

GAS FLARING AND VENTING: WHAT CAN KAZAKHSTAN LEARN FROM THE NORWEGIAN EXPERIENCE?

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ABSTRACT: Production of oil is accompanied by associated natural gas. Being an “unwanted” by-product of the oil production, a large amount of energy is being wasted mostly in the developing countries by contributing to the emissions of greenhouse gases. Recently Kazakhstan made amendments to its Petroleum legislation towards abatement of gas flaring and venting into the atmosphere. However, this positive governmental attempt reveals gaps in the national legislation, lack of efficient and effective regulatory procedures. This paper evaluates the regime for the successful implementation of a gas utilization program in Norway, a country that has considerably reduced gas flaring through a number of regulatory measures. This paper seeks to analyse the main provisions of the gas flaring and venting and address to the question, what the Norwegian experience could bring to Kazakhstan. This research paper intends to bring recommendations from the ‘first hands’ that will contribute to the improving associated gas utilization policy in Kazakhstan.

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LIST OF ABBREVIATIONS

AG	Associated Gas
BCF	Billion Cubic Feet
BCM	Billion Cubic Meters
GDP	Gross Domestic Product
GHE	Green House Effect
GTL	Gas-To-Liquids
MPE	Ministry of Petroleum and Energy (Norway)
MEMR	Ministry of Energy and Mineral Resources (Kazakhstan)
MEP	Ministry of Environment Protection (Kazakhstan)
NCS	The Norwegian Continental Shelf
NPD	The Norwegian Petroleum Directorate

1. INTRODUCTION

Every year when crude oil is brought to the surface, most oil-producing countries flare and vent large volumes of gas, which is equivalent to the combined annual natural gas consumption of Central and South America¹ or Germany and France². According to the World Bank estimation the annual volume of this associated gas (AG) that is being flared and vented is about 110 BCM³. There is also a basis to make a statement that 10-13 BCF is flared daily⁴. This is more than enough to meet the gas needs in the UK. Flaring of gas in Africa alone would be sufficient to produce twice more electricity than the Norwegian hydroelectric power system supplies annually⁵. It is widely recognized that flaring and venting of “valueless by-product”⁶ and “unwelcome stepchild”⁷ of oil, leads to the pollution of environment by contributing to greenhouse effect (GHE)⁸.

However this product that was historically disposed and wasted could potentially bring economic benefits, especially for the developing countries. Utilization of AG could be considered as a solution for different problems: it reduces the greenhouse emissions and simultaneously improves country’s economic condition due to the tendency of increase of the natural gas prices⁹.

Recently Kazakhstan has enacted amendments to its petroleum legislation¹⁰ that prohibits gas flaring and venting into the atmosphere by July 1, 2006. This research paper reveals the gaps in the national legislation, lack of efficient and effective regulatory procedures of flaring and

¹ Gerner, F., Svensson, B., and Djumena S., *Gas Flaring and Venting. A Regulatory Framework and Incentives for gas Utilization*, in the Public Policy for Private Sector Journal, No. 279, the World Bank, October 2004

² “*Regulation of associated gas flaring and venting. A Global Overview and Lessons from International Experience*”, the World Bank Report, No 3

³ *Id*

⁴ Johnston, D., *International Exploration Economics. Risks and Contract Analysis* (Tulsa: PenWell, 2003) and Haugland, T., *Results of Stakeholder Discussions*, Conference on Global Gas Flaring Reduction Initiative, the World Bank and IFC (Norway, Oslo, April 14-16, 2002)

⁵ Svalheim, S., *Norwegian initiative for responsible, environmentally-friendly gas management*, Published by the Norwegian Petroleum Directorate. Also available at http://www.npd.no/cgi-bin/MsmGo.exe?grab_id=24&EXTRA_ARG=&CFGNAME=MssFindEN%2Eefg&host_id=42&page_id=4285184&query=gas+flaring&hiword=gas+flaring+ (last visited January 20, 2006)

⁶ Mabro, R., *The Prospect for International Trade in Natural Gas*, 10, in *Natural Gas: An International Perspective*, 10, Mabro, R. (ed), (Oxford: Oxford University Press, 1986)

