LIFE + 2007

CLIM-LOCAL 2020

Volos

Local action plan on climate change

2010 - 2020

Executive summary

Δήμος Βόλου

ΔΕΜΕΚΑΒ

Δ.Ε.Υ.Α.Μ.Β ΒΟΛΟΣ

ΕΠΕΜ
ΕΤΑΙΡΕΙΑ ΠΕΡΙΒΑΛΛΟΝΤΙΚΩΝ ΜΕΛΕΤΩΝ

Climate change is now widely recognized as the major global environmental problem. The continuous build-up of 'greenhouse' gases (GHG) emitted by human activities, especially the increase in carbon dioxide levels due to emissions from fossil fuel combustion, is causing discernible climatic and environmental changes. In the long term these changes threaten to cause serious impacts on humans and the society as a whole. Effects of climate change such as sea level rise, extreme weather events, extended periods of drought and desertification that are likely to be felt in the Mediterranean region, will eventually affect the Volos area as well.

The response to the challenge of climate change is huge for all nations and it is already in the forefront agenda of the European Union. The participation and contribution of local governments in addressing and mitigating climate change is of vital importance, an effort that is strongly supported by the European Commission, technically and financially.

Local governments will be expected to take action in several or all of their possible roles: (a) consumer and service provider, (b) planner and developer and regulator, (c) advisor and motivator and (d) producer and supplier.

A growing number of European cities are taking action to reduce their GHG emissions. Several municipalities have signed voluntary agreements and committed to join forces to help combat climate change, through the implementation of sustainable energy action plans (e.g. Covenant of Mayors). Energy-related actions are the key measures of the action plans, considering the fact that cities consume ~80% of the world's energy.

In this context, a dedicated EU LIFE+2007 project, titled "Developing Local Plans for Climate Change Mitigation by 2020 (CLIM-LOCAL2020)", has been jointly launched between the Municipality of Volos, the Municipal Enterprise for Water Supply and Sewage Treatment of the greater Volos Area (DEYAMV), the Volos Municipal Enterprise for Urban Studies, Construction and Development (DEMEKAV) and the private environmental consulting firm EPEM SA. The project started in the beginning of 2009 and its main objective is to develop a systematic approach and appropriate tools, which will enable local authorities to substantially reduce greenhouse gases emissions in their region up to 2020, The project will be applied in the greater Volos area on a pilot basis. Further information is available on the CLIM-LOCAL2020 project's website http://www.epem.gr/climlocal.

The overall goal of the Local Action Plan on Climate Change is the reduction of greenhouse gases (GHG) emissions, which will have ancillary environmental benefits especially with respect to air pollution control and air quality improvements. The following principles as guidelines for action on climate change are recognised:

- The reduction of GHG emissions taking into account the economical, technical and administrative capacities of the Municipality of Volos and the involved key actors.

- The improvement of the quality of life taking into consideration the relevance of GHG reduction measures to other environmental problems of the city, such as air quality, transportation, urban solid waste and sewage management and land planning.
- The need to help the city to better adjust to climate change.

The Action Plan is wide enough to cover not only energy consumption and carbon dioxide (CO_2) emissions, but all greenhouse gases (GHG) and all the sectors of the economy that emit GHG emissions, in line with the national inventories, obligations and programmes for GHG emissions.

The Plan includes the activities of the greater Volos area that emit GHG emissions, but do not operate under specific national legal or institutional rules. In this context, the Plan does not include:

- The industrial installations, since they participate in the EU Emission Trading System
- The operation of the Volos port, since specific binding rules on fuels, navigation, ship engines etc, exist at a national level
- The transit vehicles operating in the greater Volos area that are not owned by residents nor do service local needs

Additionally, the Action Plan does not include measures for the agro-industry sector, since this sector has a minor share to the total GHG emissions of Volos that is an urban area.

Electricity, apart from the power generation options that cannot be influenced by local authorities, is a distinct sector, given that reductions in consumption of electricity have direct beneficial effects on the local community and economy and enhance local contribution to national targets.

Considering the national GHG emission obligations and the carbon footprint of the Volos area, **the overall goal of the Local Action Plan on Climate Change for the greater Volos area is to reduce GHG emissions by 7% below 2007 levels, by 2020.**

According to current estimations, **greenhouse gas emissions will be reduced by 70 thousand tonnes CO_2 eq, by 2020.**

The measures are grouped in six sectors / emission sources: buildings, transportation, water supply and sanitation, municipal solid waste, city operation and prospect actions.

(A) Buildings	The measures aim at enhancing the energy efficiency of the buildings through energy conservation, renewable energy applications (e.g. solar collectors, photovoltaics) and energy efficient systems (e.g. cogeneration). The proposed actions refer to (i) building shell (ii) cooling and air conditioning systems, (iii) energy generation and consumption and (iv) new building infrastructure.
(B) Transportation	The measures focus on three action targets: (i) increase energy efficiency of municipal vehicle fleet (ii) invest in transit improvements and infrastructure (iii) initiatives to citizens
(C) Water supply and sanitation	The measures mostly relate to the operation of DEYAMV enterprise (apart from its buildings and vehicles). The activities under consideration are the water supply system, the sewage treatment plant and the energy production from renewable energy sources.
(D) Municipal solid waste management	This sector provides measures to increase paper and biodegradable waste recycling. These two solid waste fractions significantly contribute to methane emissions when disposed to landfills.
(E) City operation	This sector includes measures that reduce energy consumption in public lighting and adaptation measures (urban tree planting).
(F) Prospect actions	This sector provides the actions to be taken for the infrastructure of the Mediterranean Games that will take place in Volos, in 2013, including prospects in regards to land rehabilitation.

