LIFE Project Number

LIFE07 ENV/GR/000282

Mid-term Report
Covering the project activities from 01/01/2009 to 15/06/2010

Reporting Date

01/07/2010

LIFE + PROJECT NAME

Developing Local Plans for Climate Change Mitigation by 2020 (CLIM-LOCAL2020)

Data Project

Project location	Municipality of Volos
Project start date:	01/01/2009
Project end date:	31/12/2011 **Extension date:** -
Total budget	2.777.891 €
EC contribution:	1.086.542 €
(%) of eligible costs	49,88

Data Beneficiary

Name Beneficiary	Municipality of Volos
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Project Website	http://www.epem.gr/climlocal/

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2. List of key-words and abbreviations

2.1. Key-words

Climate Change

Greenhouse Gases

GHG emission reduction measures

Local Action Plan

Monitoring Plan

2.2. Abbreviations

B/C	Benefit to Cost ratio
BaU	Business as Usual
CBA	Cost Benefit Analysis
CORINAIR	CORe INventory of AIR emissions
DEMEKAV	Volos Municipal Enterprise for Urban Studies, Construction and Development
DEYAMV	Municipal Enterprise for Water Supply and Sewage Treatment of the greater Volos Area
EC	European Commission
EMEP	Co-operative programme for monitoring and evaluation of the long range transmission of air pollutants in Europe, linked to the Convention on Long-range Transboundary Air Pollution
EU	European Union
GHG	Greenhouse Gases
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LAP	Local Action Plan
MINENV	(Greek) Ministry of Environment, Physical Planning and Public Works
MP	Monitoring Plan
SWOT	Strengths- Weaknesses- Opportunities - Threats analysis
UNFCCC	United Nations Convention on Climate Change

3. Executive summary

CLIM-LOCAL2020 is a joint project 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 consulting firm Environmental Planning, Engineering and Management (EPEM SA).

The project is implemented in the Municipality of Volos (Region of Thessalia, in central Greece), with a population of ~100.000 and a surface of ~28 km^2.

The project's main objectives include:

- Develop the appropriate tools which will enable local authorities to substantially reduce Greenhouse Gases (GHG) emissions in their region
- Develop appropriate monitoring and assessment activities related to GHG emissions reduction at local level
- Promote awareness, provide training and disseminate of information on climate change and its mitigation
- Initiate GHG emission reductions at local level (Municipality of Volos) within a 10-15 years horizon with the active participation of citizens

The present Mid-term Report describes the activities of the CLIM-LOCAL2020 project from its beginning until the June 2010, including administrative (chapter 4), technical (chapter 5) and financial (chapter 6) issues. Specific deliverables and support material are attached in the Annex.

3.1. General progress

The CLIM-LOCAL2020 project was initiated on 1/1/2009. Until the date covered by the present inception report (15/6/2010), the following Actions have been completed:

- Action 1: Calculation of present local GHG emissions (31/3/2009)
- Action 2: Projection of local GHG emissions (15/7/2009)
- Action 3: Identification of GHG emissions reduction options (31/7/2009)
- Action 4: Economic and environmental evaluation of GHG emission reduction measures (30/11/2009)
- Action 5: Defining priorities for GHG emissions reduction measures (20/1/2010)
- Action 6: Public consultation and finalization of Local Action Plan (LAP) (15/5/2010)

Additionally, the following Actions have started and are ongoing:

- Action 7: Implementation of measures in the LAP (to be completed by 15/8/2011)
- Action 8: Communication and dissemination (to be completed by 31/12/2011)
- Action 10: Project management (to be completed by 31/12/2011)
- Action 11: Project monitoring and evaluation (to be completed by 31/12/2011)

In later stages of the project, the following Actions will start.

- Action 9: Overall evaluation of the LAP's progress and planning of its future operation (to start by 16/8/2011)
- Action 12: Audit (to start by 1/12/2011)
- Action 13: After LIFE (to start by 1/1/2012)

Until today the project has been elaborated in relative accordance to the proposed timetable (please refer to page 33) with minimum deviations and it is on track towards achieving its objectives. The Project Team was established in the early beginning of the project (actually the kickoff meeting was held before the official project start date, on 19/12/2008) and it consists of the Project Management Team, the Project Monitoring and Evaluation Team and the specific Action Teams (with their respective Action Leaders).

Two meetings were held so far with the External Monitoring Team:

- The 1st meeting was held on 26/6/2009. According to the meeting's outcome and the subsequent EC correspondence, the project's deliverables and milestones were revised in order to fully reflect the foreseen activities of the entire project Actions, according to the EC instructions (EC letter of 24/8/2009, ref. 629094) and the actual project implementation.
- The 2nd meeting was held on 11/3/2010.

In the following tables the updated deliverables and milestones are presented (all the modifications and new entries – after the ones presented in the Inception Report – are with ***bold & italics***):

Name of the Deliverable	Action	Deadline
Project web-site	8	15/2/2009
Set of emission calculation tools	1	31/3/2009
Local inventory for GHG emissions	1	31/3/2009
Projection models	2	15/7/2009
Report with projections of GHG emissions up to 2020	2	15/7/2009
Manual for the tool packages	***1 & 2***	***31/5/2010***
Personnel training material for the developed tools	***1 & 2***	***31/5/2010***
List of GHG emissions reduction measures	3	30/7/2009
SWOT analysis	3	30/7/2009
Inception report	10	1/10/2009
CBA report	4	***31/11/2009***
Report with classification of measures into priority categories	5	***20/01/2010***
Local Action Plan (LAP) for GHG emissions reduction	6	***26/4/2010***
LAP's monitoring plan	***6***	***31/5/2010***
Practical guidelines for the LAP measures	***6***	***31/5/2010***
Mid-term report	10	1/7/2010
Intermediate assessment report on LAP's implementation	7	31/1/2011
Progress report	10	1/4/2011

Name of the Deliverable	Action	Deadline
Final assessment report on LAP's implementation	9	15/8/2011
Report with next steps and responsibilities for LAP's implementation after the end of the LIFE+ project	9	30/9/2011
Financial project audit	12	31/12/2011
Final report with payment request	10	31/3/2012
After-LIFE communication plan	13	29/2/2012

Name of the Milestone	Action	Deadline
Definition of methodologies for the calculation of GHG emissions	1	31/1/2009
Completion of local energy balance	1	15/2/2009
Completion of inventory	1	15/3/2009
Agreement on the final list of GHG emissions reduction measures	3	30/7/2009
Development of progress monitoring questionnaire	11	15/10/2009
CBA results	4	***15/11/2009***
Decision on criteria and their relative weight	5	***30/11/2009***
Completion of public consultation on LAP	6	***31/3/2010***
Completion of LAP	6	***26/4/2010***
Completion of necessary preparatory actions	7	***30/9/2010***
Intermediate assessment on LAP's implementation	7	31/1/2011
Final assessment on LAP's implementation	9	15/8/2011
Agreement on the synthesis of the management committee for the future implementation of LAP	9	15/9/2011
Completion of final project workshop	8	20/12/2011
Completion of final project report	10	29/2/2012

3.2. Assessment as to whether the project objectives and work plan are still viable

The project's main objective is the actual contribution in the global action against climate change, by reducing GHG emissions in the Municipality of Volos.

Through the elaboration of Action 6, a Local Action Plan (LAP) was developed. The LAP was presented to the public (two workshops / public consultation) and was finally approved by the Municipal Council on 26/4/2010. The LAP explicitly describes a set of climate change mitigation actions and measures.

The implementation of these actions and measures will eventually lead to 7% GHG emissions reduction at local level by 2020, compared to the emissions of 2007 (~70.000 tons CO_2 eq).

By the end of the project, the actual emission reductions, due to the specific measures that will have been implemented within the projects scope, will be quantified.

As of June 2010, and upon the successful completion of Actions 1 through 6, all the deliverables that were foreseen by the proposal, as well as the ones that were agreed to be

presented (according to the instructions of the EC LIFE Unit and the External Monitoring Team), were completed. They are included in the present Midterm Report (Annex 7.1).

These deliverables (reports, tools and methodologies) will enable the project beneficiaries (Municipality of Volos, DEYAMV and DEMEKAV), as well as other local authorities that will be interested in the future, to substantially reduce GHG emissions in their region, according to the specific provisions of the LAP, as well as to appropriate monitor and assess these activities.

Moreover, the implementation of training activities (12/2/2009, 15/5/2009, 10/7/2009 and 22/6/2010), the development of the project website (**http://www.epem.gr/climlocal/**), the dissemination material and the workshops / public consultation events / press release, all proved very successful within the overall effort to promote awareness, provide training and disseminate information on climate change and its mitigation, as well as on the CLIM-LOCAL2020 objectives and goals.

As such, the Project Team strongly believes that the CLIM-LOCAL2020 objectives and work plan are viable.

3.3. Problems encountered

As mentioned in the Inception Report, the main technical problems encountered during the first 18 months of the project implementation were related to the acquisition of data from various sources. Besides the involvement of the major municipal organizations in the project area and the experience of the project personnel in carrying out similar researches, the actual time needed for data collection proved limited for Actions 2 and 4.

More specifically, during the implementation of Action 2 significant delays were encountered for the gathering of data that would allow the estimation of future GHG emissions. There was a need to collect all the “Operational Plans” from various competent local authorities, plans for the “2013 Mediterranean Games” to be held in the city of Volos and to have extensive discussions with various local decision makers. Also, significant time was needed for the “fine tuning” of data from energy balance inventories. As a result, Action 2 was delayed and was finally completed on 15/7/2009, instead of the originally proposed deadline of 15/5/2009.

During the implementation of Action 3, concerning the “Identification of GHG emissions reduction options”, significant time was spent for consultation with local authorities and stakeholders on the “List of GHG emissions options”. It was decided to hold a workshop in Volos on 29/6/2009, in order for the project beneficiaries to present the list of possible GHG emissions reduction options and relevant measures. This resulted in a delay of 1 month and Action 3 was completed on 30/7/2009, instead of the originally proposed deadline of 30/6/2009.

