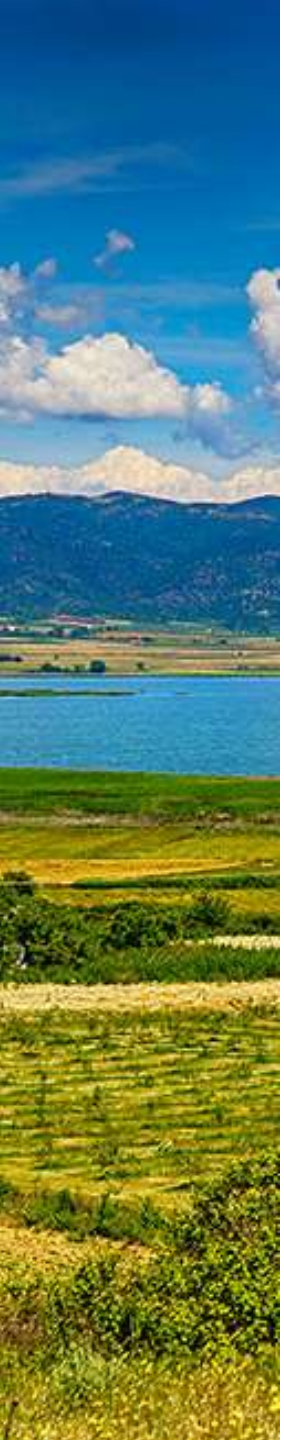
Municipality of Volvi

"Smart City Strategy towards zero waste and zero emission"

Thalia Valkouma, Dimitris Kintsakis
Consultants of Municipality of Volvi

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

- The Municipality of Volvi is situated in the Region of Central Macedonia in Northern Greece.
- It was set up in 2011 through the unification of six separate municipalities and their communities: Agios Georgios – Apollonia – Arethousa – Egnatia – Madytos – Rentina.
- The municipal area is 782 km2 and it has approx. 24.000 inhabitants.
- 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.



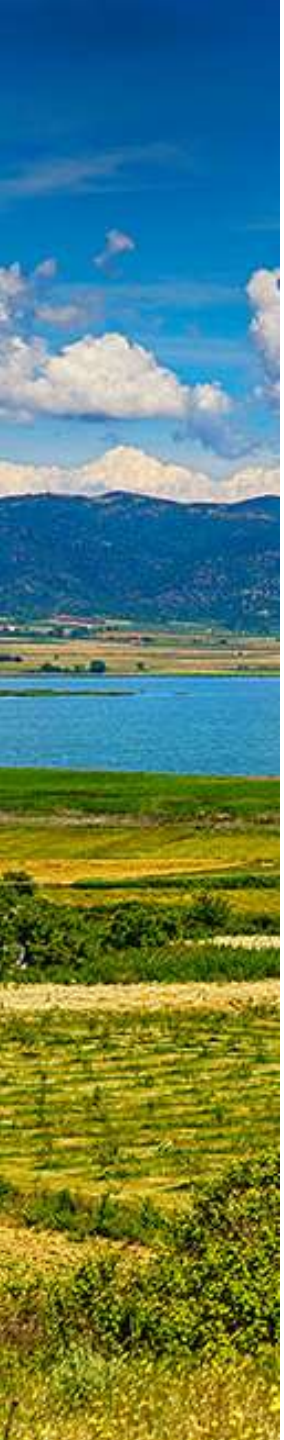
Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

Lake Volvi is the second largest lake in Greece and the biggest in northern Greece. It is about 12 miles (19 km) in length, and 6 to 8 miles (9.7 to 12.9 km) wide. The area of the lake is 68 km² and the depth is 20 m.

In the vicinity of the lake, 336 kinds of plants have been recorded, 13 of them are considered to be extremely rare. Also, 24 species of fishes, 19 amphibian species, 34 mammal species and over 200 species of birds. Lake Volvi is considered to be a stand for many migratory birds and a place to spend the winter and reproduction for some other.