⁷ Stauffer, T., *Natural Gas and Gulf Oil: Boon or Bane?*, 66, in *Gulf Energy and the World: Challenges and Threats*, Abu Dhabi, Emirate Centre for Strategic Studies and Research, 1997

⁸ Mba, F.E., *Gas Flaring in Nigeria: Legal and Institutional Response*, LLM dissertation (2004), CEPMLP, University of Dundee

⁹ *Residential Natural Gas Prices: What Consumers Should Know* in Energy Information Administration Brochure, Official Energy Statistics from US Government. Also is available electronically at www.eia.doe.gov

¹⁰ Law “*On Petroleum*”, No 2350, dated June 28, 1995

venting as well as overlapping responsibilities of the State authorities. Kazakhstan that became aware of changing its policy towards utilization of the gas flaring is facing ineffective regulatory and non-regulatory measures that could be barriers towards meeting the country's objective for sustainable utilization of AG. This research paper intends to highlight the salient points of the current gas utilization policy in Kazakhstan and discuss some problematic areas which require further legislative clarity. Nowadays Kazakhstan faces challenges in bringing and developing the effective AG utilization policy by stipulating vague provisions both for regulatory authorities of the Energy sector and oil-producers that could discourage investments to the country's petroleum sector.

This paper will also evaluate the various aspects of the successful implementation of AG utilization program in Norway, a country that has considerably reduced flaring through effective regulatory measures. This country is distinguished by the steep increase in oil production with low gas flaring volumes. By applying comparative methodology, it is proposed analysis of the main provisions of the gas flaring and venting in the hope of answering on how the Norwegian experience could be of benefit to Kazakhstan.

The choice of Norway as a model is informed by several reasons:

- Currently the World Bank has introduced voluntary global standards¹¹ for restricting gas flaring during oil production. In 2001 this project was initiated by the Norwegian authorities and is led by the World Bank;
- The Norwegian Petroleum Directorate (NPD) is working closely with the World Bank and has contributed its experience with the Norwegian system to the different projects, by assisting the several developing countries in their work to limit the gas flaring¹²;
- Norway is generally highly regarded for the way in which it carries out its gas resource management and several countries have already expressed an interest in learning from its system.

It is this writer's view such that Kazakhstan could learn a lot from Norway's vast success in this area. This research paper intends to bring recommendations from the 'first hands' that will contribute to the improving associated gas utilization policy in Kazakhstan.

I would like to reveal the main obstacles of realization of gas utilization policy in Kazakhstan

¹¹ "A Voluntary Standard For Global Gas Flaring and Venting Reduction", the World Bank Report, No 4

¹² *Supra* 5

and sketch the frame of such policy which is based on the Norwegian experience, to make it clear for both Kazakh Government and Oil-producers.

The first part will provide a brief overview of causes and implications of the gas flaring and venting and reveal gas utilization methods and new trends in the technology development. The second part will bring examples of successful implementation of utilization programs in Norway. The main provisions of the newly enacted Kazakh gas utilization policy will be discussed in this part as well. The Norwegian experience will be considered towards unsuccessful efforts that nowadays are taken by Kazakhstan in order to bring recommendations in the third part of this research paper.

2. NATURE OF GAS FLARING AND VENTING

2.1. UTILIZATION OF ASSOCIATED GAS VS. GAS FLARING AND VENTING

It is important to commence this chapter with a definition of key terms:

Gas flaring – the burning of gas in the field as a means of disposal either because there is no market for the gas or the operator does not elect (or cannot) use the gas for a non-wasteful purpose¹³.

Venting – the release (vent) of natural gas that can't be processed for sale or use because of technical or economic reasons¹⁴.

Associated Gas - the natural gas found as part of or in conjunction with other constituents of crude oil, as opposed to such gas found on its own. The expression has come to include natural gas necessarily produced along with crude oil¹⁵.

