specific rules of the draft Transit Protocol requiring non-discriminatory treatment of energy in transit.

1.2. Transit in International Law: from GATT to the Energy Charter Treaty

Reliable transit of energy is a critical issue for regional and global energy security, as energy is increasingly transported across multiple borders on their way from producer to consumer. Common rules and close cooperation among states and private companies are required to secure energy flows in transit, to develop and operate energy transport facilities and to make transit of energy commercially viable. Such rules may serve the interests of all stakeholders in the energy supply chain: energy producers and consumers in securing and diversifying sales and purchases, and transit countries in increasing the attractiveness of supply routes through their territory. The findings of this study on transit of oil and oil products will be assessed against the background of international law.

1.2.1. Transit in GATT

The general international rules on transit are set out in Article V of the General Agreement on Tariffs and Trade (GATT 1947). The article stipulates the following principles:

- Freedom of transit through the territory of a member country via the routes most convenient for international transit;
CHAPTER 1: Introduction

• Non-discrimination based on nationality, ownership, origin/destination, or entry/exit;
• Transit without any unnecessary delays or restrictions;
• Most-Favoured-Nation (MFN) treatment to goods in transit; and
• Transit traffic shall not be a source of fiscal revenue.

In particular, Article V sets out specific requirements regarding charges on transit. According to Paragraph 3 of the article, traffic in transit is exempt from customs duties, and except for transportation and administrative expenses no transit duties or other charges may be levied in respect of transit. All charges have to be reasonable, having regard to the conditions of the traffic (Para 4), and non-discriminatory (Para 5).

1.2.2. Transit in the Energy Charter Treaty

The Energy Charter Treaty (ECT), which entered into force in 1998, further developed international transit rules in energy sector. The ECT’s transit provisions establish in Article 7 an obligation for the contracting parties to facilitate the transit of energy materials and products consistent with the principle of freedom of transit from GATT. Furthermore, they explicitly cover grid-bound energy transport facilities, including:

• high-pressure gas transmission pipelines;
• high-voltage electricity transmission grids and lines;
• crude oil transmission pipelines;
• coal slurry pipelines;
• oil product pipelines; and
• other fixed facilities handling energy materials and products.

Under the ECT the parties shall treat in their provisions energy materials and products in transit no less favourable than those originating in or destined for their own area. They shall not place obstacles in the way of new capacity being established in energy transport facilities if transit cannot be achieved on commercial terms. The ECT furthermore provides for a conciliation procedure in the event of transit disputes.

Negotiations on a specific Transit Protocol under the ECT resulted in draft binding provisions related to the utilisation of available capacity for transit, transit tariffs and the construction, expansion, and operation of energy transport facilities used for transit. Due to fact that regulation first and foremost of the gas sector has developed at different pace in the Energy Charter member states a final text could however not be agreed.

Important basic provisions of the draft Transit Protocol however remained generally undisputed. This may be said about Article 10 on transit tariffs, which is relevant for the subject of this study. According to this draft Article, transit tariffs and other conditions shall be objective, reasonable, transparent and non-discriminatory and based on operational and investment costs, including a reasonable rate of return. They shall not be affected by market distortions resulting from transit countries’ abuse of their dominant positions.
The Energy Charter Conference, the governing body of the Energy Charter, further pursues the objective of developing specific binding rules on energy transit to the benefit of existing and future energy corridors. In parallel, it has developed Model Agreements to facilitate cooperation between states and private entities in developing cross-border oil and gas pipelines as well as electricity projects. The texts of these Model Agreements can be found on the Charter’s website www.encharter.org.

1.3 The Object of Investigation

It is not by coincidence that this report, which deals with access and tariffs to crude oil and oil product pipelines, has its focus on the countries of the former Soviet Union (FSU) and Central Europe, where due to geography pipeline transport has played and will continue to play a particularly important role.

The relative importance of pipeline transport helps to explain the regulatory regime for the sector chosen by the respective countries. Generally there are two major approaches to the issue of whether the oil and products pipelines are natural monopolies and thus require special regulation or not. In the European Union oil pipelines are generally not regarded as natural monopolies, since they face competition from other oil transportation vehicles, such as railway and barges. Neither the EU nor most of the countries have legislations specific to oil or products pipelines usage as they have for electricity and natural gas. Oil transport issues are regulated under the general competition rules. Related business arrangements and market access are monitored and regulated by the competition authorities in accordance with the general domestic and EU competition provisions.

Other countries, for example US and countries of the former Soviet Union (FSU), do have special regulation on oil and products pipelines, overseeing tariff setting and rules of access. This study analyses the regulation in place and the resulting tariffs in the FSU countries Russia, Ukraine, Belarus, Azerbaijan, Georgia, Kazakhstan, Uzbekistan, in Central European EU members states Bulgaria, Czech Republic, Hungary, Latvia, Lithuanian, Poland, Romania, Slovakia and in Turkey and Croatia. Essential technical and economic elements influencing costs of oil and products pipeline transportation are described, as well as typical tariff methodologies. Amounts and methodologies of oil pipeline tariffs are examined and, where relevant, cross-border tariff regimes are compared with those for domestic transport.

1.4. Sources

This report has been based on factual information from a variety of publicly available sources. Wherever possible, information from ministries, government agencies, state-owned enterprises and private sector operators in the examined countries were added. Due to requirements of commercial confidentiality the terms of cross-border or transit transportation agreements are often not publicly available. In this cases information quoted by market participants in the mass media was used if available. Some data on actual tariff used could be derived from annual reports of companies.
Note on the data in the report: In preparing this report most up to date data that was available as of 31 March 2011 has been used. More recent data may well change some of the analysis. The throughput capacity shown in the report is nominal capacity. The actual volumes delivered can be less or above this figure if a drag reducing agent is used.

The exchange rates used for calculations in Chapter 5 are as follows.

1 USD = 0.70 Euro
      = 28.36 Russian Ruble
      = 5.19 Croatian Kuna
      = 2.90 Romanian Leu
      = 145.70 Kazakhstani Tenge
      = 7.97 Ukrainian Hryivna
1.5. Abbreviations and Acronyms

AIOC: Azerbaijan International Operating Companies
BOTAŞ: Boru Hatlari ile Petrol Tasima A.S.
BPS: Baltic Pipeline System
BTC: Baku-Tbilisi-Ceyhan
CIS: Commonwealth of Independent States
CNPC: China National Petroleum Corporation
CPC: Caspian Pipeline Consortium
ESPO: Eastern Siberia-Pacific Ocean
FERC: Federal Energy Regulatory Commission
FTS: Federal Tariff Service of the Russian Federation
FSU: Former Soviet Union
IKL: Ingolstadt-Kralupy nad Vltavou-Litvínov
mb/d: million barrels per day
mm: millimetre
mt: metric ton
m³/h: cubic meter per hour
MT: Million Metric Tons
MT/Y: Million Metric Tons per Year
NKRE: National Committee for Control of Energy Industry of Ukraine
PEOP: Pan-European Oil Pipeline
PS: pump station
PSA: Production Sharing Agreements
RFFI: Russian Fund of Federal Property
RUR: Russian Ruble
SOCAR: Azerbaijan National Oil Company
TAL: Trans Alpine Line
tkm: ton-kilometre
UAH: Ukrainian Hryvnia
USD: Dollar of the United States of America
USSR: Union of Soviet Socialist Republics
CHAPTER 2. Oil Transport Tariff Methodologies for Cross-Border and Transit Flows

2.1. Introduction

Before looking into oil pipeline access regime in the countries that form the object of investigation, this section briefly describes history of regulatory developments in the US, where oil pipeline has been under the federal regulatory oversight since 1906. In early days of modern oil industry in the US, Standard Oil, founded by John D. Rockefeller in 1870, was establishing a monopoly by controlling refineries and oil transportation. There was public outrage against Standard Oil’s monopoly (which ultimately led to break-up of the company in an anti-trust suit in 1911) and then president Theodore Roosevelt enacted the Hepburn Act of 1906. The act brought oil pipelines under the Interstate Commerce Act of 1887. Under the coverage of the Interstate Commerce Act:

- Interstate oil pipelines must be common carriers,
- Tariffs must be just and reasonable,
- Undue discrimination and preferences are prohibited, and
- Carriers must report to the federal authority and post tariffs publicly.

However, the act left the following unregulated:

- construction and abandonment of oil pipelines,
- sales and leases of oil pipeline assets, and
- securities transaction of pipeline companies.

Later in 1977 the Federal Energy Regulatory Commission (FERC) was formed as an independent agency to regulate the interstate transmission of natural gas, oil and electricity. Nonetheless, the above-described elements from Interstate Commerce Act have remained as basic principles to regulate oil pipelines to date.

Most former Soviet Union countries have chosen to adopt the natural monopoly model on oil pipelines in their countries. These governments have established rules of non-discriminatory access to services and tariffs. In the rules the main specific features of the economic mechanism in oil transportation system are equal access and control of pipeline tariffs. It is also important that the systems be open and transparent, in order for the pipeline capacities to be allocated fairly and for the shippers and public to be informed.

As earlier mentioned there is no unanimity in considering oil and products pipelines as natural monopolies or not. This heavily impacts the concept of the tariff setting regulation in different countries. If there is no monopoly there is no need in special tariff regulation and commercial relations between pipeline operator and a supplier are covered by civil law. Thus the tariff is the product of commercial negotiations or there can be no tariff at all, if the pipeline serves the needs of its owners. In the latter case the costs of service are merely distributed among suppliers.
Analysing costs of service a deeper look into pipeline economics is necessary. There are several factors impacting the cost of transportation.

### 2.1.1. Capacity Utilisation and Pipe Diameter

The pipeline diameter makes a significant impact on the value of a unit delivery cost (per metric ton of oil). There is a formula that capacity of a pipe is equal to the square of its radius. However according to the existing technology regulations the optimum throughput capacity is rather proportional to the diameter for the power of 2.5:

\[ Q_{\text{optimal}} \approx D^{2.5} \]

The excerpt from the existing technology regulations is shown below.

<table>
<thead>
<tr>
<th>Throughput capacity, mb/d (MT/Y)</th>
<th>Diameter (outer), mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.08-0.18 (4-9)</td>
<td>530</td>
</tr>
<tr>
<td>0.14-0.26 (7-13)</td>
<td>630</td>
</tr>
<tr>
<td>0.22-0.38 (11-19)</td>
<td>720</td>
</tr>
<tr>
<td>0.30-0.54 (15-27)</td>
<td>820</td>
</tr>
<tr>
<td>0.46-1.00 (23-50)</td>
<td>1020</td>
</tr>
<tr>
<td>0.82-1.56 (41-78)</td>
<td>1220</td>
</tr>
</tbody>
</table>

Unit variable cost is lower when the diameter is larger. On fixed costs, depreciation is proportional to the square of the diameter. Although maintenance costs depend on the diameter, they are insignificant at the beginning of operations. Taking into account the share of depreciation in fixed costs, the tariffs decrease quickly when the diameter is larger. Thus the pipelines have significant economies of scale.

The interrelation of the level of capacity utilisation and pipe diameter is as follows: in cases of comparable average capacity utilisation, delivery costs are less in those pipelines that have a larger hydraulic diameter.

Considering the fact that the fixed costs constitute about 75% of the delivery cost, the level of capacity utilisation becomes critical. The less the utilisation rate of the pipeline, the more costs are attributed to a unit of oil or product moved through the system. Thus level of capacity utilisation is a decisive factor in the delivery cost. In view of the predominant share of fixed costs in the structure of delivery cost, a reduction in capacity utilisation will result in an increase in tariffs.

### 2.1.2. Impact of Other Technical Parameters

Climatic and natural conditions, including terrain, affect construction costs and, subsequently, depreciation. Northern conditions significantly increase construction costs and make operation more costly requiring heating of facilities and in some cases of the crude oil. The terrain profile can also impact both construction and operations...
cost requiring for example more pump stations in mountainous regions and higher energy consumption.

Quality control (except for quality control of petroleum product pipelines, which are primarily designed for transmission of different types of product) does not affect the tariffs significantly. Normally quality management issues are solved at the initial stage of the project. Pipelines are designed for either batch or commingled stream operation. Batch operation is the most natural solution. In this case the pipeline operates as it is designed and no extra expenditures are necessary.

In case of commingled stream operation, quality management is usually aimed at stabilising oil quality at the output. Transneft is an example for this. Designed to serve the needs of the centralised economy of the former Soviet Union, it carries out distribution of quality within the centralised management of the pipeline system to the extent that production capacity and oil storage capacity allow.

Other economic factors, such as prices for metal and fuel / power, have impacts on the cost of the fixed assets and expenses for delivery. The depreciation rate and depreciation policy are most significant.

Another very important factor is the cost of financing. The service of borrowings made to facilitate construction works can significantly impact the economic performance of the pipeline company thus leading to tariff increase to cover financial expenses. The exchange rates fluctuations can also impact the economics of the pipeline if for example the currency of the tariff differs from the currency of the main expenditures.

2.2. Allowed Profitability

As earlier mentioned if the pipeline transportation is considered to be a natural monopoly the tariff setting issue is always in regulatory focus. Basically there are two main approaches in the methods of tariff setting: allowed profitability and cost-of-service.

The allowed profitability methodology can be better understood with references to methodologies in the US. Legal basis of oil pipeline tariffs are the Interstate Commerce Act and Energy Policy Act of 1992. Interstate Commerce Act stipulates that oil pipeline tariffs should be just and reasonable. The methodology of setting oil pipeline tariffs has seen many revisions since 1906. The main issues were about establishing appropriate profit levels and defining a base for profit calculation.

Tariffs are set at a level so that pipeline operations generate just and reasonable profits. Technically profit limitation is based on the rate-of-return methodology. The profit levels refer to dividend of companies in the competitive market. Discussions about the basis for profit calculation were what to include in the basis – initial cost of fixed assets with or without depreciation, whether to consider inflation or not, to include a cost of the right to use land or not, whether to include current assets or not, etc.
In Opinion 154-B in 1985 the US Federal Energy Regulatory Commission (FERC) adopted TOC (trended original cost) and SRB (starting rate base) for oil pipeline tariff calculations. The basic concepts are as follows.

For TOC:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nominal rate of return</td>
<td>16%</td>
</tr>
<tr>
<td>inflation</td>
<td>7%</td>
</tr>
<tr>
<td>real rate of return</td>
<td>9%</td>
</tr>
<tr>
<td>rate base</td>
<td>$1,000</td>
</tr>
<tr>
<td>return on rate base</td>
<td>9%</td>
</tr>
<tr>
<td>current earnings</td>
<td>$90</td>
</tr>
<tr>
<td>inflation rate</td>
<td>7%</td>
</tr>
<tr>
<td>deferred earnings</td>
<td>$70</td>
</tr>
</tbody>
</table>

For SRB:

\[ \text{SRB} = O \times d + R \times e \]

\(O: \text{book net depreciated original cost as of 31 December 1983}\)

\(R: \text{net depreciated cost of reproduction new from 1983 valuation}\)

\(d: \text{debt ratio as of 28 June 1983}\)

\(e: \text{equity ratio as of 28 June 1983}\)

Although Opinion 154-B was intended to provide a basis for a cost-based rate methodology, many details were left to individual cases. In 1988, the Buckeye case created options of market-based rates and cost-of-service rates. Finally, the Energy Policy Act of 1992 reorganised the oil tariff methodologies.

The act grandfathered all existing rates and stipulated that these rates could be challenged only on a demonstration of substantially changed circumstances. There are four alternatives for existing rates:

- indexation,
- settlement rates,
- cost-based rates, and
- market-based rates.

The act also provides for three options for new service:

- negotiated rates,
- cost-of-service, and
- market-based rates.
Indexation sets the ceiling. Actual rates can be below the ceiling. If indexation rate is above the ceiling, it must come down or alternative rate justification must apply. Indexation rates are reviewed every five years.

Cost-of-service rates are not immediately available, unless pipeline operation revenues substantially diverge from the revenues based on indexation rates. In addition, the costs must be justified under the Option 154-B model.

To adopt market-based rates, a minimum anti-trust showing is required. The carrier must demonstrate that there is adequate competition in both the origin and destination markets.

### 2.3. Cost-of-Service Methodology

The easiest way to calculate a tariff is to sum up the real costs of oil delivery per section, their overheads and also rate of profit. The difficulty, however, is that cost accounting is undertaken in a company as a whole, but not by section. Therefore obtaining real costs per section is problematic. The accurate calculation of a pattern of transportation costs based on theoretical assumptions is virtually impossible because there is an established level of costs which differs according to the pipeline. These cost differences are not always explained by physical and technical aspects but often as a consequence of social, political, geographic and other factors, which are difficult to take into account. Experience shows that the planned costs at a particular section, whilst based on accurate assumptions, do not necessary coincide with real costs, and often significantly divert from them.

The specific features of the Russian tax system can be taken as an example. They have resulted in strict regulations on the list of costs that can be included into the delivery cost. A number of required production costs, for example expenses for maintenance of inhabited areas at oil transfer stations, remote from residential areas, expenses for insurance of environmental damage, are allowed to be covered from net profit only. High inflation in Russia (in years 1992-1995 and 1998) and associated deposit banking rates prevented a sizeable profit in the regulated tariffs to occur. Consequently the Russian methodology of tariff setting incorporates a justified need for technical upgrading of the equipment, social development of a company and insurance into planned tariff proceeds. In all subsequent Russian tariff calculations for oil transportation this approach has been adopted. Thus, the pipeline tariffs must provide a company with tariff proceeds that are sufficient to reimburse operational costs. Additionally justified net profits required for normal production, economic activity and payment of taxes are required by law. The usual way of calculating the specific tariff is by division of tariff proceeds by the turnover.

### 2.4. Negotiated Tariff

An example of a negotiated tariff is an agreement between the pipeline operator and a customer. This is often the case in the countries that do not consider crude oil pipelines as natural monopolies. Although the negotiated tariff should also cover the
costs of operation and provide for an amount of profit, there are known situations, when the negotiated tariff does not cover the actual expenses. This is to explain by the fact that not everything can be foreseen when agreeing to a formula-based or fixed tariff rate. The change in the business-environment like exchange rates or interest rates can easily make the economics of a pipeline unprofitable with tariff rates already agreed for a long term.

This tariff type is also used in regulated environments when, for example, the transmission capacity of either a pipeline system or its separate section has to be expanded. The users of the system who do not use the services in particular (for example, a narrow section) will continue to pay an old tariff rate. The users, who need expansion, pay, in addition to the old tariff, a negotiated new tariff. The funds that a pipeline company gains from the negotiated tariffs are used to finance expansion arrangements of transmission capacity of the system (e.g., expansion of the narrow sections).

The validity period of the negotiated tariff can vary from one to three or more years. This is quite obvious for a common law agreement, but extremely unusual for regulated tariff setting, as the general practice of regulated tariff setting is to revise the tariffs periodically, usually on an annual basis. This can be an obstacle for the financing of a new project where fixed rates are desirable.

To mitigate this problem a methodology for long-term tariffs was developed. Long-term tariffs are established for shippers who presented guarantees to oil pipeline companies for transportation of minimum volumes of oil for the time period of pipeline capacity expansion or new construction. The period of validity of the long-term tariffs can be 5, 10 or even 15 years. Stable, transparent long-term tariffs fully correspond to the interests of the oil producing, oil processing and oil transmitting companies because they attract investments and significantly decrease the impact of inflation when transporting oil to the export terminals. They ensure investment gains and the repayment of investment-related credits.

2.5. Difference between Cross-Border and Domestic Pipelines

In principle, there should not be a difference in essence between cross-border and domestic pipelines. A difference however can be made by a value added tax which is not collected when deliveries are for export or transit. Nevertheless, when there is a significant difference between the oil prices in the domestic and world markets, a significant difference arises in profits for the shippers when they export oil or deliver oil to refineries. This explains why on occasions the government is often tempted to take a part of the profits from the oil producers by means of higher tariffs for export. This happened for example in Russia in the 1990s when a special export tariff was added as a per ton rate in US dollars. At present the tariffs in Russia are practically the same.

2.6. Transit Tariffs

A tariff is the fee that is paid by a shipper for the use of a pipeline and is meant to cover the costs of investment and financing, operating and maintaining the pipeline as well
as an element of profit for the operator. A transit tariff as understood in this study is a tariff paid for the use of a pipeline for transit. The tariffs are derived on the basis of cost of service and cover the required revenue of the pipeline operator which is normally subject to business tax. In addition or alternatively, some countries levy a government charge for transit essentially as a fee for the right of way through that country's territory, as compensation for taxes not levied and for service rendered by the country (e.g. protection of pipeline, political / administrative resources, environmental risks). In the draft Transit Protocol of the Energy Charter it had been recalled that government charges need to be in line with Art. 5 GATT and be commensurate with administrative expenses entailed by transit or with the cost of services rendered. Whether a simple “royalty” payment to the transit country without any link to the cost of service would be in line with this requirement is questionable.

This does not mean that the host country may not gain a profit from the construction of a pipeline through its territory. In addition to justified government charges or business tax (no customs duties) it could do so by becoming a party of the enterprise constructing and operating the pipeline.

Payments are usually determined as a result of commercial negotiations on a governmental level as part of the Intergovernmental Agreement on Transit or in a Host Government Agreement with the pipeline owners.
CHAPTER 3. Access to Cross-Border and Transit Pipelines

3.1. Introduction

As earlier mentioned there is no unanimity in considering of the oil and products pipelines as natural monopolies. This heavily impacts the concept of the tariff setting regulation in different countries. If there is no monopoly there is no need in special regulation for rules of access, and commercial relations between pipeline operator and a supplier are covered by civil law. But if the pipeline transportation is considered to be a natural monopoly the rules of access issue is always in regulatory focus.

3.2. Russia

3.2.1. Access to Export Facilities for Domestic Producers

In accordance with the Law on the Natural Monopolies of 17/08/1995 (No. 147-FZ) the right of access to the Russian trunk pipelines and sea port terminals for exports to outside of the customs territory of the Russian Federation shall be provided to the oil producing companies in proportion to the volumes of oil delivered to the system of trunk pipelines within their throughput capacities. Therefore, access to the export pipelines is confined to the oil producers. Other legal entities do not have the right to use the Transneft pipeline system.

As there are limited export capacities in the Transneft system the access to export routes is governed by a special procedure of quarterly export quotas, also known as export schedules. The procedure of export quota distribution that is in place for the last ten years is as follows:

- The shipper submits an application for oil delivery stating a desired destination of the oil export together with the volume proposed in the next quarter to the Minenergo (Ministry of Energy of Russia) and Transneft no later than 20 days prior to the quarter.

- Transneft provides an information notice to the Minenergo no later than 30 days prior to the quarter about existing flow capacities of exporting routes and planned quantities of the oil received from the oil producing companies to the trunk pipeline system.

- Minenergo, in compliance with the transmission capacity of Transneft and the planned reception of oil, prepares and approves the delivery schedule no later than 15 days prior to the quarter. If the transmission capacity increases in a certain direction, Transneft can propose to review the delivery schedule.

The key functions of export quota distribution were previously performed by Rosenergo agency and before 2004 – by the Interdepartmental commission. This does not actually change the main principle of comparison of the desired volumes and the existing capacity of Transneft.
A new government resolution was adopted on 29/03/2011 (#218), that provides a revision of the regulation on access to oil and products pipeline system. One of the main innovations for the export quota distribution is the introduction of a sequence for determining of free capacities. According to that sequence the capacity for export deliveries are determined as leftovers after deliveries to domestic refineries and commodity exchange. This however represents no major change and basically follows the current practice.

The settlement procedure on access disputes is divided into pre-trial and trial proceedings. The company can lodge a claim to Minenergo (first to the Department, if no success – to the Minister) and, if no agreement is reached, go to court. Normally, for an individual producer it is quite hard to check whether the calculation is made correctly or not, because no one is legally required to provide information about flow capacities and total demanded volume in details. However, it is possible to obtain a quarterly coefficient, which is a percentage of the ordered quantity applied to any producer in the same manner for a particular quarter. Multiplication of the ordered quantity by the coefficient results in a quantity for export.

3.2.2. Transit through the Transneft Pipeline System

Oil transit through the Transneft pipeline system is based on the inter-government agreements for oil transit: A Treaty between the Russian Federation and the Government of the Azerbaijan Republic on Transit of Azerbaijani Oil through the Territory of the Russian Federation and Agreement between the Government of the Russian Federation and the Republic of Kazakhstan for Transit of Oil. The agreements can fix the transit tariff rate, which applies to the Baku-Novorossiysk flow. Usually these agreements are accompanied by annual protocols, confirming and providing details of the annual volume and the route of oil deliveries.

The oil transit schedule of the FSU countries through the territory of the Russian Federation is usually prepared in the same way and at the same time as an export schedule for the Russian producers. The respective authorised bodies of the FSU states submit their orders for transit noting delivery direction and volumes with a request to include the order into the transit schedule in due time. Minenergo prepares and approves a transit schedule based on the orders of the respective authorised bodies of the FSU countries, inter-government agreements and annual protocols; and available capacities of Transneft. This is done no later than 15 days before the beginning of a quarter.