The whole water system of the municipal area is extremely valuable. That’s the reason why this area is protected by several conventions and characterized as:

- Water biotope of Lakes Koronia - Volvi (Ramsar convention 1971)
- "Special Protected Area" (SPA, instruction 79/409 E.U.)
- "E.U.’s Area of Interest" :
  - Instruction 92/43 EU, Nature 2000- GR 1220001 & 1220003
  - Instruction 2009/147 EU, Nature 2000- GR 1220009

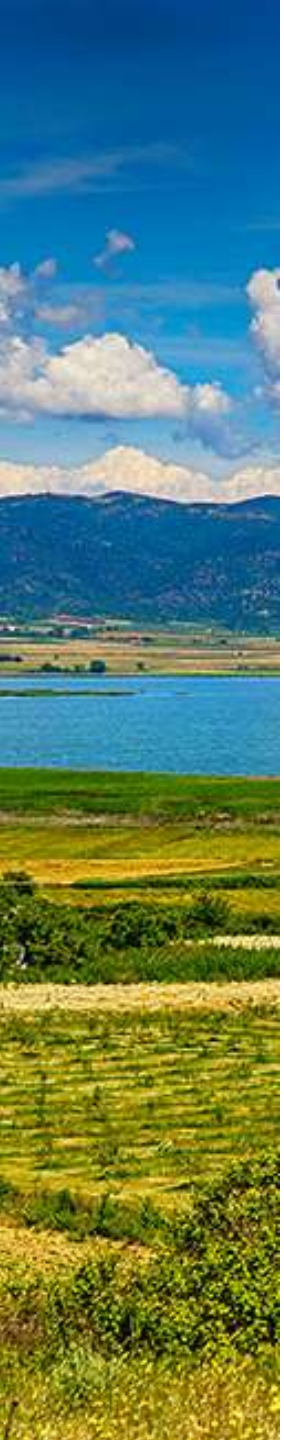


Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

The municipality of Volvi has a variety of religious, environmental and historical monuments, eco-touristic destinations and natural reserves. Those are touristic destinations and the municipality makes continuous efforts to enhance and promote them sustainably as they consist a major source of revenue and job creation.

The municipality of Volvi is also known for its thermal springs. The thermal city of “Nea Apollonia” is located in the serene and peaceful ecosystem of lake Volvi where health thermalism facilities are found.

The temperature of the water is 38-57°C and its characterized as: superheated Na - K - SO_4 - HCO_3 - F- Br hydrosulphide - hypotonic, slightly radioactive curative water. It is considered as highly therapeutic for a lot of diseases.



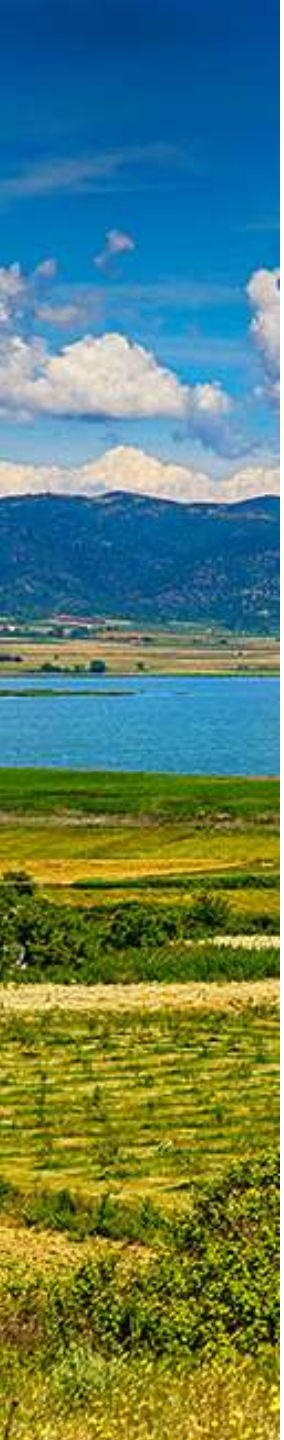
Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

The economic development in the area of the Municipality of Volvi is distinguished in:

- the coastal areas around the Strymonikos bay, where the tourist resorts are mainly located,

- and the interior of the Municipality, where agricultural production remains dominant.

In the primary sector as a whole, 28.2% of the active population is employed, 18% in the secondary sector, and 53.8% in the tertiary sector.



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

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.

