

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

*Progress Report 1*

*June 2006 – September 2006*



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



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## Report cover page

<b>Project Title:</b>	<b>Regulation on the Transport of Dangerous Goods along the TRACECA Corridor (TRACECA)</b>	
<b>Project Number:</b>	<b>EUROPEAID/120569/C/SV/MULTI</b>	
<b>Country:</b>	Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine	
	Partner	Contractor
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**Date of report:** September 2006

**Reporting period:** June 2006 - September 2006

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





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## Table of Contents

Report cover page .....	2
1 Project synopsis .....	4
2 Summary of project progress since the start of the project.....	6
2.1 Introduction .....	6
3 Project progress in the reporting period .....	8
3.1 Introduction .....	8
3.2 Status of achievement of project objectives .....	8
3.2.1 <i>Economic analysis of all possible schemes</i> .....	8
3.2.2 <i>Integrated technical scheme for LPG Transportation</i> .....	10
3.2.3 <i>Study of the regulatory authorities</i> .....	10
3.3 Country Visits and Project events.....	11
3.3.1 Meetings Team Leader.....	11
3.3.2 Other Meetings WP 1/2 .....	19
3.4 Project Administration .....	22
3.5 Risks and assumptions .....	22
4 Summary of Project planning for remainder of the project.....	23
Annex 1 Project Interim Report .....	24
Annex 2 Resource Utilisation Report .....	26
Annex 3 Output Performance Report .....	27
Annex 4 Plan of Operations for the Next Period (Work programme) (Form 1.6) .....	28
Annex 5 Contact List .....	30
Annex 6 Work Plan Working Paper 3.....	32
Annex 7 Approval short-term international experts .....	34



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## 1 Project synopsis

Project Title:	Regulation on the Transport of Dangerous Goods along the TRACECA Corridor Azerbaijan, Georgia, Kazakhstan, Turkmenistan and Ukraine (TRACECA)
Project Number:	EUROPEAID/120569/C/SV/MULTI
Country:	Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine

*Overall 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

*Specific project objectives:* 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.

*Project results:*

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. The presentation of a completely integrated technical scheme for LPG transportation.
3. A study of the regulatory authorities and their conformity with international and UN standards for the storage and transportation of LPG and chemicals.

*Planned outputs:* Additional to the progress reports (2) and final report for this project, six working papers (WP) will be produced:

- ❖ WP 1 Market Analysis Report (Task 1A)
- ❖ WP 2 Transport Forecast Report (Task 1B)
- ❖ WP 3 Transport Facilities Appraisal Report (Task 2A)
- ❖ WP 4 Safety Conditions Report (Task 2B)
- ❖ WP 5 Legal and Institutional Framework report (Task 3)
- ❖ WP 6 Economic Appraisal Report (Task 1C)

The project will organise three multi-country workshops and combine two of these with short study tours:

- ❖ WP 1 and 2 are planned to be presented and discussed in Istanbul, Turkey, combined with a short study tour, which makes it possible to have discussions with stakeholders from Turkey as described in the Terms of Reference.
- ❖ WP 3 and 4 are planned to be presented in Hamburg, Germany, combined with a short study tour aiming at the technical aspects of transport of dangerous goods.
- ❖ WP 5 and 6 are planned to be presented and discussed in Baku.





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*Project activities:*

*Result 1: Economic analysis of all possible schemes*

- Task 1A: Analysis of the market for LPG products
- Task 1B: Development of transport forecasting scenarios for LPG
- Task 1C: Economic appraisal of LPG transport schemes

*Result 2: Integrated technical scheme for LPG Transportation*

- Task 2A: Appraisal of existing transport facilities of LPG
- Task 2B: Appraisal of the safety conditions for LPG transport

*Result 3: Study of the regulatory authorities*

- Task 3A: Analysis of agreements and treaties
- Task 3B: Review of dangerous goods legislation
- Task 3C: Analysis of regulatory authorities

*Project starting date:* 18 March 2006

*Start date of activities:* 18 March 2006

*Project duration:* 18 months

*Inputs:*

International expertise:

- 216 man-days Team Leader/Transport Economist
- 144 man-days Task Leader Engineering and Operations
- 144 man-days Task Leader Legal and Environmental Matters
- 140 man-days Other Experts

Local expertise:

- 315 man-days Project Manager Kazakhstan
- 315 man-days Project Manager Azerbaijan
- 315 man-days Project Manager Georgia
- 110 man-days Short-term local senior experts
- Organisation of local support point in the beneficiary countries

Project implemented by: NEA Transport Research and Training (The Netherlands) and its partners in the consortium:  
HPTI Hamburg Port Training Institute (Germany)  
UMCO (Germany)  
Hoyer Gaslog (Germany)





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## 2 Summary of project progress since the start of the project

### 2.1 Introduction

In the period from April-September all countries have been visited, including Turkmenistan, and a start has been made to analyse the existing situation of the LPG industry and in particular the existing production and demand levels for LPG, as this will be the first project output to be presented at our Workshop/Study Tour in Istanbul, 2-3 November 2006, where we will present and discuss two Working Papers.

Very important events were two international conferences on LPG, one focussing on production and export from e.g. Kazakhstan and Turkmenistan in Moscow, and 1 focussing on demand in Turkey.

Both conferences have been attended and gave a lot of information on production and demand of LPG in the region.

Main emphasis from the beginning of the project is laid on gathering information about production data of LPG, for which especially the team leader and national coordinators have put a lot of effort. Nevertheless this is not always easy to collect as many companies regard this kind of information as confidential.

Furthermore the countries have been visited (table 2.1 below), mainly with the view of collecting more detailed information on production of LPG and transport possibilities for LPG in the region.

When	Where	Project Purpose
March	Consortium meeting Hamburg/Project kick off	Project Management
April	LPG Conference Moscow	Task 1A, 1B
April	Visit Baku TRACECA PS and SG	Project Management, Task 3
April	Consortium meeting Hamburg	Project Management
April	Baku	Task 1A, 1B
April	Georgia	Task 1A, 1B
May	Kazakhstan	Task 2A
May	Kazakhstan	Task 1A, 1B
May	Turkmenistan	Task 1A, 1B
June	LPG Conference	Task 1A, 1B
July	Consortium meeting Rijswijk	Project Management
August	Visit Baku	Task 1A, 1B
August	Visit Georgia	Task 1A, 1B
August	Visit Baku TRACECA PS and SG	Project Management
August	Visit INOGATE Kiev	Task 3
September	Visit Kazakhstan	Task 1A, 1B
September	Visit Baku TRACECA PS and SG	Project Management



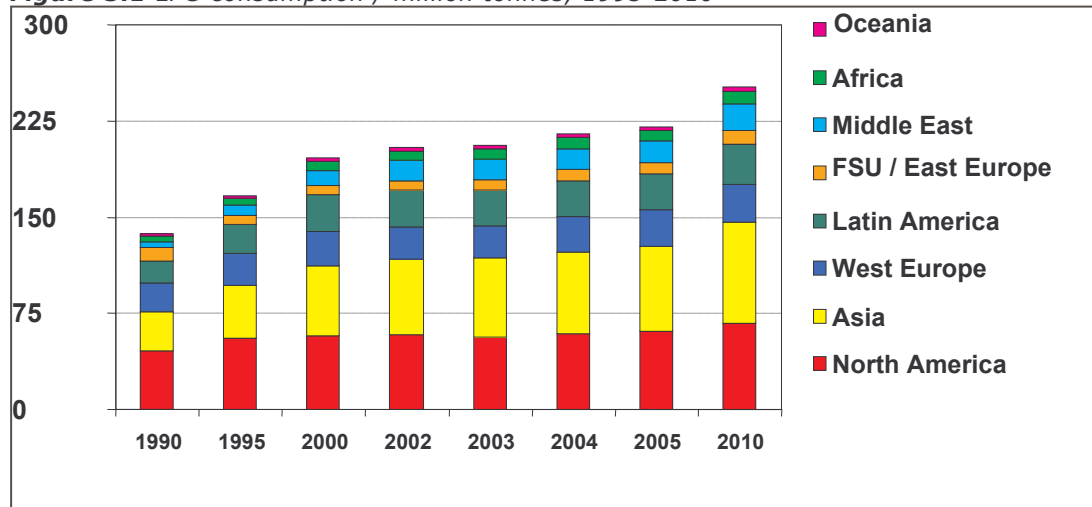
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## 2.2 Basic findings on LPG market

In order to assess the feasibility of transporting LPG via the TRACECA corridor to markets like Turkey, The Balkans and the EU an analysis of demand and supply of LPG relevant for the region is necessary. The world consumption of LPG was 212 million tonnes in 2004, an increase of 2.4% compared to the previous year. The next graph shows the consumption per region in millions of tonnes for the period 1990 to 2005 and a forecast of world consumption for 2010.

