POLICY REPORT

analytica thinking laboratory...

The story of the Macedonian heat market – how to reform it?

Content

Abbreviations

EU – European Union

CHP – Combined Heat and Power

CZK – Czech koruna

AD – joint stock company

DH – district heating

DOO – company with limited liability

DOOEL - Limited Liability Company (Sole Proprietorship)

USAID – United States Agency for International Development

Units of measurement:

MW – megawatt

MWh – megawatt hour

Introduction

Being an EU candidate country brought many reforms in Macedonia including significant energy market restructuring. Having signed the Energy Community Treaty[1], the country is undergoing many institutional, market and legal reforms. In fact, the relevant energy legal acts have been adopted; new institutional and market actors have been set; and incentives for increasing the share of renewables and improving energy efficiency are being taken. However, the area which remained overshadowed by the other energy reforms is the heat market.

Dominated by an extremely high consumption of electricity and partly supplied by an under-developed district heating (DH) which is in the hands of a dominant actor, the Macedonian heat market shows patterns of energy inefficiency and lack of vision for long-term development. In the context of increasing prices of the energy sources and heat bills, the customers are faced with ever growing worries of heating their homes and offices. Despite some developments in the heat sector, one of the possible solutions – the gasification process - progresses slowly and furthermore no significant structural reforms are planned, leaving this energy sector one of the most problematic in Macedonia.

The aim of this research is to inspect possible policy solutions for reforming the Macedonian heat market and drafting policy recommendations to the respective Macedonian authorities for the purpose of improving the state of the heat market and heat consumers' wellbeing.

The methodology uses scanning of legal documents including the relevant Macedonian laws and strategies, the relevant studies; interviews with relevant stakeholders, statistical data, and a case study focusing on good practice example of Czech Republic in the area of DH and Combined Heat and Power (CHP), applicable to the case of Macedonia.

Relevant stakeholders

Table 1: List of relevant stakeholders in the heat market area

Stakeholder	Description of relevance
Energy Regulatory Commission	The Energy Regulatory Commission is an independent regulatory body which inter alia issues licenses for energy activities, adopts regulations and methodologies for price formation for certain types of energy sources, decides about the prices on the basis of these regulations etc.[2]
Toplifikacija Group	The Macedonian heat market is dominated by Toplifikacija Group, which is in private ownership. This Group is comprised of 11 companies among which

[1] The Energy Community Treaty has the goal to organize the relations between the parties and create a legal and economic framework in order to inter alia create a stable regulatory and market framework capable of attracting investment in gas networks, power generation, and transmission and distribution networks; to enhance the security of supply and to foster the use of renewables. Internet page of the Energy Community/ Treaty (2012) http://www.energy-community.org/portal/page/portal/ENC_HOME/ENERGY_COMMUNITY/Legal/Treaty last accessed on 28.05.2012

[2] Law on energy, Official Gazette 16/11, Art. 22

	Toplifikacija AD Skopje is the mother company. Toplifikacija AD Skopje is currently a company for heat production[3] but has returned its heat production license to the Energy Regulatory Commission.[4] Toplifikacija AD Skopje used to be the holder of all three licenses – for production, distribution and supply of heat.[5] The relevant[6] daughter[7] companies are: *Distribucija na toplina DOOEL* which holds the license for heat distribution since 2010[8]; *Snabduvanje Centar DOOEL*, *Snabduvanje Istok DOOEL* and *Snabduvanje Zapad DOOEL*, all three which got the heat supply license in 2009[9]; *Proizvodstvo na toplina DOOEL Skopje* for heat production which does not have a license yet[10]; *Skopje Sever AD Skopje* which deals with heat production, distribution and supply, but does not have a license[11]; and *Toplifikacija - Bitola DOO - Skopje* for heat production, distribution and supply which is not functional since 2007.[12]
ELEM's Energetika	ELEM AD Skopje[13] holds a license for production, distribution and supply of heat serviced by its branch office Energetika.[14]

Source: set of sources separately shown with footnotes in the table text

[3] Toplifikacija Group, *Annual report 2011*, p.3
[4] Toplifikacija AD, *Liberalization of the heat market*
[5] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2006*, (Skopje, 2007),p.13
[6] "Relevant" refers to the companies performing either heat production, distribution or supply services. The other companies belonging to Toplifikacija Group as the companies for heat maintenance; engineering; and gas trade will not be subject of analysis.
[7] The daughter companies are dependent companies in which the mother company has dominant control on the management of financial and operational policies. Toplifikacija AD Skopje, *Annual report 2009 year*, p.3
[8] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2010*, (Skopje, 2011), p.21
[9] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2009*, (Skopje, 2010), p.24-25
[10] In fact neither in the documents of Toplifikacija nor in the documents of the Energy Regulatory Commission is there information about that Proizvodstvo na toplina has a heat production license. Toplifikacija Group, *Annual report 2011*; Internet page of the Energy Regulatory Commission http://www.erc.org.mk/ last accessed on 28.05.2012
[11] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2010*, (Skopje, 2011), p.69
[12] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2007*, (Skopje, 2008), p.41
[13] ELEM is the electricity generation company which is in state ownership.
[14] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2006*, (Skopje, 2007), p.13