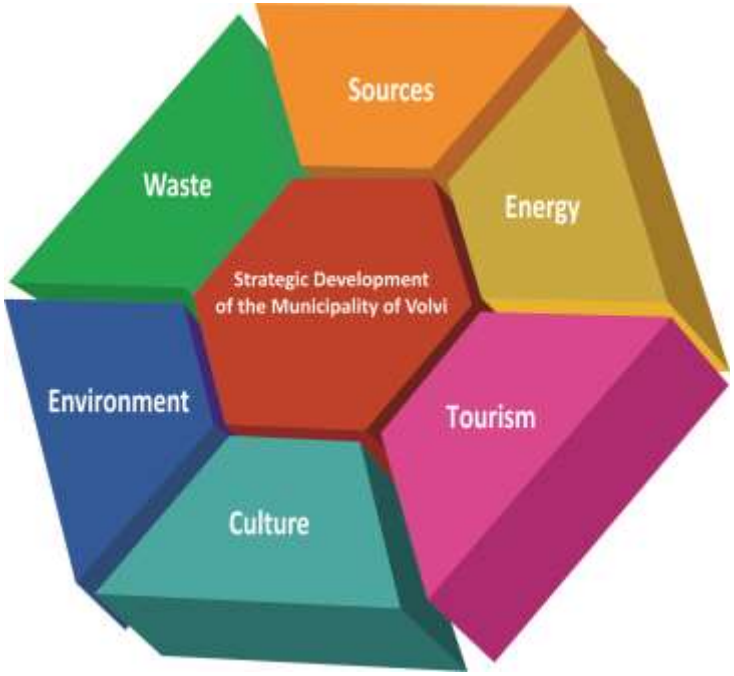
On the other hand, there is also the possibility of rural development, as a large part of its land is of high productivity with the provision of uses and facilities related to agriculture and livestock farming (agricultural warehouses, livestock farms, agricultural and livestock processing units).

Municipality of Volvi

Strategic Development Plan

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

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 – Sources.



Furthermore one of the major targets of the municipality's strategic plan is to enhance public awareness, responsibility and participation of the various stakeholders and citizens in all public issues, to strengthen initiatives and create partnerships and synergies among them and with the public authorities.

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

The Municipality of Volvi, in the context of its strategic planning, based on sustainable development, has developed a strategic development plan that includes the following thematic areas:

- Energy saving, energy upgrading and use of Renewable Energy Sources.
- Waste management and use of waste material as sources.
- Sustainable water management
- Improvement, development and promotion of the tourist product.
- Promotion of Education, Sport and Culture and promotion of cultural heritage.
- Protection and Management of the Natural Environment.
- Exploitation of natural resources.

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

On this basis, the Municipality has submitted more than 30 financing proposals over the past 2 years, collaborating with more than 100 European municipalities, research centres and agencies from almost all European Union countries.

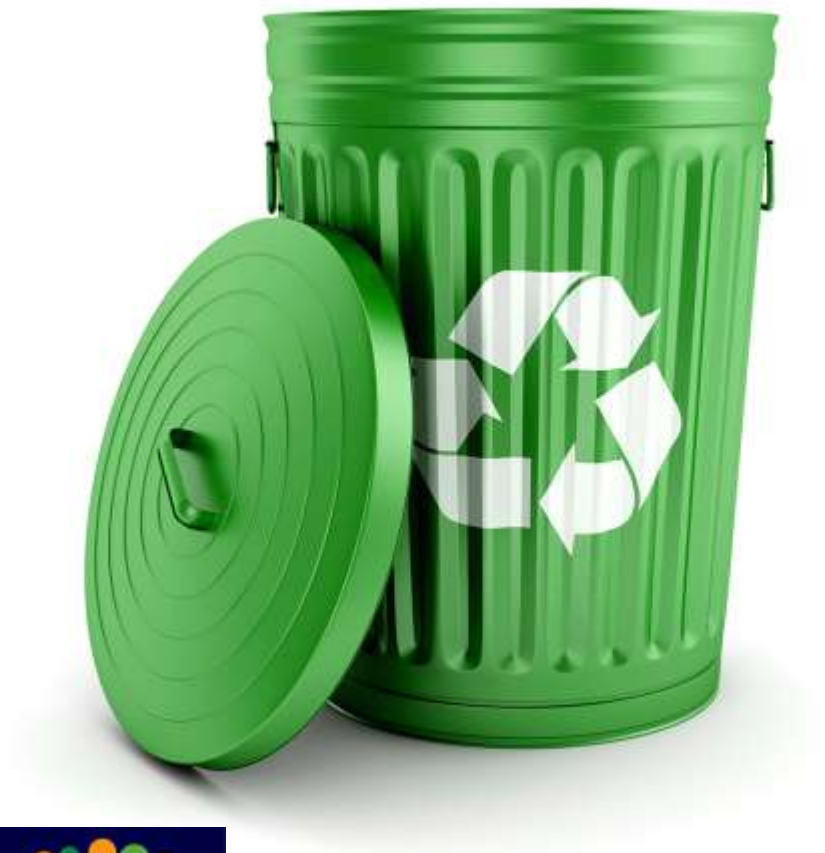
This period is in the process of implementing 7 financing proposals related to eGovernment, sustainable improvement of the tourist product, reduction of carbon footprint, implementation of alternative forms of mobility, enhancement of primary health care, implementation of innovation and new technologies.