The following are reasons why AG should be utilized rather than flared or vented:

1. It causes potential health risks. Gas flaring creates toxic airborne pollutants¹⁶. Many very dangerous toxic and detrimental petroleum compounds can be absorbed by plants and quickly enter to the food chain¹⁷. Dangerous metals can cause cancer, birth defects,

¹³ Gao, Z., Worika I.L., Appendix 9, *Petroleum Environmental Glossary*, 555, Gao, Z. (ed), Environmental Regulation of Oil and Gas (the UK: Kluwer International, 1998)

¹⁴ From Glossary of Canadian Association of Petroleum Producers, available at http://www.capp.ca/default.asp?V_DOC_ID=733#f (last visited January 23, 2006)

¹⁵ Stickley, D.C., Handbook Petroleum Industry: Words and Phrases, 5

¹⁶ Gao, Z. (ed), Environmental Regulation of Oil and Gas (the UK: Kluwer International, 1998)

¹⁷ Accion Ecologica, *Oil Watch*, 76, (Ecuador, Quito, 1996)

- blood disorders, and damage the central nervous system¹⁸;
2. It is an environmental concern with regards to global warming, acid deposition and climate change. Carbon dioxide and other gas emissions from flaring contributes to GHE and global warming. Primarily flaring contributes to emissions of sulphur dioxide, a greenhouse gas, while venting contributes to emissions of methane, also a greenhouse gas¹⁹;
 3. It wastes valuable non-renewable resources²⁰;

However we could observe an interesting tendency that countries have started to implement the gas utilization policy not because of environmental aspects, but with a view to increasing their resource revenues. For instance: since the beginning of oil production in Norway in 1970, government was not allowed to flare the gas from a resource point of view to avoid wasting valuable energy sources. It was subsequently that environmental issues were recognized²¹. According to Harrison²², Saudi Arabian American Oil Company (ARAMCO) did not undertake any gas utilization projects until the first oil shock, when in 1975 it was ordered to construct gas a gathering system.

2.2. OPTIONS FOR ASSOCIATED GAS UTILIZATION

There are several available options for AG development:

1. Application of small gas-fired mini turbine generators to produce electricity from AG for further sale in downstream energy market. AG is natural gas that is dissolved in the crude oil within the reservoir. When the oil is produced and gas is recovered it could be further sent to a processing plant for marketing²³. In this case the gas is used to power micro-turbine generators for electricity production. Several countries are currently working under adapting this new technology in their respective countries. For example:

¹⁸ Center for Economic and Social Rights, *Rights Violations in the Ecuadorian Amazon: The Human Consequences of Oil Development*, 12, (the USA, New York, March 1994)

¹⁹ http://www.capp.ca/default.asp?V_DOC_ID=768 (last visited on January 23, 2006)

²⁰ Brende, B., Norwegian Minister of Environment, *Fighting Poverty and Pollution with Energy*. Presentation from the side event on International Initiative on Reduced Flaring of Natural Gas, Marrakech, November 8, 2001. Available at <http://siteresources.worldbank.org/INTGGFR/64199955-1103819378762/20298988/MarNor.pdf> (last visited on January 24, 2006)

²¹ *Gas Flaring: The Norwegian Experience*, Official Report introduced by Norwegian Petroleum Directorate, , presented in Johannesburg Summit in August 2002

²² Harrison, G., *Associated Natural Gas Resource Management: A Comparative Study and Techno-Economic Model*, PhD thesis (1984), Heriot-Watt University

²³ http://66.102.9.104/search?q=cache:2J8nhY7qx3AJ:www.ec.gc.ca/energ/oilgas/flaring/flaring_general2_e.htm+causes+of+gas+flaring&hl=ru (last visited on January 23, 2006)

the province of Alberta (Canada) has exempted such operations from provincial royalties; Cameroon is evaluating the financial feasibility of this mechanism to reduce flaring and venting, and Russia is carrying out research on implementing such generators in its petroleum industry²⁴.