**Figure 3.1** LPG consumption / million tonnes, 1995-2010

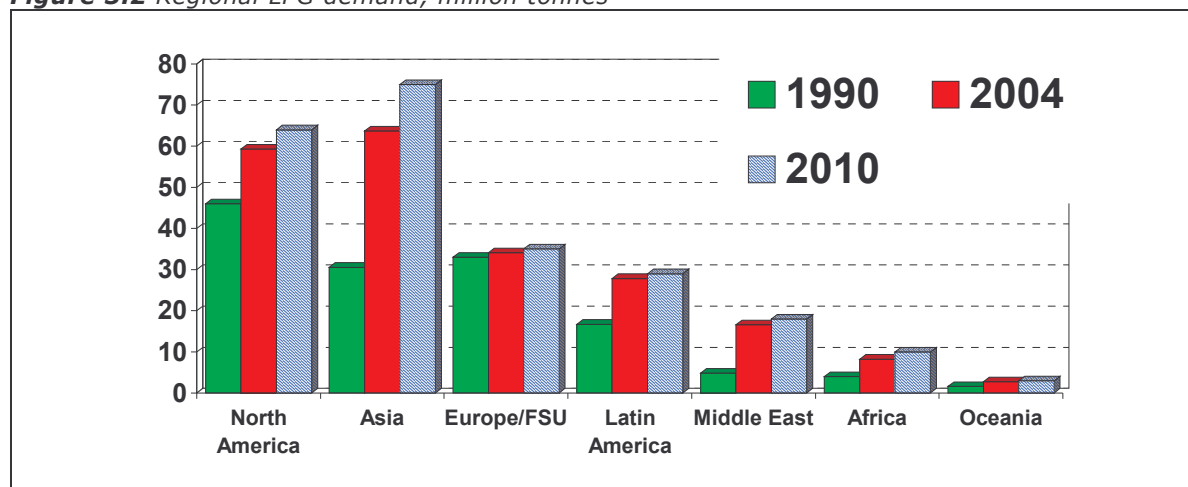


Source: Purvin & Gertz

The graph shows that the world demand for LPG is projected to continue to increase, driven by strong growth in Asia.

Regional demand: Asian consumption is expected to increase rapidly, Asian LP Gas consumption should reach a third of world demand by 2010

**Figure 3.2** Regional LPG demand, million tonnes



Source: Purvin & Gertz



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### 3 Project progress in the reporting period

#### 3.1 Introduction

This chapter will more in detail look at the progress made in achieving the project results. 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,

#### 3.2 Status of achievement of project objectives

The project is on schedule in the realization of the main project objectives, but concerning the realisation of the first Working Papers and Workshop in Istanbul we have a delay of approximately 1 ½ Month due to holiday season and difficulties to find a suitable date already in September/October .

##### 3.2.1 *Economic analysis of all possible schemes*

In this period the project was very fortunate with having two international conferences about LPG which were really very much 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, as described above looking more into the production of LPG, while the second conference was in Turkey and looked into the consumption perspective of Turkey's 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 following maps

##### Working Papers

The first outputs of this results will be the Working Paper WP 1 Market Analysis Report (Task 1A) and WP 2 Transport Forecast Report (Task 1B). In Annex

##### 3.2.1.1 *Division of responsibilities WP 1/2*

**Klaas Westerkamp:**

Final responsibility for writing the reports

**Arndt von Oertzen:**

Collection of production and consumption data and relevant information on transport modes and routes for LPG

**Nurzhhan Saginaev, Local coordinator Aktau**

Collection of production and consumption data and relevant information on transport modes and routes for LPG in Kazakhstan and preparation of meetings

**Grigor Matuashvili, Local coordinator Poti**

Collection of production and consumption data and relevant information on transport modes and routes for LPG in Kazakhstan and preparation of meetings

**Kamran Abdulrazagov Local coordinator Baku**

Collection of production and consumption data and relevant information on transport modes and routes for LPG in Kazakhstan and preparation of meetings







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### 3.2.1.2 Contents of WP 1 and WP 2

#### **WP1 Market Analysis Report**

The WP1 market analysis report contains an analysis of the current market situation for LPG in the TRACECA region and in relation with Member States of the European Union. The report is setup along the following lines:

#### **Chapter 1 Introduction**

#### **Chapter 2 General appraisal and information about LPG qualities**

- Definition and characteristics of LPG
- Application and advantages of LPG
- Formation and production
- Differences with LNG and CNG
- LPG quality requirements

#### **Chapter 3 Demand and supply of LPG**

- Introduction
- World demand of LPG
- Demand 1990 – 2010
  - Global LPG market challenges
  - Key drivers for LPG demand
  - EU policy on energy and the role of LPG
- World supply of LPG
  - Supply 1990 – 2010
  - Main supplying countries
- Conclusions on world demand and supply

#### **Chapter 4 Regional demand and supply of LPG**

- The Turkish LPG market
  - Characteristics of the Turkish market
  - Demand for LPG in Turkey
  - Factors influencing future demand
  - LPG supply
  - Imports per region
  - Transport modes used
  - Imports via Black Sea
  - Conclusions on Turkey
- The Eastern Balkans and Ukraine
  - Characteristics of the market
  - Demand for LPG
  - Factors influencing future demand
  - LPG supply
  - Imports per region
  - Transport modes used
  - Imports via Black Sea
  - Conclusions on Eastern Balkans and Ukraine
- Other relevant markets

#### **Chapter 5 Conclusions on potential markets for LPG via TRACECA route, volumes**





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## **WP2 Transport Scenarios**

The WP2 transport scenarios report contains an analysis of the current transport flows of LPG in the region and modes used, transport scenarios based on predicted demand for LPG in the region, and a first assessment of these scenarios and infrastructural needs associated with these scenarios. The report is setup along the following lines:

### **Chapter 1 Introduction**

### **Chapter 2 Current transport flows of LPG in the region**

- Current volumes
- Current transport modes used
- Indications of costs / prices

### **Chapter 3 Relevant transport scenarios in relation to volumes**

- Scenario's for volumes
- Overview of potential transport possibilities
- SWOT analysis of potential transport possibilities including appraisal of infrastructural needs

### **Chapter 4 Conclusions on transport scenarios**

## **3.2.2 Integrated technical scheme for LPG Transportation**

As the bulk of the work for this result will be carried out in the next project period main activities are concentrated towards desk study of the information coming of the field visits and the national project managers, and the bulk of information derived from the two international conferences on LPG.

Additionally many of the INOGATE reports have been studied. One of the most interesting documents coming as a result of a field visit was the business plan for the marine terminal complex for liquefied gas transshipment in the port of Temruk.

As Annex 6 the work plan and organisation for development of Working Paper3 Appraisal of existing transport facilities is presented. After desk research of documents from LPG conferences in Moscow and Istanbul, documents from INOGATE and materials derived from visits of the team leader and meetings from national coordinators, main activities for this result will start in the next period when specific technical experts will visit the countries.

## **3.2.3 Study of the regulatory authorities**

The efforts for this result will be concentrated in the last project period, and therefore not many progress can be mentioned here. A visit to INOGATE in Kiev has been made in August to make an inventory of existing legislation from INOGATE studies carried out in the past.



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### 3.3 Country Visits and Project events

#### 3.3.1 Meetings Team Leader

Meeting : Murphy Baku  
Date : 25.04.06  
Persons : Rauf/Karman/AvO

LNG Pipe Baku-Erzurum finished 2005; New Azeri ministries for Energy etc.

Meeting : Socar Baku  
Date : 25.04.06  
Persons : Arzu Azimov/AvO

Production levels not very high (yet). We will get more (all infos) during next trips etc.