Furthermore, is in close cooperation with greek and european institutes trying to implement efficiently its strategic targets.

Finally, it tries to make its strategic plan known to the responsible ministries, in order to claim funding from national resources and programs and also to all public and private sector trying to form the appropriate synergies.

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

Integrated strategic waste management planning



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

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.

The municipality aims to apply a zero waste scenario for its area and become a zero waste and a zero energy municipality.

ZERO WASTE SCENARIO

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

On this basis, the Municipality according to its strategic planning changed its philosophy and perception of dealing with waste management and started treating waste as a useful raw material.

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:

- Reduce waste
- Separation at source
- Recycle
- 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
- Establishment of IT tools for smart waste management

Reduce – Reuse – Recycle. Separation at Source

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.

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

Development of Biomass Plant

The Municipality of Volvi is developing a **biomass plant of 499 KW**, for producing renewable energy from **green biowaste**.

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 tCO_2 (electricity) and 1.093,37 tCO_2 (thermal energy). 5.919,17 tCO_2 in total (approximately **5.15% reduction** for the Municipality as a whole).

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

<u>Development of Biogas Plant</u>

The Municipality of Volvi is also developing **a 150KW Biogas plant**, for producing renewable energy by using the total amount of the **municipal biowaste**.

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 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 1.378,8tCO2 (electricity) and 224,28 tCO2 (thermal energy). 1.603,08 tCO2 in total (approximately **1.4 % reduction** for the Municipality as a whole).

Environmental awareness and knowledge of waste management for citizens and interested stakeholders

Raising awareness about municipal waste management is a critical component of effective waste management. **It is important for citizens and also key stakeholders to be aware of the municipality's waste management activities and have a strong understanding of the benefits of proper waste management.**

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.

Finally, new technology features, smart city platforms, 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.

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

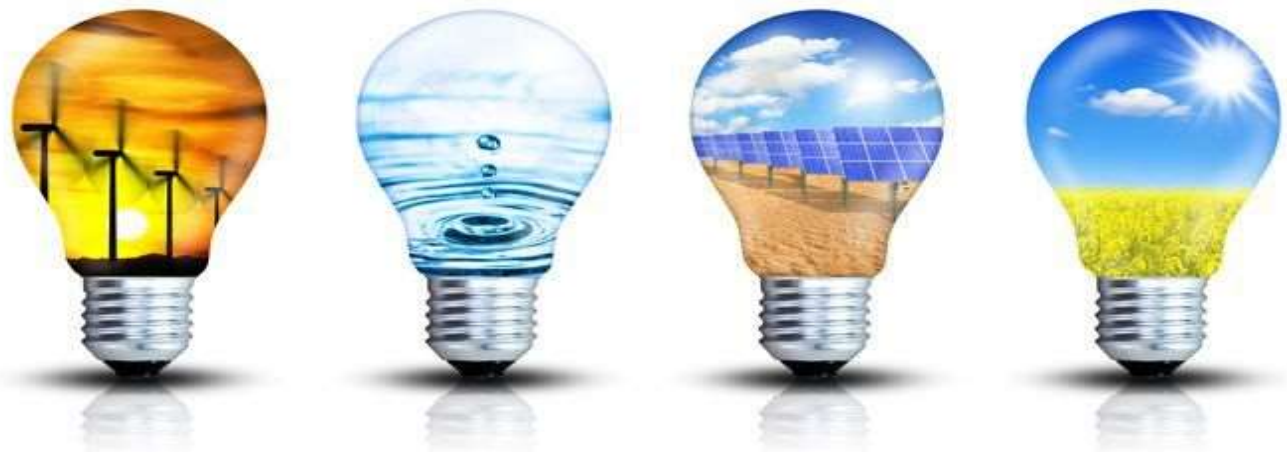
- Financing for the full implementation of the Zero Waste Scenario will derive from co-financed EU and Greek programs, own funds and a combination of private capital and lending.