The new sequence introduced by the Government resolution #218 as mentioned earlier sets that the capacity available for transit is a leftover after deliveries to domestic refineries, commodity exchange and exports.

3.3. Kazakhstan

The procedure and guidelines of equal access of the consumers to the oil and petroleum products pipelines in Kazakhstan is regulated by the Rules (approved by the Order
Equal access to regulated services in transportation of oil and / or petroleum products through the trunk pipelines is based upon the following principles:

• equal access to the regulated services in oil and / or transportation through the trunk pipelines for all consumers (natural and legal entities);
• a unified tariff policy in relation to all consumers of the regulated services in transportation of oil and petroleum products through the trunk pipelines;
• transparency of the regulated services of a pipeline company, and tariffs for the services.

A consumer in the Republic of Kazakhstan has the right of equal access to the regulated services of transportation of oil and petroleum products through trunk pipelines. The regulated services in oil and petroleum products transportation through the trunk pipelines are provided to consumers in accordance with a delivery schedule.

If there are technical problems to limit provision of the regulated services in transportation of oil and petroleum products through the trunk pipelines due to lack of free capacities of the trunk pipelines, then a priority access to the regulated services in transportation of oil and petroleum products through trunk pipelines can be provided to a consumer who:

• carries out delivery of oil to the refineries of the Republic of Kazakhstan;
• is obliged by agreements to provide fixed minimum oil amounts;
• provides oil and petroleum products of required quality which allows to match the transported mixture of oil and petroleum products in compliance with the technical requirements of quality established by the pipeline companies;
• is involved in investment to expand the transmission capacity of a trunk pipeline or parts of it in accordance with the contract;
• provides implementation of the resolutions of the Government of the Republic of Kazakhstan and / or international agreements which Kazakhstan is a party to;
• does not have an alternative technical possibility to transport its oil and petroleum products.

The pipeline quotas between the consumers, except for those indicated above, are distributed in proportion to the volumes ordered by the consumers.

3.4. The CPC

The Caspian Pipeline Consortium (CPC) is exempted from Russian and Kazakhstan regulations on access. The rules of access to CPC pipeline are determined by the
shareholders. This right is laid out in the Shareholder Agreement. The shareholders or their affiliates enjoy the right of access to the pipeline. Access by other shippers can be granted if there is spare capacity and unanimous approval of all shareholders. Currently only CPC shareholders (or their affiliates) are transporting crude oil through the pipeline. The main CPC shippers providing the pipeline’s base load are Tengizchevroil and Karachaganak Petroleum Operating B.V.

3.5. Ukraine

According to the National Electricity Regulatory Commission of Ukraine (NKRE / NERC) Resolutions No. 857 On the Approval of License Condition for Performance of Economic Activities in Oil Transportation by Trunk Pipelines (30.09.2005) and No.858 On the Approval of License Condition for Performance of Economic Activities in Oil Products Transportation by Trunk Pipelines, activity in oil and oil products transportation by trunk pipelines is carried out based on the principles of the provision of equal rights for access to the trunk oil and oil products pipelines system for all customers of oil and oil product trunk pipeline transportation services, and, in case of insufficiency of trunk pipeline throughput capacity, the observance of the established practice of distribution. The mechanism of distribution of trunk pipeline throughput capacities is not determined under the laws of Ukraine.

Transit of Russian oil through Ukraine is carried out in accordance with Agreement between the Government of the Russian Federation and the Cabinet of Ministers of Ukraine on the Transit of Oil through the Territory of Ukraine of 18.08.2004. Under this Agreement the Ukrainian party informs the Russian party of transit capacities of the trunk pipelines. The Russian party uses this information when preparing its oil export schedules. Oil transit is carried out on the basis of contracts for services signed between the authorised organisations of the parties as well as between the authorised organisation of the Russian party and the oil shipper in a quantity that is determined in the oil delivery schedules approved by the Russian party in an established manner. The quantity and direction of oil transit through Ukraine is specified in annual protocols signed by the competent bodies of the parties. The Ukrainian party ensures safety of the quantity and quality of oil that is delivered from the Russian Federation.

The transit of Kazakhstan crude oil is also regulated by a similar intergovernmental agreement. It also defines tariffs for transit.

3.6. Belarus

In accordance with Article 27 of the Law #87 of the Republic of Belarus dated 9 January 2002 On the Trunk Pipelines Transport, the services in oil and petroleum product transportation through trunk pipelines are provided with regard to available transmission capacity and actual capacity utilisation of the pipelines, proceeding from the principle of equal access and non-discrimination.

If transmission capacity of a trunk pipeline does not ensure transmission of the whole volume of product ordered, each supplier has a right to transport an equal portion
of the ordered volume, equal to a ratio of transmission capacity of a trunk pipeline to the same destination and the total amount of demand in transportation of the product to this destination that is ordered by all suppliers of the transported product. The pipeline quotas are calculated by the pipeline operator based on orders, received from shippers.

The operator of the trunk pipeline can give priority to a good the pipeline was specially built for.

### 3.7. Azerbaijan-Georgia

When building a pipeline Baku-Supsa, the contractual parties agreed that access to the export capacities is enjoyed by the project participants only. However there is a clause in the contract which allows transportation of oil that belongs to outside producers. This must be initiated by the project member oil companies. This proposal must be agreed upon with SOCAR after a notification of the Georgian party.

Search of additional sources of oil to fill in the excessive capacities is a liability of the operating company. However, a contract with an outside producer must be worded in such a way that, in case of decreasing of the free capacities or lack of them, it could be terminated by the operating company.

Similar regulation was incorporated into the BTC agreement. The BTC shareholders have agreed access quotas; free capacity can be allocated to third parties upon consent of all shareholders.

### 3.8. Access to Oil and Products Pipelines in East-European Countries and Turkey

As has been stated above, access to oil and oil product pipelines is not subject to specific regulation in most European countries. Nevertheless some countries mainly in Eastern Europe and Turkey have specific petroleum regulation and specify explicitly the third party access rule for crude oil and petroleum products pipelines.

#### 3.8.1. Croatia

The Article 4 of the Oil and Petroleum Products Market Act dated 12/05/2006 states the right of a third party access to oil and products pipelines in Croatia. The operator should grant access or give a justification of refuse. The justification can be technical Impossibility or safety requirements. If the applicant disagrees with the given justification he can reach a claim to Croatian Energy Regulatory Agency in 15 days’ period.

#### 3.8.2. Romania

The third party access to the state-owned oil and products pipelines operated by Conpet is regulated by the Petroleum Law #281 dated 07/06/2004. The operator has the obligation to provide equal access to the interested parties in a transparent and
non-discrimination manner based on available capacity. The law specifies the cases in which the operators may deny access to the transportation systems (Art. 21): in case of no available capacity, for technical and safety reasons, inappropriate quality of the supplied product. If the capacity is limited and is not sufficient to meet the needs of the applicant he can be granted an access for a part of the required transportation volume. The party whose access to the transportation system was denied may file a complaint with the competent authority.

3.8.3. Turkey

The Petroleum Market Law dated 14/12/2003 defines that the crude oil or petroleum products pipeline operator as a license holder should meet demands on non-discriminatory basis except for the capacity restrictions on transmission and storage and grant equal rights and liabilities to equal receivers (categories) and not stipulate different terms and conditions.

The reasons for justified refuse of access are typical: no spare capacity, inappropriate quality of the supplied fuel, technical and safety issues. Hindering of access directly or indirectly is considered as an administrative offence.
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

CHAPTER 4. Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

4.1. Russia

4.1.1. Cross-Border and Domestic Crude Oil and Products Pipelines

Russia was the first FSU country to have introduced methodological bases to define tariffs for oil delivery. Other FSU and even some East European countries followed suit taking the systems adopted in Russia as a model or a starting point. However the tariff methodology in Russia has undergone several changes and models borrowed by other FSU countries differ depending on the methodology version being active in the particular timeframe. That is why it is important to trace the developments in the Russian regulatory framework.

Formally, the regulation of trunk oil and oil products transportation systems was to be started by the approval of corresponding Federal laws. Nevertheless, the Federal Law No.147-FZ «On Natural Monopolies» was approved only in August 17, 1995. But the Resolution No. 555 (dated by October 18, 1991) «On the formation of “Rosneftegaz” Russian State oil-and-gas Corporation» commissioned Rosneftegaz (an entity which included Glavtransneft) to introduce payment for trunk oil transportation services based on tariffs already in 1992.

Within a short period of time the document entitled “Methodology of Tariffs Calculation for oil transfer, reloading and filling-in trunk oil pipelines” was worked out and agreed by the Price Committee under the Ministry of Economics of Russia. In December 1991 it was approved by the Minister of Fuel and Power of the Russian Federation.

During the period 1992 to 1994 tariffs for oil transportation services were sanctioned by the Price Committee under the Ministry of Economics of Russia; then by the Committee for Pricing Policy, followed by the Ministry of Economics of Russia and Mintopenergo (Ministry of Fuel and Power) of Russia. In 1995-1996 tariffs were under the approval of Mintopenergo of Russia, and since October 1996 the Federal Energy Committee (later transformed into the Federal Tariff Service – FTS of Russia), which was established as the body to control natural monopolies in the energy sector, has been in charge.

The first domestic methodology of tariff calculation, which was developed in an extremely short period of time for various reasons, was unable to completely adopt the principles of profit formation, used in the countries with advanced market economies. The main provisions of the first Russian methodology of tariff calculation were based on the following concepts:

- Tariffs should provide a transport company with the means to cover objectively essential levels of costs for oil transportation, reloading and loading operations, and standard profits;
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

- Tariff proceeds should include appropriate amounts to cover all kinds of operational expenses, insurance charges for oil loss and ecological damage as well as profits to provide self-financing of the oil-pipeline transportation system, including investment requirements.

Significant differences between Russian and Western methodological approaches towards tariffs calculation (discussed in Chapter 2) created dissatisfaction among international investors and international organisations. The latter argued that these differences made Russian tariffs unpredictable, and the method used for profit calculation in tariff structure was not sufficiently transparent. This was one of the obstacles for the Russian oil industry to attract foreign investment.

Discussions in 1997 aimed at developing a new (second) tariff methodology started. Subsequently, the adoption of this methodology became one of the obligations of the Russian party under the Third Loan for Structural Reorganisation of the Economy (SAL-3) from the World Bank. The new methodology was approved on 30 October 1998. According to the second methodology:

- the control of tariffs is based on the limitation of natural monopolists' net profits through the profitability norm established under the ratio of allowed net profit;
- tariffs are the only type of payment to be collected from a user of a trunk-oil-pipeline system for oil transportation services;
- planned tariff proceeds should not provide an opportunity to accumulate cash for investment funds or development funds, aimed at the subsequent financing of new projects.

The development and introduction of the new calculation methodology of oil pipeline tariffs undoubtedly became a step forward both in theory and practice. The new methodological approach did not arouse objections from users, was supported by international organisations, and met conventional standards of world practices.

However, due to a number of reasons (including the financial crisis in 1998), the compulsory introduction of the second methodology tariff calculation was not followed through. Attempts to adapt this methodology in day-to-day activities were not successful. It also failed to attract credits to fund new construction projects. Eventually, the second methodology was abandoned. In truth, it was a situation in which the methodology declared one thing, but practices did not correspond.

In view of the situation the third methodology (Resolution of July 10, 2002 No. 42-э/5) was worked out and approved by the Russian authorities. It legitimated tariff setting practices which had already been developed and used. These include:

- a two-tier tariff structure (the first for oil transfer and the second for services provided for order performance and dispatching) which had in practice been in place since May, 1999;
- special tariffs (the Suhodolnaya-Rodionovskaya route, (2001, etc.);
• limitation of the planned net profit which included the amount required to finance upgrading, reconstruction and trunk oil pipeline system development programmes and for other economically justified expenses;

• negotiated and long-term tariffs (a long-term tariff had been working since 2001 in the trunk oil pipeline system for TOTAL of France, which had been working under a product sharing agreement).

This third methodology does not exclude an opportunity to use several methods of tariffs calculation such as indexing, cost-based, and competitive. However, the subsequent implementation under the third methodology revealed some shortcomings:

• Currency risks: tariff rates for dispatching and export orders were denominated in US dollars. The regulation body makes calculations based on the forecasted rate accepted in the federal budget. The official forecasts tend to be more optimistic than the reality turns out to be.

• Application of negotiated and long-term tariffs was not necessary successful. It became necessary to have more studies and detailed regulation.

Taking into account the above, development of a new methodology was undertaken and on August 17, 2005 the FTS of Russia in its Order No. 380-э/2 approved the Provisions on Definition of Services Tariffs for Trunk-Oil-Pipeline Transportation to replace the third tariffs calculation methodology. The fourth revision was a quite sophisticated document providing very detailed specifications of tariff calculations procedures of all possible tariff types. The summary of the methodology can be given as follows.

The unit tariff rate is calculated as the Planned tariff proceeds divided by the Planned turnover. The Planned tariff proceeds are a sum of Allowed costs, Profit limit and Taxes. The Planned tariff proceeds are determined by two methods. In the first case, the amount required for financing of modernisation, reconstruction and development programmes, purchases of land and other economically justified expenditures are defined in the net profit. The essence of the second method is to set up the profitability norm, which is determined as a ratio of the planned net profit to the profitability base. Regulation of tariffs requires a separate account for expenses of the controlled activities.

In other words, the net profit includes:

• financing of economically justified programmes of technical modernisation and reconstruction of basic production assets which are not covered by depreciation charges;

• reserves for dividend payments;

• financing of other justified expenses.

While calculating tariffs, the following factors are taken into account: expenses for the materials used for production and economic needs; for electric power and heat power consumed; for labour payments basing on predicted number of the personnel; social allocations (uniform social tax); depreciation; rent; expenses for services of all types of transport; services rendered by other agencies (expenses for payment
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

Tariffs for oil transportation services are set in ruble and, according to the decision of the FTS of Russia, tariffs can be fixed per 100 t/km, or, per 1 ton, or, per 100 ton. The following different tariff rates can be applied based on the type of operation:

- a tariff rate for performance order and dispatching of oil deliveries to refineries of the Russian Federation and participants of the Customs Union Agreement;
- a tariff rate for performance order and dispatching of oil deliveries across the borders of customs territories of the Russian Federation and participants of the Customs Union Agreement;
- a tariff rate for oil transfer;
- a tariff rate for oil reloading, discharging / loading, acceptance / release in each point of oil reloading;
- the rate of coordinated tariff;
- the rate of long-term tariff;
- the rate of competitive tariff;
- the rate of network tariff.

Coordinated tariffs can be set as an additional rate to working tariffs, in case of the necessity to undertake actions aimed at the expansion of throughput of a trunk oil pipeline system or increasing the reliability of its functioning when the expenses for such activities have not been taken into account in the planned tariff rates.

Long-term tariffs can be set with the consent of trunk pipelines system users and under regulatory consents to conclude long-term contracts for oil transportation under the fixed tariff rate, depending on the current and perspective load of the tariff route. A long-term tariff is fixed for three-year period as minimum. Long-term tariffs can be established in foreign currencies.

In the case when a certain tariff route has alternative ways of oil transportation, competitive tariffs can be set for the route in the form of the maximum tariffs rates or in the form of correlation with the cost of oil transportation along the alternative route as long as it does not contradict the principle of equal accessibility to trunk pipeline systems.
Network tariffs can be set with a view of optimisation of freight traffic on separate routes of trunk pipelines, if there is more than one terminal point of oil delivery. Network tariffs are calculated per ton of oil shipped.

This fourth methodology was adopted in the same year when the Law on Natural Monopolies was amended the way that it should be the responsibility of the government to issue methodology regulation on tariffs, which the FTS should follow. However the fourth FTS methodology remained in force for about two years, till in 2007 a decision was taken to align the legislation. The new methodology was adopted by a Resolution of the Government #980 dated 29.12.2007. It basically doesn’t alter the previous FTS methodology. It makes it more generalised, less detailed and focuses only on main principles of the tariff settings.

The Resolution of the Government #980 defines four methods of tariff setting:

- economically justified costs of service;
- economically justified return on invested capital;
- maximum percentage ratio of transportation costs to alternative types of transport of the similar nomenclature of oil or oil products on similar directions;
- indexing.

The essence of the mentioned principles is the same as was specified by the last FTS regulation. A new addition was made in 2009 to incorporate the possibility of a tariff that includes a combination of transportation legs. This was necessary due to commissioning of the first stage of the ESPO pipeline. The first stage reached only till Skovorodino from where oil is loaded into railway tank cars and delivered by rail to Kozmino port. The amendment of 2009 made it possible to set a tariff for the whole route including the transportation by railway. Another important issue introduced by the 2009 amendment is the provision for network tariff implementation. It stipulates that tariff setting “can consider the necessity to provide shippers from same region with equal conditions for crude oil transportation to different international markets taking into account the current pricing at those markets”. This provision gives ground for implementation of a network tariff system, which can be constructed in different ways. A shipper will have a single tariff no matter the route he takes or the shipper will get tariffs, that will be calculated the way he gets the same revenue irrespective the route he takes.

There is one more important novelty in the new methodology introduced by the Resolution of the Government #980. It covers products pipelines as well. The previous practice was to issue separate methodologies for oil and products pipelines. The preceding revision of basic principles and methods of tariffs calculation for oil products transportation by trunk pipelines was established by the Methodology approved under Federal Energy Commission (currently FTS) Resolution No. 314 of 16.10.2002. No. 70-э/5. The main principle of definition of the tariffs for oil products transportation by trunk pipelines is the conformity between planned incomes and expenses of products pipeline transportation companies. The expenses of products pipeline transportation companies are planned separately for each type of operations. The expenses cover:
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

- economically justified expenses, including taxes and duties;
- economically justified operational and non-merchandising expenses required for maintenance of normal industrial and economic activities;
- expenses of a capital character;
- payments of profit tax of the enterprise.

Expenses include material inputs, labour expenses, deductions for social needs, depreciation, other expenses (communication services; transport services; services of external security; expenses for technical diagnostics of a trunk-pipelines systems; deductions to repair fund; rent of the ground and land tax; expenses for insurance; taxes and duties; expenses for personnel training; deductions for scientific and research activities, experimental and design works and other expenses).

To define tariffs for oil products transportation, the FTS of Russia approves the following maximum tariffs by type of operation for each products pipeline transportation company.

- The maximum cost of oil products transportation by trunk pipelines is defined in ruble per ton of oil products, if the stabilisation of oil products markets is necessary.
- The maximum specific rates of tariffs
  - For oil products transfer services, these rates are defined in ruble per 100 t/km, dividing planned tariff proceeds for oil products transfer services by the planned value of commodity transportation work (freight turnover).
  - For oil products discharge, reloading, filling and release services, these rates are defined in ruble per ton for each point of discharging, reloading, filling and release, dividing planned tariff proceeds for oil products discharge (reloading, filling and release) services by the planned volume of work for each terminal or tank farm.
  - Maximum percentage ratio of transportation costs to alternative types of transport of the similar nomenclature oil products on similar directions.

It should be noted, that despite the mentioned variety of tariff setting opportunities only the last method has actually been in use for all these years. The main alternative and competitor to the products pipelines is the railway thus the pipeline tariffs are set at approximately 70% of the related railway tariff. This has not changed with the adoption of the new Resolution #980.

It is worth to note that the principles of tariffs regulation and calculation are not necessarily applied in case of transit services.

4.1.2. Transit

Since 1996 the transit tariff for Azerbaijan oil, set under the inter-governmental agreement and corresponding transit contract between the Russian Federation and
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

the Azerbaijan Republic, is in force. The tariff was fixed at a rate of US$15.67 per mt which is still in force. It has never been reviewed.

Transit tariffs for Kazakhstan oil have been introduced since 1 January 1999. Originally, the logic of introducing special transit tariffs for oil producers of the Republic of Kazakhstan was based on the following circumstances. The Atyrau-Samara oil pipeline section served by “Privolzhsknefteprovod” (a Transneft daughter company) does not transfer any other oil but that from Kazakhstan. This oil pipeline is equipped with advanced heating facilities specific for Kazakhstan oils. Consequently, the expenses of “Privolzhsknefteprovod” for this oil pipeline constitute a significant part of the company’s total expenses. Thus, actually Russian oil shippers were contributing to expenses of the Kazakhstan producers. Therefore these expenses were included into the tariff of the pipeline company. The volumes of Kazakhstan oil loaded through the system of Transneft grew steadily (from 0.18 mb/d (9 MT/Y) to 0.38 mb/d (19 MT/Y). In this connection Transneft had to expand the bottlenecks of its trunk oil pipelines system on a regular basis in order to allow the delivery of increasing Kazakhstan oil volumes.

Taking into account these circumstances and based on current tariff calculation methodology the Federal Energy Commission (currently FTS) approved in Resolution No. 46/9 of 4 December 1998 a transit tariff. The amount of tariff (0.37 US dollars per 100 t/km) was calculated based on the expenses to be made to guarantee the transfer of Kazakhstan oil volumes.

All revenues received by Transneft from transit of Kazakhstan oil are considered by the FTS of Russia as the additional financial sources during the following annual tariff setting session while calculating the domestic tariffs of Transneft.

With the establishing in 2010 of the Customs Union of Russia, Belarus and Kazakhstan the rates for transportation of Kazakhstan oil were aligned with rates used for domestic producers.

4.2. Ukraine

4.2.1. Cross-Border and Domestic Pipelines

In accordance with clause 5 of the Law of Ukraine No. 1682-III On Natural Monopolies dated by April 20, 2000, the activity of natural monopolies in the sphere of oil and oil products transportation by pipelines system is a matter for state regulation in Ukraine. Regulation of activity in the sphere of oil and oil products transportation by trunk pipelines is performed by the National Electricity Regulatory Commission of Ukraine (NKRE / NERC).

The basic methods of tariffs calculation are determined in the tariffs calculation methodology for oil transportation, reloading and filling services provided by trunk oil pipelines on the territory of Ukraine. This methodology was approved by the Resolution of NKRE No. 993 dated 30.07.1999 (last amended 2009). Previously oil transportation companies of Ukraine set a methodical substantiation of their prices themselves.
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

Regulation of tariffs for oil transportation is based on limitation of net profit of the company performing its activity in the sphere of natural monopolies. Planned tariff proceeds are used as the basic settlement and control value for the definition of tariffs for oil transportation by trunk pipelines.

Tariffs for oil transportation by trunk oil pipelines are formed by oil transportation companies and should cover:

- economically justified expenses;
- planned net profit required for performance of normal economic activities of oil pipeline transport companies;
- payment of all taxes and duties established by the legislation of Ukraine.

Tariffs for oil transportation services are defined based on the expenses related to type of activity. The expenses related to rendering of oil transportation services are defined in accordance with methodological recommendations on formation of industrial production cost approved by the State Committee for Industrial Policy of Ukraine in the Order No. 47 dated 02.02.2001. These recommendations however are not obligatory. According to them production cost include material inputs; labour costs plus deductions for social activities; depreciation of fixed capital; other operational expenses. The expenses for payment of services rendered by Naftogaz Ukrainy (expenses for the maintenance of parent organisation) are included into the expenses of oil transportation companies.

Tariffs for oil transportation by oil pipelines are set by NKRE from January 1 every year. Tariffs for oil transportation services consist of one or several tariff rates:

- the tariff for filling (reloading) of oil for each filling point (tank farm) is determined per 100 t;
- specific tariff for oil transportation:
  - the first rate of oil transportation tariff is the specific tariff for payment of capacity reservation. It should cover conditionally permanent expenses for oil transportation and includes the profit allocated for reconstruction of pipeline system and taxes referred to these values. This rate is set per 100 t/km;
  - the second rate of oil transportation tariff is the specific tariff for payment of transportation services. It is defined as a difference between the specific tariff (calculated as the ratio of transportation tariff proceeds to freight turnover) and the first rate of oil transportation tariff. This rate is set per 100 t/km;
  - the address tariff - calculation of the tariff is determined per 100 ton moved through a certain route.

With the agreement of the trunk pipelines system user and the consent of the oil-pipeline transport company to conclude a long-term contract for oil transportation under a fixed tariff, a long-term tariff can be set. If the long-term tariff is lower than the oil transportation tariff established by NKRE, this body registers the tariff. If the long-
term tariff is higher, NKRE analyses the tariff validity and then approves it after due consideration. Long-term tariffs are established for a period of no less than three years.

The described methodology was developed with a view to provision of a uniform methodological approach on the territories of the Russian Federation and Ukraine in the matter of establishment of tariffs for oil pipelines transportation. As a whole, the Ukrainian methodology is based on an early Russian methodology version.

4.2.2. Products Pipelines

The methodology of tariffs definition for oil products transportation by the products pipelines of Ukraine does not exist. Tariffs for oil products transportation are being determined by products pipeline company and approved by NKRE. Tariffs are defined based on the necessity to cover the economically justified expenses and to get incomes, as well as on the stimulation of expenses reduction and the increase of profitability of products pipeline company activity (point 3.6 of NKRE Resolution No. 858 “On the Approval of License Condition for Performance of Economic Activities in Oil Products Transportation by Trunk Pipelines” dated by 30.09.2005).

4.2.3. Transit

The tariff for transit in the Ukraine is determined by Intergovernmental Agreements as a result of negotiations and is beyond the scope of regulation.

