

POLICY BRIEF

Local gasification policies in Macedonia: exploring pioneer projects



Introduction

Since its independence, one of the most anticipated policies of the Republic of Macedonia in the energy sector has been to gasify its territory, which however proved to progress very slowly over the years. On the other hand, the increasing energy prices as district heat, electricity etc. prompted the need for drafting local solutions to address the issues of inefficient and expensive heat practices. At the same time, the municipalities according to the Law on energy are obliged to adopt own local energy efficiency programs and according to the Law on construction they are responsible for approving power utilities with capacity up to 1MW and secondary gas networks, which opens the possibility for local heat or gasification projects¹. Few municipalities aware of the benefits gasification projects might bring, initiated them at local level, presenting pioneer examples of bottom-up policies that have shown positive results in a relatively short period like saving energy and finances and developing the gas distribution network, thus they have potential to increase the utilization of natural gas at national level.

The aim of this paper is to analyze the three pioneer cases of advanced local gasification policies in Macedonia (municipality of Karposh, municipality of Strumica and municipality of Kumanovo)² in their progress until January/ February 2013³ by exploring the reasons for starting the gasification, the projects' benefits and challenges for the purpose of drawing lessons for other municipalities and for other relevant stakeholders in order to raise awareness about the positive impact of these local gasification projects, thus to contribute to further spreading the gasification throughout the whole country. Although gasification in Macedonia can be analyzed from many aspects⁴, this paper however after having recognized these local gasification projects as positive practices will focus only on their experience. The importance of analyzing these pioneer gasification projects lies in their potential to improve the local heat markets, to contribute to energy and finance savings, and to implementation of one of the

¹ The amendments to the Law on energy from May 2013 however tend to centralize the gasification policies since the Government decides about starting a procedure on contract awarding about establishing public private partnership for building new gas distribution system, which also raises the issue how this will reflect on the ongoing and on future local gasification projects. However, the Government decides about this on suggestion of few eligible stakeholders, one of which are municipalities. This paper will mainly focus on the local gasification practices and policies by gathering the three municipalities' experience until January/ February 2013 and how it can be applied to other municipalities. More on the amendments of the Law on energy from May 2013 see: Sonja Zuber, Ana Stojilovska, Analysis of the Law amending the Energy law from May 2013, Analytica, 2013.

² Other municipalities announced their intention to develop local gasification projects too, however, these three are chosen for this paper since they are most advanced. Some of the other municipalities that announced local gasification projects are for example Stip, Kriva Palanka and Kavadarci since the state gasification plans envisage the gas network to be built through these municipalities.

³ The questionnaires to the three municipalities were sent on 25 January 2013 and were answered: Karposh on 30 January, Kumanovo on 31 January and Strumica on 8 February 2013.

⁴ These aspects are such as the market players, the country's regional integration especially the aspect of joining South Stream, the ongoing dispute over the existing gas transmission network, the gasification strategies on state level and their implementation, utilization of natural gas as source of energy in power utilities etc.

priorities of the country's Energy strategy⁵ which is to increase the utilization of natural gas. The methodology includes analysis of statistical data and overview of relevant strategic documents and studies on the topic; its core part being however a questionnaire filled by the three municipalities on detailed aspects about the gasification projects, their aims, target group, the authors of the idea for the projects, the benefits and challenges, and lessons learnt for the purpose of analyzing the three municipalities' local gasification policies and experience.