The above-mentioned delays, as well as the fact that the month of August consists a month of low productivity due to the summer holidays, urged the Project Management Team to reconsider the work plan concerning Action 4 (Economic and environmental evaluation of GHG emission reduction measures). As such, Action 4 started its implementation on 1/6/2009 instead of the originally proposed start of 1/7/2009. However, due to delays in data collection, especially concerning data from the sectors “buildings” and “water supply and sanitation”, Action 4 was finalised on 30/11/2009, instead of the originally proposed deadline of 30/9/2009.

The above-mentioned delays resulted in small delays in Actions 5 and 6, respectively (please refer to the timetable in page 33). Action 6 (Public consultation and finalization of the Local Action Plan) was concluded on 26/4/2010, since it involved the approval of the LAP by the Municipal Council of Volos.

Overall, these delays will not affect the timely completion of the project. No prolongation of the project will be required.

In respect to the financial issues, a delay occurred from the financial department of the Municipality of Volos, concerning its timely adjustment in the project. Due to the fact that the implementation of the LAP (Action 7) is starting now, which involves the acquisition of equipment (~1/3 of the total project budget), the majority of the project's expenses are expected to occur in the forthcoming months.

Concerning the organizational issues, the main problem was that the Municipality of Volos was not very experienced in managing projects of such magnitude and of the specific – state of the art – background. Despite the strong commitment and continuous involvement of both the Mayor (Mr. Alexandros Voulgaris) and the Vice-Mayor (Mr. Dimiris Dervenis) of the Municipality of Volos, in the project, there was a need of further support to the Project Manager, which was provided by the other beneficiaries (mainly EPEM SA).

Different measures were taken in order to solve the encountered problems. The limited availability of statistical data at local and regional level was a barrier in examining past trends and estimating their change in the next 10-15 years (Action 2). In certain cases where, despite the efforts made, the evolution of a selected driver in the past could not be assessed, the future trends assumed at national level (within the framework of national GHG emissions projections) were utilised, using modifications to take into account local circumstances. The limited technical knowledge of some decision-makers and stakeholders on GHG emissions reduction options was supported by the provision of information during the meetings, the 2 training sessions and the workshop that took place. Finally, the organizational problems were resolved internally, with the provision of support by EPEM (the beneficiary from the private sector, which was very experienced in managing such projects) in the framework of the operation of the Project Management Team.

4. Administrative part

4.1. Description of project management

The role of the CLIM-LOCAL2020 Project manager and Project Management (PM) Team is to ensure that all project actions are being carried out according to the time schedule foreseen, their output is consistent with the project proposal made and is of high quality, all partners share information, the finances of the project are properly managed, progress reports and other material (to be posted on the project web-site, to be used in public consultation etc.) is prepared in due time and there is effective reporting to the EC on project progress.

The PM team is responsible for the overall implementation and co-ordination of the project actions, especially with regards to the initiation and completion of the each planned activity according to the agreed timetable, and the accounting and financial management. The PM team is also responsible for the communication with the EC and the submission the respective reports. The PM team cooperates with the Monitoring and Evaluation Team (Action 11) and all the Action Teams.

During the first 18 months of the project elaboration, the following meetings were organized in Volos for Project Management / Monitoring purposes:

- 19/12/2008 (kickoff meeting)
- 4/2/2009
- 8/5/2009
- 16/6/2009
- 26/6/2009 (meeting with the External Monitoring Team)
- 2/11/2009
- 11/3/2010 (meeting with the External Monitoring Team)
- 22/6/2010

The PM team also participated:

- in various meetings with the project's Action Teams (12 – 13/2/2009, 15/5/2009, 29/6/2009, 10/7/2009, 25/9/2009, 23/11/2009, 18/2/2010, 11/3/2010 and 22/6/2010), concerning the elaboration of the respective Actions
- in the EC LIFE07 Kick-off Meeting (held in Athens on 5/3/2009)
- in the training sessions (12/2/2009, 15/5/2009, 10/7/2009 and 22/6/2010)
- in the local workshop (held in the city of Volos on 29/6/2009)
- in the project's press release (held in the city of Volos on 18/2/2010)
- in the local workshop / public consultation for the LAP (held in the city of Volos on 12/3/2010)
- in the Municipal Council meeting (held in the Municipality of Volos on 26/4/2010)

Obviously, frequent e-mails and phone calls were also exchanged among the members of the PM Team, as well as between the PM Team and the Action Teams.

The PM Team, especially through the assistance of the Vice-Mayor of the Municipality of Volos, was in close co-operation with all stakeholders, in order to promote the efficient application of the project and the fulfilment of its objectives and anticipated results (e.g. Regional Authorities, Public Power Corporation, Natural Gas Supply Corporation of Thessaly region, Solid Waste Management Association (SYDISA) of the Magnesia Prefecture etc)

In addition, the PM Team has started specific actions towards the CLIM-LOCAL2020 project participation in networking of other LIFE projects related to climate change (SMAQ and MEDCLIMA). Unfortunately, due to time and personnel availability restrictions, it was not possible to participate in the LIFE Climate Change seminar (18-19/1/2010, Helsinki).

Other actions taken by the PM Team included the decisions to extend the implementation period for Actions 2, 3, 4, 5 and 6, which have already been completed. Additionally, it was decided to start Action 4 earlier than the originally planned date.

The PM Team also suggested, and finally organized, the workshop that was held in Volos on 29/6/09, as an addition to the proposed workshop that was originally planned for Action 6 (as a public consultation meeting). The workshop was very important and proved very crucial for the finalization of the "List of GHG emissions reduction options" (Action 3), since it provided valuable comments and ideas from the participating local stakeholders.

Moreover, the PM Team suggested and organized a press release that was held in the city of Volos on 18/2/2010, in order to promote the local workshop / public consultation event (held in the city of Volos on 12/3/2010) for the presentation and finalization of the Local Action Plan.

During the period up to the present Midterm Report, and especially during the first months of the project elaboration, the PM Team initiated all the necessary actions for the financial management of the project. As such, the following were implemented:

- Official decisions of the Municipal Council of Volos and the Managing Boards of DEYAMV and DEMEKAV, concerning their participation in the project (submitted in the Annex of the Inception Report)
- Formulation and respective signing of the Contracts between:
  - The Municipality of Volos and DEYAMV
  - The Municipality of Volos and DEMEKAV
  - The Municipality of Volos and EPEM SA

  These contracts were submitted in the Annex of the Inception report.
- Formulation of "standard" Contracts to be used for the personnel with "Service Contracts" and for the "External Assistance".
- Formulation of timesheets to be used by the project's personnel.
- Assistance to the beneficiaries' financial departments, in order to communicate the project's financial requirements.
- Official decision of the Municipal Council of Volos for the adoption of the LAP (26/4/2010)

Finally, it should be mentioned that, following the 2 meetings with the External Monitoring Team (26/6/2009 and 11/3/2010) and the EC-LIFE Unit correspondence (24/8/2009), the project's reporting schedule was revised as follows:

- Inception Report: submitted on 1/10/2009
- Mid-Term Report: submitted on 19/7/2010
- Progress Report: due 1/4/2011
- Final Report: due 31/3/2012

4.2. Changes in the project's management structure

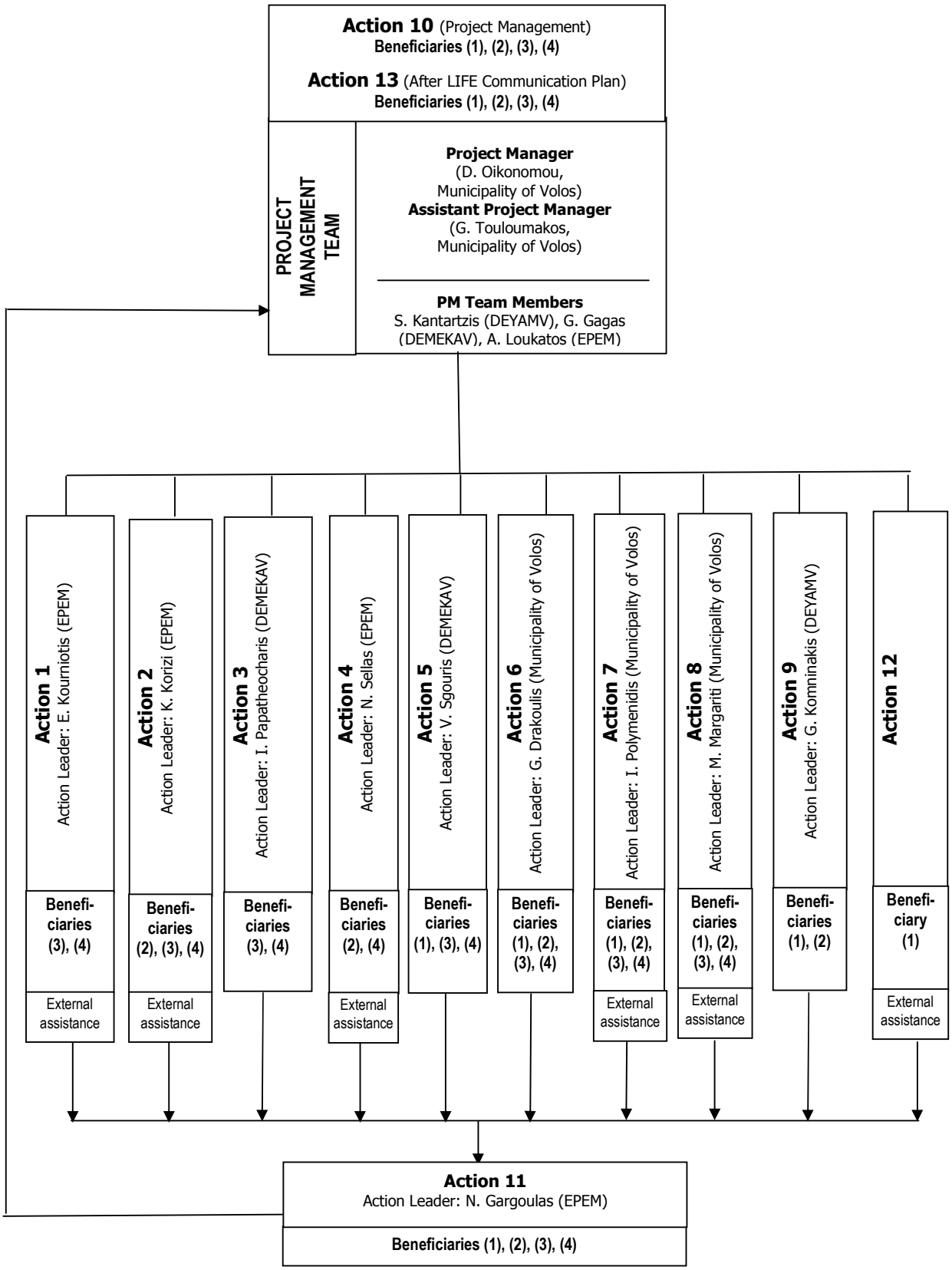
There were no changes in the project's management structure

4.3. Organigramme of the project team and project management structure

The organigramme of the project team is displayed in the following page.

