BULGARIA

The country report for Bulgaria was prepared by the Ecolinks-Regional Environmental Committee. Complementary data used comes from the web sites: www.fe.doe.gov/international/bulgover.html, www.eva.wsr.ac.at/opet/bioboiler/bulrum-cq.htm.

Current situation on CHP and biomass CHP in the national energy sector.

The Republic of Bulgaria has an approximate population of 8.6 million people. The gross domestic product (GDP) (based on purchasing power parity) was $48 billion in 2001.

Bulgaria's energy sector is dominated by nuclear power (30-40% of all electricity supplies) and imported fossil fuels. The energy balance for the country shows that more than 70 % of the energy consumption is based upon imported fuels. The rest of fuel consumption is mainly coming from low grade coals and limited hydropower generation (7-8% of all electricity generation). Due to the geographic location and the geologic conditions, Bulgaria has a number of potential sources for renewable energy, i.e. solar, hydro, biomass, geothermal and wind energy.

Gross energy consumption in 1998 was 20.5 Gtoe; of which available for final consumption were 10.9 Gtoe (the difference is attributed to transformation of primary energy, energy plants autoconsumption and transmission losses). The share in the final energy consumption of industries was 45%, the domestic sector (households, commerce & public organisations, etc.) was in total 35.1% (for households only – 25.7 %) and transport sector reached 19.9%. The share of fuels in the final energy consumption is : 2.66% coal and lignite, 9.09% fuels produced from coal and lignite, 15.36% natural gas, 38.82% petroleum products, 3.77% biomass and MSW, 20.51% electricity, and 9.8% heat.

There are 21 cities and towns in Bulgaria that have district heating. These include Sofia, Plovdiv, Republica, Traicho Kostov, Pleven, and Shumen. Of the combined heat and power plants, 30% are coal-fired. All the district heating systems in Bulgaria were built between 1970 and 1990. These systems provide 22% of the total public and residential heating. There is no biomass fuelled district heating.

The installed capacity of the Bulgarian power system in January 2001 was 13.2 GWe. Bulgaria is a major exporter of electricity, supplying power to Turkey, Greece, Yugoslavia, FYROM, and Albania. The 2001 exports to these countries have been estimated at 7 billion kWh, with the the most going to Turkey. Bulgaria's electricity export earnings for 2000 were $105 million. Over the past decade, nuclear energy was achieving a greater and greater share of the total amount of electricity generated in Bulgaria, but that will change now that two units of the Kozloduy nuclear power plant have been shut down.

The use of biomass in Bulgaria is presently confined to heat production from residues and officially this contributes 3,7 % (409 Ktoe) of final energy supply. In practice, this contribution is almost certainly larger as considerable quantities of biomass in the domestic and small industry sector may go unrecorded. The share of households using wood for heating purposes are estimated at 69% for towns and 96% for villages.

Larger biomass fuelled applications for industries are usually transformed diesel oil boilers produced in Bulgaria. Pilot installations for agricultural residues as well as biogas have also been tested in the '80s and '90s but none are in operation now due to various reasons. Total installed biomass industrial capacity by 1997 was 45 MW, and the energy production was 225 GWh/year (*Source: National Energy Efficiency Programme, 1998*).

RTD and Demonstration projects on biomass CHP

The promotion of cogeneration is a priority of the strategy for development of the District Heating Sector. This can be achieved partially with local resources and some expatriate technical assistance. Bulgarian experts have worked on a number of projects financed by the Work Bank, the Phare programme and other donors. IFI's funds for supply of measuring and

energy saving equipment are being utilized. Programmes for co-operation with foreign investors are being elaborated. Although a transfer of ownership is expected, the state will continue to exercise control as a regulatory body and finance important measures for the development of the district heating systems.

Legislation and support mechanisms

The laws valid at present relevant to the energy use of biomass are the following:

- Energy and Energy Efficiency Law
- Environmental Protection Law
- Forestry Law
- Concession Law
- Law on Municipal and State Property
- Relevant regulations and secondary legislation

In general, renewables are given priority as energy source. There are texts imposing constraints on the use of biomass in the Environmental Protection Law and the Forestry Law. These constraints are mainly linked to the protection of forests in national parks and protected areas. There are no legal constraints for the use of waste biomass as an energy resource. There are environmental norms for solid fuels use emissions updated in 1999 for capacities over 500 kW. No licenses or permissions are needed for production of heat below 1 MW and electricity below 5 MW. Renewable energy must be preferentially purchased, together with CHP as stated by the Energy Law. But in general, inspite of these texts there are no real defined mechanism for broader RES utilisation. Furthermore, the regulation and normative framework, following the Law, is still being prepared (often amended due to fast changing economic environment, for social reasons, etc.), and mainly due to this uncertainty generally profitable RES projects are not accepted for funding, as the financiers are not sure about generation of projected cash-flows and loan repayment.

Existing CHP plants

In Bulgaria there are 7 CHP plants using natural gas but no biomass fuelled CHP plants.

There are only two small size Heating Plants using Biomass.

- **Steam boiler Plant fired with Sunflower's Hulls**

  "PAPAZOLIO" S.A. in Balchik (East Bulgaria) has two boilers with a steam capacity of 4.6 tons/hour each boiler which are converted from using Black Oil to using Black Oil and sunflower's hulls. Their efficiency with reduced usage of Black Oil is 68.78 %. The calorific value of the sunflower's hulls is 3485 to 3750 Kcal/kg. The cost of conversion, made in 1999, was 170000 Euros.

- **Hot Water boiler Plant fired with Wood Residues**

  The association between Municipality of APRILZI, Municipality of SUFLY /Greece/ and FURTH and KAUTZEB /Austria/ own a hot water boiler plant in APRILZI (Central Bulgaria) that will supply with hot water six public buildings. The boiler has a capacity of 400 KW and is designed to use wood residues. The plant was to be completed in September 2002. The total cost of the project was 320590 EUR including 240542 EUR subvention by PHARE Programme (BIODIST No: 00-00420-00).

The possibility of using the biogas generated by 44 waste depots in the country was investigated, a feasibility study of the depots was performed and great data base was created for: design of a project, estimating of the Project, construction, purchasing of Materials and Equipment, contracts for energy supply. In addition, a project for "Using of Biogas from Waste Depots in Bulgaria" was executed by Company Van der Wiel Holding BV/Holland/ in

participation with Royal Haskoning Group /Holland,UK/ with a participation of the local Municipalities in the following Cities: Sofia, Pernik, Rousse, Varna, Vraza, Stamboliyski, Stara Zagora, Bourgas, Pleven.

The possibility of using the biogas generated from wastewater treatment plants in the country was investigated, and an assessment of the current situation regarding sludge treatment and disposal was performed. Guidelines were derived for the sewage sludge treatment and disposal and for permitting and inspection of (i) WWTPs and (ii) sewage sludge disposal outlets in Bulgaria. A National Plan was proposed for sludge disposal from municipal WWTPs integrated with plans for establishing new/upgraded/extended WWTPs, with a proposal for a financial scheme to implement the national plan and a plan for training of competent authorities' personnel in (i) sludge treatment & disposal guidelines and (ii) permitting of WWTPs and disposal outlets.