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GAS MARKET AND DEVELOPMENT OF GAS TECHNOLOGIES IN SLOVAK REPUBLIC BY 2010

MAIN INFIRMATIONS ABOUT GAS MARKET IN SLOVAK REPUBLIC

The document "*Industrial Policy of the Slovak Republic*", which was negotiated by the National Council of the Slovak Republic in January 1996, determines the strategy of the state for the development of individual production branches as well as the economy in its entirety. It also defines the basic long-term goals within the framework of the fuel and energy complex of the Slovak Republic (SR). Developmental targets are oriented towards the building the energy basis which is able to cover the energy consumption of SR to the highest possible extent by the resources of its own thus reducing the dependence of Slovakia on the energy import.

Natural gas is often considered the primary source of energy for 21 century. After 2000 it should create the determinative share of the total balance of fuel and energy. The raise of this share is preordained by its qualitative properties, the most important of them are as follows:

- **From the aspect of ecology, natural gas is one of the purest sources of energy** providing a comfort to the users.
- Natural gas used as a fuel for explosion turbines to produce electric energy shows **the effectiveness of approximately 15 per cent higher** than with the comparable traditional sources.
- International interface of gasworks networks enables safe delivery of the required amounts of natural gas for the needs of SR.

Gas production system, transit system and long-distance distribution system of SR nowadays is a widespread complex of gas engineering plants exceeding 7,280 km and providing the delivery of the required amount of natural gas to the economy of SR and its

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inhabitants as well as a transit to other countries of Europe. The system of long-distance gas pipelines covers the substantial part of the territory of SR and, besides large – scale consumers, it supplies especially local networks in towns and villages. National gas distribution system reaches over 5,200 km. Local networks and connections have more than 12,700 km. By the end of this millennium, it is expected to provide villages of SR with gas lines, especially localities which have not been supplied with natural gas yet. By the year 2000, approximately 56 per cent of the total number of 2,857 localities will be provided with a gas distribution. At the same time, after 2000, the programme of the completion of the gas supply to the localities, which have already been provided with gas supply, will be implemented with the aim to increase the utilization of the existing gas producing plants, i. e. the complex utilization of natural gas /heating, cooking, water heating/. It is expected that by the year 2000, the number of new consumers in the category of the population will increase in 400,000. The realization of the gas distribution process for the new consumers by the year 2010 will require the building up local networks with the approximate length of 10,000 km.

The gas market in SR had been devided into four basic categories of consumers according to the offtake amount. The largest consumers of natural gas are industries, which, including a chemical industry, represent about 75 percent of the take – off of the whole consumption (see Figs. 1, 2). As for the number of consumers, the population creates the most numerous category, which covers 18 per cent of the take – off volume of the year consumption. The smallest consumers group is small – scale consumers – tertiary sector, whose take – off constitutes about 4 percent of the whole consumption.