Meeting : Rail Baku  
Date : 26.04.06  
Persons : Teimur/Karman/AvO

LPG Transport level low, monthly 10-20 Wagons to Georgia, Transit 10-20 Waggons from Russia, Insider Azerbaijan 10-20 Wagons, Wagons all private; former Sojuzgazprom was formed into Azeri Gas; LPG Wagonsize limited by construction; rail would not invest into LPG wagons, 50 KT Daily transport Rate, 120 Oil wagons came as a grant from TRACECA in 2004 (?), BP was working for 2 years – safety controls etc. until transport of dry cargo for construction of Baku-Ceyhan pipe started = long procedures possible, LPG transport by existing Caspar ferries so far forbidden – safety  
Note : Information from rail about low level of transport contradicts the existence of the LPG terminal in Batumi – so far ‘fed’ only by Azeri LPG (!!)

Meeting : Port Baku  
Date : 26.04.06  
Persons : Karman/AvO

Port in the middle of the city, dry cargo handling, LPG container handling sub safety possible; LPG transfer ex Ferry boat possible – two rail line connections, 7 Mercury type (multi modal, +- 28 rail wagons/trucks/passengers ) ferry boats from Caspar so far not equipped for LPG; Port recommendation to start LPG container transport; Caspian Sea drafts : Aktyau : 9 M (possible ?) TMB : 5 M dredging not possible ? because of ‘flowing sands’  
Sangechal : 7/9 M

Meeting : Azertrans Baku  
Date : 26.04.06  
Persons : Royad Mirzoeyev/AvO

Operating Sangechal Crude terminal and port (‘state of the art’). Have piers, rail, territory etc. ready for LPG: ‘waiting’ for LPG volume commitments to consider starting construction of unloading facilities  
Dubendi Terminal: Suggest that Rauf/Karman meet people prior to 15.05..06 and submit small report to Menno/AvO



Date/place meeting : 27.04.06 Tbilisi

Persons present : Mr. Dmitry Kemoklidze / Director of Restructuring and Development Agency  
Mr. Vasil Kenkishvili / Head of the Department of legal Support of Restructuring  
Mr. Guram Tatunashvili/ Deputy Director Restructuring and Development Agency  
Mr. Grigol Matuashvili / National Project manager

Reporter: : Team Leader

Date/place meeting : 27.04.06 Tbilisi

Persons present : David Tsiklauri. Deputy Minister for Ministry of Economy Development of Georgia / National Secretary of Georgia in IGC TRACECA  
GMr. Grigol Matuashvili / National Project manager

Reporter : AvO Team Leader

Date/place meeting : 28.04.06 Poti Port

Persons present : Mr. Vladimir Khokhobai / Director on Production and Exploitation issues  
Mr. Eduard Machavariani / Director in Investment issues  
Mrs. Nana Gvasalia / Spectrum

Reporter : AvO

## REGULATION ON THE TRANSPORT OF DANGEROUS GOODS

### PROGRESS REPORT 1



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Date/place meeting : 28.04.06 Batumi  
 Organisation :  
 Persons present :  
 Subject : LPG Transport  
 Reporter : AvO

Have state of the art LPG terminal. Operating so far only on Azeri LPG export and Armenia LPG import. Can easily be expanded. See homepage etc.

Date/place meeting : 10.05.06 Aktyau  
 Organisation : Tranco  
 Persons present : Nurzhan Saginaev local expert  
 Subject : LPG  
 Reporter : AvO

Mangischlag - Port Aktyau 18 km rail only via Kaskortransservice.

Date/place meeting : 10.05.06 Aktyau  
 Organisation : Kasmortransflot  
 Persons present : pls. insert  
 Subject : LPG  
 Reporter : AvO

Building new port Kurik 70 km from Aktyau for crude Oil. This may be (probably is) the only place for erection of LPG loading terminal to Tankers/Ferries. Looking into project for LPG tankers. 7 m draft Aktyau, Volga allows for foll. dimensions in ballast North/South : beam 17,8/22,7 draft 2,7/3,2 loa 150/141 airdraft 1

Date/place meeting : 10.05.06 Aktyau  
 Organisation : Kascor- transservice  
 Persons present : Nurlan Chalgaspaev  
 Subject : LPG  
 Reporter : AvO

Only operator of 18 km private rail between Mangischlag and Aktyau Port and in Aktyau Port. Concerned abt. waiting times. Currently 2500 RTC's waiting (weather/Iran 'problem/other reasons). IF cargo can be loaded freely onto vessels/ferry boat - RTC's may not wait but could bypass - needs checking though. Some congestion

Date/place meeting : 11.05.06 Aktyau  
 Organisation : Aktyau Port  
 Persons present : Vladimir Lobanov  
 Subject : LPG  
 Reporter : AvO

Port is responsible for `land`, pier, vessel navigation. Rest (terminals, rail, pipes) is private. LPG could theoretically loaded to the ferry boat in Zisternes BUT : a. no safety permission b. no experience c. combined pier Ferry/tanker (one at the time) - safety !? No territory for LPG terminal which requires 100 m each side safety distance (!?). No ideas/experience/safety permission with tank containers





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Date/place meeting : 12.05.06 Astana  
 Organisation : Kasmunaigas  
 Persons present : Nurlan Turikpenbaev  
 Subject : LPG  
 Reporter : AvO

Have some 100 KT LPG p.a. from their Usinsk Processing Plant. Their cargo is sold on Platts Basis - mainly.

Date/place meeting : 12.05.06 AA  
 Organisation : Kasgermunai  
 Persons present : Frank Winderlich  
 Subject : LPG  
 Reporter : AvO

280` p.m. Crude Production = 8` KT LPG not 100 % stable, have to flare what they cannot lift - no LPG offtake = production will fall !! Trucking 600 km to Cimkent is so far the ONLY logistical outlet !!

Date/place meeting : 12.05.06 Astana  
 Organisation : Transport Ministry  
 Persons present : Marat Urazbekov  
 Subject : LPG  
 Reporter : AvO

1 Mio. tons of LPG p.a. are getting to Moldova, Georgia, Russia (probably most for transit, Kirgizia). The rolling stock of (private only) `standard` GOST SNG RTC's is some 3-4.000. Costs could be reduced by shipping in block trains. Larger LPG wagons (as advised before would require altered regulations) may not decrease the tariff costs per ton, but the investment costs per ton (if so)

Date/place meeting : 12.05.06 Astana  
 Organization : AGIP KCO  
 Persons present :  
 Subject : LPG  
 Reporter : AvO

Crude Production at Kachagan (off shore north Caspian Sea) will start in 2007-2008 starting from +- 7 Mio. tons p.a. going up to +- 20 Mio. Tons p.a.

Date/place meeting : 10-12.05.06 Kazakhstan  
 Organization : Various  
 Persons present : Various  
 Subject : LPG in general  
 Reporter : AvO

- TCHO : +- 80 KT p.m. (mainly sold to Turkey !?)
- Usinsk : +- 8 KT p.m.
- Cimkent (whereby their bulk cargo is coming from Kasgermunai) + Pavlodar + Atyrau refineries : +- 28 KT p.m.
- Total LPG production p.a. +- 1 Mio. tons
- Rough production formula : LPG = crude/gascon production x 2-4 % x pct LPG processed/recovered minus reinjection volumes
- Additional (several Mio. tons ?) volumes in future :





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- TCHO production increase
- KIO Karachakanak Volumes if any
- Okioch Kachagan
- from other smaller crude fields
- Purchase Price of Russian LPG cars may be approx. US\$ 70` (versus US\$ 120` for west made RTC's !?)
- CIS Locomotives seem to be min 25 years old;` normal` lifetime is 30 years, Rostov locomotive plant (an all others ?) has apparently production efficiency, methods, technology, output volumes of some 40 years ago. Delivery time is said to be 5 years. Western plants deliver in 2-3 years
- It appears that Kazakhstan does not want to put all their eggs into one basket - namely sales to China.
- Costs for LPG transport in RTC's seems to be approx. USD 150 MT Aktyau (Usin)-Brest and USD 180-200 MT Pavlodar-Brest. The `split` between rail tariff and RTC rental I would only guess as of today at around 2/3 - 1/3