2. **Gas conservation.** Conserving the waste gas for processing at natural gas facilities²⁵. One of the available options for gas conservation is under commercialization studies and includes Gas-to-Liquids (GTL). This project is currently under way in Qatar, utilizing the county's North Gas field reserves. GTL technology provides wide range products as substitutes to the traditional petroleum alternatives: clean diesel and jet fuel, middle distillates, lubricants, olefins and methanol²⁶.
3. **Re-injection to improve oil.** The option deals with re-injecting the waste gas underground to maintain reservoir pressure during production²⁷. Re-injection of extracted gas is used as secondary mechanism with necessity to purify the gas and compression. Although this leads to additional cost, it is aimed at increasing of production²⁸. This is done by separation of the AG from the oil at the wellhead and then pumped back into the field to enhance the oil recovery factor. In this case gas could be recycled several times without being wasted, as it may still be recovered and used towards the end of the active life of the field²⁹. This positive experience with re-injection of gas to improved oil recovery brought along Norwegian gas utilization policy³⁰. However depending on geological characteristics of the individual field, re-injected gas may actually have negative effect on oil production by unfavorably affecting its flow³¹.

²⁴ *Supra* 2 at 10

²⁵ *Supra* 5

²⁶ Petrosyan, K., *What are constraints on Associated Gas Utilization?* in CAR (CEPMLP Annual Review), No 8, 2004

²⁷ *Supra* 2

²⁸ *Supra* 5

²⁹ The Petroleum Handbook, 6th ed, Shell International Petroleum Company Limited, 511, (Amsterdam: Elsevier, 1983)

³⁰ *Id* 21

³¹ *Supra* 22

3. ASSOCIATED GAS UTILIZATION POLICIES: CASE STUDIES

3.1. NORWAY

Norway is a significant oil producer with offshore oilfields called the Norwegian Continental Shelf (NCS). The petroleum activities in Norway have an enormous income potential³². In 2002 oil accounted approximately 44 percent of country's export and 24 percent of government revenue³³. Norway brings one of the best examples of successful oil production policies as well as environmental protection. Gas flaring volumes as a percentage of oil production has decreased substantially over the last two decades in a time when production of the crude oil has almost doubled since 1990 and increased sixfold since 1981³⁴. The Norwegian Energy Policy has been able to amalgamate its role of a large energy producer³⁵ with pioneering position on environmental issues³⁶.

3.1.1. GAS FLARING AND VENTING AUTHORITY

Norway has a regulatory body called the Norwegian Petroleum Directorate (NPD) which is a part of the Ministry of Petroleum and Energy (MPE). It supervises air emissions, petroleum activities and is responsible for energy efficiency and safety of installations and for gas flaring and venting operations within Norway.

3.1.2. ASSOCIATED GAS USE

Petroleum companies, operating in the NCS are entitled³⁷:

- To lift, process, and use AG in operations (re-injection). Until 2005 some BCM gas have been re-injected into a total of 27 fields on the NCS which have produced an improved oil recovery of 270-310 million cubic meters³⁸;
- To flare gas. In 2004 only 0.16 percent of the total annual AG from oil production was flared³⁹. This is so because no development plan can be approved without provision for gas reinjection, gas export solution or other AG utilization schemes.
- To market AG downstream. Nowadays this issue is regulated by individual sales

³² *Offshore Norway-2000*, the Norwegian Petroleum Directorate Annual Report (Stavanger, April 18, 2001)

³³ *Supra 2*

³⁴ *Id*

³⁵ In 2004 the crude oil production from the NCS was 186 million standard cubic meters of liquid and the gas production was 78 BCM in *Supra 8*

³⁶ *Supra 2*

³⁷ *Supra 8 at 41*

³⁸ *Supra 21*

³⁹ *Id*

contracts.

All of these options have to be stipulated into the development plan while obtaining relevant consents and approvals.

3.1.3. PERMISSION TO FLARE

The Petroleum Activities Act of Norway⁴⁰ does not stipulate specific gas flaring and venting targets, it could be “unavoidable technical reasons”, “emergencies”, and “safety reasons”. However it provides for very strict permission procedure. In accordance with Section 4.4 of the above mentioned Act: “Flaring of petroleum in excess of the quantities needed for normal operational safety shall not be allowed unless approved by the Ministry. Upon application from the licensee, the Ministry shall stipulate, for fixed periods of time, the quantity which may be produced, injected or vented at all times”. With a reference to the World Bank Report⁴¹ applications for obtaining gas flaring permits are evaluated directly by the NDP and permits are issued by MPE. As a part of the approval procedure, NPD and MPE evaluate the flaring equipment and operating procedures. Application for obtaining permit must identify the type and level of the atmospheric emissions and technology applied to avoid or reduce environmental pollution. Emissions limits are established on case-by-case basis taking into consideration applicable national and regional standards.