4.3. Belarus

In Belarus according to clause 3 of the Law of Belarus No. 162-3 On Natural Monopolies dated by December 16, 2002, of activity of natural monopolies in the sphere of oil and products transportation by trunk pipelines is under state regulation.

According to Paragraph 5.39 of the Resolution No. 1575 Issues of the Ministry of Economics of Belarus approved by the Council of Ministers of Belarus in October 31, 2001, the state regulation and control over the activities of subjects of natural monopolies confers powers to the Ministry of Economics of Belarus.

The oil and products transportation tariffs as determined by the Decree No. 285 of the President of Belarus On Some Measures for Stabilisation of Prices (Tariffs) in Belarus (adopted 19.05.1999 and amended annually) are set by the Ministry of Economics of Belarus in accordance with “reasons of state and current social-economic situation” (Article 1.3).

There are no publicly available methodologies for tariff calculation for oil and products pipelines in Belarus. At the same time there are references to such methodologies in intergovernmental agreements on transit with the Russian Federation. Article 3 of the Agreement between the Government of Belarus and the Government of the Russian Federation regarding the settlement of trade and economic cooperation in the
sphere of oil and products export of 2007 amended in 2010 provides that the transit tariffs should be changed based on a methodology, developed and agreed by tariff regulation authorities of both countries (i.e. among Ministry of Economics of Belarus and FTS of Russia). The tariffs should be set by Gomeltransneft and / or Novopolotsk Druzhba together with Transneft. Nevertheless the application of the mentioned methodology by Belarus led to transit tariff increase by 12.5% in January 2011 raising a strong resistance from the Russian side and a temporarily halt in deliveries. The tariffs were reduced following a series of negotiations. This shows that the agreed methodology still lacks elaboration and transparency.

4.4. Kazakhstan

In compliance with Article 4 of the Law #272 of the Republic of Kazakhstan dated 1998 On the Natural Monopolies, the government regulates and controls activities of the entities of the natural monopolies in trunk piping of oil and petroleum products.

In accordance with Resolution #1109 of the Government of the Republic of Kazakhstan dated 28.10.2004 “The Issues of the Agency of the Republic of Kazakhstan on the Regulation of Natural Monopolies”, preparation, approval and application of non-discriminating methods of tariff calculation or their ceiling levels for the regulated services should be carried out by the Agency of the Republic of Kazakhstan for Regulation of the Natural Monopolies.

The main methods and features of tariff calculation for the services of oil and petroleum products piping are established in the Methodology of Tariff Calculation for the Services for Oil and Petroleum Product Transportation via the Trunk Pipelines that is approved by Order #202-OD of the Chairman of the Agency dated 27.06.2007.

The method is based on conventional principles and ensures a flexible approach in pricing. It takes account of capacities and requirements of consumers in detail, as well as encouraging maximum possible utilisation of the existent pipeline system. Its main advantages are: inalterability of the principal reimbursement of the necessary costs and gain of a just profit from the relevant capacities. The fundamental principles of the methodology are as follows:

- reimbursement of the justified costs of production (they are accounted for in accordance with the Special Procedure of Costs Calculation that is used when approving the costs of services for the entities of those natural monopolies approved by Order #185-OD of the Chairman of the Agency of the Republic of Kazakhstan for Regulation of Natural Monopolies dated 30.07.2003 and last amended 2009);

- possibility to obtain a profit that ensures effective functioning of an oil transport pipeline company (that is a profit which provides normal work of an oil pipeline company, including work for rehabilitation, technical re-equipment and upgrading of the productive facilities). The profit limits are determined in accordance with Instruction for calculation of the Rate of Profit From regulated Base of the Assets Involved of the entities of the Natural Monopolies That Render Service of Trunk Oil and Product Piping approved by Order #304-OD of the Chairman of the Agency of
Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia


The transportation tariff is calculated as a unit rate tariff: for transportation of one ton per 1,000 km.

- The unit tariff rate is calculated as the Proceeds divided by the Turnover.
- The Proceeds are a sum of Allowed costs, Profit limit and Taxes. The before mentioned Special Procedure and Instructions for calculation refer to determination of the Allowed costs and the Profit limit.

The tariff per one ton can be calculated as a product of a unit rate and the distance.

In accordance with the Special Procedure, the tariff is calculated on the basis of separate accounting of costs by a type of activity. When calculating tariffs for transport of oil within the established restrictions by the applicable law of the Republic of Kazakhstan, the following costs are taken into account: material costs, salaries expenses, depreciation, costs of maintenance and other repair and rehabilitation work, maintenance and repairs by contract, other production costs generated by outside companies; costs related to regulatory technical losses; costs related to compulsory insurance, taxes, duties and payments, costs related to environment protection, use of natural resources, costs related to audit, consulting, and marketing services, representative costs, business travelling expenses of the administrative personnel, expensive telecommunication cost, periodical press, office vehicle costs, information and consulting services, costs of salary increase for qualified administrative personnel, costs related to repayment of interests for credits extended for implementation of investment project of an entity of natural monopolies.

In addition, the Agency of the Republic of Kazakhstan for Regulation of Natural Monopolies can include into the tariffs overhead expenses that were included in the former tariffs in line with the consumer index pricing for a period before a change in tariffs. The Agency can make a decision to change the overhead expenses that are included into the tariffs as a result of an audit of the actual structure of administrative expenses. An increase in overheads beyond the consumer price index as well as incorporating expenses for maintenance and improvement of the system and instruments of management, can only be allowed after the consent of the Agency. This is only possible after its consideration of the estimation of economic effectiveness of the investments into the targets above.

The Special Procedure establishes a list of expenses that are not included in tariff structure for the services of an oil transport company. They can be referred to either unregulated types of activity or to expenses incurred from the profit of a company. In this case they must be agreed on with the Agency.

The Profit is calculated on the basis of a profit rate for a regulated base of the assets involved. A special order establishes the Profit limits, which are included in tariffs. It is determined in accordance with the Instruction for calculation of the Rate of Profit. The instruction allows for a mechanism of calculation of the acceptable level of profit that is
incorporated into a tariff and taken into account when calculating the tariffs and their approval. The rate of profit for the regulated base of the assets of a pipeline company involved is determined as an average value of capital (a value that characterises a rate of profitability for both the borrowed and own capital that reflects the investment risks related to oil transportation). It also incorporates risk levels associated with specific activities.

During the last ten years the Agency of the Republic of Kazakhstan for Regulation of Natural Monopolies was able to introduce reduction factors to the domestic tariffs. In accordance with the Rules for Setting and Cancelling Tariffs with Reduction Factor for the Services for Transportation of Oil through Trunk Pipelines in the Domestic Market that are approved by Order #166-OD of the Chairman of the Agency of the Republic of Kazakhstan for Regulation of Natural Monopolies, Protection of Competition and Support of Small Business dated 15.08.2001, it was allowed to apply reduction factors to the tariffs for services in oil transportation through the pipelines to the domestic market. Setting of tariffs with use of the reduction factor is made by the Agency on the initiative of the shipper, the Ministry of Energy and Mineral Resources of the Republic of Kazakhstan or a pipeline company. However in February 2011 this regulation was abolished.

The Agency of the Republic of Kazakhstan for Regulation of Natural Monopolies regulates tariff for oil pipelines of KazTransOil and for the Kazakhstan-China pipeline together with Kenkiyak-Atyrau section. There is also a trunk 187-km pipeline, a part TON-2 pipeline, initially belonging to Transneft, crossing the territory of Kazakhstan. This pipeline section was declared in 2005 to be a property of Kazakhstan and was leased by a decision of the Akimat of the Severo-Kazakhstansky Province to the company Altayfrakht. Due to lack of an applicable law on natural monopolies in the Republic of Kazakhstan, the activities of the Altayfrakht are not regulated by the government. This company does not render services on oil transportation to any natural or legal person of the Republic of Kazakhstan. Accordingly, there is no method to calculate tariffs for this section, i.e. in this case a purely voluntaristic approach of tariff setting was applied. As a result, the oil companies that use the routes of Transneft through this 187-km section of the pipeline have to pay times more for oil transmission. Later the control over this pipeline section was handed over to Kaztransoil. The tariff however remained unchanged till today.

4.5. CPC

The tariff policy of the CPC is beyond jurisdiction of Russian and Kazakhstan law. When the shareholders established the CPC there was not yet a law on the natural monopolies in the country. The Resolution #235 of the Government of the Russian Federation dated 26 march 1994 On Construction of Export Pipeline of the System of the Caspian Pipeline Consortium Tengiz Astrakhan-Novorossiysk stated that when transporting oil through the pipeline system of the Caspian Pipeline Consortium, a tariff that was calculated in accordance with provisions of the Protocol to Agreement for Pipeline Consortium would be applied. Later on Resolution #486 of the Government of the Russian Federation of 25.04.1997 The Issues of the Caspian Pipeline Consortium determined that in accordance with the Agreement for the Caspian Pipeline Consortium and the
Shareholders Agreement it is the CPC-R that sets and collects tariffs for the services in transportation of the liquid hydrocarbons through the system of the Caspian Pipeline Consortium through the territory of the Russian Federation, as well as regulates and establishes the rules that define an access of the users to the system.

In accordance with the Shareholders Agreement of the CPC dated 6 December 1996, the initial tariff for transportation of oil through the system of the CPC is determined to be US$25 per ton. The same document stipulates an annual indexation of the established tariff to the changes in producer price index in the USA, which is published by the Bureau for Labour Statistics of the Department of Labour of the USA.

In 2008 the CPC shareholders reached an agreement to expand the transmission capacity of the CPC pipeline up to 1.34 mb/d or 67 MT/Y and to increase the tariff up to US$38 per ton.¹

### 4.6. Uzbekistan

In accordance with Article 4 of the Law #398-I of the Republic of Uzbekistan of April 24 1997 On Natural Monopolies in Uzbekistan, the government should regulate and control natural monopolies in piping oil and petroleum products. According to Paragraph 2 of Resolution #364 of the Cabinet of Ministers of the Republic of Uzbekistan of 21.09.2000 On the Measures to Implement the Law of the Republic of Uzbekistan On the Natural Monopolies, the Ministry of Finance of the Republic of Uzbekistan is authorised to regulate natural monopoly prices.

This Resolution of the cabinet of Ministers of the Republic of Uzbekistan also approved the Regulations For the Procedure of setting Tariffs for the Services of the natural Monopolies, which includes pipeline companies. There is not a separate methodology of setting tariffs for transportation of oil and petroleum products by pipeline. The regulating body can set both tariffs and their individual levels.

For setting tariffs or their ceiling levels, pipeline companies need to submit the following to the regulating body:

- costs of services extended;
- breakdown of salaries;
- breakdown of cost of raw material;
- breakdown of operational costs (overheads, including depreciation);
- breakdown of gross profit, period expenses (including taxes and other compulsory payments);
- need of investments required for economic sustainability;
- need in state allowances or other measures of the government support.

Chapter 4: Transport Tariff Methodologies for Domestic, Cross-Border and Transit Pipelines in FSU Countries, Turkey, Romania and Croatia

The pricing control body makes a decision within a week of the reception of all required documents for its consideration of tariffs or their ceiling levels. In case of non-submission of justifying materials or with economically un-justified estimations, the body of pricing regulation within a three-day period returns the documents for proper re-preparation, with a written notification on the shortcomings. Decision on approval of the tariffs in such a case is made within five days of the reception of a full package of the finalised documents.

When making a decision on a level of tariffs, the body of pricing regulation takes into account its influence on consumer product prices. The natural monopolies, which carry out delivery of goods outside Uzbekistan, make calculations of the tariffs on a free contractual basis (free prices).

4.7. Georgia

Georgia has no special regulation on tariff setting for oil and products pipelines. The government collects transit tariffs in a sense of government charge or ‘royalty’ from each ton of crude oil mover through its territory according to Agreements with pipeline consortiums of Baku-Supsa and BTC.

In compliance with the contract for construction of the pipeline Baku-Supsa the Georgian party has a base tariff of $0,17 dollars per barrel of transmitted oil. The base tariff can change with regard of inflation, the inflation indicator being taken from the Bulletin of the Department of Trade of the USA.

This tariff is related to the oil of the participating companies. In case of delivery through pipeline of oil that belong to other producers, the tariff is set in accordance with agreements with the participating companies and SOCAR. In this case, the tariff must not be lower than tariff for the participating companies. The Georgian party, in principle, has a possibility to increase a tariff. To do this first it needs to compensate all expenses of the investors for construction of the pipeline.

4.8. Azerbaijan

In accordance with Article 5 of the Law #590-IQ of the Azerbaijan Republic dated December 15 1998 On the Natural Monopolies, it is the state that regulates activities of the natural monopolies in oil and petroleum products trunk pipeline transportation.

According to the Order #446 of the President of the Azerbaijan Republic dated 02.03.2001 On the Additional measures To Ensure for Application of the Law of the Azerbaijan Republic On the Natural Monopolies and Order #495 dated 11.06.2001 On Approval of the Regulations of the Ministry of Economic Development of the Azerbaijan Republic, it is the Ministry of the Economic Development of the Azerbaijan Republic which implements the regulations that are applied in relation to any of the natural monopolies, and adopts a mandatory for all decisions on their application. The regulating function to control activity of the natural monopolies is carried out by the State Service for Antimonopoly Policy and Protection of Consumers’ Rights
under the Ministry of Economic Development (introduced by a decree on Improving Antimonopoly Policy and Protection of Consumers’ Rights dated 25.06.2009).

The tariffs for the services of the natural monopolies are set by the Tariff Council headed by the Minister of Economic Development of the Azerbaijan Republic. According to the decree of the President of the Republic of Azerbaijan #341 dated December 26.12.2005 the Tariff Council is also developing methodologies of tariff setting. However there are no regulations on tariff setting for oil and products pipelines yet.

The state owned company SOCAR (State Oil Company of Azerbaijan Republic) plays an important role in the oil and gas sector. SOCAR at present combines an operating role covering upstream oil and gas, refining, transportation and sales of crude oil and refined products, with a holding company role associated with its ownership interest in Azerbaijan – Chirag-Guneshli, BTC, Shah Deniz, and other ventures, plus certain oil related regulatory functions including the role as a competent authority to deal with international investors in the oil and gas sector.

4.8.1. Baku-Supsa

In Azerbaijan operational costs of the shippers for transportation of oil initially were reimbursed according to the scheme of the signed PSA. The same situation was preserved when oil was transmitted through the Baku-Supsa oil pipeline from the Chirag field. Since production of the first oil in the central part of the Azeri field started, the principle of payment for transmission services through the Baku-Supsa pipeline has changed. This is because they started transmission of oil in the western direction through multiple routes. At this time the shippers themselves paid operational costs. Payment of operational costs is distributed on the basis of volumes of oil that are delivered by each shipper. The more volumes are delivered by a particular shipper per month, the more operational costs, naturally, the shipper pays. However, the change in the service payment scheme of the Baku-Supsa pipeline does not affect the volumes of the payments.

At present the transit tariff includes a royalty component. US$0.29 per barrel (US$2.14 per ton) is paid to the government of Azerbaijan as a transit tariff (and US$0.17 per barrel (US$1.48 per ton) to Georgia as shown above).

4.8.2. Baku-Tbilisi-Ceyhan

The tariff of the BTC pipeline is a complex issue determined by the shareholders. The tariff rate may vary for the oil belonging to a certain member of the consortium depending on the extent of his participation in the project. The crude oil from third parties, i.e. non-members, requires consent of consortium shareholders and their decision on the tariff fee. So the transit tariff of third parties is a negotiated one.
4.9. Turkey

The Petroleum Market Law dated 14/12/2003 defines that tariffs for pipeline transportation shall be prepared by the operators and implemented pursuant to the approval of the Energy Market Regulatory Board. The Energy Market Regulatory Board shall render decisions on the applications for tariff approvals within 30 days following the application date. However, in the case there are risks that the tariff are hindering, disrupting or restricting the competitive environment and delivery in the petroleum market, the Energy Market Regulatory Authority shall be authorised to determine base and / or ceiling price.

4.10. Romania

According to the Petroleum Law #281 dated 07/06/2004 the National Agency for Natural Resources is responsible for development of tariff setting methodologies for oil and products pipelines. The currently active methodology was introduced by Order #53 dated 21.03.2008.

The methodology in use is based on a cost-of-service principle. The tariff proceeds should allow:

- to cover operational costs, including expenses for the materials used; labour costs; maintenance; expenses for electric power; depreciation; security services; rent payments to land owners etc.;
- for modernisation and development;
- for a reasonable profit.

The tariffs are set for particular destinations (refineries) but separately for each sub-system of Conpet pipeline system, i.e. for import and domestic pipelines. Therefore the costs for oil transportation services related to those sub-systems are accounted separately. Based on those costs the tariffs for both sub-systems are determined in a similar way. The sum of costs of service for planned deliveries to a certain destination, modernisation costs and profit is divided by the planned transportation volume to that destination. The result is the tariff to a specific destination point in lei per ton.

As the result of the tariff calculation is based on the planned transportation volume it can vary depending on the actual amount of oil / product delivered. The ranges of volumes delivered and corresponding tariff de-escalation can be set.

The tariffs are determined annually, but the year-to-year growth shouldn’t exceed 10% if the inflation rate is lower.
4.11. Croatia

The tariff system for oil and products pipelines is enacted by the Croatian Energy Regulatory Agency. This is set in the Article 4 of the Oil and Petroleum Products Market Act dated 12/05/2006 together with the main principle for tariff determination.

The tariff should be based on:

• costs, to be calculated pursuant to internationally approved practice,
• negotiated economic and financial terms,
• application of any other recognised method or combination of such methods.

The acting Tariff system for transportation of oil by oil pipeline was introduced by Croatian Energy Regulatory Agency in 2007. The tariffs are defined for two major groups of shippers (pipeline users):

• those who are using the pipeline of the length up to 20 km and coastal terminals receive an average tariff expressed in kuna per ton (kuna/t);
• those who are using pipeline longer than 20 kilometres, coastal and land terminals receive an average tariff expressed in kuna per ton per 100 kilometres (kuna/t100km).

The tariff calculation method for both groups is similar. It should meet the following goals:

• covering total operating costs consisting of material costs (raw material and material, energy costs, production costs and other material costs), personnel costs and other costs,
• insurance of investments in oil pipeline transport system development,
• insurance of return on assets, that is, return on investments in oil pipeline transportation system,
• safety maintenance of transportation system,
• environmental protection.

Based on that operation costs for a planned period are calculated together with depreciation, return on assets and investments resulting in total planned tariff proceeds which are then divided by planned volumes or turnover to receive the average tariffs.

In reality, negotiated tariffs are applied. That means that every year the operator of the transportation system negotiates the tariffs with the users and concludes the contracts on oil transportation.
CHAPTER 5. Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

5.1. Cross-Border and Transit Oil Pipelines Tariffs

This Chapter gives a comparative analysis of actual cross-border, transit and domestic tariffs. Data on actual cross-border and transit tariffs for main oil flows in specific countries are given to provide a cross-country comparison. Then the cross-border/transit tariffs are being compared to domestic ones in relevant countries. Same analysis is further made for petroleum products flows.

5.1.1. Russia

Russia has two transit flows through the Transneft pipeline system; one from Kazakhstan and the other from Azerbaijan. The tariffs are determined in a different way: the tariff for Azerbaijan is a negotiable one, the Kazakhstan transit tariff is equal to domestic tariffs determined methodologically (see 4.1.2.).

The transit tariff for crude oil transportation from Azerbaijan to Novorossiysk (Baku-Novorossiysk pipeline) has been fixed at US$15.67 per mt. This tariff is set by the inter-governmental agreement between the two countries and has been valid since 01/01/1996.

Transit tariffs for Kazakhstan crude oil were last amended by FTS Resolution no. 496-э/1 on 30/12/2010.

The tariffs for transit of oil entering the Transneft pipeline system at Bolshaya Tchernigovka PS of the Atyrau-Samara pipeline depend on export destination:

<table>
<thead>
<tr>
<th>Destination</th>
<th>Tariff RUR per mt</th>
<th>Tariff USD per mt*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primorsk</td>
<td>905.00</td>
<td>31.91</td>
</tr>
<tr>
<td>Novorossiysk</td>
<td>773.98</td>
<td>27.29</td>
</tr>
<tr>
<td>Russian-Ukrainian border</td>
<td></td>
<td></td>
</tr>
<tr>
<td>via 915 km (to Lisichansk)</td>
<td>381.39</td>
<td>13.45</td>
</tr>
<tr>
<td>via Nikolskoye (to Kremenchug)</td>
<td>462.23</td>
<td>16.30</td>
</tr>
<tr>
<td>Russian-Belarus border (Druzhba)</td>
<td>527.19</td>
<td>18.59</td>
</tr>
</tbody>
</table>

*Here and after the tariffs set in national currencies are recalculated to USD for reference purpose exchange rate applied as set out in Chapter 1.6.

The Kazakhstan crude oil delivered via Makhachkala-Novorossiysk pipeline is charged 283.92 RUR (US$ 10.01) per mt.

The cross border tariffs for Russian producers are basically the same as domestic ones as set out in 5.3.1. Worth noting is the ESPO tariff which is a network one and includes
a combination of transportation legs. The rate of 1,810 rubles (US$ 64) is charged for one metric ton delivered by the ESPO pipeline irrespective the destination and route: to China via embranchment or from Skovorodino by railway to Kozmino port.

5.1.2. Belarus

The transit and cross-border tariffs of Belarus set 29/12/2010 are as follows:

<table>
<thead>
<tr>
<th>Origin</th>
<th>Destination</th>
<th>Tariff, RUR per mt</th>
<th>Tariff, US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia (via Bobovichi)</td>
<td>Germany, Poland (via Mozyr)</td>
<td>165,52</td>
<td>5,84</td>
</tr>
<tr>
<td>Russia (via Bobovichi)</td>
<td>Ukraine (via Mozyr)</td>
<td>71,09</td>
<td>2,51</td>
</tr>
<tr>
<td>Russia (via Bobovichi)</td>
<td>Mozyr refinery</td>
<td>35,28</td>
<td>1,24</td>
</tr>
<tr>
<td>Russia (via Nevel)</td>
<td>Novopolotsk refinery</td>
<td>20,08</td>
<td>0,71</td>
</tr>
<tr>
<td>Russia (via Kostukovichi)</td>
<td>Novopolotsk refinery</td>
<td>77,06</td>
<td>2,72</td>
</tr>
</tbody>
</table>

The tariffs are set by a Resolution of the Ministry of Economics of Belarus and are claimed to be methodologically justified. However there are no methodologies publicly available (see Chapter 4.3.).

5.1.3. Ukraine

The tariffs of “Ukrtransnafta” for transit of crude oil coming from the Transneft system via the Druzhba pipeline set in December 2010 are a result of negotiations and are as follows:

<table>
<thead>
<tr>
<th>Origin</th>
<th>Destination</th>
<th>Tariff (EUR per mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus</td>
<td>Slovakia</td>
<td>7.10</td>
</tr>
<tr>
<td>Belarus</td>
<td>Hungary</td>
<td>7.10</td>
</tr>
<tr>
<td>Belarus</td>
<td>Brody PS (loading into tank cars)</td>
<td>3.90</td>
</tr>
<tr>
<td>Belarus</td>
<td>Yuzhn terminal (Odessa-Brody reversed)</td>
<td>5.95</td>
</tr>
</tbody>
</table>

The tariffs of “Ukrtransnafta” for crude oil coming from the Transneft system to domestic refineries set in December 2010 calculated based on methodology (see Chapter 4.2) are as follows.
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

<table>
<thead>
<tr>
<th>From</th>
<th>Destination</th>
<th>Tariff, UAH / 1 mt</th>
<th>Tariff, US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus (via Druzhba)</td>
<td>Galychina refinery</td>
<td>21.30</td>
<td>2.67</td>
</tr>
<tr>
<td>Belarus (via Druzhba)</td>
<td>Nadvirnyanski refinery</td>
<td>26.20</td>
<td>3.29</td>
</tr>
<tr>
<td>Russia (via Velikotsk)</td>
<td>Lisitchansk refinery</td>
<td>9.40</td>
<td>1.18</td>
</tr>
<tr>
<td>Russia (via Velikotsk)</td>
<td>Krementchug refinery</td>
<td>22.00</td>
<td>2.76</td>
</tr>
<tr>
<td>Russia (via Velikotsk)</td>
<td>Odessa refinery</td>
<td>37.90</td>
<td>4.76</td>
</tr>
<tr>
<td>Russia (via Velikotsk)</td>
<td>Kherson refinery</td>
<td>32.60</td>
<td>4.09</td>
</tr>
<tr>
<td>Russia (via Michurinsk)</td>
<td>Krementchug refinery</td>
<td>13.70</td>
<td>1.72</td>
</tr>
<tr>
<td>Russia (via Michurinsk)</td>
<td>Kherson refinery</td>
<td>24.30</td>
<td>3.05</td>
</tr>
<tr>
<td>Russia (via Michurinsk)</td>
<td>Odessa refinery</td>
<td>29.60</td>
<td>3.71</td>
</tr>
</tbody>
</table>

The tariffs of “Ukrtransnafta” for crude oil coming via port of Odessa are as follows.

