

SUSTAINABLE ENERGY ACTION PLAN

EXECUTIVE SUMMARY

Municipality of Amyntaio



October 2012

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The Sustainable Energy Action Plan of the Municipality of Amyntaio has been developed within the framework of the project «Rural Web Energy Learning Network for Action (eReNet)» and Contract Number IEE/10/224/SI2.593412, supported by the Intelligent Energy Europe (IEE).



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PART 1

Overall Strategy

1.1 Overall CO₂ Reduction Target

Nowadays, sustainable energy policy has been a challenge for the Municipality of Amyntaio. Indeed, the area's univocal economy orientation of energy production through lignite is considered as a basic, inhibitory factor towards sustainability. The disengagement from the unilateral economic development may be achieved through the progressive dissemination of Renewable Energy Sources (RES) and Rational Use of Energy (RUE). However, this inquires conditions' improvement, as regards financing, legal framework and administrative procedures.

The existence of high quality scientific workforce, high national and international interest for energy sustainability investments, a variety of existing financing sources including the green fees paid by the Public Power Company (PPC) to the Municipality, European initiatives towards the direct involvement of local authorities to the European Union's (EU) policy for climate change and the Municipality's privileged geographic location comprise components of a mixture that can lead to sustainable development. In this context, the Municipality of Amyntaio has proceeded to the adoption of a series of initiatives and actions by 2020, taking into consideration that the local authorities' role is not limited to the provision of public services to citizens, but they ought to operate as a political, social and development body.

The first step towards this direction was implemented through the Municipality's participation in the Network of Energy Producing Municipalities (NEProM). NEProM includes the five Greek Municipalities, where PPC has established and operates thermal power stations for electricity production through lignite. The Network's strategic objectives include the environmental protection of the particular areas, as well as the local economies' and societies' smooth transition to the post-lignite period, through the promotion of alternative technologies. It is also noted that the network's president is the Mayor of Amyntaio, Mr. Ioakeim Iosifidis.

The Mayor and municipal council of Amyntaio, exhibiting their strong political will and commitment towards sustainable energy planning, adhered to the Covenant of Mayors (CoM) on the 18th of April 2011. The overall CO₂ emission reduction target by 2020 is 21,8%. In this context, the municipality has committed to implement a series of appropriate RES and RUE activities in its territory, laying balanced emphasis on the local energy and heat production, and the promotion and implementation of measures on energy savings. Indeed, a significant part of the CO₂ emissions' reduction will come from the installation of biomass district heating systems in local communities.

1.2 Current Status and Long Term Vision

1.2.1 Current Status

The Municipality of Amyntaio is located in the southern part of the district of Florina and has an area of 58.932,3 ha. Amyntaio is a municipality in the prefecture of Florina in Macedonia, Greece and consists of six municipal units, namely Aetos, Amyntaio, Variko, Lechovo, Nymfaio and Filotas. The total population was 16.890 inhabitants in 2011. The population of the municipality remained at the same level for the period 1991 – 2001, as shown in the table below, increased compared to 2011.

Table 1.1: Population 1991-2011

	1991	2001	2011
Municipality of Amyntaio	18.320	18.375	16.890
District of Florina	53.147	54.768	51.080

The land use allocation is presented in Figure 1.1. The agricultural sector is characterized by a strong orientation to arable crops. The vineyard plays also an important role in the Municipality of Amyntaio.

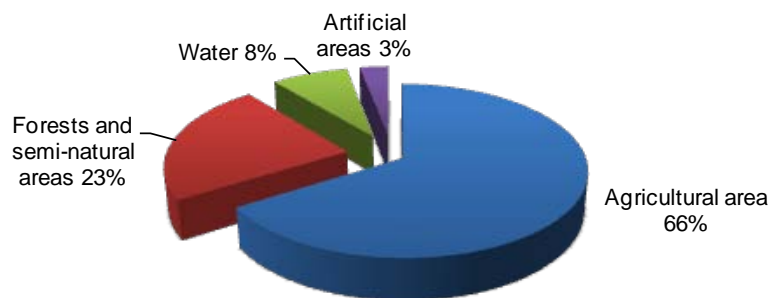


Figure 1.1: Land use allocation

The employment status in the Municipality of Amyntaio is illustrated in Figure 1.2. It should be noted that, there are important variations from community to community.

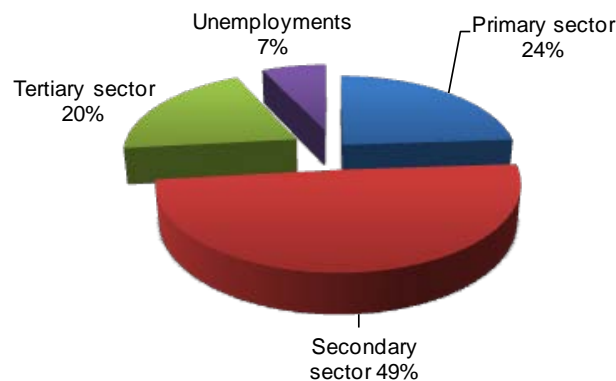


Figure 1.2: Employment status in the Municipality of Amyntaio

1.2.2 Long-term Vision

The creation of favorable conditions that will promote the area's energy performance and will attract new RES and RUE investments, is the core, on which the Municipality's energy planning will be based. The contribution towards addressing the climate change problem, through the Municipality's CO₂ emissions' reduction and the creation of sustainable jobs, strengthening the extraverted economic activity at local level, will comprise the success measure of this particular effort.

One of the bets to be won includes the liberation of local authorities from their role to promote infrastructure projects without central planning and their connection with sustainable development's strategic goals. The Municipality of Amyntaio has to work towards the direction of strengthening the area's benefits, by taking advantage of existing opportunities at national and European level, in order to achieve "true development". This term describes the development model's alteration, in order to attain capital inflow in the area, not only in the form of public works, but also in the form of private investments.

The local government's reform through "Kallikrates" decentralized operational plan has created all the conditions for a development model based largely on local authorities. The Municipality of Amyntaio already possesses several of the necessary conditions to exploit development opportunities, to undertake the coordination role among the local actors and to implement a central strategy within its regulatory role in the local development.

1.3 Organisational and Financial Issues

The Sustainable Energy Action Plan (SEAP) of the Municipality of Amyntaio has been developed within the framework of the project "Rural Web Energy Learning Network for Action (eReNet)" and Contract Number IEE/10/224/SI2.593412, supported by the Intelligent Energy Europe (IEE) Programme. The Decision Support Systems Laboratory, School of Electrical & Computer Engineering, National Technical University of Athens (EPU-NTUA) is the Project Coordinator and the responsible organization for the development of this SEAP, in close collaboration with the Municipality of Amyntaio.

In this context, significant preparatory work for the SEAP's elaboration has been carried out. Based on the adaptation of the municipality's administrative structures, according to the SEAP guidelines, a steering committee and an action plan working group have been established. These members are responsible for the implementation of the Sustainable Energy Action Plan (Figure 1.3). Moreover, the Municipality of Amyntaio participated in two training workshops, in Croatia (17-19 October 2011) and Germany (8-10 May 2012), which took place within the framework of "eReNet" project. In addition, the municipality implemented unofficial meetings with the local stakeholders.

For Amyntaio municipality, the decisive factor for the SEAP's successful implementation is the

active contribution of all local stakeholders (regional energy agencies, local chambers, producers of electricity and heat, citizens, members of the municipal council etc) for the configuration of local energy and environmental policies. Together, the local authorities and stakeholders can co-create the energy vision for the territory and the ways for its implementation, and invest financial and human resources towards this direction.