#### Interim Summary

- Kazakhstan `seems to have several millions of tons LPG available in the foreseeable future for `Europe`
- If at all, Port of Aktyau may allow only the terminal of tank containers (can you provide me with statistics - number of tank containers in the world, number of ports handling them, handling/safety precautions versus `normal` container handling and accidents and their consequences. Likewise if possible the same LPG handling in RTC's onto Ferry boats.
- LPG terminal to the Caspian Sea from Kazakhstan seems to be only possible at the to be build terminal at Kurik - 70 km off Aktyau
- Baku Port likewise Aktyau Port
- Azeri Terminal to be built at Sangechal (possible)/Dubendi (may be needs verification)/other places (may be needs verification)
- Georgian terminal at Batumi in place/can be expanded. Poti would need `Green field` construction/other to be checked
- Investments required per 1 Mio. tons as per attached table
- More in Inception report

Date Place Meeting Baku 23/24.08.06

Akif Mustafayev  
Fatima Atakishiyeva  
Anar Ismail, rail way expert  
Farid Gataulin, Land transport expert  
Kamran Abdulrazagov  
Arndt von Oertzen

- Akif will submit a list of proposed participants for the Istanbul workshop
- The transport experts advised the following : a. Russian ferry boats are bringing the loading capacities at TMB over the limits. Allegedly they are having slow turnarounds. I will try to check these information b. because of the above 500 empty RTC's are waiting in Baku to be transhipped to TMB for reloading. The local experts would like to participate in the project







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Date 1st Sep. 2006

Attn: Arndt von Oertzen

Report of the meeting held in Azerbaijan Caspian Shipping Company on 08. Sep. 2006

Baku, Azerbaijan.

Reported by the local expert Abdurazagov Kamran

I have met with Mr. Arif Ragimov - the Deputy Manager of Operational Department of Azerbaijan Caspian Shipping Company (CSC) to find out the possibility to involve their ferries for transportation LPG via TRACECA corridor.

The present situation in CSC is as below:

The total turnover of the goods via CSC's 7 ferries on below routes made about 2,5 million tons during last year

Baku – TBM

TBM – Baku

Baku – Aktau

Aktau – Baku

About 15-18 % less than the maximum allowed capacity of the ferries. The max volume, which can be transported by these 7 ferries are about 3 million tons.

The decrease in CSC's turnover is caused, due to putting into operation on Caspian Sea (TBM – Makhachkala) of 3 new ferries Makhachkala I, II, III by Russia. Makhachkala IV is under construction now and will be used on this route too. The loading capacity of such type ferries is 54 pieces of 13 meter rail wagons. For comparison, CSC ferries capacity is 32 pcs of 13 meter wagons or 28 pcs of 15 meter wagons. Due to the 2-nd floor construction the net offloading time of Makhachkala ferry is 9 hour and the net offloading time of CSC ferries is 1 hour.

The above emphasized 18% means (is equal to), if one of above ferries will stay at the seaside without any work. And due to this fact CSC lost approximately 300000 USD last year, as they should pay for the crew for diesel and other charges to keep the ferry in the working- ready condition.

At the present, the sea freight rates from Baku to TBM is about US\$ 6,5 per ton and from Baku to Aktau is about 8,0 US\$ per ton.

CSC doesn't plan to buy the ferries specialized on Gas transportation, as they haven't the clear picture at this stage.

CSC has about 34 vessels for transportation of the dry cargo. 3 of them are operated in Caspian Sea and 31 of them are under operation in Black Sea, due to the small volume of dry goods in the Caspian sea.

CSC has bought 4 new tankers with loading capacity 13 tons each and plans to buy 1 more till the end of this year. Based on the market prices the investment to purchase above 5 tankers is about 65 million USD.

If CSC buys the gas transporters now they will loose, as there are no any infrastructure - terminals to pump in / out the gas and there are also not stable market for these gas transporters.

But in future, in case of necessity to buy gas transporters, I suppose CSC also will be involved on it, as they are interested to earn money.

They bought tankers, as the investment from purchasing of tankers is recompensed within 7 years. For example the investment for purchasing of dry cargo vessels is recompensed within 15 years.

The normal profitable purchasing in this business, if the investments are recompensed within the period less than 10 years, as the average usage period of ferries is about 25-30 years.

If the investment for purchasing gas transporters recompensed during the period lesser than 7 years, I am sure CSC will purchase "gas transporters" instead of tankers.

In these stage we also haven't possibility to use Russian ferries Makhachkala for transportation of LPG from TBM to Baku. CSC doesn't allow to enter these ferries into Baku port, as Russia from their side refuse the entrance of Azeri vessels to Astrakhan port of Russia. I suppose this matter will not be settled until the political problem - the dividing the Caspian Sea between five countries (Azerbaijan Russia, KZ,







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TM and Iran) is completed. In spite of small seaside area, Iran is claiming also for 20% part of Caspian sea. Turkmenistan is pretending to Azeri oil fields in the Caspian sea...

At this stage the transportation of LPG from Aktau / TMB to Baku by "Gas transporters" and tank containers based on CSC present facilities are not possible. **(I have different infos and will check and revert)**

Astana 07.09.06

Memos of the meetings

Kairat Shotbakov  
Nurzhan Saginaev  
AvO

Kaztransgas  
local coordinator

We presented the project. Kaztransgas - being the affiliated transport structure of Kazmunaigas - seemed to be very eager to participate in the project with a leading role :

- He would like to join Istanbul workshop
- He reckons that he could provide us with all information required and could coordinate amongst the various Kasach entities
- According to him Kasach quantities will raise Essily) up to 10 Mio. tons until 2015
- The following points shall be considered : very dangerous product (see recent LPG burn out in the US (!?!), critical shipping through Bosporus, can transport via Traceca be (always)competitiv ? Kasachstan may be interested to participate in LPG downstream activities (I said be our guest; Europe is free for investments, he may also write an essay for the project
- For a feasibility study commitments from Producers for quantities would be necessary

So in essence larger quantities seem to be available - we could raise the projected volumes up to 3-8 Mio. Tons including Turkmenistan

Farina Deputy of Kazakh TRACECA Secretary

Nurzhan Saginaev  
AvO

She got acquainted with the project. She would be eager to join and assist. We can engage her to assist with the working papers

Sherkan Sugurbekov Kasmortransflot

Mathew Listerud , Vitro  
Nurzhan S.  
AvO

Vitro is the permanent consultant to Kasmortransflot. KMTF would like to/will a. Build/buy/operate/own LPG tankers in the Caspian b. Build/own/operate the new LPG terminal at Kurk (new port 40 km south of Aktyau). Sherkhan will participate in the Istanbul workshop. Listerud advised that he wrote the terms of reference for our project. We discussed the following :

- There are three types of LPG RTC`s : 4 axle +-28 tons intake,+-40 tons intake (Type 17-10-19) and 8 axle +- 60 tons intake. The latter cannot run in Azerbaijan and Georgia
- Rail tariffs from Baku-Batumi are US\$ 38,- MT for 40 the larger Wagons and US\$ 52,- for the smaller wagons. Approx. US\$ 28,- MT (my estimate) charges for wagon rent must be added to these tariffs





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- The route TMB-Baku (ferry boat)-Batumi is offered at around US\$ 105 MT Including approx. US\$ 20,- MT `costs` in Tmb between the ferry boat and loading terminal of the refinery !!) plus RTC rent
- A pipeline Baku-Batumi is considered not to be viable - quote/unquote the a.m. gentlemen. I said that we shall only know later if this may be the case. An income of may be US\$ 150-400 Mio. p.a. (3-8 Mio. Tons at US\$ 50,- MT) may however justify a pipeline Baku-Batumi. Cost of US\$ 250` (+-) per km LPG pipeline - a reference figure from India) were considered as a. `may be possible in India on flat territory when metal price where at 25 % of today's prices` b. `Too low/good to be true
- `Kazakhstan` agreed with `Georgia` to build a new terminal at Batumi (checking, reverting ). `Azerbaijan` agreed with `Georgia` to build a new terminal at Poti (checking, reverting ).
- The large factory Azovmasch (Ukraine) is building LPG wagons for around U\$ 60-70.000 per piece
- To transport of additional 1 Mio. Tons of LPG to Batumi from TMB/Aktyau additional 600 Wagons will be needed (approx.). I would also recommend 11 new locomotives per 1 Mio. Tons at US\$ 3-5 Mio. per piece
- Investments into railway systems to transport 1 Mio. tons LPG may be up to 80-100 Mio. US\$ plus additional costs for safety.
- It remains to be seen if the rail network does AT ALL fulfil western safety requirement for LPG transport
- Suggest to start collecting material about the alleged LPG `blow up` in the US
- Listerud asked if he could `listen` in at Istanbul workshop

