

The European Union's Tacis TRACECA programme for Armenia, Azerbaijan, Bulgaria, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Romania, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan

## EUROPEAID/120569/C/SV/MULTI

# **Regulation on the Transport of Dangerous Goods along the TRACECA Corridor**

Azerbaijan, Georgia, Kazakhstan, Turkmenistan and Ukraine

Final Progress Report December 2007





A project implemented by NEA and its partners HPTI, UMCO and Hoyer Gaslog





# Report cover page

Project Title:	Regulation on the Transport TRACECA Corridor (TRACECA)	t of Dangerous Goods along the								
Project Number:	EUROPEAID/120569/C/SV/MUL	EUROPEAID/120569/C/SV/MULTI								
Country:	Azerbaijan, Georgia, Kazakhstan,	Turkmenistan, Ukraine								
	Partner	Contractor								
Name:	TRACECA	Consortium led by NEA Transport								
	Intergovernmental Commission Permament Secretariat	(The Netherlands)								
Address:	8/2 General Aliyarbekov Str.	NEA Head office in the Netherlands:								
	AZ-370 000 Baku Azerbaijan	Sir Winston Churchilllaan 297 2280 DZ Rijswijk								
Tel. Number:	+994 12 982 718	+ 31 70 3988 340 (NEA office)								
Fax number:	+994 12 986 426	+ 31 70 3988 426 (NEA office)								
Telex number:										
Contact persons:	Mr Rustan Zh. Jenalinov	Project Manager: Menno Langeveld								
	Secretary General of the Permanent Secretariat of the TRACECA Intergovernmental Commission									
Signatures:										
		Alwy								

Date of report: December 2007

Reporting period: March 2006 - December 2007

Author of report: Menno Langeveld, Project manager/Task Leader Legal and environmental



REGULATION ON THE TRANSPORT OF DANGEROUS GOODS FINAL PROGRESS REPORT





# **Table of Contents**

Report cov	er page	2
1	Project synopsis	4
2	Status of achievement of project objectives	6
2.1	Introduction	6
2.2	Economic analysis of all possible schemes	6
2.2.1	Working Paper 1 Market Analysis	10
2.2.2	Working Paper 2 Transport Forecast	12
2.3	Integrated technical scheme for LPG Transportation	12
2.3.1	Working Paper 3 Transport Facilities Appraisal	13
2.3.2	Working Paper 4 Safety	15
2.4	Study of the regulatory authorities	17
2.4.1	Working Paper 5 Legal and Institutional Framework	17
2.5	Working Paper 6 Economic Appraisal	22
2.6	Project Administration	23
2.7	Field Missions	24
3	Conclusions and Recommendations	25
4	Project Deliverables on CD-ROM	27
Annex 1	Project Interim Report	28
Annex 2	Resource Utilisation Report	29
Annex 3	Output Performance Report	30
Annex 4	Project Final Report	31
Annex 5	Output Performance Summary	32







# 1 Project synopsis

Regulation on the Transport of Dangerous Goods along the TRACECA Corridor Azerbaijan, Georgia, Kazakhstan, Turkmenistan and Ukraine (TRACECA)
EUROPEAID/120569/C/SV/MULTI
Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine
The introduction of an alternative, economic and modern transport scheme of LPG in the TRACECA region, which will minimize existing high transportation costs and improve safety in handling procedures of dangerous goods but not limited to LPG only
To deliver a pre-feasibility study which includes the technical, economical, financial, environmental and legal/institutional appraisal for the transport of LPG through the TRACECA corridor.
<ol> <li>An economic analysis of all possible schemes and modes of transportation of LPG in the region, with calculations and recommendations on the operational costs and capital investments</li> <li>The presentation of a completely integrated technical scheme for LPG transportation.</li> <li>A study of the regulatory authorities and their conformity with international and UN standards for the storage and transportation of LPG and chemicals.</li> </ol>
<ul> <li>Additional to the progress reports (2) and final report for this project, six working papers (WP) will be produced:</li> <li>WP 1 Market Analysis Report (Task 1A)</li> <li>WP 2 Transport Forecast Report (Task 1B)</li> <li>WP 3 Transport Facilities Appraisal Report (Task 2A)</li> <li>WP 4 Safety Conditions Report (Task 2B)</li> <li>WP 5 Legal and Institutional Framework report (Task 3)</li> <li>WP 6 Economic Appraisal Report (Task 1C)</li> </ul> The project will organise three multi-country workshops and combine two of these with short study tours: <ul> <li>WP 1 and 2 in Istanbul, Turkey, combined with a short study tour,</li> <li>WP 3 and 4 in Hamburg, Germany, combined with a short study tour</li> <li>WP 5 and 6 in Astana, Kazakhstan.</li> </ul>







Project activities:	<i>Result 1: Econom</i> Task 1A: Task 1B: Task 1C:	<i>c analysis of all possible schemes</i> Analysis of the market for LPG products Development of transport forecasting scenarios for LPC Economic appraisal of LPG transport schemes				
	<i>Result 2: Integrate</i> Task 2A: Task 2B:	ed technical scheme for LPG Transportation Appraisal of existing transport facilities of LPG Appraisal of the safety conditions for LPG transport				
	<i>Result 3: Study of</i> Task 3A: Task 3B: Task 3C:	the regulatory authorities Analysis of agreements and treaties Review of dangerous goods legislation Analysis of regulatory authorities				
Project starting date:	18 March 2006					
Start date of activities:	18 March 2006					
Project duration:	18 months					
Inputs:	International expe 216 man-days Tea 144 man-days Tas 144 man-days Tas 140 man-days Oth Local expertise: 315 man-days Pro 315 man-days Pro 315 man-days Pro 110 man-days Sho Organisation of loc	rtise: am Leader/Transport Economist sk Leader Engineering and Operations sk Leader Legal and Environmental Matters her Experts oject Manager Kazakhstan oject Manager Azerbaijan oject Manager Georgia ort-term local senior experts cal support point in the beneficiary countries				
Project implemented by: NEA Transport Research and Training (The Netherlands) and its pather consortium: HPTI Hamburg Port Training Institute (Germany) UMCO (Germany) Hoyer Gaslog (Germany)						







# 2 Status of achievement of project objectives

# 2.1 Introduction

The overall objective of this project is the introduction of an alternative, economic and modern transport scheme of LPG in the region, which will minimize existing high transportation costs and improve safety in handling procedures of dangerous goods but not limited to LPG only, which could:

- attract further investments in the region in the transport as well as in the oil and chemical industry;
- stimulate interest from oil companies to Increase LPG production, which is currently at very low levels, since existing high costs of transportation will be minimized;
- create additional sources of income for countries involved, through the increase in LPG production and through additional transport and transit market opportunities;
- promote the use of an alternative, environmentally friendly clean fuel for both final consumers and industrial customers;
- expand the scope of the INOGATE and TRACECA projects to include an additional and potentially very profitable market, namely LPG

The specific objective of the project is to deliver a pre-feasibility study which includes the technical, economical, financial, environmental and legal/institutional appraisal for the transport of LPG through the TRACECA corridor, divided into three project results:

- 1. Economic analysis of all possible schemes
- 2. Study of the regulatory authorities
- 3. Integrated technical scheme for LPG Transportation

Main emphasis has been paid on Result 1: An economic analysis of all possible schemes and modes of transportation of LPG in the region, with calculations and recommendations on the operational costs and capital investments.