<table>
<thead>
<tr>
<th>From</th>
<th>Destination</th>
<th>Tariff, UAH / 1 mt</th>
<th>Tariff, US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odessa</td>
<td>Galychina refinery</td>
<td>29.50</td>
<td>3.70</td>
</tr>
<tr>
<td>Odessa</td>
<td>Nadvirnyanski refinery</td>
<td>31.00</td>
<td>3.89</td>
</tr>
<tr>
<td>Odessa</td>
<td>Krementchug refinery</td>
<td>20.50</td>
<td>2.57</td>
</tr>
</tbody>
</table>

5.1.4. Kazakhstan

The CPC pipeline tariff is US$38 per mt and is a result of a shareholders decision (see Chapter 4.5.).

The tariff for Russian transit through the TON-2 section Omsk-Moskalenki-Yurgamyshev is US$2.50 per mt and is of a rather negotiable nature (see Chapter 4.4.).

The tariffs for Kaztransoil pipelines are derived methodologically:

The Atasu-Alashankou pipeline tariff is 3818 tenge per ton for 1000 km set by Resolution 391-ОД dated 8.12.2009.

The Kaztransoil export tariff is 3331 tenge per ton for 1000 km (Resolution 366-ОД dated 23.11.2009).

<table>
<thead>
<tr>
<th>Tariffs</th>
<th>Tenge/1000 km</th>
<th>US$ / 1000 km</th>
<th>US$ / 100 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaztransoil cross-border tariff</td>
<td>3331</td>
<td>22.86</td>
<td>2.29</td>
</tr>
<tr>
<td>Atasu-Alashankou</td>
<td>3818</td>
<td>26.20</td>
<td>2.62</td>
</tr>
</tbody>
</table>
5.1.5. Baku-Supsa (Georgia-Azerbaijan)

In compliance with the construction contract of the Baku-Supsa pipeline the Georgian party has a base tariff of US$ 0.17 per barrel (US$1.48 per ton) of transmitted oil. As mentioned earlier it is rather a royalty, the same as the US$0.29 per barrel (US$2.14 per ton) to be paid to the government of Azerbaijan. The tariff is subject to slight periodical changes due to a quarterly inflation amendment. The total actual tariff is reported by Argus Caspian Market at US$10.70 per ton\(^2\) and is determined by the shareholders.

5.1.6. Poland

The PERN Przyjaźń company negotiates transit tariffs with the shippers. The company does not disclose the info on actual tariff rates due to commercial confidentiality reasons. There are indications on specific tariffs published by the Ministry of Economics of Belarus in 2007\(^3\) stating the tariff rate for oil transit to Germany via Poland to be about 0.90 USD/mt per 100 km.

5.1.7. Slovakia

The tariffs that Transpetrol negotiates with the shippers are part of the transportation agreements and such information is considered to be confidential. Therefore the data on actual tariff used are not publicly available. However an estimated tariff by direction can be derived from annual reports and financial statements (latest available – for the year 2009).

Transpetrol has three major transportation routes for crude oil, delivered by the Druzhba pipeline from Ukraine: to Czech Republic, to Slovnaft refinery and via Šahy-Százhalombatta pipeline to Hungarian border. The volumes delivered in 2009 were as follows.

<table>
<thead>
<tr>
<th>Crude oil delivered to</th>
<th>Volume, MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovnaft</td>
<td>5.674</td>
</tr>
<tr>
<td>Czech Refineries</td>
<td>5.008</td>
</tr>
<tr>
<td>Šahy – Hungarian border</td>
<td>0.109</td>
</tr>
</tbody>
</table>

The tariff revenue received in 2009 can be attributed to each direction:

<table>
<thead>
<tr>
<th></th>
<th>Revenue, million EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovnaft</td>
<td>27.104</td>
</tr>
<tr>
<td>Czech Refineries</td>
<td>25.909</td>
</tr>
<tr>
<td>Šahy – Hungarian border</td>
<td>0.406</td>
</tr>
</tbody>
</table>

---


\(^3\) See http://afn.by/news/i/83056.
This brings to the tariff in EUR and USD for each direction:

<table>
<thead>
<tr>
<th></th>
<th>EUR/mt</th>
<th>USD/mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovnaft</td>
<td>4.78</td>
<td>6.82</td>
</tr>
<tr>
<td>Czech Refineries</td>
<td>5.17</td>
<td>7.39</td>
</tr>
<tr>
<td>Šahy – Hungarian border</td>
<td>3.72</td>
<td>5.32</td>
</tr>
</tbody>
</table>

### 5.1.8. Czech Republic

The tariffs that Mero CR negotiates with the shippers are part of the transportation agreements and such information is considered to be confidential. Therefore the data on actual tariff used are not publicly available. Due to complexity of the Mero pipeline system, that includes IKL and Druzhba lines, a straightforward analysis is less accurate. However an estimated tariff by direction can still be derived from annual report and financial statements (latest available – for the year 2009).

The volumes of oil moved through the Druzhba and Czech IKL part in 2009 amounted to 7453 MT.

<table>
<thead>
<tr>
<th>Crude oil delivered by</th>
<th>Volume, MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Druzhba</td>
<td>5278</td>
</tr>
<tr>
<td>IKL</td>
<td>2175</td>
</tr>
<tr>
<td>Total</td>
<td>7453</td>
</tr>
</tbody>
</table>

The tariff revenue received from those operations makes 1383 million Czech Korunas. However only 796 million Kc can be attributed to the Czech part of IKL and the Druzhba. The revenue from operations of IKL Germany include not only transportation in the German part but also cover the expenses for oil delivery by the TAL pipeline and the handling costs of the tankers in Trieste.

<table>
<thead>
<tr>
<th></th>
<th>Revenue, million Kc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Druzhba + IKL</td>
<td>796</td>
</tr>
<tr>
<td>IKL Germany</td>
<td>587</td>
</tr>
<tr>
<td>Total</td>
<td>1383</td>
</tr>
</tbody>
</table>

Supposed that the unit tariff for IKL and the Druzhba pipeline is equal, a tariff of 150.80 Czech Korunas (7.72 US$) for each mt can be derived irrespective the direction. The tariff for each section can then be calculated using the info on the pipeline length.

<table>
<thead>
<tr>
<th></th>
<th>Transit tariff, US$/mt</th>
<th>Distance, km</th>
<th>US$/100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Druzhba + IKL</td>
<td>7.72</td>
<td>528</td>
<td>1.46</td>
</tr>
</tbody>
</table>
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

Tariff by section then will be:

<table>
<thead>
<tr>
<th></th>
<th>US$/100 tkm</th>
<th>Distance, km</th>
<th>Transit tariff, US$/mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Druzhba</td>
<td>1.46</td>
<td>358</td>
<td>5.23</td>
</tr>
<tr>
<td>IKL</td>
<td>1.46</td>
<td>170</td>
<td>2.48</td>
</tr>
</tbody>
</table>

However this is based on assumption that the unit tariff is equal for IKL and the Druzhba that may not be the case.

5.1.9. Hungary

Hungarian MOL is the owner and user of the pipelines in Hungary. There are no publicly available indications on the tariffs as they are an internal affair of the company. It is known that those used for supplying of MOL refineries are cost based.

5.1.10. Romania

The actual tariffs are established by Order #42 dated 14/01/2010 and amended by Order #19 dated 19/01/2011. The tariffs are determined methodologically (see Chapter 4.10).

Tariff for crude oil transportation from Constanta to Arpechim refinery, depending on volumes delivered, is as follows.

<table>
<thead>
<tr>
<th>Quantity, mt</th>
<th>Lei / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 60,000</td>
<td>25.42</td>
<td>8.77</td>
</tr>
<tr>
<td>From 60,000 to 100,000</td>
<td>24.03</td>
<td>8.29</td>
</tr>
<tr>
<td>From 100,000 to 150,000</td>
<td>23.88</td>
<td>8.23</td>
</tr>
<tr>
<td>Above 150,000</td>
<td>20.91</td>
<td>7.21</td>
</tr>
</tbody>
</table>

Tariff for crude oil transportation from Constanta to Ploiesti terminal, depending on volumes delivered, is as follows.

<table>
<thead>
<tr>
<th>Quantity, mt</th>
<th>Lei / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 60,000</td>
<td>25.42</td>
<td>8.77</td>
</tr>
<tr>
<td>From 60,000 to 100,000</td>
<td>24.73</td>
<td>8.53</td>
</tr>
<tr>
<td>From 100,000 to 150,000</td>
<td>23.74</td>
<td>8.19</td>
</tr>
<tr>
<td>Above 150,000</td>
<td>20.91</td>
<td>7.21</td>
</tr>
</tbody>
</table>

Tariff for crude oil transportation from Constanta to Rafo Onesti refinery, depending on volumes delivered, is as follows.
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

<table>
<thead>
<tr>
<th>Quantity, mt</th>
<th>Lei / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 60,000</td>
<td>25.42</td>
<td>8.77</td>
</tr>
<tr>
<td>From 60,000 to 100,000</td>
<td>24.03</td>
<td>8.29</td>
</tr>
<tr>
<td>From 100,000 to 150,000</td>
<td>23.32</td>
<td>8.04</td>
</tr>
<tr>
<td>Above 150,000</td>
<td>20.91</td>
<td>7.21</td>
</tr>
</tbody>
</table>

Tariff for crude oil transportation from Constanta to Petromidia refinery, depending on volumes delivered, is as follows.

<table>
<thead>
<tr>
<th>Quantity, mt</th>
<th>Lei / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 60,000</td>
<td>6.50</td>
<td>2.24</td>
</tr>
<tr>
<td>From 60,000 to 100,000</td>
<td>5.95</td>
<td>2.05</td>
</tr>
<tr>
<td>From 100,000 to 150,000</td>
<td>5.44</td>
<td>1.88</td>
</tr>
<tr>
<td>Above 150,000</td>
<td>3.79</td>
<td>1.31</td>
</tr>
</tbody>
</table>

The tariffs for delivery to Petromidia refinery are lower because it is located near Constanta port.

5.1.1. Croatia

The tariffs for the JANAF system are determined methodologically (see Chapter 4.11.) and set for two major groups of shippers:

- those who are using the pipeline of the length up to 20 km and coastal terminals – 19.96 kuna per ton;
- those who are using pipeline longer than 20 km, coastal and land terminals 24.29 kuna per ton per 100 kilometres.

<table>
<thead>
<tr>
<th>Tariffs</th>
<th>Kuna / 100 km</th>
<th>US$ / 100 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>length up to 20 km</td>
<td>19.96</td>
<td>3.85</td>
</tr>
<tr>
<td>longer than 20 km</td>
<td>24.29</td>
<td>4.68</td>
</tr>
</tbody>
</table>

The tariffs were introduced by Order, Official Gazette No. 57 dated 04/06/2007 as well as by Order, Official Gazette No. 53 dated 11/05/2011.

The tariffs that JANAF Plc. negotiates with the shippers are part of the transportation agreements and such information is considered to be confidential. Therefore, the data on tariffs actually used are not publicly available. The negotiated tariffs are lower than regulated tariffs.

5.1.12. Turkey

The BTC transit tariff for third parties is said⁴ to be about US$4.05 per barrel in 2010 for the whole distance. The tariff is determined by the shareholders. However this tariff

⁴ See http://news.day.az/economy/249547.html.
may vary from one supplier to other. The tariffs for 2011 are quoted by Argus Caspian
Market to be US$5.25 per barrel for BTC shareholders and in a range of US$5.25 to
US$7 per barrel for the third parties.

The Kirkuk-Ceyhan transit tariff is a negotiated one. According to publically available
information it was raised from US$0.75 to US$1 per barrel in course of transit agreement
renewal between Turkey and Iraq in September 2010.\(^5\)

### 5.2. Cross-Country Comparison of Transit Tariffs

All data are summarised in the following table. It should be noted, however, that
straight comparisons are not necessarily self-explanatory because of technical
differences (diameter, transported volumes, etc.). Therefore, diameters are given
for reference next to the name of the pipeline. For comparative purposes US$ per
100 tkm is used as the unit. All tariffs were recalculated to US$ using exchange
rates given in the Introduction.

<table>
<thead>
<tr>
<th>Country</th>
<th>Transit tariff, US$/mt</th>
<th>Distance, km</th>
<th>US$/100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus (Russia-Ukraine), Druzhba, 720 / 720 mm</td>
<td>2.51</td>
<td>245</td>
<td>1.02</td>
</tr>
<tr>
<td>Belarus (Russia-Poland), Druzhba, 630 / 820 mm</td>
<td>5.84</td>
<td>624</td>
<td>0.94</td>
</tr>
<tr>
<td>Ukraine (Belarus-Slovakia), Druzhba, 530 / 720 mm</td>
<td>10.14</td>
<td>684</td>
<td>1.48</td>
</tr>
<tr>
<td>Ukraine (border – Brody-Odessa), 720, 1020 mm</td>
<td>8.50</td>
<td>1039</td>
<td>0.82</td>
</tr>
<tr>
<td>Poland Druzhba, 630 / 820 mm*</td>
<td>-</td>
<td>660</td>
<td>0.90</td>
</tr>
<tr>
<td>Slovakia Druzhba to Czech Republic*, 720 / 530</td>
<td>7.39</td>
<td>444</td>
<td>1.66</td>
</tr>
<tr>
<td>Slovakia Druzhba to Hungary*, 400 mm</td>
<td>5.32</td>
<td>280</td>
<td>1.90</td>
</tr>
<tr>
<td>Czech Republic Druzhba*, 530 mm</td>
<td>5.23</td>
<td>357</td>
<td>1.46</td>
</tr>
<tr>
<td>Czech Republic IKL*, 710 mm</td>
<td>2.48</td>
<td>170</td>
<td>1.46</td>
</tr>
<tr>
<td>Russia (Caspian Sea-Black Sea), Makhachkala-Novorossyisk, 720 mm</td>
<td>10.01</td>
<td>774</td>
<td>1.29</td>
</tr>
<tr>
<td>Russia (Azerbaijan-Black Sea), Baku-Novorossyisk, 720 mm</td>
<td>15.67</td>
<td>1411</td>
<td>1.11</td>
</tr>
<tr>
<td>Caspian Pipeline Consortium (Kazakhstan-Russia), 1016 mm</td>
<td>38.00</td>
<td>1511</td>
<td>2.51</td>
</tr>
<tr>
<td>Kaztransoil cross-border tariff</td>
<td>-</td>
<td>-</td>
<td>2.29</td>
</tr>
<tr>
<td>Kazakhstan (Russia-Russia), Omsk-Moskalenki-Yurgamysh, 700 mm</td>
<td>2.50</td>
<td>187</td>
<td>1.34</td>
</tr>
<tr>
<td>Kazakhstan, Atasu-Alashankou, 813 mm</td>
<td>-</td>
<td>962</td>
<td>2.62</td>
</tr>
<tr>
<td>Turkey, Kirkuk-Ceyhan, 1,168 / 1,016 mm</td>
<td>7.30</td>
<td>656</td>
<td>1.11</td>
</tr>
<tr>
<td>BTC shareholders*, 1,168-1,016 mm</td>
<td>33.00</td>
<td>1776</td>
<td>1.86</td>
</tr>
<tr>
<td>BTC third parties*, 1,168-1,016 mm</td>
<td>55.00</td>
<td>1776</td>
<td>3.10</td>
</tr>
<tr>
<td>Baku-Supsa*, 530 mm</td>
<td>10.70</td>
<td>827</td>
<td>1.29</td>
</tr>
</tbody>
</table>

*data based on information obtained from publicly available sources. See previous
Section for details

---

\(^5\) Turkey Renews its Negotiation with Iraq, see http://www.energymile.com/?p=415.
5.3. Comparison of Transit and Cross-Border Tariffs with Domestic Tariffs

5.3.1. Russia

The current domestic and cross-border tariffs were introduced on 29/06/2010 by the FTS of Russia. The tariffs are calculated according to the current methodology in ruble per 100 tkm for each pipeline transportation enterprise. Currently there is no difference in tariffs for deliveries to domestic refineries and for export.

In addition to the tariffs of each enterprise, the tariffs for services provided for order performance and dispatching are charged at the rate of 25.3830 rubles per 100 tkm. Summing up tariffs and dispatch rates and converting them into US$ per 100 tkm, the tariffs are outlined in the following table.

<table>
<thead>
<tr>
<th>Company</th>
<th>Ruble / 100 tkm</th>
<th>US$ / 100 tkm</th>
<th>Dispatch rate, US$/100 tkm</th>
<th>Total tariff, US$/100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sibnefteprovod</td>
<td>7.4545</td>
<td>0.26</td>
<td>0.90</td>
<td>1.16</td>
</tr>
<tr>
<td>Centersibnefteprovod</td>
<td>8.0955</td>
<td>0.29</td>
<td>0.90</td>
<td>1.18</td>
</tr>
<tr>
<td>Transsibneft</td>
<td>9.4260</td>
<td>0.33</td>
<td>0.90</td>
<td>1.23</td>
</tr>
<tr>
<td>Vostoknefteprovod</td>
<td>13.5662</td>
<td>0.48</td>
<td>0.90</td>
<td>1.37</td>
</tr>
<tr>
<td>Uralisibnefteprovod</td>
<td>10.9944</td>
<td>0.39</td>
<td>0.90</td>
<td>1.28</td>
</tr>
<tr>
<td>Severo-Zapadnye</td>
<td>10.4322</td>
<td>0.37</td>
<td>0.90</td>
<td>1.26</td>
</tr>
<tr>
<td>Verkhnevolzhsknefteprovod</td>
<td>11.9870</td>
<td>0.42</td>
<td>0.90</td>
<td>1.32</td>
</tr>
<tr>
<td>Privolzhsknefteprovod</td>
<td>13.1175</td>
<td>0.46</td>
<td>0.90</td>
<td>1.36</td>
</tr>
<tr>
<td>Druzhba</td>
<td>11.0779</td>
<td>0.39</td>
<td>0.90</td>
<td>1.29</td>
</tr>
<tr>
<td>Tshernomortransneft</td>
<td>19.3699</td>
<td>0.87</td>
<td>0.90</td>
<td>1.58</td>
</tr>
<tr>
<td>Severne</td>
<td>24.7652</td>
<td>0.87</td>
<td>0.90</td>
<td>1.77</td>
</tr>
<tr>
<td>Baltnefteprovod</td>
<td>13.3146</td>
<td>0.47</td>
<td>0.90</td>
<td>1.36</td>
</tr>
</tbody>
</table>
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

This result shows that on average the cross-border tariffs of Transneft’s pipeline enterprises are about US$ 1.35 per 100 tkm.

The transit tariff for crude oil from Kazakhstan is claimed to be the calculated on basis of the same tariffs as for Russian crude transportation being a part of the Customs Union Agreement.

This can be verified by comparing transit tariff with the domestic one. A good example is the transit tariff for Makhachkala – Novorossiysk route. This route was used only for transit purposes and its tariff rate 283.92 ruble per one mt. With the start of oil production in the Russian sector of the Caspian sea the Russian oil came also into the pipeline. The tariff set for Russian shippers by FTS in February 2011 also equals 283.92 ruble per one mt. The transit tariff US$ 1.29 per 100 tkm appears to be lower than both the average Transneft tariff rate of 1.35 and the Tshernomortransneft (its pipelines are used) tariff of US$ 1.58 per 100 tkm:

<table>
<thead>
<tr>
<th>Route</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
<th>Length (km)</th>
<th>Tariff, US$/100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makhachkala-Novorossiysk</td>
<td>283.92</td>
<td>10.01</td>
<td>774.00</td>
<td>1.29</td>
</tr>
</tbody>
</table>

A less correct calculation can be made for transit destinations for Kazakh crude oil delivered via the Atyrau-Samara pipeline due to complexity of the routes and handling at PS terminals involved. A simple division by estimated route length will not deliver correct results as they will be less for amount of handling costs. A rough estimation can still be made. The routes are calculated from Russian-Kazakh border near B. Chernigovka.

<table>
<thead>
<tr>
<th>Route</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
<th>Length (km)</th>
<th>Tariff, US$ / 100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus border (Druzhba)</td>
<td>527.19</td>
<td>18.59</td>
<td>1554</td>
<td>1.20</td>
</tr>
<tr>
<td>Ukrainian border (to Lisichank)</td>
<td>381.39</td>
<td>13.45</td>
<td>1069</td>
<td>1.26</td>
</tr>
<tr>
<td>Ukrainian border (via Nikolskoye)</td>
<td>462.23</td>
<td>16.30</td>
<td>1358</td>
<td>1.20</td>
</tr>
</tbody>
</table>

The calculated tariffs do not exceed the average domestic ones thus proving that the tariff setting for transit and domestic deliveries is equal.

The domestic tariffs differ from cross-border rates because of VAT (18%). However, an 18-% VAT does not significantly change the picture and can be refunded thus not affecting the financial results.

5.3.2. Ukraine

The current tariffs for Ukrainian shippers were introduced by the NKRE on 01/03/2007. The tariffs are calculated in Hryvnia per 1 mt for each section.
These tariffs are set for residents of Ukraine. This means, that the shipper is a Ukrainian venture. In case of delivery to the refinery, a rate of 20% VAT is added to the tariff. The non-residents of Ukraine do not have to pay VAT. However, crude oil is not in all cases of Ukrainian origin. The crude oil produced in the East of Ukraine comes from Gnieditsy, Glinsko-Rozbyshevskaya and Malaya Pavlovka. The oil produced in the West Ukraine comes from Dolina.

<table>
<thead>
<tr>
<th>Route</th>
<th>Tariff, UAH / 1 mt</th>
<th>Tariff, US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>State border (32 km) – Drogobych refinery</td>
<td>21.30</td>
<td>2.67</td>
</tr>
<tr>
<td>State border (32 km) – Nadvyrnyansk refinery</td>
<td>26.20</td>
<td>3.29</td>
</tr>
<tr>
<td>Dolina - Drogobych refinery</td>
<td>25.00</td>
<td>3.14</td>
</tr>
<tr>
<td>Dolina – Nadvyrnyansk refinery</td>
<td>7.20</td>
<td>0.90</td>
</tr>
<tr>
<td>Golovasheva - Krementchug refinery</td>
<td>13.70</td>
<td>1.72</td>
</tr>
<tr>
<td>Golovasheva - Kherson refinery</td>
<td>24.30</td>
<td>3.05</td>
</tr>
<tr>
<td>Golovasheva - Odessa refinery</td>
<td>29.60</td>
<td>3.71</td>
</tr>
<tr>
<td>Velikotsk-Lisitchansk refinery</td>
<td>9.40</td>
<td>1.18</td>
</tr>
<tr>
<td>Velikotsk-Krementchug refinery</td>
<td>22.00</td>
<td>2.76</td>
</tr>
<tr>
<td>Velikotsk - Kherson refinery</td>
<td>32.60</td>
<td>4.09</td>
</tr>
<tr>
<td>Velikotsk - Odessa refinery</td>
<td>37.90</td>
<td>4.76</td>
</tr>
<tr>
<td>Gnieditsy - Krementchug refinery</td>
<td>10.90</td>
<td>1.37</td>
</tr>
<tr>
<td>Gnieditsy - Kherson refinery</td>
<td>21.50</td>
<td>2.70</td>
</tr>
<tr>
<td>Gnieditsy - Odessa refinery</td>
<td>26.80</td>
<td>3.36</td>
</tr>
<tr>
<td>Gnieditsy - Drogobych refinery</td>
<td>49.00</td>
<td>6.15</td>
</tr>
<tr>
<td>Gnieditsy - Nadvyrnyansk refinery</td>
<td>50.80</td>
<td>6.37</td>
</tr>
<tr>
<td>“Glinsko-Rozbyshevskaya” - Krementchug refinery</td>
<td>9.00</td>
<td>1.13</td>
</tr>
<tr>
<td>“Glinsko-Rozbyshevskaya” - Kherson refinery</td>
<td>19.50</td>
<td>2.45</td>
</tr>
<tr>
<td>“Glinsko-Rozbyshevskaya” - Odessa refinery</td>
<td>24.90</td>
<td>3.12</td>
</tr>
<tr>
<td>“Glinsko-Rozbyshevskaya” - Drogobych refinery</td>
<td>46.80</td>
<td>5.87</td>
</tr>
<tr>
<td>“Glinsko-Rozbyshevskaya” - Nadvyrnyansk refinery</td>
<td>48.60</td>
<td>6.10</td>
</tr>
<tr>
<td>S.Pavlovka - Krementchug refinery</td>
<td>11.10</td>
<td>1.39</td>
</tr>
<tr>
<td>M.Pavlovka - Kherson refinery</td>
<td>21.70</td>
<td>2.72</td>
</tr>
<tr>
<td>M.Pavlovka - Odessa refinery</td>
<td>27.00</td>
<td>3.39</td>
</tr>
<tr>
<td>M.Pavlovka - Drogobych refinery</td>
<td>48.90</td>
<td>6.14</td>
</tr>
<tr>
<td>M.Pavlovka - Nadvyrnyansk refinery</td>
<td>50.70</td>
<td>6.36</td>
</tr>
<tr>
<td>Yuzhny-Drogobych refinery</td>
<td>30.60</td>
<td>3.84</td>
</tr>
<tr>
<td>Yuzhny - Nadvyrnyansk refinery</td>
<td>32.40</td>
<td>4.07</td>
</tr>
<tr>
<td>Yuzhny-Krementchug refinery</td>
<td>19.20</td>
<td>2.40</td>
</tr>
<tr>
<td>Odessa – Krementchug refinery</td>
<td>20.50</td>
<td>2.56</td>
</tr>
</tbody>
</table>
To compare tariffs, it is necessary to separate deliveries of imported crude oil from domestic crude oil deliveries. The comparison will be still misleading, because of the significant difference in diameter. The Glinskoye-Rozbyshevskaya-Kremenchug (refinery) section has 530 mm, Dolina-Drohobych (refinery) – 273 mm, Velikotsk-Kremenchug 1,020 mm, the Druzhba represents two pipelines, one with diameter changing after Brody.