The PM team is coordinated by the Project Manager (Ms. Despina Oikonomou) and the Assistant Project Manager (Mr. George Touloumakos), both from the coordinating beneficiary (Municipality of Volos). The Project Manager is working full-time in the project. The PM team also comprises 3 more members, one from each associated beneficiary, namely Mr. Stefanos Kantartzis (DEYAMV), Mr. George Gagas (DEMEKAV) and Mr. Andreas Loukatos (EPEM).

It should be noted that the Vice-Mayor of the Municipality of Volos (Mr. Dimitris Dervenis), is significantly and continually assisting the PM team.


Action 10 (Project Management)
Beneficiaries (1), (2), (3), (4)
Action 13 (After LIFE Communication Plan)
Beneficiaries (1), (2), (3), (4)
PROJECT MANAGEMENT TEAM
Project Manager
(D. Oikonomou, Municipality of Volos)
Assistant Project Manager
(G. Touloumakos, Municipality of Volos)
PM Team Members
S. Kantartzis (DEYAMV), G. Gagas (DEMEKAV), A. Loukatos (EPEM)
Action 1
Action Leader: E. Koumiotis (EPEM)
Beneficiaries (3), (4)
External assistance
Action 2
Action Leader: K. Korizi (EPEM)
Beneficiaries (2), (3), (4)
External assistance
Action 3
Action Leader: I. Papatheocharis (DEMEKAV)
Beneficiaries (3), (4)
Action 4
Action Leader: N. Sellas (EPEM)
Beneficiaries (2), (4)
External assistance
Action 5
Action Leader: V. Sgouris (DEMEKAV)
Beneficiaries (1), (3), (4)
Action 6
Action Leader: G. Drakoulis (Municipality of Volos)
Beneficiaries (1), (2), (3), (4)
Action 7
Action Leader: I. Polymenidis (Municipality of Volos)
Beneficiaries (1), (2), (3), (4)
External assistance
Action 8
Action Leader: M. Margariti (Municipality of Volos)
Beneficiaries (1), (2), (3), (4)
External assistance
Action 9
Action Leader: G. Komninakis (DEYAMV)
Beneficiaries (1), (2)
Action 12
Beneficiary (1)
External assistance
Action 11
Action Leader: N. Gargoulas (EPEM)
Beneficiaries (1), (2), (3), (4)

4.4. Reports delivered since the start of the project

As of the beginning of the project, the following reports were delivered:

1. Inception report (1/10/2009), which included as Annexes:
   i. Local inventory for GHG emissions (Action 1)
   ii. Projections of GHG emissions up to 2020 (Action 2)
   iii. Tool package (Actions 1 & 2) [in electronic format only]
   iv. List of GHG emission reduction measures (Action 3)
   v. Report on the Presentation of proposed GHG emission reduction measures and SWOT analysis (Action 3)
   vi. CBA report / partial results (Action 4)
2. Midterm report (17/6/2010), which includes as Annexes:
   i. Local inventory for GHG emissions (Action 1)
   ii. Projections of GHG emissions up to 2020 (Action 2)
   iii. Tool package (Actions 1 & 2) [submitted only in electronic format]
   iv. Manual of tool package (Actions 1 & 2)
   v. Personnel training material (Actions 1 & 2)
   vi. List of GHG emission reduction measures (Action 3)
   vii. Presentation of GHG emission reduction measures / SWOT analysis (Action 3)
   viii. CBA report (Action 4)
   ix. Report with classification of measures into priority categories (Action 5)
   x. Local action plan (LAP) on climate change (Action 6)
   xi. LAP's monitoring plan (Action 6)
   xii. Practical guidelines of LAP's measures (Action 6)

4.5. Envisaged extension of the project duration

No extension of the project duration is needed or envisioned.

5. Technical part

Climate change is already happening and it represents one of the greatest environmental, social and economic threats that our planet is facing. During the last 100 years, increased greenhouse gases (GHG) in the atmosphere have caused the temperature of the earth to rise by 0.6°C. The 10 warmest years of the 20th century all occurred in the last 15 years, and 1998 was the warmest year on record. Thermal expansion and glacier melting are causing sea levels to rise, exposing populations to increased risk of flooding. In Greece, as in other regions of the world, patterns of precipitation are changing, with greater likelihood of extreme events and more areas subject to water stress, with consequences for agricultural production. Developing countries are particularly at risk. Global temperature will continue to increase causing further disruption to climate patterns. Ultimately all this can only be brought under control by stabilising GHG concentrations in the atmosphere.

At international level, the Kyoto Protocol (1997) is the first step towards combating climate change for the period 2008-2012, whereas negotiations are in progress regarding future commitment for the period after 2012. The European Union (EU) has long been at the forefront of international actions against climate change. In 2007, EU leaders have set the EU's position on post 2012 global action to combat climate change and committed to achieve at least 20% reduction of 1990 GHG emissions levels by 2020 and start transforming Europe into a highly energy-efficient, low-carbon economy.

Local government has a key role to play in this agenda. Within a supportive context, local authorities can make an important contribution to respond to climate change and have huge opportunity to help make national climate change targets a reality. Since the local authorities are closest to citizens and can often deal more effectively with regional characteristics than the central administration, a major challenge towards a sustainable energy future and climate change mitigation is to stimulate the local potential for GHG emissions reductions through a set of systematic, well-designed and well-monitored activities, which can have significant ancillary benefits for local environmental problems as well. Working towards this future can lead to multiple benefits for local authorities and their communities: improvements in living conditions, quality of life, strengthening of local economy and positive impact on local employment.

The "CLIM-LOCAL2020" project aims at the active participation of local authorities in the efforts made for climate protection. The project objectives are to:

1- Develop a systematic approach and appropriate tools which will enable local authorities to substantially reduce GHG emissions in their region
2- Develop appropriate monitoring and assessment activities related to GHG emissions reduction at local level, which can serve as a guide to other local authorities
3- Clearly identify the interface between local authorities and central administration with respect to climate change mitigation and the main barriers imposed at local level when taking measures for reducing GHG emissions.
4- Promote awareness, provide training and disseminate of information on climate change and its mitigation, which is necessary for the active participation of citizens and local stakeholders in any mitigation effort.
5- Initiate GHG emission reductions at local level within a 10-15 years horizon and with the active participation of citizens.

5.1. Actions

This report covers the actions that have taken place within the midterm of the project (01/01/2009 – 15/06/2010). This period involves the implementation of ten Actions, namely:

Action 1	Calculation of present local GHG emissions
Action 2	Projection of local GHG emissions
Action 3	Identification of GHG emissions reduction options
Action 4	Economic and environmental evaluation of GHG emission reduction measures
Action 5	Defining priorities for GHG emissions reduction measures
Action 6	Public consultation and finalization of Local Action Plan (LAP)
Action 7	Implementation of measures in the LAP
Action 8	Communication and dissemination
Action 10	Project Management
Action 11	Project Monitoring and evaluation

5.1.1. Action 1: Calculation of present local GHG emissions

Planned duration: 01/01/09 – 31/03/09

Implemented: 01/01/09 – 31/03/09

Status: Completed

Deliverables:

a. Local inventory report for GHG emissions

b. Set of emission calculation tools *(delivered as compact package with the deliverable 'Projection Models' of Action 2)*, including the Manual of the Tool Package

Description of the fulfilled activities:

The first Action of the project was implemented according to the time schedule and the work plan. The Action aimed at the calculation of present GHG emissions that are generated in the greater Volos area (municipalities of Volos, Nea Ionia and Esonia), taking 2007 as the base year. The outcomes of Action 1 (together with the results of Action 2) provide the basis for the identification of possible policies and measures to be defined at local level, as well as the quantification of their expected effect. The steps that were taken for its realisation include:

- Survey of all basic GHG emission sources at local level
- Decide on emission calculation methodologies per emission source and gas
- Collection of necessary input data
- Development of local energy balance
- Development of calculation tools per emission source
- Compilation of the local GHG emissions inventory
- Comparison of results with national emissions data
- Personnel training

The basic GHG emission sources that were investigated are: Energy (stationary and mobile), Industrial processes, Solvents, Agriculture, and Waste. Emissions estimates included also the indirect emissions attributed to electricity consumption. Emission calculation covered all GHG (CO_2, CH_4, N_2O, F-gases), as well as basic air pollutants (PM_{10}, NO_x, SO_2 and NMVOC). The applied GHG emission calculation methodologies followed the guidelines developed by the Intergovernmental Panel on Climate Change (IPCC) in the context of the United Nations Convention on Climate Change (UNFCCC) and the Kyoto Protocol, while the EMEP/CORINAIR methodology was mainly used for the estimation of non-GHG emissions. The indirect emission factors for electricity consumption were derived from the latest national GHG emissions inventory (Greek MINENV, 2009).