## 2.2 Economic analysis of all possible schemes

After discussions with stakeholders and carefully studying of available documents and reports, the consultant concluded that for this project three LPG production areas are of main importance:

- 1. Kazakhstan, LPG to be exported from Aktau
- 2. Turkmenistan, LPG to be exported from Turkmenbashi
- 3. Azerbaijan, LPG to be exported from Baku.

Other production areas in Kazakhstan are expected to face too much competition from mainly the Chinese consumption market to make transport via TRACECA corridor economically justifiable. Likewise, Turkmenistan is likely to find significant export markets in south-eastern directions.

Major potential consumption areas for the above mentioned 3 production areas are therefore (in order of importance), Turkey, Ukraine to some extent, Eastern Balkans (Bulgaria, Romania), Greece, and to a lesser extent Central Europe.







Other critical assumptions are:

- 1. LPG will be mainly transported by rail and maritime transport modes as this is at present the common way to transport LPG. Whereas LPG can also be transported by pipeline, the project will keep this option open, depending on early, significant transport volumes and moderate costs of a dedicated pipeline both required for economic justification of a very large up-front investment.
- 2. Production in other countries than Kazakhstan, Turkmenistan and Azerbaijan will be neglected as this will mainly purpose local consumption.
- 3. Whereas Turkey in recent years is a growing consumer market for LPG and closest to the TRACECA corridor, this country will be a potentially important destination of LPG from the three production countries. In addition the Eastern Balkans and Central Europe are also included as consumer markets of LPG.
- 4. Major source for production and consumption figures will be the Statistical Review of Global LP Gas 2005 of the World LP Gas Association, in combination with figures given by the industry and other stakeholders in the LPG market.
- 5. In case estimated production figures will see a strong growth in the coming years, the option of an LPG pipeline will become more important to include in our scope of study.
- 6. The project expects to see prices for major energy sources as oil and natural gas to continue to rise, thereby making LPG an interesting additional source of energy.

Production	Corridor	Consumption
Kazakhstan	Base case: Aktau rail-Russian rail-Black Sea Project case: Aktau Caspian-TRACECA rail-Black Sea See Map 2.1	Turkey Eastern Balkans
Turkmenistan	Base case: Turkmenbashi Caspian-Iran rail-Turkey Project case: Turkmenbashi Caspian-TRACECA rail- Black Sea See Map 2.2	Turkey Eastern Balkans Central Europe via Ukraine (Ilyichevsk)
Azorbaijan		Turkov
Azerbaijan	Base case – Project case. Baku-TRACECA rail-Black Sea Modernisation of existing corridor See Map 2.3	Eastern Balkans Central Europe via Ukraine (Ilyichevsk)

 Table 2.1
 Base case corridors and project case corridors from LPG production countries to LPG consumption countries







#### Base and project cases corridors

Based on the assumptions above, the project focused its attention to the following LPG transport corridors as described in table 2.1. Distinction is made between a base case corridor (present LPG transport against a certain figure in EUR/USD and the TRACECA project corridors.

From Kazakhstan we propose to evaluate the TRACECA corridor against the existing rail connection from Aktau via Russian and Ukrainian railways (Odessa) towards Turkey and the Eastern Balkans.

From Turkmenistan we propose to evaluate the TRACECA corridor against the maritime and rail connection from Turkmenbashi via Iran towards Turkey, Eastern Balkans. and the possible extension via Odessa towards Central Europe

From Azerbaijan we propose to evaluate the TRACECA corridor against the existing rail connection from Baku towards Turkey, Eastern Balkans and the possible extension via Odessa towards Central Europe.



Map 2.1 Base case (dotted line) and project case (black line) corridors from Kazakhstan to consumption markets (red ovals)





This Project is funded by the European Union





Map 2.2Base case (dotted line) and project case (black line) corridors from<br/>Turkmenistan to consumption markets (red ovals)



Map 2.3 Base case (dotted line) = project case (black line) corridors from Azerbaijan to consumption markets (red ovals)



REGULATION ON THE TRANSPORT OF DANGEROUS GOODS FINAL PROGRESS REPORT



This Project is funded by the European Union



The project was very fortunate to start with attending to two international conferences about LPG which were focussed on the main objective of our project: export of LPG from CIS countries towards Turkey and other countries, including EU Member States.

The first conference was in Moscow (April 2006), as described above looking into the production of LPG, while the second conference was in Turkey (June 2006) and looked into the consumption perspective of Turkeys LPG demand.

This all fits right in our perspective that, looking at production and demand of LPG in the region, the TRACECA corridor might be very interesting as a competitive supply corridor for Turkey. This is the approach we have taken from the inception phase, as illustrated by the table and maps above.



Picture 2.1 LPG Conference Moscow April 2006

#### 2.2.1 Working Paper 1 Market Analysis

The objective of Working Paper 1 is to get an insight in world demand and supply of LPG in order to be able to estimate if there is a potential market for LPG transported via the TRACECA corridor. Furthermore, the market analysis focuses on regional production and regional demand for LPG in order to get an insight in the potential volumes that could be transported via the TRACECA corridor. Such an analysis is also necessary in order to be able to present different transport scenario's with varying transport routes and transport modes.

The preliminary results of the market analysis have been discussed with main stakeholders from the TRACECA region, including Turkish stakeholders, during a seminar organised in Istanbul on November 1 and 2, 2006.









#### Figure 2.1Dynamics of Kazakhstan LPG output and demand, 1992-2010

The figure shows that in 2005 production reached 1,250,600 tonnes while it is expected that output will grow in the year 2010 to 3,340,000 tonnes per year. Domestic consumption is expected to increase from around 450,000 tonnes in 2005 to around 800,000 tonnes in the year 2010. LPG is produced by three refineries, located in Pavlodar, Chimkent and Atyrau. Production of LPG at these refineries increases by around 20% annually. LPG is also produced at three gas processing plants: Tengiz GPP (Atyrau region), Kazakstan GPP (Janauzen city) and Zhanazhol GPP (Aktyubinsk city). The three plants produced 941,680 tonnes of LPG in 2005, compared to 947,500 tonnes in 2004. Total LPG output by all the refineries stood at 1,250,600 in 2005 which is 2.4% more as compared to 2004. Production of LPG by oil and gas processing plants increases by around 10% annually. Kazakhstan's domestic consumption of LPG totaled 430,400 tonnes over 2005, while the rest (820,200 tonnes) was exported.