In the table below tariffs are recalculated into US$ per 100 tkm. As shown, the tariffs for cross-border crude oil transportation are lower than tariffs for crude oil of domestic origin. But there is significant difference in the diameter and turnover. The transit tariffs however are higher than both.

<table>
<thead>
<tr>
<th>Route</th>
<th>Diameter, mm</th>
<th>Tariff, US$/mt</th>
<th>Distance, km</th>
<th>US$ / 100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glinskoye-Rozbyshevskaya-Kremenchug refinery (domestic)</td>
<td>530</td>
<td>1.13</td>
<td>145</td>
<td>0.78</td>
</tr>
<tr>
<td>Velikotsk-Kremenchug refinery (cross-border)</td>
<td>1020</td>
<td>2.76</td>
<td>580</td>
<td>0.48</td>
</tr>
<tr>
<td>Golovasheva-Kremenchug refinery (cross-border)</td>
<td>720</td>
<td>1.72</td>
<td>250</td>
<td>0.69</td>
</tr>
<tr>
<td>Druzhba to Slovakia (transit)</td>
<td>530/720</td>
<td>10.14</td>
<td>684</td>
<td>1.48</td>
</tr>
<tr>
<td>Border – Brody- Odessa (transit)</td>
<td>1020</td>
<td>8.50</td>
<td>1036</td>
<td>0.82</td>
</tr>
</tbody>
</table>

5.3.3. Kazakhstan

The cross-border tariffs of Kazakhstan differ from domestic ones although the tariffs are based on a methodology (see Chapter 4.4).

The Kaztransoil cross-border tariff is 3331 tenge per ton for 1000 km and the tariff for domestic deliveries is 1303 tenge per ton for 1000 km.

<table>
<thead>
<tr>
<th>Kaztransoil tariffs</th>
<th>Tenge / 1000 km</th>
<th>US$/1000 km</th>
<th>US$/100 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-border tariff</td>
<td>3331</td>
<td>22.86</td>
<td>2.29</td>
</tr>
<tr>
<td>Domestic tariff</td>
<td>1303</td>
<td>8.94</td>
<td>0.89</td>
</tr>
</tbody>
</table>

The Omsk-Moskalenki-Yurgamysh transit tariff falls with 1.34 USD / 100 tkm in between the cross-border and domestic tariffs.

5.3.4. Romania

According to the actual tariffs established by Order #19 dated 19/01/2011 the transmission of one metric ton of domestically produced crude oil within the pipeline system equals 71.06 lei irrespective the direction.
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

Under current methodology the cross-border and domestic tariffs are calculated separately for different pipeline systems thus a direct comparison is ill-posed.

<table>
<thead>
<tr>
<th>Route</th>
<th>Lei / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constanta-Ploiesti, Rafo Onesti and Arpechim refineries</td>
<td>25.42-20.91</td>
<td>8.77-7.21</td>
</tr>
<tr>
<td>Constanta - Petromidia refinery</td>
<td>6.50-3.79</td>
<td>2.24-1.31</td>
</tr>
<tr>
<td>Domestic crude oil (any route)</td>
<td>71.06</td>
<td>24.50</td>
</tr>
</tbody>
</table>

The desired calculation into US$ per 100 tkm is unfeasible due to complexity of both pipeline sub-systems and differences between them.

5.4. Cross-Border and Transit Products Pipelines Tariffs

5.4.1. Russia (the Transnefteproduct System)

As set out in the Annex the FSU products pipelines remained in function and are being managed as one system under Transnefteproduct (currently a Transneft subsidiary). Therefore the tariffs for the transportation are set by FTS of Russia based on a methodology (see Chapter 4.1).

The actual tariffs were introduced by FTS Order #471-э/1 dated 24/12/2011. It sets that the tariff for pipeline transportation of petroleum products should not exceed 0.7 of the rail way tariff. So actually a tariff ceiling is set and Transnefteproduct is to determine the actual rates. The actual rates are calculated in connection to dispatch point, i.e. certain refinery, so each refinery has its tariff for each export destination available to it. Due to the structure of products pipeline system not every refinery has access to all export outlets. For example, there is only one supplier to Kirishi-St. Petersburg pipeline – the Kirishi refinery. The transportation tariff for Kirishi refinery-St. Petersburg port is 283.30 rubles (US$10) per ton.

The cross-border transportation tariffs can be grouped by the export destination.

- to the Russia-Belarus border for further delivery to Ventspils, Ukraine and Hungary;
- to Primorsk;
- to Kazakhstan.

The transportation to domestic terminals that serve as trans-shipment points to railway or river barges for further export are not covered by this study as basically every railway station can be used for export. It should be mentioned though that they are rated in a similar way as domestic or export outlets depending on claimed destination.

The transportation tariffs set for the mentioned export destinations are set as follows.
For further delivery to Belarus, Ventspils, Ukraine and Hungary:

<table>
<thead>
<tr>
<th>To Russia-Belarus border from</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moscow refinery</td>
<td>677.10</td>
<td>23.88</td>
</tr>
<tr>
<td>Ryazan refinery</td>
<td>446.25</td>
<td>15.74</td>
</tr>
<tr>
<td>Nizhniy Novgorod refinery</td>
<td>593.10</td>
<td>20.91</td>
</tr>
<tr>
<td>Yaroslavl nefteorgsintez</td>
<td>652.74</td>
<td>23.02</td>
</tr>
<tr>
<td>Nizhnekkamsk refinery</td>
<td>1008.32</td>
<td>35.55</td>
</tr>
<tr>
<td>Syzran refinery</td>
<td>567.60</td>
<td>20.01</td>
</tr>
<tr>
<td>Samara refineries group</td>
<td>622.60</td>
<td>21.95</td>
</tr>
<tr>
<td>Ufa refineries group</td>
<td>1007.33</td>
<td>35.52</td>
</tr>
<tr>
<td>Salavat refinery</td>
<td>1082.93</td>
<td>38.19</td>
</tr>
<tr>
<td>Perm refinery</td>
<td>1218.52</td>
<td>42.97</td>
</tr>
<tr>
<td>Omsk refinery</td>
<td>1683.72</td>
<td>59.37</td>
</tr>
</tbody>
</table>

To Primorsk:

<table>
<thead>
<tr>
<th>To Primorsk from</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yaroslavl nefteorgsintez</td>
<td>401.98</td>
<td>14.17</td>
</tr>
<tr>
<td>Nizhniy Novgorod refinery</td>
<td>600.72</td>
<td>21.18</td>
</tr>
<tr>
<td>Nizhnekkamsk refinery</td>
<td>1015.94</td>
<td>35.82</td>
</tr>
<tr>
<td>Ufa refineries group</td>
<td>1173.33</td>
<td>41.37</td>
</tr>
<tr>
<td>Salavat refinery</td>
<td>1248.93</td>
<td>44.04</td>
</tr>
<tr>
<td>Omsk refinery</td>
<td>1849.72</td>
<td>65.22</td>
</tr>
</tbody>
</table>

To Kazakhstan:

<table>
<thead>
<tr>
<th>To Kazakhstan from</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nizhnekkamsk refinery</td>
<td>732.59</td>
<td>25.83</td>
</tr>
<tr>
<td>Syzran refinery</td>
<td>868.93</td>
<td>30.64</td>
</tr>
<tr>
<td>Samara refineries group</td>
<td>813.93</td>
<td>28.70</td>
</tr>
<tr>
<td>Ufa refineries group</td>
<td>429.20</td>
<td>15.13</td>
</tr>
<tr>
<td>Salavat refinery</td>
<td>504.80</td>
<td>17.80</td>
</tr>
<tr>
<td>Perm refinery</td>
<td>1218.52</td>
<td>42.97</td>
</tr>
<tr>
<td>Omsk refinery</td>
<td>103.23</td>
<td>3.64</td>
</tr>
</tbody>
</table>
In addition to that, the tariffs for services provided for order performance and dispatching are charged. The cross-border dispatch rate is also set by FTS as a ceiling rate depending on the destination:

<table>
<thead>
<tr>
<th>Destination</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>via Belarus to Ventspils</td>
<td>731.47</td>
<td>25.79</td>
</tr>
<tr>
<td>via Belarus to Ukraine, Hungary</td>
<td>351.11</td>
<td>12.38</td>
</tr>
<tr>
<td>to Petropavlovsk (Kazakhstan)</td>
<td>58.51</td>
<td>2.06</td>
</tr>
<tr>
<td>to St. Petersburg for export</td>
<td>29.26</td>
<td>1.03</td>
</tr>
<tr>
<td>to Primorsk for export</td>
<td>731.47</td>
<td>25.79</td>
</tr>
</tbody>
</table>

5.4.2. Belarus

The transit and cross-border tariffs charged by Zapad-Transnefteproduct in Belarus for the products coming from Russia are as follows.

<table>
<thead>
<tr>
<th>Destination</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>to Ukrainian border</td>
<td>3.64</td>
</tr>
<tr>
<td>to Latvian Border</td>
<td>8.14</td>
</tr>
<tr>
<td>to Fanipol terminal</td>
<td>11.28</td>
</tr>
<tr>
<td>to Gomel</td>
<td>1.40</td>
</tr>
<tr>
<td>to 529 km</td>
<td>2.99</td>
</tr>
<tr>
<td>to Disna PS</td>
<td>6.66</td>
</tr>
</tbody>
</table>

The tariff is set by the Order #157 of the Ministry of Economics of Belarus at US$1.64 per 1 mt for 100 km since January 2011.

5.4.3. Ukraine

The transit and cross-border tariffs charged by Prikarpatszapadtrans (Transnefteproduct) in Ukraine for the products coming from Russia and Belarus are as follows.

<table>
<thead>
<tr>
<th>Destination</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novograd-Volynskiy terminal</td>
<td>10.00</td>
</tr>
<tr>
<td>ANP 5 terminal</td>
<td>16.00</td>
</tr>
<tr>
<td>Kalush terminal</td>
<td>24.50</td>
</tr>
<tr>
<td>Mukachevo terminal</td>
<td>25.10</td>
</tr>
<tr>
<td>to Hungarian border</td>
<td>25.54</td>
</tr>
</tbody>
</table>

The tariffs were introduced in March 2011.
5.4.4. Kazakhstan

The tariffs for Kazakhstan are set for deliveries via the Ufa-Omsk and Ufa-Pavlodar pipelines. There are three options depending on origin and direction of delivery.

From the western Russia-Kazakhstan border (from Ufa to Petropavlovsk)

<table>
<thead>
<tr>
<th>Destination</th>
<th>Tenge / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peterfeld terminal</td>
<td>327.00</td>
<td>2.24</td>
</tr>
<tr>
<td>Orbita terminal</td>
<td>558.46</td>
<td>3.83</td>
</tr>
<tr>
<td>Petropavlovsk terminal</td>
<td>648.45</td>
<td>4.45</td>
</tr>
<tr>
<td>MunainInvest terminal</td>
<td>1148.45</td>
<td>7.88</td>
</tr>
<tr>
<td>KyzylZharMunai terminal</td>
<td>705.00</td>
<td>4.84</td>
</tr>
</tbody>
</table>

From the eastern Russia-Kazakhstan border (from Omsk to Petropavlovsk)

<table>
<thead>
<tr>
<th>Destination</th>
<th>Tenge / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peterfeld terminal</td>
<td>395.47</td>
<td>2.71</td>
</tr>
<tr>
<td>Orbita terminal</td>
<td>162.59</td>
<td>1.12</td>
</tr>
<tr>
<td>Petropavlovsk terminal</td>
<td>72.60</td>
<td>0.50</td>
</tr>
<tr>
<td>MunainInvest terminal</td>
<td>572.60</td>
<td>3.93</td>
</tr>
<tr>
<td>KyzylZharMunai terminal</td>
<td>19.15</td>
<td>0.13</td>
</tr>
</tbody>
</table>

From Petropavlovsk to the western Russia-Kazakhstan border (from Petropavlovsk to Ufa)

<table>
<thead>
<tr>
<th>Destination</th>
<th>Tenge / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peterfeld terminal</td>
<td>322.87</td>
<td>2.22</td>
</tr>
<tr>
<td>Orbita terminal</td>
<td>89.99</td>
<td>0.62</td>
</tr>
<tr>
<td>MunainInvest terminal</td>
<td>500.00</td>
<td>3.43</td>
</tr>
<tr>
<td>KyzylZharMunai terminal</td>
<td>56.55</td>
<td>0.39</td>
</tr>
<tr>
<td>to the western border RF-RK</td>
<td>648.45</td>
<td>4.45</td>
</tr>
</tbody>
</table>

A dispatch rate for Petropavlovsk to the western border Russia-Kazakhstan in amount of 351.11 ruble (US$ 12.38) per 1 mt is applied.

5.4.5. Latvia / Lithuania

Latrostrans is charging about US$3.45 per mt transit fee for products delivered from Belarus border to Ventspils. The tariff is a negotiated one and the info is not publicly available but quoted by the shippers. The figure can be proved by the analysis of the annual reports and financial statements as shown.

Tariff revenue, million LVL

<table>
<thead>
<tr>
<th>Products delivered to</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventspils</td>
<td>9.9</td>
<td>6.5</td>
</tr>
</tbody>
</table>
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

Transportation volumes, MT

<table>
<thead>
<tr>
<th>Products delivered to</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventspils</td>
<td>5.635</td>
<td>3.771</td>
</tr>
</tbody>
</table>

Tariff LVL for each mt

<table>
<thead>
<tr>
<th>Products delivered to</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventspils</td>
<td>1.76</td>
<td>1.72</td>
</tr>
</tbody>
</table>

Tariff US$ for each mt

<table>
<thead>
<tr>
<th>Products delivered to</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventspils</td>
<td>3.44</td>
<td>3.45</td>
</tr>
</tbody>
</table>

5.5. Cross-Country Comparison of Cross-Border / Transit Products Pipelines Tariffs

All data are summarised in the following table. It should be noted, however, that straight comparisons are not necessarily self explanatory, because of technical differences in the pipelines (diameter, transported volumes, profile etc., etc.). Therefore, diameters are given for reference next to the name of the pipeline. For comparative purposes US$ per 100 tkm is used as the unit. All tariffs were recalculated to US$ using exchange rates given in the Introduction.

<table>
<thead>
<tr>
<th>Country</th>
<th>Transit tariff, US$ / mt</th>
<th>Distance, km</th>
<th>US$ / 100 tkm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus (Russia-Ukraine), 530 mm</td>
<td>3.64</td>
<td>240</td>
<td>1.52</td>
</tr>
<tr>
<td>Belarus (Russia-Latvia), 530 mm</td>
<td>8.14</td>
<td>470</td>
<td>1.73</td>
</tr>
<tr>
<td>Belarus (Russia - Belarus)*, 530 mm</td>
<td>1.40</td>
<td>75</td>
<td>1.87</td>
</tr>
<tr>
<td>Russia (to Western border)***, 530 mm</td>
<td>21.95</td>
<td>1300</td>
<td>1.69</td>
</tr>
<tr>
<td>Kazakhstan (from Russia), 350 and 530 mm</td>
<td>4.45</td>
<td>80</td>
<td>5.56</td>
</tr>
<tr>
<td>Russia (to Primorsk)***, 530 mm</td>
<td>14.17</td>
<td>800</td>
<td>1.77</td>
</tr>
<tr>
<td>Russia (to St. Petersburg)*****, 325 mm</td>
<td>9.99</td>
<td>300</td>
<td>3.33</td>
</tr>
<tr>
<td>Ukraine (Belarus-Ukraine)*****, 530 mm</td>
<td>10.00</td>
<td>200</td>
<td>5.00</td>
</tr>
<tr>
<td>Ukraine (Belarus-Hungary), 530 mm</td>
<td>25.54</td>
<td>750</td>
<td>3.41</td>
</tr>
<tr>
<td>Latvia, Lithuania (to Ventspils), 530 mm</td>
<td>3.40</td>
<td>400</td>
<td>0.86</td>
</tr>
</tbody>
</table>

* to Gomel
** from Samara
*** from Yaroslavl
**** from Kirishi
***** to Novograd-Volynskiy
5.6. Comparison of Transit and Cross-Border Tariffs with Domestic Tariffs for Products Transportation

5.6.1. Russia

While the tariff for transportation is the same for both domestic and export deliveries, the cross-border dispatch rate differs from those for domestic shipment. The dispatch rate for domestic deliveries amounts 19.68 ruble for 1 mt. As it was set out earlier the cross-border dispatch rate differs depending on the destination. The comparison is given below.

<table>
<thead>
<tr>
<th>Destination</th>
<th>Ruble / 1 mt</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>via Belarus to Ventspils</td>
<td>731.47</td>
<td>25.79</td>
</tr>
<tr>
<td>to Gomel (Belarus)</td>
<td>351.11</td>
<td>12.38</td>
</tr>
<tr>
<td>via Belarus to Ukraine</td>
<td>351.11</td>
<td>12.38</td>
</tr>
<tr>
<td>via Belarus to Hungary</td>
<td>351.11</td>
<td>12.38</td>
</tr>
<tr>
<td>to Petropavlovsk (Kazakhstan)</td>
<td>58.51</td>
<td>2.06</td>
</tr>
<tr>
<td>to St. Petersburg for export</td>
<td>29.26</td>
<td>1.03</td>
</tr>
<tr>
<td>to Primorsk for export</td>
<td>731.47</td>
<td>25.79</td>
</tr>
<tr>
<td>Domestic delivery</td>
<td>19.68</td>
<td>0.69</td>
</tr>
</tbody>
</table>

The dispatch rate for domestic deliveries is significantly lower than for any of the cross-border ones.

5.6.2. Belarus

The Novopolotsk and Mozyr refineries have tie-ins to the Zapad-Transnefteproduct pipelines. The tariffs are set as follows.

From Mozyr refinery

<table>
<thead>
<tr>
<th>Destination</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>529 km</td>
<td>0.09</td>
</tr>
<tr>
<td>to Ukrainian border</td>
<td>0.58</td>
</tr>
</tbody>
</table>

From Novopolotsk refinery

<table>
<thead>
<tr>
<th>Destination</th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disna PS</td>
<td>0.35</td>
</tr>
<tr>
<td>to Latvian Border</td>
<td>1.83</td>
</tr>
<tr>
<td>Fanipol terminal</td>
<td>4.97</td>
</tr>
</tbody>
</table>
Chapter 5: Transport Tariffs for Cross-Border and Transit Oil and Products Pipelines

Compared to the cross-border tariffs for Russian products the tariffs appear to be lower.

For example:

<table>
<thead>
<tr>
<th></th>
<th>US$ / 1 mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Mozyr to Ukrainian border</td>
<td>0.58</td>
</tr>
<tr>
<td>From Russia to Ukrainian border</td>
<td>3.64</td>
</tr>
</tbody>
</table>

However this reflects the difference in the distance from the Russian border to refineries (about 200 km to Mozyr and about 40 km further west). Thus the transportation tariffs appear to be comparable.

As for the dispatch rate it is applied to two routes:

<table>
<thead>
<tr>
<th>Dispatch tariffs</th>
<th>Ruble / 100 km</th>
<th>US$ / 100 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Mozyr to Ukrainian border</td>
<td>94.01</td>
<td>3.31</td>
</tr>
<tr>
<td>From Novopolotsk to Latvian Border</td>
<td>32.70</td>
<td>1.15</td>
</tr>
</tbody>
</table>

So the main difference between domestic deliveries from Belarus refineries to domestic terminals and to export is the dispatch rate.

5.6.3. Romania

According to the actual tariffs established by Order #19 dated 19/01/2011 the transmission of one metric ton of petroleum product within the pipeline system equals 71.06 lei (US$24.50) irrespective the direction – both for exports and domestic use.
CHAPTER 6. Conclusions

Lack of transparency of transit tariffs is an important challenge within the ECT area. In most of the countries, such tariffs are negotiated at the state level and set through intergovernmental agreements. Such negotiations are often conducted under strict confidentiality and the outcomes are rarely (or only partially) revealed to the public.

Similarly, for project-driven transit pipelines which are built by private companies, a system of negotiated access and tariff-setting (between pipeline shareholders and companies requesting access) is predominant. Access and tariffs are determined by shareholders.

In case of negotiated access, more transparency would be required on the outcome of negotiations, including those involving state parties at inter-state and state-investor levels (i.e. treaties and other agreements involving governments). This would better correspond to the commitment taken by the parties to the Energy Charter Treaty to promote access to international markets on commercial terms, to facilitate energy transit and to provide non-discriminatory treatment. The Energy Charter Treaty also requires in Art. 20 to publish agreements in force between the Contracting Parties which affect matters covered in the Treaty promptly. Furthermore, the draft Transit Protocol, even if not adopted, provided for another generally accepted benchmark. In Art. 10 it requires transit tariffs and other conditions to be objective, reasonable and transparent.

In the countries where pipeline transport of oil is regarded as natural monopoly, access and tariffs for domestic transport are regulated by the state and they are often published. In the Western Europe, oil transport activities are commercially driven among private actors without state interference and only subject to general competition rules of the EU and the country itself. But the information on tariffs is then considered to be confidential and is not publicly available.

The lack of transparency makes a thorough assessment of the degree of cost-reflectiveness of transit tariffs as required in the draft Transit Protocol difficult. The peculiarities of each transit case associated with its technical, economic, geographical, legal / regulatory and other characteristics would result in a range of possible cost-reflective tariffs. Therefore, a reliable assessment of cost-reflectiveness with respect to a specific case would require a more elaborated analysis of all variables.

There are few cases where national and transit flows are comparable and where tariffs are publicly available. Moreover, in the absence of sufficient transit tariff data in most cases, such an analysis cannot be based solely on a comparison of tariffs charged, but requires a detailed review and analysis of relevant legal and regulatory regime and practical implementation.
ANNEX 1. Main Cross-Border / Export Oil Flows in Eastern Europe / FSU

Cross-border / export pipelines in Eastern Europe are divided into two categories; those left from the Soviet time and newly added capacities.

The old export capacities are as follows:

- A pipeline system Druzhba that is divided between Russia, Ukraine, Belarus, Poland, Hungary, Slovakia and Czech Republic;
- A pipeline systems that lead to the port terminals of the Black Sea (the ports of Novorossiysk and Tuapse in Russia, the port of Odessa in Ukraine via Lisichansk);
- A pipeline from Polotsk (Belarus) via Lithuania to Latvia;
- The Atyrau-Samara pipeline used to connect Kazakh crude oil to the Transneft system; and
- The JANAF pipeline system.

The new cross-border / export capacities are:

- The Caspian Pipeline Consortium (the CPC);
- Upgraded existing systems, for example, the Baku-Novorossiysk;
- The Baltic pipeline system;
- The Odessa-Brody pipeline;
- The Baku-Supsa pipeline;
- The Baku- Tbilisi-Ceyhan pipeline;
- The East Siberia-Pacific Ocean pipeline; and
- The IKL pipeline.

Most pipelines are laid on flat lands. The Baku-Supsa as well as the BTC pipelines are the exceptions, since they run through the mountains of the Caucasus. The JANAF system is partly laid in mountainous region. The western part of the Ukrainian section of the Druzhba pipeline goes also through the Carpathian Mountains (1,100 m the highest point).

Most pipelines use commingled stream operations. Crude from various fields in Russia and the former Soviet republics is mingled when transported by Transneft’s pipeline system, and becomes the Urals grade. There is an upper grade called Siberian Light, which is transported by a separate line of Transneft to Tuapse. The CPC and BTC carry their own crude grades, CPC Blend and Azeri Light. Crude oil, delivered by ESPO, is a light crude expected to become a benchmark grade in the East Asia-Pacific region.

The problem Urals faces is that its markets are limited. Urals is sold mainly to Eastern Europe via the Druzhba pipeline, to Northwest Europe by tanker from the Baltic Sea ports and to the Mediterranean by tanker from the Black Sea ports through the
Annex 1: Main Cross-Border / Export Oil Flows in Eastern Europe / FSU

Turkish straights. This causes Urals’ unfavourable pricing conditions. One aim of the East Siberia-Pacific pipeline was to develop new markets for Russian crude in the Asia-Pacific and the US West coast.

The JANAF pipeline system uses batch operation for transportation.