The collection of input data involved the concentration of the necessary activity data for the calculation of emissions of all the sources under consideration, such as the demographic characteristics, the building stock, data on transportation, and the economic and energy profile of the study area. Particular attention was paid on energy data, since the energy sector is the major contributor of GHG emissions. Special attention was also given to data related to emission sources on which local authorities have direct control (e.g. public lighting, public transport, water supply and sanitation, waste management). At central level, all available bottom-up data on the consumption of fuels and electricity, as well as on non-energy parameters (e.g. agricultural areas, number of buildings etc.) for the greater Volos area were collected. At local level, the collection of data targeted competent local authorities (Municipality of Volos, DEMEKAV and DEYAMV), local fuel suppliers (e.g. Public Power Corporation, Natural Gas Supply Corporation of Thessaly region) and other sources (e.g. Solid Waste Management Association (SYDISA) of the Magnesia Prefecture).

For each sector a separate emission calculation tool has been developed in a spreadsheet form (excel files), i.e. separate files have been developed for each category. This format was selected as it allows for significant flexibility during its development and at the same time potential users are familiar with its structure.

The available spreadsheets within each file correspond to the different source categories (as defined by the IPCC guidelines) applicable for each sector. These spreadsheets were structured in accordance with the calculation method, but in general four "blocks" were defined: activity data, emission factors, calculation parameters related to activity data and/or emission factors and results. Where appropriate, references to the data sources used were included. In the case of Energy, an intermediate tool/file was developed for the estimation of the necessary activity data and the construction of a local energy balance, by means of a bottom-up modelling approach.

At all stages of the tool development, feedbacks from all partners were taken into account. All partners examined for example, among other things, the applicability of the calculation method in their area of expertise and their comments were taken into account accordingly. The final version of the tool package includes the projection models developed under Action 2 (projection of local GHG emissions).

Upon completion of the tool development, a selected number of employees from DEYAMV, DEMEKAV and the Municipality of Volos (~2 people per local partner) were trained in using the methodologies and the tools for emission calculation. The personnel training was organised in two sessions. The first was realised on 12/02/09 with the aim to introduce in detail the selected calculation methods per emission source, to discuss the applicability of the tools and to enable receiving the necessary comments before its finalisation. The second, and basic one, took place on 15/05/09 after the completion of the inventory and after the incorporation of the projection models to the tools. The scope of the second session was to

thoroughly discuss the results and familiarise the personnel with the tools, by introducing application modules and practical tips. A part of the session was dedicated to the connection of the methodologies used for the calculation of the present and future emissions. The training was repeated in 22/06/10 in order to enhance the personnel's skills on the use of the tool. The training material (programme, list of participants and associated seminars) are presented in the Annex (see 7.1.5).

The main findings of the inventory in the greater Volos area are summarised below:

- Energy consumption is dominated by the energy consumption of industrial installations participating in the EU-ETS. A totally different allocation of energy consumption per sector and fuel is obtained when excluding energy consumption of EU-ETS installations from the analysis: the residential sector is the major energy consumer, followed by road transportation. This allocation is considered as more representative for an urban area.
- Total GHG emissions are estimated at 4.575,72 kt, representing 3,5% of total GHG emissions at national level (excluding Land Use, Land Use Change and Forestry, LULUCF). The major contributor is the big industry in the area that falls under the EU-ETS.
- If both indirect emissions from electricity consumption and emissions from installations participating in the EU-ETS are excluded from totals, then GHG emissions are estimated at 395,5 kt (about 12 times lower compared with the total figure).
- Stationary combustion is the major contributor to total GHG emissions.
- Indirect emissions associated with electricity consumption in all sectors represent a significant part of total emissions as they account for 23% of total GHG emissions.
- Excluding EU-ETS installations and indirect emissions from electricity consumption, the share of emissions from mobile combustion is increased to 28%, while the waste sector accounts for 25% of the total. Industrial processes and solvents have a minor contribution (about 0,4% of the total).

Problems encountered:

The deliverables of this Action were developed on time and therefore no delays were created. Certain difficulties were faced during the data collection phase, especially in regards to the availability of energy and fuel consumption data. In order to overcome this constraint, a parallel effort was made, both at local and central level, from the beginning of the project. For each emission source, a detailed data list was formulated and dispatched to the partners to conclude on the data that would need special collection efforts and arrange data collection campaign where required (e.g. electricity consumption for the municipal/public buildings and public lighting, natural gas consumption per sector). Where necessary, simulations were made by utilising the available regional statistical data (e.g. in the case of disaggregation of energy use in buildings: space heating, cooling, hot water, cooking, etc).

5.1.2. Action 2: Projection of local GHG emissions

Planned duration: 15/02/09 – 15/05/09

Implemented: 15/02/09 – 15/07/09

Status: Completed

Deliverables: a. Report on projections of local GHG emissions up to 2020

b. Projection models *(delivered as compact package with the set of emission calculation tools of Action 1)*

Description of the fulfilled activities:

The second project Action started on time and was completed two months after the initial time schedule. The Action aimed at the projection of the GHG emissions generated in the greater Volos area up to 2020. The outcome of Action 2 (together with Action 1) provides the basis for the implementation of the next actions, in regards to the identification and quantification of the proposed measures. The steps that were taken for its realisation are presented below:

- Collection of necessary input for the estimation of GHG emissions trends per sector
- Development of projection models per emission source
- Compilation of report
- Personnel training

The projection of GHG (including non-GHG) emissions in the greater Volos area was based on the methods selected for the compilation of the emissions inventory (in order to maintain consistency), taking into account changes in the emission-generating activity. These changes were associated with activity data trends (e.g. population, number of buildings, industrial production, etc.) and the emission factors applied, as they may be affected by policies and measures that are or will be in place.

Calculation and projection of emissions were integrated in a single emission calculation tool per source category (energy, industrial processes, solvents, agriculture and waste), as the same calculation methods were applied in order to ensure, to the extent possible, the consistency of the results.

The main results of the action can be summarized to the following.

- Total GHG emissions decreased from 2007 to 2020 by 1,6%. This decrease is mainly attributed to changes in the fuel mix for the electricity generation sector that resulted to a continuous decrease of the average emission factor. If indirect emissions from electricity consumption are excluded from the total figures, then the developed scenario projects a total increase of 2% for the period 2007 – 2020. If both indirect emissions and emissions from EU-ETS installations are excluded, then a total increase (for the period 2007 – 2020) of 3,2% is projected.
- The energy sector represents the main source of GHG emissions throughout the period 2007 – 2020. Road transportation and the Tertiary sector have the highest increase within the sector (30% approximately). Such an increase is obviously not in line with the provisions of the EU legislative package on energy and climate change that calls for GHG emissions reduction targets for the non-ETS sectors (a reduction of 4% in 2020 as regards 2005 levels is foreseen for Greece). It is evident that policies and measures both at national and local level should address this issue.
- A continuous and significant decrease of non-GHG emissions is projected for the greater Volos area (excluding EU-ETS installations). This is attributed to (a) the improved qualitative characteristics (especially S content) of liquid fuels; (b) the continuous renewal of the passenger vehicles fleet and (c) the gradual reduction of traditional biomass use in the residential sector for space heating

Personnel training started after the incorporation of the projection models to the emission calculation tool package. Two training sessions organised for the personnel that was allocated in Action 1. The first one (15/05/09) was dedicated to the introduction of the projection models, their functionality and their connection with the emission calculation methods developed within Action 1. The second session was realised after the completion of the projection results (10/07/09) and its overall target was to make personnel more familiar with the tool package as a whole. The relevant training material is presented in the Annex (see 7.1.5).

Problems encountered:

Action 2 was completed two months after the initial time schedule. The activities that necessitated this extension are related to the collection of the necessary information for the determination of certain key activity data trends. This consideration was focused on the detailed input required for the estimation of the emission evolution derived from the planned activities according to the regional and local operational plans as well as the planned infrastructure for the 2013 Mediterranean Games that will be hosted in Volos.

5.1.3. Action 3: Identification of GHG emissions reduction options

Planned duration: 15/05/09 – 30/06/09

Implemented: 15/05/09 – 30/07/09

Status: Completed

Deliverables:
a. List of GHG emission reduction measures
b. Presentation of GHG emission reduction measures & SWOT analysis

Description of the fulfilled activities:

The third Action of the project started on time and was completed one month after the initial time schedule. The Action aimed at the identification of all possible options for the reduction of GHG emissions at the greater Volos area. The steps undertaken for its realisation are presented below:

- Development of an initial list of GHG emission reduction options
- Discussion of the initial list with local authorities and stakeholders in a consultation conference
- Evaluation of difficulties and opportunities associated with the implementation of measures – SWOT analysis
- Compilation of final list of potential GHG emission reduction measures

The initial list of the possible options for responding to climate change at local level was developed on the basis of the results obtained from the local inventory and projection of GHG emissions up to 2020 (outcome of Actions 1 and 2). During the list's preparation process, special consideration was given to the experience gained from the development of action plans for GHG emissions at national level, and the local action plans of European and other cities abroad (e.g. http://www.c40cities.org/). The effort was led by the Municipality of Volos with several discussions among the project beneficiaries to conclude on the "initial" list.