On the basis of the analysis of world and regional LPG demand and supply, the consultant proposed to apply a supply/demand scenario to test the viability/ feasibility of TRACECA corridor LPG transport options in the range of 1 (minimum) to 2.3 (maximum) million tonnes per year to be achieved in the period 2010+.



Source: Ministry of Energy and Mineral resources, Kazakhstan





The supply-demand margin (1-2.3 mln T/yr) via TRACECA corridor can be broken down or disaggregated as follows:

Table 2.2         LPG supply and demand scenario's for the TRACECA corridor									
	Supply		Demand						
Kazakhstan	0.7 – 1.5 mln tonnes	Turkey	0.6 – 1.0 mln tonnes						
Turkmenistan	0.3 – 0.8 mln tonnes	Balkans	0.2 – 0.3 mln tonnes						
Azerbaijan	0.0 – 0.2 mln tonnes	Transit Ukraine	0.2 – 1.0 mln tonnes						
Total	1.0 – 2.5 mln tonnes	Total	1.0 – 2.3 mln tonnes						

It must be noted however that the LPG market – mainly the autogas market – can more or less easily be influenced via taxation of fuels. As is the case in Turkey, the demand for LPG (autogas) could be considerably stimulated if taxation policies are introduced which stimulate the use of autogas.

#### 2.2.2 Working Paper 2 Transport Forecast

The objective of Working Paper 2 is to get an insight in regional demand and supply of LPG in order to be able to estimate if there is a potential market for LPG transported via the TRACECA corridor. The consultant summarizes the situation in the TRACECA corridor in respect to this working paper as follows :

- There are currently basically no LPG transports from Kazakhstan and Turkmenistan via Azerbaijan and Georgia. Reason being the lack of X Caspian Sea transport facilities. The only existing sizable operation could be effected X Caspian Sea via the Russian owned ferry boats as above however they will not operate with destination Baku.
- The existing logistics for LPG are not sufficient and competitive to cater for larger quantities of LPG which should be produced until 2015
- Significant investments into transport facilities must be undertaken if LPG shall be transported on a larger scale

For logical reasons Working Paper 6, the economic appraisal, will be discussed at the end of this chapter.

## 2.3 Integrated technical scheme for LPG Transportation

In figure 2.1 the LPG supply chain is presented. For the transport of LPG along the TRACECA corridor the consultant will especially look at transport by rail in combination with a maritime link, e.g. unit trains from production sources in Kazakhstan, Turkmenistan and Baku, straight to the destinations in the relevant hinterland of the Black Sea ports Samsun (TEN corridor 4), Varna (TEN corridor 8), Constantsa (TEN corridor 7/4) and Ilyichevsk (TEN corridor 9). Besides the possibility of transport LPG by pipeline will be considered as a possible alternative for the Caucasian land bridge Azerbaijan-Georgia.







#### Figure 2.2 LPG Distribution Chain



Source: World LP Gas Association, Statistical Review of Global LP Gas 2005

There exist significant differences between the GOST LPG standards of the Former Soviet Union and the American and European standards which are commonly used in international markets today. The major issue that is commonly found with GOST standards is the allowance of high hydrogen sulphide content. In markets where high-tensile steels are used for making transportation tanks, the hydrogen sulphide can have detrimental effects, causing cracking and corrosion. Clients who want LPG as petrochemical feedstock will be especially sensitive to the product specification since impurities can cause problems in their plant's output. With the development of new production sites based on international technologies in Turkmenistan and Kazakhstan a significant improvement in the quality of the LPG can be expected, however the consultant will also keep an eye on this issue.

#### 2.3.1 Working Paper 3 Transport Facilities Appraisal

This report focuses on the feasibility of transporting between 1.0 and 2.3 million tonnes per year of LPG on the TRACECA corridor, as established in Working Paper 2, considering the current and near future transport infrastructure, largely from a technical point of view. Together with working paper 4, which





This Project is funded by the European Union



focuses on the safety requirements of LPG transport, it seeks to provide a major input for the overall prefeasibility assessment of LPG transportation on the TRACECA corridor. The objective of the report is to get proper insight in the technical feasibility and current prevailing situation of LPG transport on the TRACECA corridor, as well as the needed capacity improvements to cope with higher tonnage of LPG transported on the TRACECA corridor. In this report some initial and preliminary estimates are made of the possible cost level of LPG transport on the TRACECA corridor



Picture 2.2 Rail ferry Caspian Shipping

Whereas LPG transport demand within the likely 'servicing' area of the TRACECA corridor is expected to follow a gradual growth pattern, the only promising concept for TRACECA for the short-to-medium term, from a technical point of view, is block train transport in dedicated LPG RTCs, while using rail ferries across the Caspian Sea and deliverable ex-Batumi at the LPG terminal.

The technical possibilities of this short-to-medium term TRACECA corridor LPG transport concept are dictated primarily by the following 'transport chain' characteristics:

- 1. Operations of LPG block trains in Kazakhstan and Turkmenistan respectively from the LPG production sites to the Caspian Sea ports (in as far as the LPG is not produced close to those ports or carried there by pipeline).
- 2. Operations of RTC rail ferries across the Caspian Sea between Aktau (Kazakhstan) and Turkmenbashi (Turkmenistan) respectively and Baku (Azerbaijan), ferrying the block train RTCs.
- 3. Operations of LPG block trains (of the same RTCs) between Baku (Azerbaijan) and Batumi (Georgia/Black Sea).
- 4. Throughput of the Batumi LPG Terminal receiving LPG from the shuttle block train-RTCs and loading it onto LPG-tankers.

Hence WP 3 proposes to consider a phase approach of transport of LPG along the TRACECA corridor. For practical reasons, a distinction should be made between what is technically possible on the:

- 1. Short term, i.e. within the next three years,
- 2. Medium term, i.e. 3-5 years from now, and
- 3. Long term, i.e. more than five years from now.

#### Current situation

The current LPG flow along the TRACECA corridor (Baku-Batumi) is less than 20,000 mT/year (whereas the operation of two block train per week, representing an annual flow of 100,000 mT might be considered the 'current (lowest) capacity potential') while the potential near future demand has been estimated (see Working Paper 2) at 1.0 - 2.3 million mT/year.

Low volumes are explained by high asking transport prices of the parties in TRACECA compared to alternative routes. Kazakhstan is exporting via Russia, as well as East bound, and Turkmenistan to Iran and other countries. Besides, there is currently a lack of a well structured overall competitive organisational set up for LPG transport on the TRACECA corridor.







