



Progress on the improvement of the safety requirement for the gas infrastructure system in Albania

Prof. As. Dr. Stavri Dhima
Head of Gas Policies and Development Sector
Ministry of Energy and Industry

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Instand of Conclusions

What to do further for safe implementation of technical rules?

I.- Historic and Recent Situation of the Albanian Petroleum Sector

Albania was established as a Hydrocarbon bearing province as early as Roman times, when **heavy oil and asphalts of Selenica** mine were used for lamps.

In 1918 the first oil discovery was made in Oligocene flysch in Drashovica.

In 1927, 1928 respectively **Kucova and Patosi oil fields** related to Messinian clastic reservoirs were discovered.

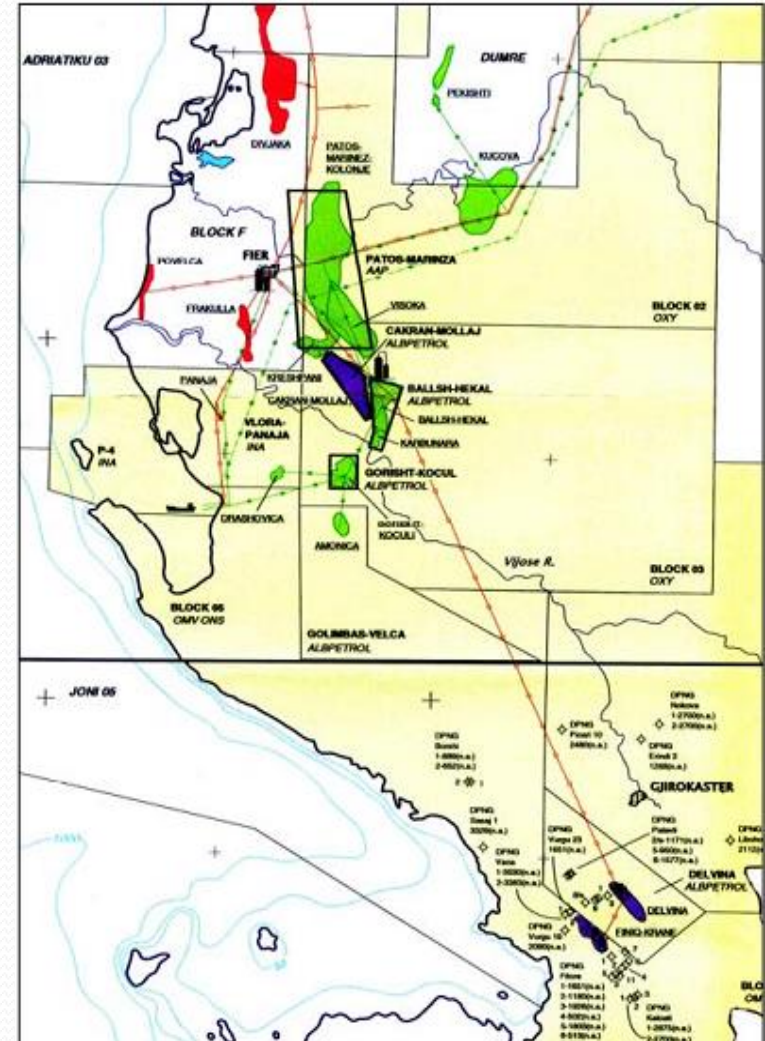
Marinza as the biggest oil field in Albania related to Messinian-Tortonian clastics reservoirs was discovered in 1957.

Visoka, as the first oil field related to carbonate reservoirs, discovered in 1963, was followed by other discoveries such as: **Gorishti** (1965), **Ballshi** (1966), **Finiq-Krane** (1974), **Cakran-Mollaj** (1977), **Amonica** (1980) and **Delvina** (1987).

With the first Gas discovery (1963) in the Tortonian sandstone layers of Divjaka, other gas fields respectively: **Frakulla** (1972), **Ballaj** 1983, **Povelca** and **Panaja** gas fields in 1987 and **Durresi** (1988) were discovered.

Gas production reached its peak in 1982 with 0.937 Bcm/year.

The cumulative production of N-G estimated at 3.15 Bcm, while the associated gas is at 8.7 Bcm.



