



Macedonia: Energy Efficiency and Renewable Sources

Energy efficiency and renewable energy in Macedonia - Civil society position paper

Problem situation

The energy sector in Macedonia is heavily dependent on fossil fuels imports, such as oil and natural gas, in order to be able to provide electricity, heating, and fuel. Every Macedonian denar spent on these energy imports is however a denar that the local and national economy loses. Regarding the current situation with RES, according to the State Statistical Office in 2010, the production of renewable energy in the Republic of Macedonia consisted of: wood (wood fuel, wood waste, other solid waste), geothermal heat, hydroelectricity and biodiesel. In 2010, the total primary production of renewable energy comprised of: wood (wood fuel, wood waste, other solid waste), 748 023 m³; geothermal heat, 3,384.243 m³; hydroelectricity, 2,429.283 MWh; and biodiesel 1 999 tonnes. The biggest consumers of wood (wood fuel, wood waste, other solid waste) in 2010 were the households, with a share of 91%, while the other sections accounted for 9% of the final energy consumption (of wood). The biggest consumer of geothermal heat in 2010 was agriculture with 83.4%, while the other sectors participated with 16.6% in the final energy consumption (of geothermal heat). Distribution losses in geothermal heat were 10.45% of the total primary production.⁸⁴

The energy resources mostly used in the total primary energy consumption in 2006 were coal (45.5%), crude oil and imported petroleum products (35%), followed by biomass (6%), imported electricity (5.6%), hydropower (5.1%), natural gas (2.4%) and geothermal energy (0.4%). On the other hand, in the final energy consumption (2006) the most common energy sources were: oil products with 42% and electricity with 32%; followed by biomass (10%), heat (7%), coal (7%), natural gas (2%) and geothermal energy (1%).⁸⁵

The statistics above also show that the existing patterns of energy use in Macedonia lead to significant impacts on the environment, due to high carbon intensity, pollution from fuel combustion, deforestation and land degradation (from excessive use of wood for fuel). These present major issues since the energy sector is unsustainable in the long-term and leads to environmental damage; as well as health issues, high levels of energy losses and low energy efficiency in heating. However Macedonia is rich with agricultural end products and agricultural residues that are underused in the production and consumption of biomass and they represent a potential vast source for heating especially in the rural parts of the country.

Biomass waste from forests, wood production and agriculture which can be economically used for combined production of electricity and heating.

Biomass production from agricultural and forestry residues

	Thousand tonnes per year
Residues from forests	20
Residues from wood production	10
Residues from agriculture	35
Total	65

84 State Statistical Office, News Release, Energy No. 6.1.11.92, 30.11.2011.

85 Strategy of Energy Development of Macedonia until 2020 with a Vision until 2030, page 8.



From 65 thousand tonnes biomass residues, the estimated total production of electricity could be 50-70 GWh and 120-180 GWh heating energy, depending on the needs and the available consumption of heating.⁸⁶ The feed-in tariffs that producers of electricity and heat from biomass can benefit from are:

Feed-in tariffs in Macedonia, source: Official Gazette, no. 176, December 2011, page 10

Installed capacity of the PP	Feed-in tariff Eurocents/kWh
≤ 1 MW	11
> 1 MW	9

The problems with high carbon intensity of the country and using electricity for heating are exacerbated by the slow development of RES and EE (energy efficiency) on the national and local level. Another major issue arises from the ineffective handling of the district heating (DH) in the capital city - Skopje. In this regard, up until last year, although the DH has been privatized and had its functions separated some time ago it was still largely owned by one 'mother' company, the Toplifikacija Group, which owned the 'daughter' companies responsible for the production, supply and distribution chain for the city of Skopje. Being the one provider of heating for the capital, Toplifikacija was abusing this position leaving residents with an expensive service without improving it. The end result is an increased number of discontented residents who disconnect from the DH and switch either to electricity or wood heating. These are not efficient means of heating for such a large city, and they create even bigger problems such as pollution and increased energy imports as well as numerous side effects such as an increased trade deficit of the country.

However, as of January 1st 2013 the situation has changed and the future trends regarding the district heating in Skopje are unknown for the moment. The latest development is that Toplifikacija was purchased by a company called "Balkan Energy Resource" established in Cyprus. The Energy Regulatory Commission decided to grant the licenses for production, supply and distribution of thermal energy to the daughter firm of "Te-To"⁸⁷ and the Russian "Sintez Group".⁸⁸ It remains to be seen what the new owners will do with the problems carried over from the old company.

Furthermore, even though as a candidate EU member state Macedonia is required to rigorously follow all the trends developing in the Union, the progress in this regard has been moderate. In 2010, three new energy strategies were adopted - the comprehensive "Strategy for the development of the energy sector until 2020, with a vision until 2030", the "Strategy for the use of renewable energy sources until 2020", and the "Energy Efficiency Strategy". At the same time a new Energy Law, which incorporates EU-like provisions for market liberalization, was passed in February 2011. Based on the priorities set in these umbrella documents, numerous bylaws and regulations were adopted, including those that regulate the production of electricity from RES (provisions for preferential users and feed-in tariff for RES). However the main Energy Strategy is disappointing in its vision of renewable power or rather, the lack of it, as the focus is mostly put on large hydropower plants that are unsustainable for a number of reasons including fertile land and biodiversity loss, and resettlement of affected people and not attractive to foreign investors. Much less attention is given to sustainable RES such as biomass from wood waste and/or animal residues. Another controversial part is the nuclear power plant scenario for the country, unrealistic in the economic reality of a country like Macedonia, which was included after heavy lobbying from several experts and academics in this area. This adds to the short-sightedness of the whole document and the institutions responsible for its implementation that need to develop a sustainable and clean energy sector, not highly controversial, expensive and possibly very dangerous plans.