A1.1. Caspian Transit Flows

A1.1.1. The Caspian Pipeline Consortium

The CPC pipeline system is one of major investment project with foreign capital involvement in the FSU. The 1511-kilometer-long pipeline of the CPC connects the fields of the Western Kazakhstan (Tengiz) with the Russian coast of the Black Sea. The pipe diameter from the Kropotkin PS to the sea terminal is 1067 mm, while the rest measures 1,016 mm. The total number of pump stations is five. The Black Sea terminal has two single mooring points, which can load tankers of deadweight of up to 300,000 mt simultaneously, supplied by sub-sea pipes of 1067-mm diameter. A tank farm of the sea terminal consists of four steel reservoirs each of them with a capacity of 100,000 m³.

In April 2003 the 1st stage of the CPC oil pipeline system was brought into regular operation. Transmission capacity of the 1st stage of the oil pipeline is 0.56 mb/d or 28.2 MT a year. However, the construction of the entire CPC system remains unfinished. The CPC project was designed to increase its initial transmission capacity by 2.5 times in the second stage. Ultimately, the CPC is expected to transport 1.34 mb/d or 67 MT/Y.

Half of the shares of the consortium belongs to the governments of Russia and Kazakhstan: RFFI – 24% plus 7% through CPC Co and KazakhOil – 19% plus 1.75% through Kazakhstan Pipeline Ventures LLC. The second half is divided up between private companies. These companies are: Chevron Caspian Pipeline Consortium Co. (15%), LUKARCO (12%), Mobile Caspian Pipeline Co. (7.5%), Rosneft-Shell Caspian Ventures Ltd (7.5%), Agip International (2%), BG Overseas Holdings Ltd (2%) and Oryx Caspian Pipeline LLC (1.75%). The shareholders have quotas to transport oil through the CPC system relative to their individual shareholdings. Two joint stock companies have been established and registered; CPC-R (Russia) and CPC-K (Kazakhstan), based on the jurisdictions of the two countries. An oil quality bank has been established based on density and sulphur content.

A1.1.2. Baku-Supsa

The Baku-Supsa pipeline connects oil fields in Azerbaijan with the Supsa Terminal on the Georgian coast of the Black Sea. The 827-km pipeline begins at the Sangachal Terminal in Azerbaijan and comprises 772 km of new steel pipes (diameter 530 mm) and 55 km of the rebuilt section. Along the route six pumping stations and two pressure reducing stations have been installed. The transmission capacity is 0.15 mb/d or 7 MT/Y.
The Sangachal terminal in Baku is designed to handle 1 mb/d or 50 MT/Y of oil. The terminal has been operational since 1997. It has eight tanks: four with 160,000 barrels or 20,000 mt storage capacity and four tanks with 100,000 mt storage capacity. The terminal is equipped with both metering devices and pumping units. The terminal distributes oil to the northern export pipeline (Baku-Novorossiysk), the western pipeline (Baku-Supsa) and to the southern direction (BTC).

In Georgia a new 13-km branch line has been built from the existing Samgori-Batumi pipeline to a new terminal in Supsa. The Samgori-Batumi pipeline section has been upgraded. The oil terminal in Supsa consists of four reservoirs each with a 1.8-million-barrel (250,000 mt) capacity, metering stations, a 5-km pipeline of 900-mm diameter that connects the terminal with a filling buoy. The last component between the terminal and an oil tanker is a 50-meter deep loading system located on the sea bed approximately three kilometres offshore.

Participants in the project are: Amoco Caspian Petroleum Limited, BP Exploration (Caspian Sea), Delta Nimir Khazar Limited, Den Norske Stats Ojeselskap a.s., Exxon Azerbaijan Limited, LukOil, McDermott Azerbaijan Inc., Pennzoil Caspian Corporation, Ramco Khazar Energy Limited, the State Oil Company of the Azerbaijan Republic (SOCAR), Turkiye Petroleri A.O. and Unocal Khazar Ltd.

**A1.1.3. Baku-Tbilisi-Ceyhan**

The Baku-Tbilisi-Ceyhan pipeline is 1,776-km long and runs through three countries; Azerbaijan (449 km, with a pipe diameter of 1,067 mm), Georgia (235 km, with a pipe diameter of 1,168 mm), and Turkey (1,092 km, with a pipe diameter of 864-1,067 mm). The construction of the pipeline began in April 2003. Approximately 10 million barrels (1.37 MT) of oil are required to fill the line. The design transmission capacity is 1.00 mb/d or 50 MT/Y. The first tanker was loaded at the Ceyhan terminal in June 2006.

Both the construction and the operation of the entire route of the oil pipeline are under the contractual commitment of the BTC pipeline company. The BTC pipeline consortium is made up of BP with a 30.1% stake as project operator, Azerbaijan’s State Oil Company (SOCAR) holding 25%, the American companies Unocal (8.9%), Conoco-Phillips (2.5%), and Amerada Hess (2.35%), Norway’s Statoil (8.7%), Turkish Petroleum (6.5%), Italy’s Eni (5%), Total of France (5%), and the Japanese-based Itochu and Inpex with 3.4% and 2.5% stakes respectively. The BTC awarded a contract to Botas, Turkey’s state-owned pipeline company, for both the construction and the operation of the Turkish section of the pipeline. The contract stipulates a fixed amount of contract money.

The pipeline carries oil from Azeri-Chirag-Guneshli, in Azerbaijan. In 2010 BTC shipped 37.3 MT of Azeri crude. The pipeline also carried small volumes of oil from Kazakhstan and Turkmenistan delivered to Baku via tankers.
A1.1.4. The Atyrau-Samara Pipeline

The Atyrau-Samara pipeline is one of main routes of Kazakhstan crude oil export. The pipeline connects Atyrau PS of the KazTransOil pipeline system with the Transneft pipeline system at Samara, from where the oil can be delivered to potentially all Russian export directions. Export directions used over the last years are Primorsk, Druzhba (Poland to Gdansk), Novorossiysk, Odessa. The pipeline Uzen-Atyrau-Samara was built in Soviet times to deliver high-pour-point crude oil from the Mangyshlak and Buzachi fields. The oil is heated to prevent it from solidifying. Prior to CPC pipeline coming into operation in 2001, the Atyrau-Samara pipeline was Kazakhstan's prime Crude oil export route. The initial design throughput capacity is 0.24 mb/d or 12 MT/Y at Atyrau-Samara section, however after some reconstruction works and using DRA it delivers up to 0.35 mb/d or 17.5 MT/Y. The pipeline runs 549 km from Atyrau to the Russian border at B. Chernigovka PS (1,232 km from Uzen) and 154 km further to Samara (1380 km total). Its pipe diameter at Atyrau – Samara section is 720 mm. The pipeline is operated by KazTransOil.

A1.2. The Druzhba System

The history of the Druzhba (which means friendship) pipeline dates back to 1960s-1970s. The system was conceived to supply Eastern European (generally Soviet-bloc) countries with the crude oil produced initially in the Volga basin of USSR. It starts in Samara and goes westwards to Belarus. Near the Russian-Belarus border there is an offspring line to the Baltic states via Belarus as well. In Belarus near Mozyr it separates into “northern” and “southern” branches.

The Northern arm crosses Poland and ends at refineries in Germany. The Southern arm crosses Ukraine to supply Slovakia, Czech Republic and Hungary.

A1.2.1. The Druzhba Pipeline in Russia

In Russia the Druzhba pipeline is part of Transneft’s trunk pipeline system. The Oil Transportation company Druzhba takes oil from the Severo-Zapadny Oil Transportation Company, Verkhne-Volzhsky Oil Transportation Company, and Privolzhsknefteprovod company. The Druzhba Oil Transportation Company delivers oil to the border with Belarus. The core of the export pipeline consists of two lines of 1,200 mm and 1,000 mm diameters starting in Samara. The pipelines run through the Penza, Tambov, Orel and Bryansk regions to Unecha PS near Russian-Belarus border where an embranchment of two 800 mm pipes goes to Polotsk in the north of Belarus. From Unecha PS the main Druzhba route runs with 820 mm and 1000 mm lines further west to Mozyr (Belarus). The Druzhba route length is approximately 1,300 km (Samara-Unecha). The average throughput at the exit to Belarus is around 1.6 mb/d or 81 MT/Y.
A1.2.2. The Druzhba Pipeline in Belarus

The transit of Russian oil via Druzhba pipeline is managed by the Belarusian Oil Transportation Company Gomeltransneft Druzhba. The pipeline consists of two parallel lines of 1,000 mm and 820 mm diameter, coming from Russia (1.6 mb/d or 81 MT/Y). This splits into two flows near the Mozyr refinery. One flow of double 720 mm parallel pipes (0.76 mb/d or 38 MT/Y) goes to Hungary, Slovakia and Hungary via the Ukraine, where the crude can be partially diverted to reversed Odessa-Brody pipeline. The second flow goes to Poland and Germany (via Adamova Zastava PS) and consists of 630 mm and 820 mm parallel pipes. In the recent years a third parallel line from Mozyr to Adamova Zastava PS has been added. The total length of the pipeline from Russia to Poland is around 624 km (0.86 mb/d or 43 MT/Y).

A1.2.3. The Druzhba Pipeline in Ukraine

The Ukrainian Oil Transportation Company Ukrtransnafta transports Russian oil to the western Ukrainian border with Slovakia and Hungary. Two parallel lines of 720 mm diameters comprise a core of the pipeline from the Belarus border to Brody, where one pipe changes diameter to 530 mm. The length of the pipeline is around 680 km. The total throughput capacity at the exit where it splits into two directions is around 0.55 mb/d or 27 MT/Y to Slovakia and Hungary. The Druzhba pipeline has connection in Brody with the Odessa-Brody pipe.

A1.2.4. The Druzhba Pipeline in Slovakia

The Druzhba stretch in Slovakia runs 444 km in two parallel lines of 530 mm and 720 mm diameters from Budkovce PS near Ukrainian border westwards to the border of the Czech Republic. Near Šahy (280 km from the border) in has a link to the Šahy-Százhalombatta pipeline (400 mm) to Hungary where it connects to the JANAF pipeline system. The Slovakian stretch of Šahy-Százhalombatta is 8.5 km long. Further at Bučany PS (390 km from the border) and an off-spring (62 km, 530 mm) to Slovnaft refinery. The capacity is around 0.4 mb/d or 20 MT/Y however in the last years the actual throughput amounted only about 11 MT/Y. The operator of the pipelines in Slovakia is Transpetrol company.

A1.2.5. The Druzhba Pipeline in the Czech Republic

From the border with Slovakia the 530 mm pipeline runs 357 km across Czech Republic to Litvinov refinery, supplying also Kralupy refinery and via branch pipe the refinery in Pardubice. In Kralupy the Druzhba pipeline is connected with the IKL pipeline and it receives domestically produced crude from MND pipeline in Klobouki. The design capacity of Czech Druzhba section is 0.18 mb/d or 9 MT/Y, but it is currently used only at 60%. The crude oil pipelines Druzhba and IKL are operated by the state-owned company MERO ČR.
A1.2.6. The Druzhba Pipeline in Hungary

Hungarian Druzhba stretch is operated by MOL. The 500 mm pipeline enters Hungary near Tiszaszentmárton (Fényeslitke PS) and goes 290 km to Duna refinery at Százhalombatta (0.16 mb/d or 7.9 MT/Y). Százhalombatta terminal is a major point of interconnection of three pipelines: Druzhba, Adria and Šahy-Százhalombatta. The Duna refinery can be supplied by all of them, but currently crude oil comes only from the Druzhba pipe and goes further via the Adria and JANAF pipeline system operating in reversed mode to Sisak refinery in Croatia.

The 400 mm Šahy-Százhalombatta pipeline (0.07 mb/d or 3.5 MT/Y) is actually the remainder of the initial Druzhba route to Hungary via Slovakia (Druzhba I) and is delivering occasional volumes being mothballed most of the time. But the pipeline can be quickly brought into operation if necessary and can operate in both directions.

A1.2.7. The Druzhba Pipeline in Poland

The Polish section of Druzhba is operated by PERN Przyjaźń company. The distance of the stretch amounts around 660 km. It transports crude oil from the Adamova Zastava PS at the Belarus Border (0.86 mb/d or 43 MT/Y) with two parallel lines (630 mm and 820 mm) to the terminal Heinersdorf for German refineries (Schwedt) (0.54 mb/d or 27 MT/Y). A third line at the eastern section was added recently. The difference in volumes is diverted to Płock PKN Orlen refinery and to Płock-Gdansk pipeline. The 180 km long Płock-Gdansk pipeline (also called Pomorski or Pomeranian pipeline) connects the Płock terminal with a terminal in Gdansk, where the crude oil can be delivered to Lotos refinery or loaded into tankers at the Baltic Sea port. The Płock-Gdansk pipeline can transport oil in two directions. From Gdansk to Płock its capacity is 0.6 mb/d or 30 MT/Y and in the opposite direction 0.4 mb/d or 20 MT/Y.
A1.3. Russian Export Pipelines

Transneft’s trunk pipeline system transports oil exports both westwards through the Baltic Pipeline System (BPS) and the Druzhba pipeline and southwards through the ports of Novorossiysk and Tuapse as well as eastwards through pipeline to the loading depots of Meget and the Angarsky refinery and further east via the ESPO pipeline to China and by railway to Pacific Coast. Transneft also carries oil from Azerbaijan, Kazakhstan and Turkmenistan.

A1.3.1. Black Sea Ports

A subsidiary of Transneft Chernomortransneft company receives oil from fields in the Krasnodar region, Stavropol area, Northern Caucasuses and Azerbaijan, as well as the Privolzhsknfteprovod company. It delivers oil to refineries in the Krasnodar area as well as the ports of Novorossiysk and Tuapse. The Chernomortransneft company possesses the pipeline network that runs through the Rostov region as well as the Stavropol and Krasnodar areas. The following pipelines deliver oil to the Black Sea ports: Tikhoretsk-Tuapse, Baku-Tikhoretsk-Novorossiysk. The Chernomortransneft company operates the trans-shipment terminals of Sheskharis (Novorossiysk), Zarechie (Tuapse). Novorossiysk is the export terminal for Urals and Tuapse is used for Siberian light exports. The loading capacity of the two ports are 0.96 mb/d (48 MT/Y) and 0.10 mb/d (5 MT/Y) respectively. Both Azeri oil delivered from the Baku-Novorossiysk pipeline and Kazakh oil through the route of Atyrau-Samara-Novorossiysk are exported from the port facilities of Novorossiysk.

A1.3.2. The Baku-Novorossiysk Pipeline

The Baku-Novorossiysk pipeline was rerouted bypassing Chechnya. The total length of the Baku-Novorossiysk pipeline is 1,411 km, while its throughput capacity is 0.14 mb/d or 7 MT/Y. The pipe diameter is 720 mm. A portion of this pipeline known as the Makhachkala-Novorossiysk section is used for the transit of Turkmen and Kazakh oil after they are delivered to the port of Makhachkala by tankers via the Caspian Sea. According to an intergovernmental agreement, Azerbaijan has a 5 MT capacity secured for its oil. However with the start of the BTC pipeline the volumes remain low. In 2010 0.05 mb/d or 2.3 MT/Y of Azerbaijan oil were delivered.

A1.3.3. The Baltic Pipeline System

After the break-up of the former Soviet Union Novorossiysk was the only one large sea terminal in the Russian Federation to ship crude oil for exports. The Russian Government therefore decided to establish a project of the Baltic Pipeline System. The Baltic Pipeline System (also called Baltnefteprovod) is an oil export facility to Northwest Europe and beyond, from the Timano-Pechorsky Basin, via a port on the Baltic sea in the city of Primorsk.
Currently, BPS consists of the Yaroslavl-Kirishi section (two lines of 720-mm diameter pipes, 540 km in length), the Kirishi-Primorsk section (one line of 720-mm diameter pipes, 261.5 km in length), and the Palkino-Primorsk section (one line of 1,020-mm diameter pipes, 713 km in length). The pipeline runs through the territory of Leningrad, Novgorod, Tver, Ivanovo, and Yaroslavl regions. The throughput capacity reaches 1.2 mb/d or 60 MT/Y. In 2010 the total amount of crude oil loaded at the Primorsk terminal exceeded 1.42 mb/d or 71 MT/Y.

A1.3.4. The Pipeline to the Baltic Countries

The pipeline to the Baltic states is supplied from Russia by Surgut-Polotsk pipeline (1020 mm with throughput capacity of 0.62 mb/d or 31 MT/Y) and an Unecha-Polotsk branch from Druzhba (two lines 820 mm of 0.3 mb/d or 15 MT/Y). Polotsk is located in Belarus from where the line goes to the border with Latvia for delivery to the Ventspils port; and Mazeikiai refinery and the Butinge Baltic Sea terminal of Lithuania. The pipeline is made of 3 pipes (720 mm, 530 mm) that go out from the Polotsk pump station with total capacity of about 28 MT/year. The deliveries to Ventspils terminal were halted in 2003, Polotsk-Ventspils pipeline remained shut, but ready for operation until recently when in 2010 Latvia decided to displace the line-fill to mothball the pipe. The deliveries of Russian crude oil to Lithuania were halted in 2006. The Mazeikiai refinery (PKN Orlen group) is currently supplied by deliveries from Butinge terminal. The pipeline in Latvia is operated by LatRosTrans, the pipeline in Lithuania by ORLEN Lietuva.

A1.3.5. The Eastern Siberia-Pacific Ocean Pipeline

The ESPO pipeline is aimed at diversifying of Russian oil exports delivering the crude oil to countries in the Asian Pacific region. The construction was split into two phases, first stage already operational since 2008. The intended pipeline route is: Tayshet-Kazachinskoye-Skovorodino-Khabarovsk-Kozmino (Pacific coast). Its length will be about 4,800 km. The system’s capacity will be 1.6 mb/d or 80 MT/Y with 1 mb/d or 50 MT/Y at Kozmino port.

The already operating pipeline section consists of 2,757 km long Tayshet-Skovorodino line (1067 mm) from where oil is transported by railway to Kozmino terminal. The current terminal capacity is 0.3 mb/d or 15 MT/Y.

End of 2010 a 64 km pipeline connection from Skovorodino PS to Mokhe at the Chinese border was brought into operation. By this link oil is delivered to a 960 km long pipeline leading to Chinese refineries. The expected annual volumes to China are said to reach 15 MT.

The second stage of the project is underway, the 2,045 km long Skovorodino-Perevoznaya section will be completed in 2011, the construction of the PS and Kozmino terminal expansion – in 2012. The capacity of the new section will reach up to 1 mb/d or 50 MT/Y. The Tayshet-Skovorodino line capacity is expected to be gradually increased up to 1.6 mb/d or 80 MT/Y.
A1.4. Odessa-Brody Pipeline

The objectives of the project are to diversify oil delivery routes to the Ukrainian oil refineries and to transit oil from the Caspian Sea and the Black Sea through to Central Europe. The project will be capable of rerouting the Caspian oil via the Black Sea to central Europe. This will not only alleviate oil traffic problems in the Bosporus strait, but will also enable the transportation of crude oil to the attractive markets of central and north-western Europe. The extension of the Odessa-Brody pipeline to the Polish town of Ploczk would unite the system with the western branch of the Druzhba oil pipeline and provide access to the new markets of Poland, Germany and the Baltic Sea (via the port of Gdansk in Poland). The project was initiated by the Ukrainian Government.

The length of the pipeline is 674 km, and its transportation capacity is approximately 0.28 mb/d or 14 MT/Y. It can be increased up to 0.60-0.80 mb/d or 30-40 MT/Y.

In August 2001 the construction was completed but oil producers / traders showed no interest in the use of the pipeline. Finally, however, TNK-BP agreed to provide the necessary oil for the line-fill and thus guarantee the deliveries but only in reversed mode operation from Brody to Odessa. For several years the pipeline was operated in reversed mode and transported delivering up to 0.18 mb/d or 9 MT/Y of Russian crude oil to Odessa. Recently there have been actions taken to start the transportation in initially designed manner. Since the beginning of 2011 the Urals blend in the line-fill is being displaced with Azeri Light crude delivered to Odessa by tankers from Georgian Black sea ports. However the crude oil delivered by pipeline to Brody is loaded into rail tank cars for the further delivery to Mozyr refinery in Belarus. There are plans under consideration to reverse one line of the Ukrainian and Belarus Druzhba pipeline section to facilitate deliveries to Mozyr refinery by pipe. An intergovernmental agreement was signed early 2011 by Belarus and Ukraine about transit of 4MT annually in 2011-2012. However the future of the Odessa-Brody operation in the designed direction remains unclear due to lack of firm commercial flow as Belarus my abandon the scheme.

A1.5. Transit to Odessa Black Sea Port (Ukraine)

The Pridnestrovsky Magistralny Nefteprovody Company transports Russian oil delivered via Samara – Lisichansk pipeline through the eastern Ukrainian pipeline network to the oil terminal in Odessa (0.16-mb/d or 8-MT/Y capacity). It needs to be mentioned that this system can also transit oil from Samara to the Russian port of Novorossiysk, but this function became redundant with the construction of Sukhodolnoe-Rodionovskaya bypass on the Russian territory. The total length of the pipelines of the Pridnestrovsky Magistralny Nefteprovody Company is 2,200 km with a diameter varying from 1020 to 720 mm. The system can also operate in reversed mode delivering crude oil from Odessa port to Ukrainian refineries.

A1.6. The Kazakhstan-China Pipeline

The idea to build a pipeline from Kazakhstan to China appeared due to involvement of the Chinese National Petroleum Corporation (CNPC) into privatisation of the
oil companies of Aktyubinsk and Uzen’. The pipeline was built by joint efforts of KazTransOil and China National Oil and Gas Exploration and Development Corporation. The construction was completed in sections.

In March 2003 Kazakhstan commissioned the first stage of the pipeline Kenkiyak-Atyrau oil pipeline of 448.8-km long and of 0.12-mb/d or 6 MT/Y capacity. Currently the pipeline is transporting oil to Atyrau. A part of the oil goes to CPC (Caspian Pipeline Consortium) and the rest to the Atyrau-Samara pipeline. But the pipeline can be also functioning in the reversed mode.

The second stage – a pipeline from Atasu to Alashankou at Chinese border. The length of the pipeline of 813-mm diameter totals 962 km. Throughput capacity at the first stage of the project implementation amounts to 0.20 mb/d or 10 MT/Y, with an expansion to 0.40 mb/d or 20 MT/Y. Construction of the pipeline Atasu-Alashankou pipeline was finished in 2005.

The third stage – a 793 km link (813 mm) from Kenkyak PS to Kumkol PS was commissioned in 2009. The capacity is 0.20 mb/d or 10 MT/Y.

The system now allows to deliver crude oil from Western Kazakhstan to China via Kenkyak-Kumkol-Atasu-Alashankou route. In 2010 the pipeline delivered to China over 0.20 mb/d or 10 MT. The pipeline is operated by a Kaztransoil and China National Oil Development Corporation joint venture Kazakhstan-Chinese pipeline.

A1.7. The Adria System

Pursuant to the Adriatic Crude Oil Pipeline Convention signed in 1974, a pipeline starting out from Omisalj port was constructed by 1979. The goal of the pipeline was to supply Yugoslavian, Czechoslovakian and Hungarian refineries with crude oil from Mediterranean. It was also connected to the Druzhba pipeline system in Hungary. During the time of the Yugoslav wars pipeline operations were suspended. Now the Adria system is split between several countries of the former Yugoslavia and Hungary. The design capacity of the pipeline was 0.68 mb/d or 34 MT/Y, allowing 0.4 mb/d or 20 MT/Y for Yugoslavian refineries and 0.2 mb/d or 10 MT/Y for transit to Hungary and Czechoslovakia. The actual capacity is somewhat lower but still allowing for supply of domestic refineries and transit.

Today the core of the system is the JANAF system in Croatia. The Omisalj terminal on the Krk island receives tankers of up to 500,000 mt deadweight and has a total storage capacity of 760,000 m³. A 7.2 km separate line (500 mm) links the terminal with Rijeka refinery. The main line (910 mm) leads 180 km to Sisak terminal where part of the crude is delivered to Sisak refinery. From Sisak the pipeline goes in two directions: to Hungarian and to Serbian borders. The first arm runs from Sisak to Virje, where one part of the flow goes to Lendava in Slovenia and the main line crosses the border with Hungary near Gola and links the Druzhba at Százhalombatta. The line from Sisak to Hungarian border is 109 km long (710 mm). The pipeline section from the Sisak Terminal through the Virje Terminal up to Százhalombatta is reversible, thus
providing the possibility of crude oil transportation in both directions. The second arm crosses Serbian border at Sotin and provides crude oil for Serbian refineries Novi Sad and Pancevo. Leading to Serbia it also has a branch at Slavonski Brod to Bosanski Brod refinery in Bosnia and Herzegovina. The distance from Sisak to Slavonski Brod is 156 km (710 mm) and 84 km further to Serbian border (660 mm).