Oil and Gas Fields in Albania

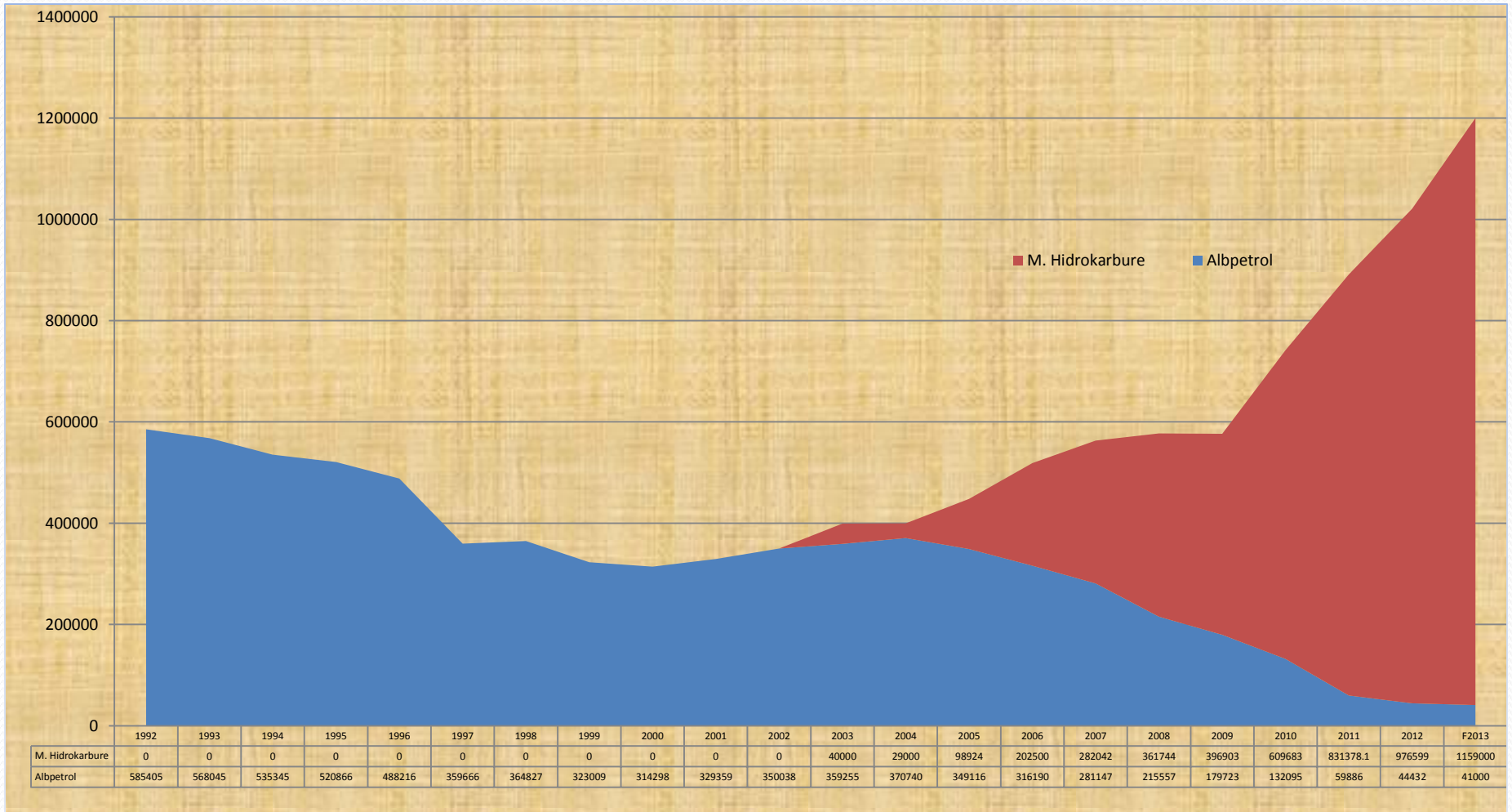
Gas production and consumption in Albania

- Since 1971, natural gas production in the Albania was increasing until 1980-ies, when **it reached its peak at 0.4 billion m³**. Since that year, production began to decline till end of 1990-ies, when it almost stopped.
At the end of 1990 this diminished production is used only for own consumption on the domestic refineries and on the gas and oil production.
The domestic gas production capacities are in their minimal limits, due to drying up of the reserves and decline of the initial pressure in oil resources. The total proven reserves of natural gas in the country are some 57 Million m³.

Total crude oil production in 2015 has been 1,279,136 tonnes (not certified yet). Total associated gas production in 2015 has been 92,015,000 Nm³,

- There is no significant gas consumption in Albania in the base year. Minor quantities of gas are used for own use in oil and gas production.
- **With the development of the TAP and IAP pipeline it is expected that natural gas consumption will grow to 1,6 bcm of natural gas till 2030.**
- Share of transformation in the forecasted total gas consumption is foreseen to be 65-70% in 2030.

DOMESTIC CRUDE OIL PRODUCTION



On 2016 it is planned that the crude oil production will arrive about 1.4 Million Tons

New petroleum explorations

Albania: Compelling Initial Well Test Results at Shpirag-2

Energy Inc.

