European Business Congress Study - 2012

Study "Legal and Regulatory Environment for the Construction and Operation of CNG Filling Stations in European Countries"

BACKGROUND TO THIS PROJECT (2011-2012)

- Sponsor: European Business Congress
- Primary Contractor: National Gas Vehicle Association Russia, assisted by Clean Fuels Consulting
- Project Scope
  - 21 European NGV Country Profiles (West & East Europe) – PowerPoint file
  - Legal & regulatory environment to build fuelling station network – Excel File
  - Strategic approaches to create NGV fuel infrastructure – PowerPoint file
  - NGV Infrastructure Calculation Tool (NICA) – Excel File

PURPOSE OF THE PROJECT

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The European market for natural gas vehicles has been expanding steadily since 1994 when there were 524,000 natural gas vehicles (NGVs) and 1,693 CNG fuelling stations. Today the European market has expanded to 1.5 million NGVs and 4,000 fuelling stations; growth of 286% and 236% respectively.

While NGVs and the fuelling infrastructure are a practical potential business opportunity they compete with the 'politically attractive' technologies such as hydrogen fuel cells and electric battery vehicles.

Thus, the time is right for the wider European business community to be made aware of the 'NGV potential.' This is best done by highlighting the excellent opportunities to invest in a sustainable fuel and technology that addresses today's important concerns about energy and the environment through the wider use of NGVs, whether they run on fossil natural gas, liquefied natural gas or renewable biomethane.

The European Business Congress has recognized this need and now is seeking a way to inspire new investments in the CNG fuelling infrastructure across Europe. Once in place, this can lead to a much more widespread development of the European NGV market in individual countries that are linked across Europe along the normal transportation corridors.

ACKNOWLEDGMENTS

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- EBC Project Coordinator: Detlef Wessling, E.On Ruhrgas
- NGVRUS Project Manager: Eugene Pronin, Gazprom
- Clean Fuels Consulting
- Principal Investigator: Dr. Jeffrey M. Seisler
- Research Assistant: Marco Dal Pont
- Project engineer for the Natural Gas Infrastructure Calculation Tool (NICA): Gijs van Schoonhoven (Ingenieurbüro van Schoonhoven)

NGV COUNTRY PROFILES

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NGV Country profiles provide, in a PowerPoint format, a template of information that represents in-depth analyses on a country-by-country basis. The profiles focus on the specific elements that are important to understand the investment environment to develop a CNG fuelling infrastructure. Taken together, these country profiles provide a unique window into individual markets that may be attractive to different commercial interests investing in the NGV infrastructure.

GEORGIA
(March 2012)

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COUNTRY PROFILE TEMPLATE

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- NGV Profile
- Motivation
- Energy Profile (oil & gas/imports & exports)
- Vehicles
- Fuelling Infrastructure
- Government Support
- Gas Industry Support
- Conclusions

NGV PROFILE

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- Number of NGVs: 3.000
- 1.5 NGVs per 1000 population
- CNG fuelling stations: 50
- 60 vehicles per fuelling station
- Price differential CNG-Petrol/diesel:
  - CNG equivalent per liter gasoline: 0.48 €/liter
  - Regular Gasoline: 1.04 €/liter

  Natural gas costs 54% less then gasoline

Source: NGV Journal, January 2008 & Gas Vehicle Report, March2012, with data from August 2011

MOTIVATION

- Environment
- Biogas to be developed as a strategy to become independent from Russian gas (but almost exclusively for the electricity sector)

ENERGY PROFILE

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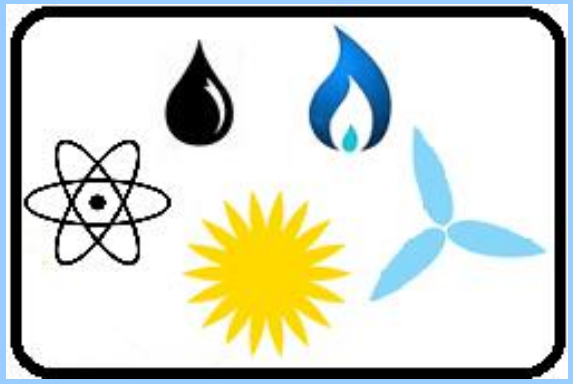