Memo Tbilisi, 25/08.09, Saknaftobi, persons attend : Arnd von Oertzen, Grigol Matuashvili, Gogi Gogiashvili, Levan Gogodze, Jemal Khudzadze

- The distance for a LPG pipeline from Baku to the Georgian cost line is approx. 1.000 km via the know `difficult` territory. From the knowledge in past completed pipeline projects we can estimate the following : The resent cost of steel U\$ 1300-2400 MT per ton. The steel it's self is making 25% of the total project cost and rest of 75%, is cost for the construction, engineering, labour, land and etc. For obvious reasons we can only very roughly estimate the total pipeline costs between US\$ 250.000 (1) and US\$ 2 Mio. per km or total costs between US\$ 250 Mio. – 2 Bio. US\$
- Meeting Sagnaftobi , no LPG in Georgia, enough LPG anywhere; LPG description  
Meeting held in Sagnaftobi with Mr. Levan Gogodze/ vice chairma of the board (Saknaftobi) and Mr. Jemal Khudzadze / Construction Manager of GIC  
At the present moment there is no production of LPG in Georgia and consumption is quite low but Georgian Government is looking for the alternative energy resources that importing currently and will be interesting in LPG as alternative energy resource.  
During the meeting was mentioned the potential of production of LPG in Central Asia (Kazakhstan , Turkmenistan) can be increased, but will need quite big investments in building the LPG factories.  
LPG description:  
LPG is mixture of Hydrocarbon gases. Varieties of LPG bought and sold include mixes that are primarily propane, mixes that are primarily butane and mixes including both propane and butane, depending on the season – in winter more propane, in summer more butane. Propylene and butylenes are usually also present in small concentration. A powerful odorant, ethanethiol, is added so that leaks can be detected easily.  
LPG is manufactured during the refining of crude oil, or extracted from oil or gas streams as they emerge from the ground.  
During the transportation , transport tare typically has to be filled to between 80% and 85% of their capacity. The ratio between the volumes of the vaporised gas and the liquefied gas varies





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depending on composition, pressure and temperature, but is typically around 250:1. The pressure at which LPG becomes liquid, called its vapor pressure, likewise varies depending on composition and temperature ; for example, it is approximately 220 kilopascals (2.2 bar) for pure butane at 20°C , and approximately 2.2 megapascals (22 bar) for pure propane at 55°C. propane gas is heavier than air, and thus will flow along floors and tend to settle in low spots, such as basements.

- Istanbul conference will take place on 2<sup>nd</sup>-3<sup>rd</sup> November 2006  
The invitation has be sent to the head of Poti Port, head of Batumi Port, head of Georgian Railway and National Traceca Secretary in Georgia. For now we received confirmation for participant from Poti port authorities. We will send remainder in written to the rest authorities with asking them to confirm their interest by the end of September.
- During the internal meeting we concluded that using the tank containers fro the LPG will not be cost effective as the price for the transportation from Kazakhstan to Poti full and return of empty container will be around 5500-6000USD. Which makes the cost per ton around 180 USD - 200 USD. So from our opinion this is not economically effective. If any other experts has their own opinion on transportation of Tank containers, please provide with ideas and routing.

### 3.3.2 Other Meetings WP 1/2

#### MINUTES MEETING WITH AYGAZ, 13 JULY 2006

Kivanc Zaimler – Logistics Group manager

Tufan Basarir – Supply planning manager

Ayşe Abamor Bilgin – LPG supply manager

Ozum Saydam – NEA Turkey

Klaas Westerkamp – NEA Responsible for writing WP 1and WP

#### Profile Aygaz

Aygaz produces and imports (and re-exports) LPG. Largest in Turkey. They have their own refineries, storage facilities and transport means (2 small vessels in the Black Sea).

See further the presentation in Moscow of Mr Zaimler attached.

Re-export by truck (to Iraq, and some very small volumes to RO/BG) is temporarily because of Iraq crisis, has stopped in January 2006 because of payment problems.

#### Overall view on (future) market demand in TR

Market is decreasing mainly because more and more households and factories are getting access to the natural gas network. Also TR production is increasing.

Due to changing government policy related to fuel taxes, now Auto gas is main market segment with a share of 11% in 1999, and 48% in 2005.

Aygaz was asked about their opinion on our assumption that in the future 1,5 mln tonnes (+/- 0,5) would be transported to Turkey and other markets. According to Aygaz the import of more than 1 mln tonnes from KZ and Turkmenistan is judged very unrealistic. Even 1 mln ton is very optimistic.

Also, they believe that in such a case Algeria would certainly lower its prices

#### Aygaz imports and related strategy

Strategy is diversification, therefore they are importing LPG from several sources.

Algeria	1610 Kt	45%
Norway	590 Kt	17%
Arabian Gulf	450 Kt	13%
Black Sea (Odessa)	370 Kt	10%
Libya	290 Kt	8%
Others	265 Kt	7% (i.e. Argentina)





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LPG is mainly transported (sea) to storage sites in Marmara Sea. Small vessels continuously between Odessa and Marmara and Samsun

Though logistics is everything in LPG business, as long as the main transportation is sea transport it doesn't matter that much where it comes from. Therefore LPG from Norway is also imported. Costs are about \$45 from Norway. From Algeria \$25. From Black Sea \$50.

Regarding prices, the price of Algerian LPG is their main reference. (Sonatrach, SP)

Recently they tried swap deals with Iran, whereby Iran imported Turkmenistan LPG, and Turkey imported LPG from Iran. They even build a small extension of a railway line in the South East to Iran. This deal has stopped, unclear why, will ask.

#### Views on possible transport routes

By vessel across Caspian Sea to Baku, then by rail. Better to go into TR instead of Batumi. They have invested some money in a rail terminal in Georgia, as a source for rail transport of LPG to TR, but this has stopped.

Problem is that the demand in TR is in the West, not in the East, so LPG should be transported by rail through Turkey (let's say Ankara).

Pipeline, not realistic. Given diversification strategy, and transport costs.

In Black Sea no large vessels, not allowed. In Samsung storage only 7000 tonnes.

In Odessa storage also very small, 3000 tonnes.

Storage in Batumi is 1300 tonnes.

LPG from Black Sea to Marmara terminals requires the route via Bosphorus, dangerous.

#### Other transport related issues

- There is a temperature problem in the winter. RTC's and vessels need to be temperature controlled.
- Ship size is very important, the larger the vessel the better. However, large vessels require large storage facilities.
- In TR there is no rail infrastructure for LPG. Import is based on sea borne trade

#### Quality of KZ & Turkmenistan LPG

Aygaz is very keen on quality, must not smell for consumers. Also, government has strict import regulations regarding quality.

Quality of LPG from natural gas is better than from crude.

KZ & Turkmenistan quality is not always good, but depends on site. Tengiz LPG is good quality, since it comes from natural gas.

Quality is also dependent on refinery. There are some bad refineries there. Because LPG is by product, it doesn't pay off to invest in upgrading the refineries just for the LPG quality.

NB. Tengiz production will increase.

#### Other observations / remarks

- AGIP was the consortium leader for research regarding the possibility to export KZ LPG (Kashagan area) to the West. There is no production there yet. The result was that they decided not to export.
- Export/transport of LPG from KZ and Turkmenistan to Greece is believed to be very unrealistic because of Algeria.
- There are many mistakes in the ToR (production data etc).



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### MINUTES MEETING TOTAL TR, 11 JULY 2006.

Abdulkadir Basar, Supply and Trade Director  
Ozum Saydam – NEA Turkey  
Klaas Westerkamp – NEA

#### Profile

Distribute LPG in Turkey. LPG is bought via Totsa (Geneva) for the whole Total Group.

#### Overall view on LPG market in TR

Decreasing

People use auto gas because of taxes, higher taxes on gasoline.

#### Feasibility

We should take the Fob price Mediterranean and calculate back.