In this respect, two public consultation meetings on the SEAP were realized, on June and October 2012. The first consultation was also realized within the framework of EUSEW2012, and in this respect had a number of informative discussions in its agenda on the CoM, eReNet and EU best practices. In the first consultation meeting the BEI was presented, as well as some initial suggestions for RES/RUE actions and feedback from the stakeholders was received. Based on this, the SEAP team updated the actions, which were presented in their final form in the 2nd consultation meeting. During this 2nd meeting, discussions were realized with all stakeholders. It should be noted that the SEAP was approved on 17th of October 2012, unanimously.

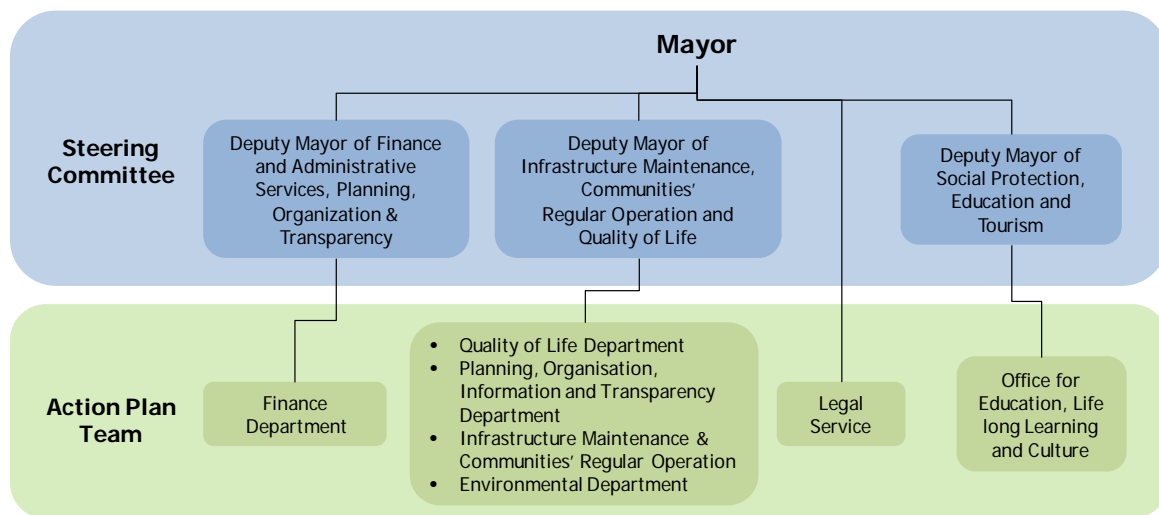


Figure 1.3: Administrative Structure

The overall estimated budget for the elaboration of the foreseen actions is 65.705.600 €. It should be noted that, a part of the estimated budget will come from external sources, such as European, national or regional funding schemes. In this context, the Municipality of Amyntaio has already focused its efforts on the participation in relevant funding programmes and initiatives, such as the Action Plan "ENERGOPOLIS", the programme "EKSIKONOMO" and the Operational Programme under the National Strategic Reference Framework (NSRF).

For the SEAP's monitoring, a series of monitoring indicators will be utilized, in order to achieve its adaptation to the real conditions and time schedules of the SEAP actions' implementation. Amyntaio will submit every two years a monitoring report, according to the guidelines of the CoM. The report will include information on the SEAP actions' implementation level and the related CO₂ reductions.

PART 2

Baseline Emission Inventory

2.1 Introduction

2.1.1 Inventory Year

According to the CoM's guidelines, the recommended baseline year is 1990, but if the local authority does not have data to compile a CO₂ inventory for 1990, then it should choose the closest subsequent year for which the most comprehensive and reliable data can be collected. To this, the selected inventory year for the Municipality of Amyntaio is 2009.

2.1.2 Emissions Factors

The Baseline Emission Inventory is based on "standard" emissions factors in line with the Intergovernmental Panel on Climate Change (IPCC) principles. This approach is based on the carbon content of each fuel, like in national greenhouse gas inventories in the context of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto protocol.

2.1.3 Study Fields

The Municipality of Amyntaio is predominantly a rural municipality, characterized by its increased energy consumption in the agricultural sector. Therefore, the separate study of the agricultural sector's energy consumption and the proposition of targeted actions/ measures were made within the framework of the SEAP. It is noted that the agricultural sector's consumptions are included in the related sectors (Tertiary, Transport) of the submitted Baseline Emissions Inventory Table, according to the CoM guidelines.

The Industrial sector was chosen not to be included in the Baseline Emission Inventory, taking into consideration the difficulty of data collection and the sector's optional character.

2.2 Agricultural Sector

The primary sector's activities lead to high energy consumption and include the operation of pumps for irrigation; use of tractors; operation of livestock. The total diesel consumption of the

agricultural sector is estimated at 35.662.420 kWh and the electricity consumption at 21.628.166 kWh. The following figure presents the energy consumption allocation in the agricultural sector.

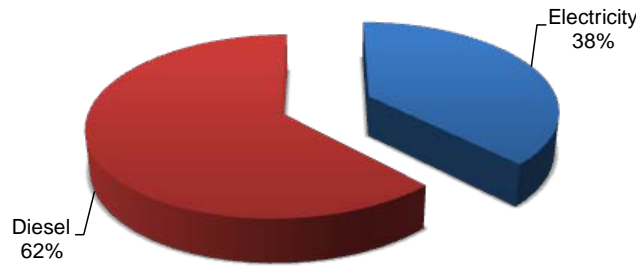


Figure 2.1: Energy consumption of the agricultural sector

2.3 Buildings, Equipment/Facilities and Industry

2.3.1 Municipal Buildings and Equipment/Facilities

This category includes all buildings operated by the municipality, such as nurseries, schools, offices, old people's homes, sport facilities, etc. Moreover, it includes municipal facilities related to water supply, irrigation and sewage treatment. Electricity, heating oil and district heating are used for heating. Electricity is used also for lighting, cooling, as well as electrical and mechanical equipment.

Table 2.1 illustrates the energy consumption of the municipal buildings and facilities, based on official data from the Municipality of Amyntaio (e.g. PPC invoices for electricity consumption, district heating data from the Municipal Company of District Heating of the greater Area of Amyntaio – DETEPA, heating oil from invoices of the respective providers).

Table 2.1: Energy consumption of the municipal buildings and equipment/facilities

	Heating Oil (lt)	Heating Oil (kWh)	District Heating (kWh)	Electricity (kWh)	Total (kWh)
Day nursery	70.266	702.660	176.568	54.874	934.102
Schools	190.580	1.905.799	956.566	249.713	3.112.078
Offices	140.807	1.408.070	327.750	839.018	2.574.838
Old people's home	5.294	52.943	62.523	21.741	137.207
Sport facilities	58.033	580.327	0	92.124	672.451
Facilities	0	0	0	3.240.937	3.240.937
Total	464.980	4.649.798	1.523.407	4.498.407	10.671.612

Figure 2.2 depicts the energy consumption allocation of the municipal buildings and equipment/facilities.