- Three day test (duration restricted due to limited fluid handling capacity/tankage)
- Well flowed at rates of **1,500 to 2,200 boe/day**
- **800 to 1,300 bpd** of **35 to 37 degree API** oil and **2 to 5 mmcf/d** of gas
- Gas to oil ratio in the range of **2,500 to 2,800 scf/bbl**
- Lower than expected levels of hydrogen sulfide (0.5%)
- Calculated oil column > 800 m
- Test results confirm ability to **flow light oil** from fractured reservoir
- Well was shut in with recorders; data retrieved and analyzed
- Oil flow validates the potential of Blocks 2-3



ALBANIA

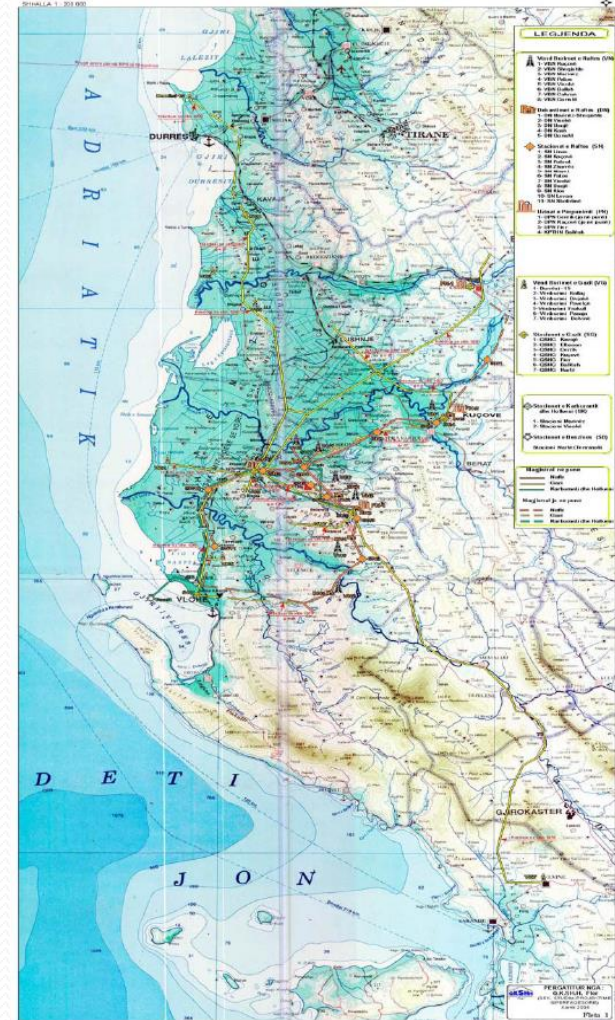


Photo: Molisht-1 Wellsite

**SHELL Int. &
Petromanas new
discovery.
Shpiragu-2 well, Blocks
2-3, ALBANIA**

II.- Historical development of petroleum infrastructure and technical rules on transport and distribution of oil, gas and their byproducts.

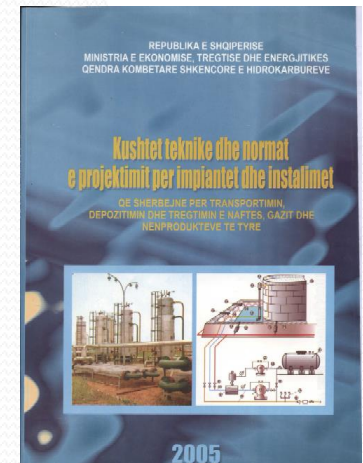
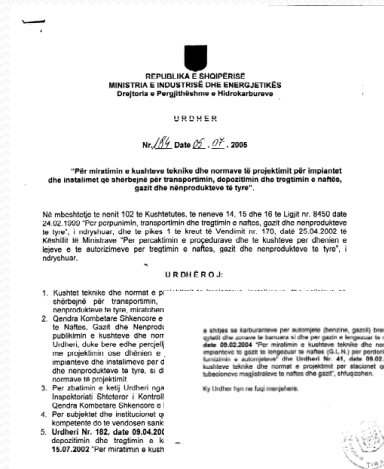
- ▶ Infrastructure Network on natural and associated gas transport has had a broader extension than oil transport infrastructure, which is conditioned by the greater geographical extension that have gas fields, starting from Durres to Delvina.
- ▶ Gas pipeline network has a length of about 410 km and connects all existing gas fields (Divjaka, Frakulla, Povelça, Ballaj, Delvina) and existing oilfields that have significant amounts of associated gas.
- ▶ Over the last decade due to low gas production, some of gas pipelines aren't in operation, which has brought their damage.
- ▶ The current pipeline network in Albania is of a low pressures one, and can not serve as supply network in the case of the international gas network connection.