#### View on pipeline idea

Not feasible, problems vary from land ownership to mountains etc. Rail would be best.

### OTHER OBSERVATIONS

- Last week the new USD 4 billion crude oil pipeline, Azerbaijan – Georgia – Turkey, South coast city Ceyhan, bypassing the Russian route and the overcrowded Turkey straits, was opened. At full capacity this pipeline will transport 50 mln tons of crude oil from Azerbaijan via Tbilisi to Turkey's Mediterranean coast, 1 mln barrels per day.
- Critics apparently have argued this pipeline would be too costly and too difficult to build (main obstacles were environmental and expropriation problems in Georgia, and avoiding historical sites in TR). The pipeline crosses many rivers and numerous mountains. The pipeline is expected to bring Turkey USD 300 mln per year of revenue.
- There are plans to Caspian and Iranian natural gas via pipelines to Europe via Turkey.
- There are plans to build a natural gas pipeline parallel to this pipeline to bring Azeri natural gas to Erzurum, eastern Turkey, project start end 2006.
- There are plans to build 3 new crude refineries in Turkey.

### CONCLUSIONS

- Demand in TR is decreasing and production increasing, though diversification strategy implies there is always interest in "new" sources. So if LPG can be imported/transported at reasonable rates there is potential demand.
- Maximum of 1 mln tonnes, as indicated by Aygaz.
- Due to quality issues only some sources (Tengiz) are feasible, given also that upgrade investments in existing refineries with current low quality are not feasible.
- LPG Pipeline is considered not realistic. Both by Total and Aygaz. Personally I feel that if the crude pipeline to Ceyhan was considered by critics as not feasible with 50 mln tonnes of crude per year, it is difficult to imagine that a LPG pipeline for 1 mln tonnes LPG would be feasible, though in this case the TR part of the pipeline is not relevant, and the pipeline would run to Batumi instead of going to TR.
- Therefore I propose to focus on vessels to Baku region, rail from Baku to Batumi and further with vessels to ie Samsun and RO/BG/UA, and rail from Baku and then via Turkey. Also the possibilities of the future gas pipeline for natural gas from Baku to Turkey should be considered. Possibly in TR LPG could be extracted from natural gas. This is however an idea of me, with no technical knowledge in this field at all. Like Klaus said, the Kerch study is also very important to get.  
Work should focus on existing storage facilities, volumes, needed facilities to store and transport 1 mln tonnes.
- Investments in equipment (RTC/Vessels) should consider the "winter" problem





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### 3.4 Project Administration

Very unfortunately our project manager in Azerbaijan, Mr Rauf Mammadov, died on 19 May 2006 due to a disease. He was replaced by Mr Kamran Abdurazagov.

On August 2, 2006 Side letter No. 1 to Contract 082-047 was received with the approval of the short term international experts. A copy of this letter is attached in Annex 7.

Our initial idea of sharing the project office with the TRACECA project Freight Forwarding Training Courses, as discussed and approved by former SG Trenkova, have been replaced by having the office on the premises of the Project Manager Azerbaijan, Mr Kamran Abdurazagov. The same applies to project offices in Kazakhstan and Georgia, which are at the premises of the Project Managers of these countries. In Ukraine we share the office with the TRACECA Maritime Training project. Additionally to above plans we will open an office in the building of the Permanent Secretariat of TRACECA in Baku, Azerbaijan.

### 3.5 Risks and assumptions

Although the project probably would be very beneficial to Turkmenistan, this country has not yet endorsed the project and was therefore not included in the project activities yet (except for one visit by the team leader in May). The project team has been trying very hard to change this situation and include Turkmenistan in all our project activities. Nevertheless there are no clear signs that the project will be endorsed very soon. Although it will probably not effect the overall objective of the project, the fact that Turkmenistan does not participate may have a significant effect on the project purpose and project results. If this situation remains as it is at present, it may therefore be necessary for the successful implementation of the project to apply for an addendum to the contract to correct some of the project contents in relation to Turkmenistan.

Main emphasis from the beginning of the project is laid on gathering information about production data of LPG, for which especially the team leader and national coordinators have put a lot of effort. Nevertheless this is not always easy to collect as many companies regard this kind of information as confidential. We assume however that information received, after having been checked, is reliable, but can not guarantee this.





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## 4 Summary of Project planning for remainder of the project

The main milestones of the project in terms of events, which will be organized are the following:

### **November 2-3, 2006**

### **Economic Workshop/Study Tour**

Venue:

Istanbul, Turkey

Participants:

in principle 5/6 participants from each country.

Purpose:

Presentation and discussion of Working Paper (WP) 1 and WP 2  
WP 1 Market Analysis Report (Task 1A)  
WP 2 Transport Forecast Report (Task 1B)

### **March, 2007**

### **Technical Workshop/Study Tour**

Venue:

Hamburg, Germany

Participants:

in principle 5/6 participants from each country.

Purpose:

Presentation and discussion of WP 3 and WP 4  
WP 3 Transport Facilities Appraisal Report (Task 2A)  
WP 4 Safety Conditions Report (Task 2B)

### **August, 2007**

### **Final Workshop**

Participants

Baku, Azerbaijan

in principle 5/6 participants from each country.

Purpose:

Presentation and discussion of WP 5 and WP6  
WP 5 Legal and Institutional Framework report (Task 3)  
WP 6 Economic Appraisal Report (Task 1C)



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## Annex 1 Project Interim Report (Form 2.2)

Project title : <b>Transport of Dangerous Goods along the TRACECA Corridor</b>		Project number : EUROPEAID/120569/C/SV/MULTI		Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine		Page : 1									
Planning period : 4/2006 - 09/2006		Prepared on : September 2006		Contractor : NEA and its partners in the consortium HPTI, UMCO and 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.															
No	ACTIVITIES IMPLEMENTED	TIME FRAME 2006 Months						INPUTS							
		4	5	6	7	8	9	PERSONNEL INTERNATIONAL (M-d)		LOCAL PARTNER (M-d) + )		EQUIPMENT AND MATERIAL		OTHER	
		Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised
1	Analysis of the market for LPG products	xxx	xxx	xxx	xxx	xxx	xxx	50	42	160	105	-	-	-	-
2	Development of transport forecasting scenarios for LPG	xxx	xxx	xxx	xxx	xxx	xxx	40	32	80	45	-	-	-	-
3	Economic appraisal of LPG transport schemes											-	-	-	-
4	Multi-Country Workshop/Study tour to present WP 1 and WP2 in Istanbul, Turkey						xxx	48	22	25	15	-	-	-	-







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Project title : Transport of Dangerous Goods along the TRACECA Corridor		Project number : EUROPEAID/120569/C/SV/MULTI		Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine		Page : 2									
Planning period : 4/2006 - 9/2006		Prepared on : September 2006		Contractor : NEA and its partners in the consortium HPTI, UMCO and 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.															
No	ACTIVITIES IMPLEMENTED	TIME FRAME 2006 Months						INPUTS							
		4	5	6	7	8	9	PERSONNEL INTERNATIONAL (M-d)		LOCAL PARTNER (M-d) +)		EQUIPMENT AND MATERIAL		OTHER	
								Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised
5	Appraisal of existing transport facilities of LPG	xxx	xxx	xxx	xxx	xxx	xxx	70	55	160	95	-	-	-	-
6	Appraisal of the safety conditions for LPG transport	xxx	xxx	xxx	xxx	xxx	xxx	23	14	65	35	-	-	-	-
7	Multi-Country Workshop/Study tour to present WP 3 and WP4 in Hamburg, Germany											-	-	-	-
8	Analysis of agreements and treaties	xxx	xxx	xxx	xxx	xxx	xxx	30	15	70	15	-	-	-	-
9	Review of dangerous goods legislation							15	7	60	5	-	-	-	-
10	Analysis of regulatory authorities							20	8	20	0	-	-	-	-
11	Multi-Country Workshop/Study tour to present WP 5 and WP6 in Baku, Azerbaijan											-	-	-	-
	TOTAL							296	195	640	315	-	-	-	-





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## Annex 2 Resource Utilisation Report (Form 2.3)