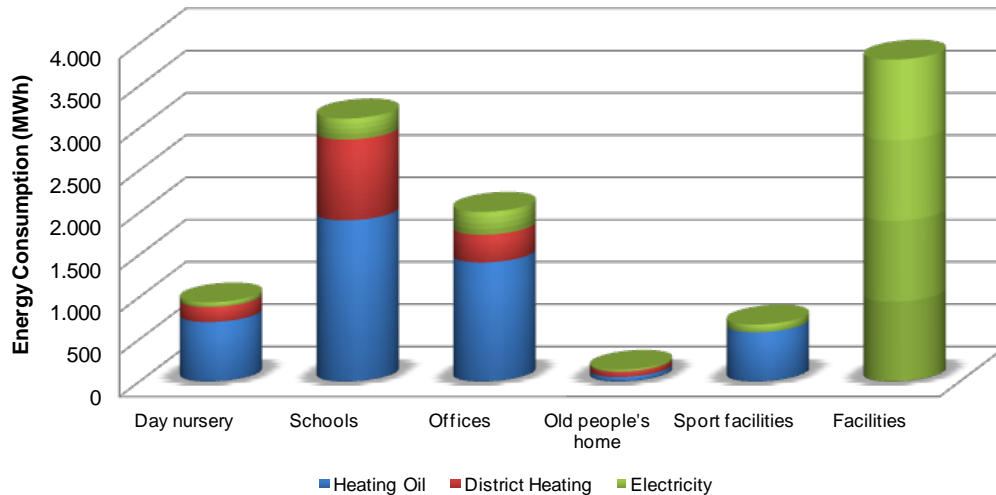


Figure 2.2: Energy consumption of the municipal buildings and equipment/facilities

2.3.2 Residential Buildings

Electricity

The electricity consumption of the residential sector is 19.538.420 kWh, based on the available data from the Public Power Corporation (PPC).

Heat

The heating oil, wood, district heating and electricity are used for heating in the residential buildings of Amyntaio. The energy consumption was calculated using a "bottom-up" approach, namely existing statistical data, specific energy consumption indicators and relevant studies.

- **District Heating:** Based on the available data from DETEPA, the energy consumption was 18.461.569 kWh in 2009.
- **Heating Oil:** The calculation of heating oil consumption is based on the available data from the Hellenic Statistical Authority (EL.STAT.) and the Municipality of Amyntaio regarding the area of residential buildings (Table 2.2). Moreover, specific indicators of the energy consumption were used, based on relevant studies.

Table 2.2: Area of residential buildings

	Detached houses		Block of apartments		Total (m ²)
	Central heating	With other heating	Central heating	With other heating	
After 1980	84.283	15.928	23.219	1.111	722.124
Before 1980	310.834	251.699	31.652	3.396	

In this context, the needs for thermal comfort of residential buildings with central heating using heating oil and district heating is estimated at 101.689.385 kWh.

Taking into consideration the fuel poverty, especially in rural areas with high thermal comfort needs, the actual energy consumption is estimated at 75% of the calculated thermal needs, as the population does not fully satisfy the conditions of thermal comfort. This result is based on the relevant study of EL.STAT. regarding living conditions in Greece and poverty level in 2009, which affects 27,6% of the population. Therefore, the total actual energy demand in the residential buildings with central heating is estimated at 76.267.038 kWh. Deducting district heating energy consumption and using an average efficiency of 85% for central heating systems, the estimated consumption of heating oil is 68.006.434 kWh.

According to a relevant study of the National Observatory of Athens and the available data of EL.STAT., the residential buildings with other form of heating use 37,5% oil stoves, 50% electricity and 12,5% open hearth fireplaces. In this context, the heating oil consumption is estimated at 15.698.413 kWh.

- **Other energy sources:** Taking into consideration the above analysis, the energy consumption for the operation of open hearth fireplaces and air conditioners is estimated at 10.465.609 kWh of biomass and 11.016.430 kWh of electricity, respectively. The calculation of solar energy is based on a relevant study regarding the energy saving from solar panels' installation (6,6 kWh/m²) and the rate of installed solar panels on buildings (30%).

The total thermal requirements of the residential buildings in the municipality of Amyntaio are presented in Figure 2.3.

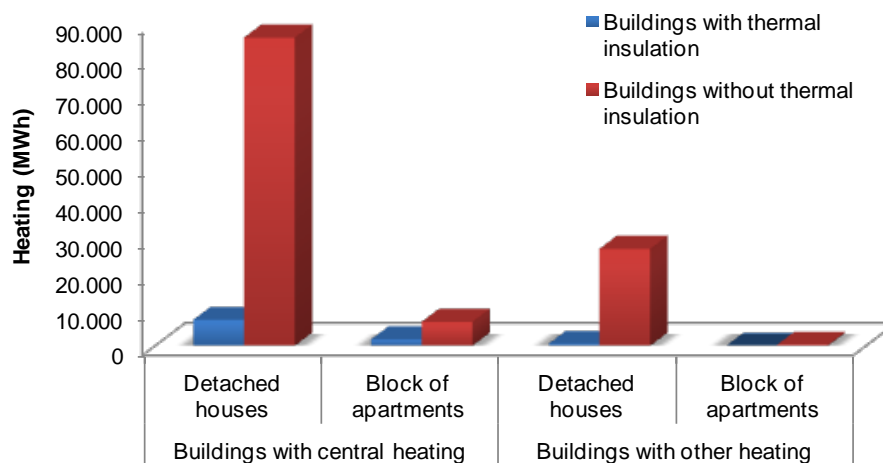


Figure 2.3: Thermal requirements of the residential buildings

The total energy consumption of the residential buildings is shown in Table 2.3.

Table 2.3: Energy Consumption of the residential buildings per category

Category	Electricity	Heat	Heating oil	Biomass	Solar energy	Total
Energy Consumption (kWh)	19.538.420	18.461.569	83.704.847	10.465.609	1.429.804	133.600.249

2.3.3 Tertiary (non Municipal) Buildings, Equipment/Facilities

The electricity consumption of the tertiary sector is estimated at 15.181.493 kWh, based on the available data from PPC. The heating oil and district heating are used for the thermal needs of the tertiary sector. The heating oil consumption was calculated using the total heating oil consumption at the municipal level minus the relevant consumptions of the municipal and residential buildings. The total heating oil consumption data for Florina district was provided by the Directorate of Petroleum Policy, Ministry of Environment, Energy & Climate Change, while population ratios were used for the identification of heating oil consumption at the municipality level.

Table 2.4: Heating oil consumption

	Heating oil
District of Florina (metric tons)	23.929
Municipality of Amyntaio (metric tons)	7.912
Municipality of Amyntaio (kWh)	95.678.003
Energy consumption in the tertiary sector (kWh)	7.323.358

Based on the available data from DETEPA, the district heating of the tertiary sector is 7.367.413 kWh. The energy consumption allocation in the tertiary sector is illustrated in Figure 2.4.

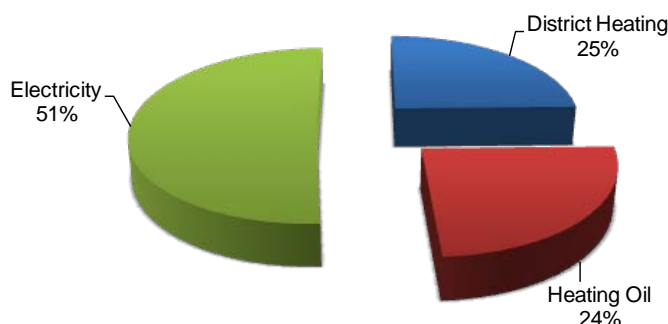


Figure 2.4: Energy consumption of the tertiary sector per energy source

2.3.4 Municipal Public Lighting

Concerning municipal public lighting, the data collection was based on the relevant PPC invoices for the Municipality. The electricity consumption allocation per municipal unit is presented in Table 2.5.

Table 2.5: Energy consumption of the municipal public lighting

Region	Energy Consumption (kWh)
Amyntaio	924.960
Filotas	525.364

Region	Energy Consumption (kWh)
Aetos	486.990
Nymfaio	23.355
Lechovo	76.028
Variko	36.596
Total	2.073.293

2.3.5 Industry

The Municipality of Amyntaio does not include the industry sector in the SEAP (not compulsory according to the CoM's guidelines) due to the limited available data.