#### Short term (now-2010)

In the short term (now-2010), the Batumi LPG terminal with an estimated annual throughput of approximately 150,000 mT/year is considered a most determining technical component in the LPG transport chain capacity. This annual throughput supplied from the Baku end calls for three block trains per week, i.e. slightly more than 150 LPG transports per year (28 RTCs carrying altogether 980 mT). From a technical point of view, this performance level should be attainable in the short term. Likewise, the trans-Caspian RTC rail ferries operating the Aktau-Baku and Turkmenbashi-Baku, should be able to guarantee the supply of the (average of) three block trains (84 RTCs) per week from the two exporting countries—the concerned train ferry terminals would need some technical improvements and more 'Dagestan' type ferries would need to be made suitable for LPG transport but this may not be a great obstacle in a technical sense. Port of Aktau advised on 20 November 2007 that, provided that Baku authorities will accept LPG from Aktau transported in rtc's loaded on ferry, Port Aktau is confident that the current ferry jetty can be used for phase 1.

#### Medium term (2010-2012)

In the medium term (2010-2012), the throughput capacity of the Batumi LPG terminal would need to be quadrupled, perhaps in two steps (300,000 mT/year in 2010, and 600,000 mT in 2012—not necessarily all at the present location) to meet the capacity of eventually 12 block trains per week (2 per day) on the Baku-Batumi railway line, and of the Caspian Sea ferries that could supply up to a combined 600,000 mT/year from Aktau/Kazakhstan and Turkmenbashi—using larger ferries of the 'Makhachkala' type (52 RTCs)<sup>1</sup>.

From a technical point of view, this level of 600,000 mT/year is believed to be the upper limit of what could be achieved with the block train LPG-RTC transport concept-cum-rail ferries across the Caspian Sea. Bottlenecks are the current two multimodal loading jetties at Aktau and Turkmenbashi and the one discharging jetty at Baku and provided other cargo flows do not increase and/or interfere significantly. These facilities need to be modernised. In addition, rail capacity for LPG transport may prove to be a serious bottleneck. This represents about 60% of the estimated (1.0 million mT/year) minimum potential demand and just 25% of the estimated (2.3 million mT/year) maximum potential demand. The future construction of additional ferry jetties and the creation of sufficient rail capacity may add to available transport volumes.

#### 2.3.2 Working Paper 4 Safety

This report contains the safety conditions assessment. The objective of this assessment is to get an overview on the safety conditions and risk properties of LPG in order to evaluate potential hazards for LPG transported via the TRACECA corridor. Furthermore, the assessment contributes to the technical part of the study evaluating varying transport routes and transport modes. The preliminary results of the safety report have been discussed with main stakeholders from the TRACECA region, during a seminar organised in Hamburg on March 29 and 30, 2007.

LPG containers that are subjected to fire of sufficient duration and intensity can result in a BLEVE. **BLEVE** is an acronym for "boiling liquid expanding vapour explosion".

<sup>&</sup>lt;sup>1</sup> Transport costs calculations based on those larger ferries will be made in Working Paper 6 and compared to transport costs of LPG tankers.









Picture 2.3 LPG rail tank car before BLEVE test.



*Picture 2.4* The same LPG rail tank car, or what was left of it, after the BLEVE test.



REGULATION ON THE TRANSPORT OF DANGEROUS GOODS FINAL PROGRESS REPORT





Working Paper 4 concluded that:

- 1. With regard to rules and regulations in the region safe LPG transport is provided for.
- 2. However, all the states concerned should obtain all the international standards on transport of dangerous goods, in order to get a common platform comparable in all aspects.
- 3. The consultant did not hear and was not informed about any accidents this on the basis of an annual LPG transport flow of about 0,5-1 Mio. tons in Ukraine; 1 Mio. tons in Kazakhstan and a few ten thousand tons p.a. in Azerbaijan and Georgia.
- 4. Physical conditions in the Caucasus may put some threat on safe LPG transport.
- 5. Whereas emergency response on the individual state level is implemented, a joint Total Disaster Risk Management (TDRM) Programme is to be highly promoted, which should also focus on accident scenarios of LPG transport.
- 6. In foreseeing increasing LPG transport volumes in the region a public awareness programme should be launched describing the properties of LPG and reaction in the case of detection.

# 2.4 Study of the regulatory authorities

Based on early discussions with TRACECA officials, the emphasis of this result has been taken from the review of existing legislation on transportation of dangerous goods in TRACECA countries to a presentation of legal, policy and institutional best practices on the transportation and storage of dangerous goods, including LPG.

### 2.4.1 Working Paper 5 Legal and Institutional Framework

Two developments have been identified as of special interest for TRACECA corridor:

- 1. integration of CIM/SMGS rail transport consignment note
- 2. Memorandum of Understanding (MoU) for Transport of Dangerous Goods in the Baltic Sea 2004

Two different legal railway systems coexist today when transporting by rail from Eastern to Western Europe The COTIF system is in use in the EU, Norway and Switzerland as well as in Turkey. The OSJD system is applicable in the former Soviet Union countries as well as in China and the Central Asian states. Bulgaria, Romania and Ukraine are members of both systems. CIM and SMGS are the terms are abbreviations for different international rail freight transport law under COTIF and OSZhD. The CIM and SMGS regulation is the international law in its area and all member states organize their railway legislation according the COM and SMGS regulation. Within their membership area this detailed regulation smoothens the transport flows enormously.











CIM/SMGS Map 2.4

As shown on the map above some of the countries are part of both legal regimes because of their geographical situation, these countries must ensure the transition between the two systems. Especially in those states there will be a need for COTIF and OSJD to work together because the influence of CIM on the one hand and SMGS on the other will overlap

Meanwhile, there is an added complication: In Europe we have not only to consider COTIF-law, but also EU regulation. So eventually three different legal areas with different legal has to be harmonized.

Due to the EU railway reform and EU railway regulation competence in the railway area lies no longer with the Member States of the EU but with the European Commission. As a consequence COTIF cooperates closely with the EU developing uniform legal provisions and the rules for implementing them.

Both CIM and SMGS regimes are quite different, and that creates many legal problems. One of these is, that you have to stop the transport at the border between CIM and SMGS and that the shipper has to reconsigne the goods with a new consignment note. Operational problems are in particular arising from the use of two different consignment notes (CIM and SMGS) as the two railway systems use different waybills. If goods cross from one zone to another, there must be two waybills. The freight liability



**REGULATION ON THE TRANSPORT OF DANGEROUS GOODS** FINAL PROGRESS REPORT

December 2007



This Project is funded by the European Union



regimes for each waybill are different. SMGS waybills are not so widely accepted by banks handling international commerce, which is an inconvenience on operations.