3.1.4. MEASURING AND REPORTING

Norway has acknowledged that environmental objectives set by Government can be achieved only if emissions are measured and monitored. These procedures are carried both by the government and the oil producing companies as illustrated in the table below.

Table 1⁴²

GOVERNMENT	COMPANY-OIL PRODUCER
Measuring	
NPD supervises internal control systems for operators to verify that petroleum activities are carried out in accordance with authorities’ requirements and accepted by companies’ criteria goals.	Operators who are flaring and venting AG during operational phase are responsible for establishing the internal control system for ensuring compliance, such as obligation to check sensor calibration every six month.
Also it observes (audits) the application of the equipment that measures quantity of gas used for flaring and venting.	Operators are responsible for keeping an emissions inventory with requirement to submit to NPD before March 1 of each year.

⁴⁰ *Petroleum Activities Act*, No 72, dated November 29, 1996

⁴¹ *Supra 11 at 42*

⁴² Adapted from *Supra 2 at 44*

Reporting	
Obtaining and evaluating Reports, submitted by Operator.	Operating company that holds flaring permit has to submit to a Report to the State authorities , indicating the amounts of gas flared <u>daily</u> .
	<u>Every six months</u> it has to report about volumes of the flared gas for the tax purposes ⁴³ .

3.2. KAZAKHSTAN

Kazakhstan is the ninth largest country in the world with a territory of 2,724,900 sq. km (1,048,300 sq miles). The country is situated in the heart of the Eurasian continent. It stretches from the eastern shore of the Caspian Sea and the Volga plains to the Altai mountains, and from the foothills of the Tien Shan in the south, to the West Siberian lowlands in the north. Kazakhstan is among the top ten countries in the world in terms of hydrocarbon reserves⁴⁴.

Nowadays there are about 214 oil and gas fields on the state balance, with 81 of them being developed by Petroleum companies. Extracted resources are about 3 billion tones of oil, 2 trillion cubic meters of gas, and more than 300 million tones of condensate. The size of investments in oil and gas subsoil use is more than 5300 million US dollars or 78 percent from the whole scope of investments⁴⁵.

3.2.1 NEW GAS UTILIZATION POLICY

Recent Law⁴⁶ has introduced the following amendments to Article 30-5 of the (old) Law “*On Petroleum*”⁴⁷:

1. It is prohibited to develop oil and gas fields without utilization of AG;
2. Flaring of AG is prohibited with exception of cases of emergency situations and causing threat to the health of population and the environment.

⁴³ In 1991 Government of Norway has introduced *Carbon Dioxide Tax (Co2Tax)* as an incentive to encourage operators to reduce gas flaring volumes.

⁴⁴ <http://www.kazakhstan-business.com/57> (last visited on January 25, 2006)

⁴⁵ “*Oil and Gas “Portrait” of Kazakhstan*”(in Russian language), in Kazinform, dated April 8, 2004

⁴⁶ Law “*On introducing modifications and amendments in some legislative acts of the Republic of Kazakhstan concerning subsoil use and carrying out petroleum operations in the Republic of Kazakhstan*”, № 79-III of October 10, 2005

⁴⁷ *Supra* 10

However the above mentioned provisions are not extended to the contractors that are carrying out petroleum operations, based on subsoil agreements by December 1, 2004, until the end of their terms, if they:

- Were agreed (approved) with the State authorities before December 1, 2004;
- Will be developed and approved by the competent authority⁴⁸ and environmental agency⁴⁹ before July 1, 2006.

AG flaring is permitted:

- In a case of emergency situations and existing threat to the health of population and the environment;
- In exceptional cases during well and AG testing throughout trial exploitation of the field with total term of not exceeding three years.

In a case of flaring and venting of AG without permit, Contractor is obliged within ten days to notify the State authority in a written form of the gas flaring and (or) venting. This notification should contain reasons that lead to the flaring and (or) venting of the AG and data on volumes of the flared gas.