Relevant legal framework

Table 2: Legal framework in the heat market area

Legal act	Description
Law on Energy	The Law on energy of 2011 envisages separation of the functions of heat production, distribution and supply.[15]
Strategy for Energy Development in the Republic of Macedonia until 2030 (in the following text referred to as Energy Strategy)	The Energy Strategy assesses that heat sector as still unbundled. This Strategy has envisages the construction of the two now existing CHP plants, plus a new one and it planned building of small CHP plants on gas or biomass. The Energy Strategy also states that it is of utmost importance that natural gas finally enters the households.[16]
The Rulebook on the conditions for heat energy supply	The Rulebook on the conditions for heat energy supply from 2009 determines the conditions for supply of heat energy as well as the common relations between the regulated heat producer, not-regulated heat producer, heat distributer, heat supplier and the heat consumers. It determines inter alia the conditions for disconnections, heat metering, time of heating, way of charging the heat energy and similar. The current Rulebook stipulates that individual heat meters can be installed on the cost of and on the demand of the consumers.[17]

Source: set of sources separately shown with footnotes in the table text

The heat market in Macedonia

The Macedonian heat market is characterized by a small and under-developed DH dominated by Toplifikacija Group. According the Energy Strategy about 10% of the heat consumers are connected to the DH.[18] As shown in Table 3, larger part of the citizens uses an individual form of heating with wood or electricity.

Table 3: Heat sources in Macedonia

	City	Rural	Total
Electric heating	25%	4,55%	16,76%
Wood	63, 83%	94%	75,98%

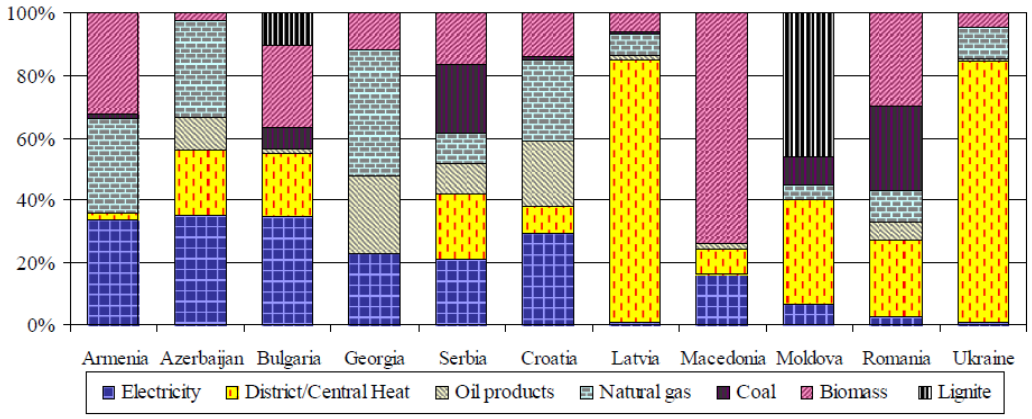
[15] Law on energy, Official Gazette 16/11, Art.4
[16] Ministry of Economy of the Republic of Macedonia, *Strategy for Energy Development in the Republic of Macedonia until 2030*, (Skopje, 2010), p.5, 123
[17] Rulebook on the conditions for heat energy supply, Art.1, 42,43
[18] Ministry of Economy of the Republic of Macedonia, *Strategy for Energy Development in the Republic of Macedonia until 2030*, (Skopje, 2010), p.5

Petroleum	1,4%	0,62%	1,08%
District heating	8,66%	0,62%	5,42%
Burning garbage	0,7%	0,21%	0,5%
Other	0,28%	0%	0,17%
Unknown	0,14%	0%	0,08%

Source: World Bank, FYR Macedonia Energy Policy Paper. Report No. 29709 – MK (2004) based on UNDP household survey from 2001

Table 3 clearly shows that DH plays a minor role, while electric heating is commonly used in the urban areas. Wood is moreover the most widely used as a source of heating both in rural and urban areas.

Picture 1: Structure of fuel used for heating in the final heat energy consumption



Source: USAID, Alliance to save energy, Municipal network for energy efficiency, Regional urban heating Policy assessment Part I (2007)

There are two DH systems in Macedonia in the cities Skopje and Bitola. In Skopje operate Toplifikacija AD Skopje, Skopje Sever AD Skopje and ELEM AD branch office Energetika Skopje. In Bitola operated Toplifikacija Bitola DOO Skopje which stopped performing the services heat production, distribution and supply in 2007.[19]

Picture 1 clearly shows that Macedonia in comparison with other countries heavily uses biomass, meaning wood and that the DH sector is among the least developed. Table 4 also shows the dominance of Toplifikacija Group's share on the heat market if the number of households, installed capacities and length of the distribution network of the different heat stakeholders are carefully compared.

[19] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2007*, (Skopje, 2008), p.41

Table 4: Overview of key features of the heat market actors

Company	Installed capacity	Number of households (circa)	Used energy source	Length of the distribution network	Losses in the distribution network
Toplifikacija AD Skopje	487 MW	50000	Heating oil and gas	177 km	12%
Skopje Sever AD Skopje	46 MW	3700 (year - 2006) 2800 (year – 2007, 2008) 2400 (year – 2009-2010)	Heating oil and gas (heating oil since 2009)	10,4 km	7%
ELEM AD Energetika	32 MW	1900 (year - 2006) 2000 (year - 2007-2010)	Heating oil and gas	7 km	7%
Toplifikacija Bitola DOO Skopje	28 MW	2500 (year - 2006) 2290 (year - 2007)	Heating oil	9,5 km	6%

Source: Energy Regulatory Commission, Annual reports 2006-2010.