Reconsignment is obviously a source of many errors. And errors cause legal uncertainty and consequently cost money. Moreover the reconsignment creates a time lag, extra administration and a lot of added costs –without any added value. In order to solve these problems, the COTIF and OSZhD have set up a project to create a uniform consignment note. The aim of this project is to overcome the difficulties resulting from the existence of two different legal systems and by this way to accelerate the railway transport flows between East and West.

The project envisages in phase 1 the creation of a common CIM/SMGS consignment note, however maintaining the two different law regimes. Phase 2 is aiming at the creation of a common liability regime and system for sharing compensation for loss and damage between the railways taking part in carriage within the contractual freedom allowed by the CIM and SMGS-regime. Phase 3 is striving for the implementation of a common legal regime in the long run. EU-support for the ongoing work is very desirable, especially for customs aspects: Only if the common CIM/SMGS consignment note is recognised by the EU and the other states as a customs document, the project can succeed as a whole. Moreover the CIM/SMGS consignment note constitutes a bank document, which allows to make sales over big distances in a very safe way. It's clear, that just this function will play an important role for the traffic between the Traceca Corridor

The objective is to use the CIM/SMGS note as a transit document for about 200 million tonnes of freight traffic crossing the Eastern Community border every year, thus reducing delays of customs formalities at the COTIF/OSZhD border. n the 25<sup>th</sup> of July 2006, the first freight train using the new common CIM/SMGS consignment note set off.

The harmonisation between CIM and SMGS is based on following principles:

- Taking CIM and SMGS as basis and starting point,
- to pay attention to the different legal cultures,
- to ensure as far as possible contractual freedom.

In the context of COTIF, the requisite uniform legal text for transport of dangerous goods by rail, including requirements concerning implementation, is set out in the regulations concerning the International Carriage of Dangerous Goods by Rail (RID)

In recent years, RID has undergone a fundamental reworking and has, from 1 July 2001, been in force with a new structure. Like ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road), ADN (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway), the IMDG Code (International Maritime Dangerous Goods Code) and the ICAO Technical Instructions (Technical Instructions for the Safe Carriage of Dangerous Goods by Air), RID has been aligned with the structure of the UN Model Regulations. The assumption is that the new structure and harmonization with the other modes will make the multimodal carriage of dangerous goods considerably easier. RID is subject to ongoing revision; amendments to the globally applicable UN Model Regulations and developments in the rail sector are both taken into account.

In the SMGS countries the carriage of dangerous goods is organised in the SMGS Annex 2. The SMGS Annex 2 is nearly harmonized with RID 2007. Its latest amendments entered into force on 1 July 2007. In the future the rules covering the carriage of dangerous goods will be brought up to date with RID on a running basis in order to make it possible for the logistical chain between Eastern and Western Europe to function normally by using the harmonized rules. Again the ongoing integration of the Western and Eastern European legal regimes facilitates railway transport passing both regimes enormously.









U – O Vom	лияется отправителен Absender auszufüllen	Нужное отме (Графы – Feld	нть крестиком – Zutrei ar 21, 22, 25, 66)	řendes ankreuzen									
গ্র্ট Накладная Frachtbrief	ЦИМ/CMFC CIM/SMGS	Оригинал нак Frachtbriefori	падной ginal	1		(0)		+ + +	(4) (4)		8 8	43	
При паравоза на ЦИИ, чака и а сприво тр тикора насто сонзвания, ролбон койо органова, паратисание ЦИИ. Колива тор, привые провозна, колива паратории, при параводно по СИСС приважалото предписания ССС III Болга провозна на СИСС IIII Болга предписания сонзвания по расписания ССС IIII Болга предписания ССС IIII Болга предписания сонзвания по моности приважалото предписания ССС IIII Болга предписания сонзвания по моности приважалото придокали на сонзвания сонзвания по моности приважалото приважали по моности приважали по мон	Ormpassmans (H) Absandar (Nam	анманованно, адраг, ст a, Anschrift, Land)+	ана) <sup>1</sup>	2 3 Зпактронная по Тал. – Таі.	erra – E-Mali	B Bastnavke a EristStrunger	sy , , , , , , , , , , , , , , , , , , ,	 s	8	Countia ormpi Absandar Rai	авы ракителе/Net terenz/Vertra	igs-Nr.	
Euros Baltar Indi Sabora ago tela Barta regental San Abrazbia, sei Banca, sei Banca. Robe Recifizioreziani sind dio Algarna ten Bolforda- rangotta Majurgan do Bolfordorezia antelari dio Algarna ten Bolforda- rangotta Majurgan do Bolfordorezia antelogi da Bolfordorezia da	O Emplanger (Nar	ниановонна, адраг, «трі nə, Anschrift, Länd)	нај	ана – Рах	4ra - E-Mail	O Com Abson	приложенные der beigefbgte ma Messa- ort Mosa-	ompasımanau Beğleitpapiere 199-3045 199-51656		! .	Ø		
Mecro gooraeixi Abileterungsort	1	0		Ð					:				
Станция назначения Т Коннариасска ус Отностия, наобяз	я – Bestimmung sbahn ховия – Kommerzielle этальные для персес	hof Badingungan Davingangan Davingangangangangangangangangangangangangan	Crpsels' Жалезная ; • • - Für den Beförderer	opora – Land/Bahn unverbindfiche Ver	merke	Станция отпрас Тракантисс а) СМГС - 5 ————————————————————————————————————	пания – Varsai фактурирован WiGS Wagan Nr.	ndbəhnhof 1949 - Transitfali		грана/Желез	ная дорога - 1 8 Л. 39	- Land/Bahn see UM sole CIM	vegeo – dusch (48) Masco rysse scora regisspace Masso nach Umladung
Hanwakosakke rp Bazelchnung des	y22 Gutes			бычная отправка ssergewöhnliche Si	enduna 🕾 🗌	22 Rid Townseve 2 c RID/Aniage 2 SMI	own:		THF G-Code	Macca	опрадалана	38 Mac	сэ определена езной дорогой
Zeichèn, Martson   V	se	i				562622A1		i i i Cruerte Zolanzik	<u>i i</u> raecosa ihe Verment			D Upa War	NOTTI 179/20 1: das Guiss Repris Repris
	55 55 55 55 56 56 56 58 58 58 58 58 58 58 58 58 58					Отпрана     Балозина     Балозина     Балозин     Балозин     Балозин     Балозин     Балозин     Балозин     Балозинно     Балозинно	nos Wa - Leitungaweg - Leitung	- Zollbehandlurg	ng istvortEnger jo – bis	Costagnee erstellt dur	ch Mecro - C	i i Mecau - Se M. Monat - Tag	
(с.). Заявлания поросо (с.). Заявлания поросо (с.). Заявлания поросо	озчика – Endärungen ( pseosник – Veringlich	dus Betönderers er Befönderer	(6) Друпно паравозче Наименсказнике, адре Б) Дата прибытия –	iun – Andere Beförd c – Name, Anschrif Ankunftsdatum	derer t	Barakaeria	Линия – Stro Macna – Monat	doe 1994 – spans Tag – Stande	60 Hatern ompas Sant	гифинация 1664 ило 5-	Строна – Lan	d Станция-!	B ISHIETEE Eigenschaft Bahnhof
Roganies – Unit b) Yhpougêriean ripo Veraintachtes I Kog ochosenoro Code Hauptver	anschrift цидура для женен карор Elsanbahnversamsker опаетельки ого лица pplichtsber		Нь попучення – Егор 70 Катандарный иго Тадеезскитрої Ve	langs-Nr. Innans craupe crn sandbahnhof	равлання	(7) Rogrea (7) Emptan	та жиранно получ gsbescholmgu нсь – Datum, L	alaen ng Joberschrift	E Merro	лий bion Dependent Uniernet	HIR Amon III	He ompass Vorsand N	M r. i i i tum der Ausstellung