The selection of the sectors / emission sources to be addressed was performed as one of the

first steps of the list preparation. Efforts were concentrated on the sectors that local authorities have direct control. The target sectors were: Buildings, Transportation, Water supply and sanitation, Municipal solid waste management, City operation, and 'Other' representing possible actions that can be taken for the "2013 Mediterranean Games" infrastructure and land rehabilitation. The sectors 'Agriculture' and 'Solvents' were excluded, as they represented minor contribution to GHG emissions at the Volos area. The industrial installations covered by the EU ETS were apparently excluded, since the competent authority is the central government (Greek Ministry of Environment). Likewise, the other Industrial Processes source category was discarded since it represented a minor contributor to local GHG emissions and the enforcement role of local authorities is considered as advisory.

For each measure, the actors responsible for implementation were specified, these being: Local government, Public sector, Private sector and Residents.

The list was addressed to local decision makers and key stakeholders at a "consultation" workshop, which took place in the premises of the Municipality of Volos on 29 June 2009. The workshop also enabled the participants to become familiar with the project and the GHG emission reduction options under consideration. There was an overwhelmingly positive reaction to the proposed measures from the attendance.

For each option, a simple SWOT analysis was performed and discussed. Barriers, both present and future, to the implementation of the measures were identified. It was concluded that no potential conflicts or specific difficulties can be foreseen at this stage that should lead to the refinement of the planned measures.

In overall, the consultation phase resulted in minor comments that did not significantly alter the initial list of measures. As a result, the initial list was adopted without modifications, as the "Final list of GHG emission reduction measures" under consideration.

Problems encountered:

This Action faced no particular problems. The extension in its implementation was mainly due to the additional time needed for the local decision makers and stakeholders to respond to the initial list of the GHG emission measures.

5.1.4. Action 4: Economic and environmental evaluation of GHG emission reduction measures

Planned duration: 01/07/09 – 30/09/09

Implemented: 01/06/09 – 31/11/09

Status: Completed

Deliverables: Cost-Benefit Analysis (CBA) report

Description of the fulfilled activities:

The fourth project Action started one month before the initial time schedule and was completed two months after the planned duration. The Action aimed at the economic and environmental evaluation of GHG emission reduction measures that were specified within Action 3. The basic steps undertaken for its realisation are presented below:

- Collection of necessary input data
- Calculation of GHG emissions reduction potential per measure

- Calculation of environmental externalities associated with each measure
- Cost-Benefit Analysis of measures

Following the formulation of the initial list of GHG emission reduction measures under consideration, the first step of Action 4 was to collect all necessary data for the assessment of the GHG emissions reduction potential and to perform the economic assessment of each measure.

In all cases within the Energy sector, the main factor determining the emissions' reduction was the extent of possible energy conservation. Two main categories of measures can be distinguished: (a) measures addressed to residents and the private sector (offices, services, commercial stores, hotels etc.), and (b) measures addressed to particular municipal and public buildings/ organizations and DEYAMV installations (e.g. specific municipal buildings, public hospital, DEYAMV, public transport etc.). The methodological approach followed for estimating the potential energy conservation and consequently the GHG emissions reduction in each category was as follows:

(a) For measures addressed to residents and the private sector, the potential for energy conservation was estimated on the basis of local characteristics and data already collected during the elaboration of project Actions 1 and 2. Consistency between the present/ future local energy balance and the results of Action's 4 estimations was maintained by using, where appropriate, the same values of parameters and assumptions as in Actions 1 and 2. For the purpose of calculations, technical data from the Greek market, similar applications in Greece and abroad, as well as simulation models (e.g. in the case of building insulation) were used. In addition, in order to calculate the total amount of energy conservation per measure, it was necessary to define a degree of penetration over time. This estimation was based on the experience already gained from similar applications in Greece and abroad, as well as on local characteristics, while the present situation and the expected evolution specified in Action 2 were also taken into account. The estimated penetration goes beyond the business-as-usual (BaU) scenario defined in Action 2 and thus GHG emissions reduction measures forming the content of a Local Action Plan are 'additional' to the BaU case.

(b) For measures addressed to particular buildings (both municipal and public), a specific data collection form was developed, facilitating the proper assessment of present situation with respect to buildings' insulation, performance of energy installations/ devices etc. Data collected, together with those of Action 1, formed the necessary basis for the estimation of possible penetration of each measure and the consequent calculation of expected energy conservation. For measures in the transport sector such as renewal of fleet or replacement of conventional vehicles, penetration was based on the characteristics of the present and future fleet. Finally, in the case of tram construction, redesign of bus lines, and extension of bicycle lanes/ pedestrian walkways, the expected energy conservation was estimated on the basis of the length of the network to be constructed, the official planning of local authorities (i.e. the Municipal Business Plan), data from similar applications elsewhere in Greece, etc.

(c) With respect to the actions of the sector 'water supply and sanitation', the expected benefit was estimated taking into consideration not only electricity but also water conservation, with the latter resulting in an additional reduction of operational cost.

Although the estimated penetration per measure determines the absolute amount of energy conservation and GHG emissions reduction, as well as the total investment cost per measure, it has little or no influence to the Benefit/ Cost ratio (B/C) of measures. Absolute figures will

represent criteria to be used in the subsequent Action 5 of the project.

The calculation of the energy conservation potential was made on an annual basis and for a time horizon appropriate for each measure. For each year of the analysis, the consumption of conventional fuels and electricity with the absence and with application of each measure were calculated. For waste management, the reduced annual amount of biodegradable materials emitting GHG emissions when placed in landfills was estimated instead.

Next, the expected GHG emissions reduction and rest environmental benefits per measure were calculated. With respect to the latter, since the majority of measures are associated with energy use, the main environmental benefit expected is the reduction of basic air pollutants (PM_{10}, SO_2, NO_x and NMVOC). In order to maintain consistency with Actions 1 and 2, the same emission factors were applied.

For the economic analysis of measures, data regarding the investment and operational cost of each measure, as well as the cost (or benefit) due to increased (or decreased) fuel and/or electricity consumption were collected. The effect of water conservation in the operational cost of DEYAMV, as well as the avoided cost of waste disposal (for waste management measures), is also considered. In order to estimate the cost / benefit due to the increased / reduced energy consumption, energy prices for Greece, derived by the IEA database for the year 2007, were used. The economic analysis was performed on the basis of constant energy prices over time. For the whole set of measures, a uniform discount rate (6%) was applied. Although this rate may be lower than the one usually used by private investors, and higher than the one used in the economic analysis of public goods, it was considered as more appropriate, since the aim is to formulate a Local Action Plan that will represent a compromise between all the actors involved. The economic analysis generated 6 economic indicators per measure: B/C, Net Present Value/ NPV (in €), Internal Rate of Return/ IRR (%), levelized cost per unit energy conserved (in €/toe), levelized cost per unit CO_2 avoided (in €/t CO_2) and payback period (in years). For the classification of measures within the context of Action 4, the first indicator (B/C) was used.

The economic assessment of measures was carried out in two steps. During the first step, a Cost Effectiveness Analysis, where only the net financial costs associated with the interventions under consideration were taken into account, was performed. Out of 91 cases examined (*note*: the term 'case' refers to combinations of GHG emission reduction measures and sectors where the measures are applied), 41 had a B/C > 1 (i.e. 'win-win' options).

The next task of Action 4 was to express environmental externalities into monetary terms. For this purpose the most recent values of external cost per unit mass of pollutant derived from the ExternE project (*European Commission 2008, "Cost assessment for sustainable energy systems", Technical report of the CASES project*) were used. For electricity, since the mix of fuels (and consequently air emissions generated) varies over time, a non-constant value of external cost was applied. The specific monetary values of externalities that were applied are shown in the Annex of the present midterm report (see 7.1.8).

The results of the Cost-Benefit Analysis (CBA), where private costs/ benefits and cost/ benefit of environmental externalities are considered, are presented in table 2 of the Annex of the present midterm report (see 7.1.8). According to the results obtained, 14 more measures turn out to have a B/C ratio greater than 1 when externalities are included in the economic analysis. In addition, 2 more measures present are added to this list when some sensitivity analyses were performed.

The results of Action 4 were discussed in two basic internal meetings: the first one took place on 25/9/2009 and the second one on 23/11/09. The subject of the first meeting was, among

others, the discussion of the results available then (formulation of the inception report) and the identification of existing deficiencies with respect to measures evaluation. In the second meeting, the final results of the Cost-Benefit Analysis were presented and agreed.

Problems encountered:

During the elaboration of Action 4, a major difficulty was the lack of recent information and data on the characteristics of the building stock and the performance of energy installations with respect to individual municipal and public buildings, as well as schools. Thus, a number of visits took place in each building, in order to collect all necessary data and, as such, the Action started one month prior to the initial time schedule. In addition, difficulties were faced with respect to the assessment of energy conservation in the water supply and sanitation system, as up to the present LIFE project there has not been an official planning for integrated energy conservation in this field and thus a great part of data required for the assessment within the context of the LIFE project were not available in the context of the inception report.

5.1.5. Action 5: Defining priorities for GHG emissions reduction measures

Planned duration: 01/10/09 – 15/11/09

Implemented: 15/11/09 – 20/01/10

Status: Completed

Deliverables: Report with classification of measures into priority categories

Description of the fulfilled activities:

Action 5 of the CLIM-LOCAL2020 project started one and a half month after the initial time schedule and was completed two months after the planned duration. This Action aimed at the finalization of the classification of the examined GHG emission reduction options into priority categories that will be subject to public consultation in the context of Action 6.

At the end of Action 4, potential measures were classified in three groups with respect to their benefit to cost (B/C) ratio. However, there are other important criteria that local decision-makers and key stakeholders consider as important and thus need to be incorporated in the decision-making process. For instance, possible financial and implementation difficulties, environmental impacts other than GHG emissions reduction etc., could be considered as additional evaluation criteria. At the same time, measures currently under implementation and/or existing priorities of the Municipality of Volos and DEYAMV, as recorded in the relevant budget and operational plans, should be considered as top priority actions in the Local Action Plan.