Analysis of key issues

- *DH vs. individual heating*[20]

DH is based on the idea of using local heat, cold and fuel sources that under normal circumstances would be lost.[21] If well-managed it the cheapest and most environmentally friendly option for heating densely populated urban areas.[22] However, with the increase of the heat prices in the last few years, the DH is not the most optimal way of heating in Macedonia.

The increasing heat prices have already prompted the customers to leave the DH and to turn to less expensive options as electric heating at the moment. The data shows that customers have been increasingly disconnecting from the Toplifikacija's Group' DH: in 2009 there have been 1858 disconnections and 491 new connections [23], while in 2008 315 customers reconnected and 3132 were disconnected. [24] Leaving the DH has the negative consequence as DH deterioration and overloading the electricity grid if these disconnected customers switch to heating with electricity.

- *Dominant market position*

The separation of the function of heat production, distribution and supply is a precondition for liberalizing the heat market. This enables opening up of the competition for the functions generation and supply.[25] Further required reform for the heat market liberalization is the existence of the independent heat producers which will compete with the regulated heat producers. The ultimate result of the liberalization process is improving the quality of the services.[26]

There is a separation of the three functions in Macedonia, but they all belong to Toplifikacija Group. The other actor beside Toplifikacija Group on the market – ELEM's Energetika - supplies different part of the city of Skopje not supplied by Toplifikacija Group[27] and therefore can be considered as an own local monopoly.

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[20] Both DH and individual heating may include also renewables, but since that way of heating plays a minor role (this paper does not consider wood as renewables), renewables for heating will not be subject of analysis in this paper.
[21] DHC+ Technology Platform, *District Heating Cooling A vision towards 2020-2030-2050*, (2009), p.5
[22] USAID. Alliance to save energy, Municipal network for energy efficiency, *Regional urban heating policy assessment Part I*, p.19
[23] Toplifikacija AD Skopje, *Annual report 2009 year*, p.34
[24] Toplifikacija AD Skopje, *Annual report 2008*, p.27
[25] The distribution however remains natural monopoly.
[26] Ministry of Economy of the Republic of Macedonia, *Strategy for Energy Development in the Republic of Macedonia until 2030*, (Skopje, 2010), p.161
[27] *Energetika* supplies the municipalities Zelezara, Madzari, Hipodrom and Triangla. *Snabduvanje Centar DOOEL Skopje* supplies heat in municipality Centar, municipality Kisela Voda, Municipality Cair and part of municipality Aerodrom; *Snabduvanje Zapad DOOEL* operates in the municipality Gorce Petrov, municipality Karpos, and part of municipality Centar; *Skopje Sever AD* supplies the municipality Butel and part of municipality Cair. *Snabduvanje Istok DOOEL* supplies in the municipalities Aerodrom and Gazi Baba. Toplifikacija Group, *Annual report 2011*, p.5,6; Internet page of Snabduvanje Istok DOOEL Skopje http://www.snabduvanjeistok.mk/?page_id=174 last accessed on 20.05.2012; Internet page of ELEM, Interview with the Zivko Cingoski, Director of ELEM for Vecer http://www.elem.com.mk/mk/nastani/235-2012-01-16-13-40-37 last accessed on 28.05.2012

Toplifikacija states that it has began liberalizing the heat market since it believes that it will achieve better performance on a liberalized rather then regulated market. Therefore, it returned in 2008 the license for heat supply, in 2009 for heat distribution and in 2011 for heat generation.[28] It also suggested the respective institutions to issue an international tender for each of the three licenses, so that Toplifikacija may apply for the license it wants to focus on in the future.[29]

After Toplifikacija returned the heat supply license, the Energy Regulatory Commission issued in 2009 a call for heat supply licence holders.[30] At the first tender there was no interested company, while on the second the three daughters of Toplifikacija AD Skopje - Snabduvanje Istok, Snabduvanje Zapad and Snabduvanje Centar applied for different parts of Skopje and were granted these licenses.[31] After Toplifikacija AD Skopje returned the license for heat distribution, the Energy Regulatory Commission issued a tender for the heat distribution license holder. The winning applicant was the new enterprise Distribucija na toplinska energija DOOEL Skopje, formerly part of Toplifikacija AD Skopje.[32] In 2011 Toplifikacija AD Skopje returned the third license – the license for heat generation[33] making it necessary for another tender for this position. According these developments Toplifikacija AD Skopje stated that the heat market in the city of Skopje is completely liberalized.[34] On the other hand, the Energy Regulatory Commission has raised the question of the inefficiency of this dominant actor's services over the years by noting in several successive annual reports that Toplifikacija AD Skopje was not able to fulfill the obligations to provide the prescribed temperature in the heated premises during the prescribed time of the day when there are low outdoor temperatures. This is also due to the non-investment in the expanding of its producing capacities.[35]

- *Increasing DH heat bills*

The DH heat bills have been constantly increasing partly due to increase of oil and gas prices on the world market. The last increase in 2011 has triggered a serial of dissatisfaction among the customers including mass of disconnections and has alarmed even the Customers' Association and the Ombudsman. The Consumers' Association reacted to the increase of the heat price by elaborating that the price of the heat energy source makes only 30% from the total price, meaning that the rest 70% are fixed costs which are paid irrespective of the real heat consumption. Accordingly, if there is an increase of the heating oil by 50%, the heat price can go

