

Integrated strategic waste management planning in Volvi Municipality

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The Municipality of Volvi is situated in the Region of Central Macedonia in Northern Greece. It has 24.000 inhabitants and covers an area of 782 km². The seat of the municipality is the town of Stavros, where the municipal council is also based. It was named after Lake Volvi, which dominates the centre of the municipal territory. One of its main characteristics is its rich natural environment which combines 20km of sea coastline, rivers, lake Volvi and also mountainous and semi mountainous areas with dense vegetation. Lake Volvi, the second biggest lake of Greece (68 km²), dominates the centre of the municipal territory. The water system of the area is extremely valuable and that is the reason why this area is protected under the Ramsar convention and is characterized as a Natura 2000 biotope. The municipality of Volvi is a destination chosen by tourists and every year more than 80.000 tourists visit its area, quadrupling the number of inhabitants for a period of almost five months.



The Municipality of Volvi is a developing region and is characterized as the core of cultural and environmental development. It has the potential to become a big tourist center, covering many forms of tourism such as cultural, thermo, religious, ecological, agrotourism and wine tourism, bringing great benefits to the municipality. The cultural resources of the region cover a wide range of historical and artistic spheres, making it possible to realize the above vision. On the other hand, there is also the possibility of rural development, as a large part of its land is of high productivity with the provision of uses and facilities related to agriculture and livestock farming (agricultural warehouses, livestock farms, agricultural and livestock processing units).

The municipality makes continuous efforts to enhance and promote sustainability and one of its major targets is the protection and promotion of the environment. The municipality focuses on Energy – Waste – Water – Environment – Tourism. It is searching to apply environmental friendly solutions and is committed to increase energy efficiency and use of renewable energy sources in its territory. The municipality aims to:

- Produce Biomass and Biogas from urban, livestock, agricultural waste combined with district heating and exploiting the thermal energy produced.
- Apply Photovoltaics in buildings and areas of the municipality, combined where appropriate with net metering.
- Construct Wind farms in its mountainous areas.
- Exploit the geothermal field of Apollonia - Volvi area and implement district heating system.
- Apply smart energy-saving systems, which will take full advantage of renewable energy sources, for lighting, facilities (buildings, water pumping and irrigation stations), transport (i.e. hybrid vehicles, eco-fuel, use of bicycle paths, use of ICT).
- Improve, develop and promote the tourist product.
- Promote Education, Sports and Culture and cultural heritage.
- Protect and Manage Natural Environment.
- Exploit natural resources.

Also, the municipality of Volvi has already completed the investigation of the optimal integrated management system of urban waste and it has prepared the local waste management plan. The municipality

wants to manage its waste based on a circular economy model. Furthermore it focuses on energy production from waste.

Currently, 11,000 tn of litter/waste per year, produced in the area of the municipality, are transported in a distance of 90km (180km in total) in order to be buried in Mavrorahi landfill, causing serious environmental, economic and technical consequences. In addition, 30,000 m³ of green biowaste (branches, leaves, etc.) per year are buried or just deposited on land. The total amount of waste management costs is up to € 1,7 million Euro per year.

Having the vision to become a zero waste municipality, the municipality of Volvi designed and adopted an integrated strategic waste management plan, involving best waste management techniques: such as eliminating waste-separation at source-recycling-reuse, development of Biomass Plant for producing energy from green biowaste, development of Biogas Plant for producing energy from biowaste, establishment of environmental awareness and knowledge of waste management for citizens and interested stakeholders.

The municipality is developing:

- a network for the collection of recyclable materials, with separation at source. Four streams of recyclable material: paper, plastic, metal, and glass, one stream for biowaste and a separate stream for electrical and electronic devices. The network will contribute to reduce total waste by 45%, reduce carbon footprint by 55% and increase municipal revenue (income) from the sale of the materials.
- a biomass plant of 499 KW, for producing renewable energy from green biowaste. It is in the process of the Environmental Impact Assessment Study and the signing of the terms of connection of the plant to the electricity grid. A total amount of 4.200 MWh per year will be generated to be sold to the responsible operator, 4.095 MWh per year of thermal energy will be produced and can be used to heat municipal buildings, schools, sports centers and greenhouses. The operation of the biomass plant will contribute significantly to a 30% reduction of the total quantity of waste produced, to the reduction of the carbon footprint and to increase the revenue/income of the Municipality. The reduction of the carbon footprint will be 4.825,8 tCO₂ (electricity) and 1.093,37 tCO₂ (thermal energy). 5.919,17 tCO₂ in total (approximately 5.15% reduction for the Municipality as a whole).
- a 150KW Biogas plant, for producing renewable energy by using the total amount of the municipal biowaste. It is in the process of the Environmental Impact Study and the signing of the terms of connection of the plant to the electricity grid. A total amount of 1.200 MWh per year will be generated to be sold to the responsible operator, 840 MWh per year of thermal energy will be produced and can be used to heat municipal buildings, schools, sports centers and greenhouses and 4.000 tn per year of soil fertiliser will be produced and distributed in agricultural areas of the Municipality. The plant will contribute significantly to a 15% reduction of the total quantity of waste produced (urban and green) and to a 40% reduction of the amount of municipal urban waste produced. Additionally, it will contribute to the reduction of the carbon footprint and to increase the revenue/income of the Municipality. The reduction of the carbon footprint will be 1.378,8 tCO₂ (electricity) and 224,28 tCO₂ (thermal energy). 1.603,08 tCO₂ in total (approximately 1.4 % reduction for the Municipality as a whole).

Finally, the Municipality of Volvi is organizing an extensive awareness raising campaign which is going to involve radio, TV, electronic and social media, printed press campaigns, door-to-door actions, etc., and also an education and motivation campaign with more interactive activities such as conferences, workshops, festivals and other events and targeted actions for school-aged students, waste producers such as catering professionals, super markets, etc. New technology features, applications for smart phones, tablets, etc. will also be used to bring about notable changes in perceptions, awareness and habits of the general public and targeted groups.

Being a Zero Waste municipality is an ethical, environmental, economical, efficient and visionary goal which will guide citizens in changing their lifestyles and practices, transform waste to resources and achieve sustainability.

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