A1.8. The IKL Pipeline

The IKL pipeline (Ingolstadt-Kralupy nad Vltavou-Litvínov) was conceived as an alternative supply route for Czech Refineries. After the fall of the Soviet block the Druzhba pipeline system remained the sole supply source for crude oil in Czech Republic. To mitigate this risk the pipeline linking Czech Druzhba stretch with the TAL system was built 1992-1995. The name of the IKL pipeline is misleading and refers to initial design route. The pipeline runs from Vohburg an der Donau (Germany) to Central Crude Oil Tank Farm at Nelahozeves (near Kralupy nad Vltavou), which handles both Druzhba and IKL oil flows. The IKL capacity amounts 0.20 mb/d or 10 MT/Y and it delivers light crude grades. The total length of IKL is 349 km (169.7 km in Czech Republic), pipe diameter - 710 mm. The pipeline operator (both in Germany and ČR) is a state-owned company MERO ČR.

A1.9. The Constanta Black Sea Port

Crude oil supply of Romania beyond domestic production is effectuated via the Black Sea through the Constanta terminal. A pipeline system starting from Constanta supplies several Romanian refineries. One separate line connects Constanta with Petromidia refinery. The three line route runs from Constanta to Calareti PS, where the stream splits into two two-line arms, one leading to Arpechim Pitesti refinery, the other – to Ploesti refinery. A branch starting at Baragan leads in one line to Rafoonesti refinery. The total length of the system for crude oil transportation imported via Constanta port amounts 1,200 km. The capacity amounts 0.36 mb/d or 18 MT/Y. The pipeline network of Romania is operated by majority state-owned Conpet S. A.

A1.10. The Kirkuk-Ceyhan Pipeline

The pipeline (1,016 mm) from Iraqi Kirkuk to Ceyhan at Turkish Mediterranean sea coast was commissioned in 1977 with a total length of 986 km (641 km in Turkey). A second line (1,168 mm) was added ten years later. The Turkish stretch has 6 PS. The design capacity of the pipeline is 1.42 mb/d or 70.9 MT/Y.

In 1990 the operation of the pipeline was suspended due to UN sanctions. Since 1996 limited quantities of crude oil were allowed to be shipped through the pipe, the pipeline operation was irregular ever since and was suspended during the war in Iraq. Now there are signs of recovery, the volumes are growing and a new transit agreement was signed recently.

The pipeline part located in Turkey is operated by state-owned Botaş.
### Main Export Pipelines

<table>
<thead>
<tr>
<th>Route</th>
<th>Diameter (mm)</th>
<th>Length (km)</th>
<th>Throughput capacity</th>
<th>Utilisation in 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Druzhba Russia</td>
<td>1,000 / 1,200</td>
<td>1,300</td>
<td>1.56 mb/d (78 MT/Y)</td>
<td>1.60 mb/d (80 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Belarus (to Poland)</td>
<td>630 / 820</td>
<td>624</td>
<td>0.86 mb/d (43 MT/Y)</td>
<td>0.94 mb/d (47 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Poland (to Germany)</td>
<td>630 / 820</td>
<td>660</td>
<td>0.86 mb/d (43 MT/Y)</td>
<td>0.36 mb/d (18 MT/Y)</td>
</tr>
<tr>
<td>Plock-Gdansk</td>
<td>630</td>
<td>180</td>
<td>0.40 mb/d (20 MT/Y)</td>
<td>0.14 mb/d (7 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Belarus (to Ukraine)</td>
<td>720 / 720</td>
<td>245</td>
<td>0.76 mb/d (38 MT/Y)</td>
<td>0.38 mb/d (19 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Ukraine</td>
<td>530 / 720</td>
<td>684</td>
<td>0.55 mb/d (27 MT/Y)</td>
<td>0.34 mb/d (17 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Slovakia</td>
<td>530 / 720</td>
<td>444</td>
<td>0.40 mb/d (20 MT/Y)</td>
<td>0.20 mb/d (10 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Czech Republic</td>
<td>530</td>
<td>357</td>
<td>0.18 mb/d (9 MT/Y)</td>
<td>0.10 mb/d (5 MT/Y)</td>
</tr>
<tr>
<td>Druzhba Hungary</td>
<td>530</td>
<td>290</td>
<td>0.16 mb/d (8 MT/Y)</td>
<td>0.14 mb/d (7 MT/Y)</td>
</tr>
<tr>
<td>Šáhy–Százhalombatta</td>
<td>400</td>
<td>126</td>
<td>0.07 mb/d (3.5 MT/Y)</td>
<td>Irregular</td>
</tr>
<tr>
<td>Baltic Pipeline System</td>
<td>720 / 1,020</td>
<td>801</td>
<td>1.20 mb/d (60 MT/Y)</td>
<td>1.42 mb/d (72 MT/Y)</td>
</tr>
<tr>
<td>Novorossiysk</td>
<td>530 / 820</td>
<td>242</td>
<td>0.84 mb/d (46 MT/Y)</td>
<td>0.92 mb/d (42 MT/Y)</td>
</tr>
<tr>
<td>Tuapse</td>
<td>530</td>
<td>247</td>
<td>0.10 mb/d (5 MT/Y)</td>
<td>0.10 mb/d (5 MT/Y)</td>
</tr>
<tr>
<td>Velikotsk-Odessa</td>
<td>720 / 1,020</td>
<td>1,097</td>
<td>0.16 mb/d (8 MT/Y)</td>
<td>-</td>
</tr>
<tr>
<td>Baku-Supsa</td>
<td>530</td>
<td>827</td>
<td>0.10 mb/d (5 MT/Y)</td>
<td>0.06 mb/d (2.8 MT/Y)</td>
</tr>
<tr>
<td>Baku-Novorossiysk</td>
<td>720</td>
<td>1,411</td>
<td>0.16 mb/d (7.8 MT/Y)</td>
<td>0.05 mb/d (2.3 MT/T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Azerbaijan 0.11 mb/d (5.5 MT/T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Makhachkala</td>
</tr>
<tr>
<td>Odessa-Brody / reversed</td>
<td>1,020</td>
<td>674</td>
<td>0.28 mb/d (14 MT/Y) / 0.18 mb/d (9 MT/Y)</td>
<td>0.02 mb/d (1 MT/Y) / 0.04 mb/d (2 MT/Y)</td>
</tr>
<tr>
<td>CPC</td>
<td>1,016</td>
<td>1,511</td>
<td>0.56 mb/d (28 MT/Y)</td>
<td>0.7 mb/d (35 MT/Y)</td>
</tr>
<tr>
<td>BTC</td>
<td>1,168-1,067</td>
<td>1,776</td>
<td>1.00 mb/d (50 MT/Y)</td>
<td>0.74 mb/d (37 MT/Y)</td>
</tr>
<tr>
<td>IKL</td>
<td>710</td>
<td>349</td>
<td>0.20 mb/d (10 MT/Y)</td>
<td>0.06 mb/d (3 MT/Y)</td>
</tr>
<tr>
<td>JANAF</td>
<td>910-710</td>
<td>289 / 429</td>
<td>0.20 mb/d (10 MT/Y)</td>
<td>0.14 mb/d (7 MT/Y)</td>
</tr>
<tr>
<td>Kirkuk-Ceyhan (Turkey)</td>
<td>1,016 / 1,168</td>
<td>641 / 656</td>
<td>1.42 mb/d (71 MT/Y)</td>
<td>0.36 mb/d (18 MT/Y)</td>
</tr>
<tr>
<td>ESPO</td>
<td>1,067</td>
<td>2,821</td>
<td>0.30 mb/d (15 MT/Y)</td>
<td>0.32 mb/d (16 MT/Y)</td>
</tr>
<tr>
<td>Atasu-Alashankou</td>
<td>813</td>
<td>962</td>
<td>0.2 mb/d (10 MT/Y)</td>
<td>0.2 mb/d (10 MT/Y)</td>
</tr>
</tbody>
</table>
ANNEX 2. Main Cross-Border / Export Petroleum Products Flows

A2.1. FSU

Unlike the destiny of the crude oil pipeline system of USSR the product pipeline network remained its integrity of ownership and management. The former Soviet products pipeline system in the Russian Federation and the FSU countries is operated by Transnefteprodukt, a Transneft subsidiary. Transnefteprodukt controls eight petroleum products companies and seven service entities. It receives petroleum products from fifteen Russian and two Belarusian refineries. The main light petroleum products that are transported are jet kerosene, diesel oil and automobile gasoline. The exported diesel oil used to be exclusively of 0.2-62 grade which means 2000 ppm sulphur content. Since 2009 upon the implementation of higher ecology standards in the Europe the diesel oil exported is now of 1000, 500 and 10 ppm sulphur content depending on the export route.

The network of the product pipelines of Transnefteprodukt runs through the territory of the Russian Federation, CIS countries and the Baltic Sea countries. The company has pipelines of overall length of 19,100 km (including 15,000 km of trunk lines) in the territory of the Russian Federation, 1,200 km in Ukraine, 1,200 km in Belarus, 300 km in Kazakhstan, and 400 km in Latvia and Lithuania.

Main export oriented pipelines are:

- The Western pipeline;
- The Northern line (Primorsk);
- The Unecha-Ventspils pipeline.

A2.1.1. The Unecha-Ventspils Pipeline

The pipeline to Ventspils was for years the main export route for Russian-born oil products. Starting at Unecha in Russia where it receives diesel oil from Samara region, Ryazan and Moscow refineries it crosses Belarus in direction of Latvian border. The 530 mm pipeline ends at the Baltic Sea port of Ventspils. The length of the pipeline is about 1,100 km. The capacity at Polotsk-Ventspils stretch was increased in 2004 up to 8 MT/Y by constructions of loopings. Unlike the case with the crude oil the volumes of diesel oil delivered to Ventspils remain to be quite high (5.6 MT in 2010) despite the launch of the Northern line to Primorsk. This is to be explained by the fact that Ventspils ships a lower grade diesel of 1000 ppm – the major grade produced at Russian refineries. The line section before Latvian border is operated by Transnefteprodukt subsidiary Zapadtransnefteproduct. The 415 km stretch in Latvia and Lithuania – by LatRosTrans, a Transnefteprodukt and Ventspils nafta joint venture.
A2.1.2. The North Line (Primorsk)

The first stage of the North line project was commissioned in 2008. This new route is aimed at safeguarding the export of higher quality diesel oil to North-West European market via the Baltic Sea port of Primorsk. The pipeline starts at Kstovo (Norsi refinery) and collects Euro-5 10 ppm sulphur diesel oil also from Yaroslavl and Kirishi refineries under way to Primorsk. The pipeline diameter is 530 mm, the overall length amounts about 1,100 km. The current capacity of the pipeline is 8.4 MT/Y while only 5.8 MT were shipped in 2010 due to lack of Euro-5 diesel volumes.

A2.1.3. The Western Line

The Western line connects the Samara-Unecha product pipeline via Belarus and Ukraine with the products pipeline system in Hungary. The line delivers diesel oil produced at Russian refineries, at Mozyr refinery in Belarus and Drogobych refinery in Ukraine. The 530 mm pipeline was built in the 1960-1970. The supplied diesel oil is received by the Tisza Refinery for desulphurisation. The throughput capacity is indicated at over 7 MT/Y, however in 2010 the total volume delivered to Hungary was over 1 MT. The length is about 1,200 km.

A2.1.4. Kirishi-St. Petersburg Line

The pipeline delivers oil products to the Baltic Sea port of St. Petersburg form the Kirishi refinery. The capacity of the pipeline amounts 3 MT/Y (2.5 MT shipped in 2010), its length is about 300 km, the diameter – 325 mm. Currently the pipeline delivers diesel oil of 500 ppm sulphur content.

A2.2. The Czech-Slovakian Link

The connection of Slovnaft refinery in Bratislava to Czech product pipelines system is a remainder of the products pipeline system of Czechoslovakia. The core of the system stayed in the Czech Republic, the link is being used to supply products produced at Slovnaft refinery to Czech Republic.
ANNEX 3. Domestic and Intra-FSU Oil Flows

Oil deliveries to refineries are the basis of domestic and intra-FSU flows. In the FSU oil is mainly delivered from the fields in Russia to refineries in Ukraine, Belarus and Pavlodar refinery in Kazakhstan. In the Eastern European countries internal pipeline network serves the domestic oil production needs to deliver locally produced crude to refineries.

A3.1. Russia

The Russian oil transportation system is centralised and managed by Transneft. Transneft prepares a unified technical policy of the system’s development, research programmes, technical improvement, and an oil pipeline development scheme. The company also acts as a centre for construction of major transportation facilities. It funds research and also designs pilot work that are of priority in the sector. Transneft handles 93% of the crude oil produced in Russia.

The Russian oil transportation system includes a network of trunk pipelines, storage depots, loading depots and pumping stations. The length of the trunk pipeline exceeds 50,000 km. The trunk pipeline facilities consist of 261 pumping stations, 897 tanks with a total capacity of 16.5 million cubic meters. The diameter of the trunk oil pipelines varies from 420 to 1,220 mm. More than 75% of the pipelines have a diameter of 720 mm.

Transneft holds 12 daughter joint stock companies which transport oil through the trunk pipeline system. Four daughter companies are described in the previous section “Flows to the EU and Sea Export Terminals”, namely Druzhba, Chernomortransneft, Baltic pipeline system and East pipeline (ESPO).

Sibneftprovod

This company receives oil from producers in the Tyumen region and delivers it to Centralnoy Sibiri, Transsibneft, Uralo-Sibirskiy and Severo-Zapadnye, which transfer the oil to the central parts of the country and to refineries.

The Sibneftprovod company has a huge network of pipelines that are laid in the Tyumen, Yekaterinburg and Kurgan regions, including pipeline sections of major trunk pipelines Ust-balyk-Kurgan-Ufa-Almetyevsk, Surgut-Polotsk, Surgut-Anzherosudjensk, Krasnoleninsk-Volgograd and Nizhnrvartovsk-Kurgan-Samara. The total length of the pipelines is around 9,990 km. The head office is located in Tyumen.

Centralnoy Sibiri

This oil transportation company manages a part of the Surgut-Anzhero-Sudjensk trunk pipeline which is located in the Tomsk region. The route length is 1,393 km. The company receives oil from the Tomsk region and Sibneftprovod, and then delivers it to the Transsibneft company. The head office is located in the city of Tomsk.
Transsibneft

This company transports oil received from Sibneftprovod and Centralnoy Sibiri. It delivers the oil further to the Uralo-Sibirskiy, Kazakhstan, Omsk refinery, Arkhangelsk petrochemical plant and Achinsk refinery; by railway to the Khabarovsk and Komsomolsk refineries and exports to China. It incorporates a part of the Tobolsk-Pavlodar pipeline that is located in the Omsk region; a trunk pipeline that is located in the Omsk, Novosibirsk and Kemerovo regions; and the Andjero-Sudjensk-Angarsk pipeline that runs through the Kemerovo, Krasnoyarsk and Irkutsk regions. The total length of the pipelines is around 4,200 kilometres. The head office is located in the city of Omsk.

Uralo-Sibirskiy

This oil transportation company receives oil produced at the Bashkiria and Orenburg region fields. It takes oil delivered by Sibneftprovod and Transsibneft. The Uralo-Sibirskiy oil transportation company delivers oil through pipelines to refineries in Bashkiria, and further transfers oil to Privolzhsknefteprovod and the Severo-Zapadnye oil transportation companies. The company’s pipelines run through the territories of Bashkiria, Chelyabinsk, Kurgan and Omsk regions. The Uralo-Sibirskiy oil transportation company possesses sections of the Ust-Balyk-Kurgan-Ufa-Almetyevsk and Nizhnevartovsk-Kurgan-Samara trunk pipelines. The overall length of the pipelines totals 7,565 km. The head office is located in Ufa.

Privolzhsknefteprovod

This company transfers oil from the fields of the lower Volga river area and also from the trunk pipelines of the Uralo-Sibirskiy oil transportation company, from Severo-Zapadnye oil transportation company, and also from Kazakhstan (via Atyrau-Samara line). The company possesses a network of pipelines that run through the Samara, Saratov and Volgograd regions, as well as sections of the Nizhnevartovsk-Samara, Samara-Lisichansk and Samara-Tikhoretsk pipelines in the Rostov region. The total pipelines length is around 5,300 km. The company delivers oil to the Samara, Syzran, the Novo-Kuybyshev, Orsk, Saratov and Volgograd refineries; Ukraine and the Druzhba oil transportation company. The head office is located in the city of Samara. The company has two tank car loading stations in Krotovka and Medveditsa, as well as an oil terminal in Samara.

Severo-Zapadnye

This oil transportation company receives oil from the producers in Tatarstan, the Perm region, Udmurtiya, as well as the crude delivered by the Uralo-Sibirskiy oil transportation company and Sibnefteprovod. The oil is subsequently transferred to the Verkhne-Volzhskye oil transportation company and the Druzhba pipeline. It delivers oil to refineries in Tatarstan, Bashkirie, and the Perm region. The oil transportation company has a network of pipelines that are located in the Perm region, Udmurtia, Mari El, Tatarstan, Bashkiria, including sections of the Almetyevsk-Nizhny Novgorod
Annex 3: Domestic and Intra-FSU Oil Flows

and Surgut-Polotsk trunk pipelines. The total length is around 6,110 km. The head office is located in Kazan.

**Verkhne-Volzgsikye**

This oil transportation company takes oil from the Severo-Zapadnye and Severny oil transportation companies and delivers it to the Druzhba, as well as to refineries in the European part of Russia and to Belarus. The oil transportation company holds oil pipelines that run across the Mari El, Nizhegorodsky, Vladimir, Ryazan, Moscow, Yaroslavl, Tver, Pskov, Kirov, and Sankt-Petersburg regions, including a section of the Surgut-Polotsk trunk pipeline. The total length is 4,470 km. The head office is located in Nizhny Novgorod.

**Severny**

This oil transportation company operates the Usa-Ukhta and Ukhta-Yaroslavl oil trunk pipelines. The oil transportation company transports oil to the Ukhta refinery and the Verkhne-Volzsiye oil transportation company. It also transports oil by railway from the Vetlosyan loading station. The Usa-Ukhta pipeline crosses through the territory of the Republic of Komi. The Ukhta-Yaroslavl pipeline starts in the Republic of Komi and runs through the Arkhangelsk, Vologda and Yaroslavl regions. The total length of the pipeline is approximately 1,570 km. The main office is located in Ukhta.

### A3.2. Belarus

The Belorussian Oil Transportation Companies Gomeltransneft and / or Novopolotsk Druzhba transport Russian oil delivered by the Druzhba to the Novopolotsk and Mozyr refineries.

### A3.3. Ukraine

Ukraine enjoys a well-developed trunk pipeline system, with a total length of more that 4,600 km. The oil transportation system consists of two transmission systems; one in the east of the country (Pridnestrovsky Magistralny Nefteprovod) and one in the northwest of the country (oil transportation system Druzhba). Ukrtransnafta, a subsidiary of Naftogaz Ukrainy, is the trunk oil pipeline operator in Ukraine.

The Pridnestrovsky Magistralny Nefteprovod Company transports oil received from domestic producers and from Russia via Privolzhsknftprovod (Samara-Lisichansk pipeline) and Severo-Zapadnye (Michurinsk-Kremenchug pipeline) and delivers it to Ukrainian oil refineries situated in both the east and the south of the country: Kremenchug, Lisichansk, Kherson, Odessa. This system can also transit oil from Samara via Lisichansk to the Russian port of Novorossiysk, but this function became redundant with the construction of Sukhodolnoe-Rodionovskaya bypass.

The Ukrainian Druzhba has also smaller pipelines linking domestic production sites (Dolina PS) with Drogobych refinery. In 2005 these pipelines were expanded and
linked with the Druzhba. A new pipeline from Dolina PS to Nadvirnyanski refinery was built as well. Now these refineries can receive not only domestic crude oil but also oil from the Druzhba line.

**A3.4. Kazakhstan**

Kazakhstan has developed an infrastructure that transports oil from the fields in the country through the Russian and other oil transportation systems to world markets. The KazTransOil Company operates the oil transportation pipelines. The company’s role is to ensure uninterrupted delivery of oil to the domestic and foreign consumers. The company consists of three branches each operating designated pipelines.

The western branch (in the city of Aktau) is an operator of 3,012-km pipelines and 3,140-km trunk lines that are laid on the Caspian Seabed, including the 1,232-km Uzen-Atyrau-Samara pipeline.

The Aktobsky branch (in the town of Aktobe) is an operator of the Zhanozhol-Kenkiyak-Orsk pipeline (total length of 891 km). Crude oil from the Aktobe field is delivered to the Orsknefteorgsintez refinery in Russia.

The eastern branch (in the city of Pavlodar) is an operator of the pipeline which crosses Kazakhstan from north to south (2,574 km). Built between 1977 and 1988, this pipeline delivers oil from western Siberia to refineries in Kazakhstan (Pavlodar and Chimkent) and Turkmenistan (Charjou).

A Russian trunk pipeline transits northern Kazakhstan for a distance of 187 km. It is a section of the TON-2 pipeline, which has been managed by Uralo-Sibirskiy pipeline company (Transneft) since 1996. As a property of the Republic of Kazakhstan, this section was leased to Altayfrakht in accordance with a decision made by the Severo-Kazakhstansky regional government.

**A3.5. Uzbekistan**

The pipeline system in Uzbekistan is autonomous delivering indigenous production to refineries in the Fergana valley.

**A3.6. Turkmenistan**

The Turkmen oil transportation company is also technically autonomous, and features shorter pipelines. Oil is delivered by pipe from the local fields to the Krasnovodsky refinery, by railway to Fergannefteorgsintez, and by ship to the Krasnovodsky refinery, Azerbaijan (Baku) and Russia (Makhachkala). The total length of the pipelines in Turkmenistan is around 280 km. The head office is located in the city of Nebit-Dag.
A3.7. Romania

Romania has a pipeline sub-system to serve the needs of the domestic production. The pipelines link production sites with refineries and rail way terminals, not all of them are integrated in one network. The main pipeline infrastructure is located around Ploiesti refinery. The total length of the sub-system pipelines is around 1,450 km.

A3.8. Hungary

Hungary has one pipeline that gathers domestically produced oil from three locations (Algyo, Kiskunhalas, Szank) and brings it to Százhalombatta terminal i.e. for Duna refinery. There is also a pipeline linking Bázakerettye and Nagylengyel with the refinery at Zalaegerszeg.

A3.9. Czech Republic

A Moravské Naftové Doly (MND) owned pipeline connects production sites in South Moravia with the MERO managed Druzhba section at Klobouky PS from where oil can be delivered to refineries.

A3.10. Turkey

The pipelines in Turkey are operated by the state-owned BOTAŞ. There are 5 main pipelines in the country, two of them – BTC and Kirkuk-Ceyhan – are used for transit (see section 1.3. and 1.13.). Other three pipelines are used to deliver domestically produced crude or to supply land-locked refineries.

The Ceyhan-Kirikkale pipeline runs from the Ceyhan terminal and delivers imported crude oil to Kirikkale refinery. The length and diameter of the pipeline are 448 km and 610 mm respectively. The throughput capacity amounts 0.1 mb/d or 5 MT/Y.

The Batman-Dörtyol pipeline transports oil produced at the Batman oil field to Dörtyol terminal of Ceyhan port. Oil produced in Diyarbakir and Sanl regions is also transported to Dörtyol through the same pipeline. The length of the pipe is 511 km, the diameter – 450 mm. The capacity amounts 0.07 mb/d or 3.5 MT/Y.

The Selmo-Batman pipeline is a short link from Selmo oil field to Batman refinery terminal. It is only 42 km long and has an annual capacity of 0.8 MT (0.01 mb/d). The diameter varies from 150 mm to 300 mm.
The product pipelines usually link refineries with terminals and storage bases. Due to limited to refinery capacities the volumes delivered are usually low, most often the pipe diameters used vary from 130 mm to 350 mm. In the bigger systems like FSU network the diameter of main lines is 500 mm.

A4.1. FSU

After the fall of the USSR an agreement was reached in negotiations upon splitting the USSR property that all product pipelines of the former Soviet Union will be the property of the Russian Federation. Today Transnefteprodukt (a Transneft subsidiary) coordinates and manages transportation of petroleum products via pipelines in the Russian Federation and the FSU countries. Transnefteprodukt controls eight petroleum products companies and seven service entities. It receives petroleum products from fifteen Russian and two Belarusian refineries. The network of the product pipelines of Transnefteprodukt runs through the territory of the Russian Federation, CIS countries and the Baltic Sea countries.

A4.1.1. Russia

The Transnefteprodukt company has pipelines of 16,400 km in the territory of the Russian Federation. The network is managed through 8 daughter companies.

The refineries in Russia are situated not evenly across the territory. In the European part there can be three main refineries groups figured out. There are four refineries in Bashkiria mostly around Ufa. Also four refineries (Moscow, Nizhniy Novgorod, Yaroslavl, Ryazan) in the central part of Russia. There are three refineries near Samara (Kuybyshev, Novo-Kuybyshev and Syzran). Other four refineries are situated in different parts of the country. Because of this reason the Transnefteprodukt daughter companies have different load and goals: some of them handle big volumes gathered from various locations and pipes, others simply deliver products from remote refineries to the core system. The core system is built of Ryazantransnefteprodukt, Mostransnefteprodukt, Uraltransnefteprodukt and Yugo-Zapadtransnefteprodukt.