Oil and Gas Pipelines network in the Albanian Territory.

Historical development of petroleum infrastructure and technical rules on transport and distribution of oil, gas and their derivatives.

- **During 50th and 60th of last century**, in Albania was built on a comprehensive and effective infrastructure of installations, plants, storages, trading stations and units for oil and gas and their byproducts.
- For the construction and operation of petroleum plants and infrastructure were implemented technical norms and conditions similar to those that have been applied mainly in Eastern European countries.
- **Adoption of the Law No. 8450, dated 24.02.1999** "On the refining, transportation and trading of oil, gas and their byproducts", has determined that companies that operate in accordance with the provisions of this law should be in use or may construct and use facilities and infrastructure in which to apply technical rules and conditions of the most advanced international standards.
- **Referring to the provisions of Law No. 8450, dated 24.02.1999**, were established procedures for the drafting of technical standards and conditions, as an obligation of the responsible ministry for petroleum activities, which charged them with publishing.
- Drafting and approving of the technical conditions and norms in the field of transportation, storage and trading of oil, gas and their by-products, **through the Minister Order No.184, dated 05.7.2005**



III.- Main goals for Gasification of Albania

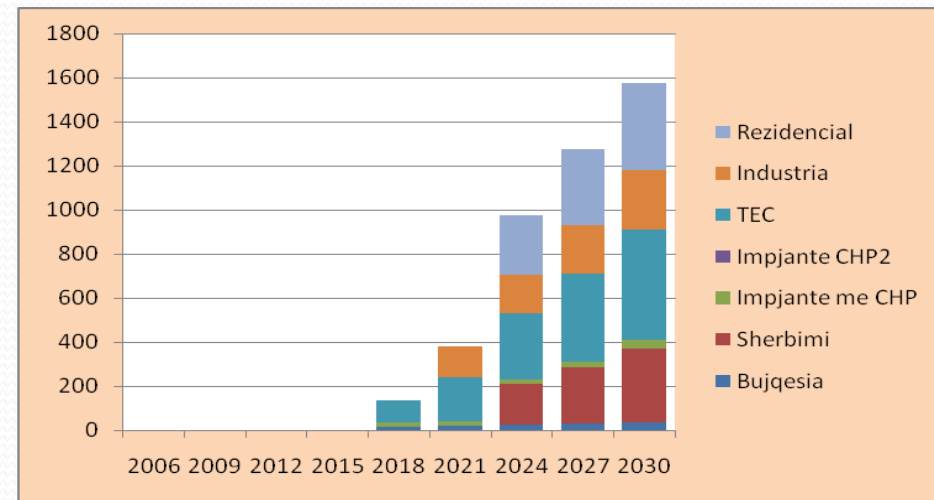
- **Linking Albania with the international gas network** according to the best option (Eurasia Gas Corridor and Energy Community Gas Ring)
- **Preparation of the necessary Albanian legislation for the gas sector** in compliance with European legal framework (Regulatory and Investment framework reliability)
- **Development of national gas resources**
- **Restructuring the existing pipeline system** for gas transmission in Albania
- **Management of the Albanian gas market**
- **Use of natural gas as an alternative energy source** and for the production of electrical energy with gas fired thermal power stations-
- **Development of regional underground gas storage reservoirs and LNG Terminals projects.**

Potential Gas Demand in Albania

- ❑ The potential **demand** for natural gas in Albania is very high, while there is no gas available.
- ❑ Exhausted indigenous gas resources are no longer able to contribute in the national primary energy balance. **The current limited gas production** is used mainly for oil and refining operations by two oil companies ARMO and Albpetrol, to fulfill part of their own technological needs.
- ❑ **The GoA plan for the development of gas sector and market in the country** addresses several aspects including legal, regulatory and institutional related to the construction operation and regulation of the gas infrastructure and gas supply of the country.
- ❑ The **“National Strategy of Energy, (updated)”**, estimates the gas consumption by year 2030 to be at the level of **1.5 to 1.8 BCM/year**.
- ❑ The main consumers are expected to be:
 - **First priority**, power generation sector and industrial consumers,
 - **Second priority**, service sectors, which will use the natural gas for heating,
 - **Third priority**, householding sector for using of natural gas for cooking and hot water,.