Gasification in Macedonia – infrastructure, policies and development

To begin with, it is inevitable to underline the reason behind the gasification rationale. In fact, natural gas is an environmental friendly source of energy eligible both for electricity generation and for heating, and although widely used in the EU, in Macedonia is being utilized modestly. Macedonia has no gas resources; the only option for utilizing it is by import. The statistical data show that natural gas contributed in 2010 in the final energy consumption in Macedonia with only 1,7%; whereas the petroleum products dominated with 43% and electricity with 32,6% in the same year. Positive development is the increase of natural gas in the final energy consumption over the years 2000-2010; but in this period also increased electricity in the final energy consumption.⁶ Additionally, the natural gas market is not completely liberalized yet, not leaving much space for new players on the market. Basic information on the gas infrastructure illustrated in Table 1 point out the lack of developed gas distribution network, which as a result has lack of possibilities for wider utilization of natural gas in households for example. In regards to developing the gas distribution network, Table 1 shows some progress achieved inter alia due to the municipalities which started running their own local gasification projects (Strumica and Kumanovo); as well as slight increase in the utilization of the capacity of the system for natural gas transmission has been noted in 2011 and 2012 compared to the years before. If more widely used, natural gas would contribute to diversification of the energy sources, energy savings; its price could drop; and companies utilizing it would become more competitive on the market. Its use could also significantly improve the Macedonian heat market by replacing the current ways of heating - with inefficient use of wood and energy-wasting electricity, as well as it could be used as an energy source in high energy efficient co-generation utilities that supply heat to the district heating.⁷ In this context it is important to underline that inter alia due to

⁵ Ministry of Economy of the Republic of Macedonia, Energy strategy of the Republic of Macedonia until 2030, Skopje, 2010

⁶ State Statistical Office of the Republic of Macedonia, Energy statistics, 2000-2010 Statistical review: Industry and energy, State Statistical Office of the Republic of Macedonia, 2012, Skopje

⁷ The Macedonian heat market is characterized by a small and under-developed district heating to which about 10% of the heat consumers are connected, although cases of customers leaving the district heating are noted which switch to wood or electricity; while dominant part of the citizens uses an individual form of heating like

their inefficient energy practices, households are largely exposed to energy poverty explained as a condition where households are living in inadequately heated homes.⁸ Households are also the second largest final energy consumer in the country, thus there is a good potential for energy savings in this sector.

Table 1: Basic facts about the gas infrastructure in Macedonia

Macedonia is connected to only 1 main gas pipeline importing gas from Russia via the International Corridor VIII.
The gas network enters Macedonia's territory in Deve Bair at the border with Bulgaria and in the territory of Macedonia goes through the cities of Kriva Palanka, Kratovo, Kumanovo and Skopje and the technological industrial development zone – Skopje (Bunardzik).
The length of the gas distribution network in 2012 is: 3269 m in Bunardzik; 4200 m in Kumanovo; 12500 m in Strumica; while in 2011 was 2000 m in Bunardzik and 3500 m in Kumanovo.
There are 38 natural gas consumers connected directly to the gas transmission system in 2012; to the gas distribution systems in 2012 only industry and commercial consumers are connected, no households yet, although households are expected to be connected in the upcoming period, which would increase the natural gas consumption.
The utilization of the capacity of the system for gas transmission compared to the transmission capacity of 800 Million nm³ annually in 2012 remains low and is 17%. In the period 2009-2010 the utilization was 10-15% and in 2011 16,9%.

Source: Energy Regulatory Commission of the Republic of Macedonia⁹

wood or electricity. For more information on the state of the heat market in Macedonia, see Ana Stojilovska, The story of the Macedonian heat market – how to reform it?, Analytica, 2012

⁸ For more information on energy poverty in Macedonia, see Ana Stojilovska, Sonja Zuber, Energy poverty in Macedonia, KAS/ Analytica, 2013

⁹ Energy Regulatory Commission of the Republic of Macedonia, Annual report on the work the Energy Regulatory Commission of the Republic of Macedonia in 2012, Skopje, 2013; Energy Regulatory Commission of the Republic of Macedonia, Annual report on the work the Energy Regulatory Commission of the Republic of Macedonia in 2011, Skopje, 2012; Energy Regulatory Commission of the Republic of Macedonia, Annual report on the work the Energy Regulatory Commission of the Republic of Macedonia in 2010, Skopje, 2011; Energy Regulatory Commission of the Republic of Macedonia, Annual report on the work the Energy Regulatory Commission of the Republic of Macedonia in 2009, Skopje, 2010

The Program for Realizing the Energy strategy envisages the gasification throughout the country as a long term process (construction of the gas system, gasification of certain cities etc.); a study on natural gas distribution and on the possibilities for increasing the capacity of the existing system for gas transmission from the current 800 Million nm³ annually to 1200 Million nm³ annually as well as building gas-fired co-generation utilities. Natural gas is also planned to be used for heating purposes in the households in all cities. Also including Macedonia in international gas corridors has been considered.¹⁰ Furthermore the country has prepared several different gasification studies, out of which the Ministry of Transport and Communications' Feasibility study on the development of the gas system in Macedonia from 2010 inter alia analyzed the possibility for long-term gasification of the whole territory of the country by 2040.¹¹ Although these state gasification policies are well drafted, the issue is that they are lagging behind in their implementation.