Figure 2.3 CIM/SMGS consignment





This Project is funded by the European Union



Some differences between these two remain. The main differences in the SMGS Annex 2 compared to RID are as follows:

- Table A contains two additional columns: namely the column with codes for barrier wagons 2.
- Hazard goods (such as "flammable", "toxic") are presented by the substance. Information of both goods shall be indicated in the transport document.
- There are additional requirements concerning loading in Part 7.
- There is some differences in the requirements of construction of tank wagons<sup>2</sup>.

Of interest to the Caspan Sea region may be the Baltic Sea MoU 2004. Eight countries surrounding the Baltic Sea (Finland, Sweden, Denmark, Germany, Poland, Lithuania, Latvia and Estonia, but not Russia).have concluded in 2004 a Memorandum of Understanding (MoU) regarding the transportation of packed general goods on board **roll on-roll off vessels in the Baltic Sea**. The Memorandum has been subject to yearly amendments, all of which have entered into force on January of the subsequent year. The shipowner can apply the rules of the Memorandum in the Baltic Sea including the Gulf of Bothnia, the Gulf of Finland and the entry to the Baltic Sea in short-sea ro-ro traffic where the requirement established in the Memorandum as regards e.g. the training of the crew and personnel are satisfied . The Memorandum contains special provisions relating to the carriage of dangerous goods within the scope of the ADR Agreement and the RID provisions. The Memorandum allows carriage of dangerous goods in designated routes.



<sup>&</sup>lt;sup>2</sup> These differences are among others based on the fact that the different gauge sizes lead to different tank wagon specifications.







The MoU (2004) lays down the exemptions (Annex 1) in accordance with the IMO/MSC Circ. 1075, when transporting dangerous goods covered by the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) and Annexes A and B of the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) onboard ro-ro ships in the Baltic Sea. According to the MoU (2004), the IMDG Code shall serve as basis for all technical and operational aspects of dangerous goods transport.

# 2.5 Working Paper 6 Economic Appraisal

The objective of the report is to assess the economic feasibility of LPG transport along the TRACECA corridor.Directly related to this is to provide recommendations on how to make the TRACECA route competitive in relation to alternative routes, notably the Russian route and the Iranian route, as indicated in Table 1.1, which is the project *base case*. It is evident (ref. Working Paper 3) that current transportation costs along the TRACECA corridor must be considerably lowered and substantial investments will be needed to achieve that.

The important aspects or steps of the pre- feasibility assessment are the following:

- The LPG-supply side, in Kazakhstan, Turkmenistan and Azerbaijan, is potentially abundant as has been shown in Working Paper 1; the supply side is not likely to pose a constraint for project feasibility under the condition that produced LPG quality will conform to EU-standards. Having said that, considering the dynamic conditions of the energy market, the consultant will provide in this Working Paper an update of LPG supply figures, i.e. quantities currently available on the concerned market (chapter 2).
- A key challenge is to find the consumer markets at the western ends of the TRACECA corridor, as discussed in Working Paper 2, and this is largely dictated by the 'door-to-door' transportation costs, from the site of the LPG producer in the East to the final consumers in the West. An updated potential Black Sea LPG demand for TRACECA LPG is provided in Chapter 2. An Estimation of realistic transportation cost is considered a critical activity and consequently is a central theme in this Working Paper, notably in chapter 4, presenting costs estimated with the help of a LPG Transportation Costs Calculation (TCC) model, which has been developed for this project.
- Potential future volume of LPG to be transported along the TRACECA corridor has been estimated (in Working Paper 2) in the range between 1.0 and 2.3 million tonnes per year. For the supply side, an update of latest export levels is provided in this Working Paper (chapter 2).









Map 2.6 Transport routes from origin to destination

Source: consultants' estimate

- Whether or not this volume-range can indeed be captured depends on the availability of both (i) the physical transport infrastructure and (ii) the "forwarding infrastructure", embedded in the proper multi-country cooperative arrangements ensuring safe LPG transports all the way. Both complexes can come only at considerable (investment) costs. Working Paper 3 already emphasized the need for increase of technical capacities, primarily in (i) a range of transport infrastructures and (ii) 'rolling stock' in various modes of transport. This mixture of investment needs is the basis for a proposed staged development or phased approach.
- This Working Paper 6 is focused on (i) most likely feasible solutions in response to the technical barriers as outlined in Working Paper 3, and (ii) investments needed, while considering the gradual growth of the annual LPG throughput volume—in steps: (1) 150,000–200,000 T/yr, (2) 600,000 T/yr, (3) 1.5-2.0 million tonnes/year.
- A possible transport-technology 'switch', notably from rail-based (block train) transport to pipeline complicates the pre-feasibility assessment. There is a certain 'maximum' (limit) that the rail-based system could achieve and there is a 'minimum' (annual volume) needed to justify LPG pipeline transport (either 'sharing' in a LNG pipeline, or a dedicated LPG pipeline—the latter requiring a much higher annual throughput volumes to be economic). Moreover, there could remain a gap between the maximum that the rail-based system could achieve and the minimum that a pipeline solution might require.

# 2.6 **Project Administration**

The project duration was extended with 3 months from 18 to 21 months.