[28] Toplifikacija AD, Liberalization of the heat market
[29] Toplifikacija AD, *Activities for addressing the problems with the expensive energy sources in the district heating in Macedonia*, (2008), p.6
[30] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2009*, (Skopje, 2010), p.65
[31] Toplifikacija AD, *Liberalization of the heat market*
[32] Energy Regulatory Commission, , *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2010*, (Skopje, 2011), p.70
[33] Toplifikacija AD, *Liberalization of the heat market*
[34] Ibid.
[35] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2006*, (Skopje, 2007),p.33; Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2007*, (Skopje, 2008), p.42; Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2008*, (Skopje, 2009), p.46

up by max. 15%.[36] Furthermore, the Ombudsman has also reacted to the heat price increase and stated that inter alia the non-setting of individual heat meters makes the heat bills too high.[37]

Further argument against the heat price formation gave the Energy Regulatory Commission in its annual report by noting that over the years the heat companies have not fully undertaken all options for reducing the costs of the heat bills. In fact, it stated that Toplifikacija AD Skopje, Toplifikacija Bitola DOO Skopje and Skopje Sever AD Skopje had not fully procured the energy sources according the Law on public procurement having as a result no reduced price for heat for the final consumers. Also, the utilization of natural gas as a source for heating was limited.[38]

The situation with the increase of prices has raised the question of the Commission for Protection of Competition's role to check whether Toplifikacija is misusing its dominant position on the market. The Commission however stated that it will check whether Toplifikacija has breached the Law on protection of competition.[39] So far, there is no information about the outcome.

- *Electricity used for heating*

The use of electricity for heating is a real energy "crime" having in mind the huge loss of energy and environmental impact which has as a consequence increasing of the energy demand, and even bigger dependence on energy imports. The latter means burdening the country's trade deficit. This matter is worrying since the trend of leaving the DH can lead to switching to electricity and as a result to further increase of the electricity consumption.

According the USAID study, the households already have in a high share of electric heat and very low use of natural gas, which is untypical since the developed European countries usually have a share of household natural gas consumption close to 40%. The average family in Macedonia in fact uses most of the electricity for heating (57%), followed by 25% for home appliances and street lighting, 11% for sanitary water and 7% for illumination.[40]

- *Lack of a gas distribution grid*

Macedonia has considered since many years ago the possibility of gasifying the city of Skopje. However, this project it is still in its study preparation phase[41]. One major obstacle is the unsolved issue between the privately owned company Makpetrol[42] and the Government about

[36] *The Consumers' Association demands reassessment of the decision for increase of the heat energy*, Internet page of the Consumers' Association http://www.opm.org.mk/izdanija/MK/toplifikacija.pdf last accessed on 27.05.2012
[37] Ombudsman of the Republic of Macedonia, *Annual report 2011*, (Skopje, 2012), p.10
[38] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2006*, (Skopje, 2007), p.32-33; Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2007*, (Skopje, 2008), p.43; Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2008*, (Skopje, 2009), p.47
[39] V.Ma. – S.Bl.,Vecer, *The Commission for Protection of Competition analyzes: if there is a monopoly, Toplifikacija will be fined!* from 18.11.2012
[40] USAID, *Macedonia energy efficiency and renewable energy assessment Final report* (2009), p.21
[41] Ana Stojilovska, Analytica, *Scanning Macedonia's performance under the European Commission's Progress Report's Chapter 21: A race with obstacles? – Part II*, (2011), p.8
[42] Makpetrol is the largest company for distribution and trade with oil products and has also invested in the development of the gas transmission pipeline.

the ownership of the existing gas transmission pipeline. This dispute has been indentified as a huge influence factor for development of the gas market.[43] The interviewed expert Grkov also added that this gasification project was feasible many years ago when the gas price was much lower but not now. He furthermore points out that this way of utilizing the gas is loss of energy if compared to a more efficient way of gas use – in CHP, where electricity is also produced and the heat, seen as a waste of the electricity production process, is being not wasted, but used for heating.[44] However, the gasification of Skopje will be competition to the Toplifikacija's DH[45], ultimately enabling reforming of the DH market and heat services as a result of a competitive pressure. However, Toplifikacija clarifies that although gasification is an option which can replace the DH, it is however connected with huge investments and takes a long time to be completed.[46]

The existing transmission gas pipeline is under-used. The lack of developed gas distribution network is an obstacle to utilizing natural gas in the households. The lack of not-developed gas network is also a problem for companies to enter the heat market.[47] In addition, due to having no distribution network in the part of the city Skopje where one of Toplifikacija Group's heat plants is, this plant uses only heating oil.[48]

- *Improving energy efficiency*

As previously mentioned, DH is usually the cheapest and most efficient way of heating. However, some preconditions need to be fulfilled as for example the premises have to be energy efficient, meaning to be insulated. This can be achieved by introducing consumption based billing, since otherwise the consumers will not have incentive to use the heat efficiently. In addition, the companies have to work on their energy efficiency as well. The DH companies' energy losses in the distribution were shown in Table 4. About the incentive to address the losses, Prof. Pocev explains that Toplifikacija does not have interest in reducing these losses due to lack of competition.[49]