Local gasification projects: the basic facts

In order to briefly present the gasification projects, basic questions as the project's timeframe, project steps, type of natural gas, gasification location, and the project team of the three pioneer projects and whether they have a gasification strategy or program were asked. Regarding the project timeframe, it is usually three years as shown in the case of Karposh and Strumica, the latter being only first part of the project. Kumanovo has replied that the project does not have a project timeframe since the gas distribution network is continuously being developed and that the project will end once the whole municipality is gasified.

Karposh and Kumanovo use normal natural gas, while Strumica uses compressed natural gas¹². Regarding the project team, it is usually in-the-house and includes the municipality and/ or the public enterprise, the latter which is important actor established to take care of the project or the gas distribution and supply. Gasifying the whole territory of the municipality is usually the end goal of the local gasification project, public buildings under the municipality's authority are usually gasified in the first phases of the project; households are to be connected as last.

A gasification strategy seems not to be a precondition for starting a gasification project, although having a project or a program is a usual step before going into practical

¹⁰ Macedonian Academy of Science and Arts, Program for Realizing the Energy strategy for the period 2012-2016, Skopje, 2012

¹¹ Energy Regulatory Commission of the Republic of Macedonia, Annual report on the work the Energy Regulatory Commission of the Republic of Macedonia in 2010, Skopje, 2011

¹² Since Strumica is geographically far from the existing gas transmission network, the gas supply in Strumica is foreseen by trucks carrying compressed natural gas from Bulgaria. Energy Community Secretariat, Annual report on the implementation of the acquis under the Treaty establishing the Energy Community, 2012

implementation of the gasification. To be more concrete on the question does your municipality have a strategy or a program on gasification, the municipality of Karposh replied that the new public enterprise KAR-GAS has a gasification program from June 2012; the municipality of Strumica stated that their gasification is implemented based on a study and a project, which was not envisaged in the Energy efficiency program 2009-2013; and the municipality of Kumanovo answered not to have a gasification strategy or a program made.

In brief, main projects' features are:

- The project's timeframe is usually short (3 years), its length however can be extended as the gas distribution network is being developed;
- Important project implementing institution is the municipality and/ or the public enterprise in charge of the project or the gas distribution and supply;
- The scope of gasification tends to include the whole territory of the municipality, whereas public utilities are to be gasified first and households last;
- Having a gasification project or a program is usually a step before starting the gasification, although is not always the case.

Rationale behind a local gasification project

On the question what is the gasification's goal, all three municipalities answered it to be for heating purposes, which due to gasification will be more environmentally friendly and less costly.

Very important aspect of the local gasification projects is whether households could access the gas distribution network and utilize natural gas for heating, which would significantly improve the local heat market and heating practices used by households. To this question all three municipalities replied that their end goal is any natural or legal person on the territory of the municipality to be able to connect to the gas distribution network. In more detail, the conditions for natural persons usually entail paying a connection fee.

Both positive financial and environmental effects were the reasons for implementing the gasification projects agreed by all three municipalities. These effects are also described as main benefits coming from the gasification projects. In particular, CO₂ emissions will be reduced; the heating will be cheaper, air quality will be better; as well as possibilities for attracting investments were listed as benefits from the gasification. On the matter of whose idea was the

local gasification project, all three municipalities replied that to be their mayor, in Karposh the team from the municipality working on these issues was an initiator too.