# 2.7 Field Missions

Who	Where and When	Purpose
Team Leader Arndt von Oertzen	Moscow LPG Conference April 2006	WP 1/2
Team Leader Arndt von Oertzen	Azerbaijan/April 2006	WP 1/2
Team Leader Arndt von Oertzen	Georgia/April 2006	WP 1/2
Team Leader Arndt von Oertzen	Kazakhstan/May 2006	WP 1/2
Team Leader Arndt von Oertzen	Azerbaijan/August 2006	WP 1/2
Team Leader Arndt von Oertzen	Georgia/August 2006	WP 1/2
Team Leader Arndt von Oertzen	Azerbaijan/September 2006	WP 1/2
Team Leader Arndt von Oertzen	Kazakhstan/September 2006	WP 1/2
Team Leader Arndt von Oertzen	Ukraine/October 2006	WP 1/2
Team Leader Arndt von Oertzen	Azerbaijan/December 2006	WP 3/4
Team Leader Arndt von Oertzen	Ukraine/February 2007	WP 3/4
Team Leader Arndt von Oertzen	Georgia/February 2007	WP 3/4
Team Leader Arndt von Oertzen	Azerbaijan/February 2007	WP 3/4
Team Leader Arndt von Oertzen	GeorgiaAzerbaijan/April 2007	WP 3/4
Team Leader Arndt von Oertzen	Kazakhstan/July 2007	WP 3/4
Team Leader Arndt von Oertzen	Azerbaijan/July 2007	WP6
Team Leader Arndt von Oertzen	Kazakhstan/November 2007	WP6
LPG Expert Herve Richard	Ukraine/	WP6
LPG Expert Herve Richard	Moscow LPG Conference	
Economist Klaas Westerkamp	Istanbul LPG conference June 2006	WP 1/2
Economist Klaas Westerkamp	Turkey Aygaz LPG July 2006	WP 1/2
Task Leader Legal Menno Langeveld	Azerbaijan/April 2006	WP5
Task Leader Legal Menno Langeveld	Istanbul LPG conference June 2006	WP5
Task Leader Legal Menno Langeveld	Azerbaijan/July 2007	WP5
Legal expert Ardriaan Roest Crollius	Azerbaijan/December 2006	WP5
Legal expert Ardriaan Roest Crollius	GeorgiaAzerbaijan/April 2007	WP5
Legal expert Ardriaan Roest Crollius	Kazakhstan/May 2007	WP5
- ·		





by the European Union



# 3 Conclusions and Recommendations

▶ With growing import LPG requirements in Black sea Countries by additional 800 kT/y up to 2,500 kT/y by 2015, the TRACECA Corridor is a new LPG export route for Caspian LPG producers with a potential LPG production of up to 6,500 kT/y by 2015. However several large LPG production projects in Azerbaijan, Kazakhstan and Turkmenistan are still debated.

► The commitment of LPG producers to supply LPG via the TRACECA corridor is a crucial step in the above joint approach.

Important is to support the production of LPG in Azerbaijan

► The TRACECA LPG corridor is currently competitive for Crude oil and oil products but not competitive for LPG. currently lack of a well structured overall competitive organisational set-up for LPG transport on the TRACECA corridor. Also transport costs in the various countries need to be reviewed to make the LPG TRACECA corridor competitive and maintain Odessa LPG export

► A development of the LPG TRACECA corridor has been developed in 3 consecutive phases Investments required have been simulated and identified to improve efficiency, safety and transport costs.



Picture 3.1 Final Workshop, Astana, 21 November 2007







#### RECOMMENDATIONS

#### LPG Production:

► The commitment of LPG producers to supply LPG via the TRACECA corridor is a crucial step in the above joint approach.

▶ Important is to support the production of LPG in Azerbaijan.

#### LPG Transport:

► Establish a "Consortium LPG Transport Company" in Kazakhstan and in Turkmenistan, in cooperation with:

- Azerbaijan and Georgian transport companies to develop similar strategies as achieved on such corridor for Oil,.
- To offer transport services on the whole export route major LPG.
- To negotiate transportation costs on the Traceca corridor due to larger volumes.
- To organize planning, leasing of railcars, operations and monitoring of transport along the route from the LPG producer loading site till FOB Batumi.

Kazakhstan and Turkmenistan, with flaring reduction, are developing an array of new LPG productions sites with yearly capacities of 50,000-200,000 tonnes, which aggregated would reach avails exceeding 500,000 T per year.

A "Consortium LPG trading Company" both In Kazakhstan and in Turkmenistan, gathering export avails from small and medium size LPG producers would be able to:

- Negotiate improved transport tariffs
- Diversify export routes
- Develop pricing formulae to hedge pricing
- Select Buyers
- Minimize operation and price risks

NOTE: In Russia this is what has been done by having Gazexport the exclusive export role for LPG export from Russia, and using CITCO in Vienna for this trading role

► Kazakhstan, Azerbaijan, Georgia, are recommended to review the transport tariffs on their territories so as to make the TRACECA LPG routes competitive and provide for example incentive to potential Azeri LPG producers.

► Ukraine is recommended to develop economics for expanding LPG distribution along the Danube by developing a fleet of LPG barges and to review LPG transport costs to Odessa to retain competitive to Temryuk-Taman.







# 4 Project Deliverables on CD-ROM

The CD-ROM, which accompanies this final progress report consists of the following documentation:

#### Project Reports

- Inception Report in English
- Inception Report in Russian
- Progress Report 1 in English
- Progress Report 1 in Russian
- Progress Report 2 in English
- Progress Report 2 in Russian
- Final Report in English
- Final Report in Russian

#### Working Papers

- WP 1 Market Analysis Report (English and Russian)
- WP 2 Transport Forecast Report (English and Russian)
- WP 3 Transport Facilities Appraisal Report (English and Russian)
- WP 4 Safety Conditions Report (English and Russian)
- WP 5 Legal and Institutional Framework report (English and Russian)
- WP 6 Economic Appraisal Report (English and Russian)







#### Annex 1 Project Interim Report

(Form 2.2)

Project title : Transport of Dangerous Goods along the TRACECA Corridor	Project number : EUROPEAID/120569/C/SV/MULTI	Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine	Page : 1
Planning period :	Prepared on :	Contractor :	loyer Gaslog
4/2007- 12/2007	December 2007	NEA and its partners in the consortium HPTI, UMCO and H	

Project objectives :

The introduction of an alternative, economic and modern transport scheme of LPG in the TRACECA region, which will minimize existing high transportation costs and improve safety in handling procedures of dangerous goods but not limited to LPG only. To deliver a feasibility study which includes the technical, economical, financial, environmental and legal/institutional appraisal for the transport of LPG through the TRACECA corridor.