- The Zero Waste Scenario will eliminate the environmental impacts, will certainly reduce the annual budget at least by 80%, will improve the citizens quality of life, the municipal services provided to them and in general the well-functioning of the municipality.

- 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.

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

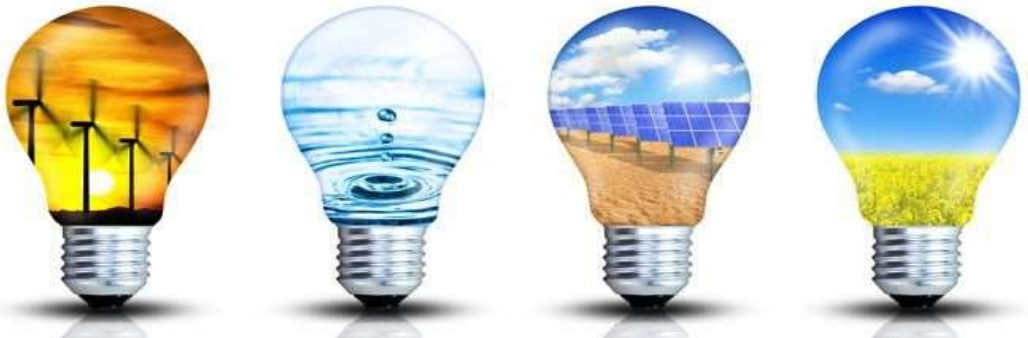
Implementation of Renewable Energy Sources – Zero Energy municipality



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

The municipality is searching to apply environmental friendly solutions and is committed to increase energy efficiency and use of renewable energy sources in its territories.

- Biomass 499kw/Biogas 150kw from urban, livestock, agricultural waste combined with district heating and exploiting the thermal energy produced.
- Photovoltaics in buildings and areas of the municipality, combined where appropriate with net metering.
- Wind farms in the mountainous areas of the municipality

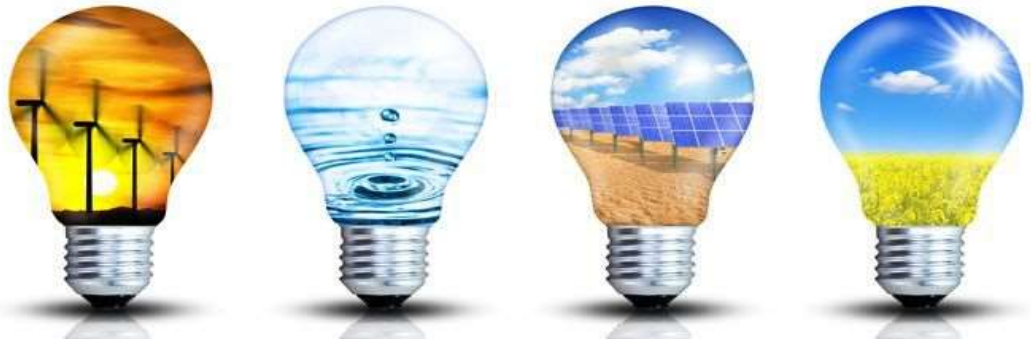


Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

Furthermore it focus on:

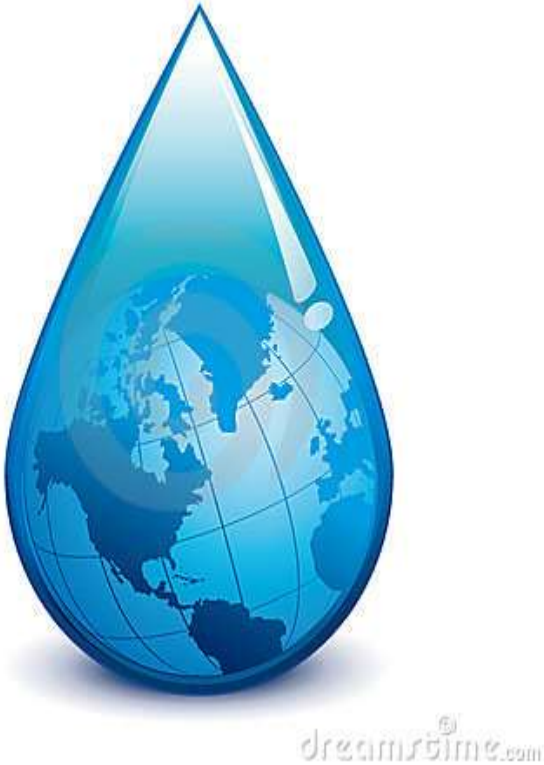
• Exploitation of the geothermal field of Apollonia - Volvi and implementing district heating system.
• Smart energy-saving systems, which will take full advantage of RES, for lighting, facilities (buildings, water pumping and irrigation stations), transport (i.e. hybrid vehicles, eco-fuel, use of bicycle paths, use of ICT).