The topic of introducing heat meters in connection with the increase of the heat prices was heavily discussed. The current legal framework stipulates that the setting of heat meters is voluntary. The heat meters are a good solution since they enable customers to save energy and to control the heat consumption. However, the fact that the costumers have to bear the costs themselves has not motivated them to install the heat meters. Toplifikacija on the other hand states that the citizens are not interested in setting heat meters and that they can not cover the costs for themselves since the Energy Regulatory Commission would not have accepted this investment as a cost. On the other hand the Energy Regulatory Commission states that Toplifikacija has not shown interest for such investment and that Toplifikacija could have

[43] Energy Community Secretariat, "*Annual Report on the Implementation of the Acquis under the Treaty establishing the Energy Community*", (2010), p.69
[44] Interview with Zoran Grkov, Mining Institute, conducted on 17.04.2012
[45] B.St, Nova Makedonija, *We have the most expensive and the least ecological heat services in Europe* from 03.12.2011
[46] Toplifikacija AD, *Activities for addressing the problems with the expensive energy sources in the district heating in Macedonia*, (2008), p.2
[47] Vladimir Nikoloski, Nova Makedonija, *State owned, but warm and cheap district heating* from 24.11.2011
[48] Toplifikacija AD Skopje, *Annual report 2009 year*, p.23
[49] Prof. Stefan Pocev, PhD, Nova Makedonija, *Toplifikacija lacks competition* from 01.12.2011

prepared a 5 year investment program for the heat meters, which would have been accepted as a cost.[50] Snabduvanje Istok has however implemented in 2011 an education project about saving energy with the heat meters in households.[51]

However, the legislation tackling the conditions for heat energy supply is subject of change. The media reported some of the possible solutions in the respective Rulebook: the disconnected customers to pay 50% of their heat bill; second option would be forbidding disconnections if living in a collective building or third - setting heat meters.[52] When discussing the obligation to pay half of the heat bills even when being disconnected, it is important to mention that in 2008 one natural person complained before the Constitutional court against the decision to pay 50% of the heat bills when disconnected. The Court decided that this person when disconnected does not have an obligation to pay reimbursement as a result of the disconnection.[53]

- *Infrastructure*

The distribution network which is used by Distribucija na toplina DOOEL Skopje is in state property. This company utilizes it based on an agreement between Toplifikacija AD Skopje and the respective public company for management for the use of the distribution network for a compensation of 50 000 EUR annually and therefore has to maintain and expand it.[54] The distribution network used and managed by Skopje Sever AD Skopje was an investment of Toplifikacija AD Skopje. In addition, AD ELEM is the owner of the distribution network which is used and managed by its subsidiary Energetika.[55]

The Land-use plan of Skopje 2001-2020 has envisaged some developments of the DH in the Skopje region as well as the Skopje gasification project. The envisaged development of the DH infrastructure is focused mostly on extending the infrastructure in the municipalities where there is already DH infrastructure. Regarding the gasification project, this Plan of 2002 has envisaged about 75% of the customers in Skopje to be connected to the DH in 16 years (59000 individual and 1800 commercial customers).[56] This year a new updated Urban Plan is prepared, which is to be adopted in autumn 2012.[57]

- *CHP*

Cogeneration or Combined Heat and Power (CHP) is a simultaneous generation of both electricity and heat from the same fuel. In fact, while the produced heat can be used for preparing hot water and/or heating the households, the produced electricity can be fed in the grid. These

[50] V.Ma. – S.Bl.,Vecer, *The Commission for Protection of Competition analyzes: if there is a monopoly, Toplifikacija will be fined!* from 18.11.2012
[51] Netpress, *Heat plant "Istok" has installed the first heat meters* from 10.02.2011
[52] Natasha Mersovska, Sitel, *No more disconnections from the district heating* from 23.03.2012
[53] Constitutional court of the Republic of Macedonia, *Decision* from 17.12.2008
[54] Energy Regulatory Commission, *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2010*, (Skopje, 2011), p.70; Toplifikacija AD Skopje, *Annual report 2009 year*, p.31
[55] *Annual report for the work of the Energy Regulatory Commission of the Republic of Macedonia in 2010*, (Skopje, 2011), p.70
[56] City of Skopje, *Land-use plan of Skopje. Planning period 2001-2020 (2002)*, p.14
[57] Internet page of the city of Skopje/ Workshop for the Land-use plan of Skopje http://www.skopje.gov.mk/ShowAnnouncements.aspx?ItemID=4890&mid=482&tabId=1&tabindex=0 last accessed on 30.05.2012

strong points of CHP advocate this generation mode to be of the possible solutions towards reforming the Macedonian heat market. CHP can be an important part of DH or can sell its heat to the DH and therefore represents an important part of improving the DH services and in more general the whole heat market.