The methodological framework that was developed to assist the process of defining priorities for the measures to be included in the Local Action Plan consists of two steps: the first step aims at the identification of the low priority measures, while in the second step, the rest of the measures are classified into high and medium priority categories. At the same time, the different characteristics of the Municipality of Volos and DEYAMV, as compared to the rest of the decision makers involved (households, services – trade and public authorities), were taken into account. The procedure for defining the priorities for GHG emissions reduction measures was discussed and agreed in the internal meeting that took place in 23/11/09 (where the CBA results were also discussed and finalised).

At first, measures with a B/C ratio less than 1 constitute the low priority measures for all implementing authorities / agents. Then, the process differentiates between (a) the Municipality of Volos and DEYMAV and (b) the rest of the involved authorities/agents.

(a) For the ‘‘Municipality of Volos and DEYAMV’’, high priority measures are those already implemented or planned by both authorities, with a penetration rate lower than the one defined in the context of Action 4. The rest of the measures correspond to the medium priority category. The application of such a procedure, enables the utilisation of existing policies and measures of both authorities, while at the same time allows for the introduction of additional elements aiming at a further reduction of GHG emissions.

The GHG emissions reduction potential (for 2020) of High and Medium priority measures is estimated at 23.000 tn CO_2 eq approximately. Interventions in the street lighting system (automation and replacement of low efficiency bulbs), utilization of water potential for electricity generation by DEYAMV and additional solid waste management options (focusing on households' contribution) account for about 65% of the above-mentioned potential

(b) The classification of GHG emissions reduction measures into high, medium and low priority categories for ‘‘Other involved authorities/agents’’ is the result of the application of the ELECTRE Tri multi-criteria method. The application of any multi-criteria method requires the definition of the set criteria to be applied as well as the associated weights. The criteria selected and the weights assigned are presented and discussed in the corresponding report of Action 5 (see Annex 7.1.9).

The GHG emissions reduction potential (for 2020) of High and Medium priority measures is estimated at 47.000 tn CO_2 eq approximately. Solar collectors for water heating in the residential sector, insulation of roof and external walls, replacement of low efficiency lighting bulbs account for about 73% of the above-mentioned potential.

Problems encountered:

Action 5 faced no particular problems. The Action started with a delay due to the delay in the completion of Action 4. The extension in its implementation (half a month) was mainly due to the additional time needed for the local decision makers and stakeholders to respond to the priorities defined.

5.1.6. Action 6: Public consultation and finalization of Local Action Plan (LAP)

Planned duration: 01/10/09 – 31/12/09

Implemented: 21/12/09 – 31/05/10

Status: Completed

Deliverables: Local action plan on climate change (LAP), including Monitoring Plan

Description of the fulfilled activities:

Action 6 is the core task of the CLIM-LOCAL 2020 project with its outcome to be the Local Action Plan (LAP) on climate change mitigation for the greater Volos area. Considering the national GHG emission obligations and the carbon footprint of the concerned area, the overall goal of the LAP that was set is to reduce GHG emissions by 7% below 2007 levels, by 2020. According to current estimations, GHG emissions are about to be reduced by 70.000 tons CO_2 eq, by 2020. The basic steps undertaken for the compilation of LAP were the following:

- Formulation of a draft LAP
- Internal project meetings
- Public consultation (invitation for written comments & open workshop / public consulatation)
- Finalisation of LAP

A draft LAP was formulated on the basis of the results of Actions 1 to 5. Actions 1 and 2 provided the background of the analysis, Action 3 the feedstock with the potential GHG emission reduction measures and Actions 4 to 5 the economic and environmental evaluation of these measures. The outcome of Actions 3 to 5 were the subject of public consultation. The purpose of the consultation was twofold: (a) to inform the general public and the stakeholders and (b) to ask for comments / additions on the measures and the proposed priorities.

The structure of the draft LAP reflects the methodological steps undertaken for its development. At first the general policy context in which the Plan was developed was described. Subsequently, an overview of the existing and expected energy consumption and emissions was presented.

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 particular, GHG emissions reduction measures are grouped into 6 main sectors / emission sources:

1. Buildings
2. Transportation
3. Water supply and sanitation
4. Municipal solid waste management
5. City operations
6. Prospect actions

The actors responsible for implementing the measures are classified in four broad categories: local government (Municipality of Volos), public sector (including DEYAMV), private sector (services – trade) and the residents of Volos.

For each measure, the penetration rate, the expected emissions reduction by 2020, the implementation cost and the prioritization category are reported, while the competent actor is also defined.

The LAP ends with the general framework for its sound monitoring and the necessary dissemination / awareness activities.

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 the responsibility of other actors (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, the Municipality of Volos 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 obtained results. The review of the Action Plan, where required, will be realised following consultation with the public and all other key stakeholders.

The public consultation of the draft LAP started in the middle of February 2010 after a press conference given by the Mayor of Volos on 18/02/2010 and lasted till the end of March 2010. In order to facilitate the consultation process, the Municipality of Volos organized an open workshop on 12/3/2010 for the presentation of the LAP to all stakeholders and the public. After the incorporation of the comments that were collected, the LAP was set for approval by the Municipal Council of Volos and was formally adopted on 26/4/2010 (please refer to Annex 7.3, in Greek).

The consultation procedure that was undertaken is outlined below:

(a) Internal work meetings of the Municipality of Volos (the major ones are presented below):
   - Internal meetings with the partners (DEYAMV and DEMEKAV) to discuss specific matters that were coming up during the development of the draft LAP (3-12/1/2010)
   - Internal meetings with the management of the Municipal Departments (e.g. Technical Department, Department of Planning, Cleaning Directorate) with the aim of fine-tuning the measures and the corresponding priorities (3-12/1/2010)
   - Internal meeting of the Municipality of Volos within the Mayor office to discuss and finalise the prioritisation of measures (13/1/2010)

(b) Upload of draft LAP on both the Clim-Local2020 website and the Municipality of Volos website (15/2/2010)
   - Open invitation for written comments up to a specific deadline (set for 19/3/2010)

(c) Mayor press conference / official start-up of the public consultation (18/2/2010)

(d) Meetings with local stakeholders (22/2 - 9/3/2010)
   - Meetings with organizations and stakeholders of the private sector
   - Meetings with the management of the primary and secondary education sector
   - Meeting with the manager of the NGO “Environmental Initiative of Magnesia”

(e) Open workshop / public consultation (12/3/2010) [with the presence and valuable contribution of Ms. Christina Marouli of the External Monitoring Team]

(f) Collection and appraisal of comments / finalisation of LAP (18/2 - 20/4/2010)

(g) LAP approval by the Municipal Council of Volos (26/4/2010)

After the formal adoption of the LAP, the practical guidelines per measure were developed, which included, inter alia, the competent bodies, the preparatory actions needed for their implementation, as well as practical steps with respect to the supply of required devices / machinery / appliances, operational and maintenance tips etc.

A Monitoring Plan (MP) was also formulated so that the progress of the LAP will be measured and reviewed in a systematic way. More specifically, for each of the measures contained in the LAP, the MP comprises a standard form, which contains the following elements:

- Sectors / organizations responsible for the implementation of the measure
- Timeframe for implementation
- Quantified targets per measure up to 2020, with intermediary reference years, which will serve as the LAP’s monitoring indices

- GHG emissions reduction expected up to 2020, with intermediary reference years
- Necessary actions to be completed before the start of construction works/ installation of electrical and mechanical equipment
- Procedures for the assessment of progress

Regarding the intermediary reference years, the years 2011 and 2015 were selected, as the former represents the end of the LIFE CLIM-LOCAL 2020 project and the latter is the middle of the 2010-2020 period. With respect to quantified targets per measure, an effort was made to select, for each measure, an index (e.g. m^2 of the surface of external walls which is foreseen to be insulated within the framework of the LAP), which can be measured / estimated in practice by the competent authority for this purpose (also specified in the MP). Finally, with respect to procedures for the assessment of progress, the Monitoring Plan gives a short description of actions to be undertaken for each measure in each target / sector. In addition, the MP contains, for each measure, a form to be completed during each evaluation of progress that will take place, while these forms, as well as any other relevant information, will be the basis for the compilation of Progress Reports to be prepared after each evaluation of progress. Finally, the MP describes the conditions under which a change of the LAP will be needed, as well as the relevant procedures for doing so.

Problems encountered:

Although Action 6 faced no significant problems, it commenced with a delay compared to the initial work plan, due to delays in the completion of previous actions (Actions 4 and 5). In addition, an extension of the consultation phase was considered necessary, in order to enhance the involvement of the local stakeholders and the public in the finalisation of the LAP.

5.1.7. Action 7: Implementation of measures in the LAP

Planned duration: 15/12/09 – 15/8/11

Implemented: 15/03/10 – 15/8/11

Status: Ongoing

Deliverables: -

Description of the fulfilled activities:

Action 7 is an ongoing activity and will be carried out until the middle of August 2011, according to the work plan. The start of this Action represented the official initiation of the Local Action Plan (LAP) that was formulated and finalised in Action 6. The activities undertaken during this project phase included:

- Initiation of certain preparatory actions
- Formulation of a ‘roadmap’ for each measure according to the practical guidelines and the monitoring plan (MP)
- Establishment of a monitoring team to overview the implementation of LAP

The initiation of the preparatory phase for the implementation of the measures started in mid-March 2010, with the set up of a working group on awareness raising that will address sustainable energy behaviour for all target groups (municipality, public and private sector, schools, residents). These activities are closely related with the implementation of measure

'A19' (non technical energy conservation measures).

Following the finalisation of the practical guidelines and the monitoring plan, all necessary practical steps and implementation procedures foreseen for each measure were made available, which constitute the implementation 'roadmap' of every measure. Special attention was given on the early definition of all the necessary preparatory actions and the involved procedural phases along with a reasonable and sound timeframe for their implementation. In view of an optimum outcome, their finalisation called for several internal discussions among partners.

The whole progress of the LAP's implementation will be closely managed by a Monitoring Team that was established on 22/6/2010 and comprises of members from all project partners. The monitoring procedure that will be followed is the one defined in the LAP's Monitoring Plan.