Ryazantransnefteprodukt

Ryazantransnefteprodukt operates the Nizhniy Novgorod-Ryazan-Tula-Orel pipeline. It also has a link to Mostransnefteprodukt via double line of the Ryazan-Moscow pipeline. Ryazantransnefteprodukt receives 10ppm sulphur diesel oil from Ryazan refinery and delivers it to Nizhniy Novgorod where it further goes into the North line to Primorsk. The 1000 ppm sulphur diesel oil received via the Ryazan-Moscow link and Ryazan refinery is being forwarded to the west to Yugozapadtransnefteprodukt. The second line of the Ryazan – Moscow link delivers aviation kerosene (jet fuel) produced at the Ryazan refinery to Mostransnefteprodukt. The total length of the Ryazantransnefteprodukt pipelines amounts 2,218 km.
Annex 4: Domestic and Intra-FSU Oil Products Flows

**Mostransnefteproduct**

The Mostransnefteproduct pipeline represents a ring around Moscow connecting the Moscow refinery (and Ryazan refinery via the Ryazan – Moscow pipeline) with different consumers and terminals of the Moscow region. The distinctive feature of the pipeline is not only its round shape of the route but also the fact that it delivers different products: jet fuel to airports, automotive gasoline to terminals and petrol stations, diesel oil for terminals and to the Ryazantransnefteproduct. The length of the Mostransnefteproduct ring is 1,151 km.

**Yugozapadtransnefteproduct**

Yugozapadtransnefteproduct is one of the most important routes, its total pipelines length is 7,886 km. It connects Samara refineries group with consumers in central and southern regions of Russia, its route following to some extent the Druzhba pipeline. At Samara-Nikolskoye section the pipeline runs in two lines. It has a branch to Belgorod and Ukraine starting from Nikolskoye.

**Uraltransnefteproduct**

Uraltransnefteproduct takes products from the Bashkiria refineries and provides a quite sophisticated handling both receiving and delivering different products from / to different directions. The total length of the pipelines is 4,934 km. Uraltransnefteproduct delivers 1000 ppm sulphur diesel oil westwards to Samara for Yugozapadtransnefteproduct, 10 ppm diesel to Kambarka terminal, jet fuel to airports. It also is linked with the eastern regions via the Ufa-Omsk pipeline and Ufa-Petropavlovsk running partially in parallel. The Ufa-Petropavlovsk pipeline delivers automotive gasoline eastwards to Chelyabinsk and Petropavlovsk; the Ufa-Omsk pipeline supplies 1000 ppm sulphur diesel oil from Omsk refinery.

**Sibtransnefteproduct**

Sibtransnefteproduct delivers automotive gasoline and diesel oil in batch operation from Omsk refinery eastwards to Plotnikovo terminal via Novosibirsk for 1068 km.

**Sredne-Volzhskiy Transnefteproduct**

Sredne-Volzhskiy Transnefteproduct receives products from Taif refinery (Tatarstan) and delivers it to Uraltransnefteproduct via the Almetyevsk-Subkhankulovo pipeline. It is also connected via Nizhniy Novgorod-Almetyevsk pipeline with the Norsi refinery (Nizhniy Novgorod) supplying 1000 ppm sulphur diesel oil. The length of the pipeline is 1,288 km.

Other two Transnefteproduct subsidiaries are managing pipelines to Primorsk (Balttransnefteproduct) and St. Petersburg (Peterburgnefteproduct), they are described in the export flow section under items 2.2.1.2. and 2.2.1.4.
A4.1.2. Ukraine

Transportation of petroleum products in Ukraine is carried out by Yugozapadtransnefteprodukt and PrikarpatZapadTrans, both daughter companies of Transnefteprodukt. The company's facilities are scattered through seven provinces in Ukraine; Zhytomir, Khmelnitsky, Rivne, Volyn, Ternopil, Lviv, and Zakarpatsky provinces. The length of the pipelines in these provinces exceeds 1,200 km. The system of trunk pipelines is connected to lateral pipes with 21 storage depots in eight provinces in Ukraine.

A4.1.3. Belarus

Transportation of petroleum products through Belarus is carried out by Zapad-Transnefteprodukt, a daughter company of Yugozapadtransneftprodukt (a daughter company of the Transnefteprodukt). The trunk petroleum product pipelines in Belarus are Nizhny Novgorod-Ryazan-Orel, Samara-Unecha-Ventspils, and Samara-Unecha-Mozyr-Rovno-Brest-Uzhgorod. Length of the pipelines totals 1,200 km. Pipe diameter varies from 350 mm to 500 mm.

A4.1.4. Kazakhstan

The Uraltransnefteprodukt company (a daughter company of Transnefteprodukt) carries out transportation of petroleum products via Kazakhstan. In accordance with the Agreement between the Russian Federation and Kazakhstan for cooperation in operation of the product pipelines dated 20/01/1995 the product pipelines Ufa-Omsk (from the 842nd km to 1027th km) and Ufa-Petropavlovsk (from the 840th to 912th km) are the property of the Russian Federation. The pipelines are crossing its territory on the way from Ufa via Pavlodar to Omsk. There are about 300 km of pipelines belonging to the Russian Federation in Kazakhstan. The diameter of the pipes varies from 350 mm to 500 mm.

The product pipeline Travnik-Kustanay (from the 0th km to 144th km) and Samara-Uralsk (from the 0th to 200th km) became the property of Kazakhstan according to the mentioned Agreement. At the present time the pipelines belonging to Kazakhstan are out of operation. The Travnik-Kustanay pipeline is almost fully disassembled.

A4.2. Poland

The product pipelines system in Poland are managed by PERN Przyjaźń. There are four main pipelines originating from Płock refinery and leading to products terminals and bases in different parts of the country. Three of them belong to PERN Przyjaźń, one – to PKN Orlen. Main PERN Przyjaźń pipelines are:

- The Płock-Nowa Wieś Wielka-Rejowiec line leading to the western part of the country with annual capacity of 2.1 MT. It also has a connection to the underground storage IKS Solino.
- The Płock-Mościska-Emilianów line to the east with about 1 MT/Y capacity.
• The Płock-Koluszki-Boronów line going southwards with an annual capacity of 3.8 MT/Y.

The main PKN Orlen-owned product pipeline connects Płock with the terminal in Ostrów in the south-west part of the country.

**A4.3. Hungary**

State-owned MOL is the Hungarian product pipelines network operator. The pipelines usually connect refineries with terminals and storage bases. The Duna refinery at Százhalombatta has two main lines leading to the north (Százhalombatta-Komárom-Gyor and Százhalombatta-Csepel) and one to the south (Százhalombatta-Pecs).

The Százhalombatta and Tisa refineries are linked by two two-way pipelines via Szajol. This connection allows for optimisation of MOL refining and processing activities. The Tisa refinery is connected to the Western export line of Transnefteproduct system and desulphurises the diesel oil received. The processed feedstock is then delivered further to Szajol or via separate line to Ebes.

**A4.4. Czech Republic**

The products pipeline network in Czech Republic is managed by the state-owned ČEPRO Company whose activities also include operation of a petrol stations network. The system connects Czech refineries with major consumer regions via a pipeline that essentially follows the Druzhba pipeline (through Slovakian border to Bratislava refinery) with branches to Loukov (in direction Ostrava), Cerekvice (near Hradec Kralove), Vcelna (near České Budějovice). In the central part of the country the pipeline makes a “loop” from Litvinov through Plzen, Belcice, Smyslov to Slapanov (near Jihlava). Overall length of the pipelines makes about 1,100 km.

**A4.5. Slovakia**

A Slovnaft-owned pipeline transports products from Slovnaft refinery at Bratislava to terminals in the central part of the country. There is also a link to ČEPRO system to Czech Republic.

**A4.6. Bulgaria**

The pipeline from Burgas refinery to Sofia via Plovdiv was acquired by LukOil together with the Burgas refinery. The 464 km long pipeline of 3 MT annual capacity transports diesel oil and after modernisation in 2006 gasoline as well.
ANNEX 5. The New Projects

A5.1. Eastern Siberian Pipeline - 2

Pursuant to Order #1737-p of the government of the Russian Federation dated 31/12/2004, and in accordance with the energy strategy of Russia for the period up to 2020, Transneft has been engaged in the construction of the Eastern Siberia-Pacific Ocean oil pipeline system to transport Russian oil to countries in the Asian Pacific region. The intended pipeline route is: Tayshet-Kazachinskoye-Skovorodino-Khabarovsk-Perevoznaya Bay (Kozmino).

In the first stage of the project is commenced 2008 (see section A1.3.5). The second stage of the project is underway, the 2,045 km long Skovorodino-Kozmino section will be completed in 2011, the construction of the PS and Kozmino terminal expansion – in 2012. The capacity of the new section will reach up to 1 mb/d or 50 MT/Y. The Tayshet-Skvorodino line capacity is expected to be gradually increased up to 1.6 mb/d or 80 MT/Y.

A5.2. Kazakhstan-China Pipeline Expansion

The Kazakhstan-China Pipeline (see section 2.1.9.) project provides for its expansion up to 0.40 mb/d or 20 MT at the whole length of Kenkyak-Kumkol-Atasu-Alashankou route. To achieve this new pump stations should be added at the Atasu-Alashankou pipeline to increase its capacity up to 0.40 mb/d or 20 MT/Y from currently 0.20 mb/d or 10 MT/Y. Then the Kenkyak-Atyrau section should be reversed to provide more crude oil resources. At the Kumkol-Atasu section one new pump station and one additional pipeline should be built. These actions will allow to raise the throughput capacity along the whole route up to 0.40 mb/d or 20 MT/Y. The project is expected to be completed by 2014.

A5.3. Baltic Pipeline System - 2

The BTS-2 project is implemented pursuant to Order #1754-p of the government of the Russian Federation dated 26/11/2008 and is aimed at diverting crude oil from the Belarus Druzhba and Surgut-Polotsk pipeline sections to the Baltic Sea port of Ust-Luga and thus avoiding transit.

The project includes a construction of a 1,000 km long pipeline from Unecha via Andreapol to Ust-Luga. The pipe diameter is 1067 mm. At the first stage two pump stations (Unecha and Andreapol) will be upgraded, two new PS and tank farm at Ust-Luga will be built. This will allow to reach a capacity of 0.6 mb/d or 30 MT/Y. At the second stage more PS will be added to rise the capacity up to 1 mb/d or 50 MT/Y. The first stage is expected to be brought into operation by 2012.
**A5.4. Atyrau-Samara Expansion**

The expansion of the Atyrau-Samara pipeline supplying Kazakh oil to the Transneft system for transit has been discussed for a long time. There are different options on the table: upgrading of the old and construction of additional pump stations on the old pipe or a second line. The desired throughput volume is quoted to reach 0.50 mb/d or 25 MT/Y. A final agreement has not been reached yet.

**A5.5. Eskene-Kuryk Pipeline**

The project should provide an export option for oil from the Kashagan field in Kazakhstan. From Eskene the pipeline should go along the Caspian Sea coast to Kuryk, where a new port should be built. The expected pipeline length is 750 km, capacity – 0.46 mb/d or 23 MT/Y at the first stage. An expansion to 35 MT/Y and 56 MT/Y will be possible. The project was expected to be started in 2010 however due to delay with the Kashagan oil field development the project has been postponed.

**A5.6. CPC Expansion**

The Expansion project of CPC will be completed in three stages. At the first stage the existing five PS will be upgraded, three additional tanks and the third single point mooring buoy added at the Marine terminal plus an 88-km section of a lower diameter in Kazakhstan will be replaced. At the second stage five PS will be added. The third stage will require erecting another five PS and three more tanks at the Marine terminal. The construction by stages will allow for a gradual increase of its capacity from 0.56 mb/d or 28 MT/Y to 1.34 mb/d or 67 MT/Y. The expansion is set to be completed by 2015.

**A5.7. The Turkish Straits (Bosporus) Bypass Options**

The notorious congestion in the Turkish Straits which leads to significant delays in crude oil delivery and demurrages gave birth to a number of bypass options. Most viable of them are Burgas-Aleksandroupolis, Samsun – Ceyhan and PEOP. None of the projects succeeded in securing shippers guarantees thus failing to provide financing.

**A5.7.1. The Burgas-Aleksandroupolis Pipeline**

The Burgas-Aleksandroupolis project implies the construction of a 258 km long pipeline (diameter 1067 mm) from the Bulgarian Burgas where oil could be accepted from tankers in the Black sea to Aleksandroupolis at the Mediterranean (Aegean) sea coast of Greece.

The project would allow to deliver 0.7 mb/d or 35 MT/Y after the first stage of implementation with a possible upgrade to 1 mb/d or 50 MT/Y. The project shareholders structure includes two host countries and Russia. The development of the project currently depends on whether the Bulgarian government will decide to support the project implementation.
**A5.7.2. The Samsun-Ceyhan Pipeline**

Samsun-Ceyhan is the name of original project which route has now changed in favour of Unye as a starting point at the Black sea. The new intended route is Unye-Akkus-Niksa-Tokat-Yildizeli-Sarkisla-Pinarbasi-Sariz-Tufanbeyli-Saimbeyli-Feke-Kozan-Sumbas-Kadirli-Ceyhan-Yumurtalik. The project is being developed by Eni and Calik Enerji in a TAP (TransAnatolian Pipeline) consortium. The length of the pipeline is expected to reach 550 km with the diameter varying from 1070 mm to 1220 mm. The pipeline will have four PS and one pressure reducing station. The project should be implemented in two stages with 1 mb/d or 50 MT/Y capacity at the first stage and 1.5 mb/d or 75 MT/Y at the second. The project is trying to acquire backing from the Russian government, the negotiations are underway.

**A5.7.3. The PEOP Project**

The Pan-European oil pipeline project intents to connect Romanian Black Sea port of Constanta with the TAL line at Trieste. According to its main purpose, the PEOP project was meant as a pan-European pipeline for oil supply of EU and other European states from the Caspian region and Russia, which would assure a new route of oil supply. Furthermore, the pipeline would supply the refineries on the route, especially with considerable oil quantities to the Italian refineries. Only with such conception the project would be cost-effective and attractive to the investors.

The basic precondition for the project development within the wanted proportions was the co-operation of all states through the territories of which the future pipeline would pass or where the pipeline would end, i.e. all states (and the European Commission) that executed the Ministerial Declaration dated 3 April 2007.

Given the fact that the Republic of Slovenia and the Republic of Italy did not join to the PEOP Development Company established in 2008, JANAF (Croatian oil pipeline company) left the Company with the attitude that without the co-operation of Italy and Slovenia, the investment in this project would not be cost-effective, taking into account that both endpoints of pipeline (Trieste, Genoa) are located in Italy and the main markets are Italy and other EU countries.

**A5.7.4. The AMBO Project**

The Albania-Macedonia-Bulgaria pipeline views the construction of a pipeline from Burgas port in Bulgaria to Albanian port of Vlorë (Adriatic Sea). The proposed pipeline length should reach about 900 km, the expected capacity – 0.75 mb/d or 37.5 MT/Y. An agreement on the construction of the pipeline was signed by the hosting countries in 2007. However there are no concrete plans in sight.
A5.8. Western Siberia-Barents Sea

In the past, some Russian oil companies proposed a project to build a pipeline from the Western Siberian region to the coast of the Barents Sea. The location of a terminal was planned to be in the vicinity of the city of Murmansk. The length of the line (depending on a route selected) would total 2,800-3,900 km. However, Transneft thinks it more expedient for the purpose of exporting oil produced in the Timano-Pechyorsk area that a pipeline be built from Kharyaga to the coast of the Barents Sea to an oil loading terminal of a 0.48-mb/d or 24-MT/Y capacity near Indiga (Bolshoy Rumyanichny Tong). Surveys proved that for such factors as ice, depth, wind and wave conditions, location of a transfer terminal in the area of Indiga would be quite acceptable. Transneft has finished preliminary engineering calculations and figured out that length of the pipeline will be 467 km. Nonetheless, the question of building the Kharyaga-Indiga oil transmission system has not yet been decided.

A5.9. Odessa-Brody Extension Project

The Odessa-Brody pipeline was built as a first stage of a broader project of delivering Caspian oil from the Black sea to Central European market. As a second stage a pipeline link from Brody to Płock was projected to bring oil from Ukraine to Poland for further delivery to Gdansk port. At present a feasibility study for construction of the Brody-Płock eyes a new route: from Brody to Adamova Zastava PS (120 km in Ukraine and 250 km in Poland) and then via the Druzhba to Płock and Gdansk. The desired capacity is 0.2 mb/d or 10 MT/Y at the first stage and an expansion up to 0.8 mb/d or 40 MT/Y will be possible. The project is backed by both Ukrainian and Polish government however there is no firm investment decision in sight yet.

A5.10. JANAF Pipeline Reversal

The project of the JANAF pipeline reversal has been discussed for a long time. The goal is to make the JANAF system reversal from Sisak Terminal to Omišalj Port and Terminal. The section from Sisak to the Hungarian / Croatian border is reversal since 1989.

A5.11. Bratislava-Schwechat Link

The 60 km long pipeline should connect Slovak Druzhba branch from Bratislava with the Schwechat refinery in Austria allowing for deliveries of Russian crude oil. The idea is to make the pipeline able to work in both directions, so oil could be delivered from Schwechat (end point of Adria-Wien pipeline) to Slovakia in case of Druzhba supply disruptions or for any other reason. The viewed capacity is 0.05 mb/d (or 2.5 MT/Y) – 0.1 mb/d (or 5 MT/Y). The project is mulled since 2003. No decision has been made yet.

A5.12. Leuna-Litvinov Pipeline

A pipeline connection between two final points of the two Druzhba arms – Czech Litvinov and German Leuna – would allow to secure oil deliveries from other sources
in case of Druzhba supply disruptions. Leuna could receive oil from Rostock or Gdansk and send it to Litvinov, or Litvinov could supply TAL crude oil to Leuna. The estimated length of the pipeline would be about 160 km. The project was developed in the early 1990s but then abandoned due to IKL construction. The project was revived recently and is being discussed between Total and Mero.

A5.13. Kazakhstan-Persian / Arabian Gulf Pipeline Projects

There have been numerous projects to connect Kazakhstan with the Persian / Arabian Gulf. Unocal, Total and Iranian projects can be named. However as for now all of them seem to have been considered unfeasible.
A6.1. The South Line Project

The Transnefteproduct products pipeline system has no outlet to the Black Sea. The pipeline exports are being carried out via the Baltic Sea ports. At the same time the volumes of diesel oil delivered to the Russian Black sea ports for export by railway remain to be relatively high (13.6 MT/Y in 2009). The South line project should mitigate this deficiency by providing a link from Syzran (near Samara) to Novorossiysk Black sea port. The 1465 km long pipeline with 11 PS will run through Saratov and Volgograd collecting 10 ppm sulphur diesel oil from three refineries under way. The projected capacity of the pipeline will be 8.7 MT/Y of Euro-5 diesel oil. The implementation of the project is not scheduled yet but the FID is expected to be taken by 2012.

A6.2. Baltic Pipeline System for Products

A project of a pipeline from Novopotsk to Ust-Luga is being mulled by Russian and Belarus officials. The pipeline should be approximately 400 km (85 km in Belarus and 300 in Russia). The line should follow the route along the border with the Baltic states via Pskov. The pipeline capacity is thought to be at least 2-3 MT/Y and it could divert diesel oil from the Unecha-Ventspils line (see section 2.2.1.1.).
ANNEX 7. Transit Pipelines in Western Europe

This section looks into three oil transit pipelines in Western Europe: Transalpine (TAL), South Europe pipeline (SPSE) and Norpipe. These three are the main transit pipelines in Europe, apart from those in the former East bloc. TAL goes through Italy, Austria and Germany, while SPSE supplies crude to refineries in France, Switzerland and Germany. The Norpipe oil pipeline connects the Ekofisk field in the Norwegian sector of the North Sea with the terminal at Teesside, UK (and from there crude is shipped out by tankers).

TAL and SPSE were built by consortiums of oil refiners which exclusively use the pipeline. Similarly, main users of Norpipe are shareholders of the pipeline company, who are in turn shareholders of the producing fields. Under the Norwegian laws and regulations, however, Norpipe has to allow pipelines to tie in and use the pipeline’s spare capacity when there is an adjacent new field development. Tariffs of these pipelines are cost-based.

A7.1 TAL

The Transalpine (TAL) pipeline starts at the oil terminal in Trieste, Italy, crosses Austria before reaching Germany. TAL is a joint venture of eight oil companies to transport crude to their refineries and storage facilities in Austria and Germany. Shareholding is as follows:

- OMV 25%
- SHELL 24%
- ExxonMobil 16%
- Ruhr Oel 11%
- ENI 10%
- BP 9%
- ConocoPhillips 3%
- Total 2%

The TAL pipeline consists of three parts; TAL-IG, TAL-OR and TAL-NE. The 465-km TAL-IG pipeline carries crude from the Trieste marine facility to Ingolstadt, Germany, while the 266-km TAL-OR runs from Ingolstadt to the Mineraloil refinery in Oberrhein (MIRO) near Karlsruhe. TAL-NE is a 21-km extension from Ingolstadt to the Bayernoil refinery in Neustadt.

There are three operation companies by country (Italy, Austria and Germany) for operation and administration of the pipeline. In 2004, the TAL pipeline system unloaded from 405 ships and carried 35.95 million tons of crude to various delivery points. From the beginning of the operation, 966 million tons of crude oil has been transported.
**A7.2 SPSE**

The South European Pipeline (SPSE) runs from the French Mediterranean port of Fos through Switzerland to Karlsruhe, Germany. The total length is 769 km. Currently the pipeline transports approximately 23 million tons per year of crude and petroleum products. SPSE was created by sixteen oil companies in 1958. In 1962, the pipeline started commercial operation, connecting the Mediterranean to the upper Rhine region. In 1996, cumulative volumes transported by SPSE reached the one-billion-ton mark.

The consortium consists of:
- BP 12.1%
- CONOCO 2.0%
- SHELL-DEA 4.0%
- EXXON 22.0%
- SHELL 10.3%
- TOTAL 27.8%
- RUHR OEL GmbH 7.5%
- WINTERSHALL 14.3%

SPSE supplies crude to the following refineries:
- Feyzin near Lyon, France (Total),
- Cressier in Switzerland (Petroplus),
- Reichstett (CRR) near Strasbourg, France (Shell / Total / BP) and
- Miro in Karlsruhe, Germany (Conoco / DEA / Esso / RuhrOel [owned 50% by Veba Oel AG and 50% by Petroleos de Venezuela SA]).

It also provides the Carling plant (Atofina) in France with naphtha and condensate. Similar to the EU countries, Switzerland does not have domestic oil pipeline legislations.

**A7.3 Norpipe**

The Norpipe oil pipeline starts at the Ekofisk field in the Norwegian sector of the North Sea, carrying crude to the export terminal at Teesside, UK. Ekofisk was the first Norwegian offshore field to come on stream in 1971. The Ekofisk field, with its satellites, currently produces 280,000 barrels per day of oil and 260 million cubic feet per day of natural gas (The Norpipe gas pipeline carries natural gas from the Ekofisk field to Emden, Germany). Operator of the field is ConocoPhillips. Remaining resources in the Ekofisk area are substantial and oil and gas production is expected to continue for another 30 years.
The Norpipe oil pipeline is owned by Norpipe Oil AS and operated by ConocoPhillips. Shareholding of Norpipe Oil AS is:

- ConocoPhillips 35.05%
- Total 34.93%
- Statoil 15.00%
- Eni 6.52%
- SDFI 5.00%
- Norsk Hydro 3.50%

The shareholding is similar to that for the Ekofisk field. The 354-km pipeline was commissioned in 1975. Starting at the Ekofisk centre, the pipeline is tied in by several UK fields at 50-km downstream of Ekofisk. The pipeline capacity is 900,000 barrels per day, while the receiving facility has only an 810,000-barrels-per-day capacity. In 1973 the Norwegian and UK governments agreed on a bilateral treaty for operation of the Norpipe oil pipeline from the Ekofisk field and adjacent areas to the UK.
Pipelines play a significant role in the international crude oil and oil product logistics. They allow exploiting remote oil fields and are a much cheaper and more convenient means of oil and oil product transportation than railways. Pipelines are especially relevant for territories with no or limited access to the sea. Thanks to the construction of pipelines, the last two decades have seen the emergence of new suppliers on the world oil market. For the latter, secure and economical transit through third countries in order to access world markets is of critical importance.

The key problems for pipeline transportation are the tariffs and the rules of access. In countries where oil transportation by pipeline has traditionally played a greater role, crude oil and oil products pipelines are often considered to be natural monopolies. Those countries often establish rules and tariffs for non-discriminatory access to services. Tariffs are normally regulated and only in exceptional cases are negotiated.

This study focuses on crude oil and oil products pipeline systems in Eastern and South Eastern Europe, the Caspian region and Central Asia. It considers:

- essential technical and economic elements, which influence costs of oil and oil products pipeline transportation;
- the methodology for calculating oil pipeline tariffs and the actual tariff rates;
- where relevant, rules for access to existing and new cross-border oil pipeline systems;
- treatment of pipeline transit against the background of the multilateral rules on transit established by the Energy Charter Treaty.