By introducing this provision almost all oil-producers were announced “out of law” and thus tagged as law-breakers of the above mentioned law. This imperative norm was enacted without taking into consideration the current situation of the oil and gas industry in Kazakhstan, when none of the production of oil and gas is carried out without gas flaring and venting⁵⁰. It reveals contradiction and inconsistency in governmental actions as the petroleum companies have been flaring and venting AG on a basis of already approved projects, technical and other technological documents, where the gas flaring and venting was indicated as a part of the process.

With respect to governmental policy towards reducing AG flaring however, we need to highlight the major constraints that could impede the realization of the policy. They are: regulatory procedures and technological process.

⁴⁸ Note: In Kazakhstan the Competent authority in petroleum operations is the Ministry of the Energy and Mineral Resources (MEMR)

⁴⁹ The Ministry of Environment Protection (MEP) and its Territorial Sub-Divisions

⁵⁰ Elubayev Zh., *Some issues of concluding and executing subsoil use contracts (in Russian language)*, in Jurist, No 11(53), November 2005

3.2.2. THE POLICY TO REDUCE GAS FLARING AND VENTING BY JULY 1, 2006

a. Regulatory Procedure

In Kazakhstan gas flaring was prohibited by Law⁵¹ in 2004. Abatement of gas flaring is a long-term process which requires proper scrutiny and investigation, as much as comprehensive legislative insight to avoid conflicting procedures and processes. Even so, government decided that it could reduce the gas flaring and venting volumes by including this provision into law without preparing corresponding gas utilization policy, without analyzing other countries' experience and enacting required amendments and modifications to the primary and secondary legislations.

Just a few months sequel to policy, it has begun to yield 'undesired results'. Petroleum companies had received notifications, issued by the MEMR and MEP requiring the companies to immediately commence the full utilization of the AG or otherwise face: a reduction of production volumes, termination of previously concluded subsoil-use contracts or penalties would be imposed⁵². Creating grounds for gas utilization process is a time consuming procedure and could not be carried out "in a day". It was only with joint active actions that the oil producing companies made the government eventually understand its mistake of "not setting a gradual transition deadline" for Companies: to reduce flaring, to prepare internal procedures, to attract sufficient financing and create all required conditions which could not damage already established and approved development plans. Most of the companies who received such notification already had obtained gas flaring permits and have been working on approved (agreed) documentary basis, where gas flaring was one of the provisions of extracting crude oil⁵³. Much to the contrary, only after ten months government had set the transition criteria which on its opinion could reduce gas flaring and venting by establishing deadline as July 1, 2006.

b. Technical provisions

There are two dimensions of the technical constraints. Firstly, the process of gas utilization is complicated and capital intensive, which requires purchase of specific high-cost equipment⁵⁴.

⁵¹ Law "On introduction, Modifications and Amendments in some Legislative Acts of the Republic of Kazakhstan concerning subsoil use and carrying out petroleum operations in the Republic of Kazakhstan", No 2-III, dated December 1, 2004

⁵² Kisimbayev, N., Zhylkaydarova S., *Gas Flaring and Utilization Issues In Petroleum Operations* (in Russian language), Jurist, No 11 (53), November 2005

⁵³ *Id*

⁵⁴ *Supra* 45

In accordance with Order of the Agency on Emergency Situations of Kazakhstan, No 256, dated November 29, 1999, equipment that is used in oil and gas industry requires corresponding certification and permits, which in its terms require them to be: purchased and not leased, be delivered following customs regulatory procedures, permits and certificates should be obtained as required, equipment be installed, and many more. For this reason, companies which were flaring gas could not terminate the gas flaring and venting in such short time frame. Secondly, according to Petrosyan⁵⁵ some oil fields could not allow implementation of the gas utilization projects due to the geological characteristics of such fields.. Also, gas may be too sour, with high contents of H₂S or too high in liquids, thus presenting problems for equipment operations and maintenance. Thirdly, due to companies' lack of expertise in dealing with AG and lack of ability to developing them⁵⁶ it is impossible to start AG utilization and prohibit gas flaring and venting within the time frame stipulated by the new Law..