The Monitoring Team will be responsible for the start-up of the measures, the data collection procedure required to review and report on the progress of measures, the proper calculation of the progress indices set in the LAP's Monitoring Plan, as well as the dissemination of the progress results to the public and the stakeholders.

Problems encountered:

So far, this Action has not faced any particular problems.

5.1.8. Action 8: Communication and dissemination

Planned duration: 01/01/09 – 31/12/11

Implemented: 01/01/09 – 31/12/11

Status: Ongoing

Deliverables: a) Project website

b) Project leaflet

c) Local Action Plan

d) Dissemination material for the 2 workshops

Description of the fulfilled activities:

Action 8 is an ongoing activity and will be implemented until the end of the project, according to the work plan. The aim of this action is to ensure that the project's goals and outputs are disseminated efficiently, to assist the implementation of LAP measures and to stimulate environmental awareness, especially in climate change issues.

The activities undertaken during this project phase included:

- Development and regular update of the project's website
- Notice boards describing the project at strategic places accessible to the public
- Dissemination of project's progress to press and radio
- 1st workshop / public consultation for the GHG emission reduction measures
- Meetings with local stakeholders, associations and NGOs
- Press release

- Formulation of project roll-up and leaflet and distribution in the consultation workshop
- 2nd workshop / public consultation for the Local Action Plan (LAP)
- Start up of awareness raising activities

More specifically, during the second month of the project implementation the project website was completed (http://www.epem.gr/climlocal/). It became available to the public through the main web pages of the project beneficiaries: the Municipality of Volos (http://www.volos-city.gr/), DEYAMV (http://www.deyamv.gr/), DEMEKAV (http://www.demekav.gr/), as well as from the above-mentioned website of EPEM.

The project website is available both in Greek and English and it was designed in a contemporary format, using artwork, photography, animation and relevant links (where applicable). Visitors are able to get information on the objectives and contents of the CLIM-LOCAL2020 project, and to download documents prepared in the scope of the project (e.g. material for public consultation etc.). Local citizens and stakeholders are able to supply comments during the duration of the project. The website consists of the following:

- Home page: general information on the CLIM-LOCAL2020 project
- Information: information on climate change, GHGs, Emissions Trading issues etc
- Actions: presentation of the 13 project Actions and the respective deliverables
- News: news concerning project activities
- Forum: space dedicated for public consultation issues and exchange of comments
- Management: information on project management
- Contact
- Links: important links on Climate Change, GHG etc

The website is updated on a regular basis, especially in regards to the field “news”. Upon completion of the project Actions, the corresponding reports are uploaded in due time. The field “forum” is already the host of two consultations asking for comments from the stakeholders and the citizens. Finally, the ‘carbon calculator’ button was activated and is linked (upon the relevant kind permission) to the WWF carbon calculator (http://www.wwf.gr/footprint/index.html), a very easy to handle personal carbon footprint tool.

Until today, one notice board was placed in the entrance of the “Programming and New Technologies” building of the Municipality of Volos (174 Dimitriados Str, Volos). More notice boards are envisaged to be placed in all the areas that interventions will be implemented, according to the LAP’s proposed measures.

As already described in section 5.1.3, a 1st public consultation workshop took place in the premises of the Municipality of Volos on 29/6/2009. The workshop consisted part of the project’s dissemination actions, but it was attributed in Action 3, since it concerned the finalization of the “List of GHG emission reduction measures”. The corresponding material of the event (invitation, agenda, list of participants, speeches) is presented in the Annex of the present report (see 7.2.4).

Under the activities undertaken within Action 6, a 2nd public consultation workshop was organised for the finalisation of the Local Action Plan on climate change mitigation, which took place in the premises of the Municipality of Volos on 12/3/2010, along with information

meetings with local stakeholders. Apart from a press conference (released by the Mayor of Volos on 18/2/2010), the event was also advertised in the local press and radio, as well as on the website of the EU LIFE Programme Community Forum (http://www.lifecommunity.eu/index.php?topic=16.0). The consultation workshop material (invitation, agenda, attendance list, speeches) is included in the Annex of the present report (see 7.2.5).

It should be mentioned that a project roll-up banner stand and a corresponding leaflet were designed and produced for the needs of the project. The leaflet was firstly distributed in the public consultation workshop (12/3/2010). The full LAP was printed and also distributed to the workshop participants. Additionally, a simple animation for the project was developed (its static format is the cover page of the LAP executive summary).

So far the project was presented in the International Solid Waste Association workshop "Waste Management and Climate Change: Securing the Benefits" (Paris, 17-19/5/2009).

Finally, the press / radio releases concerning the activities of the CLIM-LOCAL2020 project, so far, are included in the Annex of the report (see 7.2.2). Relative photos of the events are included in the Annex of the report (see 7.2).

Problems encountered:

This Action faced no particular problems so far.

5.1.9. Action 10: Project management

Planned duration: 01/01/09 – 31/12/11

Implemented: 01/01/09 – 31/12/11

Status: Ongoing

Deliverables: Inception Report

Mid-term Report

Description of the fulfilled activities:

Action 10 is described (Project Management) under section 4 of the present Mid-term Report.

Problems encountered:

This Action faced no particular problems so far.

5.1.10. Action 11: Project monitoring and evaluation

Planned duration: 01/01/09 – 31/12/11

Implemented: 01/01/09 – 31/12/11

Status: Ongoing

Deliverables: Progress monitoring questionnaire / Output indicators

Description of the fulfilled activities:

Action 11 is an ongoing activity and will be completed at the end of the project according to the work plan. The aim of this action is to measure and document the effectiveness of the

project as compared to objectives and expected results.

The activities undertaken during this project phase involved the preparation of a "Progress monitoring questionnaire", in order to monitor the project's performance against the progress indicators. A delay was encountered during the preparation of the questionnaire, which was completed on 15/10/2009, and subsequently sent to the Action Team Leaders. The first reporting on the questionnaire occurred on 15/11/2009 and from then onward it will be completed on a 6-month basis. The completed questionnaire of 22/6/2010 is submitted with the present Mid-term report (Annex 7.1.13).

The Project Monitoring Team used the "Output indicators table" that was provided by the External Monitoring Team on the 26/6/09 meeting, in order to evaluate the progress of the project. The updated "Output indicators table" became part of the progress reports (Annex 7.1.13).

With the completion of the project, the evaluation of the benefits that each project beneficiary has received from his participation and the added value will also be undertaken. In the Final Report, a chapter will be dedicated on the "Project Monitoring and Evaluation".

Finally, it should be mentioned that a Monitoring Plan for the implementation of the LAP was formulated within Action 6 (Annex 7.1.11). The Monitoring Plan (MP) was formulated so that the progress of the LAP will be measured and reviewed in a systematic way. More specifically, for each of the measures contained in the LAP, the MP comprises a standard form, which contains the following elements:

- Sectors / organizations responsible for the implementation of the measure
- Timeframe for implementation
- Quantified targets per measure up to 2020, with intermediary reference years, which will serve as the LAP's monitoring indices
- GHG emissions reduction expected up to 2020, with intermediary reference years
- Necessary actions to be completed before the start of construction works/ installation of electrical and mechanical equipment
- Procedures for the assessment of progress

The actual monitoring of the LAP implementation will take place within Action 7 and the overall LAP's progress will be evaluated within Action 9.

Problems encountered:

This Action faced no particular problems. A delay was encountered during the preparation of the "Progress monitoring questionnaire".

5.2. Envisaged progress until the next report

The next reporting period involves ~9 months implementation period. The following table presents the status of the project actions until the next report (Progress Report that is due on 1/4/2011). The overall plan of the project is presented in the Gantt-chart that follows.

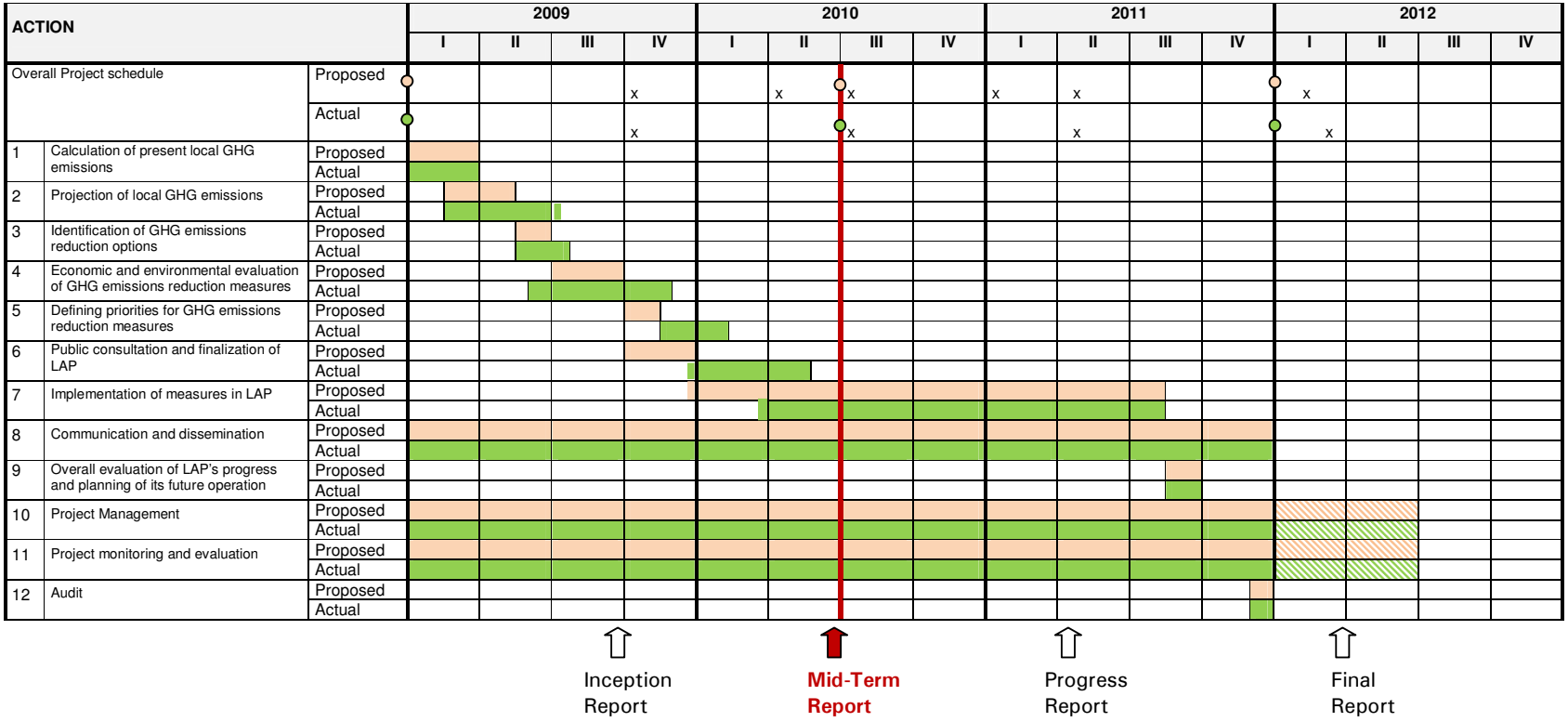
Status of Actions until the next reporting period	
To be completed	-
Ongoing	Action 7, 8, 10 & 11
Not to be started yet	Action 9, 12 & 13