DH and CHP are also high on the European energy agenda seen as tools for efficient use of energy, addressing climate change and contributing to sustainable development. The Directive 2004/8/EC on promotion of cogeneration represents the basis for the EU member states to develop cogeneration policies. It also prescribes the member states to establish a system of guarantees of origin for high-efficiency cogeneration[58] and to analyze the national potential for the application of high-efficiency cogeneration.[59]

Benefits of CHP[60]:

- energy efficient due to the simultaneous use of a same fuel both for electricity and heat generation
- reduces CO^2 emissions
- can use renewables
- enables decentralized way of supplying heat and electricity, which is highly efficient
- reduces the need for transmission and distribution networks
- reduces primary energy demand and uses the waste (surplus) energy (heat)

Issues for CHP[61]:

- high initial costs of new technologies
- barriers as policy, market, fiscal uncertainty
- need of education of the wide range of included actors from decision-makers to architects, engineers, builders, designers etc.
- need of strong policy and market incentives as tax rebates, feed-in tariffs, obligations, VAT reductions, certification and labeling of energy efficient equipment, public procurement requirements etc.
- lack of integrated urban heating supply planning
- electricity grid access and interconnection regulations
- lack of knowledge about CHP benefits and savings.

[58] High efficiency cogeneration is in this Directive defined by the energy savings obtained by combined production instead of separate production of heat and electricity. Energy savings of more than 10 % qualify for the term 'high-efficiency cogeneration'. DIRECTIVE 2004/8/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 February 2004, Official Journal of the European Union (2004) L 50/52

[59] DIRECTIVE 2004/8/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 February 2004, Official Journal of the European Union (2004) L 50/52

[60] IEA, *Co-generation and Renewables. Solutions for low-carbon energy future,* (2011), p.6; Internet page of the Association for European Heat Industry/ Combined Heat and Power http://www.ehi.eu/article/combined-heat-and-power last accessed on 27.05.2012; IEA, *Technology Roadmaps Energy efficient buildings: Heating and cooling equipment* (2011), p.14 2; DHC+ Technology Platform, *District Heating Cooling A vision towards 2020-2030-2050*, (2009), p.10

[61] IEA, *Technology Roadmaps Energy efficient buildings: Heating and cooling equipment* (2011), p.10; IEA, *Combined Heat and Power. Evaluating the benefits of greater global investment* (2008), p.27

In Macedonia the CHP-specific legislation is dominated by the EU energy policies and therefore shows support for developing CHP policies. In particular, the Law on energy stipulates that guarantees will be granted for production of electricity from high efficient CHP. Moreover, the energy strategies also consider CHP policies as important. In particular, the Energy Efficiency Strategy even considers cogeneration as a one of the leading modules of improving energy efficiency in the industry sector.[62] Regarding secondary legislation, the Rulebook on high-efficient combined utilities describes the procedure according which the register of these combined utilities is being run.[63]

In Macedonia so far there are two pioneer CHP plants. In the following text one of the two CHP projects, the CHP TE-TO will be presented and analyzed.

- *CHP plant TE-TO* [64]

- Completely constructed in 2010 and started working in 2011
- Project initiated by Toplifikacija AD Skopje
- Joint venture of the Russian company Sintez group (80%) and Toplifikacija (20%)
- Private capital
- Operating on natural gas
- Return of equity - 4,2 years
- Energy efficiency coefficient of 81%
- Income from sale of electricity, heat and of CO^2 certificates
- Average annual capacity of 220 MW for electricity generation and up to 160 MW for heat production
- Licence holder for combined electricity and heat generation
- Minor negative environmental impacts
- Increasing the utilization of the existing gas transmission line
- Signal for other foreign investments in Macedonia

TE-TO operates as a first Independent Power Producer supplying power to the Macedonian and the regional electricity market. The produced heat is delivered to the DH system of the city of Skopje.[65] TE-TO is connected to MEPSO and to Toplifikacija AD Skopje.[66] It is to sell its

[62] Government of the Republic of Macedonia, *Strategy for improving energy efficiency in Republic of Macedonia until 2020*, (Skopje, 2010) p.16
[63] Rulebook on high-efficient combined utilities
[64] Mining Institute, *Cogeneration plants KOGEL SEVER and CHP TE TO EAST;* Ljupco Gashteovski, Nova Makedonija, *TE-TO – 15 flies at one stroke* of 17.01.2012; Toplifikacija AD Skopje, *Annual report 2008*, p.9; TE-TO AD Skopje, *Combined cycle co-generation power plant project Skopje. Environmental assessment report* (2006), p.16; Internet page of TE-TO http://www.te-to.com.mk/index.php last accessed on 28.05.2012; Toplifikacija Group, *Annual report 2011*, p.14
[65] Internet page of TE-TO http://www.te-to.com.mk/index.php last accessed on 28.05.2012; Toplifikacija Group, *Annual report 2011*, p.14
[66] Toplifikacija Group, *Annual report 2010 year*, p.16-17

electricity and heat under market conditions.[67] TE-TO will have positive influence on the work of Toplifiakcija since Toplifikacija will satisfy up to 60% of its needs for heat energy from TE-TO.[68] This is shown by the concrete example of Toplifikacija AD having bought heat from TE-TO in 2011 which price was 5% lower than the price of the heat produced by the regulated producer based only on the price of the fuel. This enables cost reduction and ultimately lowering the cost of heat for the end user.[69]

By analysing TE-TO's performance and the Macedonian market for CHP, it can be concluded that more attention have to be devoted to this energy option. Mr. Grkov from the Mining Institute elaborates that the problem with CHP is in the heat grid. Except for the city of Skopje, in the other cities there is no heat grid and therefore it is more expensive to build a CHP plant in the other cities. Firstly, the heat grid should be developed and then the heat to be sold. He furthermore states that heat energy is a local matter of the municipalities – they should consider the possibilities of developing heat and gas grids. From the positive sides for CHP he emphasized the possibility for CHP for trading with CO^2 certificates.[70] One excellent possibility which CHP plants offer is utilizing the surplus heat energy which is usually being wasted as it is done with the energy of the thermo power plant REK Bitola for example. Mr. Grkov shared his personal view that electricity and heat should not be produced centrally, but locally and that in each city of Macedonia there should be a CHP plant of 50 MW. This a clear chance for local job creation.[71]

For the purpose of having even detailed picture of the Macedonian heat market, Table 4 presents a SWOT analysis.