3.3 ANALYSIS

Regulatory and technical constraints make it very doubtful for Kazakhstan to abandon AG flaring by July 2006. In Kazakhstan the procedure of issuing gas flaring permit is set up in the secondary legislation, particularly in Instruction “*On Issuing Permits for Associated and Natural Gas Flaring*”, approved by Head of the Geology and subsoil protection Committee of the MEMR, No 115-П, dated July 27, 2004. Para 2 of the article 2 in Chapter 2 states: “to the application, document confirming impossibility or economic inexpediency of the gas utilization on this stage of the field development should be submitted for obtaining gas flaring permit”. This means that this instruction as well as legislation does not exclude issuance of the gas flaring permit in a case if the gas utilization is economically inexpedient. In addition the term “impossibility” is not defined and thus open to various interpretations. There is strong contradiction between this instruction and modified Article 30-5 of the *Law “On Petroleum”*, where gas flaring permit is required for “emergencies”, “safety reasons”, and “AG testing throughout trial exploitation of the field with total term of not exceeding three years”. Whereas theoretically and hence practically (legally) gas flaring permit in accordance with the above mentioned instruction could be obtained because of impossibility or economic inexpediency of the gas utilization.

⁵⁵ Supra 26 at 19-20

⁵⁶ *Id*

From the Norwegian experience we could draw conclusions that clear and detailed gas flaring and venting policy, careful evaluation and examination of the development plan, as well as co-operation of the Norwegian Government with oil companies have been contributing factors to the successful Norwegian Gas Utilization Policy. Gas flaring and venting in this European country not only endow with positive environmental protection policy, drives the development of the gas transportation infrastructure, but contributes to the development of many oil fields, which became commercially viable due to the associated gas utilization.

In the light of the Norwegian experience and the gas flaring and venting policies both in Norway and Kazakhstan studied, the following **recommendations** that are provided in the table below.

Table 2

The Main issues of the successful AG utilization policy	Norway	Kazakhstan	Recommendations for Kazakhstan
<i>Regulatory procedure</i>	Open and transparent.	Has none of them.	Government should make AG utilization policy open (providing ability to the interested parties: Petroleum companies and non-governmental organizations to take part in proceedings) and transparent (help to understand its policy, laws, regulations, and corresponding decision making procedures).
<i>Gas Flaring and Venting Authority</i>	NPD is responsible for energy efficiency and safety on installations and for gas flaring and venting operations. It brings an example that one state body could manage gas flaring issues and avoids overlapping responsibilities with other state authorities.	There is no single authority for gas flaring and venting in Kazakhstan, MEMR and MEP through their territorial departments are participating in issuing gas flaring permits as well as providing supervisory role.	Norway example reveals that one authority with clearly defined responsibilities and no overlapping and conflicting mandates could contribute to the relevant gas flaring and venting strategies and policies.
<i>Associated Gas Use</i>	Re-injection, transportation by export pipelines and	One of the reasons of enacting AG utilization policy is to	For this reason Government should encourage investors to market associated gas by rising

	other supported by Government alternatives.	reduce country's reliance on imported gas from Russia and Uzbekistan. Nowadays Government supports a policy of low gas prices to consumers for ending the country's import dependence. However, to make expensive AG utilization due to the high sulfur content available for investors, domestic price of gas may need to rise to provide alternatives to these imports ⁵⁷ .	gas prices for constructing new pipelines from Western Kazakhstan to supply the regions of high demand. Also, the structure of the downstream market should be transparent.
<i>Permission to Flare</i>	During application procedure for issuing gas flaring permits, flaring equipment and operating procedures as well as technology applied to avoid or reduce environmental pollution are evaluated.	Neither non of them is not set up as a priority for making decision with respect to issuing gas flaring permits in Kazakh authorities.	Government should develop AG utilization policy by clearly indicating the role of flare and vent reductions, and country's environmental objectives.
<i>Circumstances and events that could justify gas flaring</i>	There is no separate regulatory approval for "unavoidable technical reasons", "emergencies", and "safety reasons".	Permit is required for "emergencies", "safety reasons", and "AG testing throughout trial exploitation of the field with total term of not exceeding three years". "Unavoidable technical reasons" are not considered as circumstance or event that could justify gas flaring.	"Unavoidable technical reasons" (such as purge venting) should be considered as a justification circumstance for gas flaring. "Unavoidable technical reason" is quite different from "emergencies" and could not be defined on this manner as it includes emergency production stops, compression, and others. The Norwegian experience highlights international experience, where flaring and venting under these circumstances normally does not require regulatory approval. The permission inclines to be part of