The actors responsible for implementing the measures are classified in four broad categories, which are presented below.

- **Local government (LOCAL GOV):** Municipality of Volos (and potentially other adjacent municipalities, whenever feasible). The Municipality of Volos will have the central role in the implementation, coordination and monitoring of the proposed measures. In addition, the Municipality of Volos will support the promotion of the actions that will be taken by residents and enterprises. The latter could be realized through awareness campaigns and active policies (e.g. municipal taxes).
- **Public sector (PUB):** public utilities such as DEYAMV (Municipal Enterprise for Water Supply & Effluent Treatment and Discharge in the greater Volos area), DEMEKAV (Volos Municipal Enterprise for Urban Studies, Construction & Development), University of Thessaly and the General Hospital of Volos. DEYAMV has a discrete role for the actions of the sector 'water supply and sanitation'.

- **Private sector (PRIV):** enterprises of the tertiary sector such as banks, hotels, commercial shops, offices etc.
- **Residents (RES):** citizens of the greater Volos area.

The measures are presented per sector/emission source in the first column of the list. The next six columns refer to the actors responsible for implementing the measures. The measures are also grouped into three priority categories (high, medium, low priority).

GHG Emission Reduction Measures		LOCAL GOV		DEYAMV	PUB	PRIV	RES
		Pub. buildings	Schools				
A. BUILDINGS							
A1	Roof and external wall insulation	✓	✓		✓	✓	✓
A2	Replacement of window/door frames & glazing	✓	✓		✓	✓	✓
A3	Green roofs						✓
A4	Replacement of low efficiency A/C units	✓		✓	✓		✓
A5	External shading	✓		✓	✓	✓	
A6	Ceiling fans	✓		✓	✓		✓
A7	Solar cooling			✓			
A8	Replacement of low efficiency diesel boilers	✓	✓		✓	✓	✓
A9	Increased penetration of natural gas use				✓	✓	✓
A10	Regular maintenance of boilers						✓
A11	Solar collectors for space & water heating					✓	✓
A12	Solar collectors for water heating only				✓	✓	✓
A13	Photovoltaics	✓	✓	✓	✓	✓	✓
A14	Co-generation				✓		
A15	Intelligent indoor temperature management system						✓
A16	Replacement of low efficiency bulbs	✓	✓	✓	✓	✓	✓
A17	Light control automation systems	✓	✓	✓	✓	✓	✓
A18	Energy efficient office and home electrical appliances	✓	✓	✓	✓	✓	✓
A19	Non-technical energy conservation measures	✓	✓				✓
A20	Installation of Building Management Systems (BMS) - new construction	✓			✓		
A21	Bioclimatic buildings - new construction	✓				✓	✓
B. TRANSPORTATION							
B1	Replacement of old municipal passenger cars with hybrid ones	✓					
B2	Renewal of heavy duty vehicles fleet	✓					

GHG Emission Reduction Measures		LOCAL GOV		DEYAMV	PUB	PRIV	RES
		Pub. buildings	Schools				
B3	Renewal of garbage truck fleet	✓					
B4	Renewal of DEYAMV vehicle fleet			✓			
B5	Municipal bicycle rental system	✓					
B6	Extension of bicycle lane network	✓					
B7	Extension of the pedestrian walkways	✓					
B8	New car parking stations	✓					
B9	Urban buses - new low emissions compact buses					✓	
B10	Urban buses - redesign of bus lines					✓	
B11	Tram construction				✓		
B12	Eco-driving	✓		✓	✓	✓	✓
B13	Car pooling						✓
C. WATER SUPPLY AND SANITATION							
C1	Reduction of water consumption through advertising campaigns			✓			
C2	Optimisation of water supply system through the installation of electromagnetic water meters of direct reading, etc.			✓			
C3	Changes in the electromechanical equipment (pumps, etc) / upgrading of the water pumping stations			✓			
C4	Minimisation of parasitic inflow into the sewer system			✓			
C5	Changes in the electromechanical equipment (pumps, etc) / upgrading of the sewage pumping stations			✓			
C6	Upgrading of the electromechanical equipment of sewage treatment plant			✓			
C7	Further sludge treatment – possible further energy recovery			✓			
C8	Utilisation of potential energy in surface waters to produce electricity– application of renewable energy systems			✓			
D. MUNICIPAL SOLID WASTE MANAGEMENT							
D1	Expansion of paper recycling	✓					
D2	Biodegradable waste recycling	✓					
E. CITY OPERATION							
E1	Replacement of low efficiency bulbs in street lighting	✓					
E2	Automation in street lighting	✓					
E3	Tree planting/ green spaces	✓					

GHG Emission Reduction Measures		LOCAL GOV		DEYAMV	PUB	PRIV	RES
		Pub. buildings	Schools				
F. PROSPECT ACTIONS							
F1	Mediterranean Games' Infrastructure – Mediterranean Village	✓			✓	✓	
F2	Land rehabilitation	✓			✓		

Priority	High	Medium	Low

The Municipality of Volos is responsible for the progressive implementation of the Local Action Plan to the extent that the described actions concern the operation of the Municipality itself or the municipal enterprises in which it participates.

For the actions that are under other actors' responsibility (e.g. residents, private enterprises), the Municipality of Volos will support the implementation of the actions through promotional campaigns to raise awareness and facilitate sharing of know-how. At the same time, it will proceed to public awareness campaigns on climate change on a regular basis.

The Municipality of Volos undertakes the responsibility to monitor the implementation of the Action Plan and regularly report on the progress and the results obtained. The review of the Action Plan, where required, will be realised following consultation with the public and all other key stakeholders.