ENERGY PROFILE SUMMARY

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- "Georgia, not an oil and gas producer of significance itself, provides an important part of the land corridor along which major volumes of Caspian oil and gas are transported in transit to European and Mediterranean markets."
- Around 75% of natural gas comes from Russia
- "Georgia has overcome the chronic energy shortages and gas supply interruptions of the past by renovating hydropower plants and by increasingly relying on natural gas imports from Azerbaijan instead of from Russia."

Source: IEA, Perspective on Caspian Oil and Gas Development, 2008

ENERGY PROFILE

- **Oil**
  - production: 984 bbl/day
  - consumption: 13.000 bbl/day
  - imports: 17.840 bbl/day
  - exports: 445 bbl/day
  - reserves: 35 million bbl
- **Natural gas**
  - production: 10 million m^3
  - consumption: 1,71 billion m^3
  - imports: 1,7 billion m^3
  - exports: 0 m^3
  - reserves: 8,5 billion m^3

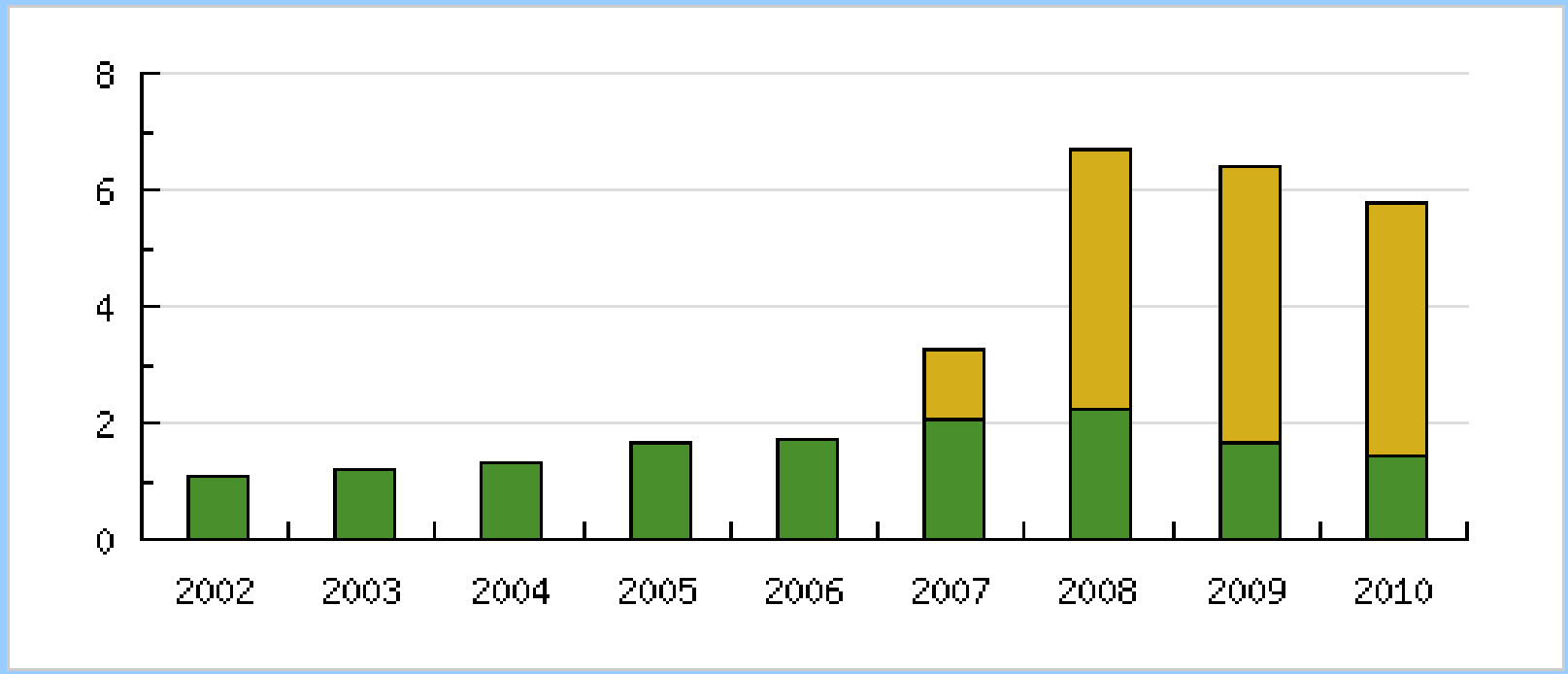
Source: CIA World Factbook 2011

Georgian Main Gas pipeline System comprises 9 gas pipelines

Baku-Tbilisi-Erzrum Trans-Caucasus Gas Pipeline: 691 kilometers (Georgia section is 249 kilometers)

- Through South Caspian Pipeline (SCP) Turkey and then all Europe will execute transportation of natural gas from deposit Shah-Deniz and other deposits of the Caspian basin
- Georgia has an option to receive 5 percent of all volume of Shah Deniz gas transported from Azerbaijan to Turkey

With the construction of Baku-Tbilisi-Erzrum pipeline, Georgia becomes a transit center between Caspian Sea and Europe



Strategic Gas Storage Project in responses to any future crisis

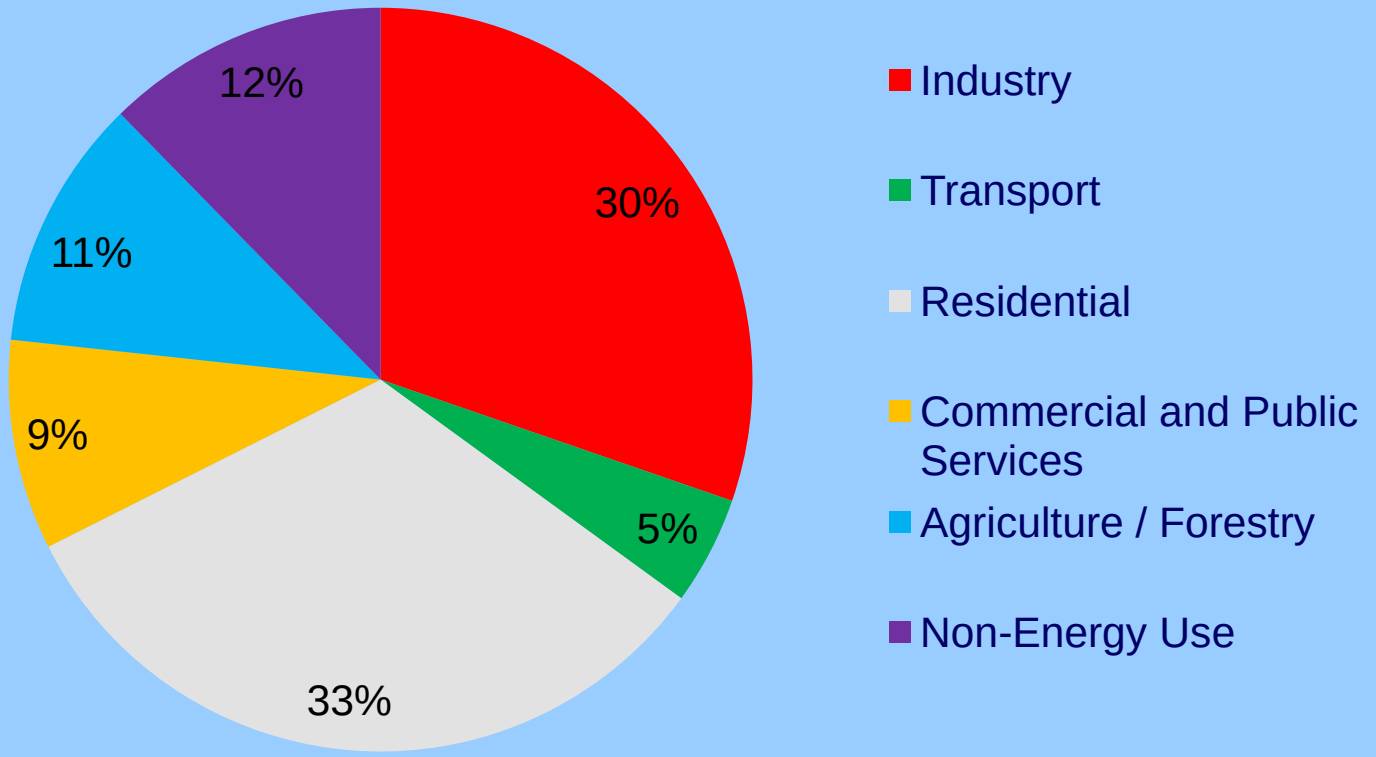
- Stoppage of gas supply has happened twice in the last 10 years
- The contract on implementation of underground gas storage facility pre-construction design works was signed between Danish company "Ramboll Oil & Gas" and MCG on 29 December 2009