2.4 Transport

2.4.1. Municipal fleet

The Municipality of Amyntaio has a number of vehicles, used to meet the needs of transport, collection and disposal of waste, emergency medical needs and technical support. The table below depicts the fuel consumption in 2009.

Table 2.6: Energy consumption per municipal unit

Municipal Unit	Diesel (lt)	Gasoline (lt)	Gasoline super 100 (lt)
Amyntaio	41.062	3.992	1.900
Filotas	20.469	4.105	0
Aetos	15.962	10.174	192
Nymfaio	4.103	4.207	0
Lechovo	4.729	1.561	0
Variko	328	644	0
Total (kWh)	866.530	227.079	19.246

2.4.2. Public transport

The energy consumption of the public transport was estimated using the available data from the operator of Florina bus station. In addition, the energy consumption of the school transport services (by buses) was taken also into consideration. The energy consumption of the public transport is presented in Table 2.7.

Table 2.7: Energy consumption of the public transport

	Km/ year	Average energy consumption (lt/100 km)	Conversion factor (kWh/lt)	Energy Consumption (kWh)
Buses	322.768	27,8	10	897.295
School transport services (by buses)	104.475	27,8	10	290.441
School transport services (by taxi)	76.738	10,2	10	78.196
Total				1.265.931

2.4.3. Private and Commercial Transport

The energy consumption of the private and commercial transport is calculated using data from the Department of Petroleum Policy of the Ministry of Environment, Energy and Climate Change, as well as the number of vehicles per fuel type at district and municipal level from the Department of Organization and Informatics, Ministry of Development, Competitiveness, Infrastructure, Transport and Networks.

Table 2.8: Number of vehicles and energy consumption

	Gasoline		Diesel	
	Vehicles	Consumption (tn)	Vehicles	Consumption (tn)
District of Florina	9.889	13.039	6.036	23.770
Municipality of Amyntaio	1976 (20%)	2.605	1667 (27,6%)	6.565
Municipality of Amyntaio (kWh)		31.279.833		79.379.694

It should be noted that, the energy consumption of private and commercial transport in the Municipality of Amyntaio is calculated by the municipal consumptions minus the energy consumptions of municipal fleet, public transport and agricultural sector.

Table 2.9: Energy Consumption of the private and commercial transport

	Gasoline (kWh)	Diesel (kWh)
Private and Commercial Transport	31.033.508	41.584.821

2.5 Final Energy Consumption

Table 2.10 presents the different energy commodities that are consumed by the end-users within the territory and are completed per category.

Table 2.10: Final energy consumption in the Municipality of Amyntaio

Category	FINAL ENERGY CONSUMPTION [MWh]							Total
	Electricity	Heat/cold	Fossil fuels			Renewable Energies		
			Heating Oil	Diesel	Gasoline	Biomass	Solar thermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:								
Municipal buildings, equipment/facilities	4.498,4	1.523,4	4.649,8	0,0	0,0	0,0	0,0	10.671,6
Tertiary (non municipal) buildings, equipement/facilities	15.181,5	7.367,4	7.323,4	0,0	0,0	0,0	0,0	29.872,3
Residential buildings	19.538,4	18.461,6	83.704,8	0,0	0,0	10.465,6	1.429,8	133.600,2
Municipal public lighting	2.073,3	0,0	0,0	0,0	0,0	0,0	0,0	2.073,3
Subtotal buildings, equipments/facilities and industries	41.291,6	27.352,4	95.678,0	0,0	0,0	10.465,6	1.429,8	176.217,4
TRANSPORT:								
Municipal fleet	0,0	0,0	0,0	866,5	246,3	0,0	0,0	1.112,9
Public transport	0,0	0,0	0,0	1.265,9	0,0	0,0	0,0	1.265,9
Private and commercial transport	0,0	0,0	0,0	41.584,8	31.033,5	0,0	0,0	72.618,3
Subtotal transport	0,0	0,0	0,0	43.717,3	31.279,8	0,0	0,0	74.997,1
AGRICULTURE SECTOR								
Agriculture	21.628,2	0,0	0,0	35.662,4	0,0	0,0	0,0	57.290,6
Total	62.919,8	27.352,4	95.678,0	79.379,7	31.279,8	10.465,6	1.429,8	308.505,1

2.6 Local Electricity Production

The Municipality of Amyntaio is an “energy producing” municipality. However, the municipality includes in its SEAP the “small” local plants/units for power generation. More specifically, the following criteria were taken into consideration:

- a) Plants/units are not included in the European Emissions Trading Scheme (ETS);
- b) Plants/units are below or equal to 20 MW as thermal energy input in the case of fuel combustion plants, or output for renewable (20 MW corresponds to the EU ETS threshold for combustion installations).

A large amount of electricity is produced within the territory from the power station Amyntaio – Filotas, based on Combined Heat and Power (CHP). However, this plant is of high installed capacity (2x300 MW) and it is included in the ETS. For these reasons, its electricity production is not included in the SEAP.

The local electricity production from photovoltaic installations included in the SEAP is estimated at 352,8 MWh.

2.7 Local Heat/Cold Production

District heating is provided by DETEPA to the local communities of Amyntaio, Philota and Levaia, including a CHP unit Amyntaio-Philota. Even though the Steam Power Plant's (SPP) thermal capacity is higher than 20MW (24MW_{th}), and the station is participating in the Greenhouse Gas Emissions Trading Scheme, thermal production was included in the municipality's SEAP, as the domestic, tertiary and municipal sector's thermal needs are satisfied through district heating, provided by the particular power plant.

According to DETEPA's data, within 2009, 31.511 MWh were purchased by PPC, amount identical to the thermal power produced by the SPP, while the total consumption of the previously mentioned sectors was 27.352,4 MWh. Therefore, the district heating network's losses amount to 13,2% of the thermal energy produced, as no own consumption exists.

2.8 CO₂ Emissions

The Baseline Emission Inventory is based on the “standard” emission factors in line with the IPCC principles. For CO₂ emissions' calculation the standard CO₂ emission factors for heating oil, gasoline, biomass and solar thermal energy are used, derived from the CoM's guidelines.

Figure 2.5 presents the contribution of each sector in the CO₂ emissions of the Municipality of Amyntaio.

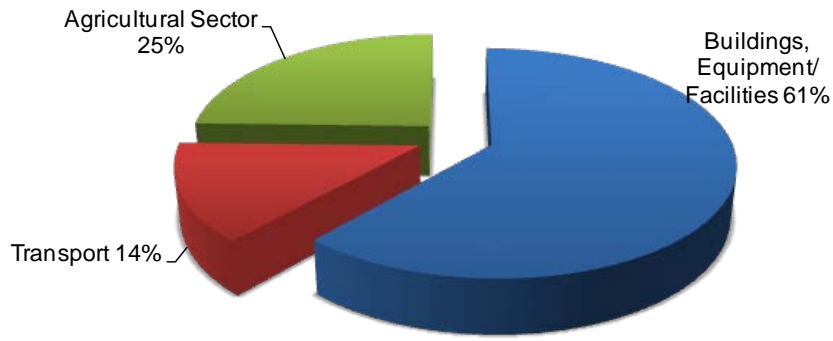


Figure 2.5: CO₂ Emissions per category

The CO₂ emissions per category and energy source are presented in Figure 2.6.