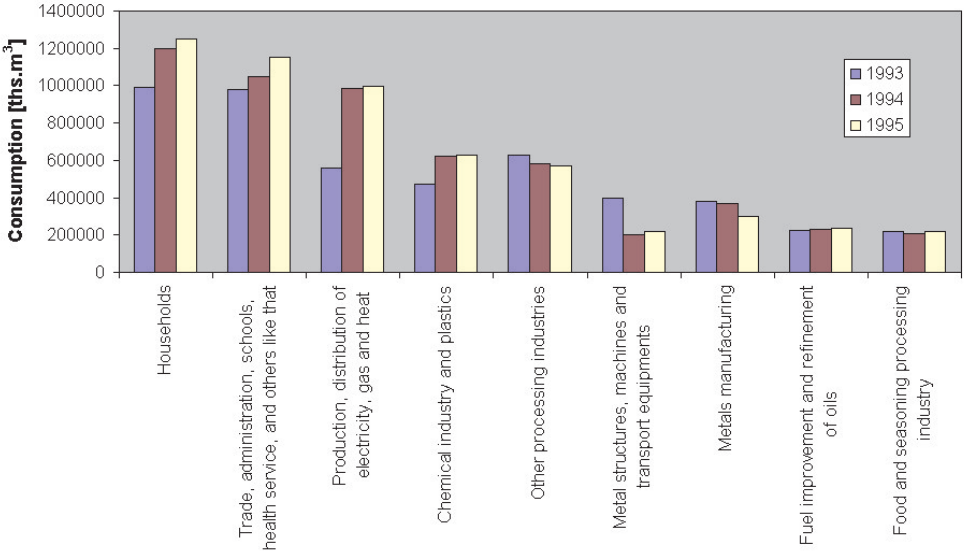

Fig. 1. Natural gas offtake according to the branches I

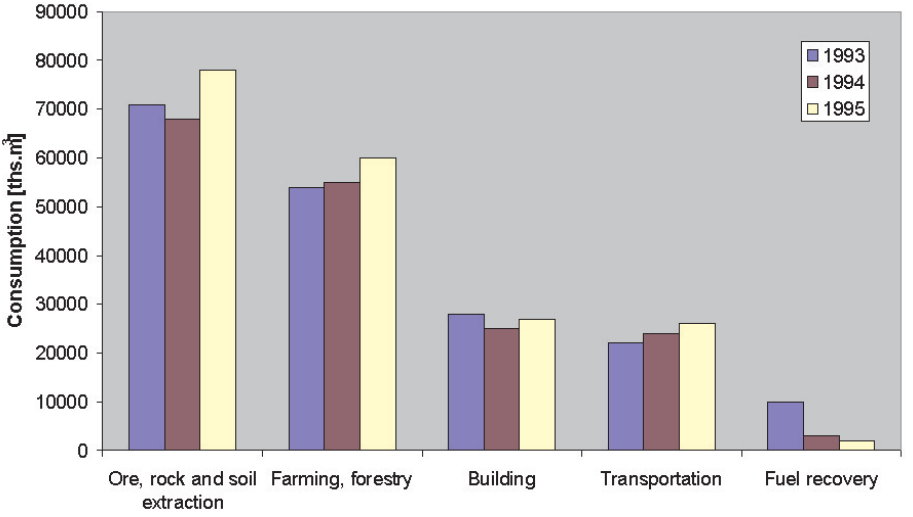

Fig. 2. Natural gas offtake according to the branches II

The prices of other kinds of energy have to increase and the advantages of the natural gas utilization are evident, having in mind its ecological purity.

It is also interesting to analyze the present structure of the natural gas offtake (see Fig. 3 and Tab. 1). Within perspective outlook by 2010, the supposed development of the losses and consumption have been taken into consideration. It is based on the present percentage of the losses of the whole consumption. The considered development of the losses can be directed downwards as far as measurement system with a more precise measuring technology is introduced.

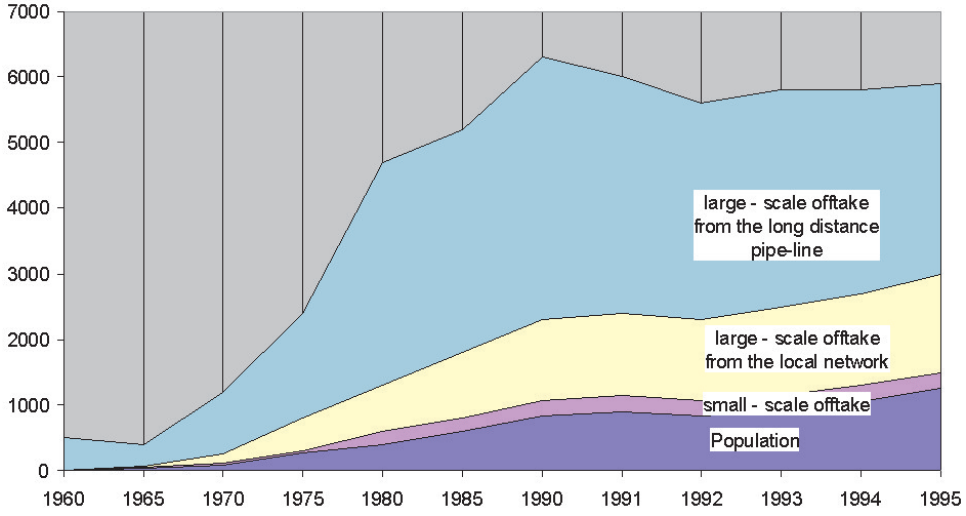

Fig. 3. Development of natural gas consumption in mil. m^3

Table 1

Supposed Development of Natural Gas Sources (of consumption) by 2000 in mil. m^3/year