			the operating rights granted to operators under production licenses (contracts) or field development plans approvals ⁵⁸ .
<i>Measuring and Reporting</i>	Norway has developed successful regulatory regime for gas flaring and venting. The effectiveness of this regime is based on error-free measuring and reporting of volumes flared and vented. NPD carries out auditing procedures for flaring and venting measurement and reporting for defining whether the provided information or data about gas flared and vented volumes are accurate or not.	In Kazakhstan there is lack of clear rules, procedures and guidelines related to measuring and reporting of gas flared and vented volumes. Therefore it is hard to verify operator's compliance with flaring and venting objectives.	Petroleum companies should be required to have Gas Flaring and Venting Registers that is subject for reporting these data to the Regulator, that the latter could audit presented data and information on a regulatory basis.
<i>Partnership between Government and private petroleum sector & Encouragement of Gas Utilization Policy</i>	In Norway there is strong and substantial partnership between Government and Petroleum Companies. Government encourages AG utilization through tax incentives and collaboration with petroleum companies.	There is no cooperation between Government and petroleum producers.	For successfully implementing gas flaring policy in Kazakhstan, Government should proceed through collective actions, closely working with Kazakh petroleum companies.

Source: This Research

4 CONCLUSION

The prohibition of the gas flaring in Kazakhstan by July 1, 2006 means re-structuring the petroleum companies towards new technologies that exclude AG flaring and venting. The complexity and time requirement of this process might mean that the objectives cannot be achieved: it takes several years for the government to create sufficient regulatory procedures and for companies to bring and establish new technologies. Technology commitments,

⁵⁷ Hardin, K. and Kapparov, N., *Kazakhstan's Gas Dilemma*, 1, in CERA. Russian and Caspian Energy, January 2004

⁵⁸ *Supra* 2

especially in the oil and gas industry requires investments that may run into several hundred millions of US dollars.

For instance, Nigeria would like to stop flaring of the AG. However, according to Engobo Emeseh,⁵⁹ unlike in Kazakhstan, the issue of stoppage of flaring is not a sudden idea for Nigeria. The Nigerian government and oil companies have had more than enough time to evaluate and plan the economic implications involved to this process, which has been on-going since 1969:

- 1969 - 1983, companies were required to submit detailed plans on how they intended to re-inject or utilize the associated gas.
- 1984 the first legislation that prohibited gas flaring except with the permission of the Minister of Petroleum was enacted.

However, flaring simply continued unabated. In the middle of 1990s, a target was set by both the companies and the government to stop flaring by 2008. The Nigerian experience reveals that more time should be taken into account when Kazakh government plans to prohibit flaring and venting of AG.

There is even no governmental support provided to the companies, neither any clarification regarding new policy, nor tax incentives, which could substantially reduce AG flaring and venting, as the Norwegian experience reveals.

For these reasons Kazakh government should not expect total reduction of the gas flaring and venting until the creation of the AG utilization facilities in all existing Petroleum companies. So after July 1, 2006 Petroleum companies should expect to obtain new notifications or new regulatory provisions that will come into existence by that time. But this is a different theme that is outside the scope of this paper. In order not to lose the country's reputation and risk discouraging investments, the government should announce moratorium to Article 30-5 of the Law "*On Petroleum*" up to three years until it eliminates all contradictions and set up detailed regulatory procedure. This could give companies adequate time to establish new AG utilization technologies; this would imply that the companies will not be announced "out of law" and also the companies will not be left only with the difficult option of being engaged in unjustified court proceedings with respect to AG flaring and venting.

⁵⁹ Engobo Emeseh, member of ENATRES, ENATRES discussion list, subject: Gas flaring in Nigeria: The decision of the court in Context, on www.jiscmail.ac.uk, Tuesday, December 20, 2005.

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