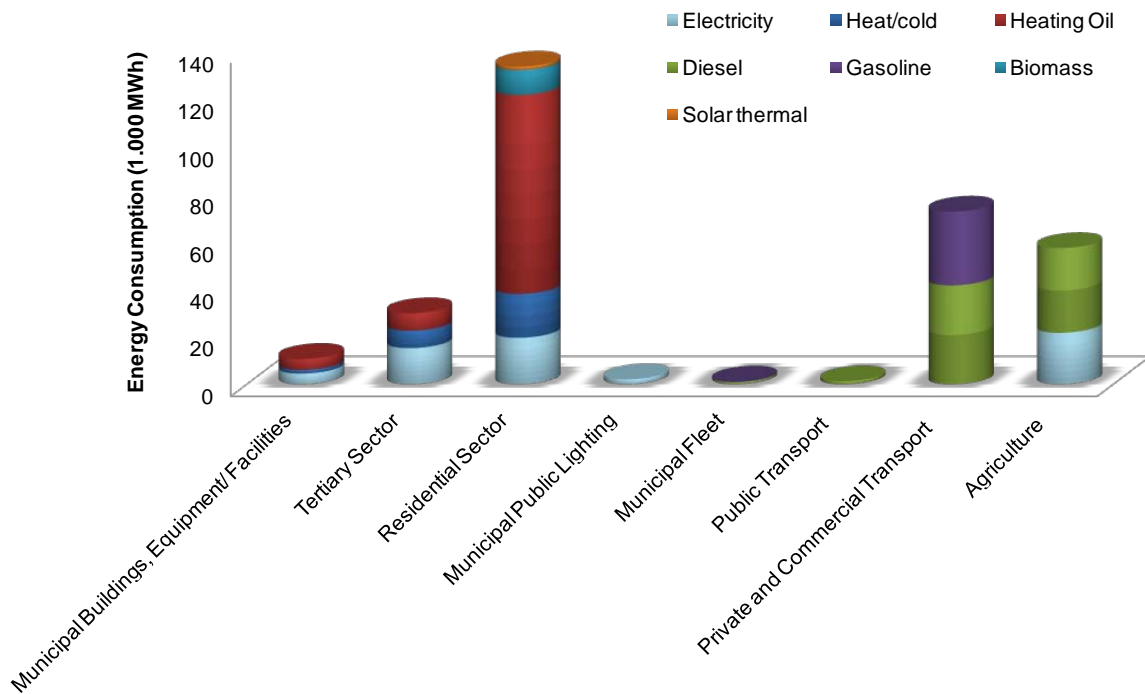


Figure 2.6: CO₂ emissions per energy source and sector

Table 2.11 refers to the sectors emitting greenhouse gases.

Table 2.11: CO₂ emissions in the Municipality of Amyntaio

Category	CO ₂ Emissions [t]							Total
	Electricity	Heat/cold	Fossil fuels			Renewable Energies		
			Heating Oil	Diesel	Gasoline	Biomass	Solar thermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:								
Municipal buildings, equipment/facilities	5.139,7	684,0	1.241,5	0,0	0,0	0,0	0,0	7.065,2
Tertiary (non municipal) buildings, equipment/facilities	17.345,7	3.308,0	1.955,3	0,0	0,0	0,0	0,0	22.609,0
Residential buildings	22.323,8	8.289,2	22.349,2	0,0	0,0	0,0	0,0	52.962,2
Municipal public lighting	2.368,9	0,0	0,0	0,0	0,0	0,0	0,0	2.368,9
Subtotal buildings, equipments/facilities and industries	47.178,0	12.281,2	25.546,0	0,0	0,0	0,0	0,0	85.005,3
TRANSPORT:								
Municipal fleet	0,0	0,0	0,0	224,4	61,3	0,0	0,0	285,8
Public transport	0,0	0,0	0,0	327,9	0,0	0,0	0,0	327,9
Private and commercial transport	0,0	0,0	0,0	10.770,5	7.727,3	0,0	0,0	18.497,8
Subtotal transport	0,0	0,0	0,0	11.322,8	7.788,7	0,0	0,0	19.111,5
AGRICULTURE SECTOR								
AGRICULTURE	24.711,4	0,0	0,0	9.236,6	0,0	0,0	0,0	33.948,0
Total	71.889,5	12.281,2	25.546,0	20.559,3	7.788,7	0,0	0,0	138.064,7

PART 3

Actions and Measures by 2020

3.1 Agricultural Sector

According to the energy baseline, the agricultural sector is responsible for the 19% of the total energy consumption in the Municipality of Amyntaio. In particular, electricity consumption is estimated at 21.628 MWh and diesel consumption at 35.662 MWh. Table 3.1 presents an overview of the actions/ measures in the agricultural sector.

Table 3.1: Actions/ measures in the agricultural sector

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
1.1 Establishment of a Department for Rural Development in the Municipality	2.291,6	1.358,3	150.000
1.2 Training seminars regarding the agricultural tractors' modernization and irrigation techniques	1.432,3	848,9	20.000
1.3 Implementation of wide informational campaign	572,9	339,6	16.000
1.4 Installation of an electronic water-supply system for irrigation based on debit cards	1.189,5	1.359,7	450.000

It should be noted that, the actions/ measures in the agricultural sector have been included in the relevant fields of the tertiary and transport sector in the submitted matrix to the CoM's website. More information about the actions/ measures in the agricultural sector are depicted in the tables below:

Table 3.2: Establishment of a department for rural development in the municipality

Action 1.1	Establishment of a department for rural development in the municipality
Start and End Time	2013/2020
Estimated Costs (€)	150.000
Expected Energy Saving (MWh/y)	2.291,6
Expected CO ₂ Reduction (tCO ₂ /y)	1.358,3
Financing	-Own resources

Table 3.3: Training seminars regarding the agricultural tractors' modernization and irrigation techniques

Action 1.2	Training seminars regarding the agricultural tractors' modernization and irrigation techniques
Start and End Time	2013/2020
Estimated Costs (€)	20.000
Expected Energy Saving (MWh/y)	1.432,3
Expected CO ₂ Reduction (tCO ₂ /y)	848,9
Financing	-Own resources

Table 3.4: Implementation of wide informational campaign

Action 1.3	Implementation of wide informational campaign
Start and End Time	2013/2020
Estimated Costs (€)	16.000
Expected Energy Saving (MWh/y)	572,9
Expected CO ₂ Reduction (tCO ₂ /y)	339,6
Financing	-Own resources

Table 3.5: Installation of an electronic water-supply system for irrigation based on debit cards

Action 1.4	Installation of an electronic water-supply system for irrigation based on debit cards
Start and End Time	2013/2020
Estimated Costs (€)	450.000
Expected Energy Saving (MWh/y)	1.189,5
Expected CO ₂ Reduction (tCO ₂ /y)	1.359,7
Financing	-Own resources -National programmes

3.2 Buildings, Equipment/Facilities and Industry

This sector is responsible for 57,1% of the energy consumption in the Municipality of Amyntaio. This consumption includes municipal buildings equipment and facilities (6%), tertiary sector (17%) and residential sector (76%), as well as municipal/ public lighting (1%).

3.2.1 Municipal Buildings and Equipment/Facilities

Table 3.6 presents an overview of the actions/ measures in the municipal buildings and equipment/facilities.