Index Consumer / year	Reality	Plan	Prognosis		
	1995	1996	2000	2005	2010
Large-scale consumer	4527.2	4670.2	5215	6030	6868
Small-scale consumer – tertial sector	273.9	259.5	285	300	350
Population	1245.1	1324.3	1320	1450	1550
Other selling from a long – distance system	234.5	130	–	–	–
Losses + consumption	185.8	216	180	220	240
Resources /whole consumption/	6466.5*	6600	7000	8000	9000

* including the difference between initial and terminal state of underground sources, i. e. buying of natural gas in 1995 was 6, 307.1 mil. m^3.

For the needs of SR, gas is nowadays supplied from the sources in Russia. It represents more than 94 percent ratio of our natural gas production (Tab. 2).

Nowadays, it is usual for the most developed European countries not to buy more than 30 percent of gas from one foreign producer. For the needs of SR, the optimum is to provide 20 percent of the gas supply from non-traditional sources.

International projects, which are solving possible natural gas supplies for the central European markets from non – Russian markets, are in the stage of the process on the level of complex study the realizability (flexibility). They are the following projects: ADRIA LNG, Iran gas Europe, Interconnector, Jamal – Europe and other bilateral activities. The gas offtake from the diversified resources could be up to 2 milliard m^3 near 2010. The selection of transport routes and natural gas purchase will depend on consistent comparative calculation of expended costs on diversification with the possibility of the gas sale in home market that is closely connected with the rate of Slovak economy recovery.

Table 2

Natural gas resources to satisfy the needs of SR

Structure of resources	**1995**	**2000**	**2005**	**2010**
Home extraction	5.60%	7.90%	5.10%	4.50%
Import from Russia	94.40%	92.10%	86.10%	76.60%
Diversification	–	–	not given	not given

In 1995, the transit system transported 79 milliard m^3 of natural gas. This amount should have upgrown, according to the existing contracts, up to 88.6 milliard m^3 per annum. On the basis of preliminary negotiations, there is a possibility of growth up to 97.7 milliard m^3 per annum by 2010 (Fig. 4).

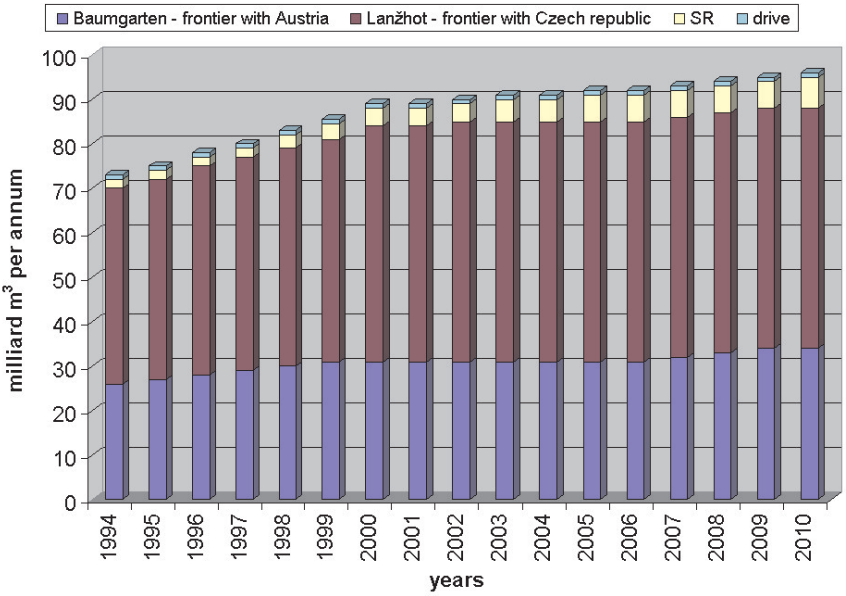

Fig. 4. Growth of transfer capacity of transit systems

Natural gas transfer for the needs of SR will be realized by transit system in gradual growth from existing 2.03 milliard m^3 per annum to 4.8 milliard m^3 per annum in 2000. This amount will be transmitted to the national gas system through the intrastate transfer stations. Natural gas transfer in 2000 by means of transit system for the **needs of SR** is expected to grow up to 7.0 milliard m^3 in 2010.