Each action is accompanied by a brief description of its activities, the milestones to be achieved and the deliverables to be produced till the next report.

Action	**Activities**	**Milestones**	**Deliverables**
7	Elaboration of necessary preparatory actions (e.g. studies, market surveys) for the LAP Implementation of measures (e.g. procurement of equipment) Awareness activities to foster implementation in the resident and the private sector	Completion of necessary preparatory actions Intermediate assessment on LAP's implementation	Intermediate assessment report on LAP's implementation
8	Update of website on a regular basis Press releases on a regular basis Development of training material and dissemination for schools and other target groups Notice boards Participation in conferences and workshops		Updated website Training and dissemination material
10	Regular meetings and systematic information exchange of the Project Management Team		Progress report
11	Performance evaluation throughout the project reporting period. Compilation of regular monitoring reports.		

The planned actions are also indicated in the following Gantt chart.

Progress and planned activities



5.3. Impact

The CLIM-LOCAL2020 project falls under the thematic area "Environmental Policy & Governance" with "Climate Change" being the principal objective.

The question on what will be the new commitments of UNFCCC Annex I Parties after 2012 remains to be answered. The EU declared that within the context of international negotiations carried out under the auspices of UNFCCC and the Kyoto Protocol, is willing to accept a reduction of GHG emissions by 30% by 2020 compared to 1990. Despite of the progress of these negotiations, an internal EU target to reduce EU emissions of greenhouse gases by at least 20% by 2020 compared to 1990 has been legally adopted. The achievement of this target will require a coordinated effort between all administrative levels within each EU Member State. In this context, local and regional governments, representing the closest administration to the citizen, need to lead action, to show example and to provide political support to actions related to energy conservation, renewable energy sources, etc.

In this general framework, this project has a positive impact on issues related to climate change mitigation policies, even though actual GHG emissions reduction are not (and could not be) delivered yet. However, the implementation of the actions and measures that are described in the adopted Local Action Plan will eventually lead to ~7% GHG emissions reduction at local level by 2020, compared to the emissions of 2007 (~70.000 tons CO_2 eq). By the end of the project, the actual emission reductions, due to the specific measures that will have been implemented within the projects scope, will be quantified. Other positive impacts include:

(a) The developed emissions inventory (together with the associated emissions projections), that provides a base (or reference) year for setting targets and for the assessment of the effectiveness of related policies and measures.

(b) The developed Tools that provided capacity building within the Municipality of Volos and DEYAMV in issues related to GHG emissions inventory and projections. The application of these tools can provide the basis for any future integrated assessment of climate change mitigation actions.

(c) The Local Action Plan (and the associated monitoring plan) for climate change mitigation in the greater Volos area, especially when considered its formal adoption by the Volos Municipal Council, on the one hand indicates the commitment of local authorities for reducing emissions and on the other hand provides a guidance on how to achieve the target set.

The implementation of the project could serve (e.g. though the dissemination activities foreseen) as an example to other Municipalities to get involved on climate change mitigation issues in their jurisdiction. Such an involvement could have a positive impact in implementing the associated EU Directives and achieving the targets set for Greece.

5.4. Outside LIFE

The Municipality of Volos is carrying out several activities complementary to the CLIM-LOCAL 2020 project, these being:

1. In order to improve the quality of life in the city of Volos, to reduce air pollution and traffic, the Municipality of Volos has decided and implemented many projects (some of them are still running) concerning: a network of bicycle lanes, renovation of old buildings and integrated communal space, including various road transportation improvements.
2. Development of an energy efficient building for the Social Centre of Volos Municipality (DOYK): 20 photovoltaic panels have been placed, which will produce 2600KWh /year, equal to 2,3 tones of CO_2 emissions for the same time.
3. A pilot project for the development of a "green school". The actions implemented involve education in health issues, environment, green spaces, safety and infrastructure.
4. Development of new green spaces: the corresponding study has been approved by the Municipal Council. It includes a proposal for the development of car parking, playgrounds and green spaces of 82.172 m^2, in total. The construction will start after financing will be guaranteed.
5. Within the year 2013, the Mediterranean Games will take place in Volos. For that purpose, the needed infrastructure and especially the housing for the athletes (village) will be constructed according to environmental friendly methods, in order to make them energy efficient, to reduce water loss, to increase green spaces etc.
6. Under the National Strategic Reference Framework (NSRF 2007-2013), a dedicated program to energy saving has been launched for the municipalities: the Municipality of Volos submitted a proposal which included actions to improve the energy efficiency in municipal buildings, actions to improve public spaces in the city and pilot actions on public dissemination and information activities.

Additionally, DEMEKAV is participating in two basic energy related projects, both of which are funded by the Intelligent Energy Europe (IEE) programme:

1. Pattern of Energy Efficiency in the Schools (P.E.E.S.): This is an educational project which aims at energy awareness of students attending the secondary schools with a strong attention on the involvement of the teachers. In order to obtain significant changes in the behaviours of energy-system users and to enable a sustainable use of the energy, facing matters about energy and environment, only the dissemination of the knowledge is not sufficient, it is necessary to actuate changes in the behaviours defining and using active involvement methods. The main targets are teen-aged students (15-18 years old) and their teachers. Furthermore, the project is oriented to realize a common auditing pattern of energy consumption within schools buildings (tools and know-how shall be supplied by the Energy Agencies) involving representative workgroups of students and teachers who will cooperate with the technicians of the Energy Agencies. (http://www.pees-project.eu)
2. Strategy for Energy Sustainability and Strengthening of the Planning of the Energy Use in Sustainable or Potentially Sustainable Municipalities (ENERGY 21): The project consists of consists of developing a strategy to reach energy sustainability through the strengthening of the Local Agenda21 in energy field. The objective of the Project

Energy 21 of the Intelligent Energy Europe program is to achieve energy sustainability in sustainable municipalities or potentially sustainable municipalities, as well as to strengthen the processes of Agenda 21 concerning the production and the energy consumption. Its main outputs are a Model Sustainable Energy Action Plan and a Guidebook for designing and implementing it. With the development in European local sustainability movement during the project, principally the Covenant of Mayors, the work has been integrated and adapted to fit within this framework. (http://energy21.diphuelva.es/)

6. Financial review by actions

The incurred project costs (1/1/2009 – 15/6/2010) are presented in the following table (they are analytically presented in the Financial Report).

Budget breakdown categories	Total cost in €	Costs incurred from the start date to 15/6/2010 in €	% of total costs
1. Personnel	941.483,00	489.964,64	52,0
2. Travel and subsistence	64.200,00	2.822,62	4,4
3. External assistance	289.000,00	49.500	17,1
4. Durable goods			
Infrastructure			
Equipment	1.198.850,00	11.745,78	1,0
Prototype			
5. Land purchase / long-term lease			
6. Consumables	33.500,00	5.131,21	15,3
7. Other Costs	117.900,00	4.568,85	3,9
8. Overheads	132.958,00	36.842,51	27,7
TOTAL	**2.777.891,00**	**600.575,61**	**21,6**

7. Annexes

7.1. Deliverables

7.1.1 Local inventory for GHG emissions (Action 1)

7.1.2 Projections of GHG emissions up to 2020 (Action 2)

7.1.3 Tool package (Actions 1 & 2) [1]

7.1.4 Manual of tool package (Actions 1 & 2)

7.1.5 Personnel training material (Actions 1 & 2)

7.1.6 List of GHG emission reduction measures (Action 3)

7.1.7 Presentation of GHG emission reduction measures / SWOT analysis (Action 3)

7.1.8 CBA report (Action 4)

7.1.9 Report with classification of measures into priority categories (Action 5)

7.1.10 Local action plan (LAP) on climate change (Action 6) [2]

7.1.11 LAP's monitoring plan (Action 6)

7.1.12 Practical guidelines of LAP's measures (Action 6)

7.1.13 Progress monitoring questionnaire / Output indicators (Action 11)

7.2. Dissemination material

7.2.1. Photos

7.2.2. Press releases

7.2.3. Project leaflet

7.2.4. Consultation workshop material (29/6/2009)

7.2.5. Public consultation workshop material (12/3/2010)

7.3. Other

7.3.1. Official adoption of the LAP by Volos Municipal Council

[1] Submitted only in electronic format

[2] The Local Action Plan is in Greek. The LAP executive summary was translated in English.