Table 3.6: Actions/ measures in the municipal buildings and equipment/facilities

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
2.1 Energy certification and improvement of the municipal buildings' energy performance	239,8	131,9	400.000
2.2 Actions and campaigns for awareness raising of municipal employees	32,5	20,0	2.000
2.3 Improvement of the school buildings' energy performance	357,9	327,7	1.000.000
2.4 Actions and campaigns for awareness raising of pupils and students	48,6	40,5	5.000
2.5 Improvement of the sports facilities' energy performance	134,5	52,0	500.000
2.6 Improvement of the energy performance of the water system and sewage treatment facilities	304,6	348,2	280.000
2.7 Establishment of the Energy Efficiency Department in the Municipality	-	-	240.000
2.8 Appointment of the municipality energy manager	106,7	70,7	120.000
2.9 Remote configuration and control of the water system	115,0	131,4	900.000

More information about the actions/ measures in the municipal buildings and equipment/facilities are depicted in the tables below:

Table 3.7: Energy certification and improvement of the municipal buildings' energy performance

Action 2.1	Energy certification and improvement of the municipal buildings' energy performance
Start and End Time	2013/2017
Estimated Costs (€)	400.000
Expected Energy Saving (MWh/y)	239,8
Expected CO ₂ Reduction (tCO ₂ /y)	131,9
Financing	-Own resources -National programmes

Table 3.8: Actions and campaigns for awareness raising of pupils and students

Action 2.2	Actions and campaigns for awareness raising of municipal employees
Start and End Time	2013/2020
Estimated Costs (€)	2.000
Expected Energy Saving (MWh/y)	32,5
Expected CO ₂ Reduction (tCO ₂ /y)	20,0
Financing	-Own resources

Table 3.9: Improvement of the school buildings' energy performance

Action 2.3	Improvement of the school buildings' energy performance
Start and End Time	2013/2017
Estimated Costs (€)	1.000.000
Expected Energy Saving (MWh/y)	357,9
Expected CO ₂ Reduction (tCO ₂ /y)	327,7
Financing	-Own resources -National programmes

Table 3.10: Actions and campaigns for awareness raising of pupils and students

Action 2.4	Actions and campaigns for awareness raising of pupils and students
Start and End Time	2013/2017
Estimated Costs (€)	5.000
Expected Energy Saving (MWh/y)	48,6
Expected CO ₂ Reduction (tCO ₂ /y)	40,5
Financing	-Own resources

Table 3.11: Improvement of the sports facilities' energy performance

Action 2.5	Improvement of the sports facilities' energy performance
Start and End Time	2015/2016
Estimated Costs (€)	500.000
Expected Energy Saving (MWh/y)	134,5
Expected CO ₂ Reduction (tCO ₂ /y)	52
Financing	-Own resources -National programmes

Table 3.12: Improvement of the energy performance of the water system and sewage treatment facilities

Action 2.6	Improvement of the energy performance of the water system and sewage treatment facilities
Start and End Time	2012/2016
Estimated Costs (€)	280.000
Expected Energy Saving (MWh/y)	304,6
Expected CO ₂ Reduction (tCO ₂ /y)	348,2
Financing	-Own resources -National programmes

Table 3.13: Establishment of the Energy Efficiency Department in the Municipality

Action 2.7	Establishment of the Energy Efficiency Department in the Municipality
Start and End Time	2013/2020
Estimated Costs (€)	240.000
Financing	-Own resources

Table 3.14: Appointment of the municipality energy manager

Action 2.8	Appointment of the municipality energy manager
Start and End Time	2013/2020
Estimated Costs (€)	120.000
Expected Energy Saving (MWh/y)	106,7
Expected CO ₂ Reduction (tCO ₂ /y)	70,7
Financing	-Own resources

Table 3.15: Remote configuration and control of the water system

Action 2.9	Remote configuration and control of the water system
Start and End Time	2014/2017
Estimated Costs (€)	900.00
Expected Energy Saving (MWh/y)	115,0
Expected CO ₂ Reduction (tCO ₂ /y)	131,4
Financing	-Own resources -National programmes -Community programmes

3.2.2 Residential Buildings

The Municipality of Amyntaio does not have the opportunity for direct interventions in the residential buildings. To this end, the relevant actions will be focused on awareness raising. An overview of the actions/ measures in the residential buildings is presented in Table 3.16.

Table 3.16: Actions/ measures in the residential buildings

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€/y)
3.1 Implementation of campaigns, events, energy days for the citizens	3.651,1	1.589,1	40.000
3.2 Design and distribution of brochures about the benefits of interventions in the residential buildings	1.825,6	794,6	24.000
3.3 Establishment of the Energy Efficiency Department in the Municipality	3.164,3	1.377,2	<i>Included in the relevant action of the municipal sector</i>
3.4 Initiatives to support the citizens' actions	1.217,0	529,7	32.000

More information about the actions/ measures in the residential buildings are depicted in the tables below:

Table 3.17: Implementation of campaigns, events, energy days for the citizens

Action 3.1	Implementation of campaigns, events, energy days for the citizens
Start and End Time	2013/2020
Estimated Costs (€)	40.000
Expected Energy Saving (MWh/y)	3.651,1
Expected CO ₂ Reduction (tCO ₂ /y)	1.589,1
Financing	-Own resources

Table 3.18: Design and distribution of brochures about the benefits of interventions in the residential buildings

Action 3.2	Design and distribution of brochures about the benefits of interventions in the residential buildings
Start and End Time	2013/2020
Estimated Costs (€)	24.000
Expected Energy Saving (MWh/y)	1.825,6
Expected CO ₂ Reduction (tCO ₂ /y)	794,6
Financing	-Own resources

Table 3.19: Establishment of the Energy Efficiency Department in the Municipality

Action 3.3	Establishment of the Energy Efficiency Department in the Municipality
Start and End Time	2013/2020
Expected Energy Saving (MWh/y)	3.164,3
Expected CO ₂ Reduction (tCO ₂ /y)	1.377,2

Table 3.20: Initiatives to support the citizens' actions

Action 3.4	Initiatives to support the citizens' actions
Start and End Time	2013/2020
Estimated Costs (€)	32.000
Expected Energy Saving (MWh/y)	1.217,0
Expected CO ₂ Reduction (tCO ₂ /y)	529,7
Financing	-Own resources

3.2.3 Tertiary (non Municipal) Buildings, Equipment/Facilities

An overview of the actions/ measures in the tertiary (non municipal) buildings, equipment/facilities is presented in Table 3.21.

Table 3.21: Actions/ measures in the tertiary (non municipal) buildings, equipment/facilities

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
4.1 Targeted seminars to professional groups	1.194,9	904,6	40.000
4.2 Information on various energy issues through leaflets, newspapers, etc.	896,2	678,5	12.000
4.3 Establishment of the Energy Efficiency Department	597,4	452,3	<i>Included in the relevant action of the municipal sector</i>

More information about the actions/ measures in the tertiary (non municipal) buildings, equipment/facilities are depicted in the tables below:

Table 3.22: Targeted seminars to professional groups

Action 4.1	Targeted seminars to professional groups
Start and End Time	2013/2020
Estimated Costs (€)	40.000
Expected Energy Saving (MWh/y)	1.194,9

Expected CO ₂ Reduction (tCO ₂ /y)	904,6
Financing	-Own resources

Table 3.23: Information on various energy issues through leaflets, newspapers, etc

Action 4.2	Information on various energy issues through leaflets, newspapers, etc
Start and End Time	2013/2020
Estimated Costs (€)	12.000
Expected Energy Saving (MWh/y)	896,2
Expected CO ₂ Reduction (tCO ₂ /y)	678,5
Financing	-Own resources

Table 3.24: Establishment of the Energy Efficiency Department

Action 4.3	Establishment of the Energy Efficiency Department
Start and End Time	2013/2020
Expected Energy Saving (MWh/y)	597,4
Expected CO ₂ Reduction (tCO ₂ /y)	452,3

3.2.4 Municipal Public Lighting

An overview of the actions/ measures in the municipal public lighting is presented in Table 3.25.