Forecast of N-G Consumption by Sectors 2018-2030 (Ktoe)

(SOURCE: NATIONAL AGENCY OF NATURAL RESOURCES -AKBN)



Albanian Gas Master Plan

- ❖ **WBIF has approved a fund of 1.1 Million Euro** to finance the preparation of the Albanian Gas Master Plan, within two years. (The project “Gas Master Plan for Albania & Project Identification Plan”, will be completed within this year)
- ❖ **Albanian Gas Master Plan is of great importance** not only for the Albanian Energy sector, but for Albanian overall development as well.
- ❖ Albanian Gas Master Plan will consider and will affect the **developing of the gas sector or the gasification of the neighbor countries** (Monte Negro, Kosovo, Macedonia, Greece), and of the region, as well.
- ❖ The COWI IPF consultant has started **the preparation of the Gas Master Plan reports and the Strategic Environmental Assessment for this project**, and they are using all studies, analyzes, reports and other documentation previously undertaken related to our project.
- ❖ An important part of the project is **the preparation of the «Project Identification Plan»**, which will design the main component of the Albanian gas network.



IV.- Improvement on the preparation of the minimum requirements of the technical design, construction and safe operation of the transmission and distribution gas systems (Natural Gas Technical Rules)

- Up the 2008 the definitions for the minimum requirements of the technical design, construction and safe operation of the transmission and distribution gas systems, has been referred to the law no. 8450, dated 24.02.1999 “On the refining, transportation and trading of oil, gas and their byproducts”, as amended, and on the Order of Minister no. 184, dated 05.7.2005,
- The approval of the law nr. 9946, dated 30.06.2008, « On the Natural Gas Sector » defined the new legal way and requirements for the preparation, adaptation and approval of the gas technical rules and the safety criteria, for the minimum requirements of the technical design, construction and operation of the transmission and distribution gas systems, the installation of LNG system, underground gas storages and direct pipelines.
- To treat and fulfil any request for construction and operation of the new gas infrastructure in Albania, considering the necessary time for the preparation of the technical rules of the gas sector (evaluated around ten years), has been approval the Order of Minister no. 666, dated 03.8.2009 for temporary technical rules, which consider the using of the greek and italian technical rules during the. technical design, construction and safe operation of the transmission and distribution gas systems,.

Technical Rules in the Treaty establishing Energy Community

Technical Rules in the EU Directive 2009/73/EC

Technical Rules in the Treaty establishing Energy Community (ratified by the Albanian Parliament law no. 9501, date 3.4.2006)

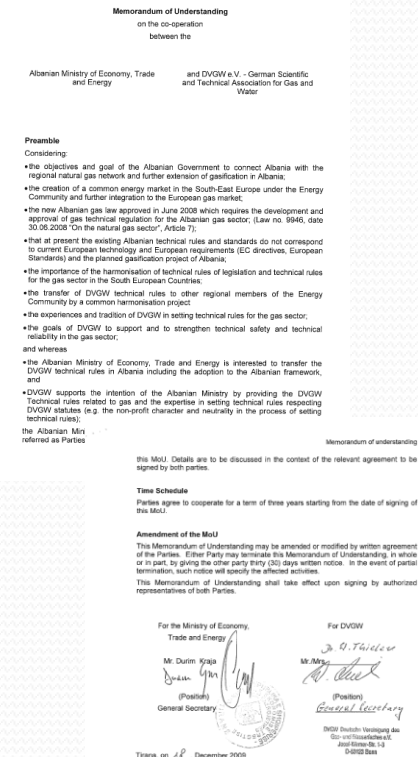
Article 21 Within one year of the date of entry into force of this Treaty, the **Secretariat shall draw up a list of the Generally Applicable Standards** of the European Community, to be submitted to the Ministerial Council for adoption.

Article 22 The Contracting Parties shall, within one year of the adoption of the list, **adopt development plans to bring their Network Energy sectors into line with these Generally Applicable Standards** of the European Community.

Article 23 “Generally Applicable Standards of the European Community” shall refer to any technical system standard that is applied within the European Community, and is necessary for operating network systems safely and efficiently, including aspects of transmission, cross-border connections, modulation and general technical system security standards issued where applicable via the CEN, the CENELEC and similar normation bodies or as issued

Preparation of Natural Gas Technical Rules and the cooperation MEI-DVGW-KfW

- **DVGW standard and role in technical safety management.**
- **The common project "Translation and adaptation of the technical rules for Albanian Gas Sector", is made supporting and respecting the provisions of the Memorandum of Understanding (MoU) signed by DVGW (German Scientific and Technical Association for Gas and Water) and METE (Albanian Energy Ministry) on December 18, 2009 as well as with the financial support of KfW which allocated a grant from 65 thousand euro.**
- For this fund on May 14, 2012 was signed The Support Contract to establish the cooperative relationships between METE, DVGW and KfW.
- **The aim of cooperation between Ministry and DVGW is the preparation of the technical rules for Albanian Natural Gas Sector using the experience of the DVGW, including the adaption to the Albanian legal framework.**
- **This DVGW and Austrian standards (OEVGW) are thought as indicative and are not foreseen to replace existing engineering rules in the regarding Contracting Party**