Georgian Oil and Gas Corporation oversees the operation of Gas Main Pipeline System in line with oil and gas pipelines

- Gas pipelines with total length of 1939.52 km
- 85 gas distribution stations
- 5 gas metering stations
- Total gas pipelines design capacity amounts to 55 MCM per day, correspondingly 20 BCM annually

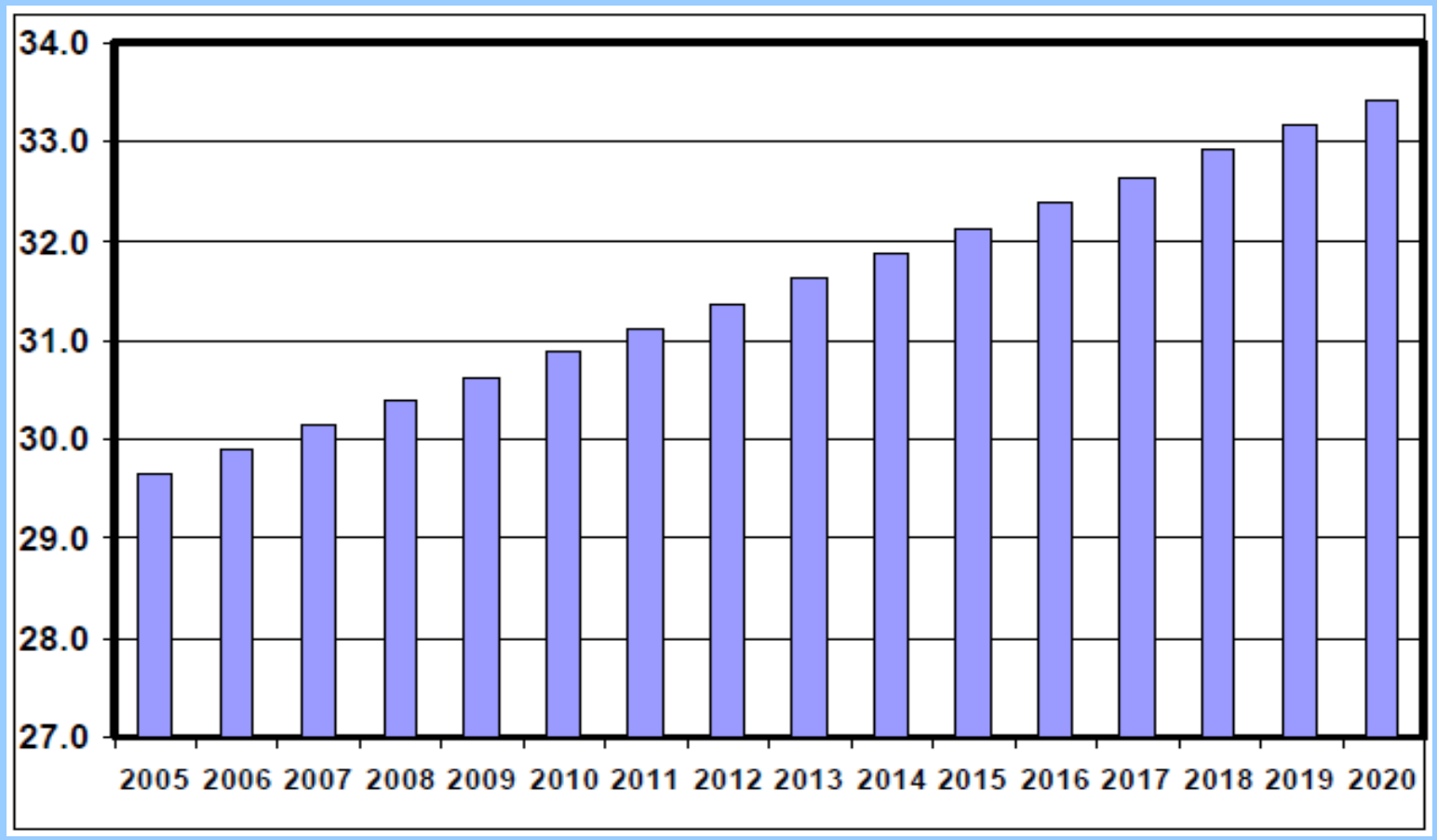
GEORGIAN OIL & GAS CORPORATION

Only a small percentage of natural gas is used in the (gas) transport sector and a tiny fraction of that is for vehicles



Source: IEA statistics, 2011

Percentage of usage of natural gas will increase in the next 10 years



Source: USAID, Natural gas strategy for Georgia

Azerbaijan, Georgia, and Romania are jointly launching an LNG project, designated as the Azerbaijan-Georgia-Romania Interconnector (AGRI)

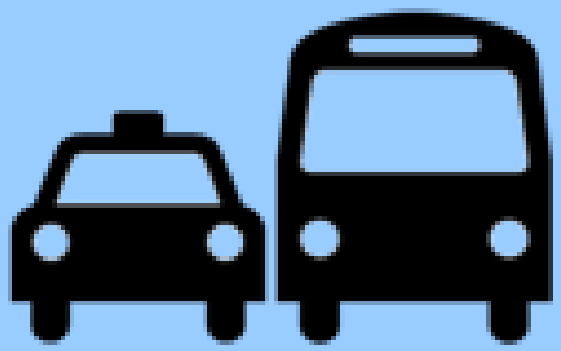
- The gas would run via pipelines from Baku to the Georgian Black Sea port of Poti, where it would be liquefied. Tankers would then transport the gas to the Romanian Black Sea port of Constanta, where the LNG would be converted back into gas and shipped onward to Western Europe
- The project is scheduled to be gas-ready by 2013 or 2014

Source: Eurasianet, Georgia Pumped Up about LNG Project with Azerbaijan and Romania, 4 May 2010

Most biogas installations have been funded by international donors

- Under the World Bank-funded ARETP project 272 digesters have been installed in 2007 in the Western Georgia
- Major aim to reduce pollutant loading in the Black Sea
- The construction of bio-digesters also is planned along the Baku-Tbilisi-Ceihan (BTC) oil pipeline under the BTC Social Investment Program (mainly for electric generation)