Table 3.25: Actions/ measures in the municipal public lighting

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
5.1 Study of the municipal lighting	103,7	118,5	50.000
5.2 Gradual replacement of the existing bulbs in the public lighting with more efficient ones	186,6	213,3	250.000
5.3 Installation of a public lighting management system	264,3	302,1	400.000

More information about the actions/ measures in the municipal public lighting are depicted in the tables below:

Table 3.26: Study of the municipal lighting

Action 5.1	Study of the municipal lighting
Start and End Time	2014/2015
Estimated Costs (€)	50.000
Expected Energy Saving (MWh/y)	103,7

Expected CO ₂ Reduction (tCO ₂ /y)	118,5
Financing	-Own resources

Table 3.27: Gradual replacement of the existing bulbs in the public lighting with more efficient ones

Action 5.2	Gradual replacement of the existing bulbs in the public lighting with more efficient ones
Start and End Time	2014/2017
Estimated Costs (€)	250.000
Expected Energy Saving (MWh/y)	186,6
Expected CO ₂ Reduction (tCO ₂ /y)	213,3
Financing	-Own resources

Table 3.28: Installation of a public lighting management system

Action 5.3	Installation of a public lighting management system
Start and End Time	2016/2018
Estimated Costs (€)	400.000
Expected Energy Saving (MWh/y)	264,3
Expected CO ₂ Reduction (tCO ₂ /y)	302,1
Financing	-Own resources -National programmes

3.2 Transport

According to the energy baseline, the transport sector is responsible for 24,4% of the total energy consumption of the Municipality of Amyntaio. Table 3.29 presents an overview of the actions/ measures in transport sector.

Table 3.29: Actions/ measures in transport

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
6.1 Replacement of the municipal vehicles with new, more efficient vehicles	70,5	18,1	1.000.000
6.2 Efficient management of the municipal fleet	22,3	5,7	10.000
6.3 Municipal fleet maintenance	72,3	18,6	20.000
6.4 Eco-driving seminars for the drivers of the municipal fleet	33,3	8,4	4.000

Actions/ Measures	Expected Energy Saving (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
6.5 Information events on the new vehicle technologies	1.103,8	281,2	40.000
6.6 Eco-driving promotion in the private transportation	3.630,9	924,9	40.000
6.7 Establishment of the Energy Efficiency Department	1.089,3	277,5	<i>Included in the relevant action of the municipal sector</i>
6.8 Increase the use of public transport and alternative modes of transport	4.720,2	1.202,4	800.000
6.9 Use of biofuels	-	697,2	-

3.2.1 Municipal Fleet and Public Transport

The Municipality's interventions towards fuel reduction in the municipal fleet will mostly result in economic benefits, as the impact in the Municipality's CO₂ emissions reduction will be quite small. However, activities dissemination will lead to citizens' exemplification, which will also lead to emission reduction in private and commercial transport.

More information about the actions/ measures in the municipal fleet and public transport are depicted in the tables below:

Table 3.30: Replacement of the municipal vehicles with new, more efficient vehicles

Action 6.1	Replacement of the municipal vehicles with new, more efficient vehicles
Start and End Time	2015/2019
Estimated Costs (€)	1.000.000
Expected Energy Saving (MWh/y)	70,5
Expected CO ₂ Reduction (tCO ₂ /y)	18,1
Financing	-Own resources -National programmes

Table 3.31: Efficient management of the municipal fleet

Action 6.2	Efficient management of the municipal fleet
Start and End Time	2014/2020
Estimated Costs (€)	10.000
Expected Energy Saving (MWh/y)	22,3
Expected CO ₂ Reduction (tCO ₂ /y)	5,7
Financing	-Own resources

Table 3.32: Municipal fleet maintenance

Action 6.3	Municipal fleet maintenance
Start and End Time	2014/2020
Estimated Costs (€)	20.000
Expected Energy Saving (MWh/y)	72,3
Expected CO ₂ Reduction (tCO ₂ /y)	18,6
Financing	-Own resources

Table 3.33: Eco-driving seminars for the drivers of the municipal fleet

Action 6.4	Eco-driving seminars for the drivers of the municipal fleet
Start and End Time	2013/2020
Estimated Costs (€)	4.000
Expected Energy Saving (MWh/y)	33,3
Expected CO ₂ Reduction (tCO ₂ /y)	8,4
Financing	-Own resources

3.2.3 Private and Commercial Transport

Details about the actions/ measures in the private and commercial transport are depicted in the tables below:

Table 3.34: Information events on the new vehicle technologies

Action 6.5	Information events on the new vehicle technologies
Start and End Time	2013/2020
Estimated Costs (€)	40.000
Expected Energy Saving (MWh/y)	1.103,8
Expected CO ₂ Reduction (tCO ₂ /y)	281,2
Financing	-Own resources

Table 3.35: Eco-driving promotion in the private transportation

Action 6.6	Eco-driving promotion in the private transportation
Start and End Time	2013/2020
Estimated Costs (€)	40.000
Expected Energy Saving (MWh/y)	3.630,9
Expected CO ₂ Reduction (tCO ₂ /y)	924,9
Financing	-Own resources

Table 3.36: Establishment of the Energy Efficiency Department

Action 6.7	Establishment of the Energy Efficiency Department
Start and End Time	2013/2020
Expected Energy Saving (MWh/y)	1.089,3
Expected CO ₂ Reduction (tCO ₂ /y)	277,5

Table 3.37: Increase the use of public transport and alternative modes of transport

Action 6.8	Increase the use of public transport and alternative modes of transport
Start and End Time	2014/2018
Estimated Costs (€)	800.000
Expected Energy Saving (MWh/y)	4.720,2
Expected CO ₂ Reduction (tCO ₂ /y)	1.202,4
Financing	-Own resources -National programmes

Table 3.38: Use of biofuels

Action 6.9	Use of biofuels
Start and End Time	2013/2020
Expected CO ₂ Reduction (tCO ₂ /y)	697,2
Financing	-Own resources -National programmes

3.4 Local Electricity Production

As regards the local electricity production, apart from the installation of photovoltaic systems, the construction of small dams and hydroelectric stations is planned. All actions/measures for local electricity production are depicted in Table 3.39.

Table 3.39: Actions/ measures for local electricity production

Actions/ Measures	Expected Energy Production (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
7.1 Photovoltaics in the buildings of the municipal sector	121,5	138,9	450.000
7.2 Information events on the installation of photovoltaic in the buildings of the residential sector	661,0	755,5	<i>Included in the relevant actions of the residential sector</i>
7.3 Information events on the installation of photovoltaic in the buildings of the tertiary sector	133,7	152,8	<i>Included in the relevant actions of the residential sector</i>

Actions/ Measures	Expected Energy Production (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
7.4 Installation of lighting points with photovoltaic panel	20,7	23,7	160.000
7.5 Promotion of the installation of small PV parks in agricultural lands	1.215,0	1.388,7	<i>Included in the relevant actions of the agricultural sector</i>
7.6 Installation of small-hydropower plants	1.360,0	2.381,2	1.200.000

More information about the actions/ measures for local electricity production are depicted in the tables below:

Table 3.40: Photovoltaics in the buildings of the municipal sector

Action	Photovoltaics in the buildings of the municipal sector
Start and End Time	2015/2018
Estimated Costs (€)	450.000
Expected Energy Production (MWh/y)	121,5
Expected CO ₂ Reduction (tCO ₂ /y)	138,9
Financing	-Own resources -National programmes

Table 3.41: Information events on the installation of photovoltaic in the buildings of the residential sector

Action	Information events on the installation of photovoltaic in the buildings of the residential sector
Start and End Time	2014/2020
Expected Energy Production (MWh/y)	661,0
Expected CO ₂ Reduction (tCO ₂ /y)	755,5

Table 3.42: Information events on the installation of photovoltaic in the buildings of the tertiary sector

Action	Information events on the installation of photovoltaic in the buildings of the tertiary sector
Start and End Time	2014/2020
Expected Energy Production (MWh/y)	133,7
Expected CO ₂ Reduction (tCO ₂ /y)	152,8

Table 3.43: Installation of lighting points with photovoltaic panel

Action	Installation of lighting points with photovoltaic panel
Start and End Time	2015/2017
Estimated Costs (€)	160.000
Expected Energy Production (MWh/y)	20,7
Expected CO ₂ Reduction (tCO ₂ /y)	23,7
Financing	-Own resources -National programmes

Table 3.44: Promotion of the installation of small PV parks in agricultural lands

Action	Promotion of the installation of small PV parks in agricultural lands
Start and End Time	2015/2017
Expected Energy Production (MWh/y)	1.215,0
Expected CO ₂ Reduction (tCO ₂ /y)	1.388,7

Table 3.45: Installation of small-hydropower plants

Action	Installation of small-hydropower plants
Start and End Time	2016/2019
Estimated Costs (€)	1.200.000
Expected Energy Production (MWh)	1.360,0
Expected CO ₂ Reduction (tCO ₂ /y)	2.381,2
Financing	-Own resources -National programmes

3.5 Local Heat Production

Apart from measures aiming to reduce losses, significant emission reduction may be achieved through the installation of heating oil systems or through electricity from the district heating system. The municipality's experience through the district heating operation in the areas of Amyntaio, Filotas and Lechovo illustrates that extension of such practices is the only way. The examined actions/measures concern the existing network's expansion, as well as the creation of new units in remote communities.