Reasons for embarking on a local gasification project summarized:

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| - Main goal of the local gasification projects is improving the local heat market, while main reasons for starting the project and project benefits are saving finances and having better environmental effects; |
| - Local leadership is shown by the fact that the mayors of the three municipalities initiated the local gasification projects; |
| - The end goal of all three local gasification projects is any natural or legal person in the municipality to be able to connect; natural persons usually need to pay a connection fee. |

Preconditions and pay-off of a local gasification project

When discussing the preconditions for a local gasification project, the municipalities replied differently: Karposh emphasized the availability of the gas ring of GA-MA¹³ through the municipality; Kumanovo stated that the precondition is the pay-off of the project since the price of natural gas is lower than other energy sources, and also the interest among the citizens in the municipality for the project; and Strumica answered this to be the project aim itself – to increase the local economy’s competitiveness by enabling access to the cheapest energy source – natural gas, and at the same time improving the quality of life in the municipality.

Regarding costs of the projects, Strumica replied to be round 2,5 million EUR and Karposh that they will know the total project cost after all projects on the network and forms of implementation (public private partnership and similar). Interesting is also that source of financing for these projects are the own municipal budgets as the case of Kumanovo and Strumica, while on the other hand Karposh replied to have considered all sources of finance as own sources, credits, grants, public private partnership etc. None of the three municipalities has concrete information on when the project will pay off, whereas Karposh stated that sustainability analyses will follow; and Kumanovo clarified that the pay-off of the project depends on the development of the gas distribution system, the number of connections and this system’s natural gas consumption.

¹³ GA-MA holds the license for both natural gas transmission and natural gas pipeline system management in Macedonia.

Some of the municipalities had exchange of experience regarding the project as Karposh had with Strumica and Kumanovo; Kumanovo had with companies from countries in the region; while Strumica has no exchange of experience. Interesting is to point out that these projects are not connected with the gasification project at state level, however Strumica has pointed out that its system is compatible with the classic systems, thus once the gasification at state level is completed, the system in Strumica can immediately connect to the state network. Two of the municipalities answered that they do not get support from the state government.

In brief on preconditions and pay-off of local gasification projects:

- Geographical closeness of existing gas infrastructure could be of advantage for a local gasification project, but is not a precondition as shown with the project with compressed natural gas;
- The total project costs are not always known and municipalities do not know when the project will be paid off; the pay-off of the project depends on the development of the gas distribution system, number of connections, natural gas consumption and similar; also natural gas as a cheaper source of energy per se enables the gasification project to be paid off;
- Dominant source of financing of a local gasification project is the municipality's own budget;
- Exchange of experience on local gasification projects is usually done before beginning with the project, although is not always the case;
- The local gasification projects are not correlated with the state gasification project;
- The state government has generally not been supportive towards these local gasification projects.

Challenges, lessons learnt and impacts of the local gasification projects

On the question what are the project challenges, the replies included finances, administrative challenges, and political obstacles (all three municipalities were run by the opposition in the period this research has covered – till February 2013). Strumica replied that the learnt lessons are that only after 3 months, the project gives the first positive results such as saving finances for heating, recommending other municipalities to embark on a similar gasification project. Further advice from these municipalities on how such local gasification projects can be promoted among other municipalities is that what is needed is the will of the municipality's mayor as well as of the other stakeholders to implement the project, technical preconditions

(primary gas network), facilitated access to finances, as well as support for public private partnership and ESCO companies.

On the questions what are the impacts from the project, Karposh estimated that it is expected there to be more than 40% savings compared with the current price for heating from the district heating. Furthermore, Strumica replied that there is a drastic reduction of finances for procurement of energy sources. This municipality clarified that procuring energy sources is one of the highest municipal budget costs, so by reducing these costs, the budget stability of the municipality will be improved. Also, by introducing natural gas, natural and legal persons will get better heating conditions at lower price. Karposh expects full substitute of the western district heating region in the municipality from heating oil to own systems; whereas co-generation¹⁴ will be also included for the municipality's public buildings. Strumica expects the utilization of fossil fuels in the public buildings and of firewood in the households to be significantly reduced. In addition, municipalities claim that gasification's effects also include reduction of CO2 emissions due to energy savings as well as improved quality of life.