Source: USAID, Biogas: retrospect and prospects. Georgia, Rural Energy Program, 2007



	0-5 years	6-10 years	11-15 years	16-20 years	Above 20 years
Total	22192 (8%)	25950 (9.4%)	69055 (25.2%)	66916 (24.4%)	90328 (33%)
Light Automobiles	17766	23764	62147	57175	74205
Truck	1095	966	3186	3317	7259
Bus and Microbus	1085	481	2664	4855	6550

Extrapolated from the vehicle data from Tbilisi, the national total vehicle registration would be 573,309*

- 88% of the Tbilisi vehicles are 10 years or older
- One third of Tbilisi vehicles are 20 years or older
- Taxis are a primary method of transportation
- Annual vehicle inspection is voluntary to January 2013

*Vehicle registrations in many countries may be only partially representative of the true vehicle population due to lack of registration enforcement

Converted petrol vehicles to CNG is the predominant feature of the Georgian NGV market

- There is hardly any opportunity for OEM NGVs as the second hand market for inexpensive vehicles dominates

Since April 2011 Wissol daughter brand Auto Express started Vehicle conversions

- New service to convert petrol cars to gas at the Wissol branded service station in Mukhiani
- Plans to launch a new outlet in Gldani region, Tbilisi, soon

Source: Wissol

NGV FUELLING INFRASTRUCTURE

JSC Wissol Petroleum Georgia is the only oil company that pioneered the integrated service stations on the Georgian market

- CNG is available at Wissol since September, 2007
- At the moment Wissol Gas successfully operates 7 CNG refueling stations

Source: Wissol

Wissol Gas operates 7 CNG refueling stations in Tbilisi, Telavi, Zestaponi, Sachkhere and Khashuri

Source: Wissol

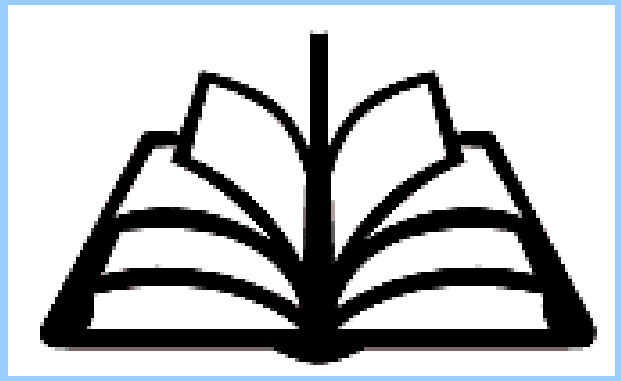
CNG fuelling stations vary in quality across Georgia

CNG Storage at a station in the Marneuli Municipality, Village of Jandara

CNG Storage at a station in the Zestaphoni Municipality, Village of Argveta

Source: Georgian International Energy Corporation (GIEC), prepared by Gamma, Scientific Research Firm, 2010

STANDARDS & REGULATIONS



There are few standards and regulations for NGVs or fuelling stations. Enforcement systems generally are not in place to adequately control operations or safety

- The only rules found in this research are the 'Rules of Safety for Automobile Compression Stations Working on Natural Gas"
- Many existing standards are regulations are based on Russian GOST standards

Source: Occupational Safety and Health National Profile, International Labour Organization, 2008

GOVERNMENT SUPPORT

GOVERNMENT SUPPORT

- Government sources contacted for this research in Georgia and in the Georgian Representation in Brussels and NATO were non-responsive to the inquiries of the researchers
- Based on research in internet sources, United Nations contacts, and other sources there is no indication that the national government of the Republic of Georgia provides any support for NGV market development