Table 5: SWOT analysis of the Macedonian heat market

Strengths	Weaknesses	Opportunities	Treats
Privatized heat market players Pioneer CHP activities Some DH planning Gasification planning	No gas or oil resources No gas distribution network Inefficient DH Under-developed DH Low energy efficiency in heating and households Lack of studies	Under-used gas pipeline CHP Increasing DH's efficiency Further development of the DH Setting heat meters Utilizing the surplus heat of the existing	Increasing oil and gas prices DH disconnections Increasing heat bills

[67] Ministry of Economy of the Republic of Macedonia, *Strategy for Energy Development in the Republic of Macedonia until 2030*, (Skopje, 2010), p.114
[68] Vladimir Nikoloski, Nova Makedonija, *Everyone will profit from TE-TO* from 08.03.2012
[69] Toplifikacija Group, *Annual report 2011*, p.1
[70] Interview with Zoran Grkov, Mining Institute, conducted on 17.04.2012.
[71] Ibid.

	focused on the heat market	electricity producing utilizes Gasification process	

Source: own conclusions

Case study on the Czech CHP and DH policies

The Czech Republic has a long tradition in DH and solid experience in CHP. This paper will present how the Czech DH and CHP policies have developed over the years and what was the crucial for their development. The Czech Republic is taken in this case as a good example since the DH heat represents half of the total Czech heat market and approximately two thirds of district heat is produced in the CHP installations.[72]

Influenced by the EU energy polices, the Czech strategic documents have declared the country's positive attitude towards improving the CHP policies. In fact, the State Energy Concept of the Czech Republic of 2004 supports CHP and has declared maintaining the existent forms of CHP support and harmonizing the Czech legislation with the Directive 2004/8/EC[73]. Furthermore, the Energy Concept stipulates ensuring closer links between the state research and development promotion policies and encourages utilization of the EU programs as Intelligent Energy as well.[74]

The CHP support is contained in the Energy law Nr. 458/2000[75] and the ordinance No. 344/2009.[76] Since 2006 high-efficient CHP is being supported by a controlled premium on the market price of electricity.[77] The contributions to electricity prices for CHP differentiate between the sizes of the installations. The different tariffs will be presented in Box 1.

Box 1: Contributions to electricity prices for CHP in the Czech Republic for 2012 according the Energy Regulatory Office (CZK[78]/MWh)

CHP electricity	Base tariffs (24 hours)	High tariff (8 hours)
Installations with installed capacity < 1 MW	590	1630
Installations with installed capacity 1-5 MW	500	1250
Installations with installed capacity > 5 MW	45	

[72] Interview with Ing. Mgr. Maria Grajcarova, M.A., District Heating Specialist, Association for District Heating, conducted on 29.02.2012.
[73] This Directive also called the Cogeneration directive stipulates policy framework for expansion of cogeneration in the EU.
[74] Ministry of Industry and Trade of the Czech Republic, *State Energy Policy of the Czech Republic* (2004), p.10
[75] There is a new upcoming Act of law on Supported Energy Sources that deals with both CHP and renewables, which will come in force in 2013, amending the existing Energy law. Interview with Ing. Mgr. Maria Grajcarova, M.A., District Heating Specialist, Association for District Heating, conducted on 29.02.2012
[76] Interview with Ing. Mgr. Maria Grajcarova, M.A., District Heating Specialist, Association for District Heating, conducted on 29.02.2012
[77] Energy Regulatory Office, *The 2009 Report on the Activities and Finances of the Energy Regulatory Office*, p.31
[78] 1 EUR is approximately 25 CZK.

Source: Internet page of the Association for District Heating of the Czech Republic

The interviews with five experts dealing with CHP and representing the private sector have contributed to the analysis. Mrs. Grajcarova, Association for District Heating, argues that the provided support with the different contributions to the electricity prices for different installations as to be seen in Box 1 puts an uneven condition having in mind the low support for high efficient CHP electricity production for installations with installed capacity > 5 MW. In fact, these installations are supported only with 45 CZK/MWh and represent 46% share in the CHP market, while the small installations < 5 MW, which are the remaining 54% of the CHP market share are substantially more supported as shown in Box 1.[79]

Regarding the further support schemes, there is a possibility to gain investment subsidy on CHP project within the Operational programme 2007-2013 of the Ministry of Industry and Trade and the Ministry of Environment financed from the EU's Structural and Cohesion Funds (SCF) (85%) and national budget (15%).[80] However, Mr. Jan Truxa, Ekowatt, explains that beside the existing legislation, the limited state funds and EU funds as Intelligent Energy Europe which predominantly supports CHP plants on biogas, there is no other support for development of CHP.[81]