Other issues include severe under-investment in RES and EE on the national and especially on the local level. The problem is multi-layered but mainly comes down to the absence of available credits or funds specifically intended for these projects. For instance, only two banks provide credits for 'green' projects and even those impose high interest rates and a whole range of other conditions. Furthermore, natural persons cannot use the opportunities same as legal entities to invest in RES. There is no legal background that permits natural persons to sell electricity in case they produce it from RES (solar panels for instance) - instead they can only use it for personal means. The distributors of electricity are not obliged to purchase that electricity under the feed-in tariff regulations unless the one providing it is a legal entity. On the other hand, the business sector faces constraints from the slow and ineffective administration even in the cases where there is great interest in investing in RES. The low electricity prices for end-users and the burdensome administrative

86 Strategy for utilizing the renewable sources of energy in Republic of Macedonia until 2020, page 41.

87 TE-TO AD CCPP (Combined Cycle Power Plant) is electricity generation and supply of heat PP to the district heating system of the city of Skopje. TE-TO is a joint venture between Toplifikacija, Skopje and Negusneft, Moscow (Sintez Group). More info at: <http://www.te-to.com.mk/index.php>

88 A Russian company with investments in Macedonia.



procedures for authorisation, permitting and licensing continue to be obstacles to the adequate uptake of renewables in the country. Preparations in the area of renewable energy are on track although the country's renewable energy potential is not efficiently harnessed.

In addition, the high number of deprived regions with limited funds at their disposal and the weak purchasing power of the people themselves, makes investing in EE and RES in Macedonia more difficult than in EU countries. Therefore low awareness about the possibilities EE and RES offer for development and growth is not the only problem, but rather also the economic reality of most people: investing in RES or EE technologies is seen as expensive by both households and businesses in a situation when the price of electricity is still heavily subsidized and lower than its market value. Due to this situation, it is more economically viable for them to use electricity for heating, which is getting to a worrisome level, than to invest in energy efficiency in buildings or hybrid renewables heating systems which are more expensive but more environmentally friendly (for example to install solar collectors plus boilers on biomass). The dire situation can be explained by the fact that in Macedonia for the time being the only incentives given for RES are the feed-in tariffs for the investors. There is neither an Energy Efficiency Fund, nor any tax incentives for households willing to invest in EE measure or RES, or any announcements that this will be changed in the foreseeable future.

Furthermore, other problems that Macedonia faces in the energy sector are: low awareness, specifically about the opportunities that biomass offers in the areas where the agriculture is a main activity, alongside the almost non-existent support from the state for greater development of this type of biomass usage. The corruption in the energy sector is another pertinent issue still not tackled on the national or local level.

The aforementioned issues and problems are the main reasons why there is an increased need for EU financing in this sector. The target set in Macedonia's energy strategy to reduce consumption by 21% is very hard to achieve given the current lack of support for renewables. After long discussions and timely considerations, CSOs have come up with several concrete proposals under the Energy Efficiency and Renewable Energy chapter for financial support from the available EU funds that should be delivered in a timely manner. The main point is to use European funds to achieve the objectives of the EU-20/20/20 policy in Macedonia, prioritize the use of solar, geothermal and wind energy, as well as the sustainable use of biomass on the local level, improve energy efficiency in public and residential buildings, as well as the efficiency of district heating, all of which are currently severely under-financed by the state.

Priorities for funding from the Instrument for Pre-Accession in Macedonia

Heat production from renewable energy sources

Geothermal, solar, sustainable local biomass (residues from agricultural production) need to be prioritized when it comes to sustainable and environmentally friendly heating for the whole country. In the case of biomass use, the most efficient cogeneration from biomass technology for electricity and heat production should be prioritized.

There is a need to invest in local sustainable production, processing and distribution of biomass for combined heat and power. The support should be provided for local and regional projects with regular sources of biomass outside the region of the City of Skopje and especially in rural regions across Macedonia where there is a shortage of available alternative heating solutions but at the same time production of agricultural residues exists. Sustainability criteria for biomass cultivation and use should be designed to avoid harmful environmental effects and inefficient use of biomass.

Energy efficiency in housing and public buildings

- Energy retrofits of existing residential and public buildings to high efficiency levels
- Support for construction of new buildings to near-zero energy standard

Energy efficiency measures in district heating

Funds should be available for projects for complex renovation of the whole system including all of the following measures in order of priority:

- Consumption - energy retrofits of buildings, including installation of individual heat meters in apartments
- Distribution - decrease of system losses.
- Production - improvement of effectiveness, shift from fossil to biomass and other renewables, efficient biomass cogeneration. Investments in heat production facilities should be scaled to the new situation of lower heat demand in energy efficient distribution system and buildings.



Technical infrastructure - smart grids

- On the regional level in South East Europe as part of the Energy Community Treaty and in the cross border regions. However priority must be given to those connections within the region, not ones designed mainly to export electricity to the EU.
- Assistance in research and development in this area on the national and on regional level.
- Smart grid elements and regional distribution grid improvements to allow connection of RES especially in rural and economically disadvantaged regions.

Strengthening the capacities of local and central administrations

The government and municipal officials as well as households - potential beneficiaries - should gain special knowledge and skills for the preparation of RES and EE projects to be financed by EU funds. The collaboration with the private sector and civil society should be improved, and knowledge transfer should be enabled (private-public, abroad-home). Additional research and studies should be prepared for the future investments in this sector, and they should provide solutions as well as project ideas eligible for EU funding.