Projects' challenges, lessons learnt and impacts in brief:

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| <ul style="list-style-type: none">- Challenges to local gasification projects are various: financial, political and administrative; |
| <ul style="list-style-type: none">- Important for starting a local gasification project is the willingness of the mayor and the municipality team, technical preconditions and access to finances; |
| <ul style="list-style-type: none">- Project impacts including finance and energy savings, reduced CO2 emissions and improved quality of life; as well as improved heating conditions and reduction of utilization of fossil fuels and firewood. |

¹⁴ Co-generation is a simultaneous generation of both electricity and heat from the same fuel. It is a highly efficient way of using energy, and some of its benefits include reducing CO2 emission, enabling decentralized way of supplying heat and electricity and reducing primary energy demand and uses the surplus energy (heat). For more information on co-generation and its application in Macedonia, see Ana Stojilovska, The story of the Macedonian heat market – how to reform it?, Analytica, 2012

Conclusion and recommendations

This paper aimed to analyze the three advanced local gasification projects (in municipalities Karposh, Kumanovo and Strumica) in Macedonia for the purpose of presenting the projects' benefits, results and challenges in order to draft recommendations to other municipalities and relevant stakeholders based on the experience drawn from these projects for the purpose of contributing to further gasification throughout the whole country.

The analysis after briefly presenting the state with the gas policies and development over the years, gave insight into the local gasification projects' details and municipalities' experiences, and has also brought on the surface set of challenges. It showed that the three projects have many positive effects such as energy and finance savings, potential to improve the local heat market, to address inefficient energy practices in households, to reduce CO₂ emissions, to be a factor for local economic development, as well as to improve the quality of life of the local population. It could be stated that they have emerged inter alia as an answer to the slow gasification plans at state level and the need to draft more efficient local solutions for the increasing energy prices and inefficient heating practices. These local gasification projects have potential to contribute to increasing the utilization of natural gas on state level. As pioneer projects they are a positive sign of a fast-result-bringing local bottom-up initiative; therefore, the paper recommends that these projects have to be widely promoted so that other municipalities could follow their example and other stakeholders need to facilitate their implementation.

Based on the analysis, this paper recommends:

The mayors of other municipalities in Macedonia after having analyzed all technical aspects and feasibility of having a gasification project and after having exchanged experience with the municipalities which have ongoing gasification projects, to consider starting their own gasification project including possibly small co-generation utilities.

The municipalities of Kumanovo, Strumica and Karposh to consider periodically publishing the interim results and effects of their gasification projects with concrete data, progress steps, positive developments and challenges which are to be made available to all other municipalities, other stakeholders and to the broader public.

Municipalities of Kumanovo, Strumica and Karposh and municipalities that plan to start local gasification project to consider other financial means beside their own budget for this project: public private partnership, state funds, international financial institutions, EU projects, bilateral donors and similar as well as to consider becoming part of regional initiatives, consortia, networks as a way to access know-how and finances.

The municipalities which consider launching local gasification projects, to sign with the Government Memorandum for cooperation on the development of the gas distribution system on their territory in order to secure the Government's support for their local gasification project and to suggest to the Government starting a procedure on contract awarding about establishing public private partnership for building new gas distribution system.

The Government to acknowledge the importance of the local gasification projects and to assist them in any possible way especially in enabling them access to finances, in putting no administrative barriers, as well as by approving their suggestions on starting a procedure on contract awarding about establishing public private partnership for building new gas distribution system.

The Government to continue implementing the state gasification plans and to further build the gas infrastructure.

The donor community in the energy and infrastructure area (EU, GIZ, embassies, USAID, UNDP, World Bank, EBRD etc.) to provide municipalities which plan to launch local gasification projects, with technical and financial assistance for their implementation.

The donor community in the energy and infrastructure area, the civil society and municipalities of Kumanovo, Strumica and Karposh to lobby, in order mayors of other municipalities to launch local gasification projects.

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Questionnaire sent to the municipalities of Strumica on 25 January 2013 and answered on 8 February 2013



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