Table 3.46: Actions/ measures for local heat production

Actions/ Measures	Expected Energy (MWh/y)	Expected CO ₂ Reduction (tn CO ₂ /y)	Estimated Cost (€)
8.1 Expansion of the district heating distribution network and related installations and installation of a telemetry system for the distribution network and thermal substations		-3.666,9	13.230.000
8.2 Installation of biomass district heating systems in local communities	42.265,2	11.284,8	38.570.600
8.3 Infrastructure for biogas production	3.950,5	2.208,3	5.250.000

More information about the actions/ measures for local heat production are depicted in the tables below:

Table 3.47: Expansion of the district heating distribution network

Action	Expansion of the district heating distribution network and related installations and installation of a telemetry system for the distribution network and thermal substations
Start and End Time	2014/2018
Estimated Costs (€)	13.230.000
Expected Energy Production (MWh)	20.148
Expected CO ₂ reduction (tCO ₂ /y)	-3.666,9
Financing	-Own resources -National programmes -Community programmes

Table 3.48: Installation of biomass district heating systems in local communities

Action	Installation of biomass district heating systems in local communities
Start and End Time	2014/2018
Estimated Costs (€)	38.570.600
Expected Energy Production (MWh/y)	42.265,2
Expected CO ₂ Reduction (tCO ₂ /y)	11.284,8
Financing	-Own resources -National programmes -Community programmes

Table 3.49: Infrastructure for biogas production

Action	Infrastructure for biogas production	
Start and End Time	2014/2018	
Estimated Costs (€)	5.250.000	
Expected Energy Production (MWh/y)	Electricity	1.316,8
	Heat	2.633,7
Expected CO ₂ Reduction (tCO ₂ /y)	2.208,3	
Financing	-Own resources	
	-National programmes	
	-Community programmes	

3.6 Overall Target

The overall CO₂ emission reduction target by 2020 of the Municipality of Amyntaio is 21,8%. In this context, the municipality has committed to implement a series of appropriate RES and RUE activities in its territory, based on its financial potentials.

Table 3.50: Target per sector

Τομέας	Expected Energy Saving/ Production (MWh)	Expected CO ₂ Reduction (tn CO ₂)	Estimated Cost (€)
Agriculture	5.486,3	3.906,5	636.000
Municipal buildings, equipment/ facilities	1.339,7	1.122,4	3.447.000
Residential buildings	9.858,1	4.290,6	96.000
Tertiary (non municipal) buildings, equipment/facilities	2.688,5	2.035,4	52.000
Municipal public lighting	554,6	633,9	700.000
Transport	10.742,5	3.433,8	1.914.000
Local electricity production	3.511,9	4.840,8	1.810.000
Local heat production	46.215,7	9.826,3	57.050.600
Total	80.397,3	30.089,8	65.705.600

3.7 Monitoring

For the SEAP's monitoring, a series of monitoring indicators will be utilized, in order to achieve its adaptation to the real conditions and time schedules of the SEAP actions' implementation. Amyntaio will submit every two years a monitoring report, according to the guidelines of the

CoM. The report will include information on the SEAP actions' implementation level and the related CO₂ reductions.

Table 3.51: Monitoring Indicators

Sector	Indicator	Monitoring
Agriculture	<ul style="list-style-type: none"> Energy consumption in the agricultural sector Number of citizens served by the Department for Rural Development Number of informational events Number of printed dissemination material Energy consumption for irrigation 	<ul style="list-style-type: none"> Municipality of Amyntaio PPC Hellenic Statistical Authority Local agricultural cooperative
Municipal Buildings, Equipment/Facilities	<ul style="list-style-type: none"> Energy consumption of municipal buildings and facilities Energy certification of municipal buildings and facilities Number of employees in the Energy Efficiency Department Appointment of the municipality energy manager 	<ul style="list-style-type: none"> Municipality of Amyntaio PPC DETEPA
Residential Sector	<ul style="list-style-type: none"> Energy consumption in residences Number of informational events for citizens Number of printed material disseminated to citizens Number of citizens served by the Energy Efficiency Department 	<ul style="list-style-type: none"> Municipality of Amyntaio PPC DETEPA Hellenic Statistical Authority Indicators from relevant literature studies
Tertiary Sector	<ul style="list-style-type: none"> Energy consumption in the tertiary sector Number of informational events for professionals Number of printed material disseminated to professionals Number of professionals served by the Energy Efficiency Department 	<ul style="list-style-type: none"> Municipality of Amyntaio PPC DETEPA Hellenic Statistical Authority Directorate of Petroleum Policy, Ministry of Environment, Energy & Climate Change Indicators from relevant literature studies
Municipal Public Lighting	<ul style="list-style-type: none"> Electricity consumption in the municipal public lighting Study of the municipal lighting Number of bulbs replaced to more efficient bulbs Installation of a public lighting management system 	<ul style="list-style-type: none"> Municipality of Amyntaio PPC
Transport Sector	<ul style="list-style-type: none"> Energy consumption in transport Number of municipal vehicles with more efficient ones Number of drivers of the municipal fleet trained under the Eco driving framework Number of informational events for citizens 	<ul style="list-style-type: none"> Municipality of Amyntaio Directorate of Petroleum Policy, Ministry of Environment, Energy & Climate Change

Sector	Indicator	Monitoring
	<ul style="list-style-type: none"> • Number of printed material disseminated to citizens • Number of citizens trained under the Eco driving framework • Number of citizens served from the Energy Efficiency Department • Number of citizens using public transport • Number of municipal itineraries re launched • Total kilometers of cycle paths and sidewalks 	<ul style="list-style-type: none"> • Department of Organization and Informatics, Ministry of Development, Competitiveness, Infrastructure, Transport and Networks • Hellenic Statistical Authority • Indicators from relevant literature studies
Local Electricity Production	<ul style="list-style-type: none"> • Total amount of electricity produced from RES within the municipality's area • Total installed power from photovoltaics in the municipal buildings • Total installed power from photovoltaics in residences • Total installed power from photovoltaics in the buildings of the tertiary sector • Number of lighting points with photovoltaic panel in the streets and squares • Total installed power from photovoltaics in agricultural land • Total installed power from small dams and hydroelectric stations 	<ul style="list-style-type: none"> • Municipality of Amyntaio • PPC
Local Heat Production	<ul style="list-style-type: none"> • Heat production through the expansion of the district heating installation • Heat production through the installation of a biomass district heating system in local communities • Electricity produced through biogas production infrastructure • Reductions of heating losses in the district heating network 	<ul style="list-style-type: none"> • Municipality of Amyntaio • DETEPA