Project title : <b>Transport of Dangerous Goods along the TRACECA Corridor</b>	Project number : EUROPEAID/120569/C/SV/MULTI	Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine	Page : 1
Planning period : 4/2006 - 9/2006	Prepared on : September 2006	Contractor : NEA and its partners in the consortium HPTI, UMCO and 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	AVAILABLE REMAINDER	FOR
PERSONNEL (in man days)						
Team Leader	216	80	76	76	76	140
Task Leader Engineering	144	60	59	59	59	85
Task Leader Legal	144	65	30	30	30	114
Project Manager Azerbaijan	315	105	105	105	105	210
Project Manager Georgia	315	105	105	105	105	210
Project Manager Kazakhstan	315	105	105	105	105	210
International senior experts	140	45	30	30	30	110
Local senior experts	110	35	6	6	6	104
Total	1699	600	516	516	516	1183
Incidental Expenditures in euro	180,000	40000	15000 (est)	15000 (est)	15000 (est)	165000





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## 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 : 4/2006 - 9/2006		Prepared on : September 2006	Contractor : NEA and its partners in the consortium HPTI, UMCO and Hoyer Gaslog	
Output results	Deviation original plan + or - %	Reason for deviation		
WP 1 Market Analysis Report (Task 1A)	1 ½ 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 find a suitable date for presenting at workshop due to holiday season		
Combined Multi-Country Seminar/Study Tour 1A/1B Istanbul, Turkey	1 ½ month later than planned	Difficult to find a suitable date for presenting at workshop due to holiday season		
WP 3 Transport Facilities Appraisal Report (Task 2A)	Not applicable yet, target date March 2007			
WP 4 Safety Conditions Report (Task 2B)	Not applicable yet, target date March 2007			
Combined Multi-Country Seminar/Study Tour 2a/2B Hamburg, Germany	Not applicable yet, target date March 2007			
WP 5 Legal and Institutional Framework report (Task 3)	Not applicable yet, target date August 2007			
WP 6 Economic Appraisal Report (Task 2C)	Not applicable yet, target date August 2007			
Combined Multi-Country Seminar (Task 2C/3) Baku/Azerbaijan	Not applicable yet, target date August 2007			





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## Annex 4 Plan of Operations for the Next Period (Work programme) (Form 1.6)

Project title : <b>Transport of Dangerous Goods along the TRACECA Corridor</b>		Project number : EUROPEAID/120569/C/SV/MULTI		Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine		Page : 1				
Planning period : 10/2006 - 3/2007		Prepared on : September 2006		Contractor : NEA and its partners in the consortium HPTI, UMCO and 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.										
No		ACTIVITIES	TIME FRAME				INPUTS			
			2006-2007 (months)				PERSONNEL (Man-Days)		EQUIPMENT AND MATERIAL	OTHER
10	11	12	01	02	03	International	Local			
01	Analysis of the market for LPG products	xxx	xxx			8	30			
02	Development of transport forecasting scenarios for LPG	xxx	xxx			8	15			
03	Economic appraisal of LPG transport schemes									
04	Multi-Country Workshop/Study tour to present WP 1 and WP2 in Istanbul, Turkey		xxx			26	10			





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Project title : <b>Transport of Dangerous Goods along the TRACECA Corridor</b>			Project number : EUROPEAID/120569/C/SV/MULTI			Country : Azerbaijan, Georgia, Kazakhstan, Turkmenistan, Ukraine			Page : 2				
Planning period :			Prepared on : May 2006			Contractor : NEA and its partners in the consortium HPTI, UMCO and 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.			TIME FRAME					INPUTS					
			2006-2007 (months)					PERSONNEL (Man-Days)		EQUIPMENT AND MATERIAL		OTHER	
No	ACTIVITIES	10	11	12	01	02	03	International	Local				
05	Appraisal of existing transport facilities of LPG	xxx	xxx	xxx	xxx	xxx	xxx	100	135				
06	Appraisal of the safety conditions for LPG transport	xxx	xxx	xxx	xxx	xxx	xxx	50	65				
07	Multi-Country Workshop/Study tour to present WP 3 and WP4 in Hamburg, Germany					xxx	xxx	48	25				
08	Analysis of agreements and treaties				xxx	xxx	xxx	15	15				
09	Review of dangerous goods legislation				xxx	xxx	xxx	15	15				
10	Analysis of regulatory authorities						xxx	5					
11	Multi-Country Workshop/Study tour to present WP 5 and WP6 in Baku, Azerbaijan												





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## Annex 5 Contact List

### List of major meetings of project staff in the TRACECA Region and elsewhere

Name	Position
<b>Azerbaijan</b>	
Mustafayev, Akif	TRACECA National Secretary
Arzu Azimov	Socar Baku
Teimur Mamedov	Rail Baku
Vahid Akhmedov	Port Baku
Rafael Rachmanov	Caspian Shipping
Royad Mirzoev	Azertrans Baku
Arif Ragimov	Deputy Manager of Operational Department of Azerbaijan Caspian Shipping Company (CSC)
Anar Ismail	rail way expert
Farid Gataulin	Land transport expert
<b>Georgia</b>	
Steen L. Jensen	Batumi Greenoak Oil Terminal
Dimitry Kemoklidze	Director of Restructuring and Development Agency/Georgian Rail
Vasil Kenkishvili	Head of the Department of legal Support of Restructuring/Georgian Rail
Guram Tatumashvili	Deputy Director Restructuring and Development Agency/Georgian Rail
David Tsiklauri	Deputy Minister for Ministry of Economy Development of Georgia / National Secretary of Georgia in IGC TRACECA
Vladimir Khokhobai	Director on Production and Exploitation issues/Poti Port
Eduard Machavariani	Director in Investment issues/Poti Port
Nana Gvasalia	Spectrum
David Jinjolia	Commercial Director, Georgian Railways
Gela Kalveslashvili	Operations Director, Georgian Railways
Mamouka Vadachkoria	Transport Coordinator, Batumi Oil Terminal
Levan Gogodze	Jemal Khudzadze Company Sagnaftobi
<b>Kazakhstan</b>	
Murat Bekmagambetov	TRACECA National Secretary
Dmitry Zhelesniak	OOO Kondensate
Frank Winderlich	Kasger munai
Dmitry Zhelesniak	OOO Kondensate
Nurzhan Seitzhanov	South Oil
Sherkhan M. Sugurbekov	Kazmortransflot



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Vlentina V. Guzenko	CNPC Aktobe
Vladimir Lobanov	Aktyau Port
Nurlan Chalgaspaev	Kascor- transservice
Nurlan Turikpenbaev	Kasmunaigas
Marat Urazbekov	Transport Ministry
Almasbek A. Mukhashov	Agip KCO
Kairat Shotbakov	Kaztransgas
<b>Ukraine</b>	
Stepan Chernik + Team	NaftoGaz Ukraine
Vitaly Mudrov	Speztransservis
Viktor Illarionov	Interchem Odessa
Oleg Kramarenko	Antos Odessa
Olena Nevmerzhytska	Traceca Kiev Regional Office
<b>Turkey</b>	
Kivanc Zaimler	Logistics Group manager AYGZ
Tufan Basarir	Supply planning manager AYGZ
Ayse Abamor Bilgin	LPG supply manager AYGZ
Abdulkadir Basar	Suply and trade Director TOTAL Turkey
<b>Intergovernmental Commission TRACECA</b>	
Trenkova, Lyudmilla	Intergovernmental Commission TRACECA , Permanent Secretariat, Secretary General
Rustan Jenalinov	Intergovernmental Commission TRACECA , Permanent Secretariat, Secretary General
<b>INOATE</b>	
Serguei Gorbachov	Senior Expert
Irina Arischenko	Promotional expert
<b>OTHERS</b>	
Agostinelli	Okioe Agip KCO
Ernesto Soria	ILF



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## Annex 6 Approach Working Paper 3