The estimated results of transformation, reclassification and vitalization of national economy by 2010 indicates the prognosis of natural gas consumption of about 9 milliard m^3 per annum in Slovakia. According to the analysis of natural gas consumption growth and the inevitability of cover of maximum daily peaks, the growth of storing capacities in the underground gas tanks from 2 milliard m^3 to 3 milliard m^3 (creation of natural gas strategic reserves is included) makes sense.

From the aspect of the building of strategic and mobilization reserves the **building of new tanks** is reasonable.

The further development of Slovak Gas Engineering Industry activities in the process of gas tanks buildings is closely related with the establishment of the position of the reliable natural gas transporter to supply the west European needs when providing agreed all-day transit schedule.

The concepts for fuel and energy /natural gas/ **saving,**which is necessary to realize because of energy – saving mode and removable loss, can be divided into:

1. **Economic and legal**, which have to be realized on the state government level by means of:
   a) price policy influence enhancement,
   b) modification of typification in building trade (building of dwelling objects, used materials),

c) decentralization of resources as close as possible to the place of consumption in order to reduce or to eliminate completely the loss in distribution systems.

2. **Technical**, which could be realized on the business level. The following points could be included there:

   a) **steam – gas cycle**, the utilization of which in the process of electrical energy production from the point of view of effectiveness is 10–15 per cent higher than comparable classical resources with steam turbines,

   b) **cogeneration units** on the basis of combustion turbines for heat and electricity production. 30–40 per cent of fuel can be saved by using such an equipment effectiveness of which is about 85 per cent. Their the most effective utilization is in the industry with regular heat and electricity consumption during the whole year /6000 and more hours of operation per annum/ – in glasswork, pharmaceutical chemistry, chemical industry, food industry, breweries, milk plants, meat packing plants and pulp industry. In plants, where electricity offtake isn't regular /single – shift operation/, it's suitable to cover the peaks of consumption by the utilization of cogeneration units,

c) **the utilization of compressed natural gas** for motor vehicles driving, where the building and arrangement of loading plants have to be realized, the development of certain engines powered by natural gas at the same rate the producers create the new versions of engines powered by high – quality fuel. The possibility to choose from the great number of different types of vehicles will appear to the consumer,

d) **measurement enhancement and more effective appliances installation.** Slovak Gas Engineering Industry, state enterprise is investing a lot in the development of projects on **new information technology systems and control technologies,** which are characterized in certain areas as follows:

   – information providing of the actual economy state and economical indicators prognosis,
     • optimum control of gas system, safe operation providing, reduction of loss caused by gas escape, optimalization of purchase, storing and eventually the sale of gas,
     • technical geographical information system /TEGIS/ – maintenance, operation administration, engineering activities, designing, building and reconstruction of gas equipment,
     • communication system of Slovak Gas Engineering Industry.

Ecological geothermal energy is one of the most significant alternate sources of energy. Its utilization in power industry can help to complete, eventually, partly to substitute common heat resources used in greenhouse heating.

Biogas could be included among the non-traditional sources of energy which represents convenient source of additional fuel with power equivalent of 2/3 of natural gas value (about 22 MJ m^3). It could be utilized in gas boilers for steam and hot water production for heating and technologic purposes as well as process heat for specific purposes /for example for special waste devaluation/.

The utilization of energy lost during gas decompression in *ZP* regulating stations or pressure regulators is the next issue that hasn't been solved yet. The principle of its work is based on the utilization of gas pressure energy, its conversion into mechanical energy and electric power next. The whole equipment when comparing with the other power sources are of high effectiveness (75–88 per cent).

The main strategic aim of gas engineering is:

- on the basis of economical and ecological advantages to increase the share of natural gas in energy balance in stages up to 35 per cent by 2010,
- to provide the increase of foreign currency for Slovak republic in order to buy inevitable natural gas from abroad by means of transit system development and natural gas transit increase.

By the realization of the developmental targets of our gas engineering Slovakia could become the heart of European gas engineering. Strategic and technical advantages, great commercial and business possibilities could be the main contribution by means of which the independence of SR could be enforced and the positive effect in our state economical balance could be achieved.

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