The Municipality of Volvi is also a member of the Covenant of Mayors and has an approved Sustainable Energy Action Plan.



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

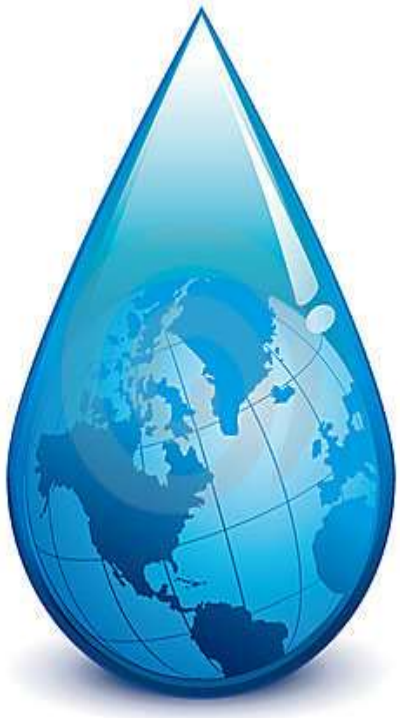
Integrated Water Management



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

Regarding water the municipality has rivers, lakes and sea, and makes efforts to prevent and reduce pollution deriving mainly from agricultural runoff and urban stormwater runoff. It focuses on WATER MANAGEMENT, especially:

- Management and sustainable use of water
- Sustainable management of groundwater
- Implementation of good practices of water management
- Implementation of ICT tools



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

Last but not least the municipality focuses on

- eGovernment
- sustainable improvement of the tourist product
- enhancement of primary health care and e-health

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

smart
URBANA

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

European Commission

Horizon 2020
European Union funding
for Research & Innovation

smart URBANA

CPSE Labs

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

ASIDEES

smart URBANA

Faro

Ajuntament de Calvià Mallorca

NISPOREN CITY HALL

Municipality of Volvi

ALBA IULIA

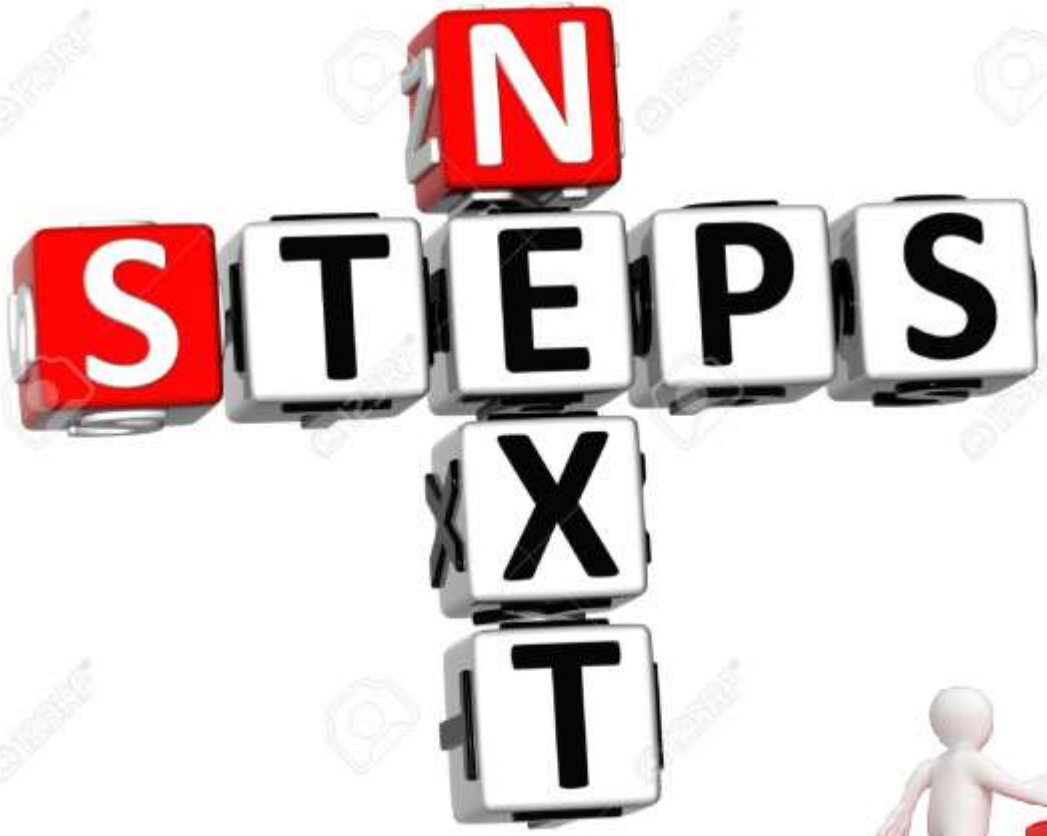
Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