<b>WP3: Appraisal of existing LPG transport facilities</b>									
Consider the consecutive LPG transport facilities in the total transport chain from origin (= process plant in Kazakh or Turkmeni) to destination (= Europe or Turkey)									
<b>A) Description of existing routes:</b>		1) Kazakh LPG process plant:		Location	TO	1) Brest (Poland)		WHAT IS THE EXACT ROUTE ON THE RUSSIAN RAIL NETWORK (today)?	
		via Russia		??		2) ?? Samsun (Turkey) across Black Sea			
		2) Turkmeni LPG process plant:		??	TO	3) ?? Via Kerch (Azov Sea) in near future (2010?)			
						1) ?? Samsun (Turkey) via Batumi or otherwise		By railferry TMB - Makhachkala and HOW EXACTLY FURTHER?	
						2) Neka (Iran) in near future (2007/8?)			
<b>B) LPG loading terminal (rail head at processing plant) in Kazakh/Turkmeni respectively</b>									
Storage capacity:		m3 or ton		specify e.g. butane/propane					
Loading capacity or time:		block train(s) of # RTCs with ? Ton load capacity							
		# tracks for (parallel) loading							
		max. # of block trains/day							
		loading costs per RTC or block train of # RTCs							
<b>C) Rail branch line = connection of LPG loading terminal and entry junction of main railway line (national network)</b>									
Length:		Km							
Single/double track:		mm gauge							
Track condition:		good/fair/poor		need for mtce/upgrade?					
Average travel time/speed:		on branch line							
<b>D) Main line railway link to border with Russia (Kazakh) of Caspian Sea port (Aktau/Kuryk/other? in Kazakh or TMB/other? in Turkmeni)</b>									
Specify each route (refer to A)		Typical costs of LPG(-like) transport/ton on this route?							
Length:		Km							
Single/double track:		mm gauge							
Track condition:		good/fair/poor		need for mtce/upgrade?					
Capacity constraining factors? E.g.		max. permissible (block) train length (# RTC's/tons)							
		single track with limited length of sidings							
		type of signalling system & block length							
		weight restrictions (e.g. bridges)							
		bottle neck section(s) determining current practical max. capacity							
<b>E) Current railway routes through Russia/Ukraine:</b> From Yaysan or Atyrau (Kazakh) to resp. Saratov or Volgograd (Russia) and onwards to Minsk (Brest) and Kiev or Odessa/Ilyichevsk (Ukraine)									
Specify each route (refer to A)		Typical costs of LPG(-like) transport/ton on this route?							
Length:		Km							
Single/double track:		mm gauge							
Track condition:		good/fair/poor		need for mtce/upgrade?					
Capacity constraining factors? E.g.		max. permissible (block) train length (# RTC's/tons)							
		bottle neck section(s) determining current practical max. capacity							
<b>F) Caspian Sea Port/Railferry facilities in Aktau (Kazakh) and TMB (Turkmeni)</b>									
Specify typical railferry:		# RTCs (LPG)/ferry							
		rail yard capacity (LPG-dedicated tracks?)							
		loading/unloading time							
		port clearing procedures (if any)							
		restrictions in port (ferry) operations due to weather or otherwise							
<b>G) Caspian Sea Port/Railferry facilities in Makhachkala (Russia) and (in future?) Baku (Azerbaijan)</b>									
Specify typical railferry:		# RTCs (LPG)/ferry							
		rail yard capacity (LPG-dedicated tracks?)							
		loading/unloading time							
		port clearing procedures (if any)							
		restrictions in port (ferry) operations due to weather or otherwise							
<b>H) Current railway routes through Russia/Azerbaijan-Georgia</b> From Makhachkala (Russia) to Baku (Azer) and Batumi (Georg) and to Temryuk (Russia) and Kerch (Ukraine)									
Specify each route (refer to A)		Typical costs of LPG(-like) transport/ton on this route?							
Length:		Km							
Single/double track:		mm gauge							
Track condition:		good/fair/poor		need for mtce/upgrade?					
Capacity constraining factors? E.g.		max. permissible (block) train length (# RTC's/tons)							
		bottle neck section(s) determining current practical max. capacity							





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<b>I) Export LPG terminals in Batumi (Georgia), Temryuk (Russia) and Kerch (near future? 2008)</b>			
Specify salient terminal characteristics			
Storage capacity:	m3 or ton	specify e.g. butane/propane/etc	
Train unloading capacity:	block train(s) of # RTCs with ? Ton load capacity		
or time	# tracks for (parallel) unloading		
	max. # of block trains/day		
	unloading costs per RTC or block train of # RTCs		
LPG-tanker loading	typical tanker load capacity		
capacity or time	# berth (length) for loading		
	max. # of tankers/day		
	loading cost per tanker of specific tonnage		
typical annual throughput	m3 or ton	specify e.g. butane/propane/etc	
<b>J) Black Sea tankers (serving LPG terminals)</b>			
LPG carrying capacity	tons	Russian-manufactured and operated?	
Loading time NE side	hours	Other 'flags'?	
Average operating speed	Knots/hour	- Ukraine	
Plying time across	hours	- Turkey	
Unloading time SW side	hours	- Rumania/	
Turnround time	hours		
Non-operable sea	average # days/year		
Transport rate/Ton	US\$ or Ruble		
Vessel charter cost/year	US\$ or Ruble		

<b>K) Caspian Sea rail ferries (serving LPG block trains)</b>			
only Russian-manufactured and operated now?		TMB-Makhachkala	
RTC carrying capacity	# and total tonnage	non-Russian in future?	Aktau-Baku
Loading time East-side	hours	dedicated new design?	TMB-Baku
Average operating speed	Knots/hour		
Plying time across	hours		
Unloading time West-side	hours		
Turnround time	hours		
Non-operable sea	average # days/year		
Transport rate/RTC or T	US\$ or Ruble		
Vessel charter cost/year	US\$ or Ruble		
<b>L) Black Sea rail ferries (serving LPG block trains)</b>			
Russian-manufactured and operated?			
RTC carrying capacity	# and total tonnage	Others?	
Loading time East-side	hours	- Turkey	
Average operating speed	Knots/hour	- Rumania/Bulgaria	
Plying time across	hours		
Unloading West side	hours		
Turnround time	hours		
Non-operable sea	average # days/year		
Transport rate/RTC or T	US\$		
Charter cost/year	US\$		

<b>M) Main line railway link from Black Sea LPG-RTCs receiving port inland (Turkey, Ukraine, Bulgaria/Rumania?)</b>			
Specify each route (refer to A)		Typical costs of LPG(-like) transport/ton on this route?	
Length:	Km		
Single/double track:	mm gauge		
Track condition:	good/fair/poor	need for mtce/upgrade?	
Capacity constraining factors? E.g.	max. permissible (block) train length (# RTC's/tons)		
	single track with limited length of sidings		
	type of signalling system & block length		
	weight restrictions (e.g. bridges)		
	bottle neck section(s) determining current practical max. capacity		
<b>N) Transit LPG terminal in Black Sea port(s) Turkey, Ukraine, etc?</b>			
Specify salient terminal characteristics			
Storage capacity:	m3 or ton	specify e.g. butane/propane/etc	
Train unloading capacity:	block train(s) of # RTCs with ? Ton load capacity		
or time	# tracks for (parallel) unloading		
	max. # of block trains/day		
	unloading costs per RTC or block train of # RTCs		
LPG-tanker loading	typical tanker load capacity		
capacity or time	# berth (length) for loading		
	max. # of tankers/day		
	loading cost per tanker of specific tonnage		
typical annual throughput	m3 or ton	specify e.g. butane/propane/etc	



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## Annex 7 Approval short-term international experts



**EUROPEAN COMMISSION**  
EuropeAid Co-operation Office

Europe, Southern Mediterranean, Middle-East and Neighbourhood Policy  
**Centralised operations for Europe, the Mediterranean and Middle-East**  
The Head of Unit

Brussels, **02 AOUT 2006**  
EuropeAid A3/CM/hh/ D(2006) 18396

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**Subject:** Side Letter No 1 to Contract 082-047

**Project Title:** Transport of dangerous goods along the TRACECA corridor

Dear Mr Langeveld,

In response to your e-mail dated 21/07/06, we hereby confirm the recruitment of the following local and international experts, as Short Term Experts:

Mr. Klaas Westerkamp, Economist  
Mr. Ulf C. Inzelmann, Safety Expert  
Mr. Jochen Schmidt, Maritime safety and dangerous goods expert  
Mr. Jurgen Schlotelburg, Technical expert  
Mr. Gerhard Persdorf, Transport and railways expert  
Ms. Tatiana Eggert, Environmental and safety expert  
Ms. Olga Senyuk, Local expert, Ukraine.

Sincerely,

Carla MONTESI

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.  
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