Preparation of Natural Gas Technical Rules and the cooperation MEI-DVGW-KfW

- The DVGW technical rules are in line with European requirements and are already transferred to other regional members of the Energy Community by a common harmonization project.
- --Connection of DVGW-technical regulation for gas to standards (ISO; EN; DIN), and mutual connections of DVGW technical regulation -
- From September 2012 up to third quarter 2014, are completed and approved by the respective decisions of the Council of Ministers 22 gas technical rules which constitute a real contribution in the way of development of the gas sector in Albania. (5 more rules are ready for the approval)



Minimum requirements of the technical design, construction and safe operation of the transmission and distribution gas systems (Natural Gas Technical Rules)

- **Albanian New Gas Law No.102/2015, approved on September 23, 2015.**
- **In article 10 of new gas law** is specify the preparation, adaptation and approval of the gas technical rules and the safety criterions, for the minimum requirements of the technical design, construction and operation of the transmission and distribution gas systems, the installation of LNG system, underground gas storages and direct pipelines"
- **In article 10 of new the competent authority** " The state Inspectorag**as law is specify** te for Albanian Gas Sector" who is in charge for control, inspection and supervise the implementation of the gas technical rules. (Actually "The state Inspectorate for Albanian Gas Sector" is included as a part of State Technical and Industrial Inspectorate).
- **Responsibilities and duties of the state Inspectorate for Albanian Gas Sector** are included on the article 101 of the Law no.102/2015, dated 23.09.2015

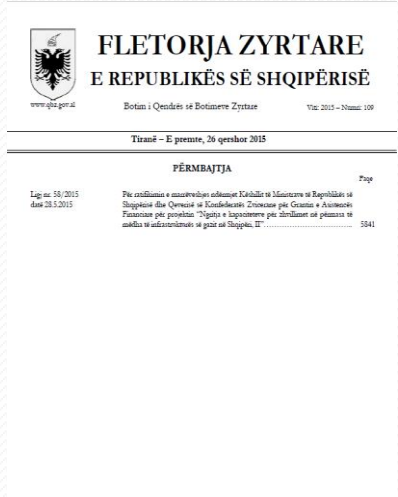


Preparation of Natural Gas Technical Rules and the cooperation MEI-DVGW-SECO

- **Considering continuation of the project "Translation and adaptation of the technical rules for Albanian Gas Sector"**, as one of the important obligations of the Ministry within the completion of the legal framework, institutional, regulator and technical for Albania gas sector, from our part are taken all necessary steps that this job proceed further with the second part of the technical rules package predicted in the Memorandum of Understanding (MoU) with DVGW, enabling to have a full package of the technical rules for Albania Gas Sector.
- **To accomplish this second phase of the project "Translation and adaptation of the technical rules for Albanian Gas Sector"** it is predicted a further fund of 150 thousand euro, from the Project Agreement that the Ministry of Energy and Industry has signed with Swiss Government represent by SECO (State Secretariat for Economic Affairs) on 18.03.2015.

Preparation of Natural Gas Technical Rules and the cooperation MEI-DVGW-SECO

- The approval in principle of this Agreement is done before on 25.02.2015 with DCM no.170
- "For approval in principle of the Project Agreement between the Council of Ministers of the Albanian Republic and the Swiss Confederate Government, about the grant and financial assistance of the project: "Raising of the capacity for large scale developments of gas infrastructure in Albania II“, **ratified by the Albanian Parliamnet by the law no 58/2015, dated 28.05.2015.**
- The aim of the Project as regard the technical rules, is the preparation of a basic package of the technical rules for the Albanian natural gas sector (27+52=77 tech. rules), including their adoption to the Albanian legal framework using the experience and expertise of the DVGW.