No	ACTIVITIES IMPLEMENTED	TIME FRAME 2007									INPUTS							
						Months	6				PERSONNEL INTERNATIONAL (M-d)		LOCAL PARTNER (M-d) +)		EQUIPMENT AND MATERIAL		OTHER	
		4	5	6	7	8	9	10	11	12	Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised
1	Appraisal of existing transport facilities of LPG	ххх	xxx								16	16	35	35	-	-	-	-
2	Appraisal of the safety conditions for LPG transport	ххх	ххх								14	14	30	30	-	-	-	-
3	Economic appraisal of LPG transport schemes		ххх	ххх	ххх	ххх	ххх	ххх	ххх		105	105	202	202	-	-	-	-
4	Study of the regulatory authorities	ххх	ххх	xxx	ххх	ххх	ххх	ххх	ххх		60	60	95	95				
5	Workshop Astana						ххх	ххх	xxx		15	15	45	45	-	-	-	-
	Total										215	215	407	407				







#### Annex 2 Resource Utilisation Report

(Form 2.3)

Project title : Transport of Dangerous Goods along the TRACECA Corridor	Project number : EUROPEAID/120569/C/SV/MULTI	Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine	Page : 1
Planning period : 4/2007 – 12/2007	Prepared on :     Contractor :       12/2007     December 2007     NEA and its partners in the consortium HPTI, UMC		d Hoyer Gaslog

Project objectives :

The introduction of an alternative, economic and modern transport scheme of LPG in the TRACECA region, which will minimize existing high transportation costs and improve safety in handling procedures of dangerous goods but not limited to LPG only. To deliver a feasibility study which includes the technical, economical, financial, environmental and legal/institutional appraisal for the transport of LPG through the TRACECA corridor.

RESOURCES/INPUTS	TOTAL PLANNED	PERIOD PLANNED	PERIOD REALISED	TOTAL REALISED BEFORE	AVAILABLE FOR REMAINDER
PERSONNEL (in man days)					
Team Leader	216	62	62	154	0
Task Leader Engineering	144	23	23	121	0
Task Leader Legal	144	60	60	84	0
Project Manager Azerbaijan	315	105	105	210	0
Project Manager Georgia	315	105	105	210	0
Project Manager Kazakhstan	315	105	105	210	0
International senior experts	140	70	70	70	0
Local senior experts	110	86	86	24	0
Total	1699	616	616	1083	0
Incidental Expenditures in euro	180,000			)	







# Annex 3 Output Performance Report

(Form 2.4)

Project title : Transport of Dangerous Goods along the TRACECA Corridor		Project number : EUROPEAID/120569/C/SV/MULTI		Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine		Page : 1	
Planning period : 4/2007 - 12/2007		Prepared on : December 2007		Contractor : NEA and its partners in the consortium HPTI, UMCO and Hoyer Gaslog			
Output results	Deviat	ion original plan + or - %		Reason for deviation	Comment		
WP 1 Market Analysis Report (Task 1A)	1 1/2 month later than planned		Difficult to find a suitable date for presenting at workshop due to holiday season				
WP 2 Transport Forecast Report (Task 1B)	1 ½ month later than planned		Difficult to at worksh	find a suitable date for presenting op due to holiday season			
Combined Multi-Country Seminar/Study Tour 1A/1B Istanbul, Turkey	1 ½ month later than planned		Difficult to at worksh	find a suitable date for presenting op due to holiday season			
WP 3 Transport Facilities Appraisal Report (Task 2A)	3 Months later		Availabilit additional	y of new data and requests for info			
WP 4 Safety Conditions Report (Task 2B)	1 Month later		Due too c during wo	omments and questions raides rkshop in Hamburg			
Combined Multi-Country Seminar/Study Tour 2a/2B Hamburg, Germany	March 2007						
WP 5 Legal and Institutional Framework report (Task 3)	3 Months later		On request of PS IGC TRACECA to combine with TRACECA ministers meeting				
WP 6 Economic Appraisal Report (Task 2C)	3 Months late	Ionths later		On request of PS IGC TRACECA to combine with TRACECA ministers meeting			
Final Seminar Astana	3 Months later		On reque	st of PS IGC TRACECA to with TRACECA ministers meeting			







## Annex 4 Project Final Report

(Form 3.2)

Drojost titla		Droject number :	Country		Daga
Project title : Transport of Dangerous Goods along the TRACECA Corridor		EUROPEAID/120569/C/SV/MULTI	Azerbaijan, Georgia, Kazakhstan, Turkme Ukraine	nistan,	1
Planning period : 4/2006 – 12/2007		Prepared on : December 2007	Contractor : NEA and its partners in the consortium HPTI, UMCO and Hoyer Gaslog		
Project objectives : The introduction handling procedures of dangerous get transport of LPG through the TRACE	of an alternative, economic ar bods but not limited to LPG or CA corridor.	nd modern transport scheme of LPG in the nly. To deliver a feasibility study which inclu	FRACECA region, which will minimize existing high t des the technical, economical, financial, environmen	transportation c ntal and legal/in	osts and improve safety in stitutional appraisal for the
Reporting Period	Mair	n Activities Undertaken	Contractor	Inputs	
4/2006 – 12/2007	Analysis of the market for LPG products		60 days international experts 129 days local experts		
4/2006 – 12/2007	Development of transport forecasting scenarios for LPG		53 days international experts 69 days local experts		
4/2006 – 12/2007	Economic appraisal of LPG transport schemes		110 days international experts 202 days local experts		
4/2006 – 12/2007	Multi-Country Workshop/Study tour in Istanbul, Turkey		48 days international experts 24 days local experts		
4/2006 – 12/2007	Appraisal of existing transport facilities of LPG		132 days international experts 288 days local experts		
4/2006 – 12/2007	Appraisal of the safety conditions for LPG transport		64 days international experts 110 days local experts		
4/2006 – 12/2007	Multi-Country Workshop/Study in Hamburg, Germany		18 days international experts 28 days local experts		
4/2006 – 12/2007	Study of the regulatory a	uthorities	144 days international experts 160 days local experts		
4/2006 – 12/2007	Multi-Country Workshop	in Astana, Kazakhstan	15 days international experts 45 days local experts		
Total			644 days international experts 1055 days local experts		







# Annex 5 Output Performance Summary

(Form 3.3)

Project title : Transport of Dangerous Goods along the TRACECA Corridor		Project number : EUROPEAID/120569/C/SV/MULTI		Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine		Page : 1
Planning period : 4/2006 – 12/2007		Prepared on : December 2007		Contractor : NEA and its partners in the consortium HPTI, UMCO and Hoyer Gaslog		
Output results	Deviat	tion original plan + or - %		Reason for deviation	Comment	
An economic analysis of all possible schemes and modes of transportation of LPG in the region, with calculations and recommendations on the operational costs and capital investments						
The presentation of a completely integrated technical scheme for LPG transportation.						
A study of the regulatory authorities and their conformity with international and UN standards for the storage and transportation of LPG and chemicals.						



Published March 2006

This publication has been produced with the assistance of the European Union. The contents of this publication is the sole responsibility of NEA and its partners and can in no way be taken to reflect the views of the European Union.