The Municipality of Volvi has at its disposal its SMART CITY MONITOR (SCM):

- for energy management
- for waste management
- for water management
- for handling of emergencies
- for smart mobility
- for strengthening safety and prevention
- for the improvement of tourist services
- for integrated and real time information of citizens and tourists
- for health services

and many others

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"



Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

WASTE MANAGEMENT

- Monitoring of municipal waste transportation
- Optimal routes of waste trucks and road cleaning vehicles
- Informing citizens about the positions of the waste bins, the routes of waste trucks and the times of their transit
- Smart remote monitoring of waste bins, by knowing the fill-level of each of them
- Informing and raising awareness among citizens regarding sustainable waste management

RESULTS

✓Minimize operational and service costs
✓No more manual operations
✓Provide high class services to the citizens
✓Reduce carbon footprint

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

ENERGY MANAGEMENT

- Mapping of the energy grid
- Real time monitoring of municipal energy consumption
- Presentation of energy consumption per each customer
- Calculation of amounts paid by each customer
- Production and consumption of energy produced by RES
- Monitoring of carbon footprint
- Estimation of possible savings by changing "procedures"

RESULTS

✓Minimize operational and service costs
✓No more manual operations
✓Provide high class services to the citizens
✓Reduce carbon footprint

Municipality of Volvi: "Smart City Strategy towards zero waste and zero emission"

WATER MANAGEMENT

- Real time monitoring of the water quality
- Real time monitoring of municipal water consumption
- Track usage and wastage of water at selected points to provide transparency of relevant processes for the stakeholders
- Presentation of water consumption per each customer
- Calculation of amounts paid by each customer
- Real time alert system in case of water leakages in the network
- Estimation of possible savings by changing "procedures"

RESULTS

✓Minimize operational and service costs
✓No more manual operations
✓Provide high class services to the citizens
✓Reduce water footprint

TOURISM - CULTURE

- Establisment of network of hotels, restaurants, bars, etc.
- Smart city monitor to promote hotels, restaurants, bars, museums, other sights of cultural and touristic interest with networking capability while providing multiple services to all stakeholders.
- Proposed selected routes for different types of tourism products: sports tourism, agro tourism, environmental tourism, wealth tourism, religious tourism, etc.
- Mapping of areas of touristic interest

RESULTS

✓Maximize the number of tourists/visitors
✓Provide high class services to tourists/visitors
✓Maximize municipal and stakeholders income

E-Government

- Establishment of on line systems for citizens such as:
  e-Licences
  e-Payments
  e-Announcements
  e-Register
  e-Tax
  e-Information
  e-Public participation
  e-Complaints

RESULTS

✓Minimize costs and time spent
✓Provide high class services to citizens
✓Maximize municipality, stakeholders and citizens co-operation

Health

- Establishment of e-Health system in the smart city platform
- Mapping of hospitals, health care centres, pharmacies, doctors
- Real time information regarding health care services in the municipal area

RESULTS

✓**Provide high class health care services to citizens**

Municipality of Volvi, Stavros, Thessaloniki, 57014, Greece
T *+3023970 61661* F *+3023970 61888* M *+306948305245, +306972848394*
E *consultant@dimosvolvis.gr*
W *www.dimosvolvis.gr*

Municipality of Volvi

"Smart City Strategy towards zero waste and zero emission"

THANK YOU FOR YOUR ATTENTION