ANEKSI 3
BUXHETI

Procedura e punës	Kontributi	Shuma
Afërsi teknike të lidhura me infrastrukturën e gazit		
1. Strategjia dhe politika e sektorit	euro	815,000
2. Legjislacioni, lejjet, si dhe kushtet ligjor dhe rregullores: i favorizohet për zhvillimin e sektorit të gazit në përputhje me direktivat e BE-së. (**maksimumi 150,000 euro të buxhetit të procedurës; së punës: 2 janë ekstrax për miratimin dhe përkthimin e rregullave të DVGW-së në ligjin shqiptar).	euro	1,100,000*
3. Përfshirja gjerë zhvillimit të Projektit (**maksimumi 300,000 euro të buxhetit të procedurës; së punës: 3 janë ekstrax për financimin e studimit të fizibilitetit për të lidhur Termocentralin e Vlorës me	euro	1,230,000**

V.- Safety and technical requirements for gas infrastructure

- **Principles for Pipeline Safety**
- 1. **Governments should provide leadership and create and maintain administrative frameworks** to facilitate the development of a safe and environmentally sound transportation infrastructure, including pipelines.
- 2. **The pipeline operator and/or owner has primary responsibility throughout the whole lifecycle of its systems for ensuring safety** and for taking measures to prevent accidents and limit their consequences for human health and the environment. Furthermore, in case of accidents, all possible measures should be taken to limit such consequences.
- 3. Pipelines for the transport of hazardous substances should be designed and operated so as **to prevent any uncontrolled release into the environment.**
- 4. Leaks from any part of a facility or pipeline that contain hazardous substances should be recognized adequately in a quick and reliable way, especially in environmentally sensitive or highly populated areas.
- 5. **The pipeline operator should implement a management system to develop and maintain the integrity of pipelines.** The integrity of pipelines should be ensured through adequate design, construction, maintenance, inspection and monitoring and through sound management.
- 6. **Deterministic and/or probabilistic approaches should be used in evaluating pipeline integrity** and impacts on human health and the environment.

Safety and technical requirements for gas infrastructure

- **7. Appropriate measures should be taken in case of accidents.** **Emergency plans should be established by pipeline operators** (internal emergency plans) and by authorities (external emergency plans) and should be tested and regularly updated. These plans should include descriptions of the measures necessary to control accidents and limit their consequences for human health and the environment.
- **8. Land-use planning considerations should be taken into account** both in the routing of new pipelines (e.g. to limit proximity to populated areas and water catchment areas to the extent possible) and in decisions concerning proposals for new developments/construction in the vicinity of existing pipelines.
- **9. Pipeline operators and the authorities responsible for pipelines should review and, if necessary, develop and implement systems to reduce third-party interference**, which is a main cause of accidents, including their transboundary effects.
- **10. Information on the safety of pipelines, the geographic position of pipelines**, safety measures and the required behaviour in the event of an accident should be supplied to persons likely to be involved in case of a pipeline accident. General information should be made available to the public.
- **11. Regular exchange of information between pipeline operators and authorities** regarding good practices, improvement of pipeline safety, and past accidents and near-miss cases should be considered.

Safety and technical requirements for gas infrastructure

Crude oil, its derivatives and natural gas are among the major substances transported by the region's pipelines.

- If well-constructed, carefully monitored and properly attended, pipelines can be a safe, environmentally sound and economical means of transport.