GAS INDUSTRY SUPPORT

There are 5 principal gas 'customers' in Georgia

- KazTransGas Tbilisi – distribution in the capital
- Itera-Georgia – supplier in the regions, which owns 10 distribution companies in economically active Kvemo Kartli and Shida Kartli regions
- Mtkvari-Energy, which own the ninth and tenth3 energy blocks of Gardabani
- Energy-Invest, which owns Rustavi Azoti and Gardabani gas turbine
- Georgian Industrial Group, which owns Rustavi and Kaspi Cement Works with the equity participation of the German company HeidelbergCement

Source:Transparency International Georgia, February 2008

Kaztransgas Tbilisi is a principal gas distributor but has financial issues with government owned gas suppliers

- Georgia's state energy regulator has appointed a "special administrator" to temporarily take over the management of gas distribution company KazTransGas-Tbilisi
- Reportedly, the company failed to pay a debt of some 80 million lari (roughly $48 million) to government-owned gas suppliers. The Georgian National Electricity Regulatory Commission (GNERC) said that the company, owned by Kazakhstan's KazMunaiGas, repeatedly failed to collect gas bills and to cover arrears

Source: Silk Road Intelligencer, 29 March 2012.

The natural gas infrastructure is in need of major repair

- Inspectors from the Department of Supervision of Gas and Main Pipelines Systems found 754 violations in 476 pipeline facilities and closed 26 of them
- Repairs are needed on multiple kilometers of pipeline. In-depth work is needed on more than 200 units of gas regulatory points and pipeline compressor stations

Source: Occupational Safety and Health National Profile, International Labour Organization, 2008

GAS INDUSTRY SUPPORT

- **There is no indication that the gas industry is supporting the maintenance or expansion of the CNG infrastructure***

***Direct sources from the gas industry were did not provide information.**

Notable reforms in business, trade and fiscal freedom have spurred economic development in recent years

- The overall efficiency of Georgia's entrepreneurial environment has been greatly enhanced over the years, but the pace of reform has slowed
- The process for launching a business is relatively streamlined and licensing requirements have been reduced

Source: The Heritage Foundation, 2011 Index of economic freedom

Foreign and domestic investments receive equal treatment

- Exceptions may be made for certain sectors, including air and maritime transport
- Foreign firms may participate freely in privatizations, though transparency has been an issue
- Residents and non-residents may hold foreign exchange accounts
- There are few limits on international payments and current transfers; capital transactions are not restricted but must be registered

Source: The Heritage Foundation, 2011 Index of economic freedom

The political conflict in Georgia increased the difficulty and cost of infrastructure projects in the region

- In order to get projects off the ground and mobilize equity investment and commercial financing, investors may look for greater support from multilateral funding agencies and export credit agencies, as well as stronger backing from governments

Source: IEA, caspian perspectives 2008

CONCLUSIONS

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- Energy environment
- Gas industry support
- Government support
- NGV market development
- Legal and regulatory framework for CNG station development
- Investment environment

Energy Environment

- While the gas network is well developed the pipeline infrastructure is in disrepair, which is a reflection of the potential challenges to enlarging the CNG infrastructure in the country
- The dependence on Russian gas could stimulate the use of renewables sources (hydropower and biogas) but the focus would be on electricity generation

Gas Industry Support

- There is no visible support from the natural gas industry to expand the CNG fuelling infrastructure

Government Support

- There is no visible support from the government to stimulate the development of the NGV market

NGV Market Development

- Vehicle development will be based on conversions of existing vehicles, which are predominantly very old by Western standards
- There is a very small market for new vehicles, regardless of their fuel type

Legal and regulatory framework for CNG station development

- There is one standard for fuelling stations and other standards that might exist will be based on the old Russian GOST standards
- Enforcement of regulations is weak or non-existent
- Safety and the ability to grow into new generations of technology will be impacted by the lack of a more robust standards and regulatory structure

Investment Environment

- Despite a sharp contraction due to the Russian invasion and the global recession, there is relatively good economic freedom
- It is not difficult to invest in Georgia

GEORGIA
(March 2012)