Mr. Truxa also emphasised that the contributions to electricity prices are changing every year and in December it is being pronounced what the contributions to the electricity prices for the following year will be. This creates an area of uncertainty among the investors.[82] Furthermore, important challenge remains to be energy efficiency. In this line Mr. Pasek argues that DH systems can not currently be considered as environmentally friendly as most of them use fossil fuels, predominantly lignite, as a fuel. To improve its environmental record, it is necessary to invest into energy efficiency of the heated buildings and of the distribution system, including switch to renewable sources of energy. [83]

Beside the fact that the Czech Republic is still facing some legislation shortcomings, it is one of the European countries that have most developed DH. About the crucial policy that contributed to the development of the DH, Mrs. Grajcarova argues that this policy is the long tradition of planning the DH got as a "legacy" from the previous system. In fact, the Czech DH including the CHP plants in the DH have been built in the 1970s and 1980s.[84]

From the presented arguments and facts it can be concluded that the market incentives and policies under the EU influence have been developing in favour of CHP. However, these incentives generally do not fully satisfy the need of the private sector working in the field. The key policy in fact was the planning of the DH which makes the Czech Republic to have developed DH including lot of CHP plants.

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[79] Interview with Ing. Mgr. Maria Grajcarova, M.A., District Heating Specialist, Association for District Heating, conducted on 29.02.2012
[80] E-Mail interview with Tomas Chadim and Miroslav Honzik, SEVEn, The Energy Efficiency Center, conducted on 06.03.2012
[81] Interview with Ing. Jan Truxa, Ekowatt, conducted on 01.03.2012
[82] Ibid.
[83] Interview with Ondrej Pasek, CEE Bankwatch network, conducted on 02.03.2012.
[84] Interview with Ing. Mgr. Maria Grajcarova, M.A., District Heating Specialist, Association for District Heating, conducted on 29.02.2012.

The conclusions that can be drawn from the Czech case and applicable to the Macedonian case are:

- **Conditions for long term stability for CHP investments have to be met**
- **CHP and especially heat incentives have to get greater attention**
- **Energy efficiency measures are to be implemented in the households**
- **The CHP and DH infrastructure has to be planned and constructed as a long term investment**

Conclusion and recommendations

This paper aimed to present the situation with the heat market in Macedonia in order to propose improved policy solutions. It assessed various aspects of the Macedonian heat market, presented the key legal obstacles, the dominant actor's behavior and focused on the main problematic issues. One part focused on exploring some good Czech practices in DH and CHP.

The research has shown that despite the separation of the key heat market functions, Toplifikacija Group remains to dominate the market. Having lack of competition from other more influential heat market actors or from the gasification sector, Toplifikacija has no incentive to reduce the heat prices. Although DH is known as the most efficient option for heating, the Macedonian DH should go through more in-depth restructuring for the purpose of offering more efficient services. The presented heat legislation does not give incentive for the citizens to introduce energy efficient measures in their households and thus to use the heat energy more efficiently. The energy strategies although support improving the DH market and building CHP plants, they lack a more heat market focused analysis. However, the positive experience of the new highly efficient energy capacity TE-TO after many years of non-investment should be a clear signal for investing in further CHP projects. In addition, the gasification process has to be developed more intensively. One crucial aspect is however the long term planning and constructing of the relevant gas and heat infrastructure and especially CHP.

On the basis of the conducted analysis, this paper recommends:

- The Energy Regulatory Commission to issue an international tender for the license for heat production;
- The Commission for Protection of Competition to check whether Toplifikacija has breached the Law on protection of competition and to control more closely its actions in the future;
- The Rulebook on the conditions for heat energy supply to outline an obligation for the DH consumers to set individual heat meters within reasonable deadlines;
- The heat supply companies in cooperation with the Association of Consumers and the civil society organizations to develop program for promoting the installation of the heat meters and introducing energy efficient measures in the households;
- The city of Skopje in cooperation with the heat distribution companies to plan the development of the DH and gas network in the upcoming Land-use plan of Skopje;
- The Ministry of Economy and the Government to issue and to support conducting a heat market focused study containing a strategy for restructuring the heat market with focus on improving the heat market investment climate;

- The Ministry of Economy and the Government to issue and to support conducting a study based on the experience of the existing CHP plants and especially highlighting the existing obstacles and the possibly for introducing strong CHP-support policies;
- Investing in CHP has to be indentified as one of the priority means for improving the heat sector;
- The municipalities to consider developing plans for local heat utilization by planning construction of small CHP plans and respective heat infrastructure;
- The existing thermal power stations to consider making strategies for utilizing their surplus heat;
- The gasification process to continue being implemented;
- The long-lasting dispute over the ownership of the gas transmission pipeline to be finally solved.

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POLICY
REPORT

Energy and Infrastructure

The story of the Macedonian heat market – how to reform it?

This paper was prepared in the framework of the Fellowship Programme for Policy Researchers from the Western Balkans Region, a joint undertaking of the European Fund for the Balkans (EFB) and the Think Tank Fund (TTF) of the Open Society Institute based in Budapest, enabling the author inter alia one month research stay at the Association for International Affairs (AMO) in Prague, the Czech Republic. The paper was prepared under mentorship of Jan Prasil, Tomas Karasek and Petr Binhack and with support of Vladka Votavova, AMO.
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