Regulation of the high pressure gas pipelines

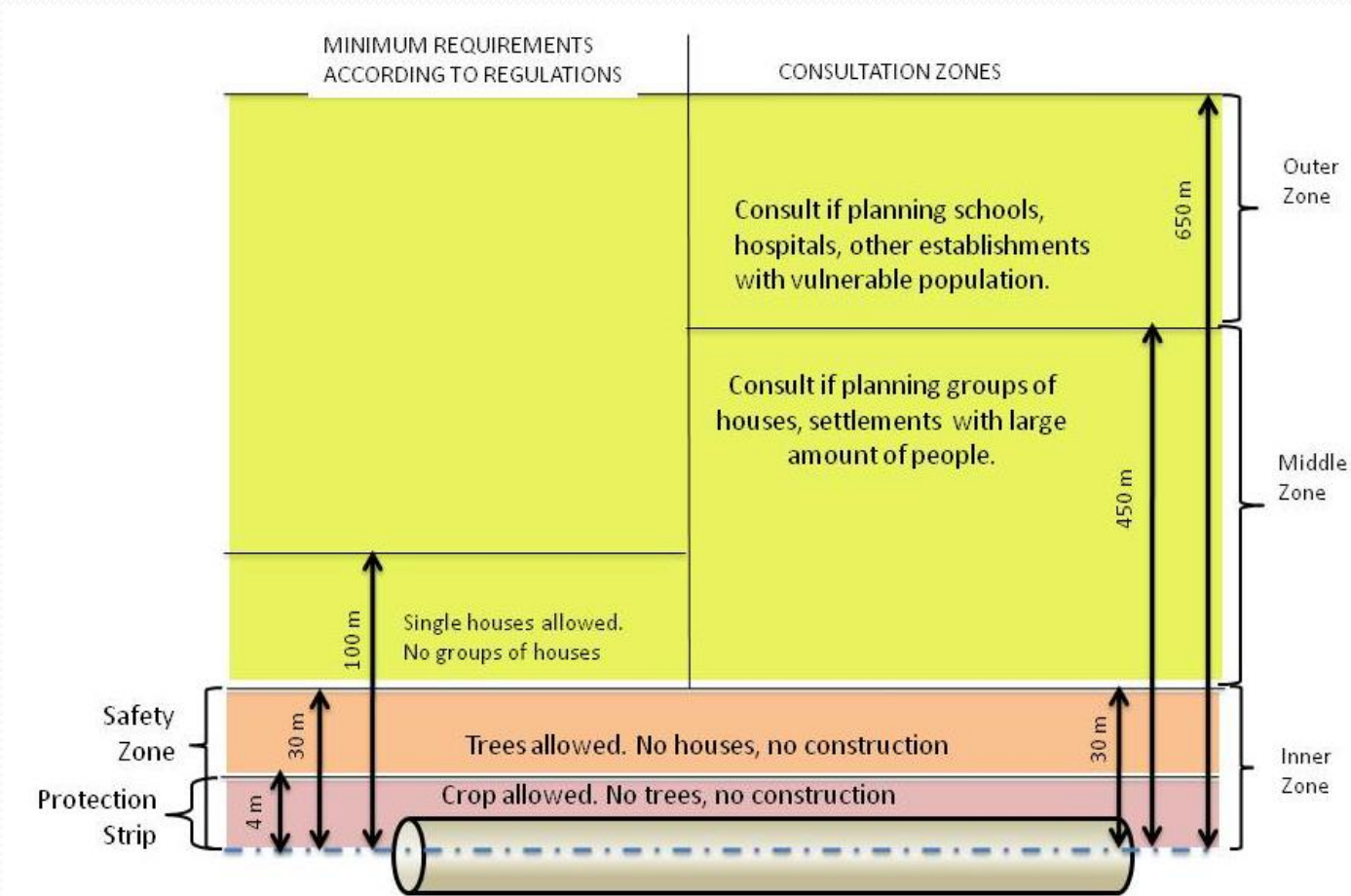
According to DCM no. 1030, dated 27.11.2013, and DCM no.104, dated 4.02.2015

- safety requirements during pipeline construction
- safety requirements when operating
- safety procedures for working on high pressure gas pipeline
- arrangements for the regular training of personnel
- procedures for testing of the transmission line projects
- commissioning and prohibiting the pipeline operation
- requirements for the establishment of the expert
- proof of the qualifications and equipment

Safety and technical requirements for gas infrastructure

- **Safety First, but Other Factors are Important**
 - safety and technical requirements for gas infrastructure, quality of gas supply, obligations of distribution system operators and retailers as well as the quality of LPG supplied in cylinders
 - gas fitting work and installing or commissioning gas appliances
 - reporting of gas related accidents
 - licensing of gas entities covering areas such as exemptions, licensing fees and license conditions for gas retailers outlining requirements such as pricing information for small customers and matching available gas to aggregated demand
- **Residential Energy Efficiency Scheme** - the scheme outlines areas such as energy efficiency activities, energy audits, energy efficiency arrangements for retailers and energy efficiency shortfalls
 - safety, reliability, maintenance and technical management plans and reports.

The most advanced technical standards in the safe design and construction of the TAP pipeline



- Similar restrictions shall apply to safety and consultation zones around the **compressor stations** and **other infrastructure** associated with any such pipelines. The width of such zones shall be defined by a quantitative risk assessment.

What to do further for safe implementation of technical rules?

INSTEAD OF CONCLUSIONS

Fulfilment of it following conditions needed for safe implementation of technical rules:

- **Use of appropriate equipment and materials** (authorized labors – registers of approved equipment)
- **Licensing of companies** (gas operator companies, their partners on pipeline construction and maintenance)
- **Licensing of experts working in the gas sector** (expert network in the region according to the specific fields: gas transmission, distribution, usage (residential, industry), regulation and metering)
- **Permanent education of all people** included in the gas sector – **from top management to field workers** (specialized training centers / institutions)
- **These conditions should be provided by responsible state institutions together with gas companies – A support of ECS would be very useful**

Technical rules prepared through the Project, and Project itself give answers how to do that.

- Technical rules have **to be actual**, have **to be updated** based on technical progress, or generally speaking, technical rules have **to be prepared by experts and used by experts**. Unfortunately, the most often case is that ministries and/or agencies **can't fulfill this requirement** and follow this process alone, so is necessary to continue the cooperation with foreign contributors, with DVGW, and the Energy Community Secretariat.

Thank you !

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stavri.dhima@energjia.gov.al

www.energjia.gov.al